Prepared for
Commander, U.S. Pacific Fleet, Executive Agent

In accordance with
The National Environmental Policy Act and
Executive Order 12114

MARIANA ISLANDS RANGE COMPLEX

ENVIRONMENTAL IMPACT STATEMENT/

OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Volume 2 of 3

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Final

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Acronyms and Abbreviations

µg/L	micrograms per liter
µm	micrometers
µg/m^3	micrograms per cubic meter
µPa^2-s	squared micropascal-second
µPa	micropascal
A-	Alert Area
A-A	Air-to-Air
A-G	Air-to-Ground
A-S	Air-to-Surface
AFB	Air Force Base
AAFB	Andersen Air Force Base
AAMEX	Air-to-Air Missile Exercise
AAV	Amphibious Assault Vehicle
AAW	Anti-Air Warfare
ABR	Auditory Brainstem Response
ACHP	Advisory Council on Historic Preservation
ACM	Air Combat Maneuvers
ADAR	Air Deployed Active Receiver
ADC	Acoustic Device Countermeasure
ADV	SEAL Delivery Vehicle
AEER	Advanced Extended Echo Ranging
AEP	Auditory Evoked Potentials
AESA	Airborne Electronically Scanned Array
AFAST	Atlantic Fleet Active Sonar Training
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AGE	Aerospace Ground Equipment
AGL	Above Ground Level
AICUZ	Air Installations Compatible Use Zones
AIM	Air Intercept Missile
AK	Alaska
AMRAAM	Advanced Medium-Range Air-to-Air Missile
AMSP	Advanced Multi-Static Processing Program
AMW	Amphibious Warfare
ANNUALEX	Annual Exercise
AOR	area of responsibility
APCD	Air Pollution Control District
APZ	Accident Potential Zones
AQCR	Air Quality Control Region
AR	Army Reserves
AR-Marianas	Army Reserves Marianas
Army	U.S. Army
ARPA	Archaeological Resources Protection Act
ARS	Advance Ranging Source
ARTCC	Air Route Traffic Control Center
AS	Assault Support
ASDS	Advanced SEAL Delivery System
ASL	Above Sea Level
ASTA	Andersen South Training Area
ASTM	American Society for Testing and Materials
ASUW	Anti-Surface Warfare
ASW	Anti-Submarine Warfare
AT	Anti-Terrorism
AT/FP	Anti-Terrorism/Force Protection
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
atm	atmosphere (pressure)
ATOC	Acoustic Thermometry of Ocean Climate
ATSDR	Agency for Toxic Substances and Disease Registry
AUPM	Above & Underground Storage Tanks and Pesticide Management
AUTEC	Atlantic Undersea Test and Evaluation Center
AV-8B	Vertical/Short Takeoff and Landing Strike Aircraft
AW	Air Warfare
B-1	Strategic Bomber
B-2	Stealth Bomber
B-52	Strategic Bomber
BA	Biological Assessment
BAMS	Broad Area Maritime Surveillance
BASH	Bird Aircraft Strike Hazard
BDA	Battle-Damage Assessment
BDU	Bomb Dummy Unit
BH	Breacher House
BMDTF	Ballistic Missile Defense Task Force
BMP	Best Management Practices
BO	Biological Opinion
BOMBEX	Bombing Exercise
BQM	Aerial Target Drone Designation
BRAC	Base Realignment and Closure
BSP	Bureau of Statistics and Plans
BSS	Beaufort Sea State
BZO	Battle Sight Zero
°C	degrees Centigrade
C2	Command and Control
C-4	Composition 4
C-130	Military Transport Aircraft
CA	California
CAA	Clean Air Act
CAL	Confined Area Landing
CAN	Center for Naval Analysis
CAS	Close Air Support
CASS	Comprehensive Acoustic System Simulation
CASS-GRAB	Comprehensive Acoustic System Simulation Gaussian Ray Bundle
CATM	Combat Arms and Training Maintenance
CATMEX	Captive Air Training Missile Exercise
cc	cubic centimeter(s)
CCD	Carbonate Compensation Depth
CCF	Combined Control Facility
CDF	Cumulative Distribution Function
CDS	Container Delivery System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CG	Cruiser
CHAFFEX/FLAREX	Chaff/Flare Exercise
CHESS	Chase Encirclement Stress Studies
CI	Confidence Interval
CIP	Capital Improvements Program
CITES	Convention on International Trade In Endangered Species
CIWS	Close-in Weapons System
cm	centimeters
CMC	Northern Mariana Islands Commonwealth Code

CMP	Coastal Management Plan
CNEL	Community Noise Equivalent Level
CNO	Chief of Naval Operations
CNRM	Commander, Navy Region Marianas
CNMI	Commonwealth of the Northern Mariana Islands
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COMNAVREG	Commander, Navy Region Marianas
COMNAVMAR	Commander, United States Naval Forces Marianas
COMPACFLT	Commander, Pacific Fleet
COMPTUEX	Composite Training Unit Exercise
COMSUBPAC	Commander, Submarine Forces Pacific
CONEX	Container Express (Shipping Container)
CONUS	Continental United States
CPF	Commander, U.S. Pacific Fleet
CPRW	Commander, Patrol and Reconnaissance Wing
CPX	Command Post Exercise
CQC	Close Quarters Combat
CR	Control Regulation
CRE FMP	Coral Reef Ecosystem Fishery Management Plan
CRG	Contingency Response Group
CRM	Coastal Resources Management
CRRC	Combat Rubber Raiding Craft
CRU	Cruiser
CSAR	Combat Search and Rescue
CSG	Carrier Strike Group
CSS	Commander, Submarine Squadron
CT	Computerized Tomography
CTF	Cable Termination Facility
CUC	Commonwealth Utilities Corporation
CV	Coefficients of Variation
CVN	Aircraft Carrier, Nuclear
CW	Continuous Wave
CWA	Clean Water Act
CY	Calendar Year
CZ	Clear Zones
CZMA	Coastal Zone Management Act
DARPA	Defense Advanced Research Programs Agency
DAWR	Division of Aquatic and Wildlife Resources
dB	Decibel
dBA	A-Weighted Sound Level
DBDBV	Digital Bathymetry Data Base Variable
DDG	Guided Missile Destroyer
DDT	Dichlorodiphenyltrichloroethane
DES	Destroyer
DESRON	Destroyer Squadron
DEQ	Department of Environmental Quality
DFW	CNMI Division of Fish and Wildlife
DICASS	Directional Command Activated Sonobuoy System
DLCD	Department of Land Conservation and Development
DNL	Day-Night Average A-Weighted Sound Level
DNT	Dinitrotoluene
DoD	Department of Defense
DoD REP	DoD Representative Guam, Commonwealth of Northern Mariana Islands, Federated States of Micronesia and Republic of Palau
DoN	Department of Navy
DPW	Department of Public Works
DTR	Demolition Training Range
DZ	Drop Zone
EA-6	Electronic Attack Aircraft
EA-18	Electronic Warfare Aircraft
EA	Electronic Attack
EA	Environmental Assessment
EAC	Early Action Compact
EC	Electronic Combat
EC OPS	Chaff and Electronic Combat
ECSWTR	East Coast Shallow-Water Training Range
EDS	Emergency Detonation Site
EER	Extended Echo Ranging
EEZ	Exclusive Economic Zone
EFD	Energy Flux Density
EFH	Essential Fish Habitat
EFSEC	Energy Facility Site Evaluation Council
EGTTR	Eglin Gulf Test and Training Range
EIS	Environmental Impact Statement
EL	Sound Energy Flux Density Level
EMATT	Expendable Mobile ASW Training Target
EMR	Electromagnetic Radiation
EMUA	Exclusive Military Use Area
ENP	Eastern North Pacific
ENSO	El Niño/Southern Oscillation
EO	Executive Order
EOD	Explosive Ordnance Disposal
EODMU	Explosive Ordnance Disposal Mobile Unit
EPA	Environmental Protection Agency
EPAct	Energy Policy Act
EPCRA	Emergency Planning and Community Right to Know Act
ER	Extended Range
ES	Electronic Support
ESA	Endangered Species Act
ESG	Expeditionary Strike Group
ESGEX	Expeditionary Strike Group Exercise
ESQD	Explosive Safety Quantity Distance
ET	Electronically Timed
ETP	Eastern Tropical Pacific
EW	Electronic Warfare
EX	Exercise
EXTORP	Exercise Torpedo
°F	degrees Fahrenheit
FA-18	Flight/Attack Strike Fighter
FAA	Federal Aviation Administration
FAC	Forward Air Control
FACSFAC	Fleet Area Control and Surveillance Facility
FAD	Fish Aggregating Devices
FARP	Fuel and Armament Replenishment Point
FAST	Floating At-Sea Target
FAST	Fleet Anti-Terrorism Security Team
FCLP	Field Carrier Landing Practice
FDM	Farallon de Medinilla
FDNF	Forward Deployed Naval Forces
FEA	Final Environmental Assessment
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FFG	Frigate
FHA	Federal Housing Administration
FICUN	Federal Interagency Committee On Urban Noise
FIP	Federal Implementation Plan
FIREX	Fire Support
FIRP	Flood Insurance Rate Map
FISC	Fleet and Industrial Supply Center
FHA	Federal Housing Administration
FL	Flight Level
FM	Frequency Modulated

FMC	Fishery Management Council
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FP	Force Protection
FP	fibropapillomatosis
FR	Federal Register
FRP	Facility Response Plan
FRTP	Fleet Response Training Plan
FSAR	Finegayan Small Arms Ranges
FSM	Federated States of Micronesia
ft	feet
ft^2	square feet
FTX	Field Training Exercise
FUTR	Fixed Underwater Tracking Range
FY	Fiscal Year
FY04 NDAA	National Defense Authorization Act For Fiscal Year 2004
g	gram
GBU	Guided Bomb Unit
GCA	Guam Code Annotated
GCA	Ground Controlled Approach
GCE	Ground Combat Element
GCMP	Guam Coastal Management Plan
GDEM	Generalized Digital Environmental Model
GDP	Gross Domestic Product
GEPA	Guam Environmental Protection Agency
GHG	greenhouse gas
GIAA	Guam International Airport Authority
GIAT	Guam International Air Terminal
GJMMP	Guam Joint Military Master Plan
GLUP	Guam Land Use Plan
GNWR	Guam National Wildlife Refuge
GovGuam	Government of Guam
GRAB	Gaussian Ray Bundle
GUANG	Guam Air National Guard
GUARNG	Guam Army National Guard
GUNEX	Gunnery Exercise
GVB	Guam Visitors Bureau
HABS	Historic American Building Survey
HADR	Humanitarian and Disaster Relief
HAER	Historic American Engineering Record
HAPC	Habitat Areas of Particular Concern
HARM	High Speed Anti-radiation Missile
HC	Helicopter Coordinator
HC(A)	Helicopter Coordinator (Airborne)
HCN	Hydrogen Cyanide
HE	High Explosive
HELO	Helicopter
HFA	High-Frequency Active
HFBL	High-Frequency Bottom Loss
HFM3	High Frequency Marine Mammal Monitoring Sonar System
HH	Helicopter Designation (Typically Search/Rescue/Medical Evacuation))
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HMX	High Melting Explosive
HPA	Hypothalamic-pituitary-adrenal
HPO	Historic Preservation Officer
hr	hour
HRST	Helicopter Rope Suspension Training
HSC	Helicopter Sea Combat
HSWA	Hazardous and Solid Waste Act
HUD	Department of Housing and Urban Development
Hz	hertz
IAH	Inner Apra Harbor
IBB	International Broadcasting Bureau
ICAP	Improved Capability
ICMP	Integrated Comprehensive Monitoring Program
ICRMP	Integrated Cultural Resource Management Plan
ICWC	International Whaling Commission
IED	Improvised Explosive Device
IEER	Improved Extended Echo Ranging
IFR	Instrument Flight Rules
IHA	Incidental Harassment Authorization
III MEF	Third Marine Expeditionary Force
in.	inch
in^3	cubic inch
INRMP	Integrated Natural Resource Management Plan
IOC	Initial Operating Capability
IP	Implementation Plan
IR	infrared
ISR	Intelligence, Surveillance, and Reconnaissance
ISR/Strike	Intelligence, Surveillance, and Reconnaissance/Strike
IUCN	The World Conservation Union
IWC	International Whaling Commission
JDAM	Joint Direct Attack Munition
JFCOM	Joint Forces Command
JGPO	Joint Guam Program Office
JLOTS	Joint Logistics over the shore
JNTC	Joint National Training Capability
JSOW	Joint Stand-Off Weapon
JTFEX	Joint Task Force Exercise
JUCAS	Joint Unmanned Combat Air System
KD	Known Distance
KE	Kinetic Energy
kg	kilogram
kHz	kilohertz
km	kilometer
km^2	square kilometer
kts	knots
LAV	Light Armored Vehicle
lb	pound
LBA	Lease Back Area
LCAC	Landing Craft Air Cushion
LCE	Logistics Combat Element
LCS	Littoral Combat Ship
LCU	Landing Craft Utility
LFA	Low-Frequency Active
LFBL	Low-Frequency Bottom Loss
L_{eq}	Equivalent Sound Level
LHA	Amphibious Assault Ship
LHD	Amphibious Assault Ship
L_{max}	Maximum Sound Level
LGB	Laser Guided Bomb
LGTR	Laser Guided Training Round
LMRS	Long-Term Mine Reconnaissance System
ln	natural log
LOA	Letter of Agreement
LOA	Letter of Authorization
LPD	Amphibious Transport Dock
LSD	Amphibious Assault Ship
LT	Limited Training
LZ	Landing Zone
m	meters
m^2	square meters
m^3	cubic meters
M-4	Assault Rifle
M-16	Assault Rifle

M-203	40 mm Grenade Launcher
M-240G	Medium Machine Gun
M-249 SAW	Light Machine Gun, Squad Automatic Weapon
MAGTF	Marine Air Ground Task Force
MARPOL 73/78	Marine Pollution Convention '73, modified in '78
MAW	Marine Air Wing
MBTA	Migratory Bird Treaty Act
MCM	Mine Countermeasure
MCMEX	Mine Exercise
MEDEVAC	Medical Evacuation
MEF	Marine Expeditionary Force
MEMC	Military Expended Material Constituent
METOC	Meteorological and Oceanographic Operations
MEU	Marine Expeditionary Unit
MFA	Mid-Frequency Active
MFAS	Medium-Frequency Active Sonar
MG	Machine Gun
mgd	million gallons per day
mg/L	milligrams per liter
MH	Helicopter Designation (Typically Multi-mission)
MHWM	Mean High Water Mark
mi.	miles
mi^2	square miles
MI	Maritime Interdiction
MILCON	Military Construction
min	minutes
MINEX	Mine Laying Exercise
MIO	Maritime Interception Operation
MIRC	Mariana Islands Range Complex
MISSILEX	Missile Exercise
MISTCS	The Mariana Islands Sea Turtle and Cetacean Survey
MIW	Mine Warfare
MLA	Military Lease Area
mm	millimeters
MMA	Multi-mission Maritime Aircraft
MMHSRA	Marine Mammal Health and Stranding Response Act
MMHSRP	Marine Mammal Health and Stranding Response Program
MMPA	Marine Mammal Protection Act
MMR	Military Munitions Rule
MOA	Military Operations Area
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
MPA	Maritime Patrol Aircraft
MPRSA	Marine Protection, Research, and Sanctuaries Act
MRA	Marine Resources Assessment
MRUUV	Mission Reconfigurable Unmanned Undersea Vehicle
MSA	Munitions Storage Area
MSE	Multiple Successive Explosions
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSL	Mean Sea Level
MSS	Mobile Security Squadron
MTH	Marianas Training Handbook
MVA	Marianas Visitors Authority
MWR	Morale, Welfare, and Recreation
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station
NAS	National Academies of Science
NATO	North Atlantic Treaty Organization
NAVBASE	Naval Base
NAVFAC PAC	Naval Facilities Engineering Command Pacific
NAVMAG	Naval Magazine
NAVSTA	Naval Station
NAWQC	National Ambient Water Quality Criteria
NCA	National Command Authority
NCRD	No Cultural Resource Damage
NCTAMS	Naval Communications Area Master Station
NCTS	Naval Computers and Telecommunications Station
NDAA	National Defense Authorization Act
NDE	National Defense Exemption
NEC	North Equatorial Current
NECC	Navy Expeditionary Combat Command
NEO	Noncombatant Evacuation Operations
NEPA	National Environmental Policy Act
NEW	Net Explosive Weight
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NITTRSS	Navy Integrated Training and Test Range Strategic Study
NLNA	Northern Land Navigation Area
nm	nautical mile
nm^2	square nautical mile
NMFS	National Marine Fisheries Service
NMMTB	National Marine Mammal Tissue Bank
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
NPAL	North Pacific Acoustic Laboratory
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	National Research Council
NRFCC	National Recreational Fisheries Coordination Council
NRHP	National Register of Historic Places
NRIS	National Register Information System
NRL	Naval Research Laboratory
NS	Naval Station
NSCT	Naval Special Clearance Team
NSFS	Naval Surface Fire Support
NSR	New Source Review
NSW	Naval Special Warfare
NSWG	Naval Special Warfare Group
NSWU	Naval Special Warfare Unit
NT	No Training
NUWC	Naval Undersea Warfare Center
NVG	Night Vision Goggle
NWD	No Wildlife Disturbance
NWF	Northwest Field
NWR	National Wildlife Refuge

NZ	Noise Zones
O_3	Ozone
OAH	Outer Apra Harbor
OAMCM	Organic Airborne Mine Countermeasure
OCE	Officer-In-Charge of the Exercise
OEA	Overseas Environmental Assessment
OEIS	Overseas Environmental Impact Statement
OLF	Outlying Landing Field
OP	Orote Point
OPA	Oil Pollution Act
OPAREA	Operating Area
OPCQC	Orote Point Close Quarters Combat
OPFOR	Opposition Forces
OPKDR	Orote Point Known Distance Range
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Chief of Naval Operations Instruction
OPS	Operations
OR	Oregon
ORMA	Ocean Resources Management Act
OSS	Operations Support Squadron
OTB	Over-the-Beach
OTH	Over the Horizon
Pa	Pascal
PA	Programmatic Agreement
Pa•s	Pascal•seconds
PACAF	Pacific Air Forces
PACFIRE	Pre-action Calibration Firing
PACOM	U.S. Pacific Command
PAG	Port Authority of Guam
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Biphenyl
PETN	Pentaerythritol Tetranitrate
pH	Hydrogen Ion Concentration
PIFSC	Pacific Islands Fisheries Science Center
PIRO	Pacific Islands Regional Office
PL	Public Law
$PM_{2.5}$	Particulate Matter 2.5 Microns in Diameter
PM_{10}	Particulate Matter 10 Microns in Diameter
PMAR	Primary Mission Area
POL	Petroleum, Oils, and Lubricants
POW	Prisoner of War
PPA	Pollution Prevention Act
ppb	parts per billion
PPF	Polaris Point Field
ppm	parts per million
PRI	Primary Training Area
psf	pounds per square foot
psi	pounds per square inch
psi-ms	pounds per square inch - milliseconds
PTP	Pre-deployment Training Phase
PTS	Permanent Threshold Shift
PUTR	Portable Underwater Tracking Range
PWC	Public Works Center
PWSS	Public Water Supply Systems
QDR	Quadrennial Defense Review
R-	Restricted Area
R&S	Reconnaissance and Surveillance
RAICUZ	Range Air Installations Compatible Use Zones
RCA	Range Condition Assessment
RCB	Reserve Craft Beach
RCD	Required Capabilities Document
RCMP	Range Complex Management Plan
RCRA	Resource Conservation and Recovery Act
RDT&E	Research, Development, Test, and Evaluation
RDX	Royal Demolition Explosive
re 1 µPa-m	referenced to 1 micropascal at 1 meter
RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer
REXTORP	Recoverable Exercise Torpedo
RFRCP	Recreational Fisheries Resources Conservation Plan
RHA	Rivers and Harbors Act
RHIB	Rigid Hull Inflatable Boat
RICRMP	Regional Integrated Cultural Resources Management Plan
RIMPAC	Rim of the Pacific
RL	Received Level
rms	root mean square
RNM	Rotorcraft Noise Model
ROD	Record of Decision
ROWPU	Reverse Osmosis Water Purification Unit
RSIP	Regional Shore Infrastructure Plan
RSO	Range Safety Officer
S-A	Surface-to-Air
S-S	Surface-to-Surface
S&R	Surveillance and Reconnaissance
SACEX	Supporting Arms Coordination Exercise
SAM	Surface-to-Air Missile
SAMEX	Surface-to Air Missile Exercise
SAR	Search and Rescue
SARS	Severe Acute Respiratory Syndrome
SAW	Squad Automatic Weapon
SBU	Special Boat Unit
SCD	Silicate Compensation Depth
SCUBA	Self-Contained Underwater Breathing Apparatus
SD	Standard Deviation
SDV	SEAL Delivery Vehicle
SDWA	Safe Drinking Water Act
SDZ	Surface Danger Zone
SEAD	Suppression of Enemy Air Defense
SEAL	Sea, Air, and Land Forces
sec	second
SEC	Secondary Training Areas
§	Section
SEIS	Supplemental Environmental Impact Statement
SEL	Sound Exposure Level
SEPA	State Environmental Policy Act
SFCP	Shore Fire Control Parties
SFS	Security Forces Squadron
SH	Helicopter Designation (Typically Anti-Submarine)
SHAREM	Ship ASW Readiness and Evaluation Measuring
SHPO	State Historic Preservation Officer
SINKEX	Sinking Exercise
SIP	State Implementation Plan
SLAM-ER	Stand-off Land Attack Missile - Extended Range
SLC	Submarine Learning Center
SLNA	Southern Land Navigation Area
SM	Standard Missile
SMA	Shoreline Management Act
SNS	Sympathetic Nervous System
SO_2	Sulfur Dioxide
SOCAL	Southern California
SOC	Special Operations Capable
SOCEX	Special Operations Capable Exercise

SOF	Special Operations Forces
SONAR	Sound Navigation and Ranging
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasure
SPIE	Special Purpose Insertion and Extraction
SPL	Sound Pressure Level
SPMAGTF	Special Purpose Marine Air Ground Task Force
SPORTS	Sonar Positional Reporting System
sqrt	Square Root
SRBOC	Super Rapid Bloom Off-board Chaff
SRF	Ship Repair Facility
SRP	Scientific Research Program
SSBN	Ship, Submersible, Ballistic, Nuclear (Submarine)
SSC	SPAWAR Systems Center
SSG	Surface Strike Group
SSGN	Guided Missile Submarine
SSN	Fast Attack Submarine
SSN	Nuclear Submarine
STD	Standard
STOM	Ship to Objective Maneuver
STW	Strike Warfare
SUA	Special Use Airspace
SURC	Small Unit River Craft
SURTASS	Surveillance Towed-Array Sensor System
SUS	Signal Underwater Sound
SUW	Surface Warfare
SVP	Sound Velocity Profile
SWFSC	Southwest Fisheries Science Center
SWPPP	Storm Water Pollution Prevention Plans
T&E	Threatened and Endangered Species
TACP	Tactical Air Control Party
TALD	Tactical Air-Launched Decoy
TAP	Tactical Training Theater Assessment And Planning
TDU	Target Drone Unit
TGEX	Task Group Exercise
TM	Tympanic Membrane
TMDL	Total Maximum Daily Loads
TNT	Trinitrotoluene
TORPEX	Torpedo Exercise
TP	Training Projectile
TRACKEX	Tracking Exercise
TRUEX	Training in Urban Environment Exercise
TS	Threshold Shift
TSCA	Toxic Substances Control Act
TSPI	Time, Space, Position, Information
TSV	Training Support Vessel
TTS	Temporary Threshold Shift
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicle
UCRMP	Updated Cultural Resources Management Plan
UDP	Unit Deployment Program
UJTL	Universal Joint Task List
ULT	Unit-level Training
UME	Unusual Mortality Event
UN	United Nations
UNDET	Underwater Detonations
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USCG	United States Coast Guard
USCINCPAC REP	Commander In Chief, U.S. Pacific Command Representative
USCINCPAC REP GUAM/CNMI	Commander In Chief, U.S. Pacific Command Representative Guam and the Commonwealth of the Northern Mariana Islands
USDA	United States Department of Agriculture
USDA WS	United States Department of Agriculture Wildlife Services
USEPA	United States Environmental Protection Agency
USFF	United States Fleet Forces
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USGS – BRD	United States Geological Survey Biological Resources Division
USMC	United States Marine Corps
USNS	U.S.Naval Ship
USPACOM	United States Pacific Command
USWEX	Undersea Warfare Exercise
USWTR	Undersea Warfare Training Range
UTR	Underwater Tracking Range
UUV	Unmanned Underwater Vehicle
UXO	Unexploded Ordnance
V&VE	coastal flood hazard zones
VAST-IMPASS	Virtual At-Sea Training Integrated Maritime Portable Acoustic Scoring and Simulator
VBSS	Visit, Board, Search, and Seizure
VFR	Visual Flight Rules
VoA-IBB	Voice of America - International Broadcasting Bureau
VOC	Volatile Organic Compounds
VTNF	Variable Timed, Non-Fragmentation
VTOL	Vertical Takeoff and Landing
VTUAV	Vertical Take-off and Land UAV
W-	Warning Area
WestPac	Western Pacific
WISS	Weapons Impact Scoring System
WPRFMC	Western Pacific Regional Fisheries Management Council
WS	Wildlife Service
WWII	World War Two
ZOI	Zone of Influence

CHAPTER 4 OTHER CONSIDERATIONS

4.1 CONSISTENCY WITH OTHER FEDERAL, STATE, AND LOCAL PLANS, POLICIES, AND REGULATIONS

Based on evaluation with respect to consistency and statutory obligations, the Navy's Proposed Action and Alternatives for the Mariana Islands Range Complex (MIRC) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) does not conflict with the objectives or requirements of federal, state, regional, or local plans, policies, or legal requirements. Table 4-1 provides a summary of environmental compliance requirements that may apply. As of the date of this document, none of the analysis indicates an inconsistency with environmental compliance requirements that may apply to this Proposed Action and Alternatives. *The Draft Marine Biological Opinion and Draft Marine Mammal Protection Act (MMPA) Letter of Authorization have been received. All consultation will be completed prior to the signing of the Record of Decision.*

Table 4-1: Summary of Environmental Compliance for the Proposed Action

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
National Environmental Policy Act (NEPA) of 1969 (42 USC §§ 4321, *et seq.*) **Council on Environmental Quality (CEQ)** **Regulations for Implementing the Procedural Provisions of NEPA (40 CFR §§ 1500-1508)** **DoN Procedures for Implementing NEPA (32 CFR § 775)**	Navy Marines Air Force Army	This EIS/OEIS has been prepared in accordance with NEPA, CEQ regulations and the Services' NEPA procedures. Public participation and review is being conducted in compliance with NEPA. The Proposed Action would not result in significant impacts.
Clean Water Act (CWA) (33 USC §§ 1344, *et seq.*)	USEPA	No permit under the CWA, whether under Section 401, 402, or 404 (b) (1), is required.
Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions	Navy Marines Air Force Army	EO 12114 requires environmental consideration for actions that may affect the environment outside of U.S. Territorial Waters. The Proposed Action would not result in significant harm to the environment.

Table 4-1: Summary of Environmental Compliance for the Proposed Action (Continued)

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
Coastal Zone Management Act (CZMA) (16 CFR §§ 1451, *et seq*.)	Bureau of Statistics and Plans - Guam Coastal Resources Management Office - CNMI	The Navy has determined that the Proposed Action is consistent to the maximum extent practicable with the Guam and CNMI Coastal Management Plans. The Consistency Determination for Guam and the Negative Determination for CNMI were submitted on March 18, 2009. The Navy assumed concurrence based on statutory deadline for response (no response received from CNMI; Guam's response was unrelated to CZMA, received June 25, 2009, Navy replied 20 Jul 09).
Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801-1802)	National Marine Fisheries Service (NMFS)	The Proposed Action would not adversely affect Essential Fish Habitat (EFH) and would not decrease the available area or quality of EFH.
Endangered Species Act (ESA) (16 USC §§ 1531, *et seq*.)	U.S. Fish and Wildlife Service (USFWS) NMFS	The EIS/OEIS analyzes potential effects to species listed under the ESA. The Navy has consulted under Section 7 of the ESA with NMFS and USFWS on the potential that the Proposed Action may affect listed species.
The National Marine Sanctuaries Act (16 USC §§ 1431, *et. seq*.)	National Oceanic and Atmospheric Administration	The Proposed Action would have no effect on sanctuary resources in the off-shore environment of the Study Area. Review of agency actions under Section 304 is not required.
EO 13089, Coral Reef Protection	Navy Marines Air Force Army	EO 13089 requires Federal agencies whose actions may affect U.S. coral reef ecosystems to preserve and protect the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment.

Table 4-1: Summary of Environmental Compliance for the Proposed Action (Continued)

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
Marine Mammal Protection Act (MMPA) (16 USC §§ 1431, *et seq*.)	NMFS	This EIS/OEIS analyzes potential effects to marine mammals, some of which are species-listed under the ESA. As noted, potential effects on listed species are the subject of consultations with NMFS. NMFS will issue the Navy a Letter of Authorization regarding effects on marine mammals.
National Historic Preservation Act (NHPA) (16 USC §§ 470, *et seq*.)	Navy Marines Air Force Army	The Services comply with the consultation and other requirements of the NHPA. The Proposed Action would not have a significant impact on cultural resources.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	Navy Marines Air Force Army	The Proposed Action would not result in disproportionately high and adverse human health or environmental effects on minority or low income populations.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	Navy Marines Air Force Army	The Proposed Action would not result in disproportionate risks to children from environmental health risks or safety risks.
EO 13112, Invasive Species	Navy Marines Air Force Army	EO 13112 requires Agencies to identify actions that may affect the status of invasive species and take measures to avoid introduction and spread of those species. This EIS/OEIS satisfies the requirement of EO 13112 with regard to the Proposed Action.
EO 11990, Protection of Wetlands	Navy Marines Air Force Army	The Proposed Action would not have a significant impact on wetlands.

Table 4-1: Summary of Environmental Compliance for the Proposed Action (Continued)

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
EO 12962, Recreational Fisheries	Navy Marines Air Force Army	EO 12962 requires Agencies to fulfill certain duties with regard to promoting the health and access of the public to recreational fishing areas. The Proposed Action complies with these duties.
Migratory Bird Treaty Act (MBTA) (16 USC §§703-712)	USFWS	The Proposed Action would not have a significant impact on migratory birds, and would comply with applicable requirements of the MBTA.
The Sikes Act of 1960 (16 USC §§670a-670o, as amended by the Sikes Act Improvement Act of 1997, Public Law No. 105-85) requires military installations with significant natural resources, to prepare and implement Integrated Natural Resource Management Plans (INRMP).	Navy Marines Air Force Army	The Proposed Action would be implemented in accordance with the management and conservation criteria developed in the INRMPs for MIRC. The Proposed Action and Alternatives will not result in a requirement for an update of INRMPs outside of their normal update schedule of every 5 years.
The Antiquities Act (34 Stat. 225, 16 U.S.C. 431)	National Oceanic and Atmospheric Administration (NOAA) USFWS	The Study Area includes a small portion of the Marianas Trench Marine National Monument (a small portion of the Monument lies within the MIRC, including a small area on the northern border of the MIRC as well as the Volcanic Unit and the Trench Unit). Any of the activities identified under the Proposed Action could take place within areas included in the Monument, where they overlap. The Presidential Proclamation establishing the Monument includes specific language regarding military activities in the area. The Proposed Action would be implemented in accordance with criteria established for military activities.

Table 4-1: Summary of Environmental Compliance for the Proposed Action (Continued)

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
Act to Prevent Pollution from Ships (APPS) (33 USC §§ 1901, et seq.)	Navy Marines	The Navy and Marines comply with the discharge regulations set forth under the requirements of the APPS.
EO 13158, Marine Protected Areas	Navy Marines Air Force Army	EO 13158 requires Agencies to identify any actions that affect the natural or cultural resources that are protected by MPA. Agencies shall avoid harm to the natural and cultural resources that are protected by an MPA. This EIS/OEIS satisfies the requirement of EO 13158 with regard to the Proposed Action

4.2 REQUIRED PERMITS AND APPROVALS

All required permits and approvals will be or are in the process of being obtained.

4.3 RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA requires analysis of the relationship between a project's short-term impacts on the environment and the effects that those impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This means that choosing one option may reduce future flexibility in pursuing other options, or that committing a resource to a certain use may often eliminate the possibility for other uses of that resource.

With respect to marine mammals, the Services, in partnership with the National Marine Fisheries Service (NMFS), are committed to furthering understanding of these creatures and developing ways to lessen or eliminate the impacts DoD training activities may have on these animals. Degradation of habitat is not anticipated due to implementation of the chosen alternative as a result implementation and development of Integrated Natural Resource Management Plans (INRMPs) (agencies coordinate and co-sign the INRMPs) and mitigations.

The Proposed Action would result in both short- and long-term environmental effects. However, the Proposed Action would not be expected to result in any impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or general welfare of the public. The Services are committed to sustainable range management, including co-use of the MIRC with general public and commercial interests. This commitment to co-use will enhance long-term productivity of the range areas within the MIRC.

4.4 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (*e.g.*, energy or minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (*e.g.*, the disturbance of a cultural site).

For the Proposed Action and Alternatives, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or long lasting but negligible. Culturally significant resources that are known to occur in the area proposed for training activities have protective measures in place for sensitive areas, therefore, there will be no adverse effect on historic properties. No habitat associated with threatened or endangered species would be lost as result of implementation of the Proposed Action. Since there would be no building or facility construction, the consumption of materials typically associated with such construction (*e.g.*, concrete, metal, sand, fuel) would not occur. Energy typically associated with construction activities would not be expended and irreversibly lost. Implementation of the Proposed Action would require fuels used by aircraft, ships, and ground-based vehicles. Since fixed- and rotary-wing flight and ship activities could increase relative to what is currently experienced, total fuel use would increase. Fuel use by ground-based vehicles involved in training activities would also increase. Therefore, total fuel consumption would increase and this nonrenewable resource would be considered irretrievably lost.

4.5 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES AND MITIGATION MEASURES

Increased training and testing operations on the MIRC would result in an increase in energy demand over the No Action Alternative. This would result in an increase in fossil fuel consumption, mainly from aircraft, vessels, ground equipment, and power supply. Although the required electricity demands of increased intensity of land-use would be met by the existing electrical generation infrastructure at the MIRC, the alternatives would result in a net cumulative negative impact on the energy supply.

Energy requirements would be subject to any established energy conservation practices at each facility. No additional power generation capacity other than the potential use of generators would be required for any of the training activities. The use of energy sources has been minimized wherever possible without compromising safety, training, or testing operations.

At the present time, the Services, under the direction of the Energy Policy Act (EPAct) of 1992 and EO 13149, is actively testing and introducing several different types of alternate fuels (bio-diesel B100/B20, clean natural gas, fuel ethanol E85, fuel cells, *etc.*) to further reduce the impacts of its activities on the environment and non-renewable resources.

4.6 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL OF VARIOUS ALTERNATIVES AND MITIGATION MEASURES

Resources that would be permanently and continually consumed by project implementation include water, electricity, natural gas, and fossil fuels; however, the amount and rate of consumption of these resources would not result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of resources. Nuclear powered vessels would be a benefit as they decrease the use of fossil fuels. In addition, construction activities related to increased training and testing operations on the MIRC would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil), natural gas, and gasoline construction equipment. With respect to training activities, compliance with all applicable building codes, as well as project mitigation measures, would ensure that all natural resources are conserved or recycled to the maximum extent feasible. It is also possible that new technologies or systems would emerge, or would become more cost effective or user-friendly, which would further reduce reliance on nonrenewable natural resources. However, even with implementation of conservation measures, consumption of natural resources would generally increase with implementation of the alternatives.

Aircraft training activities within the MIRC airspace are the single largest airborne noise source. Noise levels in excess of 90 decibels can occur. Protective measures (structural attenuation features) are in place. Sustainable range management practices are in place that protect and conserve natural and cultural resources as well as preserve access to training areas for current and future training requirements, while addressing potential encroachments that threaten to impact range capabilities.

4.7 URBAN QUALITY, HISTORIC AND CULTURAL RESOURCES, AND THE DESIGN OF THE BUILT ENVIRONMENT

There are no urban areas under consideration in this EIS/OEIS and therefore no urban quality issues exist. Likewise, there is no new construction being proposed. Historic and cultural resources are addressed in Section 3.13.

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CHAPTER 5 MITIGATION MEASURES

As part of the Navy's commitment to sustainable use of resources and environmental stewardship, the Navy incorporates minimization, avoidance and mitigation measures into all of its activities. These include employment of best management practice, standard operating procedures (SOPs), adoption of conservation recommendations, and other measures that mitigate the impacts of Navy activities on the environment. Some of these measures are generally applicable and others are designed to apply to certain geographic areas during certain times of year, for specific types of military training. Mitigation measures covering habitats and species occurring in the Mariana Islands Range Complex (MIRC) have been developed through various environmental analyses conducted by the Navy for land and sea ranges and adjacent coastal waters.

The Navy has implemented a variety of marine mammal mitigation measures over the last two decades. The following discussion briefly describes the development and status of those mitigation measures.

The Navy has developed and implemented mitigation measures as a result of environmental analysis or in consultation with regulatory agencies for research, development, test, and evaluation activities (RDT&E) and training exercises involving various sonar systems. These measures include visual detection by trained lookouts, power down and shut down procedures, the use of passive sensors to detect marine mammals, and avoidance of marine mammals.

In 2003, the Navy issued the Protective Measures Assessment Protocol (PMAP) that implemented Navy-wide mitigation measures for various types of routine training events. Following the implementation of PMAP, the Navy agreed to additional mitigation measures as part of Marine Mammal Protection Act (MMPA) authorization and Endangered Species Act (ESA) consultation processes for specific training exercises from 2004-2007.

Additionally, the Navy conducted Section 7 consultations under the ESA with regard to listed species that may be affected by the activities described in this EIS/OEIS. If required to satisfy requirements of the ESA, National Marine Fisheries Service (NMFS) may develop an additional set of measures contained in Reasonable and Prudent Alternatives, Reasonable and Prudent Measures, or Conservation Recommendations in any Biological Opinion issued for this Proposed Action.

This Section describes mitigation measures applicable to the military readiness activities described in Chapter 2 within the Study Area of the Mariana Islands Range Complex Final EIS/OEIS.

5.1 MITIGATION MEASURES ASSOCIATED WITH MARINE MAMMALS AND SEA TURTLES IN THE MARINE ENVIRONMENT

As discussed in Section 3.7 through 3.9, the comprehensive suite of mitigation measures and SOPs implemented by the Navy to reduce impacts to marine mammals also serves to mitigate potential impacts on sea turtles. In particular, personnel and watchstander training, establishment of turtle-free exclusion zones for underwater detonations of explosives, and pre- and post-exercise surveys, all serve to reduce or eliminate potential impacts of Navy activities on sea turtles that may be present in the vicinity.

Effective training in the MIRC dictates that ship, submarine, and aircraft participants utilize their sensors and exercise weapons to their optimum capabilities as required by the mission. This section is a comprehensive list of mitigation measures that would be utilized for training activities analyzed in the EIS/OEIS in order to minimize potential for impacts on marine mammals and sea turtles in the MIRC.

Marine mammals may be exposed to sound energy levels sufficient to cause a physiological effect. As described in Section 3.7, specific received sound energy levels are associated with permanent threshold shift (PTS), a permanent hearing loss over a subsection of an animal's hearing range (injury); and with temporary threshold shift (TTS), a temporary hearing loss and associated behavioral disruption. Received sound energy level thresholds for PTS and TTS from exposure to mid-frequency sonar are 215 decibels (dB) referenced to 1 micro-Pascal squared second (re $1\mu Pa^2$-s) and 195dB $1\mu Pa^2$-s respectively. The predicted ranges, or distances, to received sound energy levels associated with marine mammal PTS and TTS for the most powerful and the most commonly used shipboard mid-frequency active sonar used in the MIRC are shown in Table 5-1.

Due to spreading loss, sound attenuates logarithmically from the source, so the area in which an animal could be exposed to potential injury (PTS) is small. Because the most powerful sources would typically be used in deep water and the range to effect is limited, spherical spreading is assumed for 195 dB re $1\mu Pa^2$-s and above. Also, due to the limited ranges, interactions with the bottom or surface ducts are rarely an issue.

Table 5-1. Range to Effects for Shipboard Mid-Frequency Active Sonar

Active Sonar Source	PTS level dB re $1\mu Pa^2$-s	Range to PTS (ft/m)	TTS level dB re $1\mu Pa^2$-s	Range To TTS (ft/m)
SQS-53 ship	215	33/10	195	459/140
SQS-56 ship	215	11/3.2	195	108/33

Current mitigation measures employed by the Navy include applicable training of personnel and implementation of activity specific procedures resulting in minimization and/or avoidance of interactions with protected resources.

This section includes mitigation measures that are followed for all types of exercises; those that are associated with a particular type of training event. For major exercises, the applicable mitigation measures are incorporated into a naval message which is disseminated to all of the units and Services participating in the exercise or training event and applicable responsible commands and Services. U.S. participants are required to comply with these measures. Non-U.S. participants involved in events within the territorial seas of the U.S. (12 nm) are requested to comply with these measures to the extent these measures do not conflict with Status of Forces Agreements. Non-U.S. participants involved in events beyond the territorial seas (12 nm) are encouraged to comply with these mitigation measures to the extent the measures do not impair training, operations, or operational capabilities.

5.1.1 General Maritime Measures

5.1.1.1 Personnel Training – Watchstanders and Lookouts

The use of shipboard lookouts is a critical component of all Navy mitigation measures. Navy shipboard lookouts (also referred to as "watchstanders") are highly qualified and experienced observers of the marine environment. Their duties require that they report all objects sighted in the water to the Officer of the Deck (OOD) (*e.g.*, trash, a periscope, marine mammals, sea turtles) and all disturbances (*e.g.*, surface disturbance, discoloration) that may be indicative of a threat to the vessel and its crew. There are personnel serving as lookouts on station at all times (day and night) when a ship or surfaced submarine is moving through the water.

All Commanding Officers (COs), Executive Officers (XOs), lookouts, OODs, junior OODs (JOODs), maritime patrol aircraft aircrews, and Anti-submarine Warfare (ASW) helicopter crews will complete the NMFS-approved Marine Species Awareness Training (MSAT) by viewing the U.S. Navy MSAT digital versatile disk (DVD). MSAT may also be viewed on-line at https://portal.navfac.navy.mil/go/msat. All bridge watchstanders/lookouts will complete both parts one and two of the MSAT; part two is optional for other personnel. Part 1 of this training addresses the lookout's role in environmental protection, laws governing the protection of marine species, Navy stewardship commitments and general observation information to aid in avoiding interactions with marine species. Part 2 focuses on identification of specific species.

- Navy lookouts will undertake extensive training in order to qualify as a watchstander in accordance with the Lookout Training Handbook (Naval Education and Training Command [NAVEDTRA] 12968-D).
- Lookout training will include on-the-job instruction under the supervision of a qualified, experienced lookout. Following successful completion of this supervised training period, Lookouts will complete the Personal Qualification Standard Program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects). Personnel being trained as lookouts can be counted among the number of lookouts required by a particular mitigation measures as long as supervisors monitor their progress and performance.
- Lookouts will be trained in the most effective means to ensure quick and effective communication within the command structure in order to facilitate implementation of mitigation measures if marine species are spotted.
- All lookouts onboard platforms involved in ASW training events will review the NMFS-approved MSAT material prior to use of mid-frequency active sonar.
- All COs, XOs, and officers standing watch on the bridge will have reviewed the MSAT material prior to a training event employing the use of Mid-Frequency Active Sonar/High-Frequency Active Sonar (MFAS/HFAS).

5.1.1.2 Operating Procedures & Collision Avoidance (For All Training Types)

- Prior to major exercises, a Letter of Instruction, Mitigation Measures Message or Environmental Annex to the Operational Order will be issued prior to the exercise to further disseminate the personnel training requirement and general marine mammal and sea turtle protective measures.
- Commanding Officers will make use of marine species detection cues and information to limit interaction with marine mammals and sea turtles to the maximum extent possible consistent with safety of the ship.
- While underway, surface vessels will have at least two lookouts with binoculars; surfaced submarines will have at least one lookout with binoculars. Lookouts already posted for safety of navigation and man-overboard precautions may be used to fill this requirement. As part of their regular duties, lookouts will watch for and report to the OOD the presence of marine mammals and sea turtles.
- On surface vessels equipped with a mid-frequency active sonar, pedestal mounted "Big Eye" (20x110) binoculars will be properly installed and in good working order to assist in the detection of marine mammals and sea turtles in the vicinity of the vessel.
- Personnel on lookout will employ visual search procedures employing a scanning methodology in accordance with the Lookout Training Handbook (NAVEDTRA 12968-D).
- After sunset and prior to sunrise, lookouts will employ Night Lookouts Techniques in accordance with the Lookout Training Handbook (NAVEDTRA 12968-D).
- While in transit, naval vessels will be alert at all times, use extreme caution, and proceed at a "safe speed", which means the speed at which CO can maintain crew safety and effectiveness of current operational directives, so that the vessel can take action to avoid a collision with any marine animal.
- When marine species have been sighted in the area, Navy vessels will increase vigilance and take reasonable and practicable actions to avoid collisions and activities that might result in close interaction of naval assets and marine species. Actions may include changing speed and/or direction and are dictated by environmental and other conditions (*e.g.*, safety, weather).
- Naval vessels will maneuver to keep a safe distance from any observed marine species in the vessel's path and avoid approaching them head-on. These requirements do not apply if a vessel's safety is threatened, such as when change of course will create an imminent and serious threat to a person, vessel, or aircraft, and to the extent vessels are restricted in their ability to maneuver. Restricted maneuverability includes, but is not limited to, situations when vessels are engaged in dredging, submerged activities, launching and recovering aircraft or landing craft, minesweeping activities, replenishment while underway and towing activities that severely restrict a vessel's ability to deviate course. Vessels will take reasonable steps to alert other vessels in the vicinity of the marine species. Given rapid swimming speeds and maneuverability of many dolphin species, naval vessels would maintain normal course and speed on sighting dolphins unless some condition indicated a need for the vessel to maneuver.
- Navy aircraft participating in exercises at sea will conduct and maintain, when operationally feasible and safe, surveillance for marine species of concern as long as it does not violate safety constraints or interfere with the accomplishment of primary operational duties.
- Marine species detections will be immediately reported to assigned Aircraft Control Unit for further dissemination to ships in the vicinity of the marine species as appropriate where it is

reasonable to conclude that the course of the ship will likely result in a closing of the distance to the detected marine species.

5.1.2 Measures for Specific Training Events

5.1.2.1 Mid-Frequency Active Sonar Operations

5.1.2.1.1 General Maritime Mitigation Measures: Personnel Training

- All lookouts onboard platforms involved in ASW training events will review the NMFS approved MSAT material prior to MFA sonar use.
- All Commanding Officers, Executive Officers, and officers standing watch on the Bridge will have reviewed the MSAT material prior to a training event employing the use of MFA sonar.
- Navy personnel will undertake extensive training in order to qualify as a lookout in accordance with the Lookout Training Handbook (Naval Education and Training [NAVEDTRA] 12968-D).
- Lookout training will include on-the-job instruction under the supervision of a qualified, experienced lookout. Following successful completion of this supervised training period, Lookouts will complete the Personal Qualification Standard program, certifying that they have demonstrated the necessary skills (such as detection and reporting of partially submerged objects). This does not preclude personnel being trained as lookouts from being counted as those listed in previous measures so long as supervisors monitor their progress and performance.
- Lookouts will be trained in the most effective means to ensure quick and effective communication within the command structure in order to facilitate implementation of mitigation measures if marine species are spotted.

5.1.2.1.2 Operating Procedures (for Anti-Submarine Warfare Operations)

- On the bridge of surface ships, there will always be at least three people on watch whose duties include observing the water surface around the vessel.
- All surface ships participating in ASW training events will, in addition to the three personnel on watch noted previously, have at all times during the exercise at least two additional personnel on watch as marine mammal lookouts.
- Personnel on lookout and officers on watch on the bridge will have at least one set of binoculars available for each person to aid in the detection of marine mammals and sea turtles.
- Personnel on lookout will be responsible for reporting all objects or anomalies sighted in the water (regardless of the distance from the vessel) to the Officer of the Deck, since any object or disturbance (e.g., trash, periscope, surface disturbance, discoloration) in the water may be indicative of a threat to the vessel and its crew or indicative of a marine species that may need to be avoided as warranted.
- All personnel engaged in passive acoustic sonar operation (including aircraft, surface ships, or submarines) will monitor for marine mammal vocalizations and report the detection of any marine mammal to the appropriate watch station for dissemination and appropriate action.
- During MFA sonar operations, personnel will utilize all available sensor and optical systems (such as night vision goggles) to aid in the detection of marine mammals and sea turtles.
- Aircraft with deployed sonobuoys will use only the passive capability of sonobuoys when marine mammals are detected within 200 yd (183 m) of the sonobuoy.

- Helicopters shall observe/survey the vicinity of an ASW exercise for 10 minutes before the first deployment of active (dipping) sonar in the water.
- Helicopters shall not dip their sonar within 200 yards of a marine mammal and sea turtles and shall cease pinging if a marine mammal or sea turtles closes within 200 yards after pinging has begun.
- Safety Zones—When marine mammals or sea turtles are detected by any means (aircraft, shipboard lookout, or acoustically) within 1,000 yds (914 m) of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 decibels (dB) below normal operating levels (i.e., limit to at most 229 dB for AN/SQS-53 and 219 for AN/SQS-56, etc.)
- Ships and submarines will continue to limit maximum MFA transmission levels by this 6-dB factor until the marine mammal has been seen to leave the 1,000 yd safety zone, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yds (1,829 m) beyond the location of the last detection.
- Should a marine mammal be detected within 500 yds (457 m) of the sonar dome, active transmissions will be limited to at least 10 dB below the equipment's normal operating level (i.e., limit to at most 225 dB for AN/SQS-53 and 215 for AN/SQS-56, etc.). Ships and submarines will continue to limit maximum ping levels by this 10-dB factor until the marine mammal has been seen to leave the 500 yd safety zone, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yds (1,829 m) beyond the location of the last detection.
- Should the marine mammal be detected within 200 yards (183 m) of the sonar dome, active sonar transmissions will cease. Active sonar will not resume until the animal has been seen to leave the 200 yd safety zone, has not been detected for 30 minutes, or the vessel has transited more than 2,000 yds (1,829 m) beyond the location of the last detection.
- Special conditions applicable for dolphins and porpoises only: If, after conducting an initial maneuver to avoid close quarters with dolphins or porpoises, the Officer of the Deck concludes that dolphins or porpoises are deliberately closing to ride the vessel's bow wave, no further mitigation actions are necessary while the dolphins or porpoises continue to exhibit bow wave riding behavior.
- If the need for power-down should arise (as detailed in “Safety Zones” above), when operating a hull-mounted or sub-mounted source above 235 dB (infrequent), the Navy shall follow the requirements as though they were operating at 235 dB (i.e., the first power-down will be to 229 dB).
- Prior to start up or restart of active sonar, operators will check that the Safety Zone radius around the sound source is clear of marine mammals.
- Active sonar levels (generally)—the ship or submarine will operate sonar at the lowest
- Submarine sonar operators will review detection indicators of close-aboard marine mammals prior to the commencement of ASW events involving MFA sonar.

Based on lessons learned from strandings in the Bahamas (2000), Madeira (2000), the Canaries (2002), and Spain (2006), beaked whales are of particular concern since they have been associated with MFA sonar operations. The Navy should avoid planning major ASW training with MFA sonar in areas where they will encounter conditions that, in their aggregate, may contribute to a marine mammal stranding event.

The conditions to be considered during exercise planning include:

- Areas of at least 1,094 yards (1,000 m depth) near a shoreline where there is a rapid change in bathymetry on the order of 1,000 to 6,000 meters occurring across a relatively short horizontal distance (e.g., 5 nautical miles [nm]).
- Cases for which multiple ships or submarines (≥ 3) operating MFA sonar in the same area over extended periods of time (≥ 6 hours) in close proximity (≤ 10 nm apart).
- An area surrounded by land masses, separated by less than 35 nm and at least 10 nm in length, or an embayment, wherein events involving multiple ships/subs (≥ 3) employing MFA sonar near land may produce sound directed toward the channel or embayment that may cut off the lines of egress for marine mammals.
- Though not as dominant a condition as bathymetric features, the historical presence of a strong surface duct (i.e., a mixed layer of constant water temperature extending from the sea surface to 100 or more feet).

If the Major Exercise must occur in an area where the above conditions exist in their aggregate, these conditions must be fully analyzed in environmental planning documentation. The Navy will increase vigilance by undertaking the following additional mitigation measure:

- A dedicated aircraft (Navy asset or contracted aircraft) will undertake reconnaissance of the embayment or channel ahead of the exercise participants to detect marine mammals that may be in the area exposed to active sonar. Where practical, advance survey should occur within about 2 hours prior to MFA sonar use and periodic surveillance should continue for the duration of the exercise. Any unusual conditions (e.g., presence of sensitive species, groups of species milling out of habitat, and any stranded animals) shall be reported to the Officer in Tactical Command, who should give consideration to delaying, suspending, or altering the exercise.
- All safety zone power-down requirements described in this measure apply.
- The post-exercise report must include specific reference to any event conducted in areas where the above conditions exist, with exact location and time/duration of the event, and noting results of surveys conducted.

5.1.2.2 Surface-to-Surface Gunnery (up to 5-inch explosive rounds)

- For exercises using targets towed by a vessel, target-towing vessels shall maintain a trained lookout for marine mammals and sea turtles when feasible. If a marine mammal or sea turtle is sighted in the vicinity, the tow vessel will immediately notify the firing vessel, which will suspend the exercise until the area is clear.
- A 600 yard (585 m) radius buffer zone will be established around the intended target.
- From the intended firing position, trained lookouts will survey the buffer zone for marine mammals and sea turtles prior to commencement and during the exercise as long as practicable. Due to the distance between the firing position and the buffer zone, lookouts are only expected to visually detect breaching whales, whale blows, and large pods of dolphins and porpoises.
- The exercise will be conducted only when the buffer zone is visible and marine mammals and sea turtles are not detected within it.

5.1.2.3 Surface-to-Surface Gunnery (non-explosive rounds)

- A 200 yard (183 m) radius buffer zone will be established around the intended target.
- From the intended firing position, trained lookouts will survey the buffer zone for marine mammals and sea turtles prior to commencement and during the exercise as long as practicable. Due to the distance between the firing position and the buffer zone, lookouts are only expected to visually detect breaching whales, whale blows, and large pods of dolphins and porpoises.
- If applicable, target towing vessels will maintain a lookout. If a marine mammal or sea turtle is sighted in the vicinity of the exercise, the tow vessel will immediately notify the firing vessel in order to secure gunnery firing until the area is clear.
- The exercise will be conducted only when the buffer zone is visible and marine mammals and sea turtles are not detected within the target area and the buffer zone.

5.1.2.4 Surface-to-Air Gunnery (explosive and non-explosive rounds)

- Vessels will orient the geometry of gunnery exercises in order to prevent debris from falling in the area of sighted marine mammals.
- Vessels will attempt to recover any parachute deploying aerial targets, to the extent practicable (and their parachutes if feasible), to reduce the potential for entanglement of marine mammals and sea turtles.
- Target towing vessel shall maintain a lookout if feasible. If a marine mammal or sea turtle is sighted in the vicinity of the exercise, the tow vessel will immediately notify the firing vessel in order to secure gunnery firing until the area is clear.

5.1.2.5 Air-to-Surface Gunnery (explosive and non-explosive rounds)

- A 200 yard (183 m) radius buffer zone will be established around the intended target.
- If surface vessels are involved, lookout(s) will visually survey the buffer zone for marine mammals and sea turtles prior to and during the exercise.
- Aerial surveillance of the buffer zone for marine mammals and sea turtles will be conducted prior to commencement of the exercise. Aerial surveillance altitude of 500 feet to 1,500 feet (152 – 456 m) is optimum. Aircraft crew/pilot will maintain visual watch during exercises. Release of ordnance through cloud cover is prohibited; aircraft must be able to actually see ordnance impact areas.
- The exercise will be conducted only if marine mammals and sea turtles are not visible within the buffer zone.

5.1.2.6 Small Arms Training (grenades, explosive and non-explosive rounds)

Lookouts will visually survey for marine mammals and sea turtles. Weapons will not be fired in the direction of known or observed marine mammals or sea turtles.

5.1.2.7 Air-to-Surface At-Sea Bombing Exercises (explosive bombs and rockets)

- Ordnance shall not be targeted to impact within 1,000 yards (914 m) of known or observed sea turtles or marine mammals.
- A buffer zone of 1,000 yards (914 m) radius will be established around the intended target.

- Aircraft will visually survey the target and buffer zone for marine mammals and sea turtles prior to and during the exercise. The survey of the impact area will be made by flying at 1,500 feet or lower, if safe to do so, and at the slowest safe speed. When safety or other considerations require the release of weapons without the releasing pilot having visual sight of the target area, a second aircraft, the "wingman," will clear the target area and perform the clearance and observation functions required before the dropping plane may release its weapons. Both planes must have direct communication to assure immediate notification to the dropping plane that the target area may have been fouled by encroaching animals or people. The clearing aircraft will assure it has visual site of the target area at a maximum height of 1500 ft. The clearing plane will remain within visual sight of the target until required to clear the area for safety reasons. Survey aircraft should employ most effective search tactics and capabilities.
- The exercises will be conducted only if marine mammals and sea turtles are not visible within the buffer zone.

5.1.2.8 Air-to-Surface At-Sea Bombing Exercises (non-explosive bombs and rockets)

- If surface vessels are involved, trained lookouts will survey for sea turtles and marine mammals. Ordnance shall not be targeted to impact within 1,000 yards (914 m) of known or observed sea turtles or marine mammals.
- A buffer zone of 1,000 yards (914 m) radius will be established around the intended target.
- Aircraft will visually survey the target and buffer zone for marine mammals and sea turtles prior to and during the exercise. The survey of the impact area will be made by flying at 1,500 feet or lower, if safe to do so, and at the slowest safe speed. When safety or other considerations require the release of weapons without the releasing pilot having visual sight of the target area, a second aircraft, the "wingman," will clear the target area and perform the clearance and observation functions required before the dropping plane may release its weapons. Both planes must have direct communication to assure immediate notification to the dropping plane that the target area may have been fouled by encroaching animals or people. The clearing aircraft will assure it has visual site of the target area at a maximum height of 1500 ft. The clearing plane will remain within visual sight of the target until required to clear the area for safety reasons. Survey aircraft should employ most effective search tactics and capabilities.
- The exercises will be conducted only if marine mammals and sea turtles are not visible within the buffer zone.

5.1.2.9 Air-to-Surface Missile Exercises (explosive and non-explosive)

Aircraft will visually survey the target area for marine mammals and sea turtles. Visual inspection of the target area will be made by flying at 1,500 (457 m) feet or lower, if safe to do so, and at slowest safe speed. Firing or range clearance aircraft must be able to actually see ordnance impact areas. Explosive ordnance shall not be targeted to impact within 1,800 yds (1,646 m) or sighted marine mammals and sea turtles.

5.1.2.10 Underwater Detonations (up to 10-lb charges)

- Exclusion Zones – all training activities involving the use of explosive changes must include exclusion zone for marine mammals and sea turtles to prevent physical and/or acoustic effects to those species. These exclusion zones for demolitions and ship mine countermeasures shall extend in a 700 yd arc (640 m) radius around the detonation site. Should a marine mammal or sea turtle

be present within the surveillance area, the explosive event shall not be started until the animal leaves the area.

- Pre-Exercise Surveys – for demolition and ship mine countermeasures operations, pre-exercise surveys shall be conducted within 30 minutes prior to the commencement of the scheduled explosive event. The survey may be conducted from the surface, by divers, and/or from the air, and personnel shall be alert to the presence of any marine mammal or sea turtle. Should such an animal be present within the exclusion area, the explosive event shall be paused until the animal voluntarily leaves the area. The Navy will ensure the exclusion area is clear of marine mammals and sea turtles for a full 30 minutes prior to initiating the explosive event.
- Post-Exercise Surveys – Surveys within the same radius shall also be conducted within 30 minutes after the completion of the explosive event.

Reporting – if there is any evidence that a marine mammal or sea turtle may have been injured or killed by the action, Navy training activities shall be immediately suspended and the situation immediately reported by the participating unit to the Officer in Charge of the Exercise, who will follow Navy procedures for reporting the incident to Commander Pacific Fleet, Commander, Navy Marianas, and the chain-of-command. The situation shall also be reported to NMFS (see Section 5.1.7, Stranding Response Plan for details).

5.1.2.11 Aircraft Training Activities Involving Non-Explosive Devices

Non-explosive devices such as some sonobuoys, inert bombs, and mining training activities involve aerial drops of devices that have the potential to hit marine mammals and sea turtles if they are in the immediate vicinity of a floating target. The exclusion zone, as established above for each non-explosive exercise type and if not-defined above, the minimum exclusion zone is 200 yards, shall be clear of marine mammals and sea turtles around the target location. Pre- and post- surveillance and reporting requirements outline for underwater detonations shall be implemented during mining training activities.

5.1.2.12 Sinking Exercise (SINKEX)

The Marine Protection, Research and Sanctuaries Act (MPRSA) authorization for SINKEX targets (40 Code of Federal Regulations §229.2), requires that the targets be sunk in waters which are at least 2,000 yards (1,839 m) deep and at least 50 nm from land.

The Navy has developed range clearance procedures to maximize the probability of sighting any ships or protected species in the vicinity of an exercise, which are as follows:

- All weapons firing would be conducted during the period 1 hour after official sunrise to 30 minutes before official sunset.
- Extensive range clearance operations would be conducted in the hours prior to commencement of the exercise, ensuring that no shipping is located within the hazard range of the longest-range weapon being fired for that event.
- An exclusion zone with a radius of 1.0 nm (1.9 km) would be established around each target. This exclusion zone is based on calculations using a 990-pound (lb) (450-kg) H6 net explosive weight high explosive source detonated 5 feet (ft) (1.5 m) below the surface of the water, which yields a distance of 0.85 nm (1.57 km) (cold season) and 0.89 nm (1.65 km) (warm season) beyond which the received level is below the 182 decibels (dB) re: 1 micropascal squared-seconds (μPa^2-s) threshold established for the *WINSTON S. CHURCHILL* (DDG 81) shock trials (DoN 2001a). An additional buffer of 0.5 nm (0.9 km), would be added to account for errors, target drift, and

animal movements. Additionally, a safety zone, which would extend beyond the buffer zone by an additional 0.5 nm (0.9 km), would be surveyed. Together the zones extend out 2 nm (3.7 km) from the target.

- A series of surveillance over-flights would be conducted within the exclusion and the safety zones, prior to and during the exercise, when feasible. Survey protocol would be as follows:
  - Overflights within the exclusion zone would be conducted in a manner that optimizes the surface area of the water observed. This may be accomplished through the use of the Navy's Search and Rescue Tactical Aid, which provides the best search altitude, ground speed, and track spacing for the discovery of small, possibly dark objects in the water based on the environmental conditions of the day. These environmental conditions include the angle of sun inclination, amount of daylight, cloud cover, visibility, and sea state.
  - All visual surveillance activities would be conducted by Navy personnel trained in visual surveillance. At least one member of the mitigation team would have completed the Navy's marine mammal training program for lookouts.
  - In addition to the overflights, the exclusion zone would be monitored by passive acoustic means, when assets are available. This passive acoustic monitoring would be maintained throughout the exercise. Potential assets include sonobuoys, which can be utilized to detect vocalizing marine mammals (particularly sperm whales) in the vicinity of the exercise. The sonobuoys would be re-seeded as necessary throughout the exercise. Additionally, passive sonar onboard submarines may be utilized to detect any vocalizing marine mammals in the area. The Officer Conducting the Exercise (OCE) would be informed of any aural detection of marine mammals and would include this information in the determination of when it is safe to commence the exercise.
  - On each day of the exercise, aerial surveillance of the exclusion and safety zones would commence 2 hours prior to the first firing.
  - The results of all visual, aerial, and acoustic searches would be reported immediately to the OCE. No weapons launches or firing would commence until the OCE declares the safety and exclusion zones free of marine mammals and threatened and endangered species.
  - If a marine mammal or sea turtle observed within the exclusion zone is diving, firing would be delayed until the animal is re-sighted outside the exclusion zone, or 30 minutes have elapsed. After 30 minutes, if the animal has not been re-sighted it would be assumed to have left the exclusion zone. This is based on a typical dive time of 30 minutes for traveling listed species of concern. The OCE would determine if the listed species is in danger of being adversely affected by commencement of the exercise.
  - During breaks in the exercise of 30 minutes or more, the exclusion zone would again be surveyed for any protected species. If protected species are sighted within the exclusion zone, the OCE would be notified, and the procedure described above would be followed.
  - Upon sinking of the vessel, a final surveillance of the exclusion zone would be monitored for 2 hours, or until sunset, to verify that no listed species were harmed.
  - Aerial surveillance would be conducted using helicopters or other aircraft based on necessity and availability. The Navy has several types of aircraft capable of performing this task; however, not all types are available for every exercise. For each exercise, the available asset best suited for identifying objects on and near the surface of the ocean would be used. These aircraft would be capable of flying at the slow safe speeds necessary to enable viewing of marine vertebrates with unobstructed, or minimally obstructed, downward and outward

visibility. The exclusion and safety zone surveys may be cancelled in the event that a mechanical problem, emergency search and rescue, or other similar and unexpected event preempts the use of one of the aircraft onsite for the exercise.

- Every attempt would be made to conduct the exercise in sea states that are ideal for marine mammal sighting, Beaufort Sea State 3 or less. In the event of a 4 or above, survey efforts would be increased within the zones. This would be accomplished through the use of an additional aircraft, if available, and conducting tight search patterns.
- The exercise would not be conducted unless the exclusion zone could be adequately monitored visually. Should low cloud cover or surface visibility prevent adequate visual monitoring as described previously, the exercise would be delayed until conditions improved, and all of the above monitoring criteria could be met.
- In the unlikely event that any listed species are observed to be harmed in the area, a detailed description of the animal would be taken, the location noted, and if possible, photos taken. This information would be provided to National Oceanic and Atmospheric Administration (NOAA) Fisheries via the Navy's regional environmental coordinator for purposes of identification see the Stranding Response Plan, Section 5.1.7).
- An after action report detailing the exercise's time line, the time the surveys commenced and terminated, amount, and types of all ordnance expended, and the results of survey efforts for each event would be submitted to NMFS.

5.1.2.13 Mitigation Measures Related to Explosive Source Sonobuoys (AN/SSQ-110A)

5.1.2.13.1 AN/SSQ-110A Pattern Deployment

- Crews will conduct visual reconnaissance of the drop area prior to laying their intended sonobuoy pattern. This search should be conducted below 500 yards (457 m) at a slow speed, if operationally feasible and weather conditions permit. In dual aircraft operations, crews are allowed to conduct coordinated area clearances.
- Crews shall conduct a minimum of 30 minutes of visual and aural monitoring of the search area prior to commanding the first post detonation. This 30-minute observation period may include pattern deployment time.
- For any part of the briefed pattern where a post (source/receiver sonobuoy pair) will be deployed within 1,000 yards (914 m) of observed marine mammal activity, crews will deploy the receiver ONLY and monitor while conducting a visual search. When marine mammals are no longer detected within 1,000 yards (914 m) of the intended post position, crews will co-locate the explosive source sonobuoy (AN/SSQ-110A) (source) with the receiver.
- When operationally feasible, crews will conduct continuous visual and aural monitoring of marine mammal activity. This is to include monitoring of own-aircraft sensors from first sensor placement to checking off station and out of radio frequency (RF) range of these sensors.

5.1.2.13.2 AN/SSQ-110A Pattern Employment

- Aural Detection:
  - Aural detection of marine mammals cues the aircrew to increase the diligence of their visual surveillance.

- If, following aural detection, no marine mammals are visually detected, then the crew may continue multi-static active search.

- Visual Detection:
  - If marine mammals are visually detected within 1,000 yards (914 m) of the explosive source sonobuoy (AN/SSQ-110A) intended for use, then that payload shall not be detonated. Aircrews may utilize this post once the marine mammals have not been re-sighted for 30 minutes, or are observed to have moved outside the 1,000 yards (914 m) safety buffer, whichever occurs first.
  - Aircrews may shift their multi-static active search to another post, where marine mammals are outside the 1,000 yards (914 m) safety buffer.

5.1.2.13.3 AN/SSQ-110A Scuttling Sonobuoys

- Aircrews shall make every attempt to manually detonate the unexploded charges at each post in the pattern prior to departing the operations area by using the "Payload 1 Release" command followed by the "Payload 2 Release" command. Aircrews shall refrain from using the "Scuttle" command when two payloads remain at a given post. Aircrews will ensure that a 1,000 yard (914 m) safety buffer, visually clear of marine mammals, is maintained around each post as is done during active search training activities.
- Aircrews shall only leave posts with unexploded charges in the event of a sonobuoy malfunction, an aircraft system malfunction, or when an aircraft must immediately depart the area due to issues such as fuel constraints, inclement weather, and in-flight emergencies. In these cases, the sonobuoy will self-scuttle using the secondary or tertiary method.
- Aircrews shall ensure all payloads are accounted for. Explosive source sonobuoys (AN/SSQ-110A) that cannot be scuttled shall be reported as unexploded ordnance via voice communications while airborne, then upon landing via naval message.
- Mammal monitoring shall continue until out of own-aircraft sensor range.

5.1.3 Adaptive Management

Adaptive management principles consider appropriate adjustments to mitigation, monitoring, and reporting as the outcomes of the Proposed Actions and required mitigation are better understood. NMFS includes adaptive management principles in the regulations for the implementation of the Proposed Action, and any adaptive adjustments of mitigation and monitoring would be led by NMFS via the MMPA process and developed in coordination with the Navy. Continued opportunity for public input would be included via the MMPA process, as appropriate (*i.e.,* via the "Letter of Authorization" process). The intent of adaptive management is to ensure the continued proper implementation of the required mitigation measures, to conduct appropriate monitoring and evaluation efforts, and to recommend possible adjustments to the mitigation/monitoring/reporting to accomplish the established goals of the mitigation and monitoring which include:

Mitigation

- Avoidance or minimization of injury or death of marine mammals wherever possible
- A reduction in the numbers of marine mammals (total number or number at biologically important time or location to received levels of sound associated with the proposed active sonar activities;

- A reduction in the number of times (total number or number at biologically time or location) individuals would be exposed to received levels;
- A reduction in the intensity of exposures (either total number or number at biologically important time or location) to received levels;
- A reduction in effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time; and
- For monitoring directly related to mitigation – an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation measures (shut-down zone, *etc*.).

Monitoring

- An increase in the probability of detecting marine mammals, both within the safety zone (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the effects analyses.
- An increase in the understanding of how many marine mammals are likely to be exposed to levels of MFA sonar/HFA sonar (or explosives or other stimuli) that are associated with specific adverse effects, such as behavioral harassment, TTS, or PTS.
- An increase in the understanding of how marine mammals respond to MFA sonar/HFA sonar (at specific received levels), explosives, or other stimuli expected to result in take and how anticipated adverse effects on individuals (in different ways and to varying degrees) may impact the population, species, or stock (specifically through effects on annual rates of recruitment or survival).
- An increased knowledge of the affected species.
- An increase in the understanding of the effectiveness of certain mitigation and monitoring measures.

Generally speaking, adaptive management supports the integration of NEPA's principles into the ongoing implementation and management of the Proposed Action, including a process for improving, where needed, the effectiveness of the identified mitigations. Note that any adjustment of mitigation and monitoring would be within the scope of the environmental analyses and considerations presented in this EIS/OEIS.

5.1.4 Proposed Monitoring Plan for the Mariana Islands Range Complex

The Navy has submitted a Monitoring Plan for the Mariana Islands Range Complex, which may be viewed at NMFS' Web site: http:// www.nmfs.noaa.gov/pr/permits/incidental.htm. NMFS and the Navy have worked together on the development of this plan in the months preceding the publication of this Final EIS/OEIS.

Marine species monitoring plans have been implemented by the Navy on other range complexes which focus on assessing any potential impacts from training activities and evaluating the effectiveness of the Navy's current mitigation process. However, NMFS recommended that, for the MIRC monitoring plan, the Navy focus on gathering data to augment the limited distribution and abundance data for this region. Monitoring methods proposed for the MIRC include passive acoustic monitoring and visual surveys. In addition to the U.S. Pacific Fleet funded compliance monitoring, Chief of Naval Operations

Environmental Readiness Division plans to develop a coordination plan with NMFS for additional surveys in the Marianas.

5.1.5 Integrated Comprehensive Monitoring Program (ICMP)

The Navy is committed to demonstrating environmental stewardship while executing its National Defense mission and is responsible for compliance with a suite of federal environmental and natural resources laws and regulations that apply to the marine environment. As part of those responsibilities, an assessment of the long-term and/or population-level effects of Navy training activities, as well as the efficacy of mitigation measures, is necessary. To address this need, the Navy developed an Integrated Comprehensive Monitoring Program (ICMP) to assess the effects of training activities on marine species and investigate population-level trends in marine species distribution, abundance, and habitat use in various range complexes and geographic locations where Navy training occurs (see Figure 5-1). Although the ICMP is intended to apply to all Navy training, use of MFA Sonar in training and RDT&E will comprise a major component of the overall program.

The ICMP provides the overarching framework for coordination of the United States Navy monitoring program. It is intended for use as a planning tool to focus Navy monitoring priorities pursuant to ESA and MMPA requirements and as an adaptive management tool to analyze and refine monitoring and mitigation techniques over time. The ICMP was developed in direct response to Navy range permitting requirements established in the various MMPA Final Rules, ESA Consultations, Biological Opinions, and applicable regulations. As a framework document, the ICMP applies by regulation to those activities on ranges and operating areas for which the Navy sought and received incidental take authorizations.

The primary objectives of the ICMP are to:

- Monitor and assess the effects of Navy activities on protected marine species;
- Ensure that data collected at multiple locations is collected in a manner that allows comparison between and among different geographic locations;
- Assess the efficacy and practicability of the monitoring and mitigation techniques;
- Add to the overall knowledge base of protected marine species and the effects of Navy activities on these species.

The ICMP will be evaluated annually through the adaptive management process to assess progress, provide a matrix of goals for the following year, and make recommendations for refinement and analysis of the monitoring and mitigation techniques. This process includes conducting an Adaptive Management Review (AMR) at which Navy and NMFS will jointly consider the prior year goals, monitoring results, and released science advances to determine if modifications are needed to more effectively address monitoring programs goals. Modifications to the ICMP that result from AMR decisions will be incorporated by an addendum or revision to the ICMP. These ICMP updates will be provided to NMFS by 31 December annually beginning in 2010. This adaptive management process recurs annually, with some modifications to the process in 2011, when the Navy, with guidance and support from NMFS, is to host a Monitoring Workshop that incorporates outside experts and expanded participation.

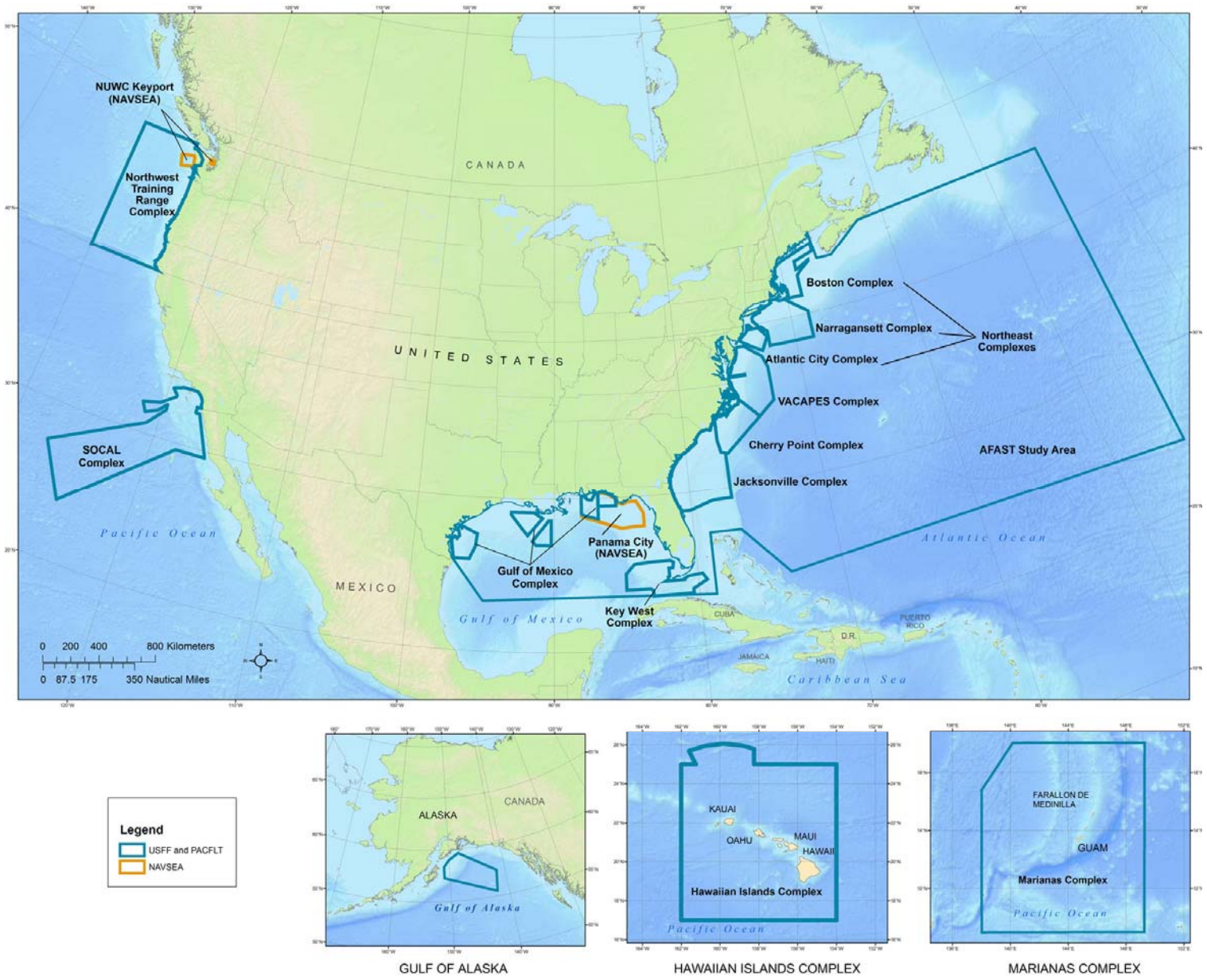

Figure 5-1. Integrated Comprehensive Monitoring Program –Map of Ranges and Study Areas Where Data Collection is Expected to Occur.

5.1.6 Research

The Navy provides a significant amount of funding and support to marine research. In the past five years the agency funded over $100 million ($26 million in FY08 alone) to universities, research institutions, federal laboratories, private companies, and independent researchers around the world to study marine mammals. The Navy sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide. Major topics of Navy-supported research include the following:

- Better understanding of marine species distribution and important habitat areas,
- Developing methods to detect and monitor marine species before, during and after training,
- Understanding the effects of sound on marine mammals, sea turtles, fish, and birds, and,
- Developing tools to model and estimate potential effects of sound.

This research is directly applicable to Fleet training activities, particularly with respect to the investigations of the potential effects of underwater noise sources on marine mammals and other protected species. Proposed training activities employ sonar and underwater explosives, which introduce sound into the marine environment.

The Marine Life Sciences Division of the Office of Naval Research currently coordinates six programs that examine the marine environment and are devoted solely to studying the effects of noise and/or the implementation of technology tools that will assist the Navy in studying and tracking marine mammals. The six programs are as follows:

1. Environmental Consequences of Underwater Sound,
2. Non-Auditory Biological Effects of Sound on Marine Mammals,
3. Effects of Sound on the Marine Environment,
4. Sensors and Models for Marine Environmental Monitoring,
5. Effects of Sound on Hearing of Marine Animals, and
6. Passive Acoustic Detection, Classification, and Tracking of Marine Mammals.

The Navy has also developed the technical reports referenced within this document, including the Marine Resources Assessment for the Mariana Islands and the Marine Mammal and sea turtle density estimates for Guam and the CNMI (DoN 2007). Furthermore, research cruises by the NMFS and by academic institutions have received funding from the Navy.

The Navy has sponsored several workshops to evaluate the current state of knowledge and potential for future acoustic monitoring of marine mammals. The workshops brought together acoustic experts and marine biologists from the Navy and other research organizations to present data and information on current acoustic monitoring research efforts and to evaluate the potential for incorporating similar technology and methods on instrumented ranges. However, acoustic detection, identification, localization, and tracking of individual animals still requires a significant amount of research effort to be considered a reliable method for marine mammal monitoring. The Navy supports research efforts on acoustic monitoring and will continue to investigate the feasibility of passive acoustics as a potential mitigation and monitoring tool.

Overall, the Navy will continue to fund ongoing marine mammal research, and is planning to coordinate long term monitoring/studies of marine mammals on various established ranges and operating areas. The Navy will continue to research and contribute to university/external research to improve the state of the science regarding marine species biology and acoustic effects. These efforts include mitigation and

monitoring programs; data sharing with NMFS and via the literature for research and development efforts; and future research as described previously.

5.1.7 MIRC Stranding Response Plan

Navy and NMFS have developed a Stranding Response Plan for Major Exercises in the MIRC Study Area (available at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm). Pursuant to 50 CFR 216.105, the plan will be included as part of (attached to) the Navy's MMPA Letter of Authorization (LOA), which contains the conditions under which the Navy is authorized to take marine mammals pursuant to training activities in the MIRC Study Area. The Strandings Response Plan is specifically intended to outline the applicable requirement the authorization is conditioned upon in the event that a marine mammal stranding is reported in the MIRC Study Area during a major training exercise. NMFS considers all plausible causes within the course of a stranding investigation and this plan in no way presumes that any strandings in the MIRC Study Area are related to, or caused by, Navy training activities, absent a determination made in a Phase 2 Investigation, as outlined in Paragraph 7 of this plan indicating that MFAS or explosive detonation in the MIRC Study Area were a cause of the stranding. This plan is designed to address the following three issues:

- Mitigation – the shutdown component of this plan is intended to minimize the exposure of animals to MFAS and explosive detonations, regarding of whether or not these activities may have initially played a role in the event.
- Monitoring - this plan will enhance the understanding of how MFAS/HFAS or Improved Extended Echo Ranging (IEER) (as well as other environmental conditions) may, or may not, be associated with marine mammal injury or strandings. Additionally, information gained from the investigations associated with this plan may be used in the adaptive management of mitigation or monitoring measures in subsequent LOAs, if appropriate.
- Compliance – the information gathered pursuant to this protocol will inform NMFS' decisions regarding compliance with Sections 101(1)(5)(B) and (C) of the MMPA.

5.1.8 Alternative Mitigation Measures Considered but Eliminated

As described in Chapter 3, Section 3.9 and Appendix E, the vast majority of estimated sound exposures of marine mammals during proposed active sonar activities would not cause injury. Potential acoustic effects on marine mammals would be further reduced by the mitigation measures described above. Therefore, through this EIS and associated regulatory documents, the NMFS has concluded the Proposed Action and mitigation measures would achieve the least practical adverse impact on species or stocks of marine mammals.

Based on NMFS' preliminary determinations reached in the development of the proposed rule associated with the MIRC as well as NMFS' analysis of the comments received during the public comment period on the proposed rule, NMFS has determined that the Navy's Final EIS/OEIS adequately analyzes the training activities in the Mariana Islands Range Complex. NMFS has adopted the MIRC Final EIS/OEIS to support the proposed issuance of the MMPA incidental take regulations, the 2009 LOA, and future LOAs as appropriate. As mentioned above, NMFS must also prescribe regulations that set forth the means of affecting the least practicable adverse impact on affected species or stocks and their habitat (i.e., mitigation measures). The Navy's Final EIS/OEIS includes a suite of proposed mitigation measures, a discussion of mitigation measures that were considered by the Navy and NMFS, but eliminated, and an indication that additional mitigation measures (either not discussed in the Final EIS/OEIS or measures considered but eliminated in the Final EIS/OEIS) may be required by NMFS/Navy Final Rule adaptive management process. As indicated in the Final EIS/OEIS, all alternatives include implementation of

mitigation measures, and the analysis of mitigation alternatives is specifically presented in this chapter of the Final EIS/OEIS.

In making a determination of "least practicable adverse impact", NMFS considers the following factors relative to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals; (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for Navy implementation, which includes consideration of personnel safety, practicality of implementation, and the impact on the effectiveness of the military readiness activity. Accordingly, the following additional mitigation measures were analyzed and eliminated from further consideration:

Seasonal and/or Geographic Limitations

Benefit to Marine Mammals / Effectiveness of Measure

In previous documents NMFS has indicated that seasonal or geographic limitations are a direct and effective means of reducing adverse impacts to marine mammals. By reducing the overlap in time and space of the known concentrations of marine mammals and the acoustic footprint associated with the thresholds for the different types of take (either at all times and places where animals are concentrated, or times and places where they are concentrated for specifically important behaviors (such as reproduction or feeding), the amount of take can be reduced. However, the concept of geographical and seasonal (or temporal) limitations must be balanced with the Title 10 responsibilities of Department of Defense to assure a fully trained and ready military force. Avoidance of marine mammal habitats is not possible given that the full habitat requirements the marine mammals in the Mariana Islands are unknown. Accordingly, there is no information available on possible alternative exercise locations or environmental factors that would otherwise be less important to marine mammals in the Mariana Islands. In addition, these exercise locations were very carefully chosen by exercise planners based on training requirements and the ability of ships, aircraft, and submarines to operate safely. Moving the exercise events to alternative locations would impact the effectiveness of the training and has no known benefit (especially as there is no scientific data available to determine which specific areas should be avoided).

It is important that any measures are used carefully at times and places where their effects are relatively well known. For example, if there is credible evidence that concentrations of marine mammals are known to be high at a specific place or during a specific time of the year, or that certain areas are selectively used for important life functions like breeding or feeding (such as the high densities of humpback whales in the main Hawaiian Islands, or North Atlantic right whale critical habitat on the east coast), then these types of seasonal or geographic exclusions or limitations can be effective. However, if marine mammals are only known to *prefer* certain *types* of areas (as opposed to specific areas) for certain functions (such as beaked whales use of seamounts or marine mammal use of productive areas like fronts), which means that they may or may not be present at any specific time, it may be less effective to require avoidance or limited use of that type of area all of the time.

Spinner dolphins, which rest primarily during the day in relatively large groups, are known to consistently use certain areas (usually Bays) for this function. Because of this, they are a regular target for whale watching boats or other members of the public interested in viewing or interacting with them, which could potentially put them at increased energetic risk if their resting cycles are repeatedly interrupted in a significant manner. There are several resting areas for spinner dolphins in the MIRC Study Area: Agat Bay, Bile/Tougan Bay, and Double Reef. These areas usually occur in clear, calm, shallow waters sheltered from prevailing tradewinds. NMFS and the Navy considered spinner dolphin resting areas in relation to areas where the Navy plans to conduct training activities, including the Agat Bay Underwater Detonation (UNDET) areas (as depicted on Figure 2-4). Although not required by NMFS, the outermost edge of the resting areas extends out approximately .5 nm (900m) from shore, which is 4 nm (7.4km) away from the Agat Bay UNDET area. The estimated threshold range for TTS exposure from explosives

ordnance used in the Agat Bay UNDET area is approximately 0.3nm (500m). Therefore, explosive activities conducted at this site are not expected to impact resting spinner dolphins.

Unlike the UNDET areas for MIW, there are no areas specifically designated for ASW and SUW exercises. The TTS threshold distance for MFA ranges from 0 to 110m from the source and, therefore, spinner dolphins resting in these Bays are not expected to be exposed to levels associated with TTS. The received SPL level at 2.5nm (4.6km), is between 160 and 170dB and there could be potential for some behavioral impacts if spinner dolphins were resting in the area when ASW was conducted at the closest possible spot, however, due to the large size of the MIRC study area (over 500,000nm^2), the probability that ASW training activities would be conducted in close proximity to any of the recognized resting areas when spinner dolphins are present is very low.

Practicability of the Measure

Generally speaking and specifically discussed in section 2.7 of the Final EIS/OEIS, the Navy needs to have the flexibility to operate at any time or place to meet their training needs pursuant to Title 10. The Navy needs to be able to train in the largest variety of physical (bathymetry, etc.), environmental, and operational (within vicinity of different assets, such as airfields, instrumented ranges, homeports, etc.) parameters in order to be properly prepared. Additionally, Navy training, planning and implementation needs to be adaptable in order to accommodate the need of the Navy to respond to world events and the ever-changing strategic focus of the U.S. In some cases, the Navy has been able to commit to considering certain areas that are important to marine mammals in their planning process, or limiting MFAS use in certain ways in certain areas, but the Navy has always expressed a need to maintain the flexibility to train in an area if necessary for national security, and any measures imposed by NMFS need to account for this reality.

Aside from the general reasons of impracticability cited above, below are some of the specific reasons that certain specific types of seasonal and geographic restrictions or limitations are impracticable for the Navy.

Coastal restrictions (such as 25 nm from 200-m isobath) - Littoral waterspace is where potential enemies will operate. The littoral waterspace is also the most challenging area to operate due to a diverse acoustic environment. In real world situations, it is highly likely the Navy would be working in these types of areas. It is not realistic to refrain from training in the areas that are the most challenging and operationally important. Areas where ASW events are scheduled to occur are carefully chosen to provide for the safety of events and to allow for the realistic development of the training scenario including the ability of the exercise participants to develop, maintain, and demonstrate proficiency in all areas of warfare simultaneously. Limiting the training event to a few areas would have an adverse impact on the effectiveness of the training by limiting the ability to conduct other critical warfare areas including, but not limited to, the ability of the Strike Group to defend itself from threats on the surface and in the air while carrying out air strikes and/or amphibious assaults. In those locations where amphibious landing events occur, coastal restrictions would decouple ASW training and Amphibious training, which are critically important to be conducted together due to the high risk to forces during actual Amphibious operations. Furthermore, major exercises using integrated warfare components require large areas of the littorals and open ocean for realistic and safe training.

Sea Mounts and Canyons- Submarine tracking is a long and complicated tactical procedure. Seamounts are often used by submarines to hide or mask their presence, requiring the need to train in this complex ocean environment. This is precisely the type of area needed by the Navy to train. Sea mounts and canyons impact the way sound travels in water as well as the Navy's ability to search and track submarines. If the Navy does not train near sea mounts and canyons and understand how these features affect their ability to search and track a submarine, they will be unable to do so when faced with an actual threat. Exercise locations are carefully chosen based on training requirements and the ability of ships,

aircraft, and submarines to operate safely. Given the strategic training needs, restricting active sonar operation around seamounts and canyons in the MIRC study area is not practicable. This discussion considers the impracticability of avoiding all seamounts and canyons. While it may be somewhat less impracticable to avoid a subset of specific seamounts or canyons, marine mammal use of these areas is ephemeral and varies based on many changing factors, which would make it difficult to justify requiring the avoidance of any particular features since doing so may or may not benefit marine mammals at any particular time.

Fronts and other Major Oceanographic Features – NMFS has determined that the impracticability to the Navy of avoiding these features outweighs the potential conservation gain. Though many species may congregate near fronts and other major oceanographic features, these areas may be both large and transitory, and, so restricting access to these features to avoid animals that *may* congregate in a small subset of the total areas is not practicable. Additionally, limiting sonar use in the vicinity of these types of features would disrupt training for the reasons described above for sea mounts and canyons.

Use of Dedicated or Independent Marine Mammal Observers (MMOs) to Implement Mitigation

Benefit to Marine Mammals / Effectiveness of Measure

Navy lookouts are specifically trained to detect anything (living or inanimate) that is in the vicinity of, visible from, or approaching the vessel. The safety of the personnel on board and of the vessel depends on their performance. While they receive training that is intended to expose them to the different species of marine mammals they might see and the behaviors they might potentially observe, they would certainly not be expected to differentiate between species or identify the significance of a behavior as effectively as an independent MMO. However, identification to species and understanding of marine mammal behavior is not necessary for mitigation implementation – for that, a lookout must simply detect a marine mammal and estimate its distance (e.g., within 1000 yds, 500 yds, or 200 yds) to the vessel. Though dedicated and independent MMOs are critical to implement a Monitoring Plan, Navy lookouts performing their normal duties are expected to be effective at detecting marine mammals for mitigation implementation.

Of note, the Navy has included in their Monitoring Plan a study that compares the effectiveness of Navy lookouts, versus MMOs, at detecting marine mammals to implement mitigation measures.

Practicability of the Measure

Following are several reasons for why using third-party observers from air or surface platforms, in addition to or instead of the existing Navy-trained lookouts is not practicable.

- The use of third-party observers could compromise security due to the requirement to provide advance notification of specific times/locations of Navy platforms.
- Reliance on the availability of third-party personnel would also impact training flexibility, thus adversely affecting training effectiveness. The presence of other aircraft in the vicinity of naval exercises would raise safety concerns for both the commercial observers and naval aircraft.
- Use of Navy observers is the most effective means to ensure quick and effective implementation of mitigation measures if marine species are spotted. A critical skill set of effective Navy training is communication. Navy lookouts are trained to act swiftly and decisively to ensure that appropriate actions are taken.
- Security clearance issues would have to be overcome to allow non-Navy observers onboard exercise platforms.
- Some training events will span one or more 24-hour period(s), with operations underway continuously in that timeframe. It is not feasible to maintain non-Navy surveillance of these operations, given the number of non-Navy observers that would be required onboard.

- Surface ships with active mid-frequency sonar have limited berthing capacity. Exercise planning includes careful consideration of this limited capacity in the placement of exercise controllers, data collection personnel, and Afloat Training Group personnel on ships involved in the exercise. Inclusion of non-Navy observers onboard these ships would require that in some cases there would be no additional berthing space for essential Navy personnel required to fully evaluate and efficiently use the training opportunity to accomplish the exercise objectives.
- Aerial surveying during an event raises safety issues with multiple, slow civilian aircraft operating in the same airspace as military aircraft engaged in combat training activities. In addition, most of the training events take place far from land, limiting both the time available for civilian aircraft to be in the exercise area and presenting a concern should aircraft mechanical problems arise.
- Scheduling civilian vessels or aircraft to coincide with training events would impact training effectiveness, since exercise event timetables cannot be precisely fixed and are instead based on the free-flow development of tactical situations. Waiting for civilian aircraft or vessels to complete surveys, refuel, or be on station would slow the progress of the exercise and impact the effectiveness of the military readiness activity.
- Multiple events may occur simultaneously in areas at opposite ends of the MIRC Range Complex and continue for up to multiple days at a time. There are not enough qualified third-party personnel to accomplish the monitoring task.

Use of Additional Detection Methods to Implement Mitigation (Shutdown Zones)

Benefit to Marine Mammals / Effectiveness of Measure

Lookouts stationed on surface vessels are currently the primary component of the Navy's marine mammal detection capabilities, with some opportunistic assistance from aerial or passive acoustic platforms when such assets are participating in a given exercise. NMFS recognizes the inherent limitations in using vessel-based visual observers to detect marine mammals (especially cryptic and deep-diving species like beaked whales, which are not at the surface often and are difficult to see when they are) (Barlow *et al*. 2006). The use of additional detection methods, such as those listed in Chapter 2, for the implementation of mitigation might further minimize the take of marine mammals (through mitigation goal (e), Section 1.3). Specifically, passive and active acoustic methods may detect animals that were below the surface (for passive acoustic detection, the animals would have to be vocalizing to be detected, but for active acoustic detection they would not – the High Frequency Marine Mammal Monitoring Sonar System (HFM3) system utilized by LFA sonar vessels effectively detects marine mammals to within 1 km of the sonar source).

In order for additional marine mammal detection methods to assist in the implementation of mitigation (shutdown and powerdown), they must be able to localize, or identify where the marine mammal is in relation to the sound source of concern (since shutdown and powerdown mitigation is triggered by the distance from the sound source), and transmit the applicable data to the commanding officer in real time (i.e., quickly so that the sonar source can be turned down or shut off right away or the explosive detonation can be delayed). A limited number of techniques based on the realtime participation of additional observers (such as additional aerial platforms) can achieve this, while many passive acoustic methods cannot. The section below contains information that speaks both to the practicality of implementation of some methods as well as the effectiveness.

Practicability of the Measure

Radars - While Navy radars are used to detect objects at or near the water surface, radars are not specifically designed to search for and identify marine mammals. For example, when an object is

detected by radar, the operators cannot definitively discern that it is a whale. During a demonstration project at Pacific Missile Range Facility (PMRF) in Hawaii, radar systems were only capable of detecting whales under very controlled circumstances and when these whales were already visually spotted by lookouts/watchstanders. Enhancing radar systems to detect marine mammals requires additional resources to schedule, plan and execute Navy limited objective experiments (LOEs) and RDT&E events. The Navy is currently reviewing opportunities to pursue enhancing radar systems and other developmental methods such as laser detection and ranging technology as potential mitigation for detecting marine mammals. Until funding resources and the data are available to develop enhanced systems, it is not known whether it will be technically feasible in the future to implement radar as an additional detection method.

Additional Platforms (aerial, UAV, Gliders, and Other**)** - The number of aerial and unmanned aerial vehicle (UAV) systems currently integrated into fleet training is extremely low and their availability for use in most training events is rare; therefore, shifting their use and focus from hunting submarines to locating marine mammals would be costly and negatively impact the training objectives related to these systems. If additional platforms are civilian, scheduling civilian vessels or aircraft to coincide with training events would affect training effectiveness since exercise events or timetables are not fixed and are based on a free flow development of tactical situations. Waiting for civilian aircraft or vessels to complete surveys, refuel, or be on station would slow the required progress of the training exercise. In addition, the precise location data and exercise plans provided to non-Navy assets poses logistical challenges and classification or security issues. While the Navy is currently reviewing options for additional detection methods, these additional platforms proved to be impracticable for the following reasons:

- Additional Aerial Survey Detection: Airborne assets when available already monitor for the presence of marine mammals with no reported incidents where marine mammals were overlooked during an exercise or where aerial assets were unable to perform their duties while watching for marine mammals; therefore, the allocation of additional airborne assets is not well justified. In addition, the presence of additional aircraft (not involved in the exercise) near naval exercises would present safety concerns for both commercial and naval observers because ASW training exercises are dynamic, can last several hours or days, and cover large areas of ocean several miles from land.
- UAV Detection: Currently and in the foreseeable five-year period of the requested authorization, these assets are extremely limited and are rarely if ever available, therefore impractical and expensive.
- Gliders Detection: Gliders are not currently capable of providing real time data, and therefore, are not an effective detection method for use in mitigation implementation.

Active Sonar - As previously noted, the Navy is actively engaged in acoustic monitoring research involving a variety of methodologies; however, none of the methodologies have been developed to the point where they could be used as a mitigation tool for MFAS or HFAS. At this time, the active sonar and adjunct systems listed below proved to be impracticable for the following reasons:

- Use of multiple systems (meaning the MFAS used for the exercise plus any additional active system used for marine mammal detection) operating simultaneously increases the likelihood that a submarine may be detected under conditions where it is attempting to mask its presence before activating sonar, resulting in an impact to the effectiveness of the military readiness activity. Additionally, interference may occur when certain active sonar systems (such as HFM3) are activated concurrently with MFAS.

- HFM3 is an adjunct system used by LFA because the hulls of those platforms can be modified and travel can occur at slow speeds. MFAS combatants are not equipped with HFM3 systems and it is impractical to install such a system on MFAS combatants.

The Navy will continue to coordinate acoustic monitoring and detection research specific to the proposed use of active sonar. As technology and methodologies become available, their applicability and viability will be evaluated for potential future incorporation.

Additional Passive Acoustic Monitoring - To provide a specialized localization capability (distance, direction, etc.), most of the systems (Sonobuoys, SQQ-89, Bottom-Mounted Sensors) would require significant modifications. The Navy is working to develop or enhance systems with distance measuring capabilities. Until these capabilities are available, exercise participants can use these systems to aid in marine mammal detection, but not solely to implement mitigation measures. Although passive contact on marine mammals only indicates the presence, not the range (distance and direction), the information on any passive acoustic detections is disseminated real time to allow lookouts to focus their visual search for marine mammals.

The Navy is improving the capabilities to use range instrumentation to aid in the passive acoustic detection of marine mammals. At the Southern California Offshore ASW Range (SOAR) Range in the Southern California (SOCAL) Range Complex, development of effective passive acoustic detection as part of the instrumented range is progressing fairly rapidly. Passive acoustic monitoring has the potential to significantly improve the ability to detect marine mammal presence within SOAR. The Navy sponsored Marine Mammal Monitoring on Navy Ranges (M3R) program has developed hardware and software that leverages the SOAR sensors to detect and localize marine mammal vocalizations. Localization is possible when the same signal is detected, precisely time-tagged, and associated on at least three sensors. Prototype M3R systems have been installed on both the Atlantic Undersea Test and Evaluation Center (AUTEC) (Bahamas) and SOAR ranges.

The M3R system is capable of monitoring all the range hydrophones in real-time. The Navy is refining the M3R system by developing tools to display detected transient signals including marine mammal vocalizations and localizations. The tools operate in real-time and are being used in a series of tests to document marine mammal species, their vocalizations, and their distribution on the SOAR range. In addition, they are being used to collect and analyze opportunistic data at AUTEC, and as part of the on-going Behavioral Response Study (BRS) there.

Reliable automated methods are needed for detection and classification of marine mammal calls to allow range hydrophones to be used for routine marine mammal monitoring in SOAR. The performance of these hydrophones must be quantified. The calls of many baleen whale species are stereotyped and well known. Identification of stereotyped mysticete calls within SOAR has been accomplished using automatic detectors. However, the full range of mysticete call types that are expected within SOAR is not known (e.g., sei whales). Odontocete call identification is more difficult owing to their call complexity. Calls of some odontocetes, such as sperm whales, killer whales, and porpoises, are easily distinguishable. For most species, however, the variation in and among call types is a topic of current research. Likewise, pinniped call types are complex and more data are needed to develop automatic detectors and classifiers to allow automated identification for pinniped species within SOAR. The Navy continues to develop this technology.

Of the 3 major Navy instrumented ranges, only AUTEC monitors the sensors in real-time for mitigation during active sonar operations. Animal densities at AUTEC are low. The dominant species is Blainville's beaked whale. The M3R opportunistic study of these animals during active operations strongly suggests they move off range during operations. This avoidance behavior combined with low densities makes the use of the range for mitigation implementation using imprecise localization associated with passive acoustic monitoring possible without major impact to operations.

At SOAR the large number of species and high animal density combined with imprecise acoustic localization makes the efficacy of such monitoring for use for mitigation implementation during real-time operations questionable.

Prior to implementation of real-time passive acoustic monitoring for use in mitigation, the species present and their distribution should be established. A system must be implemented on range and Detection, Classification, and Localization (DCL) algorithms specific to these species must be developed and tests with visual observers must be conducted to verify their performance. The Navy continues to work on this, and such systems are not yet available for consideration as required mitigation.

Infrared technology – As a complement to existing methods, use of the Infrared (IR) band for marine mammal detection and location has some obvious benefits if proved viable, including the ability to operate infrared at night, as well as the ability to establish automated detections procedures which might well reduce the factor of human fatigue that affects observer-based methods. The Navy has committed to a program of research, development, and testing of IR-based technologies for detection of marine mammals in the wild.

The Navy program will have two main thrusts. The Navy will continue to pursue operational tests of their airborne monitoring and mitigation program for marine species using net-centric Intelligence, Surveillance, and Reconnaissance (ISR) systems. The proposed system uses a radar detect and track cueing sensor for a turreted airborne Electro-Optic/Infrared/Multi-spectral imaging sensor. If fully funded for prototyping and demonstration, this program would evaluate the efficacy for marine mammal detection of a large, high-powered system designed, tested, and deployed for other purposes, and operates beyond the domain of research Science and Technology.

At the same time, the Office of Naval Research (ONR) will take the lead in pursuing a longer-range, research S&T program to evaluate new concepts for IR detection that may ultimately lead to an operationally viable technique(s). The focus of the ONR effort will be on comparatively small, low-power systems that might be deployable on small, robot aircraft known as Unmanned Aerial Vehicles (UAVs) as well as operating in a ship-based mode. Either option might allow the inclusion of standard video for confirmation of mammal detections during the day. The UAV option might allow for multiple passages of an area of interest at low altitude to confirm mammal detections and identification.

ONR will continue to support this effort for at least several years, with the potential for sustained support, though the future breadth of this program will depend on the outcome of early efforts. The system is not considered practicable to require for implementation at this time.

Avoidance of Federal Marine National Monuments, including the Marianas Trench National Monument (MTNM)

Benefit to Marine Mammals / Effectiveness of Measure

Pursuant to the MMPA, NMFS makes decisions regarding required mitigation based on biological information pertaining to the potential impacts of an activity on marine mammals and their habitat (and the practicability of the measure), not management designations intended for the broad protection of various other marine resources.

The Marianas Trench National Monument (MTNM) was established to protect the submerged lands and waters of the Mariana Archipelago and was designated with the purpose of protecting the submerged volcanic areas of the Mariana Ridge, the coral reef ecosystem of the waters of surrounding islands, and the Marianas Trench. The Monument includes the submerged lands of the "Volcano Unit" and the water column and submerged lands within the "Island Unit". There are no specifically designated marine mammal protection areas in the MTNM.

A portion of the MTNM overlaps with the MIRC Study Area (see Figure 3.6-1). When operations do occur in this area or any of the other Monuments, the Navy would follow the general mitigation protocols established in the final rule and LOA, for example, powering or shutting down sonar when marine mammals are detected within ranges where the received sound level is likely to result in temporary threshold shift (TTS) or injury and using exclusion zones that avoid exposing marine mammals to levels of explosives likely to result in injury or death of marine mammals. NMFS expects that the mitigation measures employed in the MTNM and other Monuments will reduce the number of marine mammals exposed to levels of sound expected to result in TTS in these areas.

As mentioned previously, no known areas of specific importance to marine mammals (that would benefit from a training restriction, i.e., not counting pinniped haulouts where the animals are not in the water the majority of the time) are present within these designated areas. Therefore, limiting activity in these areas would be of questionable value to marine mammals.

Practicability of the Measure

As discussed above, these measures would not offer any additional benefit to marine mammals. Additionally, the impracticability of seasonal and geographic restrictions and limitations, which applies to this measure, is discussed above.

Suspension of MFAS Training at Night, or During Low Visibility or Surface Duct

Benefit to Marine Mammals / Effectiveness of Measure

The Navy is capable of effectively monitoring a 1000-yd safety zone using night vision goggles (infrared cameras are sometimes used as an extra tool for detection, when available, but have not been shown to show a significant enhancement of current capabilities). Night vision goggles are always available to all vessel and aircrews as needed and passive acoustic monitoring is always in use. As mentioned previously, the estimated zone in which TTS may be incurred is within about 140 m of the sound source (830 m for harbor seals), and the estimated zone for injury is within 10 m of the sonar dome. The powerdown and shutdown zones are at 1000, 500, and 200 yds. The Navy is expected to be able to effectively implement the necessary mitigation measures during nighttime and times of lower visibility.

Because of the limited visibility beyond 1000 yards, Navy personnel could potentially detect fewer animals early (outside of the 1000 yds), as they are approaching to within 1000 yd, which could result in a slightly delayed powerdown or shutdown as compared to when operations are conducted in full daylight. However, any such potential delays would be at the outer edge of the safety zone and would not result in an animal being exposed to received sound levels associated with TTS or injury. So, suspension of MFAS during times of lower visibility may slightly reduce the exposures of marine mammals to levels associated with behavioral harassment (goals b-d), but would not reduce the number of marine mammals exposed to sound levels associated with TTS or injury.

Regarding surface ducts, their presence is based on water conditions in the exercise areas, is not uniform, and can change over a period of a few hours as the effects of environmental conditions such as wind, sunlight, cloud cover, and tide changes alter surface duct conditions. Across a typical exercise area, the determination of "significant surface ducting" is continually changing, and Navy this mitigation measure cannot be accurately implemented. Furthermore, surface ducting alone does not necessarily increase the risk of MFA sonar impacts to marine mammals. While surface ducting causes sound to travel farther before losing intensity, simple spherical and cylindrical spreading losses result in a received level of no more than 175 dB rms at approximately 1,100 yards (assuming the nominal source of 235 dB rms), even in significant surface ducting conditions.

Practicability of the Measure

ASW training using MFAS is required year round in all environments, to include nighttime and low visibility conditions or conditions that realistically portray bathymetric features where adversary submarines threats (i.e., extremely quite diesel electric or nuclear powered) can hide and present significant detection challenges. Unlike an aerial dogfight, which is over in minutes or even seconds, ASW is a cat and mouse game that requires large teams of personnel working in shifts around the clock (24-hours) typically over multiple days to complete an ASW scenario. ASW can take a significant amount of time to develop the tactical picture (i.e., understanding of the battle space such as area searched or unsearched, identifying false contacts, and water conditions). Reducing or securing power at night or in low visibility conditions would affect a Commander's ability to develop the tactical picture as well as not provide the needed training realism. If there is an artificial break in the exercise by reducing power or suspending MFAS use, the flow of the exercise is lost and several hours of training will have been wasted. Both lost time and training differently than what would be needed in combat diminish training effectiveness.

MFAS training at night is vital because differences between daytime and nighttime affect the detection capabilities of MFAS systems. Ambient noise levels are higher at night because many species use the nighttime period for foraging and movement. Temperature layers, which affect sound propagation, move up and down in the water column from day to night. Consequently, personnel must train during all hours of the day to ensure they identify and respond to changing environmental conditions. An ASW team trained solely during the day cannot be sent on deployment and be expected to fight at night because they would not identify and respond to the changing conditions.

Finally, as a matter of safety and international law, Navy vessels are required to use all means available in restricted visibility, including MFAS and positioning of additional lookouts, to provide heightened vigilance to avoid collision. The *International Navigation Rules of the Road* considers periods of fog, mist, falling snow, heavy rainstorm, sandstorms, or any similar events as "restricted visibility." In restricted visibility, all mariners, including Navy vessel crews, are required to maintain proper lookout by sight and hearing as well as "by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision." Prohibiting or limiting vessels from using sensors like MFAS during periods of restricted visibility violates international navigational rules, increases navigational risk, and jeopardizes the safety of the vessel and crew.

Surface ducting occurs when water conditions (e.g., temperature layers, lack of wave action) result in sound energy emitted at or near the surface to be refracted back up to the surface, then reflected from the surface only to be refracted back up to the surface so that relatively little sound energy penetrates to the depths that otherwise would be expected. This increases active detection ranges in a narrow layer near the surface, but decreases active sonar detection below the thermocline, a phenomenon that submarines have long exploited. Significant surface ducts are conditions under which ASW training must occur to ensure Sailors learn to identify these conditions, how they alter the abilities of MFA sonar systems, and how to deal with the resulting effects on MFA sonar capabilities. To be effective, the complexity of ASW requires the most realistic training possible. Reducing power in significant surface ducting conditions undermines training realism, and is, therefore, impracticable.

Delayed Restart of MFAS after Shutdown or Powerdown

Benefit to Marine Mammals / Effectiveness of Measure

NMFS' assessment indicates that expanding the delay (until sonar can be restarted after a shutdown due to a marine mammal sighting) for deep-diving species adds minimal protective value for the following reasons:

- The ability of an animal to dive longer than the required shutdown time does not mean that it will always do so. Therefore, the additional time would only potentially add value in instances when animals had remained under water for longer than the shutdown time required..
- Navy vessels typically move at 10-12 knots (5-6 m/sec) when operating active sonar and potentially much faster when not. Fish *et al*. (2006) (as detailed in NMFS 2009) measured speeds of 7 species of odontocetes and found that they ranged from 1.4–7.30 m/sec. Even if a vessel was moving at the slower typical speed associated with active sonar use, an animal would need to be swimming near sustained maximum speed for an hour in the direction of the vessel's course to stay within the safety zone of the vessel (i.e., to be in danger of being exposed to levels of sonar associated with injury or TTS).
- Additionally, the times when marine mammals are deep-diving (i.e., the times when they are under the water for longer periods of time) are the same times that a large portion of their motion is in the vertical direction, which means that they are far less likely to keep pace with a horizontally moving vessel.
- Given that, the animal would need to have stayed in the immediate vicinity of the sound source for an hour and considering the maximum area that both the vessel and the animal could cover in an hour, it is improbable that this would randomly occur. Moreover, considering that many animals have been shown to avoid both acoustic sources and ships without acoustic sources, it is improbable that a deep-diving cetacean (as opposed to a dolphin that might bow ride) would choose to remain in the immediate vicinity of the source. It is unlikely that a single cetacean would remain in the safety zone of a Navy sound source for more than 30 minutes.
- Last, in many cases, the lookouts are not able to differentiate species to the degree that would be necessary to implement this measure. Plus, Navy operators have indicated that increasing the number of mitigation decisions that need to be made based on biological information is more difficult for the lookouts (because it is not their area of expertise).

Practicability of the Measure

When there is an artificial break in the exercise (such as a shutdown) the flow of the exercise is lost and several hours of training may be wasted, depending on where the Navy was in the exercise. An increase in the delay of MFAS use that occurs during an exercise will likely further negatively affect the effectiveness of the military readiness training because it will be harder to regain the flow of the exercise the longer the equipment and personnel are on hold. Moreover, lengthening a delay in training necessitates a continuation of the expenditure of resources (operation of all of the equipment and personnel), while not making progress towards the accomplishment of the mission (training completion).

Halting of MFAS Use in the Event of a Marine Mammal Injury or Death (and Stranding) until Cause is Determined

Benefit to Marine Mammals / Effectiveness of Measure

Only in a very small portion of incidents (such as when a ship strikes a whale and personnel realize it immediately) is the cause of marine mammal injury or death immediately known. Halting MFAS use in the event of a marine mammal stranding may have only a very limited immediate benefit to marine mammals if animals have stranded and are still in the water and are within a certain distance of a Navy sound source(s) (not to imply that the Navy source would be assumed to have caused the event), i.e., it is physically possible for them to be exposed to received levels of sound that could potentially result in an additional adverse effects. In this case, cessation of sonar may alleviate additional stress to an animal that is already in a compromised physical state. However, if stranded animals are dead or on the beach, the benefit of a cessation of sonar does not exist as neither dead nor beached animals can benefit from it. The

Navy will be required (by the MMPA authorization) to notify NMFS immediately if an injured, stranded, or dead marine mammal is found during or shortly after, and in the vicinity of, any Navy training exercise utilizing MFAS, HFAS, or underwater explosive detonations taking place with the MIRC.

Practicability of the Measure

Investigations into the causes of stranding events often take months or years and the most probable outcome is that a definitive determination of cause is not made. Despite the fact that the Navy has been conducting thousands of hours of sonar, each, in southern California, around Hawaii, and off the east coast of the U.S. for multiple years, NMFS and the Navy have concluded that only 5 strandings worldwide (and not in the areas mentioned) can be associated with MFAS use. It is impracticable to halt the use of MFAS while the cause of a stranding is determined.

Ramp Up of Sonar Source Prior to Full Power Operation

Benefit to Marine Mammals / Effectiveness of Measure

Based on the evidence that some marine mammals avoid sound sources, such as vessels, seismic sources, or MFAS (Richardson *et al*. 1995, Southall *et al*. 2007), the theory behind the ramp-up is that animals would move away from a sound source that was ramped up starting at low energy, which would result in the animals not being suddenly exposed to a more alarming, or potentially injurious sound. Compton *et al*. (2008) noted that this response has not been empirically demonstrated, that the effectiveness of the measure would likely vary between species and circumstances, and that the effectiveness of the measure should be the focus of further research (i.e., controlled exposure experiments).With seismic surveys, which have relatively large safety zones compared to MFAS (and for which NMFS estimates that injury can occur at greater distances from the source than MFAS), NMFS utilizes ramp-up as a cautious mitigation measure to reduce Level B harassment and help ensure that Level A harassment does not occur.

Practicability of the Measure

Ramp-up procedures are not a viable alternative for MFA sonar training events as the ramp-up would alert opponents to the participants' presence, thus undermining training realism and effectiveness of the military readiness activity. When a MFA sonar ship turns its sonar on, area submarines are alerted to its presence. A submarine can hear an active sonar transmission farther away than the surface ship can hear the echo of its sonar off the submarine. Ideally, the surface ship will detect the submarine in time to attack the submarine before the submarine can attack one of the ships of the Strike Group (noting of course, that attacks during training events are not actual attacks). If the MFA sonar ship starts out at a low power and gradually ramps up, it will give time for the submarine to take evasive action, hide, or close in for an attack before the MFA sonar is at a high enough power level to detect the submarine. Additionally, using these procedures would not allow the Navy to conduct realistic training, or "train as they fight," thus adversely impacting the effectiveness of the military readiness activity. Ramp up would constitute additional unnecessary sound introduced into the marine environment, in and of itself constituting harassment and this measure does not account for the movement of the ASW participants over the period of time when ramp up would be implemented.

Enlargement or Modification of Powerdown/Shutdown Zones of Hull-mounted Sonar

Benefit to Marine Mammals / Effectiveness of Measure

The current power down and shut down zones are based on scientific investigations specific to MFA sonar for a representative group of marine mammals. They are based on the source level, frequency, and sound propagation characteristics of MFA sonar. The zones are designed to preclude direct physiological effect from exposure to MFA sonar. Specifically, the current power-downs at 500 yards and 1,000 yards, as well as the 200 yard shut-down, were developed to minimize exposing marine mammals to sound

levels that could cause TTS and PTS.. The underlying received levels of sound that were used to determine the appropriate safety zone distances are based on: for TTS - empirical information gathered on the levels at which the onset of noise-induced loss in the hearing sensitivity of captive cetaceans occurs, and; and for PTS – extrapolations from the cetacean TTS data that incorporate TTS growth data from terrestrial animals. NMFS has determined that these measures effectively accomplish this.

Enlargement of the powerdown or shutdown zones would primarily result in the further reduction of the maximum received level that the detected animal might be exposed to, which could potentially mean that an animal expected to respond in a manner NMFS would classify as level B harassment could potentially either respond in a less severe manner or maybe not respond at all. This could be more important at an important time or place or in the presence of species or age-classes of concern (such as beaked whales). NMFS has received varying recommendations regarding the potential size of an expanded powerdown or shutdown zone, including 2 km, 4 km, or the 154 dB isopleth. As noted below, the ability of the lookouts to effectively monitor the safety zone decreases as the distance to the edge of the zone increases and the area that it is necessary to monitor increases by a factor of 4 as the distance to the edge doubles.

A review of the Navy's post-exercise reports shows lookouts have not reported any observed response of marine mammals at any distance.

Practicability of the Measure

The outer safety zone the Navy has developed (1000 yd) is also based on a lookout's ability to realistically maintain situational awareness over a large area of the ocean, including the ability to detect marine mammals at that distance during most conditions at sea. Requirements to implement procedures when marine mammals are present well beyond 1,000 yards dictate that lookouts sight marine mammals at distances that, in reality, are not always possible. These increased distances also significantly expand the area that must be monitored to implement these procedures. For instance, if a power down zone increases from 1,000 to 4,000 yards, the area that must be monitored increases sixteen-fold. Increases in safety zones are not based in science, provide limited benefit to marine mammals and severely impact realistic ASW training by increasing the number of times that a ship would have to shut down active sonar, impacting realistic training, and depriving ships of valuable submarine contact time. Commanders participating in training designed for locating, tracking, and attacking a hostile submarine could lose awareness of the tactical situation through increased stopping and starting of MFA sonar leading to significant exercise event disruption. Increased shutdowns could allow a submarine to take advantage of the lapses of active sonar, and position itself for a simulated attack, artificially changing the reality of the training activity. Given the operational training needs, increasing the size of the safety range is generally impracticable.

Expansion of Exclusion Area Delineated for Use with Explosive Detonations

Benefit to Marine Mammals / Effectiveness of Measure

As described previously, the current designated exclusion zones for three exercise types (SINKEX, BOMBEX, and MISSILEX) are not large enough to prevent TTS should one of the largest explosives (MK-82 or Harpoon) detonate while the animal is at some distance outside of the exclusion zone. If the exclusion zone were enlarged, the Navy could theoretically reduce the number of TTS takes that might occur – however, anticipated takes by TTS are already very low and the exclusion zones are more than large enough to avoid injury from all charges.

Practicability of the Measure

As mentioned above, SINKEXs have associated range clearance procedures that cover a circle with a radius of either 2 nm (though the exclusion zone is only 1 nm), 1645 m, or 914 m. Enlarging these circles to encompass the TTS isopleths for these exercise means doubling the radius of the exclusion zones (or

more), which would mean that an area 4 times the size would need to be monitored. Generally speaking, the Navy could do this in one of two ways: they could either use the same amount of resources to monitor the area that is 4 times larger, which could potentially result in less focus on the center area that is more critical (because more severe effects are expected closer to the source where the received level would be louder), or they could maintain the same level of coverage by increasing the resources used for monitoring by four times (or more), which is not practicable considering the limited anticipated protective value of the measure.

Monitoring of Explosive Exclusion Area During Exercises

Benefit to Marine Mammals / Effectiveness of Measure

The Navy's SINKEX and BOMBEX measures currently require that the Navy survey a safety zone prior to an exercise, and then during the exercise when feasible. In addition to the overflights, the exclusion zone would be monitored by passive acoustic means, when assets are available. Continuous monitoring during an explosive exercise could potentially decrease the number of animals exposed to energy or pressure levels associated with take. However, one could assume that animals would continue to avoid the area to some degree if continuous explosions were occurring in the areas.

Of note, aside from SINKEXs, training events involving explosives are generally completed in a short amount of time. For smaller detonations such as those involving underwater demolitions training, the area is observed to ensure all the charges detonated and that they did so in the manner intended; however, it is not possible to have visual contact 100 percent of the time for all explosive inwater events. Navy must clear all people from the explosive zone of influence prior to an inwater explosive event for the safety of personnel and assets. If there is an extended break between clearance procedures and the timing of the explosive event, clearance procedures are repeated.

Practicability of the Measure

There are potentially serious safety concerns associated with monitoring an area where explosions will occur and the Navy must take those into consideration when determining when monitoring during an exercise is feasible. While the Navy's measures allow for some monitoring during explosive exercises, it is not practicable to do all of the time.

Using MFA and HFA sonar with output levels as low as possible consistent with mission requirements or using active sonar only when necessary:

Operators of sonar equipment are trained to be aware of the environmental variables affecting sound propagation. In this regard, the sonar equipment power levels are always set consistent with mission requirements. Active sonar is only used when required by the mission since it has the potential to alert opposing forces to the sonar platform's presence. The Navy remains committed to using passive sonar and all other available sensors in concert with active sonar to the maximum extent practicable consistent with mission requirements.

Scaling down training to meet core aims:

As with each Navy range complex, the primary mission of the MIRC is to provide a realistic training environment for naval forces to ensure that they have the capabilities and high state of readiness required to accomplish assigned missions. Modern war and security operations are complex. Modern weaponry has brought both unprecedented opportunity and innumerable challenges to the Navy. Smart weapons, used properly, are very accurate and actually allow the military Services to accomplish their missions with greater precision and far less destruction than in past conflicts. But these modern smart weapons are very complex to use. U.S. military personnel must train regularly with them to understand their capabilities, limitations, and operation. Modern military actions require teamwork between hundreds or thousands of people, and their various equipment, vehicles, ships, and aircraft, all working individually

and as a coordinated unit to achieve success. These teams must be prepared to conduct activities in multiple warfare areas simultaneously in an integrated and effective manner. Navy training addresses all aspects of the team, from the individual to joint and coalition teamwork. Training events are identified and planned because they are necessary to develop and maintain critical skills and proficiency in many warfare areas. Exercise planners and Commanding Officers are obligated to ensure they maximize the use of time, personnel and equipment during training. The level of training expressed in the Proposed Action and alternatives is essential to achieving the primary mission of the MIRC.

Limiting the active sonar event locations:

Areas where events are scheduled to occur are carefully chosen to provide for the safety of events and to allow for the realistic development of the training scenario including the ability of the exercise participants to develop, maintain, and demonstrate proficiency in all areas of warfare simultaneously. Limiting the training event to a few areas would have an adverse impact to the effectiveness of the training by limiting the ability to conduct other critical warfare areas including, but not limited to, the ability of the Strike Group to defend itself from threats on the surface and in the air while carrying out other activities. Limiting the exercise areas would concentrate all active sonar use, resulting in unnecessarily prolonged and intensive sound levels rather than the more transient exposures predicted by the current planning that makes use of multiple exercise areas. Furthermore, exercises using integrated warfare components require large areas of the littorals and open ocean for realistic and safe training.

Implementing vessel speed reduction:

Vessels engaged in training use extreme caution and operate at a slow, safe speed consistent with mission and safety. Ships and submarines need to be able to react to changing tactical situations in training as they would in actual combat. Placing arbitrary speed restrictions would not allow them to properly react to these situations. Training differently than that which would be needed in an actual combat scenario would decrease training effectiveness and reduce the crew's abilities.

Restricting the use of MFA sonar during ASW training events while conducting transits between islands (i.e., choke-points):

This restriction is not applicable to training in the MIRC. A chokepoint is a strategic strait or canal. Although there are over 200 major straits around the world, only a handful are considered to be strategic "chokepoints," such as the Strait of Gibraltar, Panama Canal, Strait of Magellan, Strait of Malacca, Bosporus and Dardanelles, Strait of Hormuz, Suez Canal, and Bab el Mandeb. While chokepoints are relatively few in number, significant quantities of international commerce and naval shipping move through these chokepoints, making them strategically important to the United States because a single quiet diesel submarine can position itself in the chokepoint and effectively block access beyond that point. The primary similarity of these chokepoints is lengthy shorelines that restrict maneuverability. The longer and more narrow the passage, the more likely the chokepoint creates an area of restricted egress for marine mammals.

Adopting mitigation measures of foreign nation navies:

The Navy typically operates in a Strike Group configuration where the group focuses its efforts on conducting air strikes and/or amphibious operations ashore. This requires that the Navy train to what it calls "integrated warfare" meaning that Strike Groups must conduct many different warfare areas simultaneously. These include the ability to defend itself from attacks from submarines, mines, ships, aircraft and missiles. Other nations do not possess the same integrated warfare capabilities as the United States. As a result, many foreign nations' measures are focused solely on reducing what they perceive to be impacts involving ASW. They are not required to locate training areas and position naval forces for the simultaneous and integrated warfare elements that the Navy conducts. As a result, many nations are

willing to move training to areas where they believe marine mammals may not exist and do not train in the same bathymetric and littoral environments.

5.2 MITIGATION MEASURES SPECIFIC TO RESOURCES (OTHER THAN MARINE MAMMALS AND SEA TURTLES)

5.2.1 GEOLOGY, SOILS, AND BATHYMETRY

The following measures are current mitigation measures for activities that could impact geology and soils in the Study Area:

- Locate ground-disturbing training activities on previously disturbed sites whenever possible.
- Ensure that all training areas, including transit routes necessary to reach training areas, are clearly identified or marked. Restrict vehicular activities to designated/previously identified areas.
- Continue to control erosion through the Site Approval Process, whereby the Navy reviews each proposed project for its erosion potential, and involves the designated installation Natural Resource Specialist in the process.
- Continue to manage erosion in accordance with the applicable storm water pollution prevention plan (SWPPP) at each training location.
- Prohibit off-road vehicle use except in designated off-road areas or on established trails.
- Monitor erosion and drainage at select locations, particularly at Unai Dankulo.
- Implement mitigation measures for terrestrial biological resources (to reduce impacts from loss of ground cover) (see Section 5.2.5) and cultural resources (to ensure avoidance of restricted areas) (see Section 5.2.7).
- Comply with existing policies and management activities to conserve soils, including requirements and restrictions outlined in the Marianas Training Handbook (COMNAVMARIANAS Instruction 3500.4 [DoN 2000]).

5.2.2 HAZARDOUS MATERIALS

In support of training activities in the MIRC, the Marianas Training Handbook (MTH) (COMNAVMARIANAS 3500.4 [DoN 2000]) was developed to provide information, instructions, and procedures governing the use of training areas in the MIRC. Chapter 4 of the MTH presents a notional Environmental Protection Plan to be developed for a major training exercise at the MIRC. Appendix C of the MTH presents the Hazardous Wastes and Solid Waste Management Plan.

Chapter 4 of the MTH lists general requirements and restrictions categorized for air, maritime, and shore training as well as specific requirements and restrictions pertaining to air/air support training, naval ships training, land training, amphibious training, and underwater demolitions. General requirements and restrictions relating to hazardous materials include:

- No washdown activity on Tinian (air training).
- No hazardous material or substance allowed in trash containers or dumpsters (shore).
- No discharge allowed at sea (maritime training).
- Report spills in water immediately (maritime training).
- Report spills immediately (shore training).

Specific requirements and restrictions relating to hazardous materials include:

- Maintain airfield Crash-Fire-Rescue equipment and crews at North Field for the duration of the exercise (Tinian – Fixed Wing Aircraft/Airborne, Airmobile, Container Delivery System [CDS]).
- Do not use live cluster weapons, live scatterable munitions, fuel air explosives, incendiaries, or bombs greater than 2,000 lb (FDM – Live and Inert Bombing, Live Fire Guns, Naval Surface Fire Support).
- Emergency fuel release may only be conducted in designated aircraft emergency fuel release areas. If designated emergency fuel release areas are unavailable, fuel may be released as directed at locations at least 12 nm from any land, sea mound or island, in depths greater than or equal to 1,000 fathoms (6,000 ft) of water and at an altitude safe for flight or as directed to ensure complete evaporation of the fuel.
- Ordnance may be jettisoned in designated emergency jettison areas only. If designated emergency jettison areas are unavailable, ordnance may be jettisoned at locations at least 12 nm from any land, sea mound or island, in depths greater than or equal to 1,000 fathoms (6,000 ft) of water and at an altitude safe for flight or as directed.
- Use approved oil-spill and cleanup equipment (Guam and Tinian – Craft and Amphibious Assault Vehicle [AAV] refueling).
- Set up fuel bladders within berms with impervious liner or double wall protection, preferably over existing pavement rather than open ground. Spill kit and spill response capability must be readily available. (Guam and Tinian – Fuel Bladders).
- No live fire or tracer rounds will be used on Tinian, except sniper small arms into bullet traps. Use of pyrotechnics, flares, blank fire, and other potential fire-starting activities must be conducted on existing cleared runways and in accordance with the Fire Prevention Plan (Tinian – Field Maneuvers and Simulated POW Camps).
- Collect and haul away all expended brass and lead rounds (Training in Urban Environment Exercise [TRUEX], Military Operations in Urban Terrain [MOUT], Naval Special Warfare [NSW] Direct Action, Embassy Reinforcement, Force Protection).
- For underwater demolitions, the maximum size of the charge will be 10 lb Net Explosive Weight (NEW) (Deepwater Mine Countermeasures).
- Dispose oily waste and bilge water at disposal facilities on Guam and/or Saipan.

Appendix C of the MTH or the Hazardous Wastes and Solid Waste Management Plan provides further guidance to ensure that hazardous materials and solid wastes are handled in an environmentally responsible and sustainable manner. The plan covers, but is not limited to, the following:

- Reduction in hazardous materials usage.
- Establishment of hazardous materials storage facilities away from catch basins, storm drains, and waterways. Storage of liquid hazardous materials in containers/facilities with an impervious lining.
- Use of hazardous chemical warning labels on all hazardous materials. Material Safety Data Sheets for each hazardous material to be carried by deploying unit.
- Availability of spill containment and cleanup equipment.
- Availability of trained spill response teams.

- Designated collection points for segregation, packaging, and labeling of hazardous wastes for disposal.
- Availability of packaging materials for hazardous materials and hazardous waste.
- Segregation of hazardous waste from general refuse.

In addition to compliance with the requirements of the MTH, Navy shore installations, ships, and air detachments comply with the hazardous materials and hazardous waste management requirements of OPNAVINST 5090.1 series (DoN 2007).

All military installations on Guam also implement rigorous programs for hazardous materials and hazardous waste management, including Spill Prevention, Control, and Countermeasure Plans and Facility Response Plans for the management of fuels (*e.g.* gasoline, diesel, jet fuel) and petroleum, oil, and lubricants (POLs); Lead-Based Management Plans; Asbestos Management Plans; Ozone Depleting Substances Management Plans; and others. The last three plans are specific to the management of materials on buildings, including structures used for training, particularly those used for MOUT.

Each land range has a hazardous materials and waste management plan, and is cleared of expended hazardous materials accordingly. Expended materials are removed after an exercise to the extent possible, and all ranges are monitored for off-site release of hazardous constituents.

5.2.3 WATER QUALITY

Navy activities could result in environmental effects on water quality in ocean areas due to shipboard training, expenditure of ordnance, and training-related debris such as used targets. Navy ships are required to conduct activities at sea in a manner that minimizes or eliminates any adverse impacts on the marine environment. Environmental compliance policies and procedures applicable to shipboard training afloat and pollution prevention are defined in Navy instructions, DoD Instruction 5000.2-R, EO 12856, and EO 13101. These instructions reinforce the CWA's prohibition against discharge of harmful quantities of hazardous substances into or upon U.S. waters out to 200 nm (371 km), and mandate stringent hazardous waste discharge, storage, dumping, and pollution prevention requirements. Navy mitigation measures for shipboard management, storage, and discharge of hazardous materials and wastes, and other pollution protection measures are intended to protect water quality. Governing procedures for the use of training areas, ranges and airspace operated and controlled by the Commander U.S. Naval Forces, Marianas including instructions and procedures for the use of Guam, Saipan, Tinian, Rota and FDM are included in COMNAVMARIANAS Instruction 3500.4 (Marianas Training Handbook) (DoN 2000). This guidance identifies specific land use constraints to enable protection of environmental resources during military training activities in the MIRC.

5.2.4 Marine Communities

5.2.4.1 Amphibious Landing Restrictions at Unai Chulu, Unai Babui, and Unai Dankulo

At Unai Chulu, the Navy recognizes that surge waves may be generated by slow moving Landing Craft Air Cushion (LCACs) that could break off coral heads. To avoid or minimize the surge effect, amphibious landings occur at high tide, and LCACs remain fully on cushion when over shallow reef and slowing and turning when over land or deeper water. Amphibious assault vehicle landings at Unai Babui are restricted to an established approach land and land at high tide, one vehicle at a time.

5.2.5 Terrestrial Species and Habitats, Including Seabirds, Shorebirds, and Nesting Sea Turtles

5.2.5.1 Mitigation, Conservation, and Other Standard Mitigation Measures Relating to Terrestrial Species and Habitats

The Navy proposes to include the following conservation measures to minimize, avoid, or offset adverse effects associated with the proposed increase in training activities as part of the Proposed Action. The conservation measures include measures from prior consultations and additional measures associated with the proposed increases in training activities within the MIRC. Most of the conservation measures outlined below are grouped by island and would supplement existing conservation measures from prior consultations and ongoing NAVFACMAR monitoring programs for special status species, habitats, and recovery efforts. Some measures are applicable throughout the MIRC and are not limited to any specific island, such as the measures that address invasive species management programs and overall migratory bird conservation.

5.2.5.2 Conservation Measures for Predators, Pests, and Plants: Invasive Species Management Associated with MIRC Training Activities

5.2.5.2.1 Brown Treesnake Interdiction and Control and DoD Participation in the Brown Treesnake Control Plan

The Section 7 ESA consultation discussions between the Navy and USFWS for activities described in the BA have resulted in procedures for brown treesnake (*Boiga irregularis*) control and interdiction. These procedures will support efforts outlined in the Draft Brown Treesnake Control Plan (Brown Treesnake Technical Working Group 2008). Both the Navy and USFWS agree that brown treesnake-specific conservation measures are necessary for the additional training levels. Increases in multiple large and small unit level training activities may increase the risk of unintentional transport and introduction of brown treesnake to CNMI terrestrial habitats and unintentional transport and introductions to sites outside of the MIRC, such as the Hawaiian Islands. Training activities that present potential brown treesnake introduction pathways include amphibious assaults and raids, MOUT, and other activities that require cargo or personnel to move through Guam to other MIRC training locations within the MIRC. The Navy, working in collaboration with the USFWS, and U.S. Department of Agriculture –Wildlife Services (USDA-WS) and Animal and Plant Health Inspection Service (APHIS) will decide how best to implement the Brown Treesnake Control Plan relevant to MIRC activities. Specific aspects of these strategies are still in development; however, the overall strategies are outlined below:

- The Navy, in compliance with the DoD Defense Transportation Regulations, Chapter 505 protocols, is committed to implementing 100% inspection of all outgoing cargo vessels and aircraft with dog detection teams, which could be supplemented by other pest control expertise (with appropriate USDA-Wildlife Service brown treesnake detection training and oversight) to meet 100% inspection goals for large scale training activities (DoD 2008). The Navy understands that inspection capacity limitations exist within the present USDA-WS interdiction capabilities. In the event of military units, vehicles, and equipment leaving Guam without inspection, the Navy will notify the point of destination port or airport authorities. In addition, the Navy will route inbound personnel and cargo for tactical approach exercises that require an uninterrupted flow of events direct to CNMI training locations to avoid Guam seaports and airfields to the extent possible. For example, a Hawaii-based unit destined to Tinian for MOUT training will travel direct to Tinian and only through Guam on the outbound journey. The Navy is committed to implementing redundant inspections, where and when appropriate after discussions with appropriate stakeholders. Redundant inspections include inspections at the receiving jurisdiction

for administrative and logistical movements that do not require a tactical approach to complete the training requirements. It is anticipated that redundant inspections would utilize existing quarantine and inspection protocols at receiving ports.

- The Navy will support rapid response actions to brown treesnake sightings within the CNMI and locations outside of the MIRC, specifically Hawaii by working with USGS Biological Resources Discipline (BRD) in developing procedures and protocols that will support rapid action for a brown treesnake sighting. For example, Navy personnel (civilian and uniform) could be trained to augment response teams on Guam and Hawaii or by retaining an agreement with local pest control contractors. The Navy will also establish temporary snake-free quarantine areas for cargo traveling from Guam to CNMI and locations outside of the MIRC. These brown treesnake sterile areas will be subject to multiple night searches with appropriately trained interdiction (dog) teams. Temporary barriers are preferable to permanent exclosures because of the variable sizes needed for various training activities.

  In addition, the Navy will supplement and update the existing environmental education program for new arrivals. The updates may include (1) mandatory viewing of a new brown treesnake educational video, (2) pocket guides with brown treesnake information and personal inspection guidelines, and (3) assurance that brown treesnake awareness extends from the chain of command to the individual marine and sailor. Currently used examples of environmental education are the "CNRM Area Training Welcome Aboard Brief" and information cards that personnel carry on their person during exercises.

5.2.5.2.2 Self-Inspection Training for Personnel and Awareness: Avoidance Invasive Species Introductions

All personnel involved in MIRC training will adhere to DoD Instruction 5090.7, which calls for individual troops to be responsible for conducting self inspections to avoid potential introductions of invasive species to Guam and the CNMI. Troops will inspect all gear and clothing (*e.g.* boots, bags, weapons, pants) for soil accumulations, seeds, invertebrates, and possible inconspicuous stow away brown treesnakes). The intent of this measure is to minimize the potential effects associated with transport of troops and personnel to Guam and to CNMI from areas that contain species not native to terrestrial habitats within the MIRC (extra-MIRC travel). In addition, Instruction 5090.7 will be required for travel to and from training sites within the MIRC (inter-MIRC travel).

5.2.5.2.3 DoD Participation in the Regional Biosecurity Plan

The Navy is a participating agency in the development of the Regional Biosecurity Plan. The Regional Biosecurity Plan will be applicable to MIRC training activities and will coordinate and integrate inter-agency invasive species management efforts such as control, interdiction, eradication, and research. Until the Regional Biosecurity Plan is implemented, pathway analysis may be used as a tool to improve programmatic efficiency. Methods such as Hazard Analysis and Critical Control Points (HACCP) may be utilized to conduct pathway analysis applied to aspects of brown treesnake interdiction and other potential invasive species. USDA and USFWS have experience in conducting pathway analysis and have offered to assist the DOD in the development these actions.

5.2.5.2.4 Cooperative Development of Regional Training Standard Operating Procedures and Exercise Planning

The Navy will invite USFWS Pacific Islands Field Office to participate in the development of regional standard operating procedures and exercise planning to better meet invasive species management needs associated with MIRC training.

5.2.5.2.5 Coordination of Training Events

The DoD Representative will assure that Area Training coordinates meetings for brown treesnake interdiction on all training activities for the training execution phase and an after action review (AAR) phase.

5.2.5.3 Overall Management of Migratory Birds within the MIRC

Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding developed in accordance with EO 13186, signed January 10, 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The Memorandum of Understanding between DoD and USFWS was signed on July 31, 2006. DoD responsibilities discussed in the Memorandum of Understanding include, but are not limited to:

(1) Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities;

(2) Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents;

(3) Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in Integrated Natural Resource Management Plans;

(4) Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation;

(5) Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds; and,

(6) Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and, if necessary, conferring with the Service on revisions to these conservation measures.

5.2.5.4 Conservation Measures for Amphibious Landings and Land-Based Training: Guam and Tinian

To reduce the effects to sea turtles associated with amphibious landing activities, the Navy implements the following training measures, which were minimization measures included in previous consultations with USFWS:

- The Navy maintains a sea turtle nesting monitoring program on beaches on DoD property on Guam. Monitoring on Guam occurs on a weekly basis by NAVFACMAR natural resource specialists. The Navy began a monitoring program for sea turtles on Tinian in 1998, which involves surveys of all sandy areas within military lease lands on Tinian on a monthly basis (approximate) (DoN 2008a). During the monthly surveys, crawls, nests, potential nests, body pits, and hatchling tracks are noted. Monitoring occurs at Unai Dankulo (Long Beach), Unai Chulu, Unai Masalok, and Unai Lamlam. Lepresarium Beach was once part of the monitoring program, however, monitoring at this location ceased when the MLA boundary was updated to not include this beach. Monitoring data is shared with both CNMI DFW and USFWS.
- The Navy maintains "No Wildlife Disturbance" (NWD) and "No Training" (NT) areas at Orote Peninsula, Tarague Beach, Unai Chulu, Unai Chiget, and Unai Dankulo (Long Beach). Cross-

country off-road vehicle travel, pyrotechnics, demolition, digging/excavation (without prior approval of Joint Region Marianas or 36 Civil Engineering Squadron (CEV) environmental monitors), open fires, mechanical vegetation clearing, live ammunition, firing blanks, flights below 1,000 ft (313 m), and helicopter landings (except for designated landing zones) are prohibited in NWD areas. All entry or training, except specifically authorized administrative troop and vehicle movement on designated roads or trails, are prohibited in NT areas, in addition to prohibitions in NWD areas. The Navy evaluates NWD and NT boundaries based on additional survey information obtained during monthly monitoring surveys for sea turtle nesting activity on Tinian.

- Navy biologists monitor beaches during landing exercises. If sea turtles are observed or known to be within the area, training activities are halted until all nests have been located and sea turtles have left the area. Identified nests are avoided during the night-time landing exercise.
- Prior to beach landings by amphibious vehicles, known sea turtle nesting beaches are surveyed by Navy biologists for the presence of sea turtle nests no more than six hours prior to a landing exercise. Areas free of nests are flagged, and vehicles are directed to remain within these areas. Further, each landing activity has a "beach master" that would "wave off" vehicle approaches if sea turtles or sea turtle nests were observed in the water or on the land.

The Navy recognizes that surge waves generated by slow moving LCACs could break off coral heads and cause beach scour, degrading foraging and nesting habitat for sea turtles. To minimize the surge effect, LCAC landings on Tinian are scheduled for high-tide. LCACs stay on-cushion until clear of the water and within a designated Craft Landing Zone (CLZ). Amphibious assault vehicle (AAV) landings at Unai Babui are restricted to an established approach lane and land at high tide one vehicle at a time. Within the CLZ, LCAC come off-cushion with the LCAC oriented to permit expeditious vehicle and cargo offload onto a cleared offload and vehicle traffic area. The Navy recognizes ruts resulting from vehicle traffic on beaches may prevent sea turtle hatchlings from reaching the water and expose them to predation or desiccation. Although LCAC and expeditionary vehicle traffic typically do not leave ruts, some compaction of sand in vehicle tracks is possible. If restoration of beach topography is required, it is conducted using non-mechanized methods.

5.2.5.5 Conservation Measures Specific to FDM

5.2.5.5.1 Continuance of Existing Conservation Measures: Training at FDM

In recognition that FDM is an important nesting location for seabird species and the ESA-listed Micronesian megapode, the Navy has designed the following measures to avoid and minimize impacts associated with the EIS/OEIS Alternatives. Use restrictions are in place to minimize adverse effects such as decreasing wildfire potential, decrease direct strike potential of ESA listed species (specifically, Micronesian megapodes), and to limit degradation of the interior mesic flats found outside of the impact zones, and minimize impacts to seabirds.

Use constraints include targeting restrictions on MISSILEX A-G, GUNEX A-G. FIREX (Land), and other amphibious assault exercises involving RHIB or other vessels. Targeting from vessels and aircraft observe the following restrictions: (1) no targeting of cliffs on the eastern coast of the island, (2) firing direction is from the west only towards the island, and (3) no firing south of a designated "No Fire Line."

BOMBEX (Land) and MISSILEX A-G restrictions include: (1) only targeting two impact areas located on the interior plateau of the island and the southern peninsula (the impact areas total approximately 34 acres, which accounts for 20 percent of the island's area), (2) prohibiting cluster bombs and fuel-air

explosives or incendiary devices, and (3) targets have been placed to avoid sensitive areas (e.g. seabird nests, megapode habitats, potential roosting sites for transient Mariana fruit bats).

5.2.5.5.2 Quarterly Seabird Monitoring

The Navy proposes to conduct quarterly surveys using the same protocols as the monthly monitoring surveys for seabirds and other resources at FDM (aerial surveys). NAVFACPAC biologists have over 10 years of monitoring data at FDM for seabird populations on FDM, which show no significant changes in the population indices. Therefore, the Navy concludes that quarterly monitoring of FDM seabird populations would be sufficient to meet monitoring goals at FDM.

5.2.5.5.3 Five-year Interval Megapode Surveys on FDM

The Navy proposes to conduct density and abundance surveys for the FDM megapode population every five years. These surveys will follow existing transects and methods established during prior surveys (e.g. DoN 2008b,f). Surveys will be conducted in coordination with other range management activities.

5.2.5.5.4 Conduct Rat Eradication on FDM

The rodenticide diphacinone has recently been approved for field use by USEPA for rat eradications (EPA Registration Number 56228-35 [EPA 2007]). Successful rat eradications on Pacific Islands have been accomplished on Mokapu (off Molokai), Campbell Island (New Zealand), and San Jorge (Solomon Islands), as well as successful application within portions of Hawaii Volcanoes National Park. Given the small size of FDM, island wide eradication is possible (DoN 2008b). This action will provide direct benefits to nesting birds (eggs and nesting substrate) and indirect benefits to Micronesian megapodes by increasing vegetation on certain portions of the island.

5.2.5.6 Conservation Measures Specific to Saipan

Training events as described under the MIRC will be conducted within an area that is not near, known occupied Mariana swiftlet caves and the two major wetland areas on Saipan.

5.2.5.6.1 Megapode Study

The Navy proposes to conduct a study on the Micronesian megapode life history on Saipan and Sarigan.

5.2.5.6.2 Scheduling Training with Marpi Maneuver Area to Minimize Impacts to Nightingale Reed Warbler Nesting Activity

Mosher and Fancy (2002) identified two peak breeding seasons on Saipan for the nightingale reed warbler—January through March and July through September. Although nightingale reed warblers are believed to nest year-round, scheduling training within the Marpi Maneuver Area can minimize direct and indirect impacts associated with training activities. Training within the Marpi tract is expected to be infrequent and limited to pedestrian land navigation training in open areas. Implementation of any training restrictions during peak breeding periods may be implemented by the individual Commanding Officer conducting the training under guidance of the DOD representative. The Marpi tract is shown on Figure 3.11-7.

5.2.5.6.3 Conservation Measures for Micronesian Megapodes

The Marpi Training Area is dominated by non-native vegetation, however the southern border is near Suicide Cliff where native vegetation occurs in mixed limestone forests. Megapodes have been observed

in this area (Vogt 2009, personal communication), therefore there will be no digging in the soil or cutting of vegetation along the southern border of the Marpi Training area, shown on Figure 3.11-7**.** No ground disturbance or vegetation removal of any kind is permitted in this area.

5.2.5.7 Conservation Measures Specific to Tinian

5.2.5.7.1 Continuance of Existing Conservation Measures: Training on Tinian

Existing conservation measures for MIRC training are associated with limiting the potential effects to special status species (ESA-listed species and birds listed under the MBTA) from aircraft training, amphibious landings, and vehicle and pedestrian land navigation within the EMUA and bivouac training.

Aircraft Training Restrictions over Wetlands – The Navy restricts helicopter training over Tinian wetland areas. Helicopters must maintain a minimum altitude of 1,000 feet AGL during training exercises that require flights over Hagoi. In addition, the Navy avoids overflights over Mahalang wetland and Bateha wetland. No aviation live-fire activity is conducted.

Hagoi Management and Training Restrictions – Hagoi and adjacent areas are designated as a "No Training Area," which is shown on Figure 3.11-8. No ground disturbance or vegetation removal of any kind is permitted in this area. The next iteration of INRMP updates for DoD lands on Guam and the CNMI, the Joint Region INRMP, will include a management plan specific to Hagoi and other wetlands within the MLA.

Vehicle and Pedestrian Land Navigation and Bivouac Training – Unrestricted use of off-road vehicles and pedestrian land navigation within the Tinian MLA could produce unexpected noise, vegetation trampling, or unintentional ignition of fires. Therefore, the Navy avoids intrusive training activities within limestone forest areas (delineated on maps distributed to operators and marked in the field) with restrictions on cross country off-road vehicle travel and other activities that may disturb ESA listed species or degrade habitats. These areas are shown on Figure 3.11-8. Bivouac training restrictions prohibit the clearing of additional vegetation to establish new bivouac areas. Maneuver units remain tactical with no support camps.

5.2.5.7.2 Fire Management within the EMUA

Grass fires are regular occurrences on Tinian, and there is greater danger during the dry season (February through April) than in the wet season (July through October). Some fires have been caused by campfires and cigarettes. Fire spreads rapidly through light fuels (such as grasslands); and depending on weather conditions, fires may or may not burn out when fires reach heavier fuels (such as tangantangan thickets). The alteration of habitats by fire can result in direct effects to ESA listed species and other species through mortality from smoke inhalation or burning individuals and by removing their habitat which could prevent or inhibit breeding during the year, and create competition for feeding and sheltering, particularly for species that establish discrete territories (USFWS 2008).

The area authorized for open fires and pyrotechnics is restricted to the North Field only (except for actual emergency signaling). Cooking is not authorized in outdoor training areas (except for heating tabs and mechanisms in "meals ready to eat"). North Field's existing runways and taxiways act as fire breaks and fire access roads, and the vegetation is primarily characterized by tangantangan thickets. Standard Operating Procedures for all exercises include fire response measures that must be adhered to.

To augment military fire response efforts, the Tinian Fire Department maintains a 300-gallon pump truck and fire crew to respond to wildland fires. The Tinian Fire Department also maintains a 750 gallon pumper truck and crew in San Jose to respond to and provide fire service for the southern, more

developed portion of the island, and backup Crash, Fire, and Rescue support to West Field. Request for the use of these assets will be made through the West Field command post during major exercises.

To date, no wildland fire has been sourced from MIRC training activities on Tinian (or on other DoD lands in the Mariana Islands).

5.2.5.8 Conservation Measures Specific to Rota

The Navy will not initiate any action requiring the removal, trimming, or pruning of any tree known to support nesting, roosting, or foraging habitat for the Mariana crow, Mariana fruit bat or Rota bridled white-eye. No training activities will occur near or within critical habitat or habitat occupied by ESA listed species. If such activities are planned in the future, consultation with USFWS under the ESA will occur.

5.2.5.9 Conservation Measures Specific to Guam

5.2.5.9.1 Continuance of Existing Conservation Measures: Training on Guam

The Proposed Action will not conflict with conservation measures developed in agreement between the Navy and Air Force action proponents and the USFWS Pacific Islands Field Office for prior ESA consultations. These ongoing conservation measures are described below, and are not additional mitigations proposed as part of this EIS/OEIS.

Andersen AFB Training Restrictions:

- **Aircraft Training Restrictions –** The Air Force maintains helicopter and fixed wing flight restrictions associated with MIRC training over portions of Northwest Field, and Pati Point. At Northwest Field, helicopter overflights north of the South Runway below 1,000 feet AGL are prohibited. Overflights of the Munitions Storage Area (MSA) are prohibited below 1,000 feet AGL. Overflights within 3,000 feet of Pati Point are prohibited below 1,600 feet MSL, except for flights from the end of the Andersen Main runways.

- **Habitat enhancement activities at Northwest Field** – To offset the loss of potential breeding and foraging habitat from the proposed action, the Air Force proposed to construct 10 foraging plots within ungulate exclosure units totaling approximately 255 hectares (630 acres) north of the Northwest Field FTX area on the upper plateau above Ritidian Point. In addition, the Air Force proposed completing a pig, deer, and brown treesnake barrier around a 55 hectare (136 acre) habitat management unit located near Potts Junction. The Air Force is also developing an ungulate management plan. Implementation of the plan will reduce ungulates in non-fenced areas, with eradication as the objective within ungulate exclosures. Within these areas, the Air Force proposed to develop and implement an ungulate eradication program and reduce ungulate numbers in non-exclosure areas. Further, the Air Force proposed to establish five 50x50-square meter foraging plots (a total of 2,500 square meters per plot) in the ungulate control exclosure for outplanting native tree species utilized by foraging Mariana fruit bats and Mariana crows.

- **Post-typhoon Training Schedule** – After a typhoon event, food resources for the Mariana crow and Mariana fruit bat may be severely reduced, and in response to typhoon events, the Air Force implements the following modifications to training schedules: (1) If crows are nesting within an (approximate) 1,800 meter radius of cratering exercises and within 500 meters of small arms firing, no crater charges will be detonated within two to three months of a typhoon event; (2) If Mariana crows are nesting within these buffer areas within one to two months of a typhoon event, no cratering charges will be detonated, and no M2, M115A, and M116A munitions will be used;

and (3) If crows are nesting within these buffer areas within one month of a typhoon event, no training events will occur in the Northwest Field training areas. The Air Force agreed to coordinate with GovGuam DAWR to alter training schedules to minimize effects to solitary roosting bats or foraging bats after typhoon events.

- **Avoidance and Minimization Measures** – The Air Force will develop an Adaptive Management Strategy and implement various measures to avoid, minimize, and/or offset potential impacts to listed species associated with both the Northwest Field Beddown and the establishment of the ISR/Strike capability at Andersen AFB. Potential management measures included in the Adaptive Management Strategy are: (1) aircraft noise reduction by modifying ground track location and flight profile of aircraft, (2) threat removal through brown treesnake control around fruit bat colony roosts and crow nest locations and poaching enforcement activities, (3) population enhancement through reintroduction support, and (4) efforts to establish and maintain Mariana fruit bat, Mariana crow, Guam Micronesian kingfisher, and Guam rail on Guam. The Air Force has completed in 2008 a noise monitoring study to assist in the adaptive management effort (SWCA 2008). To better understand the habitat components and conservation management needs for ESA listed species in northern Guam habitats and ESA listed species' recovery efforts, the Air Force also completed in 2008 quantitative vegetation sampling throughout Andersen AFB (e2m 2008).

Navy Lands Training Restrictions:

- **Aircraft Training Restrictions -** The Navy maintains helicopter and fixed wing flight restrictions associated with MIRC training over portions of the Naval Munitions Site. Helicopter bucket training at Fena Reservoir only occurs near the spillway, away from emergent vegetation areas in the shallower portions of the reservoir. Except at designated landing and drop zones, the Navy prohibits flights over the Naval Munitions Site below 1,000 feet AGL for fixed wing aircraft and 500 feet AGL for helicopters.

- **Amphibious Landing Restrictions –** The Navy maintains restrictions on landings and launches such as the required use of the concrete boat ramp at Sumay Cove (across from potential turtle nest sites). Coupled with speed restrictions to avoid creating wakes, the use of the Sumay Cove ramp avoids and minimizes effects to sea turtle nesting sites.

5.2.5.9.2 Fire Bucket Training Exercise Monitoring at Fena Reservoir

Fire bucket training, which occurs near the spillway at Fena Reservoir continues to follow the BO, "95I0012 Fire Bucket Training" of February 16, 1995, but assumed that activity near the spillway would not occur in areas overlapping Mariana common moorhen foraging areas. In April 2009, two Mariana common moorhens were observed near the spillway at Fena Reservoir. This kind of training may affect moorhens using this area through harassment, therefore, for the first three exercise, qualified Navy biologists will monitor moorhens for behavioral changes associated with training near the spillway. If significant behavioral changes are noted, training activities will stop pending Section 7 ESA consultation between the Navy and USFWS.

5.2.5.9.3 Ungulate Management Planning on Navy Lands

An ungulate management plan and an Environmental Assessment is currently in development that will provide a long-term program and methods for a sustained reduction of ungulates on Navy lands (Brooke 2007, personal communication).

5.2.5.9.4 Establishment of No Training Areas Around the Three Known Mariana Swiftlet Caves within the Naval Munitions Site

The Navy will establish No Training Areas around the three known Mariana swiftlet caves within the Naval Munitions Site. Training will be restricted to occur outside of the 100-meter radius buffers around these caves (due to the potential of poaching, the three swiftlet caves are not shown on Figure 3.11-2). The largest cave, Mahlac, has been monitored since 1984 by GovGuam DAWR and NAVFACPAC biologists. Two smaller caves, Fachi Cave and Maemong Cave, have been monitored since 1992 and 2004, respectively. A recent survey of the three known swiftlet caves suggests an overall increase in swiftlet numbers in Mahlac Cave and Maemong Cave, and Fachi Cave may have reached a maximum capacity to support swiftlets (due to limited size of roosting sites) (DoN 2008a). The Navy has contracted USDA WS to trap brown treesnakes in areas surrounding the caves since 2005, which has resulted in the removal of 488 snakes (DoN 2008a).

The Navy believes that 100-meter buffers to exclude training activities are sufficient to meet conservation goals for the swiftlet because (1) populations have increased under similar training restrictions and (2) the Navy will continue trapping efforts in swiftlet cave areas, which is likely to have factored into the population increases within the Naval Munitions Site. Some normal day-to-day operations of the Naval Munitions Site may occur within the buffers (such as driving on roads), but no training will occur within the buffers during exercises.

5.2.5.9.5 Wetland Buffers Around Naval Munitions Site Wetland Areas

Potential nesting habitats (palustrine emergent wetlands) are dispersed throughout the SLNA and the NLNA. No maneuver and navigation training occur in areas with known Mariana common moorhen nesting activity or migratory birds that may utilize these wetlands.

5.2.5.9.6 Fire Management Planning Within the Naval Munitions Site

The U.S. Forest Service has developed a fire management plan for the Naval Munitions Site and other Navy lands on Guam (USFS 2008). The plan includes fire danger modeling of different fuel loadings within the Naval Munitions Site and determines if new fuel breaks are needed to protect personnel, infrastructure, and sensitive ecological areas.

5.2.6 Land Use

Mitigation measures have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities.

Andersen Air Force Base. The future land use for Guam does not protect the off-base CZ and APZ areas of North field and the areas around Northwest Field from future encroachment. There are no restrictions on higher residential densities and various, more intense land uses or height restrictions. On the southwest end of the Northwest Field runway, lands have been rezoned allowing hotels and resorts in the CZ and APZ I. On the northeast end of the Northwest Field runway, the area was rezoned low intensity development. On both ends of the Northwest Field runway, there is a possibility of exposing a large number of people to the risk of an aircraft accident.

5.2.7 Cultural Resources

A Memorandum of Agreement (MOA) regarding the implementation of military training on Guam was signed and executed in 1999 (DoD 1999a). The 1999 restrictions on training exercises correspond to

mapped constrained areas designated as No Cultural Resource Damage (NCRD). The northwest portion of Andersen Air Force Base (AFB) including Northwest Field is encompassed by a large NCRD zone. The MOA also stipulates an annual commemoration of the last World War II bombing mission that took off from Northwest Field; development of a long-term management plan for Northwest Field; and consultation with the Guam Historic Preservation Officer (HPO) to avoid historic properties during rapid runway repair training. As a result of this MOA, a permanent marker to the last mission of World War II has been established at Northwest Field.

A MOA regarding the Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer (RED HORSE) Beddown Initiatives at Northwest Field, Andersen AFB was signed and executed in 2006 (USAF 2006). The MOA stipulated Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation of the Northwest Field runway complex and previously existing facilities; and implementation of cultural resources inventory and evaluation investigations for areas scheduled for ground disturbing activities. As a result of this MOA, a runway repair location has been established at Northwest Field for the RED HORSE Beddown Initiatives.

An Integrated Cultural Resource Management Plan (ICRMP) was prepared in 2003 (USAF 2003) for Andersen AFB to ensure that cultural resources are managed in a planned and coordinated manner. The ICRMP established SOPs for the review of work orders; inadvertent discovery of archaeological resources; inadvertent discovery of human remains; ground disturbing activity in archaeological sensitive areas; request for access by off-base personnel; requests to conduct archaeological studies; during emergency situations; in the event of natural disasters; for permits, leases, and contracts; for enforcement and monitoring; and installation restoration projects.

Based on consultations with the Guam State Historic Preservation Officer (SHPO), CNMI HPO, Advisory Council on Historic Preservation (ACHP), and the National Park Service (NPS), a new Programmatic Agreement (PA) was negotiated for all military training activities proposed under the Preferred Alternative and included additional mitigation measures and procedures. Previous training constraints maps have been revisited and refined as needed; no training (NT) and limited training (LT) areas are identified. LT areas are defined as pedestrian traffic areas with vehicular access limited to designated roadways and/or the use of rubber-tired vehicles. No pyrotechnics, demolition, or digging is allowed without prior consultation with the appropriate HPO. The PA also stipulates multiple site checks and studies to assess the impact of training on the Tinian NHL. Up to four times a year, field checks will be conducted with the CNMI HPO and/or NPS representative. An annual report will be submitted to the CNMI HPO and to the NPS on any training activities and any subsequent impacts. Currently, a Cultural Landscape Report is being prepared on the Tinian NHL to establish a baseline for existing conditions. A copy of the signed PA is included in Appendix K.

5.2.7.1 Guam Commercial Harbor

The training constraints map for this area identifies two NT areas and eleven Limited Training (LT) areas, refined from the previous MOA constraints map boundaries (DoD 2009).

5.2.7.2 Apra Harbor Naval Complex (Main Base)

The training constraints map for this area identifies one NT area and four LT areas, including two areas on Dadi Beach, refined from the previous MOA constraints map boundaries (DoD 2009).

5.2.7.3 Tinian

A PA regarding the implementation of military training on Tinian was signed and executed in 1999 (DoD 1999b). Restrictions on training exercises correspond to mapped constrained areas designed as NT or

NCRD. NT areas designate complete avoidance with no training exercises. NCRD areas indicate limited military training activities with no vehicular travel off-road, no pyrotechnic, no demolition, and no digging without prior written approval from the USCINCPAC REP. Beach access roads for ingress and egress by military and recreational vehicles are also clearly delineated on the constraints map, particularly in regard to Unai Chulu and Unai Dankulo. The PA also stipulates cultural resources monitoring of specific military training activities by qualified personnel. Three areas in the Military Lease Area (MLA) are designed as NT areas; nine large areas are designed as NCRD (DoD 1999b).

Under the new PA, the training constraints map identifies the same four NT area boundaries as previously designated in the original PA; however the Unai Dankulo NT area has been greatly reduced in size (DoD 2009). The nine LT areas have the same boundaries as previously designated. In addition, the new PA stipulates multiple site checks and studies to assess the impact of training on the Tinian NHL. Up to four times a year, field checks will be conducted with the CNMI HPO and/or NPS representative. An annual report will be submitted to the CNMI HPO and to the NPS on any training activities and any subsequent impacts. Currently, a Cultural Landscape Report is being prepared on the Tinian NHL to establish a baseline for existing conditions.

An Updated Cultural Resources Management Plan (UCRMP) was prepared in 2003 (DoN 2003) for the Military Lease Area (MLA) on Tinian to ensure that cultural resources are managed in a planned and coordinated manner. The UCRMP established standard operating procedures for new projects; inadvertent discovery of archaeological resources; inadvertent discovery of human remains; inadvertent disturbance to historic properties; during emergency situations; in the event of natural disasters; and for permits, leases, and contracts.

5.2.7.4 Andersen Air Force Base

In addition to the 1999 MOA regarding the implementation of training on Guam, a MOA regarding the Northwest Field Beddown Initiatives at Anderson AFB was signed and executed in 2006 (USAF 2006). The MOA stipulated Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation of the Northwest Field runway complex and previously existing facilities; and implementation of cultural resources inventory and evaluation investigations for areas scheduled for ground disturbing activities. Under the new PA, the Northwest Field LT zone boundary remains the same as identified in the 1999 MOA (DoD 2009).

5.2.8 TRANSPORTATION

Regulations applicable to all aircraft are promulgated by the FAA to define permissible uses of designated airspace, and to control that use. These regulations are intended to accommodate the various categories of aviation, whether military, commercial, or general aviation. The regulatory scheme for airspace and air traffic control varies from highly controlled to uncontrolled. Less controlled situations include flight under Visual Flight Rules (VFR) or flight outside of U.S.-controlled airspace (*e.g.,* flight over international waters off the east coast). Examples of highly controlled air traffic situations are flights in the vicinity of airports where aircraft are in critical phases of flight, either takeoff or landing, and flight under Instrument Flight Rules (IFR), particularly flights on high- or low-altitude airways.

The FAA owns and operates the air traffic control system. The system of airspace designation makes use of various definitions and classifications of airspace to facilitate control. “Controlled Airspace” is a generic term that covers different classes of airspace. The controlling agency of any airspace is the FAA Air Traffic Control facility that exercises control of the airspace when SUA is not active. SUA is specially designated airspace that is used for a specific purpose and is controlled by the military unit or other organization whose activity established the requirement for the SUA (FAA 2008). SUA includes

restricted areas and military training areas, as well as warning, prohibited, alert, and controlled firing areas. Range control consists of scheduling SUA with operational units and notifying military and civilian stakeholders of SUA schedules via NOTAMs and NOTMARs. NOTAMs are available on the Internet at https://www.notams.jcs.mil and NOTMARs can be found on the Internet at www.nga.mil/portal/site/maritime.

Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities.

The existing 3nm surface safety zone around FDM is an informal clear zone based upon the existing FAA approved warning area R-7210 which restricts air space from an altitude of "Zero" feet to "infinity"; however, no corresponding Surface Danger Zone (SDZ) has been designated for navigable waters nor have any restrictions been approved by the Army Corps of Engineers. The proposed SDZ extends to a 10nm radius around FDM, i.e., the edge of territorial waters and will be submitted for approval. It provides for enhanced public safety and improved military readiness and provides for the required SDZ around the live impact area of the range.

Joint Region Marianas has instituted and will continue its current rigorous routine for notifying mariners of time, date and extent of intended use of FDM, using NOTMARS, government agencies including local mayors offices and emergency management agencies, and local media including NOAA marine weather channel. Notices shall include the dates, times and extent (distance from land) the hazard area extends. To accommodate competing uses of the seaspace, the proposed regulatory action will provide that when the range is not in use, the waters will be open to mariners who can legally be in the area. This new process will allow flexibility to schedule only the space needed, and only the times needed for effective training, leaving the area open for the fishermen who depend upon the area around FDM as a fishing ground to the maximum extent compatible with military requirements.

5.2.9 REGIONAL ECONOMY AND RECREATION

NOTMARs provide advance notice to recreational boaters and other users, informing them when the military will be operating in a specific area, and allowing them to plan their own activities accordingly. Schedules are updated when changes occur up until the date of the operation. If training activities are cancelled at any time, this information is posted and the area is again identified as clear for public use. NOTMARs advise the public, fishermen, and divers in advance of ongoing military activities that may temporarily relocate civilian/recreational activities. NOTAMs are available on the internet at https://www.notams.jcs.mil and NOTMARs can be found on the internet at www.nga.mil/portal/site/maritime. In addition to NOTMARs and NOTAMs, the military is developing an extensive system of communication through NOAA broadcasts, radio, television, newspaper, and community notification systems to ensure the public is aware of training events, training times and training locations.

The principal purpose of Department of Defense (DoD) lands and waters is to support mission-related activities. It is the policy of the DoD to make those lands available to the public for educational or recreational use of natural and cultural resources when such access is compatible with military mission activities, ecosystem sustainability, and other considerations such as safety, security, and fiscal soundness (DoN 2001a).

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CHAPTER 6 CUMULATIVE IMPACTS

6.1 PRINCIPLES OF CUMULATIVE IMPACTS ANALYSIS

The assessment of cumulative impacts (or cumulative effects)[1] was made using an ecosystem management approach and follows the objectives of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. CEQ regulations (40 Code of Federal Regulations [CFR] Sections Parts 1500-1508) provide the implementing procedures for NEPA. The regulations define cumulative effects as:

> "'. . . the impact on the environment which results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR §1508.7).

The CEQ provides guidance on cumulative impacts analysis in *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997). This guidance further identifies cumulative effects as those environmental effects resulting "from spatial and temporal crowding of environmental perturbations. The effects of human activities will accumulate when a second perturbation occurs at a site before the ecosystem can fully rebound from the effects of the first perturbation." Noting that environmental impacts result from a diversity of sources and processes, this CEQ guidance observes that "no universally accepted framework for cumulative effects analysis exists," while noting that certain general principles have gained acceptance. One such principle provides that "cumulative effects analysis should be conducted within the context of resource, ecosystem, and community thresholds – levels of stress beyond which the desired condition degrades." Thus, "each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters." Therefore, cumulative effects analysis normally will encompass geographic boundaries beyond the immediate area of the Proposed Action, and a time frame including past actions and foreseeable future actions, in order to capture these additional effects. Bounding the cumulative effects analysis is a complex undertaking, appropriately limited by practical considerations. Thus, CEQ guidelines observe, "[i]t is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful."

6.1.1 Identifying Geographical Boundaries for Cumulative Impacts Analysis

Geographic boundaries for analyses of cumulative impacts in this EIS/OEIS vary for different resources and environmental media. For air quality, the potentially affected air quality regions are the appropriate boundaries for assessment of cumulative impacts from releases of pollutants into the atmosphere. For wide-ranging or migratory wildlife, specifically marine mammals and sea turtles, any impacts from the Proposed Action or Alternatives might combine with impacts from other sources within the range of the population. Therefore, identification of impacts elsewhere in the range of a potentially affected population is appropriate. For terrestrial biological resources, the military Service controlled and managed areas and locations in Table 2-2 and Figures 2-1 through 2-11 are the appropriate geographical area for assessing cumulative impacts. For all other ocean resources, the ocean ecosystem of the marine waters off Mariana Islands is the appropriate geographic area for analysis of cumulative impacts.

[1] CEQ Regulations provide that the terms "cumulative impacts" and "cumulative effects" are synonymous (40 CFR § 1508.8[b]); the terms are used interchangeably.

6.1.2 Past, Present, and Reasonably Foreseeable Future Actions

Identifiable present effects of past actions are analyzed, to the extent they may be additive to impacts of the Proposed Action. In general, the Services need not list or analyze the effect of individual past actions; cumulative impacts analysis appropriately focuses on aggregate effects of past actions. Reasonably foreseeable future actions that may have impacts additive to the effects of the Proposed Action also are to be analyzed.

6.1.2.1 Other Projects and Activities Analyzed for Cumulative Impacts

Various types of reasonably foreseeable future actions that are relevant to the Proposed Action have the potential to affect the resources identified in Chapter 3. Table 6-1 is an overview of these actions that emphasizes components of the activities that are relevant to the effects analysis in Chapter 3. Additionally, projects in the planning phase were considered, including reasonably foreseeable (rather than speculative) actions that have the potential to interact with the proposed Services action. Geographic distribution, intensity, duration, and the historical effects of similar activities are considered when determining whether a particular activity may contribute cumulatively and significantly to the effect identified in Chapter 3.

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Guam - GovGuam					
Commercial Port Improvements East of Hotel Wharf	Port Authority of Guam (PAG)	Construct new wharf to accommodate deep-draft container vessels and cruise ships. Dredging and filling of GovGuam submerged lands required.	2021-2025	Additive	Marine
New Landfill Dandan	Department of Public Works (DPW)	Development of a municipal solid waste landfill facility. Project involves construction and operation of integrated solid waste facility and transfer stations. Will provide for waste management through diversion, recycling, composting, and processing.	Design complete	Beneficial	Terrestrial
Pagan Mining	CNMI Government Administration	The government administration is negotiating with JG Sablan Rock Quarry, Inc. for a settlement that would allow mining to resume at Pagan. The volcanic ash on Pagan has a pozzolan substance which is an ingredient in the production of hydraulic cement.	To be determined	Additive	Terrestrial
Guam International Airport Improvements	Guam International Airport Authority (GIAA)	Various upgrades to airport property, main terminal, industrial park, airfield, and south ramp.	To be determined	Additive	Terrestrial
Reforestation of Masso Reservoir	GovGuam and U.S. Navy	The reforestation plan was developed as a mitigation project for coral reef loss in Apra Harbor. 12 acres of native vegetation and a 30-acre security fence will surround the reservoir.	Completed within 3 years	Additive	Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
2030 Guam Transportation Plan	Department of Public Works (DPW)	The plan involves significant repairs and upgrades of Guam's transportation network. The project will be funded through grants from the U.S. Department of Transportation, Federal Highway Administration, and other funding sources.	The plan guides Federally funded transportation projects over the next 5 years	Additive	Terrestrial
Other Guam and CNMI Projects					
Marianas Trench Marine National Monument	National Park Service	The Monument consists of approximately 71,897 square nautical miles (246,600 square kilometers) of submerged lands and waters of the Mariana Archipelago. The Monument includes the waters and submerged lands of the three northernmost Mariana Islands (the 'Islands Unit') and only the submerged lands of designated volcanic sites (the 'Volcanic Unit') and the Mariana Trench (the 'Trench Unit').	Established in January 2009 by Presidential Proclamation.	Additive	Marine
Draft Safe Harbor Agreement	U.S. Fish and Wildlife Service (USFWS)	Cocos Island Resort and the Guam Department of Agriculture have applied for an enhancement of survival permit and a proposed Safe Harbor Agreement for the benefit of the ko'ko'. Implementation of the proposed agreement would provide for voluntary habitat restoration, maintenance, and activities to enhance the habitat and recovery of the Guam rail on 83.1 acres of Cocos Island partly owned by Cocos Island Resort, and the Guam Department of Parks and Recreation.	The draft agreement and proposed permit was published in the *Federal Register* on January 10, 2008	Additive	Terrestrial
5-year review of species under the Federal Endangered Species Act (ESA)	USFWS	The Pacific Region of the USFWS is initiating 5-year reviews of 70 species protected under the Federal Endangered Species Act. One of the species under review is the Megapode, Micronesian (*Megapodius laperouse*) which is endangered with a current range of the Mariana Islands.	Public Comment ended June 30, 2008	Additive	Terrestrial
Designation of Ocean Dredge Material Disposal Site EIS	USEPA	USEPA environmental analysis for proposed designation of offshore disposal site for dredged materials.	Notice of Intent published December 2007	Additive	Marine
Review of Special Use Airspace in the Guam and CNMI	FAA	A study has been proposed to conduct a periodic review and evaluation of the utilization of the special use airspace in the Guam and CNMI.	Under consideration	Beneficial	Marine Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Residential Construction Tamuning (Near Nikko Hotel)	Non-Governmental Organization (NGO)	Construction of a 700-unit condominium facility. Subdivision on Ypao Road.	2010	Additive	Terrestrial
Residential Construction Yigo (Near AAFB Back Gate)	Non-Governmental Organization (NGO) Base Corp.	Construction of Paradise Estates residential homes, a 400-lot subdivision and Villa Pacita residential homes.	Currently under construction	Additive	Terrestrial
Residential Construction Machanao	Non-Governmental Organization (NGO) Core Tech	Construction of low-income rental subdivision named Ironwood Estates.	Currently under construction	Additive	Terrestrial
"Project Runway" Australia-Guam Submarine Cable	Non-Governmental Organization (NGO) PIPE Networks	Construction of a submarine cable link from Australia to Guam.	2008–2009	Additive	Marine
Rota Avian Behavioral Ecology Program	University of Washington, Psychology Department, Seattle, WA RABEP Field Station, Rota, MP	Analyze suffering declines in avifauna on Rota including endangered species (Mariana crow *(Corvus kubaryi*) and the Rota White-eye (*Zosterops rotensis*)).	2006–Indefinite	Non-Additive	Terrestrial
Saipan TMAPS Program	Institute for Bird Populations (IBP), Point Reyes Stations, CA DFW Lower Base, Saipan, MP	Improve understanding of the ecology, population status, and conservation needs of Saipan avifauna and provide baseline population data for these species.	2008–Indefinite	Non-Additive	Terrestrial
Mariana Avifauna Conservation (MAC) Project	MAC Working Group Division of Fish and Wildlife, CNMI Association of Zoos and Aquariums (AZA) US Geological Survey (USGS)	Translocate the Bridled White-eye from Saipan to Sarigan.	2008–Indefinite	Non-Additive	Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Other Guam and CNMI Projects					
Hotel Construction Bayview 5 Luxury Project	Non-Governmental Organization (NGO)	Construction of 220-room 28-story hotel in Tumon Bay.	2010	Additive	Terrestrial Marine
Tinian					
Casino and Condominium Resort Development	Bridge Investment Group	Development of a second casino for Tinian.	2008	Additive	Terrestrial
Relocation of Quarry	Marpo Valley Quarry (Government DPW)	Existing quarry operated by Power Builders International has to be relocated due to land lease to developers.	2008	Additive	Terrestrial
Relocation of Landfill	DPW	Relocation of current landfill to be co-located with Proposed Wastewater Treatment Plant.	To be determined Environmental analysis complete	Additive	Terrestrial
Proposed Wastewater Treatment Plant	Commonwealth Utilities Corporation	Proposed Tinian Wastewater Treatment Plant.	Environmental analysis in progress	Additive	Terrestrial
Harbor Rehabilitation Project	Commonwealth Ports Authority	Power Builders International is presently upgrading dock surfaces, bulkheads, and bollards.	Current construction	Additive	Terrestrial
Airport Infrastructure Improvements	CPA	Project and construction specifics to be determined.	Ongoing construction	Additive	Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Navy					
Guam and CNMI Military Relocation EIS/OEIS	Joint Guam Program Office (JGPO)	The JGPO is preparing an EIS/OEIS for relocation of Marines from Okinawa. Project notionally includes infrastructure construction and beddown of personnel, CVN Berthing and the Army's Ballistic Missile Defense System.	To be determined	Additive	Terrestrial Marine
Facility Construction AAFB	FACSFAC Range Control	Construction of a facility to serve as a Training Operations Center and CVW-5 liaison office.	To be determined	Additive	Terrestrial
Facility Construction Navy Base	Navy	Construction of surface, subsurface, and aerial target facility; underwater tracking range (portable acoustic range); and Theater Support Vessel facility.	To be determined	Additive	Terrestrial
Facility Construction Guam and CNMI Various Locations	Navy	Data backbone that includes microwave and data link backbone, electronic warfare portable staging site.	To be determined	Additive	Terrestrial
Infrastructure Construction Consolidated Submarine Learning Center and Commander, Submarine Squadron Headquarters Facility	Commander Joint Region Marianas	Pending site approval for a Proposed Action to construct a new two-story consolidated Submarine Learning Center (SLC) and Commander, Submarine Squadron (CSS) Headquarters Facility. The SLC will house valuable equipment that will allow multiple undersea warfare training scenarios. The CSS facility will include administrative spaces, conference room, emergency control center, and classified material storage.	2010 pending site approval	Additive	Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Navy (Continued)					
Infrastructure Construction and Environmental Analysis Orote Penninsula	Commander Joint Region Marianas	Analysis of a Proposed Action to construct 17 nonpropagation wall magazines for storage of 2M lb NEW C/D 1.1 on Orote Plateau. New construction will provide sufficient capacity for one full cargo ship and include security fencing, utility extensions, access road, and vegetation clearing. Recent completion of environmental analysis for a Proposed Action to improve the Navy's power infrastructure by increasing the capability of the Orote Substation to increase backup generation capacity and replace 2 miles of overhead power lines under ground. A project currently under construction to replace existing water lines with larger size lines, provide miscellaneous water mains and line connections, construct a concrete enclosure for the Fena Lake Pump Station, and install pressure reducing valves for waterlines feeding Sasa Valley, X-Ray Wharf, and Polaris Point. Analysis of a Proposed Action to construct the Kilo Wharf Extension and construction of associated facilities. Project requires construction of new facilities at Kilo Wharf to meet DoD technical design standards to ensure safe and efficient ordnance loading/offloading for the Auxiliary Dry Cargo/Ammunition Ship. Waterfront improvements to accommodate the new T-AKE supply ship and utility upgrades to meet wharf requirements. Includes construction dredging at the southern portion of Inner Apra Harbor to -35 feet.	To be determined Finding of No Significant Impact (FONSI) completed 2008 2010 2010	Additive	Terrestrial Marine

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Navy (Continued)					
Infrastructure Construction Navy Base	Commander Joint Region Marianas	Environmental analysis for a Proposed Action to construct new Bachelor Enlisted Quarters at Guam Naval Base for enlisted personnel. The project includes three- and four-story buildings with reinforced concrete walls, flooring, and foundation, containing 376 modules. The proposed site for the facility is a 2.6-acre site A contract was awarded for wastewater treatment plant repairs and upgrades. The project will replace one of the sewage lift stations and reinforce the protection from major storms.	2009 2010	Additive	Terrestrial
Infrastructure Construction Sumay Cove Polaris Point	Commander Joint Region Marianas	Pending environmental analysis for a Proposed Action to construct a new consolidated waterfront operations complex at Sumay Cove; project includes an equipment storage facility at Polaris Point and installation of two surface approach radar systems.	2010 pending site approval and environ analysis	Additive	Terrestrial Marine
Infrastructure Construction	Commander Joint Region Marianas	Pending environmental analysis of a Proposed Action to harden Navy's electrical distribution system by replacing the existing overhead primary and secondary electrical distribution with an underground installation for increased system reliability during frequent typhoons.	2010 pending site approval and environ analysis	Additive	Terrestrial
Infrastructure Construction Joint Region Headquarters and Operations Center	Commander Joint Region Marianas	Pending environmental analysis of a Proposed Action to renovate and adapt existing Buildings 200, 202, and 205 currently used as Department of Defense Education Activity high schools for joint use by Navy and JGPO.	2010 pending site approval and environ analysis	Additive	Terrestrial
Infrastructure Construction	Commander Joint Region Marianas	Pending site approval for a Proposed Action to construct a one-story torpedo exercise support facility.	2010 pending site approval	Additive	Terrestrial
Wind Turbines	Naval Facilities Engineering Command	Pending funding and approval for a $16 million proposal that includes installing four turbines on Naval Magazine, Guam.	Pending Approval	Additive	Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Air Force					
AAFB – Infrastructure Improvement Northwest Field	36WG of the Pacific Air Forces (PACAF)	Proposed Action to relocate a Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer (RED HORSE) Squadron, the PACAF Commando Warrior training program, and a Combat Communication Squadron and its training program at the same location. The project includes beddown of an additional 400 personnel, utility and infrastructure improvements, and construction of field training areas, offices, classrooms, and warehouses to be based at Northwest Field, AAFB.	FONSI 2006 Construction pending 2006-2011	Additive	Terrestrial
AAFB – Beddown of Additional Missions and Personnel	36WG of the Pacific Air Forces (PACAF)	Proposed Action to base 3 unmanned aerial reconnaissance craft and 12 refueling aircraft at AAFB and accommodate 48 fighter and 6 bomber aircraft on a rotational basis. An additional 2,400 personnel would be based at AAFB.	Record of Decision (ROD) 2007 Pending Implementation 2007-2016	Additive	Terrestrial
AAFB – Infrastructure Improvement	36WG of the Pacific Air Forces (PACAF)	Multiple AAFB Infrastructure initiatives are programmed through 2012. These initiatives include (but are not limited to) munitions igloos, facilities, fencing, roads, relocation of the main gate, war readiness material storage facility, warehouse, and runway repair.	2012	Additive	Terrestrial

Table 6-1: Reasonably Foreseeable Future Actions Relevant to the Proposed Action (Continued)

Project	Project Sponsor	Project Description	Projected Completion Date	Relevance to MIRC EIS	Terrestrial or Marine
Proposed Wastewater Treatment Plant	Commonwealth Utilities Corporation	Proposed Tinian Wastewater Treatment Plant.	Environmental analysis in progress	Additive	Terrestrial
Harbor Rehabilitation Project	Commonwealth Ports Authority	Power Builders International is presently upgrading dock surfaces, bulkheads, and bollards.	Current construction	Additive	Terrestrial
Airport Infrastructure Improvements	CPA	Project and construction specifics to be determined.	Ongoing construction	Additive	Terrestrial
ARMY					
Proposed use of existing ranges for training	U.S. Army Reserve	Proposal to co-use an existing civilian range currently used by CNMI law enforcement for training.	Conceptual	Additive	Terrestrial

6.2 CUMULATIVE IMPACTS ANALYSIS

6.2.1 Air Quality

Activities affecting air quality in the region include, but are not limited to, mobile sources such as automobiles and aircraft, and stationary sources such as power generating stations, manufacturing operations, and other industries. Implementation of the No Action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 6-1 would result in increases in air emissions within the MIRC Study Area; however, in general terms, the air quality of the MIRC is designated in attainment of the National Ambient Air Quality Standard (NAAQS), except for areas within 3.5 km radius of Piti and Tanguisson, which are designated as non-attainment for SO_2. (40 CFR §81.353).

The proposed project consists of continuing military training activities in the MIRC. The project does not include the construction of new stationary emission sources; however, it includes repair and maintenance of existing training facilities to accommodate increased training events. Guam has an approved State Implementation Plan (SIP) which was developed to allow the Territory to achieve attainment of the NAAQS for sulfur oxides in an area where the standard is exceeded (area where power production facilities [Tanguisson and Piti power plants] burning high sulfur content fuel oil are located). The CNMI is in attainment of the NAAQS for all criteria pollutants and therefore is not required to have a SIP. The MIRC Study Area for this EIS/OEIS is in attainment for all criteria pollutants, except those areas within 3.5 km radius of the Piti and Tanguisson power plants (Piti Floating Mine Neutralization Area, Reserve

Craft Beach, Polaris Point Field, and the firing ranges at the Finegayan Communications Annex) as noted above. Included within this characterization of regional air quality are the existing aircraft, surface ship, small water craft, and weapon emissions.

Greenhouse gases are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature and there is scientific evidence that indicates a trend of increasing global temperature over the past century due to an increase in global greenhouse gas emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe. Federal agencies are, on a national scale, addressing emissions of GHGs by reductions mandated in federal laws and Executive Orders, most recently, Executive Order 13423. Several states (although none in the EIS/OEIS Study Area) have promulgated laws as a means to reduce statewide levels of GHG emissions. In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by Executive Order 13423 (as originally mandated in Executive 13123, which was revoked by Executive Order 13423) and the Energy Policy Act of 2005, the Department of Defense (DoD) is currently conducting an assessment of the impact of global warming on US military installations worldwide for the next 30 to 40 years. These impacts include, but are not limited to, rising sea levels, extreme weather events, and other projected climate change impacts. In addition, the DoD is now considering and integrating climate change effects in its national security and national defense strategic planning. Executive Order 13514, signed on 5 October 2009, further expands on the energy reduction and environmental performance requirements of Executive Order 13423, including requiring Federal agencies to set targets for greenhouse gas emission reductions.

The potential effects of proposed greenhouse emissions are by nature global. Cumulative impacts are minimal as individual sources of greenhouse gas emissions are not large enough to have an appreciable effect on climate change. The impact of proposed greenhouse gas emissions to climate change is therefore discussed in a cumulative context. An appreciable impact on global climate change would only occur when proposed greenhouse gas emissions combine with greenhouse gas emissions from other man-made activities on a global scale. The emissions associated with Alternative 1 and Alternative 2 in this EIS/OEIS would amount to only minor increases in emissions above baseline (No Action Alternative) conditions therefore under any of the alternatives, cumulative impacts to global climate change would not be significant.

Joint Region Marianas has an energy program architecture in place based on revised NAVFAC Marianas energy conservation instruction (NAVFACMARIANAINST 4100.6C, Dec 2008), the Naval Base Guam energy conservation instruction (NAVBASEGUAMINST 4100.1, Feb 2009), and the Joint Region Marianas energy conservation instruction (COMNAVMARIANAINST 4100.1, Jun 2009). The Energy Management Steering Committee has been established and is chaired by the Naval Base Guam Executive Officer and has membership from all major tenants and commands. The Building Energy Monitor Program has been established and meets regularly. Major goals of the energy program include a three percent reduction in energy use per year to result in a cumulative reduction of 30 percent by 2015, increased renewable energy use, and sustainable design in new construction and major renovations. Current and planned energy projects include the following:

- The North Tipalao Phase III housing solar hot water heating,
- Military housing playground solar lighting,
- Bachelor housing solar water heating,

- Barracks 1 and 2 100 kW solar array,
- Wind data collection and 4 megawatts wind generation project at Naval Ordnance Annex (formerly Naval Magazine Guam),
- Polaris Point side walk solar lighting,
- NAVBASE Guam Energy Saving Performance Contract Detailed Energy Survey with Johnson Controls,
- Defense Reutilization and Marketing Office (DRMO) (Building 631), 52 kW solar array membrane,
- Guam recently completed a feasibility study for possible Ocean Thermal Energy Conversion energy generation and Salt Water Air Conditions for South Finegayan Marine Base,
- New Bachelor Enlisted Quarters military construction will be first sustainable design in new construction and major renovations Gold certified project,
- Current and future alternative energy feasibility studies promised by NAVFAC PAC Energy Manager include Geo-thermal (through NAWS China Lake, CA), Landfill Bio-gas (through DOE), and Micro Hydro-turbine (through NFESC),
- Sierra Wharf solar parking lot lighting, and
- Military working dog kennel military construction to include 75 kW PV array and rain catchment system to wash kennel runs.

Table 6-2 summarizes the annual GHG emissions associated with the No Action Alternative, Alternative 1 and Alternative 2. This summary is limited to GHG emissions from ships and aircraft which are the largest emissions sources associated with training in the MIRC. GHG emissions from minor sources such as military vehicles, small boats, weapons platforms and auxiliary equipment were not included because of the high variability in their use during the various training events and because information on their types and numbers, types of fuel and consumption, hours of use, etc. , are not readily available.

Ship GHG emissions were estimated by determining annual ship fuel (diesel) use based on proposed training activities and multiplying total annual ship diesel consumption by the corresponding emission factors for CO_2, CH_4 and N_2O (Tables G-9 and G-12, CARB 2008). Aircraft GHG emissions consist of GHG emissions from LTOs and from cruising/maneuvering. LTO and cruising/maneuvering GHG emissions were calculated by multiplying jet fuel use rates (lb/hr) by the total operating time (hrs) [sum of the average time in mode (Table 3-7, USAF 2002) and assumed average range time of two hours], by the corresponding jet fuel emission factors for CO_2, CH_4 and N_2O (lb/lb of fuel) (Tables G-9 and G-12, CARB 2008, converted from kg/gal to lb/lb of fuel), and by the total annual sorties.

Total ship and aircraft GHG emissions by alternative in terms of CO_2e are compared to the U.S. 2007 GHG emissions in Table 6-3. CO_2e emissions associated with each alternative are predicted to range from 0.0012 to 0.0023 percent of the total CO_2e emissions generated by the U.S.

Table 6-2: Greenhouse Gas Emissions from Ships and Aircraft

Alternative	Greenhouse Gas, metric tons per year[1]			
	CO_2	CH_4	N_2O	CO_2e
No Action Alternative	87,159	8	4	88,703
Alternative 1	125,746	9	6	127,729
Net increase in greenhouse gases for Alternative 1	38,587	1	2	39,026
Alternative 2	162,560	12	7	165,036
Net increase in greenhouse gases for Alternative 2	75,401	4	3	76,333

[1]GHG emissions reported in metric tons per year

Table 6-3: Comparison of Ship and Aircraft GHG Emissions by Alternative to the U.S. 2007 GHG Baseline Emissions

Alternative	GHG Emissions (CO_2e), metric tons per year	Percent (%) of U.S. 2007 GHG Baseline Emissions
No Action Alternative	88,703	0.0012%
Alternative 1	127,729	0.0017%
Alternative 2	165,036	0.0023%
U.S. 2007 GHG Baseline Emissions[1]	7,150,100,000	

[1] Source: USEPA 2009

Greenhouse gas emissions associated with the No Action Alternative would amount to approximately 0.0012 percent of the total GHG emissions generated by the U.S. Under this alternative, impacts to global climate change would not be significant. Greenhouse gas emissions associated with Alternative 1 would amount to approximately 0.0017 percent of the total GHG emissions generated by the U.S. Under this alternative, impacts to global climate change would not be significant. Greenhouse gas emissions associated with Alternative 2 would amount to approximately 0.0023 percent of the total GHG emissions generated by the U.S. Under this alternative, impacts to global climate change would not be significant. Naval activity in non-territorial waters would not cause significant harm to air quality under the No Action Alternative, Alternative 1, or Alternative 2. The Proposed Action would not result in significant cumulative air quality impacts.

6.2.2 Cultural Resources

Implementation of the No Action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 6-1 is not anticipated to result in significant cumulative impacts on cultural resources. The types of impacts typically associated with the alternatives include disturbance of archaeological sites during ground disturbance (construction or troop/equipment movement) or the unanticipated discovery of archaeological materials. In accordance with Section 106 of the National Historic Preservation Act (36 CFR Part 800), cultural resources mitigation measures as described in the various sections of Chapter 3 would be implemented, including avoidance of resources (the preferred mitigation) and/or implementation of specific requirements already outlined in agency planning documents for the affected area (e.g., Integrated Cultural Resource Management Plans [ICRMPs], Programmatic Agreements [PAs], Memorandums of Agreement [MOAs]). Given the rigorous review process required under Section 106 prior to activities taking place, the measures already in place within agency planning documents to mitigate potential effects, and the diverse range of locations where activities would occur (representing different cultural contexts and site types), the implementation of alternatives presented in this EIS/OEIS, either individually or as a whole, is not anticipated to result in significant cumulative impacts.

Shipwrecks are vulnerable to the effects of time, tides, storm surges, and marine organisms, damage from boats, wakes, anchor drops, and looting. Over time, elements of the ship deteriorate, break apart, and are covered by sand and marine organisms. The same is true for archeological sites, for they are also vulnerable to development, looting, erosion, and natural processes. Once damaged or destroyed, they cannot be recreated. However, with preplanning and avoidance, implementation of Alternative 1 would have a negligible contribution to continuing cumulative impacts (*"no adverse affect"* under Section 106). Two additional projects are scheduled for construction and implementation in the MIRC: the Kilo Wharf Extension and the JGPO actions.

Kilo Wharf Extension. The Kilo Wharf Extension project consists of 400 feet of wharf construction at the Apra Harbor Naval Complex. No impacts to cultural resources were identified as a result of this project (DoN 2008) and the Guam State Historic Preservation Office concurred with this determination. The Kilo Wharf Extension project does not contribute to regional cumulative impacts to cultural resources. No cumulative adverse effects on National Register of Historic Places (NRHP)-eligible or listed cultural resources, including visual resources, would occur resulting from the Kilo Wharf Extension project.

Joint Guam Program Office (JGPO) Actions. The JGPO actions involve the relocation of Command, Air, Ground, and Logistics units (about 8,500 Marine Corps personnel and 9,000 dependents) from Okinawa, Japan to Guam, CVN Berthing and the Army's Ballistic Missile Defense System (DoN 2007b). Cultural resources impacts from the JGPO actions are expected to be extensive; archaeological surveys and cultural resources surveys will be conducted on approximately 11,535 acres on Guam, Tinian, Saipan, Pagan Island and Sarigan Island (DoN 2007a) to identify additional NRHP-eligible resources. There is the potential for effects on cultural resources on Guam and Tinian from the implementation of the JGPO actions. Effects to cultural resources from the JGPO actions will be identified in a separate environmental document. No unmitigated impacts to cultural resources will occur as a result of the No Action Alternative, Alternative 1, or Alternative 2 for the proposed MIRC project; therefore the No Action Alternative, Alternative 1, or Alternative 2 is not anticipated to contribute to regional cumulative impacts created by the proposed JGPO actions.

Andersen Air Force Base. Andersen Air Force Base has completed Section 106 consultation with the Guam State Historic Preservation Officer (SHPO) for the repair of potholes at Northwest Field. The

consultation has resulted in a recommendation that the project be conducted consistent with the Secretary of Interior's Standards. The potholes are the result of cumulative use of the field by heavy equipment.

6.2.3 Marine Biological Resources

6.2.3.1 Marine Plants and Invertebrates

Potential cumulative impacts on marine plants and invertebrates in the MIRC Study Area include releases of chemicals into the ocean, introduction of debris into the water column and onto the seafloor, and mortality and injury of marine organisms near the detonation or impact point of ordnance or explosives. The presence of persistent organic compounds such as DDT (dichlorodiphyenyltrichloroethane) and PCBs (polychlorinated biphenyls) are of particular concern. In light of these concerns, the military activities would have small or negligible potential impacts. There would be no long-term changes to species abundance or diversity, no loss or degradation of sensitive habitats, and no effects to threatened and endangered species. None of the potential impacts would affect the sustainability of resources, the regional ecosystem, or the human community.

6.2.3.2 Fish

Human uses of the MIRC include prior, current, and future military activities, navigation, transportation, coastal development, oil/gas exploration and development, sand and mineral mining, dredge and fill operations, cooling water intake and discharge, wastewater discharge, mariculture, and recreational and commercial fishing. Potential threats to EFH and managed species include sound from aircraft and vessel traffic, degradation of water quality, habitat modification, pollution (thermal, chemical, marine debris, etc.), introduction of exotic species, disease, natural events, and global climate change.

Fishing activities, individually or in combination, can adversely affect EFH and managed species (NOAA 1998, Dayton *et al*. 2003, Morgan and Chuenpagdee 2003, Levin *et al*. 2006). Potential impacts of commercial fishing include over-fishing of targeted species and bycatch, both of which negatively affect fish stocks (Barnette 2001, NRC 2002). Mobile fishing gears such as bottom trawls disturb the seafloor and reduce structural complexity (Auster and Langton 1998, Johnson 2002). Indirect effects of trawls include increased turbidity; alteration of surface sediment, removal of prey (leading to declines in predator abundance), removal of predators, ghost fishing, and generation of marine debris. Lost gill nets, purse seines, and long-lines may foul and disrupt bottom habitats. Recreational fishing also poses a threat because of the large number of participants and the concentrated use of specific habitats (Coleman *et al*. 2004).

Natural stresses include storms and climate-based environmental shifts, such as harmful algal blooms and hypoxia (DoN 2005). Disturbance from ship traffic and exposure to biotoxins and anthropogenic contaminants may stress animals, weaken their immune systems, and make them vulnerable to parasites and diseases that would not normally compromise natural activities or be fatal (Pew Oceans Commissions 2003). As evidenced by Carpenter *et al*. (2008), approximately one-third of the world's reef building corals face extinction risk from bleaching and diseases driven by ocean acidification and globally elevated sea surface temperatures, as well as human-induced impacts at the local level. Development of the world's coasts has accelerated, with some 37% of the world's population living within 60 miles (100 km) of the coast, at a population density twice the global average (UNEP 2006). Heavy population pressure on the coasts is causing the destruction or modification of more and more of the natural environment. Halpern *et al*. (2008) developed an ecosystem-specific, multiscale spatial model to synthesize 17 global data sets of anthropogenic drivers of ecological change for 20 marine ecosystems. Their analysis indicated that no area is unaffected by human influence and that a large fraction (41%) is strongly affected by multiple drivers. Small human population and coastal watershed size predicted light human impact, but do not

ensure it, as shipping, fishing, and climate change affect even remote locations. Their data suggested that almost half of all coral reefs experience medium high to very high impact; however, it appeared that the area encompassing the MIRC study area was regarded as experiencing medium impact.

Potential cumulative impacts of Service training exercises include release of chemicals into the ocean, introduction of debris into the water column and onto the seafloor, mortality and injury of marine organisms near the detonation or impact point of ordnance or explosives, and, physical and acoustic impacts of vessel activity. Impacts to EFH were assessed based on single events, and based on single events, some training activities would result in temporary and localized impacts to FMP species. This finding was based on the generally small area that was affected, the avoidance of HAPCs, the relatively large size of the MIRC, and the distribution of FMP species. Due to the temporal and spatial variation of each training activity, multiple concurrent activities and/or other actions proposed under the No Action Alternative, would not contribute to long-term adverse impacts to EFH. For training activities that occur in nearshore waters, there is a greater probability that these activities could affect EFH and HAPC, such as coral reefs. However, administrative controls reduce the likelihood of impacts to coral reefs and HAPC, such as conducting nearshore activities in less sensitive habitats, like sandy bottom habitat. Although, there may still be impacts to these less sensitive habitats, the impacts would be localized and temporary. The incremental contribution by implementation of the No Action Alternative, Alternative 1, or Alternative 2 to impacts on the marine ecosystem structure and function and associated ecosystem services is expected to be insignificant. The overall effect on fish stocks would be negligible compared to the impact of commercial and recreational fishing in the MIRC. After completion of an exercise, repopulation of an area by fish should take place within a matter of hours. Implementation of protective measures designed to avoid adverse or long-term impacts would further protect marine life and the environment.

Because of the transient nature of the training exercises and the minor, localized potential ecosystem effects, there would not be incremental or synergistic impacts on present or reasonably foreseeable future ecosystem structure and function or ecosystem services within the MIRC. Implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not make a significant contribution to the regional cumulative ecosystem impacts on EFH or Managed Species.

6.2.3.3 Marine Mammals

Marine mammal distribution within the MIRC Study Area and throughout the world is affected by demographic, evolutionary, ecological, habitat-related, and anthropogenic factors (Bjørge 2002; Bowen et al. 2002; Forcada 2002; Stevick et al. 2002). Movement of individuals is generally associated with feeding or breeding activity (Stevick et al. 2002). Some baleen whale species, such as the humpback whale, make extensive annual migrations in the northern hemisphere to low-latitude mating and calving grounds in the winter and to high-latitude feeding grounds in the summer (Corkeron and Connor 1999). Migrations likely occur during these seasons due to the presence of highly productive waters and associated cetacean prey species at high latitudes and of warm water temperatures at low latitudes (Corkeron and Connor 1999; Stern 2002). However, not all baleen whales migrate. Cetacean movements can also reflect the distribution and abundance of prey (Gaskin 1982; Payne et al. 1986; Kenney et al. 1996). Cetacean movements are linked to indirect indicators of prey, such as temperature variations, sea-surface chlorophyll concentrations, and bottom depth (Fiedler 2002).

Risks to marine mammals emanate primarily from ship strikes, exposure to chemical toxins or biotoxins, exposure to fishing equipment that may result in entanglements, and disruption or depletion of food sources from fishing pressure and other environmental factors. Potential cumulative impacts of Services activities on marine mammals would result primarily from possible ship strikes and sonar use.

Stressors on marine mammals and marine mammal populations can include both natural and human-influenced causes listed below and described in the following sections:

Natural Stressors:

- Disease
- Natural toxins
- Weather and climatic influences
- Navigation errors
- Social cohesion

Human-Influenced Stressors:

- Fisheries interactions/bycatch
- Ship strikes
- Pollution and ingestion
- Noise
- Whale watching

6.2.3.4 Sea Turtles

Five sea turtle species are known to occur, or have the potential to occur, in the MIRC Study Area. Each of these species is globally distributed, and each is listed as threatened or endangered. Please refer to Section 3.8.2 for more complete information regarding the distribution and conservation status of these sea turtle species. Direct harvest (of eggs and turtles), habitat degradation, and incidental takes in fishing operations, or bycatch, are the most serious threats to sea turtle populations. Sea turtles commonly ingest or become entangled in marine debris (*e.g.*, tar balls, plastic bags, plastic pellets, balloons, and ghost fishing gear) as they feed along oceanographic fronts, where debris and their natural food items converge. Marine pollution from coastal runoff, marina and dock construction, dredging, aquaculture, increased underwater noise, and boat traffic can degrade marine habitats used by sea turtles. Sea turtles swimming or feeding at or just beneath the surface of the water are vulnerable to boat and vessel strikes, which can result in serious propeller injuries and death.

Disease, specifically fibropapillomatosis (FP), is a threat to green turtles in some areas of the world. In addition, scientists have documented FP in populations of loggerhead, and olive ridley turtles. The effects of FP at the population level are not well understood. It is poorly understood how some sea turtles function within the marine ecosystem. Global warming could potentially have an extensive impact on all aspects of a turtle's life cycle, as well as impact the abundance and distribution of prey items. Loss or degradation of nesting habitat resulting from erosion control through beach nourishment and armoring, beachfront development, artificial lighting, nonnative vegetation, and sea level rise is a serious threat affecting nesting females and hatchlings (National Oceanic and Atmospheric Administration [NOAA] 2007).

Vessel movements have the potential to affect sea turtles by directly striking or disturbing individual animals. Waves caused by vessels or landing craft may scour beaches. Repeated exposure to stressors, including human disturbance at nesting beaches, vessel disturbance and anthropogenic sound or lighting, can result in negative consequences to the health, survival, or reproductive viability of an individual or population. Habitat degradation and anthropogenic lighting are not applicable in the MIRC.

Directed harvest for subsistence, commercial, or scientific research adds to mortalities of sea turtle species. Impacts from military training activities in the MIRC Study Area are not likely to cumulatively affect any of the species subject to direct harvest (*i.e.*, illegal poaching activities). Throughout their life cycles, sea turtles undergo complex seasonal movements. Sea turtle movement patterns are influenced by changes in ocean currents, reproduction migrations to and from foraging habitats to nesting beaches, turbidity, salinity, and food availability. In addition to these factors, the distribution of many sea turtle species is dependent upon and often restricted by water temperature (Epperly *et al.* 1995; Davenport 1997; Coles and Musick 2000).

Sea turtles can be found throughout the MIRC Study Area; temporary disturbance incidents associated with MIRC activities could result in an incremental contribution to cumulative impacts on sea turtles. However, the mitigation measures identified in Chapter 5 would minimize any potential adverse effects on sea turtles from stressors generated by MIRC training activities (*e.g.* explosives, vessel movements, sonar use, or landing activities at nesting beaches or foraging habitats). Further, since it is not likely that sea turtles can hear Mid-Frequency Active/High-Frequency Active (MFA/HFA) sonar, the Services believe that this activity would not constitute a significant contribution to cumulative effects on sea turtles from other sources of impact including anthropogenic sound. Analysis of the SURTASS LFA system was previously presented in a series of documents (DON 1999, 2002b, 2007) and addressed by NOAA/NMFS (2009) in consideration of applicable regulations including the potential for synergistic and cumulative effects for sea turtles. When and if use of the SURTASS LFA system was to occur concurrent with other Navy MFA/HFA sonars and/or commercial sonar systems, synergistic effects are not probable because of differences between these systems (DoN 2007). The impacts of the Proposed Action and Alternatives are not likely to affect the species' or stock's annual rates of recruitment or survival. Therefore, the incremental impacts of the Proposed Action, Alternative 1, or Alternative 2 would not present a significant contribution to the effects on sea turtles when added to effects on sea turtles from other past, present, and reasonably foreseeable future actions.

6.2.3.5 Natural Stressors

Significant natural causes of mortality, die-offs, and stranding discussed below include disease and parasitism; marine neurotoxins from algae; navigation errors that lead to inadvertent stranding; and climatic influences that impact the distribution and abundance of potential food resources (i.e., starvation). Stranding also is caused by predation by other species such as sharks (Cockcroft et al. 1989; Heithaus 2001), killer whales (Constantine et al. 1998; Guinet et al. 2000; Pitman et al. 2001), and some species of pinniped (Hiruki et al. 1999; Robinson et al. 1999).

Disease. Like other mammals, marine mammals frequently suffer from a variety of diseases of viral, bacterial, and fungal origin (Visser et al. 1991; Dunn et al. 2001; Harwood 2002). Gulland and Hall (2005, 2007) provide a summary of individual and population effects of marine mammal diseases.

Marine Neurotoxins. Some single-celled marine algae common in coastal waters, such as dinoflagellates and diatoms, produce toxic compounds that can bioaccumulate in the flesh and organs of fish and invertebrates (Geraci et al. 1999; Harwood 2002). Marine mammals become exposed to these compounds when they eat prey contaminated by these naturally produced toxins (Van Dolah 2005).

Weather Events and Climate Influences. Severe storms, hurricanes, typhoons, and prolonged temperature extremes may lead to local marine mammal strandings (Geraci et al. 1999; Walsh et al. 2001). Seasonal oceanographic conditions in terms of weather, frontal systems, and local currents may also play a role in stranding (Walker et al. 2005).

The effect of large-scale climatic changes to the world's oceans and how these changes impact marine mammals and influence strandings are difficult to quantify, given the broad spatial and temporal scales involved, and the cryptic movement patterns of marine mammals (Moore 2005; Learmonth et al. 2006). The most immediate, although indirect, effect is decreased prey availability during unusual conditions. This, in turn, results in increased search effort required by marine mammals (Crocker et al. 2006), potential starvation if not successful, and corresponding stranding due directly to starvation or succumbing to disease or predation while in a weakened, stressed state (Selzer and Payne 1988; Geraci et al. 1999; Moore 2005; Learmonth et al. 2006; Weise et al. 2006).

Navigational Error. *Geomagnetism.* Like some land animals and birds, marine mammals may be able to orient to the Earth's magnetic field as a navigational cue, and areas of local magnetic anomalies may influence strandings (Bauer et al., 1985; Klinowska 1985; Kirschvink et al. 1986; Klinowska 1986; Walker et al. 1992; Wartzok and Ketten 1999).

Echolocation Disruption in Shallow Water. Some researchers believe stranding may result from reductions in the effectiveness of echolocation in shallow water, especially in the pelagic species of odontocetes who may be less familiar with coastlines (Dudok van Heel 1966; Chambers and James 2005). For an odontocete, echoes from echolocation signals contain important information on the location and identity of underwater objects and the shoreline. The authors postulate that the gradual slope of a beach may present difficulties to the navigational systems of some cetaceans, since live strandings commonly occur along beaches with shallow, sandy gradients (Brabyn and McLean 1992; Mazzuca et al. 1999; Maldini et al. 2005; Walker et al. 2005). A factor contributing to echolocation interference in turbulent, shallow water is the presence of microbubbles from the interaction of wind, breaking waves, and currents. Additionally, ocean water near the shoreline can have an increased turbidity (e.g., floating sand or silt, particulate plant matter) due to the run-off of fresh water into the ocean, either from rainfall or from freshwater outflows (e.g., rivers and creeks). Collectively, these factors can reduce and scatter the sound energy in echolocation signals and reduce the perceptibility of returning echoes of interest.

Social Cohesion. Many pelagic species such as sperm whales, pilot whales, melon-head whales, and false killer whales, and some dolphins occur in large groups with strong social bonds between individuals. When one or more animals strand due to any number of causative events, then the entire pod may follow suit out of social cohesion (Geraci et al., 1999; Conner 2000; Perrin and Geraci 2002; NMFS 2007).

6.2.3.6 Human-Influenced Stressors

During the past few decades there has been an increase in marine mammal mortalities associated with a variety of human activities (Geraci et al. 1999; NMFS 2007). These activities include fisheries interactions (bycatch and directed catch), pollution (marine debris, toxic compounds), habitat modification (degradation, prey reduction), and ship strikes (Laist et al. 2001) (See Figure 6-1).

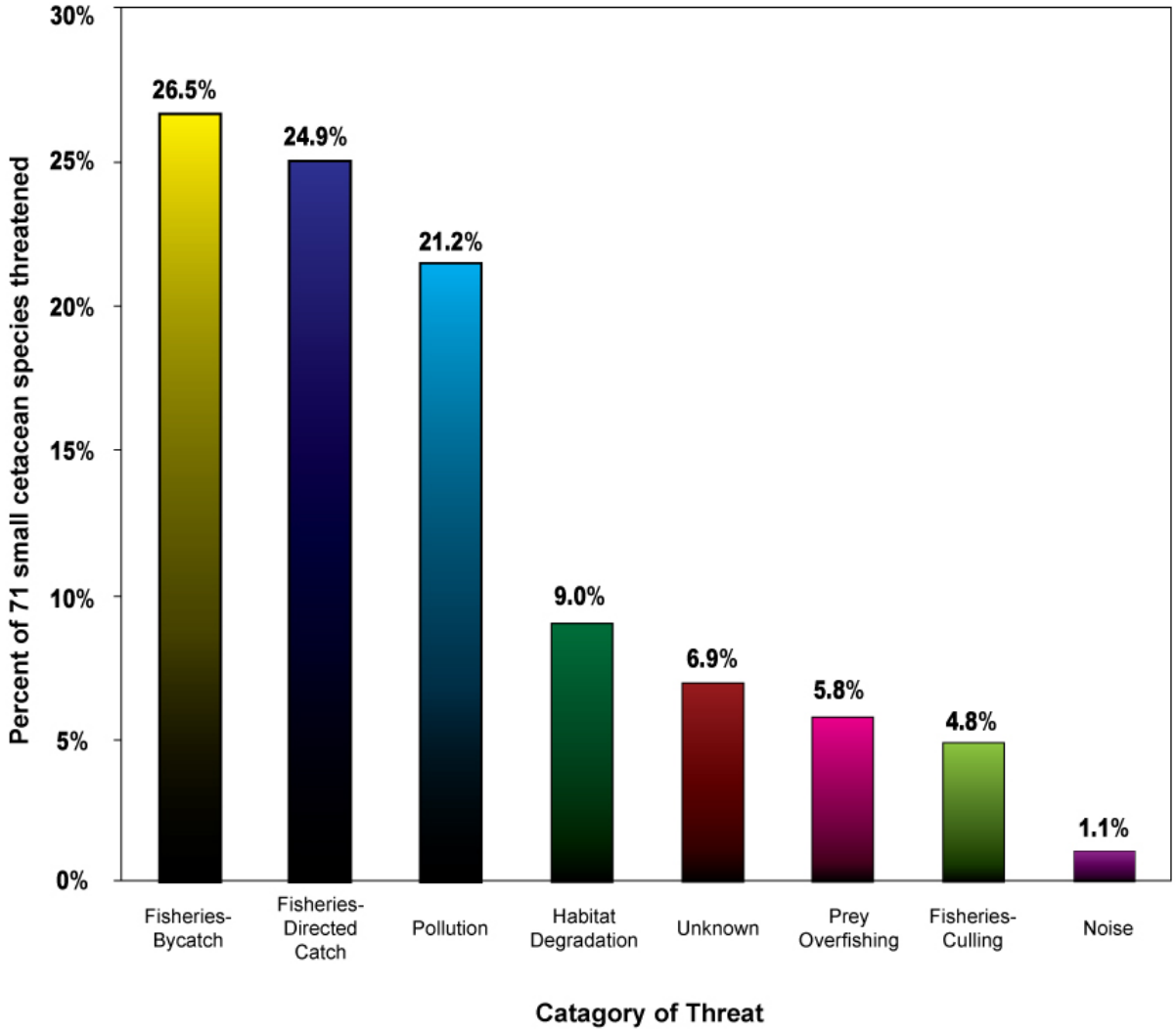

Figure 6-1: Human Threats to Worldwide Small Cetacean Populations

Source: Culik, 2002

Ship Strikes. Many of the migratory species of large whales examined in this EIS/OEIS could be at risk to ship strike from all sources during their migrations within the MIRC Study Area as well as their destinations outside of the Study Area. These species include humpback whales, fin whales, sperm whales, sei whales, Bryde's whales, and minke whales. Commercial shipping and commercial fishing could contribute to ship strike as part of cumulative effects. As noted in Jensen and Silber (2004), certain classes of vessels are likely overrepresented in the data, in particular Federal vessels including Navy and Coast Guard ships, which are required to report all strikes of marine mammals.

Factors that contribute to this include nonreporting by commercial vessels, failure to recognize ship-strikes by larger ships (*e.g.*, ≥40,000 tons), smaller Navy and Coast Guard ships, and greater numbers of dedicated observers/watch standers aboard Navy and Coast Guard ships which result in more and better reporting. In 2006 there were nine ship strikes by vessels engaged in whale watching according to the Pacific Islands Region Marine Mammal Response Network.

Navy vessel traffic is a small fraction (approximately 2 percent) of the overall U.S. commercial and fishing vessel traffic (Jensen and Silber 2003). While Navy vessel movements may contribute to the ship strike threat, given the lookout and mitigation measures adopted by the Navy, probability of vessel strikes is greatly reduced. Furthermore, actions to avoid close interaction of Navy ships and marine mammals and sea turtles, such as maneuvering to keep away from any observed marine mammal and sea turtle are part of existing at-sea protocols and standard operating procedures (see Chapter 5 for further explanation of Navy Standard Operating Procedures and Mitigation Measures). Navy ships have up to three or more dedicated and trained lookouts as well as two to three bridge watchstanders during at-sea movements who would be searching for any whales, sea turtles, or other obstacles on the water surface. Such lookouts are expected to further reduce the chances of a collision.

Note that the majority of ships participating in Navy Training exercises, such as Navy destroyers, have a number of advantages for avoiding ship strike as compared to most commercial merchant vessels.

- The Navy ships have their bridges positioned forward, offering good visibility ahead of the bow.
- Crew size is much larger than merchant ships
- During all Anti-Submarine Warfare (ASW) events, Mine Integrated Warfare (MIW) events, and some nearshore ship movements, there are lookouts posted scanning the ocean for anything detectible in the water; anything detected is reported to the Officer of the Deck.
- Navy lookouts receive extensive training, including Marine Species Awareness Training designed to provide marine species detection cues and information necessary to detect marine mammals and sea turtles.
- Navy ships are generally much more maneuverable than commercial merchant vessels.

The contribution to cumulative effects by military readiness activities within the MIRC Study Area with respect to ship strike are expected to be minimal given the relatively small percentage of ship traffic represented by Navy ships and the mitigation measures identified in Chapter 5.

Fisheries Interaction: Bycatch, Entanglement, and Directed Catch. The incidental catch of marine mammals in commercial fisheries is a significant threat to the survival and recovery of many populations of marine mammals (Geraci et al. 1999; Baird 2002; Culik 2002; Carretta et al. 2004; Geraci and Lounsbury 2005; National Marine Fisheries Service [NMFS] 2007). Interactions with fisheries and entanglement in discarded or lost gear continue to be a major factor in marine mammal deaths worldwide (Geraci et al. 1999; Nieri et al. 1999; Geraci and Lounsbury 2005; Read et al. 2006; Zeeber et al. 2006). For instance, baleen whales and pinnipeds have been found entangled in nets, ropes, monofilament line, and other fishing gear that has been discarded out at sea (Geraci et al. 1999; Campagna et al. 2007).

Bycatch. Bycatch is the catching of nontarget species within a given fishing operation and can include noncommercially used invertebrates, fish, sea turtles, birds, and marine mammals (National Research Council [NRC] 2006). Read et al. (2006) attempted to estimate the magnitude of marine mammal bycatch in U.S. and global fisheries. Within U.S. fisheries, between 1990 and 1999 the mean annual bycatch of marine mammals was 6,215 animals. Eighty-four percent of cetacean bycatch occurred in gill-net fisheries, with dolphins and porpoises constituting most of the cetacean bycatch (Read et al. 2006). Over the decade there was a 40 percent decline in marine mammal bycatch, primarily due to effective conservation measures that were implemented during this time period. With global marine mammal bycatch likely to be in the hundreds of thousands every year, bycatch in fisheries are the single greatest threat to many marine mammal populations around the world (Read et al. 2006).

Section 118 of the Marine Mammal Protection Act (MMPA) requires that the NMFS implement take reduction plans to reduce interactions between commercial fishing gear and marine mammals, as necessary. NMFS has also assessed the potential risk for marine mammal interactions in the United States and assigned each fishery to a Category (Category I, II, or III) depending on the likelihood of interactions with marine mammals in a particular fishery. Additional information on NMFS's efforts to implement the MMPA and minimize interactions with marine mammals and fisheries can be found on the official NOAA website, "Marine Mammal Protection Act (MMPA) of 1972 (NOAA 2008a).

Entanglement. Entangled marine mammals may die as a result of drowning, escape with pieces of gear still attached to their bodies, or manage to be set free either of their own accord or by fishermen. Many large whales carry off gear after becoming entangled (Read et al. 2006). When a marine mammal swims off with gear attached, the result can be fatal. The gear may become too cumbersome for the animal or it can be wrapped around a crucial body part and tighten over time. Stranded marine mammals frequently exhibit signs of previous fishery interaction, such as scarring or gear attached to their bodies. For stranded marine mammals, death is often attributed to such interactions (Baird and Gorgone 2005). Because marine mammals that die due to fisheries interactions may not wash ashore and not all animals that do wash ashore exhibit clear signs of interactions, data probably underestimate fishery-related mortality and serious injury (NMFS 2005).

Directed Catch. Within the region of influence authorized whale kills from scientific research and subsistence harvest are not known to occur. Therefore, no cumulative effects are expected from military readiness activities within the MIRC Study Area with respect to authorized directed kills of marine mammals. Directed harvest of sea turtle nesting females and eggs on the beach and in the water is still widespread. Directed take is a major threat to hawksbills in the CNMI (NMFS 2008).

Ingestion of Plastic Objects and Other Marine Debris and Toxic Pollution Exposure. For many marine mammals, debris in the marine environment is a great hazard. Not only is debris a hazard because of possible entanglement, animals may mistake plastics and other debris for food (NMFS 2007g). Sperm whales have been known to ingest plastic debris, such as plastic bags (Evans et al. 2003; Whitehead 2003). While this has led to mortality, the scale on which this is affecting sperm whale populations is unknown, but Whitehead (2003) suspects it is not substantial at this time.

High concentrations of potentially toxic substances within marine mammals along with an increase in new diseases have been documented in recent years. Scientists have begun to consider the possibility of a link between pollutants and marine mammal mortality events. NMFS takes part in a marine mammal biomonitoring program not only to help assess the health and contaminant loads of marine mammals, but also to assist in determining anthropogenic impacts on marine mammals, marine food chains, and marine ecosystem health. Using strandings and bycatch animals, the program provides tissue/serum archiving, samples for analyses, disease monitoring and reporting, and additional response during disease investigations (NMFS 2007).

The impacts of these activities are difficult to measure. However, some researchers have correlated contaminant exposure with possible adverse health effects in marine mammals (Borell 1993; O'Shea and Brownelll 1994; O'Hara and Rice 1996; O'Hara et al. 1999).

The manmade chemical PCB, and the pesticide DDT are both considered persistent organic pollutants that are currently banned in the United States for their harmful effects in wildlife and humans (NMFS 2007c). Despite having been banned for decades, the levels of these compounds are still high in marine mammal tissue samples taken along U.S. coasts (Hickie et al. 2007; Krahn et al. 2007; NMFS 2007c). Both compounds are long-lasting, reside in marine mammal fat tissues (especially in the blubber), and can have toxic effects such as reproductive impairment and immunosuppression (NMFS 2007c).

In addition to direct effects, marine mammals are indirectly affected by habitat contamination that degrades prey species availability, or increases disease susceptibility (Geraci et al. 1999).

Navy vessel operation between ports and exercise locations has the potential to release small amounts of pollutant discharges into the water column. Navy vessels are not a typical source, however, of either pathogens or other contaminants with bioaccumulation potential such as pesticides and PCBs. Furthermore, any vessel discharges such as bilge water and deck runoff associated with the vessels would be in accordance with international and U.S. requirements for eliminating or minimizing discharges of oil, garbage, and other substances, and not likely to contribute significant changes to ocean water quality or to affect marine mammals.

Anthropogenic Sound. As one of the potential stressors to marine mammal populations, noise and acoustic influences may disrupt marine mammal communication, navigational ability, and social patterns, and may or may not influence stranding. Many marine mammals use sound to communicate, navigate, locate prey, and sense their environment. Both anthropogenic and natural sounds may interfere with these functions, although comprehension of the type and magnitude of any behavioral or physiological responses resulting from man-made sound, and how these responses may contribute to strandings, is rudimentary at best (NMFS 2007). Marine mammals may respond both behaviorally and physiologically to anthropogenic sound exposure, (e.g., Richardson et al. 1995; Finneran et al. 2000; Finneran et al. 2003; Finneran et al. 2005). However, the range and magnitude of the behavioral response of marine mammals to various sound sources is highly variable (Richardson et al. 1995) and appears to depend on the species involved, the experience of the animal with the sound source, the motivation of the animal (e.g., feeding, mating), and the context of the exposure.

Marine mammals are regularly exposed to several sources of natural and anthropogenic sounds. Anthropogenic noise that could affect ambient noise arises from the following general types of activities in and near the sea, any combination of which can contribute to the total noise at any one place and time. These noises include: transportation; dredging; construction; oil, gas, and mineral exploration in offshore areas; geophysical (seismic) surveys; sonar; explosions; and ocean research activities (Richardson et al. 1995). Commercial fishing vessels, cruise ships, transport boats, recreational boats, and aircraft, all contribute sound into the ocean (NRC 2003, 2006). Several investigators have argued that anthropogenic sources of noise have increased ambient noise levels in the ocean over the last 50 years (NRC 1994, 1996, 2000, 2003, 2005; Richardson et al. 1995; Jasny et al. 2005; McDonald et al. 2006). Much of this increase is due to increased shipping due to ships becoming more numerous and of larger tonnage (NRC 2003; McDonald et al. 2006). Andrew et al. (2002) compared ocean ambient sound from the 1960s with the 1990s for a receiver off the California coast. The data showed an increase in ambient noise of approximately 10 decibel (dB) in the frequency range of 20 to 80 Hertz (Hz) and 200 and 300 Hz, and about 3 dB at 100 Hz over a 33-year period.

Vessel Noise. Sound emitted from large vessels, particularly in the course of transit, is the principal source of noise in the ocean today, primarily due to the properties of sound emitted by civilian cargo vessels (Richardson et al. 1995; Arveson and Vendittis 2006). Ship propulsion and electricity generation engines, engine gearing, compressors, bilge and ballast pumps, as well as hydrodynamic flow surrounding a ship's hull and any hull protrusions, contribute to a large vessels' noise emissions in the marine environment. Prop-driven vessels also generate noise through cavitation, which accounts much of the noise emitted by a large vessel depending on its travel speed. Military vessels underway or involved in naval operations or exercises, also introduce anthropogenic noise into the marine environment. Noise emitted by large vessels can be characterized as low-frequency, continuous, and tonal. The sound pressure levels at the vessel will vary according to speed, burden, capacity, and length (Richardson et al. 1995; Arveson and Vendittis 2000). Vessels ranging from 135 to 337 meters generate peak source sound levels

from 169 to 200 dB between 8 Hz and 430 Hz, although Arveson and Vendittis (2000) documented components of higher frequencies (10-30 kHz) as a function of newer merchant ship engines and faster transit speeds. Given the propagation of low-frequency sounds, a large vessel in this sound range can be heard 139 to 463 kilometers away (Ross 1976 in Polefka 2004). Navy vessels, however, have incorporated significant underwater ship quieting technology to reduce their acoustic signature (as compared to a similarly sized vessel) and thus reduce their vulnerability to detection by enemy passive acoustics (Southall 2006).

Vessel Mechanical Noise Sources. Mechanical noise on Navy ships, especially those engaged in ASW, is very quiet in comparison to civilian vessels of similar or larger size. Most Navy ships are built to reduce radiated noise so as to assist with the ship's passive ASW and make the ship harder for submarines to detect and classify them passively. This general feature is also enhanced by the use of additional quieting technologies (i.e., gas turbine propulsion) as a means of limiting passive detection by opposing submarines.

Airborne Sound Source. Airborne sound from a low-flying helicopter or airplane may be heard by marine mammals and turtles while at the surface or underwater. Due to the transient nature of sounds from aircraft involved in at-sea exercises, such sounds would not likely cause physical effects but have the potential to affect behaviors. Responses by mammals and turtles could include hasty dives or turns, or decreased foraging (Soto et al. 2006). Whales may also slap the water with flukes or flippers, and swim away from the aircraft track.

Seismic and Explosive Sources. There are no reasonably foreseeable oil and gas exploration activities that would be occurring in the action area and thus no impacts from air guns or explosives to marine mammals are expected. Seismic exploration and nearshore/harbor construction employing explosives may contribute to anthropogenic noise within the action area.

Military Training Sources. Temporary disturbance incidents associated with Service activities, such as mine neutralization training, Gunnery Exercises, Sinking Exercises, or Service Weapons Tests could result in an incremental contribution to cumulative impacts on marine mammals. However, the mitigation measures identified in Chapter 5 should eliminate any potential adverse effects to marine mammals from explosives and no significant cumulative effects are anticipated.

Whale Watching. Whale and dolphin watching is specifically directed at following, closely observing these animals, or placing swimmers/divers to swim with dolphins and whales. Conversely Navy ships attempt to avoid marine mammals and sea turtles when they are observed or detected. While these commercial whale watching activities may have as yet undetected adverse impacts on marine mammals, including population level effects, military readiness activities within the MIRC Study Area are not expected to contribute to cumulative effects associated with whale watching in the MIRC Study Area.

Scientific Research. The effects of scientific research on marine mammals within the MIRC Study Area are not expected to be significant, and the contribution of military readiness activities within the MIRC Study Area to cumulative effects of scientific research are expected to be additive but minimal with implementation of the monitoring plan and mitigation measures presented in Chapter 5, and scientific research permit application evaluations conducted by NMFS.

Naval activity would have no significant impact on marine biological resources under the No Action Alternative, Alternative 1, or Alternative 2. Naval activity in non-territorial waters would not cause significant harm to marine biological resources under the No Action Alternative, Alternative 1, or

Alternative 2. The Proposed Action would not result in significant cumulative marine biological resources impacts.

Navy LFA/MFA/HFA Sonar. Naval sonars are designed for three primary functions: submarine hunting, mine hunting, and shipping surveillance. There are two classes of sonar employed by the Navy: active sonar and passive sonar. Most active military sonars operate in a limited number of areas, and are most likely not a significant contributor to a comprehensive global ocean noise budget (International Council for the Exploration of the Sea 2005).

Increases in ambient noise levels might have the potential to mask an animal's ability to detect objects, such as fishing gear, and thus increase their susceptibility to bycatch. MFA sonar transmission, however, involves a very small portion of the frequency spectrum and falls between the central hearing range of the (generally) low-frequency specializing baleen whales and the (generally) high-frequency specializing odontocetes. In addition, the active portion of MFA/HFA sonar is intermittent, brief, and individual units engaged in the exercise are separated by large distances. As a result, MFA/HFA sonar use during Navy training activities will not contribute to an increase in baseline anthropogenic ambient noise levels to any significant degree. Additional discussion of MFA/HFA operational parameters is found in Section 3.7, Marine Mammals.

During training exercises, MFA/HFA sonar will add to regional sound levels, but the cumulative effects of potential short-term and intermittent acoustic exposure to marine mammals are not well known. The analysis of potential effects of MFA sonar from training events determined there is a potential for harassment of marine mammals. It is possible that harassment in any form may cause a stress response (Fair and Becker 2000). Cetaceans can exhibit some of the same stress symptoms as found in terrestrial mammals (Curry 1999). Disturbance from ship traffic, noise from ships and aircraft, and/or exposure to biotoxins and anthropogenic contaminants may stress animals, weakening their immune systems, and making them more vulnerable to parasites and diseases that normally would not be fatal. Any minimal incremental contribution to cumulative impacts on marine mammals from possible temporary harassment incidents associated with military readiness training within the MIRC Study Area would not likely be significant. The mitigation measures identified in Chapter 5 would be implemented to further minimize any potential adverse effects on marine mammals.

The Navy's most powerful surface ship sonar is the SQS-53, which has the nominal source level of 235 dB re 1 squared micropascal (μPa^2) at 1.09 yards (or 1 meter [m]). Generally (based on water conditions) a ping will lose approximately 60 dB after traveling 1,000 yards from the sonar dome, resulting in a received level of 175 dB at 1,000 yards from the sonar dome. The Navy's standard mitigation measures consider the area within 1,000 yards of the bow (the sonar dome) a Safety Zone. The resulting 175 dB sound level at 1,000 yards, where the Navy's mitigation Safety Zone begins, is for comparison, less than source level produced by the vocalization of many marine mammals and less than other sounds marine mammals may be exposed to, such as humpback fluke and flipper slaps at source levels of 183 to 192 dB (Richardson et al. 1995).

A nominal sonar ping is approximately 1 second in duration followed by a period of silence lasting 30 seconds or longer during which the MFA sonar system listens for a return reflection of that ping. An Undersea Warfare Exercise (USWEX) event can last for 72 to 96 hours, although the ASW portions of the exercise (modeled as three periods lasting approximately 16 hours each) are a subset of the total exercise timeframe. Within the ASW event where hull-mounted MFA sonar is used, the sonar system produces sound in the water only a small fraction of the time ASW is being conducted or, as in the preceding example, 2 seconds of sound every minute. When compared against naturally occurring and other man-made sources of noise in the oceans, the sonar pings during ASW events are only a brief and intermittent portion of the total acoustic noise.

The Navy's standard mitigation measures are designed to prevent direct injury to marine mammals as a result of the sonar's acoustic energy. The Navy currently employs the mitigation measures described in Chapter 5. These are designed to prevent direct injury to marine mammals as a result of the sonar's acoustic energy. If any marine mammal is sighted within 1,000 yards of the bow, the sonar power is reduced by 75 percent (6 dB). The average level (195 dB) at which the onset of measurable physiological change to hearing (technically referred to as "temporary threshold shift [TTS]") could be determined occurs approximately 200 yards from a sonar dome transmitting a 1-second, 235 dB ping. The Safety Zone distance of 1,000 yards is more than four times the average distance at which the onset of a measurable and temporary physiological change occurs, and yet a significant power reduction is mandated if a marine mammal comes within this range. Additional protective measures, as detailed in Chapter 5, are in place to lessen the potential for there to be cumulative impacts or synergistic effect from the use of sonar during training exercises.

As discussed previously, because MFA/HFA sonar transmissions are brief and intermittent, cumulative impacts from ship strikes due to masking from MFA/HFA sonar signals are not a reasonably foreseeable significant adverse impact on marine animals

Cumulative Impacts and Synergistic Effects of LFA/MFA/HFA. MFA/HFA sonar make use of distinct and narrow fractions of the mid-frequency and high-frequency sound spectrum as noted previously. Other Navy systems (*i.e*., fathometers) are specifically designed to avoid use of these same frequencies, which would otherwise interfere with the MFA/HFA sonar. These HFA sonar systems generally employ weaker power levels at higher frequencies which both result rapid attenuation of the sound levels. There should, therefore, be no cumulative impacts from multiple systems using the same frequency. For the same reason, there should be no synergistic effects from the MFA/HFA systems in use during Navy training. Because of major differences in signal characteristics between Low-Frequency Active (LFA) sonar, MFA/HFA sonar, there is negligible chance of producing a "synergistic" sound field. It is also unlikely that LFA sources, if operated in proximity to each other would produce a sound field so complex that marine animals would not be able to escape. The potential for sound waves from multiple sources and a marine mammal would converge at the same time to cause harm to the mammal is so unlikely that it is statistically insignificant.

The potential simultaneous use of both LFA sonar and MFA/HFA sonar systems in the MIRC would involve transmission in portions of both the low, mid-, and high-frequency sound spectrums. This raises a question regarding the potential for masking from the simultaneous use of these systems. There are, however, large differences between LFA and MFA/HFA sonar systems' signal characteristics given the time of transmission, depth, vertical steering angle, waveform, wavetrain, pulse length, pulse repetition rate, bandwidth, and duty cycle. The portion of the low frequency spectrum that LFA can affect is both small and short in duration. As described previously, MFA sonar transmissions are very brief, in a narrow frequency band, and typically on the order of a 1-second ping with 30 seconds between pings. Similarly, the HFA sources used are lower in power and generally at a single distinct frequency. Therefore, transmissions of LFA and MFA/HFA sonar, if overlapping in time, would do so only temporarily and would each be in narrow, non-overlapping and distinct frequency bands. They would, therefore, not be additive in a masking sense, even if they did overlap in time (they would mask different signals), though in the rare instances where there were overlapping signals from LFA and MFA/HFA sonar they could affect a broader portion of the broadband signals. However, due to the differences in the operational characteristics, especially signal duration, any cumulative masking effects from the simultaneous use of LFA and MFA/HFA systems are expected to be negligible and extremely unlikely.

Given the information provided in the Final Supplemental Environmental Impact Statement (SEIS) for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar, the potential for cumulative impacts and synergistic effects from the operations of up to four SURTASS LFA sonars

was considered to be small and has been addressed by limitations proposed for employment of the system (*i.e.*, geographical restrictions and monitoring mitigation). Even if considered in combination with other underwater sounds, such as commercial shipping, other operational, research, and exploration activities (*e.g.*, acoustic thermometry, hydrocarbon exploration and production), recreational water activities, naturally-occurring sounds (*e.g.*, storms, lightning strikes, subsea earthquakes, underwater volcanoes, whale vocalizations, etc.) and mid-frequency active/high-frequency active (MFA/HFA) sonar, the proposed four SURTASS LFA sonar systems would not add appreciably to the underwater sounds to which fish, sea turtle and marine mammal stocks would be exposed. Moreover, SURTASS LFA sonar will cause no lethal takes of marine mammals (DoN 2007). Therefore, cumulative impacts and synergistic effects of the operation of SURTASS LFA sonar systems in conjunction with the Proposed Action and Alternatives, in particular MFA/HFA, are not reasonably foreseeable.

Impacts from military readiness activities associated with the MIRC Study Area, including the use of MFA/HFA sonar, are not likely to affect the identified species or stock of marine mammals through effects on annual rates of recruitment or survival. Therefore, the incremental impacts from these activities would not represent a significant contribution to the cumulative effects on marine mammals or sea turtles when added to other past, present, and reasonably foreseeable future actions.

Potential harassment from SURTASS LFA sonar has been evaluated for the MIRC area in the 2007 SURTASS LFA Supplemental EIS (Department of the Navy [DoN] 2007a) and for synergistic affects of use of the systems for training. The potential cumulative impact issue associated with SURTASS LFA sonar operations is the addition of underwater sound to oceanic ambient noise levels and its use during the operation of MFA/HFA sonar in the MIRC area. While the operation of LFA and MFA/HFA sonar together in the MIRC area has the potential to expose marine mammals to these sources, there should not be any cumulative or synergistic effects given the differences in the systems frequencies as detailed below.

Anthropogenic sources of ambient noise that are most likely to contribute to increases in ambient noise levels are commercial shipping, offshore oil and gas exploration and drilling, and naval and other use of sonar (International Council for the Exploration of the Sea 2005). Increases in ambient noise levels have the potential to cause masking, and decrease in distances that underwater sound can be detected by marine animals. These effects have the potential to cause a long-term decrease in a marine mammal's efficiency at foraging, navigating, or communicating (International Council for the Exploration of the Sea 2005). NRC (2003) discussed acoustically induced stress in marine mammals. National Research Council stated that sounds resulting from one-time exposure are less likely to have population-level effects than sounds that animals are exposed to repeatedly over extended periods of time.

Broadband, continuous low-frequency shipping noise is more likely to affect marine mammals than narrowband, low duty cycle SURTASS LFA sonar or the brief and intermittent signals from MFA/HFA sources. SURTASS LFA sonar bandwidth is limited (approximately 30 Hz), the average maximum pulse length is 60 seconds, signals do not remain at a single frequency for more than 10 seconds, and during an operation the system is off nominally 90 to 92.5 percent of the time. Most mysticete vocalizations are in the low frequency band below 1 kHz. No direct auditory measurements have been made for any mysticete, but it is generally believed that their frequency band of best hearing is below 1,000 Hz, where their calls have the greatest energy (Clark 1990; Edds-Walton 2000; Ketten 2000). However, with the nominal duty cycle of 7.5 to 10 percent, masking would be temporary. For these reasons, any masking effects from SURTASS LFA sonar are expected to be negligible and extremely unlikely.

Odontocetes have a broad acoustic range and hearing thresholds measure between 400 Hz and 100 kHz (Richardson et al. 1995a; Finneran et al. 2002). It is believed that odontocetes communicate above 1,000 Hz and echolocate above 20 kHz (Würsig and Richardson 2002). While the upward spread of masking is

known to exist, the phenomenon has a limited range in frequency. Yost (2000) showed that magnitude of the masking effect decreases as the difference between signal and masking frequency increase; i.e., the masking effect is lower at three times the frequency of the masker than at two times the frequency. Gorga et al. (2002) demonstrated that for a 1.2-kHz masking signal, the upward spread of masking was extinguished at frequencies of 6 kHz and higher. Therefore, while the phenomenon of upward spread of masking does exist, it is unlikely that LFA would have any significant effect on the hearing of higher frequency animals. Gorga et al. (2002) also demonstrated that the upward spread of masking is a function of the received level of the masking signal. Therefore, a large increase in the masked bandwidth due to upward masking would only occur at high received levels of the LFA signal.

In a recent analysis for the Policy on Sound and Marine Mammals: An International Workshop sponsored by the Marine Mammal Commission (United States) and the Joint Nature Conservation Committee (United Kingdom) in 2004, Dr. John Hildebrand provided a comparison of anthropogenic underwater sound sources by their annual energy output. On an annual basis, four SURTASS LFA systems are estimated to have a total energy output of 6.8×10^{11} Joules/yr. MFA and super tankers were both greater at 8.5 x 10 and 3.7 x 10 Joules/year, respectively (Hildebrand 2004). Hildebrand concluded that increases in anthropogenic sources most likely to contribute to increased noise in order of importance are commercial shipping, offshore oil and gas exploration and drilling, and naval and other uses of sonar. The use of SURTASS LFA sonar is not scheduled to increase past the originally analyzed four systems during the next 5-year regulation under the MMPA. The percentage of the total anthropogenic acoustic energy budget added by each LFA source is actually closer to 0.5 percent per system (or less), when other man-made sources are considered (Hildebrand 2004). When combined with the naturally occurring and other manmade sources of noise in the oceans, the intermittent LFA signals barely contribute a measurable portion of the total acoustic energy.

In a recently released report entitled *Ad-Hoc Group on the Impact of Sonar on Cetaceans*, the International Council for the Exploration of the Sea (International Council for the Exploration of the Sea 2005) concluded that shipping accounts for more than 75 percent of all human sound in the sea, and sonar amounts to no more than 10 percent or so. It further stated that sonar (noise budget) would probably never exceed 10 percent, but that sonar deployment seems likely to increase in the future. Therefore, the SURTASS LFA Final SEIS, dated April 2007, concluded that because LFA transmissions would not significantly increase anthropogenic oceanic noise, cumulative impacts and synergistic effects from the proposed four SURTASS LFA sonar systems for masking would not be a reasonably foreseeable significant adverse impact on marine animals.

Synergistic Effects. The potential for synergistic effects of the operation of SURTASS LFA sonar with overlapping sound fields from other anthropogenic sound sources was initially analyzed based on two LFA sources (DoN 2007). In order for the sound fields to converge, the multiple sources would have to transmit exactly in phase (at the same time), requiring similar signal characteristics, such as time of transmissions, depth, vertical steering angle, waveform, wavetrain, pulse length, pulse repetition rate, and duty cycle. In the very unlikely event that this ever occurred, the analysis demonstrated that the "synergistic" sound field generated would be 75 percent or less of the value obtained by adding the results. Therefore, adding the results conservatively bounds the potential effects of employing multiple LFA sources. In the areas where marine mammals would potentially be affected by significant behavioral changes, they would be far enough away that they would discern each LFA sonar as an individual source. Standard operational employment of two SURTASS LFA sonars calls for the vessels to be nominally at least 185 km (100 nm) apart (DoN 2007). Moreover, LFA sources would not normally operate in proximity to each other and would be unlikely to transmit in phase as noted above. Based on this and the coastal standoff restriction, it is unlikely that LFA sources, under any circumstances, could produce a sound field so complex that marine animals would not know how to escape it if they desired to do so.

Because of the potential for seismic surveys to interfere with the reception of passive signals and return echoes, SURTASS LFA sonar operations are not expected to be close enough to these activities to have any synergistic effects. Marine animals would perceive these two sources of underwater sound differently and any addition of received signals would be insignificant. This situation would present itself only rarely, as LFA testing and training operations have not been, and are not expected to be conducted in proximity to any seismic survey activity.

If SURTASS LFA sonar operations were to occur concurrent with other military (including MFA/HFA sonars) and commercial sonar systems, synergistic effects are not probable because of differences between these systems (DoN 2007). For the sound fields to converge, the multiple sources would have to transmit exactly in phase (at the same time), requiring similar signal characteristics, such as time of transmissions, depth, frequency, bandwidth, vertical steering angle, waveform, wavetrain, pulse length, pulse repetition rate, and duty cycle. The potential for this occurring is negligible.

Another area for potential cumulative effects would be those associated with marine mammal populations. To evaluate the effects of MIRC area sonar operations, it is necessary to place it in perspective with other anthropogenic impacts on marine resources.

Bycatch. Increases in ambient noise levels have the potential to mask an animal's ability to detect objects, such as fishing gear, thus increasing their susceptibility to becoming bycatch. Because LFA/MFA/HFA transmissions are intermittent and would not significantly increase anthropogenic oceanic noise, cumulative impacts and synergistic effects from masking by MIRC activities signals are not a reasonably foreseeable significant adverse impact on marine animals.

Ship Strikes. Increases in ambient noise levels have the potential to mask an animal's ability to detect approaching vessels, thus increasing their susceptibility to ship strikes. Because LFA/MFA/HFA transmissions are intermittent and will not significantly increase anthropogenic oceanic noise, cumulative impacts and synergistic effects from ship strikes due to masking are not a reasonably foreseeable significant adverse impact on marine animals from MIRC activities.

6.2.4 Onshore Biological Resources

6.2.4.1 Geology, Soils, and Bathymetry Environment

Implementation of the No Action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 6-1 would not result in significant impacts on geology and soils within the MIRC Study Area. The impacts on geology are minor and mostly consist of limited temporal and spatial disturbances to underwater sediments or localized soil disturbance in previously disturbed areas on the islands. Erosion is a naturally recurring issue, but it is not heavily exacerbated by military activities. While construction type projects in the region may have localized erosion, overall cumulative effects would be negligible since Best Management Practices for soil disturbing activities are typically implemented during any construction activity.

6.2.4.2 Hazardous Materials

Some materials expended during training activities would be left in place. The expended materials are unlikely to result either in any significant environmental impacts to the sea floor or in a significant degradation of marine water quality. Over a period of years, these materials would degrade, corrode, and become incorporated into the sediments. There are no significant environmental impacts associated with hazardous materials and there are no anticipated impacts to listed species and critical habitats.

Two additional projects are scheduled for construction and implementation in the MIRC: the Kilo Wharf Extension and the Guam and CNMI Military Relocation.

Kilo Wharf Extension. The Kilo Wharf Extension project does not contribute to regional cumulative impacts of hazardous materials.

Guam and CNMI Military Relocation EIS/OEIS. The Guam and CNMI Military Relocation EIS/OEIS will address impacts and issues for hazardous materials. For this reason, impacts of hazardous materials from the JGPO actions will be identified in a separate environmental document. The Proposed Actions in the MIRC EIS/OEIS would not result in significant cumulative hazardous materials impacts.

6.2.4.3 Nesting Sea Turtles, Terrestrial Biological Resources, and Seabirds and Shorebirds

Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 6-1 could affect terrestrial biological resources within the MIRC Study Area. These biological resources may include sea turtles in nesting habitats (see Section 3.8), seabirds and shorebirds (Section 3.10), and terrestrial species of concern (Section 3.11). Thirty-seven projects, which are listed in Table 6-1, occur within terrestrial habitats.

Several events contribute cumulatively to habitat degradation, including disturbance to soils and vegetation, spread of invasive non-native species, compaction, erosion and sedimentation, and impacts on native plant species. Although individual impacts may be less than significant, collectively they have the potential to be significant over time and space. Some potential effects of invasive species are difficult to foresee (such as leading to a change in fire frequency or intensity); however, it is clear that the potential for damage associated with erosion, beach compaction, or introduction or spread of invasive species is high and increases over time with repeated training missions, especially exercises that cover a very large area, because of the difficulty in effectively monitoring for invasive establishment and achieving timely control. Further, some events outside of the Military Service control may displace special status species onto DoD lands, thereby exposing the species to greater risk from military training activities. As an example, the 2006 USFWS Biological Opinion for the implementation of the ISR/Strike Capability at Andersen AFB noted that a poaching event on Rota caused Mariana fruit bats vacate roosts and relocate to Guam. Typhoon events may also cause shifting population concentrations, which may temporarily increase or decrease fruit bat populations on Andersen AFB.

The Services are addressing these effects with several strategies including (1) continued cooperation with resource agencies to implement conservation measures specified in prior Endangered Species Act (ESA) consultations or cooperative planning associated with the Migratory Bird Treaty Act (MBTA), (2) implementation of Integrated Natural Resources Management Plans (INRMPs) on Service-owned lands on Guam, leased lands within the CNMI, and on Andersen AFB, (3) continued development and implementation of measures to prevent the establishment of invasive species by minimizing the potential for introductions of seed or other plant parts (propagules) of exotic species, and (4) finding and eliminating incipient populations before they are able to spread. The most conspicuous invasive species concerning conservation of native species within the MIRC is the brown treesnake. Although many protective measures are focused on brown treesnake interdiction and control within Guam and the CNMI, the Services, resource agencies, and other stakeholders are cooperating in the development of a Regional Biosecurity Plan that addresses a variety of potential invasive species, not just brown treesnakes.

Any construction project or training event would be required to be in compliance with established INRMPs within the MIRC and U.S. Fish and Wildlife Service (USFWS) Biological Opinions. In addition, any project proposed within the MIRC affecting threatened or endangered species would have included ESA Section 7 consultation addressing direct, indirect, and cumulative impacts. Many of the projects listed in Table 6-1 occur within previously disturbed or developed areas and/or will have

consultation obligations with resource agencies (e.g. USFWS Pacific Islands Field Office [PIFO], GovGuam Department of Agriculture, Division of Aquatic and Wildlife Resources [DAWR], or CNMI Department of Fish and Wildlife [DFW]). Although there are impacts associated with the implementation of the No-action Alternative, Alternative 1, or Alternative 2 on terrestrial biology within the MIRC; these impacts would be mitigated to less than significant level.

6.2.4.4 Land Use

There are no military activities proposed that will be incompatible with current land use plans and policies, there are no anticipated changes to current land use, and no incompatibility exists with adjacent land use. Naval activity would have no significant impact on land use activities under the No Action Alternative, Alternative 1, or Alternative 2. The Proposed Action would not result in significant cumulative land use impacts.

6.2.4.5 Health and Safety

Public health and safety impacts are considered significant if the general public is substantially endangered as a result of military training activities on the ranges. Several factors were considered in evaluating the effects of military Service activities on public health and safety. These factors include proximity to the public, access control, scheduling, public notification of events, frequency of events, duration of events, range safety procedures, operational control of training events, and safety history.

No unavoidable significant environmental effects would be expected because the MIRC activities would continue to be accomplished in accordance with directives that are developed to ensure public health and safety. The Proposed Action would not result in significant cumulative public health and safety impacts.

6.2.4.6 Noise

Implementation of the No Action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 6-1 would not incrementally affect noise within the MIRC Study Area. Noise levels are inherently localized because sound levels decrease relatively quickly with increasing distance from the source. Cumulative impacts would occur when multiple projects affect the same geographic areas simultaneously or when sequential projects extend the duration of noise impacts on a given area over a longer period of time. The increased level of training proposed under Alternatives 1 or 2 would increase noise levels; however, noise levels from training would be intermittent and similar to other noise levels already experienced in the MIRC Study Area. In addition, spatial separation among the cumulative projects listed in Table 6-1 would minimize or preclude cumulative noise impacts within the MIRC Study Area.

6.2.4.7 Socioeconomics

Implementation of the No Action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 6-1 would not result in significant socioeconomic impacts within the region of influence. Implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not produce any significant regional employment, income, housing, or infrastructure impacts. Effects on commercial and recreational fishermen, divers, and boaters would be short term in nature and produce some temporary access limitations. Some offshore events, especially if coincident with peak fishing locations and periods, could cause temporary displacement and potential economic loss to individual fishermen. However, most offshore events are of short duration and have a small operational footprint. Effects on fishermen are mitigated by public notification of scheduled activities. In selected instances where safety requires exclusive use of a specific area, commercial fishing vessels, commercial vessels, or private vessels may be asked to relocate to a safer nearby area for the duration of the exercise. These

measures should not significantly impact any individual fisherman, overall commercial revenue, or public recreational opportunity in the open ocean area. Implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not affect minority or low-income populations disproportionately, nor would children be exposed to increased noise levels or safety risks because events mainly occur at sea or in areas already designated for military activities.

6.2.4.8 Water Resources

Implementation of the No Action Alternative, Alternative 1, or Alternative 2 in conjunction with the identified cumulative actions listed in Table 6-1 would not result in significant impacts on water quality within the MIRC Study Area. For offshore training, the Navy would comply with the *Oil and Hazardous Substance Release and Contingency Plan* (40 CFR Part 300) developed for Navy activities within the MIRC Study Area. Water quality impacts associated with implementation of the No Action Alternative, Alternative 1, or Alternative 2 are transitory in nature and would not reach a level of significance even in conjunction with the impacts of the other actions considered in a regional context.

CHAPTER 7 REFERENCES

The following references are subdivided by their corresponding chapter/section where they are cited.

Chapter 1 References: Purpose and Need for Proposed Action

There are no references in this section.

Chapter 2 References: Description of Proposed Action and Alternatives

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CHAPTER 8 GLOSSARY OF TERMS

Access—the right to transit to and from and to make use of an area.

Activity—an individual scheduled training function or action such as missile launching, bombardment, vehicle driving, or Field Carrier Landing Practice.

Aeronautical Chart—a map used in air navigation containing all or part of the following: topographic features, hazards and obstructions, navigation aids, navigation routes, designated airspace, and airports.

Aesthetic—a pleasing appearance, effect, or quality that allows appreciation of character-defining features, such as of the landscape.

Air Basin—a region within which the air quality is determined by the meteorology and emissions within it with minimal influence on and impact by contiguous regions.

Air Traffic Control Assigned Airspace (ATCAA)-an area of airspace of defined vertical and lateral limits assigned by FAA Air Traffic Control.

Air Route Traffic Control Center (ARTCC)—a facility established to provide air traffic control service to aircraft operating on Instrument Flight Rules flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to aircraft operating under Visual Flight Rules.

Air Traffic Control—a service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

Airfield—usually an active and/or inactive airfield, or infrequently used landing strip, with or without a hard surface, without Federal Aviation Administration-approved instrument approach procedures. An airfield has no control tower and is usually private.

Airport—usually an active airport with hard-surface runways of 3,000 feet or more, with Federal Aviation Administration approved instrument approach procedures regardless of runway length or composition. An airport may or may not have a control tower. Airports may be public or private.

Airspace, Controlled—airspace of defined dimensions within which air traffic control service is provided to Instrument Flight Rules flights and to Visual Flight Rules flights in accordance with the airspace classification. Controlled airspace is divided into five classes, dependent upon location, use, and degree of control: Class A, B, C, D, and E.

Airspace, Special Use—airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon non-participating aircraft.

Airspace, Uncontrolled—uncontrolled airspace, or Class G airspace, has no specific definition but generally refers to airspace not otherwise designated and operations below 1,200 feet above ground level. No air traffic control service to either Instrument Flight Rules or Visual Flight Rules aircraft is provided other than possible traffic advisories when the air traffic control workload permits and radio communications can be established.

Airspace—the space lying above the earth or above a certain land or water area (such as the Pacific Ocean); more specifically, the space lying above a nation and coming under its jurisdiction.

Airway—Class E airspace established in the form of a corridor, the centerline of which is defined by radio navigational aids.

Alert Area—a designated airspace in which flights are not restricted but there is concentrated student training or other unusual area activity of significance.

Alkaline—basic, having a pH greater than 7.

Alluvium—a general term for clay, silt, sand, gravel, or similar unconsolidated material deposited during comparatively recent geologic time by a stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a maintained slope.

Aluminum Oxide (Al_2O_3)—a common chemical component of missile exhaust. Under natural conditions, the chemical is not a source of toxic aluminum; the U.S. Environmental Protection Agency has determined that nonfibrous Al_2O_3, as found in solid rocket motor exhaust, is nontoxic.

Ambient Air Quality Standards—legal limitations on pollutant concentration levels allowed to occur in the ambient air established by the U.S. Environmental Protection Agency or state agencies. Primary ambient air quality standards are designed to protect public health with an adequate margin of safety. Secondary ambient air quality standards are designed to protect public welfare-related values including property, materials, and plant and animal life.

Ambient Air—that portion of the encompassing atmosphere, external to buildings, to which the general public has access.

Amplitude—the maximum departure of the value of a sound wave from the average value.

Anthropogenic—human-related.

Aquaculture—the cultivation of the natural produce of water, such as fish or shellfish.

Archaeology—a scientific approach to the study of human ecology, cultural history, prehistory and cultural processes, emphasizing systematic interpretation of material remains.

Area of Potential Effect—the geographic area within which direct and indirect impacts generated by the Proposed Action and alternatives could reasonably be expected to occur and thus cause a change in historic, architectural, archaeological, or cultural qualities possessed by the property.

Artifact—any thing or item that owes its shape, form, or placement to human activity. In archaeological studies, the term is applied to portable objects (e.g., tools and the by-products of their manufacture).

Attainment Area—an air quality control region that has been designated by the U.S. Environmental Protection Agency and the appropriate state air quality agency as having ambient air quality levels as good as or better than the standards set forth by the National Ambient Air Quality Standards, as defined in the Clean Air Act. A single geographic area may have acceptable levels of one criteria air pollutant, but unacceptable levels of another; thus, an area can be in attainment and non-attainment status simultaneously.

Average Daily Traffic (ADT)—the total volume of traffic passing a given point or segment of a roadway in both directions divided by a set number of days.

A-weighted Sound Level—a number representing the sound level which is frequency-weighted according to a prescribed frequency response established by the American National Standards Institute (ANS1.4-19711) and accounts for the response of the human ear.

Azimuth—a distance in angular degrees in a clockwise direction from the north point.

Benthic Communities—of or having to do with populations of bottom-dwelling flora or fauna of oceans, seas, or the deepest parts of a large body of water.

Benthopelagic—living and feeding near the sea floor as well as in midwaters or near the surface.

Benthos—the sea floor.

Bioaccumulation—building up of a substance, such as PCBs, in the systems of living organisms (and thus, a food web) due to ready solubility in living tissues.

Biological Diversity—the complexity and stability of an ecosystem, described in terms of species richness, species evenness, and the direct interaction between species such as competition and predation.

Biological Resources—a collective term for native or naturalized vegetation, wildlife, and the habitats in which they occur.

Booster—an auxiliary or initial propulsion system that travels with a missile or aircraft and that may not separate from the parent craft when its impulse has been delivered; may consist of one or more units.

Brackish—slightly salty; applicable to waters whose saline content is intermediate between that of streams and sea water.

Calcareous—containing calcium carbonate.

Candidate Species—a species of plant or animal for which there is sufficient information to indicate biological vulnerability and threat, and for which proposing to list as "threatened" or "endangered" is or may be appropriate.

Carbon Dioxide—a colorless, odorless, incombustible gas which is a product of respiration, combustion, fermentation, decomposition and other processes, and is always present in the atmosphere.

Carbon Monoxide—a colorless, odorless, poisonous gas produced by incomplete fossil-fuel combustion; it is one of the six pollutants for which there is a national ambient standard (see Criteria Pollutants).

Cetacean—an order of aquatic, mostly marine, animals including the whales, dolphins, porpoise, and related forms with large head, fishlike nearly hairless body, and paddle-shaped forelimbs.

Class A Airspace (also Positive Controlled Area)—airspace designated in Federal Aviation Administration Regulation Part 71 within which there is positive control of aircraft**.**

Coastal Zone—a region beyond the littoral zone occupying the area near the coastline in depths of water less than 538.2 feet. The coastal zone typically extends from the high tide mark on the land to the gently sloping, relatively shallow edge of the continental shelf. The sharp increase in water depth at the edge of the continental shelf separates the coastal zone from the offshore zone. Although comprising less than 10 percent of the ocean's area, this zone contains 90 percent of all marine species and is the site of most large commercial marine fisheries. This may differ from the way the term "coastal zone" is defined in the State Coastal Zone Management Program.

Community—an ecological collection of different plant and animal populations within a given area or zone.

Component (Cultural Resources)—a location or element within a settlement or subsistence system. Archaeological sites may contain several components that reflect the use of the locality by different groups in different time periods.

Continental Shelf—a shallow submarine plain of varying width forming a border to a continent and typically ending in a steep slope to the oceanic abyss.

Continental Slope—the steep slope that starts at the shelf break about 492 to 656 feet and extends down to the continental rise of the deep ocean floor.

Continental United States (CONUS)—the United States and its territorial waters between Mexico and Canada, but excluding overseas states.

Controlled Access—area where public access is prohibited or limited due to periodic training operations or sensitive natural or cultural resources.

Controlled Airspace—airspace of defined dimensions within which air traffic control service is provided to Instrument Flight Rules flights and to Visual Flight Rules flights in accordance with the airspace classification. Controlled airspace is divided into five classes, dependent upon location, use, and degree of control: Class A, B, C, D, and E.

Controlled Firing Area (CFA)—airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to non-participating aircraft and to ensure the safety of persons and property on the ground.

Copepod—a small, shrimp-like crustacean.

Coral Reef—a calcareous organic area composed of solid coral and coral sand.

Council on Environmental Quality (CEQ)—established by the National Environmental Policy Act, the CEQ consists of three members appointed by the President. A CEQ regulation (Title 40 Code of Federal Regulations 1500-1508, as of July 1, 1986) describes the process for implementing the National Environmental Policy Act, including preparation of environmental assessments and environmental impact statements, and the timing and extent of public participation.

Co-Use—Scheduled uses that safely allow other units to transit the area or conduct activities.

Criteria Pollutants—pollutants identified by the U.S. Environmental Protection Agency (required by the Clean Air Act to set air quality standards for common and widespread pollutants); also established under state ambient air quality standards. There are standards in effect for six criteria pollutants: sulfur dioxide, carbon monoxide, particulate matter, nitrogen dioxide, ozone, and lead.

Cultural Resources—prehistoric and/or historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered of importance to a culture, subculture, or community for scientific, traditional, religious, or any other reason.

Culture—a group of people who share standards of behavior and have common ways of interpreting the circumstances of their lives.

Cumulative Impact—the impact of the environment which results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Current—a horizontal movement of water or air.

C-weighted—utilized to determine effects of high-intensity impulsive sound on human populations, a scale providing unweighted sound levels over a frequency range of maximum human sensitivity.

Danger Area—(1) In air traffic control, an airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times; (2) (DoD only) A specified area above, below, or within which there may be potential danger.

Decibel (dB)—the accepted standard unit of measure for sound pressure levels. Due to the extremely large range of measurable sound pressures, decibels are expressed in a logarithmic scale.

Degradation—the process by which a system will no longer deliver acceptable performance.

Demersal—living close to the seafloor.

Direct Effects—immediate consequences of program activities.

Direct Impact—effects resulting solely from program implementation.

District—National Register of Historic Places designation of a geographically defined area (urban or rural) possessing a significant concentration, linkage, or continuity of sites, structures, or objects united by past events (theme) or aesthetically by plan of physical development.

Diurnal—active during the daytime.

Dunes—hills and ridges of sand-size particles (derived predominantly from coral and seashells) drifted and piled by the wind. These dunes are actively shifting or are so recently fixed or stabilized that no soil horizons develop; their surface typically consists of loose sand.

Ecosystem—all the living organisms in a given environment with the associated non-living factors.

Effects—a change in an attribute, which can be caused by a variety of events, including those that result from program attributes acting on the resource attribute (direct effect); those that do not result directly from the action or from the attributes of other resources acting on the attribute being studied (indirect effect); those that result from attributes of other programs or other attributes that change because of other programs (cumulative effects); and those that result from natural causes (for example, seasonal change).

Effluent—an outflowing branch of a main stream or lake; waste material (such as smoke, liquid industrial refuse, or sewage) discharged into the environment.

Electromagnetic Radiation (EMR)—waves of energy with both electric and magnetic components at right angles to one another.

Electronic Countermeasures (ECM)—includes both active jamming and passive techniques. Active jamming includes noise jamming to suppress hostile radars and radios, and deception jamming, intended to mislead enemy radars. Passive ECM includes the use of chaff to mask targets with multiple false echoes, as well as the reduction of radar signatures through the use of radar-absorbent materials and other stealth technologies.

En Route Airways—a low-altitude (up to, but not including 18,000 feet [5,486.4 meters] mean sea level) airway based on a center line that extends from one navigational aid or intersection to another navigational aid (or through several navigational aids and intersections) specified for that airway.

En Route Jet Routes—high altitude (above 18,000 feet mean sea level) airway based on a center line that extends from one navigational aid or intersection to another navigational aid (or through several navigational aids and intersections) specified for that airway.

Encroachment—the placement of an unauthorized structure or facility on someone's property or the unauthorized use of property.

Endangered Species—a plant or animal species that is threatened with extinction throughout all or a significant portion of its range.

Endemic—plants or animals that are native to an area or limited to a certain region.

Environmental Justice—an identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed Federal actions (required by Executive Order 12898).

Epibenthic—living on the ocean floor.

Epipelagic—living in the ocean zone from the surface to 109 fathoms (656 feet).

Erosion—the wearing away of a land surface by water, wind, ice, or other geologic agents.

Estuary—a water passage where the tide meets a river current; an arm of the sea at the lower end of a river; characterized by brackish water.

Event—a significant operational employment during which training is accomplished. "Event" is a Navy approved employment schedule term. The event may be primarily designated as operational, such as TRANSIT, MIO, or STRIKEOPS during which training may take place. Training events may be periods of operational employment that are also considered major training events such as Composite Training Unit Exercise (COMPTUEX), Joint Training Fleet Exercise (JTFEX), or other exercises such as BRIGHT STAR, COBRA GOLD, or UNIFIED.

Exclusive Use—scheduled solely for the assigned unit for safety reasons.

Exotic—not native to an area.

Explosive Ordnance Disposal (EOD)—the process of recovering and neutralizing domestic and foreign conventional, nuclear and chemical/biological ordnance and improvised explosive devices; a procedure in Explosive Ordnance Management.

Explosive Safety Quantity-Distance (ESQD)—the quantity of explosive material and distance separation relationships providing defined types of protection based on levels of risk considered acceptable.

Facilities—physical elements that can include roads, buildings, structures, and utilities. These elements are generally permanent or, if temporary, have been placed in one location for an extended period of time.

Fahnstock Clip—a mechanical electrical terminal found in teaching laboratories and consisting of a single piece of flexible metal with a rectangle punched out of one end and a loop punched out of the other. The clip is bent over itself so the loop can be pushed through the rectangular opening. A wire can be inserted through the loop that is through the cut out, and the spring force of the clip pulling up makes an electrically sound mechanical connection. Fahnstock clips were commonly made of phosphor bronze or spring steel and plated with tin for good electrical conductivity and corrosion-resistance. Most Fahnstock clips seen today are nickel-plated.

Fathom—a unit of length equal to 6 feet; used to measure the depth of water.

Feature—in archaeology, a non-portable portion of an archaeological site, including such facilities as fire pits, storage pits, stone circles, or foundations.

Federal Candidate Species—taxa for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.

Fee Simple Land—land held absolute and clear of any condition or restriction, and where the owner has unconditional power of disposition.

Feral—having escaped from domestication and become wild.

Fleet Area Control and Surveillance Facility (FACSFAC)—Navy facility that provides air traffic control services and controls and manages Navy-controlled off-shore operating areas and instrumented ranges.

Fleet Response Training Plan (FRTP)—the 27-month cycle that replaces the Interdeployment Training Cycle. The FRTP includes four phases prior to deployment: Maintenance, Unit Level Training, Integrated Training, and Sustainment.

Fleet Response Plan/Fleet Readiness Program (FRP)—the Fleet Response Plan was the Navy's response to the 2002/2003 international situations in Afghanistan and Iraq. The Fleet Readiness Program was later developed by the Fleet commanders. Both names refer to the same operational construct. The FRP is designed to more rapidly develop and then sustain readiness in ships and squadrons so that, in a national crisis or contingency operation, the Navy can quickly surge significant combat power to the scene.

Flight Level—a level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury stated in three digits that represent hundreds of feet. For example, flight level 250 represents a barometric altimeter indication of 25,000 feet; flight level 255 represents an indication of 25,500 feet.

Flight Termination—action taken in certain post-launch situations, such as a missile veering off of its predicted flight corridor; accomplished by stopping the propulsive thrust of a rocket motor via explosive charge. At this point, the missile continues along its current path, falling to earth under gravitational influence.

Floodplain—the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands; includes, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year (100-year floodplain).

Flotsam—marine debris floating on the water.

Free Flight—a joint initiative of the aviation industry and the Federal Aviation Administration to allow aircraft to take advantage of advanced satellite voice and data communication to provide faster and more reliable transmission to enable reductions in vertical, lateral, and longitudinal separation of aircraft, more direct flights and tracts, and faster altitude clearance. It will allow pilots, whenever practicable, to choose their own route and file a flight plan that follows the most efficient and economical route, rather than following the published preferred instrument flight rules routes.

Frequent User—a unit that conducts training and exercises in the training areas on a regular basis but does not maintain a permanent presence.

Fugitive Dust—any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man. Fugitive dust may include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is either removed or redistributed.

Ground Hazard Area—the land area contained in an arc within which all debris from a terminated launch will fall. For example, the arc for a Strategic Target System launch is described such that the radius is approximately 10,000 feet to the northeast, 9,100 feet to the east, and 9,000 feet to the south of the launch point. For the Vandal launch, the arc is 6,000 feet.

Groundwater Table—the highest part of the soil or underlying rock material that is wholly saturated with water.

Groundwater—water within the earth that supplies wells and springs; specifically, water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table.

Habitat—the area or type of environment in which a species or ecological community normally occurs.

Harm - An act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. See also Significant Harm.

Hazardous Air Pollutants—other pollutants, in addition to those addressed by the NAAQS, that present the threat of adverse effects to human health or to the environment as covered by Title III of the Clean Air Act. Incorporates, but is not limited to, the pollutants controlled by the National Emissions Standards for Hazardous Air Pollutants program.

Hazardous Material—generally, a substance or mixture of substances capable of either causing or significantly contributing to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; it may pose a threat or a substantial present or potential risk to human health or the environment. Hazardous materials use is regulated by the U.S. Department of Transportation, the Occupational Safety and Health Administration, and the Emergency Right-to-Know Act.

Hazardous Waste—a waste, or combination of wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hertz (Hz)—the standard radio equivalent of frequency in cycles per second of an electromagnetic wave. Kilohertz (kHz) is a frequency of 1,000 cycles per second. Megahertz (MHz) is a frequency of 1 million cycles per second.

High Explosive (HE)—used when describing explosive ordnance, i.e., ordnance typically used in combat or possessing same or similar explosive-filler as combat ordnance; example – 20mm through 2,000LB Mk-80 series HE.

Historic Properties—under the National Historic Preservation Act, these are properties of national, state, or local significance in American history, architecture, archaeology, engineering, or culture, and worthy of preservation

Host—the Facilities Host holds plant account of all Class I (Land) and most Class II (Buildings) property. The Operational Host determines and executes operational policy for the range/range complex.

Hydraulic Conductivity—the rate in gallons per day water flow through a cross section of one square foot under a unit hydraulic gradient, at the prevailing temperature.

Hydrocarbons—any of a vast family of compounds containing hydrogen and carbon, including fossil fuels.

Hydrochloric Acid—a common chemical component of missile exhaust believed to injure plant leaves and affect wildlife.

Hydrology—the science dealing with the properties, distribution, and circulation of water on the face of the land (surface water) and in the soil and underlying rocks (groundwater).

Hydrophone—an instrument for listening to sound transmitted through water.

Impact Area—the identified area within a range intended to capture or contain ammunition, munitions, or explosives and resulting debris, fragments, and components from various weapon system employments.

Impacts (effects)—an assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique. In this Environmental Impact Statement, as well as in the Council on Environmental Quality regulations, the word impact is used synonymously with the word effect.

Indurated—rendered hard, as in dunes where surface sand is loose, but subsurface areas become increasingly compact (see lithified).

Infrastructure—the system of public works of a country, state, or region, such as utilities or communication systems; physical support systems and basic installations needed to operate a particular area or facility.

In-Shore—lying close to the shore or coast.

Instrument Flight Rules (IFR)—rules governing the procedures for conducting instrument flight; it is a term used by pilots and controllers to indicate type of flight plan.

Interdeployment Readiness Cycle—the period by which Naval units progress through maintenance/unit level training, integrated training, and sustainment training stages prior to being deployed with the Fleet to support the gaining CINC.

Intermittent User—a unit that conducts training and exercises in the training areas throughout the year, but not on a regularly scheduled basis, and does not maintain a permanent presence.

International Waters—sea areas beyond 12 nm of the U.S. shoreline.

Intertidal Zone—occupies the space between high and low tide, also referred to as the littoral zone; found closest to the coastal fringe and thus only occurring in shallow depths.

Ionizing Radiation—particles or photons that have sufficient energy to produce direct ionization in their passage through a substance. X-rays, gamma rays, and cosmic rays are forms of ionizing radiation.

Isobath—the line on a marine map or chart joining points of equal depth, usually in fathoms below mean sea level.

Jet Routes—a route designed to serve aircraft operating from 18,000 feet (5,486 meters) up to and including flight level 450, referred to as J routes with numbering to identify the designated route.

Land/Sea Use—the exclusive or prioritized commitment of a land/sea area, and any targets, systems, and facilities therein, to a continuing purpose that could include a grouping of operations, buffer zone, environmental mitigation, etc. The land/sea area may consist of a range/range complex, grouping of similar facilities, or natural resource-based area with no facilities.

Lead—a heavy metal which can accumulate in the body and cause a variety of negative effects; one of the six pollutants for which there is a national ambient air quality standard (see Criteria Pollutants).

Lead-based Paint—paint on surfaces with lead in excess of 1.0 milligram per square centimeter as measured by X-ray fluorescence detector, or 0.5 percent lead by weight.

Leptocephalic—small, elongate, transparent, planktonic.

Level of Service (LOS)—describes operational conditions within a traffic stream and how they are perceived by motorists and/or passengers; a monitor of highway congestion that takes into account the average annual daily traffic, the specified road segment's number of lanes, peak hour volume by direction, and the estimated peak hour capacity by a roadway's functional classification, area type, and signal spacing.

Lithified—the conversion of newly deposited sediment into an indurated rock.

Littoral—species found in tide pools and near-shore surge channels.

Loam—a loose soil composed of a mixture of clay, silt, sand, and organic matter.

Long-Term Sustainability of Department of Defense Ranges—the ability to indefinitely support national security objectives and the operational readiness of the Armed Forces, while still protecting human health and the environment.

Major Exercise—a significant operational employment of live, virtual, and/or constructive forces during which live training is accomplished. A Major Exercise includes multiple training objectives, usually occurring over an extended period of days or weeks. An exercise can have multiple training operations (sub-events each with its own mission, objective and time period. Examples include C2X, JTFEX, SACEX, and CAX. Events (JTFEX) are composed of specific operations (e.g., Air-to-Air Missile), which consist of individual activities (e.g., missile launch).

Maneuver Area—range used for maneuver element training.

Maneuver Element—basic element of a larger force independently capable of maneuver. Normally, a Marine Division recognizes its infantry battalions, tank battalion, and light armored reconnaissance (LAR) battalion as maneuver elements. A rifle (or tank/LAR) battalion would recognize its companies as maneuver elements. A rifle (or tank/LAR) company would recognize its platoons as maneuver elements. Maneuver below the platoon level is not normally possible since fire and movement can be combined only at the platoon level or higher. The Army and National Guard recognize a squad and platoon as maneuver elements.

Maneuver—employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage with respect to the enemy in order to accomplish the mission.

Marine Corps Ground Unit—Marine Expeditionary Unit Ground Combat Element, or Battalion Landing Team, composed of an infantry battalion of about 1,200 personnel reinforced with artillery, amphibious assault vehicles, light armored reconnaissance assets and other units as the mission and circumstances require. (The analysis will scale units of different size or composition from this Battalion Landing Team standard unit to include a 12-man Special Operations platoon.)

Maritime—of, relating to, or bordering on the sea.

Material Safety Data Sheet—presents information, required under Occupational Safety and Health Act standards, on a chemical's physical properties, health effects, and use precautions.

Medical Evacuation—emergency services, typically aerial, designed to remove the wounded or severely ill to medical facilities.

Mesopelagic—the oceanic zone from 109 to 547 fathoms (656 to 3,280 feet).

Migration—repeated departure and return of individuals and their offspring to and from an area.

Migratory Birds—birds characterized by their practice of passing, usually periodically, from one region or climate to another.

Military Expended Material (MEM)—For the purpose of this policy, refers to those munitions, items, devices, equipment and materials which are uniquely military in nature, and are used and expended in the conduct of the military training and testing mission, such as: sonobuoys, flares, chaff, drones, targets, bathymetry measuring devices and other instrumentation, communications devices, and items used as training substitutes. This definition may also include materials expended (such as propellants, weights, guidance wires) from items typically recovered, such as aerial target drones and practice torpedoes.

Military Expended Material Constituent (MEMC)—Any constituent released into the environment from the use of MEM. This definition also includes constituents from explosive and non-explosive materials and the emission, degradation, or breakdown products from such MEM.

Military Operating Area—airspace below 18,000 feet used to separate or segregate certain non-hazardous military flight activities from Instrument Flight Rules traffic and to identify for Visual Flight Rules traffic where these activities are conducted.

Military Training Route—an airspace corridor established for military flight training at airspeeds in excess of 250 nautical miles/hour.

Minority—minority populations, as reported by the 2000 Census of Population and Housing, includes Black, American Indian, Eskimo or Aleut, Asian or Pacific Islander, Hispanic, or other.

Mitigation—a method or action to reduce or eliminate adverse environmental impacts. Such measures may avoid impacts by not taking a certain action or parts of an action; minimize impacts by limiting the magnitude of an action; rectify impacts by restoration measures; reduce or eliminate impacts over time by preservation or maintenance measures during the action; or compensate for impacts by replacing or providing substitute resources or environments.

Mobile Sources—any movable source that emits any regulated air pollutant.

Mortality—the number of deaths in a given time or place.

Munitions Constituents—any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

National Airspace System—the common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components shared jointly with the military.

National Ambient Air Quality Standards (NAAQS)—as set by the Environmental Protection Agency under Section 109 of the Clean Air Act, nationwide standards for limiting concentrations of certain widespread airborne pollutants to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility and materials (secondary standards). Currently, six pollutants are regulated by primary and secondary NAAQS: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide (see Criteria Pollutants).

National Environmental Policy Act (NEPA)—Public Law 91-190, passed by Congress in 1969. The Act established a national policy designed to encourage consideration of the influences of human activities, such as population growth, high-density urbanization, or industrial development, on the natural environment. The National Environmental Policy Act procedures require that environmental information be made available to the public before decisions are made. Information contained in the National Environmental Policy Act documents must focus on the relevant issues in order to facilitate the decision-making process.

National Register of Historic Places Eligible Property—property that has been determined eligible for the National Register of Historic Places listing by the Secretary of the Interior, or one that has not yet gone through the formal eligibility determination process but which meets the National Register of Historic Places criteria for section review purposes; eligible properties are treated as if they were already listed.

National Register of Historic Places—a register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior under authority of Section 2 (b) of the Historic Sites Act of 1935 and Section 101 (a)(1) of the National Historic Preservation Act of 1966, as amended.

National Wildlife Refuge—a part of the national network of refuges and wetlands managed by the U.S. Fish and Wildlife Service in order to provide, preserve, and restore lands and waters sufficient in size, diversity and location to meet society's needs for areas where the widest possible spectrum of benefits associated with wildlife and wildlands is enhanced and made available. This includes 504 wildlife refuges nationwide encompassing 92 million acres and ranging in size from one-half acre to thousands of square miles. Dedicated to protecting wildlife and their habitat, U.S. refuges encompass numerous ecosystems and are home to a wide variety of fauna, including large numbers of migratory birds and some 215 threatened or endangered species.

Native Americans—used in a collective sense to refer to individuals, bands, or tribes who trace their ancestry to indigenous populations of North America prior to Euro-American contact.

Native Species—plants or animals living or growing naturally in a given region and often referred to as indigenous.

Native Vegetation—often referred to as indigenous, these are plants living or growing naturally in a given region without agricultural or cultivational efforts.

Navigational Aid—any visual or electronic device, airborne or on the surface, which provides point-to-point guidance information or position data to aircraft in flight.

Near-Shore—an indefinite zone that extends seaward from the shoreline.

Neritic—relating to the shallow ocean waters, usually no deeper than 109 fathoms (656 feet).

Nitrogen Dioxide—gas formed primarily from atmospheric nitrogen and oxygen when combustion takes place at high temperatures.

Nitrogen Oxides—gases formed primarily by fuel combustion and which contribute to the formation of acid rain. In the presence of sunlight, hydrocarbons and nitrogen oxides combine to form ozone, a major constituent of photochemical smog.

Nonattainment Area—an area that has been designated by the U.S. Environmental Protection Agency or the appropriate state air quality agency as exceeding one or more of the national or state ambient air quality standards.

Non-directional Radio Beacon—a radio beacon transmitting non-directional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine the aircraft's bearing to or from the radio beacon and "home" on or track to or from the station.

Non-explosive, Practice Munitions (NEPM)—used when describing most common types of practice ordnance. However, non-explosive, practice munitions may contain spotting charges or signal cartridges for impact locating purposes (smoke charges for daylight spotting, flash charges for night spotting); example - MK-76, BDU-45. Some non-explosive, practice munitions may also contain unburned propellant (such as rockets).

Non-ionizing Radiation—electromagnetic radiation at wavelengths whose corresponding photon energy is not high enough to ionize an absorbing molecule. All radio frequency, infrared, visible, and near ultraviolet radiation are non-ionizing.

Non-Point Source Pollution—diffuse pollution; that is, from a combination of sources; typically originates from rain and melted snow flowing over the land (runoff). As runoff contacts the land's surface, it picks up many pollutants in its path: sediment, oil and grease, road salt, fertilizers, pesticides, nutrients, toxics, and other contaminants. Runoff also originates from irrigation water used in agriculture and on landscapes. Other types of non-point pollution include changes to the natural flow of water in stream channels or wetlands.

Notice to Airmen (NOTAM)—a notice containing information, not known sufficiently in advance to publicize by other means, the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System), the timely knowledge of which is essential to personnel concerned with flight operations.

Notice to Mariners (NOTMAR)—a periodic notice regarding changes in aids to navigation, dangers to navigation and other information essential to mariners.

Off-Shore—open-ocean waters over the continental slope which are deeper than 200 meters, beyond the continental shelf break.

Operating Area (OPAREA)—ocean area not part of a range used by military personnel or equipment for training and weapons system Research, Development, Test & Evaluation (RDT&E).

Operation—A combination of activities accomplished together for a scheduled period of time for an intended military mission or task. An operation can range in size from a single unit exercise to a Joint or Combined event with many participants (e.g., aircraft, ships, submarines, troops).

Operational Range—a range that is under the jurisdiction, custody, or control of the Secretary of Defense and is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.

Ordnance—military supplies including weapons, ammunition, combat vehicles, and maintenance equipment.

OTTO Fuel—a torpedo fuel.

Ozone (O_3)—a highly reactive form of oxygen that is the predominant component of photochemical smog and an irritating agent to the respiratory system. Ozone is not emitted directly into the atmosphere but results from a series of chemical reactions between oxidant precursors (nitrogen oxides and volatile organic compounds) in the presence of sunlight.

Ozone Layer—a naturally occurring layer of ozone 7 to 30 miles above the earth's surface (in the stratosphere) which filters out the sun's harmful ultraviolet radiation. It is not affected by photochemical smog found in the lower atmosphere, nor is there any mixing between ground level ozone and ozone in the upper atmosphere.

Paleontological Resources—fossilized organic remains from past geological periods.

Paleontology—the study of life in the past geologic time, based on fossil plants and animals.

Parabasal water—freshwater that flows directly on the impermeable volcanic basement rock.

Participant—an individual ship, aircraft, submarine, amphibious vehicle, or ground unit.

Particulate Matter, Fine Respirable—finely divided solids or liquids less than 10 microns in diameter which, when inhaled, remain lodged in the lungs and contribute to adverse health effects.

Particulate Matter, Total Suspended—finely divided solids or liquids ranging from about 0.1 to 50 microns in diameter which comprise the bulk of the particulate matter mass in the atmosphere.

Particulate Matter—particles small enough to be airborne, such as dust or smoke (see Criteria Pollutants).

Payload—any non-nuclear and possibly propulsive object or objects, weighing up to 272.2 kilograms (600 pounds), which are carried above the Strategic Target System third stage.

Pelagic Zone—commonly referred to as the open ocean.

Pelagic—of the ocean waters.

Peninsula—a portion of land nearly surrounded by water and generally connected with a larger body by an isthmus, although the isthmus is not always well defined.

Per Capita—per unit of population; by or for each person.

Permeability—a quality that enables water to penetrate.

Pesticide—any substance, organic, or inorganic, used to destroy or inhibit the action of plant or animal pests; the term thus includes insecticides, herbicides, fungicides, rodenticides, miticides, fumigants, and repellents. All pesticides are toxic to humans to a greater or lesser degree. Pesticides vary in biodegradability.

pH—a measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity.

Photosynthesis—the plant process by which water and carbon dioxide are used to manufacture energy-rich organic compounds in the presence of chlorophyll and energy from sunlight.

Physiography—geography dealing with the exterior physical features and changes of the earth (also known as physical geography).

Phytoplankton—plant-like organisms that drift with the ocean currents, with little ability to move through the water on their own. Predominately one-celled, phytoplankton float in the photic zone (sunlit surface waters of the ocean, which extends to only about 100 meters (330 feet) below the surface), where they obtain sunlight and nutrients, and serve as food for zooplankton and certain larger marine animals.

Pinniped—having finlike feet or flippers, such as a seal or walrus.

Plankton—free-floating, usually minute, organisms of the sea; includes larvae of benthic species.

Pliocene—of, relating to, or being the latest epoch of the Tertiary Period or the corresponding system of rocks; following the Pleistocene and prior to the Miocene.

PM-2.5 and PM-10—standards for measuring the amount of solid or liquid matter suspended in the atmosphere; refers to the amount of particulate matter less than or equal to 2.5 and 10 micrometers in diameter, respectively. The PM-2.5 and PM-10 particles penetrate to the deeper portions of the lungs, affecting sensitive population groups such as children and people with respiratory or cardiac diseases.

Point Source—a distinct and identifiable source, such as a sewer or industrial outfall pipe, from which a pollutant is discharged.

Population Density—the average number of individuals or organisms per unit of space or area.

Potable Water—water that is safe to drink.

Prehistoric—literally, "before history," or before the advent of written records. In the old world writing first occurred about 5400 years ago (the Sumerians). Generally, in North America and the Pacific region, the prehistoric era ended when European explorers and mariners made written accounts of what they encountered. This time will vary from place to place.

Prohibited Area—designated airspace where aircraft are prohibited, except by special permission. Can also apply to surface craft.

Radar—a radio device or system for locating an object by means of radio waves reflected from the object and received, observed, and analyzed by the receiving part of the device in such a way that characteristics (such as distance and direction) of the object may be determined.

Range—a land or sea area designated and equipped for any or all of the following reasons:

Range Activity—an individual training or test function performed on a range or in an Operating Area. Examples include missile launching, bombardment, and vehicle driving. Individual RDT&E functions are also included in this category.

Range Complex—a geographically integrated set of ranges, operational areas, and associated special use airspace, designated and equipped with a command and control system and supporting infrastructure for freedom of maneuver and practice in munitions firing and live ordnance use against scored and/or tactical targets and/or Electronic Warfare tactical combat training environment.

Range Operation—a live training exercise, RDT&E test, or field maneuver conducted for a specific strategic, operational or tactical military mission, or task. A military action. Operations may occur independently, or multiple operations may be accomplished as part of a larger event. One operation consists of a combination of activities accomplished together. The type of operation can include air, land, sea, and undersea warfare training or testing. Participants can include a specific number and type of aircraft, ships, submarines, amphibious or other vehicles and personnel. Ordnance broadly encompasses all weapons, missiles, shells, and expendables (chaff and flares). An individual operation occurs over a given geographic footprint for a scheduled period of time. An example is a Mining Operation. Each Mining Operation is discrete and relatively short in duration, but it may be combined with other operations in a single, larger exercise, like a JTFEX, which lasts for several days or weeks.

Range Safety Zone—area around air-to-ground ranges designed to provide safety of flight and personnel safety relative to dropped ordnance and crash sites. Land use restrictions can vary depending on the degree of safety hazard, usually decreasing in magnitude from the weapons impact area (including potential ricochet) to the area of armed over flight and aircraft maneuvering.

Readiness—the ability of forces, units, weapon systems, or equipment to deliver the outputs for which they were designed (includes the ability to deploy and employ without unacceptable delays).

Region of Influence—the geographical region that would be expected to be affected in some way by the Proposed Action and alternatives.

Relative Humidity—the ratio of the amount of water vapor actually present in the air to the greatest amount possible at the same temperature.

Relief—the difference in elevation between the tops of hills and the bottoms of valleys.

Remediation—all necessary actions to investigate and clean up any known or suspected discharge or threatened discharge of contaminants, including without limitation: preliminary assessment, site investigations, remedial investigations, remedial alternative analyses and remedial actions.

Restricted Area—a designated airspace in which flights are prohibited during published periods of use unless permission is obtained from the controlling authority.

Runoff—the portion of precipitation on land that ultimately reaches streams, often with dissolved or suspended materials.

Safety Zone—administratively designated/implied areas designated to limit hazards to personnel and the public, and resolve conflicts between operations. Can include range safety zones, ESQDS, surface danger zones, special use airspace, HERO/HERP areas, etc.

Saline—consisting of or containing salt.

Sampling—the selection of a portion of a study area or population, the analysis of which is intended to permit generalization of the entire population. In archaeology, samples are often used to reduce the amount of land area covered in a survey or the number of artifacts analyzed from a site. Statistical sampling is generally preferred since it is possible to specify the bias or probability of error in the results, but judgmental or intuitive samples are sometimes used.

Scoping—a process initiated early during preparation of an Environmental Impact Statement to identify the scope of issues to be addressed, including the significant issues related to the Proposed Action. During scoping, input is solicited from affected agencies as well as the interested public.

Seamount—a peaked, underwater mountain that rises at least 3,281 feet above the ocean floor.

Seawall—a wall or embankment to protect the shore from erosion or to act as a breakwater.

Security Zone—area where public or non-operational support access is prohibited due to training operations of a classified or hazardous nature.

Sensitive Habitats—areas of special importance to regional wildlife populations or protected species that have other important biological characteristics (for example, wintering habitats, nesting areas, and wetlands).

Sensitive Receptor—an organism or population of organisms sensitive to alterations of some environmental factor (such as air quality or sound waves) that undergo specific effects when exposed to such alteration.

Short-Term Public Exposure Guidance Level—an acceptable concentration for unpredicted, single, short-term, emergency exposure of the general public, as published by the National Research Council.

Significant harm— Use in NEPA requires consideration of both context and intensity (40 CFR 1508.27): Context - significance of an action must be analyzed in its current and proposed short-and long-term effects on the whole of a given resource (e.g.-affected region) Intensity – Refers to the severity of the effect. **Harm** - An act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Site—in archaeology, any location where human beings have altered the terrain or have discarded artifacts.

Solid Waste—municipal waste products and construction and demolition materials; includes non-recyclable materials with the exception of yard waste.

Sonobuoy—hydrophones, or floating sensors, which acoustically score bomb drops during a training exercise from the sound where a bomb impacts the surface of the ocean.

Sortie—a single operational training or RDT&E event conducted by one aircraft tin a range or operating area. A single aircraft sortie is one complete flight (i.e., one take-off and one final landing).

Special Use Airspace—consists of several types of airspace used by the military to meet its particular needs. Special use airspace consists of that airspace wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of these activities, or both. Special use airspace, except for Control Firing Areas, are chartered on instrument flight rules or visual flight rules charts and include hours of operation, altitudes, and the controlling agency.

Species—a taxonomic category ranking immediately below a genus and including closely related, morphologically similar individuals which actually or potentially interbreed.

Specific Absorption Rate—the time rate at which radio frequency energy is absorbed per unit mass of material, usually measured in watts per kilogram (W/kg).

Stakeholder—those people or organizations that are affected by or have the ability to influence the outcome of an issue. In general this includes regulators, the regulated entity, and the public. It also includes those individuals who meet the above criteria and do not have a formal or statutorily defined decision-making role.

State Historic Preservation Officer (SHPO)—the official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the National Historic Preservation Act.

State Jurisdictional Waters—sea areas within 3 nm of a state's continental and island shoreline.

Stationary Source—any building, structure, facility, installation, or other fixed source that emits any regulated air pollutant.

Stormwater—runoff produced during storms, generally diverted by rain spouts and stormwater sewerage systems. Stormwater has the potential to be polluted by such sources as yard trimmings and pesticides. A stormwater outfall refers to the mouth of a drain or sewer that channels this runoff.

Subsistence Economy—a community, usually based on farming and/or fishing, that provides all or most of the basic goods required by its members for survival, usually without any significant surplus for sale.

Subsistence—the traditional harvesting of natural resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade.

Subspecies—a geographically defined grouping of local populations which differs taxonomically from similar subdivisions of species.

Substrate—the layer of soil beneath the surface soil; the base upon which an organism lives.

Substantially—relating to, or having substance. Being of considerable importance.

Sulfur Dioxide—a toxic gas that is produced when fossil fuels, such as coal and oil, are burned.

Sustainable Range Management—management of an operational range in a manner that supports national security objectives, maintains the operational readiness of the Armed Forces, and ensures the long-term viability of operational ranges while protecting human health and the environment.

Sustaining the Capability—maintaining necessary skills, readiness and abilities.

Symbiotic—living in or on the host.

System of Systems—all communications, electronic warfare, instrumentation, and systems linkage supporting the range/range complex.

Taking—to harass, harm, pursue, hunt, shout, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Taking can involve harming the habitat of an endangered species.

Targets—earthwork, materials, actual or simulated weapons platforms (tanks, aircraft, EW systems, vehicles, ships, etc.) comprising tactical target scenarios within the range/range complex impact areas. Could also include SEPTAR, AQM, BQM, MQM, etc.

Tenant—a unit that has an Inter-Service Support Agreement with the host for use of the training areas and that maintains a permanent presence.

Thermocline—a thin, narrow region in a thermally stratified body of water which separates warmer, oxygen-rich surface water from cold, oxygen-poor deep water and in which temperature decreases rapidly with depth. In tropical latitudes, the thermocline is present as a permanent feature and is located 200 to 1,000 feet below the surface.

Threatened Species—a plant or animal species likely to become endangered in the foreseeable future.

Topography—the configuration of a surface including its relief and the position of its natural and man-made features.

Traditional Resources—prehistoric sites and artifacts, historic areas of occupation and events, historic and contemporary sacred areas, material used to produce implements and sacred objects, hunting and gathering areas, and other botanical, biological, and geographical resources of importance to contemporary groups.

Transient—remaining a short time in a particular area.

Troposphere—the atmosphere from ground level to an altitude of 6.2 to 9.3 miles (see stratosphere).

Turbid—the condition of being thick, cloudy, or opaque as if with roiled sediment; muddy.

Uncontrolled Airspace—airspace of defined dimensions in which no air traffic control services to either instrument flight rules or visual flight rules aircraft will be provided, other than possible traffic advisories when the air traffic control workload permits and radio communications can be established.

Understory—a vegetal layer growing near the ground and beneath the canopy of a taller layer.

Unique and Sensitive Habitats—areas of special importance to regional wildlife populations or protected species that have other important biological characteristics (for example, wintering habitats, nesting areas, and wetlands).

Upland—an area of land of higher elevation.

Upwelling—the replenishing process of upward movement to the surface of marine often nutrient-rich lower waters (a boon to plankton growth), especially along some shores due to the offshore drift of surface water as from the action of winds and the Coriolis force.

U.S. Territorial Waters—sea areas within 12 nm of the U.S. continental and island shoreline.

Viewshed—total area seen within the cone of vision from a single observer position, or vantage point; a collection of viewpoints with optimal linear paths of visibility.

Vista—a distant view through or along an avenue or opening.

Visual Flight Rules (VFR)—rules that govern the procedures for conducting flight under visual conditions; used by pilots and controllers to indicate type of flight plan.

Vessel Days – vessel days are computed as the number of steaming days per year by summing the number of steaming hours proposed in the range complex, dividing by 24 hours per day, and rounding to the nearest 10 days.

Volatile Organic Compound (VOC)—one of a group of chemicals that react in the atmosphere with nitrogen oxides in the presence of heat and sunlight to form ozone; it does not include methane and other compounds determined by the Environmental Protection Agency to have negligible photochemical reactivity. Examples of volatile organic compounds include gasoline fumes and oil-based paints.

Warning Area—a designated airspace in which flights are not restricted but avoidance is advised during published times of use.

Wastewater—water that has been previously utilized; sewage.

Wetlands—lands or areas that either contain much soil moisture or are inundated by surface or groundwater with a frequency sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include such areas as bogs, marshes, mud and tidal flats, sloughs, river overflows, seeps, springs, or swamps.

Yearly Average Day-Night Sound Level (DNL or L_{dn})—utilized in evaluating long-term environmental impacts from noise, this is an annual mean of the day-night sound level.

Zoning—the division of a municipality (or county) into districts for the purpose of regulating land use, types of buildings, required yards, necessary off-street parking, and other prerequisites to development. Zones are generally shown on a map, and the text of the zoning ordinance specifies requirements for each zoning category.

Zooplankton—animals that drift with the ocean currents, with little ability to move through the water on their own, ranging from one-celled organisms to jellyfish up to 1.8 meters (6 feet) wide. Zooplankton live in both surface and deep waters of the ocean; crustaceans make up about 70 percent. While some float about freely throughout their lives, many spend only the early part of their lives as plankton.

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CNMI Resident Representative
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Coral Reef Marine Center
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Tamuning GU 96911

Earth Justice
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Earth Justice National Headquarters
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426 17th Street, 6th Floor
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Fleet Reserve Association
Director
National Headquarters 125 N. West Street
Alexandria VA 22314-2754

Governor's Civilian-Military Taskforce
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430 Route 16 Bldg. 300 Rm 113
Barrigada GU 96913

Guam Contractor's Association
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East West Business Center
Upper Tumon GU 96913

Guam Diving Industry Association (GIDA)
John Bent , President
275 C Farenholt Ave. Suite 163
Tamuning GU 96931

Guam Fisherman's Co-op
Mike Duenas, General Manager
Greg D. Perez Marina
Hagatna GU 96910

I Nasion Chamorro
Ben Garrido
Maga Haga
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Merizo GU 96916

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Washington DC 20001

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Sapan MP 96950

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406 Mai Mai Rd.
Chala Pago GU 96910

Micronesian Diving Association (MDA)
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Piti GU 96915

Natural Resource Defense Council
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1314 Second Street
Santa Monica CA 90401

Natural Resources Defense Council
Regional Office
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San Francisco CA 94104

Navy League
Director
National Headquarters 2300 Wilson Blvd., Suite 200
Arlington VA 22201-3308

Pacific Concerns Resource Center
Director
Private Mail Bag
Suva Fiji Islands

Rotary Club of Guam
Dianne Keller
President
Attn: Rotary Club of Guam, 202 Hilton Road
Tumon Bay GU 96913

Rotary Club of Northern Guam
Steffen Niu
President
R.I. District 2750 P.O. Box 21542
GMF GU 96921

Sierra Club
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85 Second Street, 2nd Floor
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The Nature Conservancy, FSM Program Office
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Executive Director
P.O. Box 216 Kolonia
Pohnpei FSM 96941

The Nature Conservancy, Micronesia Program
Trina Leberer
Executive Director
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Hagatna GU 96932

Veterans of Foreign Wars
Director
National Headquarters 406 West 34th Street
Kansas City MO 64111

Women's Working Group
c/o Senator Won Pat's Office
Director
Payless Corporate Office Bldg. 116 Chalan Santo Papa
Hagatna GU 96910

Community and Business Organizations

A.B. Won Pat International Airport, Guam
Jess Q. Torres, Executive Manager
355 Chalan Pasaheru
Tamuning GU 96913

Alupang Beach Club Inc, (Parasailing Operation)
Kazu Aoki, General Manager
997A Marine Dr.
Tamuning GU 96931

Aqua World Marina
Bree McDowell, General Manager
198 Adrian Sanchez St
Harmon GU 96913

Atlantis Submarines
Bo Baba, General Manager
756 S. Marine Corps Dr. Suite 201
Tamuning GU 96913

Bailan Tasi Windsurfing
Cathy Moore-Linn, President
P.O. Box 3643
Hagåtña GU 96911

Cabras Marine Corp. (Commercial Harbor Pilots)
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1026 Cabras Hwy, Suite 114
Piti GU 96915

Guam Chamber of Commerce
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Guam Contractors Association
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Guam Lagoon Scuba Diving
Booken Oh, Manager
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Guam Sailing Federation
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Hagåtña GU 96932

Guam Tropical Dive Station (GTDS)
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Tamuning GU 96931

Marianas Yacht Club
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Ocean Jet Club
Keiko Tran, Manager
Marine Dr.
Hagåtña GU 96932

Real World Diving
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Piti GU 96925

Scuba Company
Rick Tuncap, President
PO Box 11901
Tamuning GU 96931

CNMI Department of Lands and Natural Resources
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Market Manager
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Saipan MP 96950

Saipan Chamber of Commerce
Board of Directors
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Saipan MP 96950

Saipan Chamber of Commerce
Jim Arenovski, President

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Saipan MP 96950

Helber Hastert & Fee
Faith Caplan
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Honolulu HI 96813

Honolulu Japanese Chamber of Commerce
Director
1132 Bishop Street, Suite 402
Honolulu HI 96826

Japanese Chamber of Commerce &
Industry of Hawaii
Director
2454 South Beretania Street, Suite 201
Honolulu HI 96826

Okinawan Chamber of Commerce of
Hawaii aka WUB Hawaii
Director
2454 S. Berentania St., Ste. 201
Honolulu HI 96825

The Chamber of Commerce of Hawaii
Director
400 Hualani St., Ste. 20B
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Media

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P.O. Box 3191
Hagåtña GU 96932

Marianas Variety Guam
Amier Younis, Editor
215 Rojas St., Ste. 101
Harmon GU 96913

Pacific Daily News
Gaynor Daleno
Business Editor
P.O. Box DN
Hagåtña GU 96932

Pacific Daily News, Guam Publications Inc.
Lee Webber, Publisher
P.O. Box DN
Hagåtña GU 96910

Marianas Variety
Zaldy Dandan, Editor
P.O. Box 231
Saipan MP 96950

Saipan Tribune
Marconi Calindas, Reporter
PMB 34 Box 1001
Saipan MP 96950

Associated Press
Dave Briscoe, Bureau Chief
500 Ala Moana Blvd. #590
Honolulu HI 96813

Hawaii Tribune Herald
David Bock, Editor
P.O. Box 767
Hilo HI 96721

Honolulu Advertiser
Fernando Pizarro, City Editor
605 Kapiolani Blvd.
Honolulu HI 96813

Honolulu Star-Bulletin
Ed Lynch, City Editor
7 Waterfront Plaza, 500 Ala Moana Blvd. Suite 500
Honolulu HI 96813

Maui News
David Hoff, Editor
100 Mahalani Street
Wailuku HI 96793

Pacific Business News
Jim Kelly, Editor
1833 Kalakaua Ave.
Honolulu HI 96815

Isla 61 and Classic 94 FM
Micronesian Broadcasting Corp.
Joseph Calvo, General Manager
P.O. Box 368
Hagåtña GU 96910

KOKU FM, Western Systems Inc.
Roland Franquez, General Manager
530 West O'Brien Dr.
Hagåtña GU 96910

Newstalk 57AM, Sorenson Pacific Broadcasting Inc.
Patti Arroyo
News Director
P.O. Box GM
Hagåtña GU 96910

IBB Voice of America Tinian
Director
330 Independence Ave
Washington DC 20237

Information Repositories

University of Guam Robert F. Kennedy Memorial
Library, Government Documents
Suzanne Bell
Librarian
Tan Siu Lin Building, UOG Station
Mangilao GU 96923

Rota Public Library
c/o Mayor Joseph S. Inos
Village of Rota
P.O. Box 537
Rota, MP 96951

Joeten-Kiyu Public Library
Kevin Latham
State Library Director
P.O. Box 501092
Saipan MP 96950

Northern Marianas College Public Library
Librarian
P.O. Box 459
Tinian MP 96952

Individuals

Aguilar, Margaret
Dedido, GU

Aloaig-Leon Guerrero, Machelle
Hagatna, GU

Anderson, Jon A.
Saipan, MP

Aniti, Maya
Mangilao, GU

Aranza, Ed
GMF, Barrigada, GU

Bearden, Brian
Saipan, MP

Benavent, Robert L.G.
Hagatna, GU

Benavente, Eddie
Hagatna, GU

Bilmemghan-Balanti, Sami
Saipan, MP

Blackburn, Mark
Saipan, MP

Blanco0Maratita, Lucy
Tinian, MP

Bordallo, Miguel
Hagatna, GU

Borja, Vicente H.
Tinian, MP

Borja, Nazarid
Tinian, MP

Brewster, Larry
Tinian, MP

Brown, Val
Mangilao, GU

Caras, Gemma
Saipan, MP

Caresoy, Bernadette
Tinian, MP

Charfaures, Joey C.
Tinian, MP

Coleman, Ruth
Saipan, MP

Creachbaum, Sarah
Hagatna, GU

Dell'Isola, Elaine
Hagatna, GU

Denney, Peggy
Barrigada, GU

Donato, Agnes E.
Saipan, MP

Ebmeus, Moises
Tinian, MP

El-Rali, Michel
Saipan, MP

Farrell, Don
Tinian, MP

Fejeron, Tom
Barrigada, GU

Fleming, Zania
Tinian, MP

Franquez, R.
Hagatna, GU

Gamatrotao, Bea
Hagatna, GU

Guerrero, Robert
Saipan, MP

Hechanova, Thelma
Hagatna, GU

Hernandez, Jacq
Saipan, MP

Hocoy, Lary
Saipan, MP

Hoftclmeina, Ed
Tinian, MP

Jackson, Danny
Barrigada, GU

Jackson, Josephine
Barrigada, GU

Jackson, Kili
Tinian, MP

Johnson, Nathan
Hagatna, GU

Joyner, John B.
Saipan, MP

Kaipat, Cinta
Saipan, MP

Kaipat, Gus
Saipan, MP

Kalojian, Harout
Saipan, MP

King, Vince
Tinian, MP

Kuy, Ta Bun
Saipan, MP

Leberer, Trina
Hagatna, GU

Leon Guerrero, Carlotta
Hagatna, GU

Liu, Tom
Tinian, MP

Loan, David
Saipan, MP

Lya, Evangeline
Hagatna, GU

Malore, Mike
Saipan, MP

McKagan, Steve
Saipan, MP

Mendiola, Joe
Tinian, MP

Mendiola-Long, Phillip
Tinian, MP

Olopai, Linto M.
Saipan, MP

Pagut, Matao
Barrigada, GU

Pangelinan, Manny
Saipan, MP

Paulino, Herman
Santa Rita, GU

Penaranda, Mark
Saipan, MP

Perez, Jose S.
Tamuning, GU

Quicheche, Ray
Saipan, MP

Quitugua
Rota, MP

Quinata, Debbie
Merizo, GU

Rabauliman, Amada
Saipan, MP

Reyes, Antonio L.G.
Saipan, MP

Roberto, J. Peter
Hagatna, GU

Roberto, Phil
Hagatna, GU

Sablan, Antonio
Sinajana, GU

Sablan, Patria U.
Sinajana, GU

Sablow, Roy
Saipan, MP

Sager, Randy G.
Tamuning, GU

Santos, Eugene
Hagatna, GU

Sarden, Rogelio A.
Tamuning, GU

Satallg, Joagui
Saipan, MP

Scott, John
Yona, GU

Sirok, Jim
Saipan, MP

Skvaril, Cerila P.
Nimitz Hill, GU

Smith, Ron
Saipan, MP

Taitingfong, AbuRose
Barrigada, GU

Tighe, Ruth
Saipan, MP

Torres, Trini
Barrigada, GU

Torres, Victor R.
Hagatna, GU

Trianni, Mike
Saipan, MP

Villagomez, Angelo
Saipan, MP

Villazon, Alex
Saipan, MP

Waki, Absalon
Saipan, MP

Wedding, James M.
Tinian, MP

Wyttenbach-Santos, Richard
Mangilao, GU

Youns, Pg
Saipan, MP

Yus, Alfred
Tinian, MP

Zak, Paul
Saipan, MP

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Saipan, MP

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CHAPTER 11 COMMENTS AND RESPONSES—DRAFT EIS/OEIS

This chapter presents responses to comments received on the Mariana Islands Range Complex (MIRC) Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) (January 2009) during the public comment period for the document. Section 11.1 provides an overview of the Public Involvement process, Section 11.2 is a summary of comments received (Table 11-6), and Section 11.3 is a summary of responses. Section 11.4 contains copies of all the comments received, and summary tables summarizing the comments and the responses.

11.1 PUBLIC INVOLVEMENT PROCESS

11.1.1 Public Scoping Process

The MIRC EIS/OEIS public involvement process began with the publishing of a Notice of Intent (NOI) to prepare an EIS. The NOI initiated a public scoping period, and was published in the *Federal Register* on June 1, 2007. The NOI was published in two local newspapers: the *Pacific Daily News* (Guam) on June 4, 16, 17, and 18, 2007 and the *Saipan Tribune* (Saipan/Tinian) on June 4, 19, 20, and 21, 2007. The scoping period lasted 45 days, concluding on July 16, 2007. Three scoping meetings were held on June 20, 21, and 22, 2007, one on each of the islands of Guam, Saipan, and Tinian. Table 1-1 lists the location, date, and number of attendees at the scoping meetings.

The scoping meetings were held in an open house format, presenting informational posters, a video showing an overview of MIRC, written information and Services project experts available to answer participants' questions. A tape recorder was available to record participants' oral comments and a Services staff representative was available to transcribe oral comments using a laptop computer. The interaction during the information sessions was productive and helpful to the Services. Comments received during scoping were used to help determine the breadth of issues analyzed in the Draft EIS/OEIS.

In addition to the scoping meetings, the public could make comments by sending an email or by mailing a written comment. Issues identified by the public were provided to resource specialists working on the Draft EIS/OEIS to ensure that all comments were considered during the preparation of the document. Table 1-2 presents a summary of the number of issues identified for each resource during scoping.

11.1.2 Public Review Process

After scoping, a Draft EIS/OEIS was prepared to assess the potential effects of the Proposed Action and Alternatives on the environment. The Draft EIS/OEIS was then provided to the U.S. Environmental Protection Agency (EPA) for review and to have a Notice of Availability (NOA) published in the *Federal Register*. EPA published a combined NOA/NOPH (Notice of Public Hearing) for the MIRC Draft EIS/OEIS in the *Federal Register* on Friday, January 30, 2009. The Department of Defense (DoD) Representative Guam, Commonwealth of the Northern Mariana Islands (CNMI), Federated States of Micronesia, and Republic of Palau (DoD REP) also placed a combined NOA/NOPH in both the *Pacific Daily News* and the *Saipan Tribune*, and in an additional newspaper, the *Daily Marianas Variety* (Guam, Saipan, Tinian, Rota, Federated States of Micronesia [FSM]).

Copies of the Draft EIS/OEIS were distributed to various agencies, elected officials, Chambers of Commerce, individuals who provided comments during the scoping period, and libraries. A detailed listing of the distribution list is in Chapter 10. A cover letter accompanying the Draft EIS/OEIS informed stakeholders that the Draft EIS/OEIS was also available on the MIRC project website: http://www.MarianasRangeComplexEIS.com, and informed the stakeholders of the dates, locations, and times for the public hearings on the Draft EIS/OEIS. A notification postcard was sent to the entire mailing list which included community members, elected officials, agency staff and individuals who signed up at the scoping meetings. The postcard included public hearing information. Fliers announcing the public hearings were sent to five locations (post offices, libraries, Chambers of Commerce) on Guam and three

locations each on Saipan, Tinian, and Rota (See Table 11-1). The Commander, Naval Forces Marianas (COMNAVMAR) Public Affairs Officer (PAO) also provided a press release announcing the public hearings on February 2, 9, and 16, 2009 to local media outlets (TV, print, associated press, radio, and individual reporters). A second news release announcing the completion of the public hearings and comment period deadline was released on March 5, 2009. A third news release announcing the extension of the comment period for the MIRC EIS/OEIS was released on March 19, 2009.

Table 11-1 lists the public libraries where copies of the Draft EIS/OEIS were placed.

Table 11-1: Information Repositories with Copies of the MIRC Draft EIS/OEIS

Library	Address				
Nieves M. Flores Memorial Library	254 Martyr Street	Hagätna	GU	96910	(671)475-4751
University of Guam Robert F. Kennedy Memorial Library	Government Documents Tan Siu Lin Building, UOG Station	Mangilao	GU	96923	(671) 735-2315
Rota Public Library	c/o Mayor Joseph S. Inos Village of Rota P.O. Box 537	Rota	MP	96951	(670) 532-9451
Joeten-Kiyu Public Library	P.O. Box 501092	Saipan	MP	96950	(670) 235-7322
Northern Marianas College Public Library	P.O. Box 459	Tinian	MP	96952	(670) 433-0657

On March 23, 2009, the DoD REP published a Notice of Public Hearings in the *Federal Register* to extend the initial public comment period from 45 days to 60 days, until March 31, 2009. The *Federal Register* notice included supplemental information, including the original and extended comment periods, ways to comment, and locations of the information repositories. On March 20, 2009, an ad announcing the extension of the MIRC Draft EIS/OEIS comment period was placed in the aforementioned three newspapers.

Detailed information concerning locations and times for each of the public hearings was published in local and regional newspapers (Table 11-2).

Table 11-2: Advertisements Published for the MIRC Draft EIS/OEIS Public Hearings and Comment Period

Mariana Islands Newspapers	The Pacific Daily News	The Saipan Tribune	The Daily Marianas Variety
Dates Published – February 2009	1, 17, 18, 19, 20	3, 20, 21, 23,24, 25, 26	2, 17, 18, 19, 20, 23, 24, 25, 26
Dates Published – March 2009	20	20	20

The purpose of the public hearings was to solicit comments on the Draft EIS/OEIS. In addition, the public hearings identified significant environmental issues that the public and government agencies believed

needed further analysis. This chapter includes transcripts from the hearings and written public comments received during the comment period.

Table 11-3 lists the locations where the public meetings were held. During these public hearings, attendees were invited to view information posters and a video, ask questions, and make comments to the program representatives at each meeting. In addition, written comments were received from the public and regulatory agencies by letter, email, and through the MIRC project website during the comment period. Comments received from the public and agencies pertaining to specific resource areas and locations were considered, and more-detailed analysis was provided in the EIS/OEIS. Those comments received from the public concerning DoD policy and program issues outside the scope of the analysis in this EIS/OEIS were not addressed in the EIS/OEIS.

Table 11-3: Public Hearing Locations—MIRC Draft EIS/OEIS

Location	Date	Location
Guam	19 February 2009	Jesus & Eugenia Leon Guerrero, School of Business and Public Administration Building, University of Guam
Guam	20 February 2009	Southern High School
Saipan	23 February 2009	Multi-Purpose Center in Susupe
Tinian	24 February 2009	Tinian Elementary School
Rota	26 February 2009	Sinapolo Elementary School

At the public hearings, the Pacific Fleet Program Manager and COMNAVMAR provided a clear and concise MIRC overview, explaining the Purpose and Need of the Proposed Action and Alternatives, summarized potential environmental effects as described in the Draft EIS/OEIS, described ongoing environmental protective measures, and presented the remaining steps in the National Environmental Policy Act (NEPA) process. This overview was followed by individual testimony. A summary of attendance at the five public hearings is found in Table 11-4.

Table 11-4: Public Hearing Locations—MIRC Draft EIS/OEIS Summary of Attendance

Location	Number of Attendees	Number of Oral Commenters	Number of Written Commenters
Guam—University of Guam	32	4	2
Guam—Southern High School	20	2	1
Saipan	40	5	1
Tinian	22	1	2
Rota	15	3	3
Total	**129**	**15**	**9**

The DoD REP solicited additional comments from agencies and the public during the comment period that followed the public hearings for the Draft EIS/OEIS. The comment period was extended 15 days until March 31, 2009. In addition to the public hearings, the public was able to provide comments through the project website, by sending an email, or by mailing a written comment. Table 11-5 provides the number of commenters by affiliation or venue and Table 11-6 provides a resource summary of the comments received.

11.2 SUMMARY OF COMMENTS

Table 11-5: Number of Public Commenters—MIRC Draft EIS/OEIS

Commenter	Number of Commenters
Federal	7
State	14
Organization	7
Comments Received at the Public Hearings, through the Web site, Email, or US Mail	25
Oral Public Comments Provided at Public Hearings	15
Total	**68**

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS

Resource Issue	Comment Summary
Alternatives and Proposed Action	The DEIS evaluates a limited range of alternatives. The alternatives analysis would be much improved by including alternatives that represent a more diverse level and mix of training instead of formulating alternatives that simply build upon one another. The EPA recommends an alternative with additional mitigation measures and one with geographic and/or temporal exclusions. The exclusion alternative would identify geographic areas where training exclusions would be especially beneficial to environmental resources. While the Strategic mission of MIRC is to provide training venues for AW, AMW, SUW, ASW, MIW, STW, EC and NSW, the limited real estate on the island argues for consideration of employing simulators and synthetic training to provide early skills rather than traditional warfare area training. Realistic training can be performed with many training exercises scheduled in the Pacific, e.g., Cobra Gold, Foal Eagle, Balikatan, Tandem Thrust, and Cope Tiger. It is unclear in the impact summary tables whether the No Action alternative shows the number and extent of actions that are currently taking place and/or historically took place and/or whether this number simply represents the number/extent of a given activity that has been previously permitted and is projected for the future. Tables should show the number/extent of each action that occurred in each year in one column and number/ extent of each action that is currently permitted in a second column. The DEIS proposes several new activities that may not have been analyzed previously. New proposed activities are not described in sufficient detail to determine their potential environmental impact. Site-specific natural resource information has not been provided for these activities, nor has any discussion of activity-specific alternatives been included. ISR/Strike discussions need to be clarified with regards to previous actions, new actions, and how proposed modifications result in either expedited implementation of the conservation measures or development of additional conservation measures to minimize impacts from modifications to the ISR/Strike project.
Policy	The impediment of a democratically approved process of mutual consent by the people of Guam of any major decision affecting native people should be addressed. The military attempts to control what goes on in the islands at the exclusion of native inhabitants, their interests, and their culture. Self determination and our political status should be reviewed. The continued presence of the military and any increase in military activities and range affects our political future. Request AAFB activities of practice takeoffs/landings, instrument approaches, and base maintenance run-ups activities be limited to the hours of 8am to 5pm and that the community be notified.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Geology	Do the CWA, CAA, CZMA, CRCA and other Federal laws apply to impacts on geology, as in erosion and deposit of non-recovered materials? Do the Guam water pollution control, solid waste, UIC, excavation, clearing and grading, and other laws and regulations apply to impacts on geology , as in erosion and deposit of non-recovered materials? The DEIS states that "Because the location, extent and quality of paleontological resources in the MIRC are unknown and the impacts of training, if any, on these resources can be mitigated, this resource will not be evaluated herein" (p. 3.1-1). It is not clear how impacts to these resources can be mitigated if they are unknown. Land disturbing activities, such as amphibious landings, increase the potential for erosion resulting in loss of shorelines that leads to damage to coral reefs and disturbance of marine habitat. Amphibious landing protective measures would need to be developed for all applicable islands. The document states that LCACs may re-suspend sediment similar to wave events. Recent experience suggests that they re-suspend sediment at a rate greater than all but perhaps the most extreme wave events. The Services should determine the extent of these impacts and then develop better mitigation measures to protect beach and near-shore area eco-systems. There needs to a more elaborate discussion on the erosion processes of FDM and how the detonation or air-to-surface munitions has contributed to the erosion.
Hazardous Materials	The Services are justifying no impacts by indicating that the training area is large so there will not be one location accumulating the waste. Because of the cumulative impacts to ocean water quality, good stewardship can no longer assume that the size of ocean areas will dilute and disperse all pollutants to safe levels. For example, currents will not adequately disperse contaminants added to sediments within Apra Harbor. Good stewardship can no longer assume that the size of ocean areas will dilute and disperse all pollutants to safe levels, especially considering that metals such as copper and lead bio-accumulate in marine organisms. The Services should establish a monitoring regime for range areas to validate the Service's conclusions that hazardous materials impacts would not result in long-term degradation of water resources. What are risks and damages of chaff being ingested by seabirds and marine life? There is concern that chemical attack/response exercises and pyrotechnic firing may impact Guam's sole source northern aquifer, below the exercise site? Moreover, the small arms firing ranges in the North are located in the vicinity of the sole source aquifer for the island's drinking water . A stricter recovery of lead base bullet should be implemented. There is risk of a buildup of expended materials after years of increased training as proposed. Additional clean-up practices must be planned for accumulated materials, especially plastics and metals. release of cyanide from torpedoes, various explosives compounds, picric acid, organic chemicals from underwater detonations, and floating debris. The Services conclude that there would be no long-term degradation of water resources and no short-term impacts (p. ES-17) because contaminants would be diluted in the ocean (p.3.2-15).

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Hazardous Materials (Continued)	The DEIS contains no estimate of the amounts of hazardous materials anticipated to be released or expected to accumulate in the environment, nor is there adequate discussion of environmental fate of these compounds. There is no determination of contaminant impacts to the environment, other than to determine that substance concentrations would not "affect human health since military personnel exposure is limited and public access to training areas is restricted." (Page 3.2-25). There is recommendation of an ecological risk assessment addressing potential impacts to biological resources and human health. The DEIS states that ranges will be cleaned up when no longer needed. We recommend that cleanup plans include provisions for habitat restoration after contaminant remediation has been completed in areas where viable habitat existed prior to contamination resulting from the proposed action. The DEIS identifies the potential for contamination from munitions components including various heavy metals releases from sonobouys; leaching of hazardous bomb materials; release of cyanide from torpedoes, various explosives compounds, picric acid, organic chemicals from underwater detonations, and floating debris. The Services conclude that there would be no long-term degradation of water resources and no short-term impacts (p. ES-17) because contaminants would be diluted in the ocean (p.3.2-15).
Water Quality	Any action requiring the discharge of dredge and fill material into the water will require a CWA section 404 permit from the USCOE. This permit will require coordination with USFWS under the ESA and the FWCA. Previous Services' coordination with the Service on water resource development projects aimed at infrastructure improvement in the MIRC have begun late in the project planning and EIS development process and has resulted in delays. Expended materials entering the ocean could affect marine water quality. The use of different training materials in the ocean such as, pyrotechnics, chaff, sonobuoys, otto fuel II, torpedoes, ordnance, underwater explosives, and missiles all reflect that residues, chemicals leached, and spills will be released into the ocean but because of the large ocean volume the substance will be diluted so it will be ok. In other words dilution is the solution to pollution.
Air Quality	Comments about air quality centered on concerns that increased training activity would decrease air quality. Commenters are concerned with potential impacts from fires, noxious fumes from equipment, LCAC sand and dust pollution, and air emissions. Commenters want to make sure the EIS has sufficient analysis to identify air quality degradation potential and to determine air quality impacts.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Airborne Noise	There is concern that airborne noise will impact trust resources (seabirds, shorebirds, terrestrial species, sea turtles, marine mammals, et al). Commenters want a comparative analysis of before and after training activities to determine the impacts of increased training noise on trust resources. An understanding of behavioral responses and habituation to noise by trust resources would inform conservation and mitigation measures. There is the perception by some that military rotary- and fixed-wing aircraft fly extensively over residential areas, thus exposing residents to excessive airborne noise. In addition, increased aircraft activities at AAFB will have very noticeable noise impacts outside the base. Noise levels and noise impacts on residents and wildlife from increased flights at AAFB will be significant. The noise issue should be assessed and appropriate measures taken to decrease airborne noise impacts.
Marine Communities	Including artificial habitats in the affected environment section is misleading and not necessary. Artificial reefs neither replace nor function as effectively as natural coral reef habitat. We recommend the body of scientific data on artificial reefs be reviewed to determine if it supports the validity of the stated purposes for deploying artificial reefs. If it does not, we recommend that such stated purpose be removed from the text. The analysis of vessel movements in marine environment is incomplete. No analysis of small crafts or Amphibious Assault Vehicles [AAVs]) in nearshore waters has been provided. The potential impact resulting from use of these vessels should be included in the impact analysis for the proposed action. "No significant impact to marine communities" is premature since impact analysis is incomplete. All activities should be included in the impact analysis prior to reaching any conclusions regarding significance of impacts anticipated from the proposed action. The DEIS does not discuss beach repairs or improvements, both of which have potential to adversely affect sea turtles by permanently altering habitat. The Services have implemented and plans to continue applying "no wildlife disturbance" and "no training" areas for several beaches on Guam and Tinian; however, the DEIS does not include details on criteria that would be used to determine how such "off-limits" areas would be delineated and thresholds that would be used to trigger their implementation over time. The Navy surveys for coral cover, turbidity, fish assemblage, sedimentation rates, and site topography at Unai Chulu and Unai Babui and Unai Lamlam (as a control) to evaluate potential impacts from training; however, no comparative data are collected to evaluate sea turtle nesting rates or nesting success at beaches used for training versus a control site. The proposed beach repairs and improvements and re-nourishment should be discussed in the EIS. Please include brief discussion demonstrating how "no wildlife disturbance" and "no training" areas are determined and modified from monthly monitoring data (i.e., what are the thresholds for making a determination?). The DEIS evaluates impacts to marine communities, including coral communities and reefs; however, the evaluation is insufficient for the following reasons: coral resources were not fully identified; impacts to coral reefs from amphibious vehicles, especially landing craft air cushion (LCAC) vehicles, were not discussed; indirect impacts from sedimentation were not fully discussed; and cumulative impacts from the dredging expected for the new CVN berth as part of the Guam military build-up were not considered. There is recommendation that the DEIS requires improvements to the impact assessment for marine communities, including coral communities and reefs. Indirect and cumulative impacts should be identified and assessed. Mitigation measures to avoid impacts should be discussed and included in the proposed action. Marine based training activities occur in a wide range of areas around Guam, including numerous important fishing areas.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Marine Communities (Continued)	The draft EIS does not adequately address the impacts to local fishermen and boaters, and instead glosses over increased activities as having no significant impact. Many fishers are already restricted by weather conditions and other factors, so any additional closure of valuable fishing grounds could have potentially severe impacts on these users. Additionally, permanent harm from some of the military activities, which could kill fish, larvae and eggs, could result from the training, leading to reduced fishing success overall and having a broader impact than the periodic closures. The document does not provide any mitigation suggestions for the impacts of closures and other indirect effects on the fishing grounds. Alternatives that minimize these problems, or some sort of compensatory mitigation, should be considered. The OEIS zone outer reef and banks of Guam, such as Santa Rosa Reef must be addressed in the OEIS and will be impacted by training. These banks need to be described and BMPs during training exercises and mitigation listed to protect the resources and the local fishing dependent on these sites. Accumulation of expended materials in substrate exposes benthic communities to unknown risks, and can still expose the food chain to accumulations of toxic materials. Detonations kill benthic organisms, including fish, on soft substrates. There is risk of injury or death for mobile marine organisms, including marine mammals and reptiles. No amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms. If any such exercises have been done at Tipalao, what are the results of impact monitoring and damage assessment? Exercises must avoid the outer coral reefs and banks, such as Santa Rosa Reef, Galvez Banks, White Tuna Bank, etc. No anchoring or other actions that would damage the coral reef ecosystems should be allowed during training. These reefs support local fishing and may be a source of recruitment of corals and other organisms to the fringing and barrier reefs of Guam.
Marine Mammals	There is concern about noise in the water (UNDET and sonar) and its impact on marine species and marine mammal beach strandings. Information on impacts of active sonar to marine mammals in the MIRC is not adequate. DEIS analysis should be thorough enough to identify and describe noise and sonar impacts on marine species. Such analysis should lead to mitigation measures that protect species from harmful impacts during exercises. A precautionary approach must be taken to the implementation of mitigation measures and procedures must be modified constantly as new information becomes available to allow protection of the marine resources. Current procedures for mitigation should not remain in place for five years if they can be improved at any time. There is potential for injury to marine mammals and disruption of the dolphin-watching tourism in Agat Bay from landing craft exercises and underwater demolitions. Even without direct injury, increased noise and activity could alter dolphin behavior, causing them to leave the area. Although the chapter on Marine Mammals provides much new information, there are very serious gaps in the knowledge of the status of most species in the MIRC area and impacts on protected species from the various proposed training activities. Substitution of data from other ocean areas for projection of MIRC area resources cannot be accepted as conclusive. Further work and monitoring of impacts on marine mammals during ongoing exercises in the MIRC are required and modifications of activities need to be implemented based on such findings. There is much potential for marine mammal injury or mortality from vessel collisions, underwater detonations and active sonar. According to the EIS, critical habitat for marine mammals has not been designated within the MIRC Study Area. Because these mammals are supposedly protected under the Endangered Species Act or the Marine Mammal Protection Act, the Services consulted with the National Marine Fisheries Service regarding such disturbances to marine mammals and related behavior disturbances.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Sea Turtles	Repairs and improvements to Unai Chulu and Unai Babui are not described and assessment of potential impacts of these modifications cannot be made. We recommend a complete description of these modifications be included and their potential impacts on Federal trust resources be analyzed in the EIS. Sea turtles are frequently seen and have nested in inner Apra Harbor. The use of amphibious craft in Apra Harbor could impact sea turtle nesting sites. The DFW Sea Turtle Program would like to obtain Navy sea turtle data and share them with turtle programs Pacific-wide. Sea turtle data are critical information that has widespread implications to the Pacific region for sea turtle management and conservation efforts. Amphibious landings on Unai Chulu and Unai Dankulo are a concern for the DFW Sea Turtle Program. Long Beach was documented to support one of the highest green turtle nesting populations in the CNMI. Mitigation measures should be taken to reduce the amount of take incurred on critical nesting beaches. Beaches provide habitat to a remnant nesting green turtle population currently in danger of extirpation in the CNMI. The Navy should consider amphibious training on the beaches only during October 1 through January 31 for minimum impact to nesting turtles.
Fish	Underwater detonation training in Apra Harbor has resulted in mortality of adult fishes. Increased training will increase numbers of fishes killed. An estimate should be provided of numbers of fishes to be killed by future increased activities, based on projections of past mortalities due to detonations during trainings. Projections should be compared to estimated populations of vulnerable species in the impact zone of this training. EFH analysis concludes that the DEIS alternatives will only have short-term or localized impacts and no long-term significant impacts on fish or EFH. Similar conclusions are made about sea turtles, sea birds, and marine mammals in subsequent sections of the document. The description of EFH is lacking a full description of Coral Reef EFH. This should be added to the document as it is a key element of fisheries in this area and needs to be fully considered in the analysis. There are no references to large schooling pelagic fish (tunas, mahi, wahoo) or to the smaller pelagic schooling fish that they follow. Given the economic benefit these fish provide to local residents, impacts on pelagic fish and their migratory routes are a serious concern. Piti, Agat, and Apra Harbor detonation locations appear to be relatively close to shore; areas frequented by important fisheries resources, including dolphins and sea turtles, and by recreational users. The DoD may want to consider moving the detonation sites to other locations further offshore that might have fewer resource conflicts? As much as the Services have explained the importance of training, the Services should equally consider the importance of fishing. That way the Services will be viewed positively as protecting the interests of the people. Fishing to us is not a side issue; it is simply one of the most important issues to be considered alongside training. FDM waters are at the outer limits of most fishing boats and represent perhaps the most fertile fishing grounds readily accessible to local fishermen, commercial or subsistence. Additional restricted access to waters surrounding FDM will have devastating consequences to local fishing that the Draft EIS may not have taken into consideration.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Seabirds and Shorebirds	Sonar impacts on seabirds are unknown. Will exercise observers be recording and documenting any evidence of sonar impacts on seabirds and will the results of such observations be used to modify exercise procedures to protect seabirds? At some point short-term bird behavioral responses to environmental disturbances (noise, aircraft overflight, explosions,) may become long-term or permanent responses. These responses may not have population level effects, but repeated bombing may well have a permanent behavioral response from the seabirds. An increase by three fold of over-flights and bombing at FDM may elicit a permanent behavioral response or permanent population decline. Impacts to seabirds and shorebirds as a result of vessel movements, aircraft overflights, amphibious landings, weapons firing, and other ordinance use, including underwater detonations, present potential for injury or death from collisions, primarily at night. Such activities present increased danger to shorebirds and seabirds, especially at sites like FDM. The DEIS currently lacks analysis of the proposed action on migratory birds. We recommend the EIS include analysis of noise, percussive force, and fire in relation to migratory seabirds and shorebirds and clarify anticipated effects to migratory (and endangered) birds at Lake Hagoi and Fena Reservoir.
Terrestrial	The DEIS lacks a biosecurity plan to prevent introduction of invasive species and to prevent spread of species. Increases in training activity will require new measures to ensure that Guam does not receive new invasive species, and conversely, to ensure that other islands do not receive invasive species from Guam. There are pockets of terrestrial species (e.g., swiftlets, crows, fruit bats, partullids, Tinian monarch, Micronesian megapode) throughout the islands that require conservation measures. The DEIS has insufficient data to determine the adequacy of protective measures for terrestrial species. Protective measures are required to mitigate the impacts of fires, habitat disturbance, noise, and others resulting from military training activities.
Land Use	Agat Bay is a popular tourist destination; it is the location of several popular dive sites. Will increasing both the underwater detonation (22 to 30 mines/yr, pg 2-45) and surface detonations (8 to 20 mines, pg 2-45, 2-56) negatively impact divers/dive tourism in Agat? Sound analysis showed that sounds up to 170 dB could be heard up to 2-5 kms from the blast(pg 3.7-95, dB vs. distance table). The current analysis does not show convincingly that increased activity in the Agat Bay area will not negatively impact tourist use and diver safety. Tourism and diving in the Agat Bay area must be included in the final analysis. While the DEIS acknowledges the existence of GNWR overlay units, it does not clearly describe what activities are proposed to occur within these units, nor does it conduct an analysis of the potential impacts to natural resources within them. Further detailed information should be provided on activities proposed to occur within these overlay units. The Services should conduct a more comprehensive analysis of potential impacts to resources within these units.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Cultural	There appear to be more accepting cultural attitudes towards war and militarism and culture militarization, including erosion of the democratic process and faith, as the military increasingly determines most aspects of Guam's fate and peoples' fate. The expanded training presented in the EIS is notice to residents of the cultural impacts of military expansion on Guam. Expanded military presence threatens the island culture, especially as regards to recreational and commercial fishing. Additional military population dilutes native populations; hence, having a direct effect on native cultures. The DEIS is deficient in assessing the impacts of cultural resources. For example, there is lacking detail regards the impacts of training on cultural sites especially on the island of Tinian. The NHL and other cultural sites on Tinian are exposed to military training activities. Military impacts affect tour operators and local residents during training exercises. Such training impacts on cultural sites throughout the affected islands must be more thoroughly assessed. There are cultural resources that would be impacted by amphibious training. For example, Tipalao Cove would impact archeological sites on shore. The Tipalao Cove shore archeological sites must be assessed before training activities are allowed to cause damage.
Airspace	The FAA stated that any changes in existing airspace must be addressed in accordance with FAAO 7400.2. The FAA asks the EIS to verify individual or cumulative impacts are evaluated and the level of significance determined for increased training operations. In addition, the FAA recommended capping the ATCAAs to FL300 to accommodate nonparticipating aircraft, especially those on User Preferred Routes. Altitudes above FL300 would be coordinated and approved on a case-by-case basis.
Transportation	Foreign fishing boats passing through the MIRC or fishing within it (such as the Asian tuna long-liners in the FSM EEZ), do not stay within shipping lanes nor read the Notice to Mariners. If warned to stay out of naval exercise zones, they may stop using Guam shore facilities and Apra Harbor and negatively impact their suppliers of goods and services on Guam. Indicate where the impact of helicopter activities will be addressed that may occur below large commercial jet aircraft altitudes (2200-2600 ft). include the effects to wildlife in relation to frequency of aircraft fly-overs and/or troop deployments, including refueling runs over Saipan.
Regional Economy	The FEIS should include accurate information on the number of part-commercial fishermen in CNMI and Guam and analyze the impacts of the alternatives on those fishermen. The DEIS does not address inshore and offshore seasonal fishing patterns and how carrying out training activities may impact such seasonal fishing. The MIRC supports Guam's economy due to the volume of defense spending during the exercise events, the preparation for such projects and other costs associated with maintaining operations on island. The draft EIS diminishes the value of other contributions to Guam's economy, perhaps as a justification to allow the military to increase its operation. The DEIS states that defense spending has a greater ripple effect than visitor dollars. This assessment should not imply that the military should be allowed to harm the environment and disrupt existing activities because defense money is worth more? The people of Guam are prepared to do their part to support the nation, but our nation depends on strong, vital communities, which we cannot achieve without the ability to pursue independent industries that do not rely on federal dollars alone.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Regional Economy (Continued)	In addition, the EIS should evaluate secondary impacts of the preferred alternative including the extent to which on-island spending is increased or decreased by military personnel as well as other impacts (e.g., crime and other social issues) upon completion of training. It is no secret that training events usually result in an increase in Guam's population soon after training ends. Socio-economic impacts of post-training events must be evaluated in the EIS. The importance of commercial and recreational fishing in the outer banks and reefs has not been addressed. Data should be shown and the impacts of existing and expanded exercises discussed. There needs to be a balance between the military training requirements and the indigenous fishing requirements in the MIRC. This is especially exemplified in the expansion of restricted zones around FDM and the traditional fishing grounds the restricted areas invade. The people of Rota are in support of U.S. military activities. Rota would like to see military activity that assists economic development through projects that help the local community.
Recreation	Many areas used by the military also are frequented by boaters, including fishermen, divers and other recreational users. There is no clear indication of how extensive these closures will be – do such events last for an hour, or a day, or a week? Again, the notification process will be critical, and every attempt should be made to reduce impacts to the existing community of users. The training activities themselves present additional challenges that may alter the landscape far beyond the closure period. The potential loss of marine life, whether through injury, morality or simply scaring them out of the area, presents significant problems, especially for tour operators who rely on a health population of marine animals to support their tours. The underwater detonations, for example, could lead to the relocation of Agat Bay's resident dolphin pod, disrupting the dolphin watch boats and other tours. In general, the draft EIS makes very little mention of the potential impacts associated with these activities and makes even less mention of mitigation options that may be viable. I request that these areas be revisited and more effort made to either find alternatives that will cause fewer impacts, or to provide environmental and compensatory mitigation to offset these issues.
Public Health	There is concern that military toxins are detrimental to the health of the residents in the Mariana Islands. Increased military activity will expose the populations to increased exposure to military toxins. Population health is being sacrificed to increased military presence and increased training activity that exposes residents to unacceptable levels of military hazardous materials.
Mitigation Measures	Brown tree snake conservation measures should include interdiction for 100 percent of all training activities, not just large actions. The Services should develop and implement a plan to evaluate the effectiveness of monitoring and mitigation measures before beginning, or in conjunction with, operations under the FEIS and anticipated issuance by the National Marine Fisheries Service of an incidental harassment authorization. Mitigation measures are not well defined in the DEIS. There are references to protective measures, but specific actions are rarely identified, and when they are, no discussion of the effectiveness of mitigation generally occurs. It is important that mitigation measures be discussed, especially if they are the basis for concluding that impacts will not be significant or not occur at all. Results of monitoring of training impacts would also be helpful to include in mitigation discussions.

Table 11-6: Resource Comment Summary—MIRC Draft EIS/OEIS (Continued)

Resource Issue	Comment Summary
Mitigation Measures (Continued)	The Services should include in the FEIS a section in each resource chapter that identifies mitigation measures and discusses their effectiveness and likelihood of implementation. Monitoring efforts should be included. Information should also be provided regarding how destruction, loss, or injury from DoD activities will be monitored in the Marianas Trench Marine National Monument per the requirement in the Presidential Proclamation that requires coordination with the Department of Interior or Commerce, and mitigation/restoration.
Cumulative Impacts	Global climate change is expected to have significant impacts on the Pacific islands. The DEIS does not include a discussion of potential impacts that climate change may have on training activities or facilities. Relocation of U.S. military forces to Guam and the CNMI, Northwest Field Beddown, Global Strike Task Force expansions at Andersen Air Force Base, and private developments in combination with increased training activities would add to impacts on Federal trust resources and should be included in the cumulative impacts analysis for the proposed project. Specific issues may include increased traffic among islands, increased probability of transporting invasive species to new locations, and continued habitat destruction due to concurrent development projects. The DEIS restricts the impact analysis to only activities in the proposed alternatives and does not provide a full cumulative effects analysis. Additive impacts and stressors to Federal trust species and habitat should be addressed in aggregate. There should be a more thorough cumulative impacts assessment beyond just the proposed alternatives. Should take a pre-cautionary approach when impacts are not clearly known and be prepared to modify exercises when negative impacts are observed. The EIS should include a more comprehensive assessment of the Matua Bay Development, FPA Pacific Corp Quarry, Resources Management Quarry, Tinian Landfill, and the Wastewater Treatment plant. The assessment should include the impacts on the Tinian monarch and the Micronesian megapode. The geographical boundary for the cumulative impacts analysis for terrestrial biological resources is not adequate. The cumulative impact analysis needs to include locations outside Navy controlled and managed areas for Tinian. The EIS should provide an analysis of the cumulative effects of all proposed Tinian projects listed in Table 6-1. The cumulative effects to the Tinian monarch could be especially devastating.
Miscellaneous	There are some citizens of Guam and the CNMI who would prefer the military presence in the islands either be scaled down or eliminated. There are perceptions that the military presence, particularly the increase in military training activity presented in the DEIS will have a negative impact on the traditional and historical culture of the Marina Islands. The preference is that the culture takes preference over the military presence.

Table 11-7: Number of Comments by Resource Issue—MIRC Draft EIS/OEIS

Resource Issue	Federal	State	Organization	Public	Public Meeting Transcript	Total
Proposed Action and Alternatives	22	93	33	32	3	183
Policy	2	6		13		21
Geology	1	18		2		21
Hazardous Materials	4	24	1	10	3	42
Water Quality	2	34		6		42
Air Quality	2	2				4
Airborne Noise	2	12		1		15
Marine Communities	7	34		8		49
Marine Mammals	1	59	24	6	3	93
Sea Turtles	3	29		3		35
Fish	1	18	1	7		27
Seabirds & Shorebirds	4	21	1	11		37
Terrestrial	32	90		13		135
Land Use	4	6		1		11
Cultural	6	6		1		13
Airspace	6					6
Transportation		4		7		11
Regional Economy	3	46		7	7	63
Recreation	3	24	2	6		35
Public Health				3	3	6
Mitigation Measures	22	80	16	14		132
Cumulative Impacts	13	16	3	8		40
Miscellaneous	9	40		5	24	78
Total	**149**	**662**	**81**	**164**	**43**	**1,099**

Note: Several comments covered more than one resources area.

11.3 SUMMARY TABLES

The following sections contain copies of the comments submitted and a table summarizing the comments and providing the response. Table 11-8 details the commenters for each of the five categories of comments: Federal, State, Organization, Public Comments (received at the public hearings, through the web site, email, or US mail), and Oral Public Comments (provided at public hearings).

Table 11-8: Number of Comments by Category and Comment Tracking Code Legend

MIRC Draft EIS/OEIS

Comment Tracking Code	Number of Comments	Date Rec'd	Affiliation	Author
Federal				
FED1	**7**	16-Mar-09	U.S. Department of Agriculture, APHIS Wildlife Services	Shannon M. Hebert
FED2	**9**	16-Mar-09	U.S. Department of the Interior, National Park Service	Steve Gibbons
FED3	**54**	16-Mar-09	U.S. Department of Interior, U.S. Fish and Wildlife Service	Patricia Sanderson Port
FED4	**6**	13-Mar-09	Western Pacific Regional Fishery Management Council	Kitty M. Simonds
FED5	**6**	16-Mar-09	Marine Mammal Commission	Timothy J. Ragen
FED6	**14**	26-Mar-09	U.S. Environmental Protection Agency, Region IX	Kathleen M. Goforth
FED7	**5**	30-Jul-07	U.S. Department of Interior, U.S. Fish and Wildlife Service	Patrick Leonard
State Guam (STG)				
STG1	**30**	16-Mar-09	Bureau of Statistics and Plans	Alberto A. Lamorena V
STG2	**6**	16-Mar-09	Office of the Governor of Guam	Felix P. Camacho
STG3	**61**	16-Mar-09	Guam Department of Agriculture	Paul C. Bassler
STG4	**1**	12-Feb-09	Guam Department of Parks, Recreation & Historic Preservation	Joseph W. Duenas
STG5	**2**	10-Mar-09	Assistant Majority Leader, Chairperson, Committee on the Guam Military Buildup and Homeland Security	Senator Judith Paulette Guthertz, D.P.A.
STG6	**3**	16-Mar-09	Guam Economic Development Authority	Anthony C. Blaz
STG7	**202**	31-Mar-09	Guam Environmental Protection Agency	Lorilee T. Crisostomo

Table 11-8: Number of Comments by Category and Comment Tracking Code Legend

MIRC Draft EIS/OEIS (Continued)

State CNMI (STM)				
STM1	**95**	16-Mar-09	CNMI, Department of Lands and Natural Resources, Division of Fish and Wildlife	Sylvan Igisomar
STM2	**8**	24-Feb-09	CNMI, Office of the Mayor, Municipality of Saipan	Juan Borja Tudela
STM3	**1**		Department of Public Works	Martin S. Atalig
STM4	**2**		Chairman 16th CNMI House of Representative	Representative Tebuteb
STM5	**1**		Rota Municipal Treasury	Frank M. Atalig
STM6	**1**		Mayor's Advisor	Tom Glenn A. Quitugua
STM7	**1**		Chairman, 12th Rota Municipal Council	Roy James A. Masga
STM8	**4**	9-Mar-09	Mayor, The Northern Islands Municipality	Valentin I. Taisakan
State (STA)				
STA1	**2**	9-Feb-09	State of Hawai'I Office of Hawaiian Affairs	Clyde W. Namu'o
Organizations (ORG)				
ORG1	**41**	16-Mar-09	Natural Resources Defense Council	Taryn Kiekow
ORG2	**30**	13-Mar-09	Guam Fishermen's Cooperative Association	Manuel P. Duenas II
ORG3	**3**	16-Mar-09	Taotaomona Native Rights	Trini Torres
ORG4	**3**	25-Feb-09	Tinian Chamber of Commerce	Phillip T. Mendiola-Long
ORG5	**3**	4-Mar-09	Citizens for Safe Water Around Badger	Laura Olah
Public Comment Guam (PUG)				
PUG1	**1**	Jun-09	Barrigada, Guam	Marceline U. Maratita
PUG2	**1**		Agat, Guam	Erlinda J. Baldevia
PUG3	**1**		Agat, Guam	Pacifico Martir
PUG4	**1**		Santa Rosa, Guam	Mary Jane Q. Cruz
PUG5	**1**		Agat, Guam	Cecilia T. Solidum
PUG6	**1**		None Given	Mr. Chaco
PUG7	**2**		None Given	None Given
PUG8	**3**		Hagatna, Guam	Dionisio De Leon
PUG9	**2**		Yigo, Guam	Mark Ganeb
PUG10	**3**		None Given	Joel P. Verango
PUG11	**2**		Barrigada, Guam	Kristel Aganon
PUG12	**3**		Dededo, Guam	Marie Garcia
PUG13	**33**		Barrigada, Guam	Valerie Brown

Table 11-8: Number of Comments by Category and Comment Tracking Code Legend

MIRC Draft EIS/OEIS (Continued)

Public Comment Guam (PUG) (Continued)				
PUG14	**2**	10-Feb-09	Barrigada, Guam	Prudencio Flores Meno
PUG15	**2**	22-Feb-09	Hagatna, Guam	Richard Clayton Brown
PUG16	**1**	None Given	None Given	Cheri Dautuman
PUG17	**1**	None Given	Barrigada, Guam	Eric J. Untalan
PUG18	**1**	None Given	Hagatna, Guam	Patrick Wolff
Public Comment CNMI (PUM)				
PUM1	**17**	No Date	Saipan, MP	Ruth L. Tighe
PUM2	**1**	2-Feb-09	Saipan Island, CNMI	Captain Leslie Gottwald Kimo
PUM3	**1**	23-Feb-09	Saipan, MP	David Castro Sablan
PUM4	**1**	23-Feb-09	Saipan, MP	Fred Cabrera Camacho
PUM5	**1**	25-Feb-09	Tinian, MP	Phillip T. Mendiola-Long
PUM6	**4**	31-Mar-09	Saipan, MP	Marilyn Swift
General Public Comment (PUB)				
PUB1	**31**	15-Mar-09	New Britain, CT	Dr. Justine B. de Cruz
PUB2	**1**	23-Mar-09	St Florham Park, NJ	B. Sachau (a.k.a. Jean Public)
Oral Comment (PM)				
PM1	**2**	19-Feb-09	University of Guam Public Hearing	Jesse Limtiaco
PM2	**4**	19-Feb-09	University of Guam Public Hearing	Hope Cristobal
PM3	**8**	19-Feb-09	University of Guam Public Hearing	Victoria Leon Guerrero
PM4	**3**	19-Feb-09	University of Guam Public Hearing	Marie Ada Auyong
PM5	**4**	20-Feb-09	Southern High School Public Hearing	Trini Torres
PM6	**5**	20-Feb-09	Southern High School Public Hearing	Ian Catlin
PM7	**4**	23-Feb-09	Susupe, Saipan Public Hearing	CNMI Representative Ray A. Tebuteb
PM8	**2**	23-Feb-09	Susupe, Saipan Public Hearing	CNMI Representative Diego T. Benavente
PM9	**4**	23-Feb-09	Susupe, Saipan Public Hearing	Richard Seman
PM10	**1**	23-Feb-09	Susupe, Saipan Public Hearing	David Sablan
PM11	**1**	23-Feb-09	Susupe, Saipan Public Hearing	Sam McPhetres
PM12	**1**	24-Feb-09	San Jose Village Public Hearing	Stephen Smith

Table 11-8: Number of Comments by Category and Comment Tracking Code Legend

MIRC Draft EIS/OEIS (Continued)

Oral Comment (PM) (Continued)				
PM13	**1**	26-Feb-09	Sinapolo, Rota Public Hearing	Richard E. Taisacan, Director, Department of Labor
PM14	**1**	26-Feb-09	Sinapolo, Rota Public Hearing	Thomas Mendiola
PM15	**2**	26-Feb-09	Sinapolo, Rota Public Hearing	Joaquin Manglona

11.4 COMMENTS AND COMMENT RESPONSES

11.4.1 Comments Received

Original Comments as received – Table 11-9 follows this page.

Table 11-9 Original Comments as received follows this page.

FED-1

From: Shannon.M.Hebert@aphis.usda.gov [mailto:Shannon.M.Hebert@aphis.usda.gov]
Posted At: Monday, March 16, 2009 16:40
Posted To: MARTAPEIS
Conversation: USDA APHIS Wildlife Services comments on Marianas Range Complex EIS/OEIS
Subject: USDA APHIS Wildlife Services comments on Marianas Range Complex EIS/OEIS

FED1-1 Please accept these comments on the Marianas Range Complex EIS/OEIS on behalf of the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services program (USDA-APHIS-WS or APHIS Wildlife Services program). Our agency was not invited to formally participate as a cooperating agency on the development of this EIS/OEIS, however, our Guam program was sent a notice of the availability of the DEIS. Our interests are in safeguarding U.S. agriculture and natural resources from the risks associated with the entry, establishment and spread of invasive species, including but not limited to the brown treesnake. In addition, we have identified a need for the EIS to address bird aircraft strike hazards. Wildlife Services' sister program, APHIS Plant Protection and Quarantine, may be contacted to address concerns with animal pathogens, plant pests, diseases, and noxious weeds.

FED1-2 The Mariana Islands Range Complex EIS/OEIS must include an invasive species risk assessment and management plan to prevent the spread of invasive species into and out of the Mariana Islands with troop, vessel and cargo movement. The invasive species management plan should include the development of brown treesnake containment strategies. In addition, we recommend that the cumulative impacts analysis include collaboration with and findings from the Guam military build up EIS/OEIS since both proposed actions have the potential to pose significant risks on ecolgical, economic, and other environmental resources in terms of biosecurity in Guam, the Mariana Islands, other Pacific Islands including Hawaii, and elsewhere.

The EIS must include detailed discussion which fully describe the need for management and risks associated with each separate invasive species, as well as comprehensive, detailed plans for prevention, containment and control. The APHIS-Wildlife Services program has the legal authority and expertise relating to vertebrate invasive species and other vertebrate pest management issues and our program's comments herein relate to these as well as bird aircraft strike hazards (BASH). For issues relating to spread of disease, fungus, noxious weeds, and insect pests, please contact the USDA APHIS Plant Protection and Quarantine program.

FED1-3 **1. Integrated Invasive Species Management Plans must include BTS and Other Taxa in the EIS**
Comprehensive integrated invasive species management plans which detail logistical requirements including personnel, locations, equipment, infrastructure, control methods and strategies, must be developed, approved and be ready for implementation prior to cargo and personnel movements into or out of the Marianas to any location. Commitments and plans must be included in the final EIS for disclosure of environmental effects. In addition, the invasive species management plans should identify pathways of risk for arriving invasives.

FED1-4 **2. Early Detection and Rapid Response Plans Must be Included in the EIS**
While there are more obvious taxa to target specifically BTS and rodents in management plans, broader response plans must also be developed for emergency response procedures when unanticipated new species arrive or are detected on island. Failure to plan and provide for these kinds of events until after the fact seriously increases the risks of failure and therefore places undue risks on the people, ecology and economy of the Mariana Islands and other U.S. interests. Early detection and rapid response capacity must be addressed in dealing with BTS in recipient locations and for any newly arriving species in CNMI associated with regularly anticipated movements. The development of broad contingency funds would also make immediate response actions possible.

FED1-5 **3. Brown Treesnake Control Plans Must be Developed**

A. Plan Strategy. A BTS control plan must be an integrated control plan that includes reduction of attractants such as rodent control, logistical requirements including personnel needs and training, locations, equipment, infrastructure development, detection dogs and associated infrastructure and personnel, and other control methods and strategies. It must be developed, approved and be ready for implementation prior to cargo and personnel movements into or out of MI to any location. For a BTS management plan, the strategy must include depopulation throughout MI to reduce risks of snakes being transported, and inspection and containment at ports. It will be crucial to have containment capacity for the arrival of significantly increased numbers and quantities of people, materials, and equipment. Capacity and all planning and operations must be firmly established well in advance of these events.

B. The EIS must include the integrated BTS plan for review by cooperating agencies. Failure to include a comprehensive, effective plan to control invasive species such as the BTS prior to initiating the earliest stages of project initiation will result in a high risk of significant ecological and economic risks to the Marianas and other Pacific Islands including Hawaii and the U.S. mainland. Failure to include an acceptable plan would be a failure to utilize the cooperating agencies with expertise and jurisdiction by law assist in an open and early process in EIS development that is sufficient for issue identification, disclosure of environmental consequences, and mitigation development to reduce significant impacts.

C. The EIS must identify for review all anticipated increases in both DOD and civilian transport occurring as a reasonably foreseeable response to project implementation. Risks of BTS movement occur across all facets of the transportation network.

D. Project proponents must address BTS containment for effects on all resources, not only T&E issues. Significant economic and ecological effects on the Mariana Islands, United States, territories and other countries would otherwise not be disclosed and addressed in the EIS.

E. APHIS WS' Role in BTS Control
APHIS Wildlife Services is currently conducting operations and research to control and prevent new infestations of the invasive brown treesnake (BTS) from Guam to other Pacific islands including Hawaii and to the U.S. mainland. The APHIS-WS program may be available to assist in the development of a BTS management plan by providing technical input and review. Developing plans for BTS containment must involve those with recognized expertise and legal authorities, such as the APHIS Wildlife Services program, the USFWS, and other experts. The EIS should create binding commitments to plan development and implementation so that local commands will be required to support these efforts. Comprehensive, expertly designed (with input and review by cooperating agencies), and fully approved plans must be include in the EIS and fully supported by project proponents, both financially and logistically, to have the best chance for success in preventing significantly harmful economic, social, and ecological effects to MI, its neighbors, and to numerous other United States interests.

FED1-6

4. Invasive Vertebrate Species Effects on Threatened and Endangered Species
The effects of invasive vertebrate species on T&E species are broad and will require substantial cat, rodent, deer, pig and other management efforts. The EIS must include plans for controlling invasive species. Invasive species will not only be an impact concern on T&E species from project activities (e.g. increases in feral cats or rodents associated with housing and cargo), but populations of invasive species will exacerbate other effects on T&E species from other project effects (for example, noise and habitat destruction effects). Therefore, plans must be included in the EIS for issue identification, disclosure of environmental effects, and development of strategies to protect T&E and native species from invasive species effects.

FED1-7

5. Bird Aircraft Strike Hazards
Bird aircraft strike hazards are also a critical issue that will be a growing concern and should be acknowledged and prepared for independent of invasive species issues. The increases in military and civilian aircraft operations associated with the proposal presents associated increases in risks to civilian

and military personnel safety and to aircraft.

Further information on brown treesnake and other vertebrate pest prevention, management, or control can be obtained by contacting Dan Vice, Assistant State Director in Guam at telephone (671) 635-4400, or Mike Pitzler, State Director (Hawaii/Guam programs) at telephone (808) 861-8575.

Shannon Hebert
Environmental Coordinator
Operational Support Staff
Wildlife Services
tel: 503-327-8937
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PO Box 13321
Portland, OR 97213

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WAR IN THE PACIFIC NATIONAL HISTORICAL PARK
Casa De Espana
135 Murray Boulevard, Suite 100
Hagatna, Guam 96910

FED-2

Fax Form

To:	Mora Marariola-See		
Fax No:	808-474-5419		
From:	Steve Gibbons		
Subject:	Letter dtd March 16, 2009		
	March 16, 2009	4	

Administrative Headquarters
Telephone: (671) 477-7278/9 — Superintendent, Admin Div; Landscape Arch, Park Ranger, Chief of Interp, Museum Curator, AMMA Natural Resources
Fax:(671) 477-7281
Administrative HQS

Maintenance Facility
Telephone: (671) 472-7240 — Facility Manager
(671) 472-7248 — Maintenance Shop
(671) 477-9362 — Maintenance Worker
(671) 472-1041 — Natural Resource Field Sta.
Fax: (671) 472-1475 — Maintenance Facility

REMARKS

Hello Ms. Marcariola-See

Please see attached letter pertaining to the Marianas Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement.

Thank you.

Steve Gibbons
Superintendent
War in the Pacific NHP
American Memorial Park
Work: 671-477-7278 ext 1003
Fax: 671-472-7241

United States Department of the Interior
NATIONAL PARK SERVICE
WAR IN THE PACIFIC NATIONAL HISTORICAL PARK
AMERICAN MEMORIAL PARK
135 Murray Boulevard, Suite 100
Hagatna, Guam 96910

March 16, 2009

Mariana Islands Range Complex EIS/OEIS
Nora Macariola-See, Project Manager, Code EV21
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

Dear Ms. Macariola-See,

Thank you for inviting the National Park Service (NPS) to review the Marianas Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement. The NPS hopes that it's comments as a Cooperating Agency (DOI), an agency with jurisdiction over lands adjacent to proposed actions, and as a special expert in the areas of natural resources, cultural resources, and recreational use of Agat Bay as well as other NPS lands adjacent to proposed actions, will contribute to a fuller more effective proposed action and final EIS document.

The scope of our comments will be limited to actions directly or indirectly impacting park resources or visitors and to actions impacting areas of historical significance (e.g. NHL resources on the Island of Tinian) within the Marianas Islands Range Complex sphere of proposed activities.

FED2-1

- The EIS maps (pg. ES-35 and ES-36) do not include relevant jurisdictional boundaries. Boundaries of War in the Pacific NHP, the Piti Bombhole and Sasa Bay Marine Protected Areas (MPA), as well as other managed areas adjacent to proposed actions should be included in the Final EIS. This information is necessary to assess potential impacts of proposed actions.

FED2-2

- It is unclear in the impact summary tables (those used throughout document) whether the No Action alternative shows the number and extent of actions that are currently taking place and/or historically took place and/or this number simply represents the number/extent of a given activity that has been previously permitted and is projected for the future. It is critical to make this distinction. Tables should show the number/extent of each action that actually occurred in each year in one column and number/extent of each action that is currently permitted for in a second column.

FED2-3

- Agat Bay is a popular tourist destination; it is the location of several popular dive sites. Will increasing both the underwater detonation (22 to 30 mines/yr, pg 2-45) and surface detonations (8 to 20 mines, pg 2-45, 2-56) negatively impact divers/dive tourism in Agat? Sound analysis showed that sounds up to 170 dB could be heard up to 2-5 kms from the blast (pg 3.7-95, dB vs. distance table). The current analysis does not show convincingly that increased activity in this area will not negatively impact tourist use or impact diver safety. At

the least, tourism (primarily diving) in this area must be included in the final analysis. Will there be notification to the public (dive and tourism operators) about times and locations of mine detonations?

Although this is a large and complex study area, we provide the following set of comments specifically for the potential effects the proposed action will have on the North Field National Historic Landmark (NHL), located on the Island of Tinian. The agency's comments regarding, and responsibilities for, this and other NHLs are in accordance with the National Historic Preservation Act of 1966 [16 U.S.C. 470], as amended, and the implementing regulations for Section 106 (36 CFR Part 800).

General Comments Related to the EIS/OEIS Training on Tinian and the Potential Effects on the North Field NHL under Alternative 1 (Preferred Alternative):

- The preferred alternative proposes to continue training activities on Tinian and the North Field NHL that have been in place for ten years. A Programmatic Agreement (PA), signed in 1999, covers the constraints imposed on those activities and addresses their potential effects—impacts—on the NHL.
- The difference between the 1999 MIRC training plan and the proposed plan is that the proposed plan calls for increased training activities within the NHL and surrounding area on Tinian.
- To account for the existing and new levels of training and to include additional mitigation measures and procedures, a new PA is being prepared. The NPS is one of the consulting parties, along with the Guam State Historic Preservation Office, the CNMI Historic Preservation Office, the Advisory Council on Historic Preservation, and the DoD.
- In addition to the PA, the DoD has developed adequate management measures, such as an Updated Cultural Resources Management Plan (2003), and more recent cultural resources surveys and documentation to help assess the effects of military training. The DoD also has in place procedures for addressing inadvertent discoveries of and disturbances to prehistoric and historic properties, natural disasters, and emergency situations.

FED2-4

- We recommend that the DoD make clear that it has, or will be, consulting the Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (63 Federal Register, April 24, 1998). These Section 110 Guidelines, as they are also known, make special provision not only for potential adverse effects on a NHL during planning for a proposed undertaking but also place special emphasis on the public interest in the NHL and the proposed undertaking. Does the new MIRC training program, as it relates to the North Field NHL, take into account not just the potential adverse effects to the NHL from training but also the impacts the training will have on the public interest, specifically public access to the NHL?
- Overall, the new PA should provide adequate protective measures for the NHL; therefore, the new PA, currently slated for signature in late spring or early summer, adequately addresses the National Park Service's concerns regarding the preferred alternative and potential effects to the NHL.

Specific Comments Related to the EIS/OEIS Training on Tinian and the Potential Effects on the North Field NHL under Alternative 1 (Preferred Alternative):

FED2-5
- Chapter 3.13.2.7 (pp.3.13-31-33): It would be helpful to have a more clearly stated description of the North Field NHL to enable readers to recognize that it is a distinct historic property. It might be useful to give readers a sense of the size of the NHL-approximately 2,600 acres-and note that among the contributing elements there are physical features such as Landing Beaches White 1 and White 2 (Unai Babui and Unai Chulu) along with the historic structures and other elements of the built environment.

FED2-6
- Figure 3.13-6 gives the impression that the northern boundary of the NHL could either extend to the northern tip of the island or extend across the northern edge of the runways. It is the latter, according to the NHL nomination.

FED2-7
- In this section (3.13.2.7), using the formal name of the NHL might improve clarity as well. The official name is the Tinian Landing Beaches, Ushi Point Field, and North Field, Tinian Island, National Historic Landmark.

FED2-8
- Section 5.4.3: The NPS is also one of the Cultural Resources Partners participating in the negotiation of a new PA and should be listed.

FED2-9
- Section 6.2.2: It seems that the first sentence of this section overstates the case when it claims in such absolute terms that none of the alternatives, including the preferred, would result in "significant cumulative impacts on cultural resources." It would be more accurate to state that the DoD does not *anticipate* that there will be significant cumulative impacts. Although this statement refers to all of the MIRC, it is relevant to the North Field NHL. Even though the type of training under the MIRC plan is similar to past training, the level is increasing, all of which raises the potential for increased cumulative effects.

Sincerely,

Stephen T. Gibbons

Stephen T. Gibbons
Superintendent
War in the Pacific National Historical Park
American Memorial Park

cc:
DLouter, NPS-Seattle
ASchmierer, PNP-Oakland

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
1111 Jackson Street, Suite 520
Oakland, California 94607

IN REPLY REFER TO:
ER# 09/127

Hardcopy

16 March 2009

Mariana Islands Range Complex (DEIS/OEIS)
Nora Macariola-See, PM code EV21
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

Subject: Review of the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS/OEIS), for the Mariana Islands Range Complex **(ER 09/127)**

Dear Ms. Macariola-See:

The Department of the Interior has reviewed the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS) for the Mariana Islands Range Complex (MIRC) and is offering the following comments. The lead Federal agency for the proposed action is the Department of Navy. Comments on the DEIS were submitted by the U.S. Fish and Wildlife Service (USFWS) pursuant to the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852] (NEPA); and other authorities mandating concern for environmental resources, including the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 et seq.; 48 Stat. 401], as amended (FWCA); the Federal Clean Water Act [33 U.S.C. 1251 *et seq.*; 62 stat. 1155], as amended (CWA); the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended (ESA); and the Sikes Act of 1960 [16 USC *et seq.*; 74 stat. 1052], as amended, and the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), as amended (MBTA).

The purpose of the proposed action is to upgrade and modernize the capabilities of the MIRC, which encompasses land, air and sea training ranges in Guam and the Commonwealth of the Northern Mariana Islands (CNMI). This proposed action is intended to fulfill and improve U.S. government national security and alliance requirements in the Western Pacific Region and increase the strategic defense role of Guam and the CNMI. The proposed action includes numerous activities that may result in significant impacts to fish and wildlife resources in Guam and the CNMI.

In a July 30, 2007, response to the Notice of Intent (NOI) to prepare the EIS for the proposed action, the USFWS recommended that specific resource areas of concern be addressed in the

FED3-1 DEIS. Some of these topics were not adequately addressed in the document. Rather than repeating these comments, the Department recommends that you ensure all concerns identified in the NOI are addressed in the Final EIS.

FED3-2 As currently written, the DEIS does not contain sufficient information for us to assess impacts of the proposed actions on federally listed species and other Federal trust resources. We recommend your providing additional specific information in the following areas in the EIS: 1) description of the action and analysis of alternatives; 2) new activities; 3) the overlay units of the Guam National Wildlife Refuge; 4) threatened and endangered species; 5) coastal and marine environment; 6) migratory birds; 7) brown treesnakes and other invasive species; 8) contaminants; 9) global climate change; and, 10) cumulative impacts. These categories are described in greater detail below.

FED3-3 *Description of the Action and Analysis of Alternatives*

Alternatives described in the DEIS form complex suites of activities with differences in frequency, duration and geographical footprint. Many proposed actions will employ apparently new and untested equipment, weaponry and/or technology whose potential environmental effects are poorly understood. As such, few details are provided on potential impacts of employing such actions. In addition, the DEIS does not provide sufficient detail on proposed construction of facilities and live-fire ranges, base expansion and alteration projects, and military training activities on land and in nearshore waters.

FED3-4 We recommend that either additional detailed information be supplied for each proposed activity or appropriate references to descriptions of these activities in other supporting documents be identified at relevant locations within the text.

FED3-5 Additionally, it appears that impacts from activities, conducted on the same range are considered the same regardless of their frequency or intensity. We maintain that increased frequency or intensity of a training exercise may increase the duration over which Federal trust resources are exposed to the impact (e.g., noise, fire risk). We recommend analysis of impacts for both Alternatives consider differences in frequency and intensity as they relate to impacts to listed species and trust resources.

New Activities

FED3-6 The DEIS proposes several new activities that may not have been analyzed previously. These activities include the Ferguson-Hill drop zone, Military Operations in Urban Terrain (MOUT) facilities, Portable Underwater Tracking Range (PUTR), Anti-submarine Warfare (ASW) training, Amphibious Raid Special Purposes training, and unspecified improvements to amphibious landing beaches.

These new proposed activities are not described in sufficient detail to determine their potential environmental impact. Site-specific natural resource information has not been provided for these activities, nor has any discussion of activity-specific alternatives been included. These new activities do not appear to have been included in the impact analysis of the proposed action on the terrestrial or marine environment.

FED3-7 We recommend these activities be described in more detail in the EIS, including site-specific information on natural resources, discussion of alternatives considered for each new activity, and analysis of impacts of these new activities. We recommend the EIS identify best management practices and/or standard operating procedures that will be implemented to avoid and minimize

unavoidable resource impacts from these activities. Where appropriate, the EIS should identify compensatory mitigation that will be developed for unavoidable resource losses to Federal trust resources resulting from these activities.

If this information is not available, we recommend these proposed training activities be identified as new and the EIS clearly state that appropriate environmental documents will be developed and permits obtained prior to implementing them.

Overlay Units of the Guam National Wildlife Refuge

FED3-8 In 1994, the Navy and U.S. Air Force entered into cooperative agreements with USFWS to create the Guam National Wildlife Refuge Overlay on military lands on Guam. This agreement established that the military will coordinate with the USFWS regarding Federal activities that may affect these areas even if they are currently unoccupied by the species. While the DEIS acknowledges the existence of overlay units, it does not clearly describe what activities are proposed to occur within these units, nor does it conduct an analysis of the potential impacts to natural resources within them. We recommend that further detailed information be provided on activities proposed to occur within these overlay units and that analysis of potential impacts to resources within these units be conducted.

Threatened and Endangered Species

The proposed actions have potential to adversely impact federally listed, candidate and Federal trust resource species. These impacts may include, but are not limited to: (1) habitat degradation from land-based training exercises, including live-fire ranges; (2) disturbance or collision with marine life during nearshore training exercises; (3) disturbance by aircraft over-flights and land-base training activities (e.g., increased risk of fire, noise, percussive force); and, (4) introduction of invasive alien species, especially the brown treesnake (*Boiga irregularis*). Detailed comments and recommendations on these issues are provided in the enclosure.

We recommend addressing these comments in the EIS and anticipate concerns and issues outlined in the enclosure regarding federally listed species will be addressed in our ongoing section 7 consultation pursuant to the ESA.

Coastal and Marine Environment

FED3-9 Several proposed activities (*e.g.*, amphibious landings, PUTR etc.) that are expected to have direct and potentially adverse impacts do not appear to have been included in the analysis (see section 3.6.3). Terrestrial-based activities have been excluded from analysis of potential impacts to the marine environment. Land-based activities can indirectly impact marine environment by increasing upland erosion and associated runoff of sediment, pollutants, and nutrients into coastal marine waters. Any activity on land that involves clearing of vegetation or may result in release of pollutants could result in adverse marine impacts. Therefore, we recommend that all proposed activities that will have direct and indirect impacts on marine and coastal resources are included in the impact analysis.

Migratory Birds

FED3-10 The DEIS currently lacks analysis of the proposed action on migratory birds. For example, the document does not include a detailed noise/percussive force analysis for overflights and weapons use. The DEIS also does not describe potential impacts from habitat loss due to fire, particularly for birds on FDM. Although it is indicated that impacts to seabirds are expected to occur at Lake Hagoi on Tinian and Fena Reservoir on Guam, later discussion discounts impacts to birds (including the Mariana common moorhen (*Gallinula chloropus guami*) an endangered species) at

both these locations. We recommend the EIS include analysis of noise, percussive force, and fire in relation to migratory seabirds and shorebirds and clarify anticipated effects to migratory (and endangered) birds at Lake Hagoi and Fena Reservoir.

Invasive Species

The inadvertent introduction of invasive species, including the brown treesnake, to Guam, the CNMI and Hawaii due to MIRC-related activities could adversely affect threatened and endangered species and other Federal trust species. The proposed action includes numerous avenues for transporting invasive species as outlined in our Specific Comments. Once established, new invasive species are often difficult and costly to eradicate. Therefore, prevention is the best way to reduce this potential threat. We are particularly concerned that proposed activities may directly increase the risk that brown treesnakes will be accidentally introduced to the CNMI and Hawaii.

Introduction of non-native invasive species (*e.g.*, plants, insects etc.) by MIRC activities can result in habitat degradation and/or loss. The loss and degradation that could occur as a result of the MIRC, coupled with the current status of the habitat and its continued loss through other actions (e.g., DoD and non-DoD construction activities, ungulate browsing etc.), could result in large cumulative loss of habitat throughout Guam and the CNMI. These additional impacts could have adverse effects on federally listed species and other Federal trust resources.

FED3-11 The DEIS describes the intention to outline inspection and sanitary procedures to avoid introducing invasive species to any islands where they are not currently found. We support this effort. We recommend specific operating instructions for invasive species quarantine and control be developed and incorporated into the EIS. It is recommended that the EIS identify funding mechanisms and techniques for early detection and eradication of incipient invasive species associated with proposed activities. Similarly, the EIS should identify funding mechanisms to manage and eradicate harmful invasive species that would get established in new sites due to the proposed activities.

Contaminants

FED3-12 The DEIS contains no estimate of amount of hazardous materials anticipated to be released or expected to accumulate in the environment, nor any discussion of environmental fate of these compounds. No determination on level of contaminant impacts to the environment has been made, other than to determine that substance concentrations would not "affect human health since military personnel exposure is limited and public access to training areas is restricted." (Page 3.2-25). We recommend an ecological risk assessment be conducted (*i.e.*, addressing potential impacts to biological resources in addition to human health risk).

The DEIS states that ranges will be cleaned up when no longer needed. We recommend that clean-up plans include provisions for habitat restoration after contaminant remediation has been completed in areas where viable habitat existed prior to contamination resulting from the proposed action.

Global Climate Change

FED3-13 Global climate change is expected to have significant impacts on the Pacific Islands. The DEIS does not include a discussion of potential impacts that climate change may have on training activities or facilities. Similarly, the DEIS has not considered how near-term impacts of climate

change may compound adverse impacts resulting from proposed training activities on fish and wildlife resources within the MIRC area.

We recommend the EIS consider (1) how climate change may affect proposed training activities (*e.g.*, alteration in training activity due to extended periods of drought), (2) how the influence of climate change may affect impacts of training activities (*e.g.*, reduction in rainfall may increase wildfire occurrence on live-fire ranges), (3) how these changes in potential impacts may affect fish and wildlife resources, and (4) proposed measures to monitor the effects of climate change and to make near-term adaptive changes to training activities accordingly in order to minimize adverse impacts to fish and wildlife resources.

Cumulative Impacts

In our July 30, 2007, response to the Notice of Intent to Prepare an EIS for the MIRC, we recommended that the analysis of cumulative impacts include the proposed relocation of U.S. military forces to Guam and the CNMI, other planned military projects (*e.g.*, Northwest Field Beddown and Global Strike Task Force expansions at Andersen Air Force Base) and private developments (*e.g.*, casino and homestead development on Tinian and inter-island ferry service). These activities combined with expanded training under the MIRC would add to impacts on Federal trust resources and should be included in the cumulative impacts analysis for the proposed project.

FED3-14

The DEIS restricts the impact analysis to only activities in the proposed alternatives and does not provide a full cumulative effects analysis, other than noting that impacts of certain developments within geographic areas would (a) be additive, (b) be beneficial, and (c) affect terrestrial or marine resources (see Table 6-1). Noted additive impacts and stressors to Federal trust species and habitat should be addressed in aggregate, and we recommend that a cumulative impacts assessment incorporating such effects be included in the EIS.

Summary

As currently written, the DEIS lacks sufficient information that should be disclosed in an EIS and is not considered adequate for decision-making. Specific comments on various sections in the DEIS are attached in Enclosure 1. The Department recommends you contact the USFWS to discuss concerns in detail and work to resolve outstanding issues prior to finalizing the EIS.

Thank you for the opportunity to review this project.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc:
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ENCLOSURE 1

Specific Comments

Page ES-8, ES 3.3. Other Environmental Requirements Considered. The list of other environmental requirements should include the Fish and Wildlife Coordination Act (FWCA).
FED3-15 This act requires Federal agencies to coordinate with Department of the Interior through the U.S. Fish and Wildlife Service (USFWS) when water resource development projects and other proposed actions may impact fish and wildlife resources. We recommend that the FWCA be added to the list and that requirements of the FWCA be considered within EIS analysis in all relevant sections of the document.

Page ES-11, ES 4.3.2. Alternative 1 (Preferred Alternative) – Increase Training, Modernization, and Upgrades; ISR/Strike. The paragraph indicates that (a) the force structure consists of a
FED3-16 variety of aircraft, (b) aircraft events will increase by 45 percent over the 2006 level, and (c) the increase will require improved range infrastructure to accommodate increased training tempo, newer aircraft, and weapons system. The USFWS completed a Biological Opinion for the ISR/Strike project on October 3, 2006, which evaluated a specific set of anticipated aircraft operations, construction activities, and conservation measures between 2007 and 2017. For the years 2009 through 2016, use of only 46 total aircraft was evaluated. There was not an evaluation of impacts for 48 fighters, 12 tankers, 6 bombers, and 4 unmanned aircraft as stated in the DEIS. Further, our evaluation included a maximum of 70 aircraft. From your summary it is unclear if proposed increase in training tempo, newer aircraft, and improved infrastructure are the same actions evaluated within the Biological Opinion and if the proposed timeline for implementation is still valid.

We recommend this paragraph and any subsequent discussions within the EIS regarding ISR/Strike be clarified. Please indicate which actions were previously evaluated, which actions are new, and how proposed modifications will need to result in either expedited implementation of the conservation measures or development of additional conservation measures to minimize impacts from modifications to the ISR/Strike project.

Page ES-11, ES 4.3.2. Alternative 1 (Preferred Alternative) – Increase Training, Modernization, and Upgrades; FDM. The paragraph describes restrictions in place for FDM but does not include
FED3-17 a brief summary of training actions that will occur on or around the island, although it is stated that "usage of FDM increases under either Alternative 1 or Alternative 2." We recommend a brief summary of training activities on or around FDM be included in order to make this summary more informative and meaningful.

Increased restriction to permanently close more area (up to 30 nautical miles) around FDM to public access is mentioned but not analyzed in the DEIS. This restriction is intended to minimize danger from hazardous activity in the area. Based on this, analysis of potential impacts to marine fish and wildlife resources, and potentially terrestrial resources on Anatahan, from these hazardous activities, should be conducted. This restriction represents a new action and does not appear to have been previously analyzed. We recommend analysis be included in the EIS.

Page ES-12, ES 4.3.2. Alternative 1 (Preferred Alternative) – Increase Training, Modernization,
FED3-18 and Upgrades; MOUT Repair. This paragraph, and text at other locations throughout the DEIS,

indicate that repairs and improvements to existing facilities and training beaches are needed. Depending on type of repair or improvement and location, these actions could adversely affect Federal trust resources. We recommend this summary include a table describing needed repairs or improvements. The section should indicate each area where facilities or beaches need repairs or improvements, type of repairs or improvements needed, and how they will be implemented (e.g., need for staging areas, equipment or supplies, alteration of habitat etc.). We recommend including a summary of measures that will be implemented to avoid unnecessary impacts and minimize unavoidable impacts, and compensatory mitigation that will be needed to replace any unavoidable loss of resources, particularly Federal trust resources.

FED3-19

Page ES-15, ES 6.2. Environmental Stressors Analyzed. The stressors presented here are direct impacts only (e.g., noise, trampling nests, direct strikes on wildlife). Indirect impacts caused by these activities, specifically results of disturbances caused by foot and vehicle traffic and exploding ordnances, should also be included in the analysis. These activities create ground and canopy disturbances, which are conducive to establishment of invasive species. Commensurately, transport of equipment and personnel provide vectors for organisms and propagules to be introduced to these sites. We recommend the EIS address all potential impacts, and describe biosecurity measures that will be implemented to prevent transport and establishment of invasive plants, invertebrates and microorganisms.

FED3-20

Page ES-15, ES 6.3. Summary of Environmental Impacts. This section is comprised primarily of Table ES-3. We recommend this table be updated based on resolution of specific comments that will result from further inter-agency discussions.

FED3-21

Page ES-28, ES 9.3. Irreversible or Irretrievable Commitment of Resources. The paragraph indicates that no habitat associated with threatened or endangered species would be lost as a result of implementation of training activities comprising the Proposed Action. The proposed action includes many conservation and mitigation measures to reduce potential habitat loss and most actions will not result in permanent loss of habitat. However, many actions may result in increased habitat degradation (e.g., trampling and compaction, erosion, clearing of pathways/trails etc.), temporary habitat loss (e.g., fires from explosive ordnance), and spread of invasive species. Introduction of non-native invasive species (plants, insects, ungulates, etc.) by MIRC activities has potential to alter habitats and could also result in habitat degradation and loss. These minor losses and degradation that could occur with implementation of the MIRC, coupled with current status of the habitats, continued loss of forest (by construction activities, both DOD and non-DOD, ungulate browse, etc.) on many islands, and the risk for non-native species introductions could result in a large cumulative loss of habitat throughout Guam and the CNMI. We recommend that this be clarified in the EIS particularly in light of plans for future expansion of military activities in the area.

FED3-22

Page 2-2, Section 2.1.2. Navy Controlled and Managed Training Areas of the MIRC and Page 2-17, Section 2.1.3. Air Force Controlled and Managed Training Areas of the MIRC. The figures in these sections should include boundaries of all recognized Federal and Territorial protected areas. Many of these legislated conservation areas are critical to conservation of Guam's and the CNMI's natural resources and their proximity to proposed training activities should be clearly indicated. We recommend all figures include boundaries of the U.S National Park Service (e.g., War in the Pacific National Historic Park and American Memorial Park), the USFWS (e.g., Guam National Wildlife Refuge, including its overlay units), DoD Ecological Reserves (e.g.,

Haputo and Orote, and Pati Point reserves), and local conservation areas (e.g., Sasa Bay Marine Preserve, etc.).

FED3-23

Page 2-22, Section 2.1.5. Other MIRC Training Assets. Table 2-5 indicates that training may be conducted within the Marpi Point area of Saipan (near Cow Town, see Chapter 3.11) and on non-DoD lands within the Municipality of Rota. These locations are not specifically defined in the DEIS nor are they delineated on Figures 2-8 and 2-11, respectively. Both Saipan and Rota support endangered and threatened species and migratory birds, which may be affected by implementation of the MIRC. Rota also supports critical habitat for two endangered species. We recommend that location of training activities on non-DoD lands on Saipan and Rota be delineated in Figures 2-8 and 2-11. These delineations may then be used to evaluate any potential impacts to listed species or their critical habitats on these islands.

FED3-24

Page 3.2-2, Section 3.2.1.2. Federal Laws and Regulations. The text on the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Pages 3.2-2 and 3.2-3) discusses hazardous wastes and hazardous substances, both of which already occur or will occur as a result of implementation of the MIRC. Hazardous waste and substance clean up, while designed to remove wastes that pose a risk to human health and safety or the environment, can result in habitat loss and destruction for endangered and threatened species and migratory birds and has resulted in habitat loss on Andersen Air Force Base.

We recommend that any clean up action planned under RCRA, CERCLA, or any other Act, on any DoD installations within Guam or the CNMI be coordinated with the USFWS as early as possible, ideally six months prior to soliciting bids for contractors, to ensure that impacts to trust resources and their habitats are avoided, minimized, or offset. Commitment to early coordination, as described above, should be included within the final EIS Chapter 5 on Mitigation Measures. We also request that you provide us with the National Priorities List of sites on Andersen Air Force Base and other areas in the CNMI so that we can provide you with early guidance regarding avoidance, minimization, and compensatory mitigation.

FED3-25

Page 3.4-1, Section 3.4. Air Quality. Neither this section nor any other section within the DEIS includes a discussion regarding training-related and arson-related wildfires on DoD lands associated with MIRC. Smoke inhalation is as detrimental to humans as it is to birds and other mammals. Additionally, training-related and arson-related wildfires can result in temporal or permanent loss of native species habitat (e.g., replacement of native vegetation by non-native invasive vegetation that does not provide adequate or any breeding, foraging, or sheltering functions for Federal trust resources). Therefore, we recommend revising this section to address all potential impacts from training-related and arson-related wildfires on DoD lands associated with the MIRC. The discussion should include assessment of potential impacts from smoke inhalation, habitat degradation, temporary habitat loss, including impacts to streams or wetlands where water may be extracted to extinguish fires, any planned use of retardants or fire/fuel break development, potential long-term or permanent habitat loss due to forest conversion to non-native grass and shrub savannahs, fire history (i.e., number of fires, location, size of the burn, control methods used, vegetation community prior to fires, current status of burned area), and fire risk at all locations within the MIRC action area. Within the DEIS, there is a conservation and mitigation measure to develop fire management protocols for training activities within the MIRC. We recommend conservation and mitigation measures be revised throughout the

document to include a timeline for completion of the plan and specifically indicate that fire management protocols will be implemented after they are developed.

Page 3.5-1, Section 3.5.1.2. Airborne Noise. The DEIS indicates that noise impacts to trust resources will be discussed within the respective chapters (Seabirds and Shorebirds, Terrestrial Species and Habitats, possibly Sea Turtles); however, only a narrow discussion is provided within these chapters. The discussion in these sections includes limited information regarding physiological and behavioral responses, including habituation to noise by trust resources. We

FED3-26

recommend that for Seabirds and Shorebirds, Terrestrial Species and Habitats, and Sea Turtles, more detailed discussions of anticipated noise impacts be included in the EIS. Analysis should address noise from overflights (fixed wing and rotary) and use of munitions and ordnance. Please include a comparative analysis of monitoring data collecting before, during, and/or after previous training exercises within the MIRC in relation to type of noise and noise level produced. Ideally, this comparative analysis would be at the species level; however, species groups (seabirds, shorebirds, passerines, bats, turtles) would be acceptable. This type of analysis is needed to support the discussion regarding behavioral response and habituation to noise by trust resources within MIRC. If these data are not available, we recommend development of a conservation and mitigation measure to conduct a short-term study at multiple locations within the MIRC action area to provide conclusive data regarding impacts of noise from training.

Page 3.5-8, Section 3.5.3.1 Environmental Consequences: Approach to Analysis. Table 3.5-2 is

FED3-27

restricted to Public Sensitive Receptors and does not necessarily include habitats for trust resources. We recommend that EIS sections on Seabirds and Shorebirds, Terrestrial Species and Habitats, and Sea Turtles contain more detailed discussions of anticipated noise, including a table for likelihood and frequency of the operation to exceed 65 decibels DNL for each area that supports habitat for listed species for each operation. We recommend noise model maps depicting different noise contours be developed following Figure 3.5-3 and Figure 3.5-4 on pages 3.5-11 and 3.5-13, respectively.

FED3-28

Page 3.6-12, Section 3.6.2.4. Coastal Communities. The text on Mangroves (Page 3.6-16) includes a description of the Puerto Rico Dump that implies the dump is still active. We recommend that it be made clear in the EIS that the dump has been capped and that waste is no longer being deposited into it.

FED3-29

Page 3.6-17, Section 3.6.2.5, Artificial Habitats. The discussion of artificial reefs is misleading because it implies that all materials that are not ships or Fish Aggregating Devices (FADs) were intentionally deposited into the marine environment to "enhance" resources or opportunities for recreation and fishing. There are few instances in the Mariana Islands where objects were intentionally placed in marine waters to create viable coral reef habitat. Rather, many of these objects were either inadvertently lost or intentionally disposed of and should more accurately be described as waste.

The resulting collection of organisms that normally settles on these discarded objects seldom comprises a community that possesses ecological function comparable to a natural coral reef community. The International Coral Reef Initiative (ICRI) has recommend against using artificial reefs as any form of compensatory mitigation because little scientific evidence exists to demonstrate that artificial reefs replace natural coral reef habitat. Moreover, ICRI has stated that "artificial reefs of any kind cannot replace a natural reef and do not function as effectively as a living

coral reef" and that "[artificial reefs] have the potential to cause environmental damage to coral reefs and associated ecosystems during construction and operation."

We agree that the purposes of deploying artificial reefs in the marine environment have been to enhance commercial fishery production/harvest, recreational activities, restore/enhance water and habitat quality, provide habitat protection and aquaculture production sites, and control fish mortality. However, we are not aware of any conclusive scientific evidence demonstrating that artificial reefs have enhanced commercial fishery production, or restored or enhanced water and habitat quality.

For reasons stated above, it is our opinion that including artificial habitats in the affected environment section is misleading and not necessary. Therefore, we recommend that Section 3.6.2.5 on artificial habitats be removed from the EIS. If you choose not to remove this section, we recommend it be clarified to accurately describe the intention, purpose, and source of the materials that have been dumped into coastal waters in the Mariana Islands. More importantly, this section should acknowledge that artificial reefs of any kind neither replace nor function as effectively as natural coral reef habitat. We recommend the body of scientific data on artificial reefs be reviewed to determine if it supports the validity of the stated purposes for deploying artificial reefs. If it does not, we recommend that such stated purpose be removed from the text.

FED3-30

Page 3.6-25, Section 3.6.3. Environmental Consequences. The analysis of vessel movements in marine environment is incomplete. No analysis of small crafts (e.g., Rigid Hull Inflatable Boats, Landing Craft Air Cushion [LCACs] or Amphibious Assault Vehicles [AAVs]) in nearshore waters has been provided. These vessels have potential to adversely impact nearshore coral reefs through direct impact with the bottom and alteration of the beach profile. Vessels also have potential to release contaminants (e.g., fuel, oil, etc.) into the environment. We recommend that potential impact resulting from use of these vessels be included in the impact analysis for the proposed action.

FED3-31

Page 3.6-29, Section 3.6.5. Summary of Environmental Impacts. Table 3.6-2 (Page 3.6-30) indicates that there will be "no significant impact to marine communities" from the proposed action. We are concerned that this conclusion is premature since impact analysis is incomplete. We recommend all activities be included in the impact analysis (see specific and general comments above) prior to reaching any conclusions regarding significance of impacts anticipated from the proposed action.

FED3-32

Page 3.8-25, Section 3.8.3.1.3. Sea Turtles: Land-based Training (Amphibious Landings). The DEIS indicates that Unai Chulu beach has been and will be used for LCAC landings; however, beach repairs are needed for future use. The DEIS also indicates that improvements are needed at Unai Babui. The DEIS does not discuss beach repairs or improvements, both of which have potential to adversely affect sea turtles by permanently altering habitat. The Navy has implemented and plans to continue applying "no wildlife disturbance" and "no training" areas for several beaches on Guam and Tinian; however, the DEIS does not include details on criteria that would be used to determine how such "off-limits" areas would be delineated and thresholds that would be used to trigger their implementation over time. The Navy surveys for coral cover, turbidity, fish assemblage, sedimentation rates, and site topography at Unai Chulu and Unai Babui and Unai Lamlam (as a control) to evaluate potential impacts from training; however, no comparative data are collected to evaluate sea turtle nesting rates or nesting success at beaches used for training versus a control site.

We recommend proposed beach repairs and improvements be described in the EIS, along with clarification of whether beach re-nourishment will be needed (see also comments above related to repairs and improvements to existing facilities and beaches). Please include brief discussion demonstrating how "no wildlife disturbance" and "no training" areas are determined and modified from monthly monitoring data (i.e., what are the thresholds for making a determination?). Please add additional conservation/mitigation measure that evaluates potential impacts from training on the rate of sea turtle nesting (versus false crawls) and success of nesting (hatch rates) at beaches used for training and at a control site. Nesting beaches should be inspected on a daily basis beginning at 90 days prior to an amphibious landing or other training activity on beaches known to support nesting sea turtles to further avoid disturbance to active nests. Night training should be avoided around expected dates for nest hatches.

FED3-33

Page 3.8-25, Section 3.8.3.1.3. Sea Turtles: Land-based Training (Amphibious Landings). The DEIS says that Unai Chulu will "require beach repairs prior to use" and that Unai Babui will be "capable of supporting AAV landings with improvements." Repairs and improvements are not described and assessment of potential impacts of these modifications cannot be made. We recommend a complete description of these modifications be included and their potential impacts on Federal trust resources be analyzed in the EIS.

FED3-34

Page 3.8-25, Section 3.8.3.1.3. Sea Turtles: Land-based Training (Amphibious Landings). More current information on the marine environment fronting Unai Dankulo, Unai Chulu, and Unai Babui is available. In cooperation with numerous Federal and commonwealth partners, the USFWS completed surveys of coral reefs fronting these Tinian Beaches. This report is available from Naval Facilities Engineering Command Pacific (Ms. Vanessa Pepi). We recommend results of this work be reviewed and incorporated into description of the affected environment as appropriate.

FED3-35

Page 3.8-25, Section 3.8.3.1.3. A wide reef flat, one of the widest on Tinian, fronts unai Dankulo. It is significantly wider than reef flats at Unai Chulu and Unai Babui. The description of the reef flat at Unai Dankulo contained in the DEIS is somewhat misleading, and we recommend the description be reworded to clearly state that this reef flat is significantly wider than reef flats at Unai Chulu and Unai Babui.

FED3-36

Page 3.10-1 Seabirds and Shorebirds. We appreciate development of conservation measures to minimize or mitigate adverse effects from military readiness activities to migratory birds. However, the section does not include a detailed noise/percussive force analysis for overflights and weapons use. The chapter also does not describe potential impacts from habitat loss due to fire, particularly for birds on FDM. The section does indicate that effects to seabirds are expected to occur at Lake Hagoi, Tinian and Fena Reservoir. However, later discussion discounts effects to birds (including the Mariana common moorhen, an endangered species) at both these locations. Additionally, Table 3.10-2 Seabirds and shorebirds within the MIRC study area does not include species on Saipan that may be using areas near the commercial port, Garapan, or the Marpi area. There are missing data within this table and chapter. Figure 3.10-1 Seabird rookery locations on FDM for masked, red-footed, and brown boobies, and great frigate birds is dated 2000 and documents a great frigate bird population on the western cliffs of FDM; however training on FDM, which has been ongoing since the map was developed, may have eliminated the colony of great frigate birds. The lack of records of occurrence of the short-tailed albatross, Hawaiian petrel, and Newell's shearwater may be an artifact of the lack of

comprehensive seabird surveys in and around Guam and the CNMI. The chapter also discusses the ingestion of expended materials.

To address these concerns, we recommend:

- Inclusion of an analysis of noise, percussive force, and fire as described above (see Airborne Noise and Air Quality) in relation to seabirds and shorebirds.

- Clarification of effects of proposed action on migratory and endangered birds at Lake Hagoi on Tinian and Fena Reservoir on Guam.

- Inclusion of a discussion of the Newell's shearwater within this chapter. We also recommend you make a determination of effects of the proposed action on this species because it is listed as threatened under the ESA.

- Revision of Table 3.10 to reflect seabirds and shorebirds on Saipan, and indicate specifically where short-tailed albatross, Hawaiian petrel, and Newell's shearwater were detected during the 2007 Mariana Islands Sea Turtle and Cetacean Survey cruise. Please provide a copy of the cruise report to the Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii.

- Removal of the Guam rail from Table 3.10 since it is neither a seabird nor a shorebird and relocation of the information in Chapter 3.11 on Terrestrial Species and Habitats.

- Revision of Table 3.10-2 to include additional data from the U.S. Department of Agriculture, Animal and Plant Inspection Service, Wildlife Services on Guam, which completed avian surveys in selected locations to document the presence and absence of avian diseases. Since the Navy has monitored seabirds at FDM for several years, please provide a more detailed analysis of potential impacts to these species. Include relative population numbers, whether breeding colonies have shifted their locations or size due to military training, and complete an analysis that evaluates population abundance in relation to season and training activities as covariates. This more detailed analysis should be used to evaluate and modify, if necessary, existing conservation and minimization measures to protect seabirds and should be used to better describe potential impacts from overflight and explosive ordnance exposure (i.e., are population fluctuations correlated with increased training or are they driven by seasonality, weather, etc. See also the noise-related comments above).

- Removal of the section regarding the family Rallidae since rails, moorhen, gallinules and coots are neither seabirds nor shorebirds and relocation of the information to Chapter 3.11 on Terrestrial Species and Habitats. It should be noted that the Mariana common moorhen occurs on Guam, Rota, Tinian, and Saipan and the Guam rail occurs on Guam and Rota.

- Inclusion of a discussion of cumulative effects from implementing the proposed action while long-line and short-line fishing is occurring as both fishing techniques are known to attract and injure seabirds, including albatross. We recommend consideration of incorporating a mitigation measure to have a trained Navy observer on 100 percent of Naval missions to identify seabird species (particularly those protected under the ESA or

those that could be significantly impacted by MIRC, i.e., great frigate bird and masked booby), enumerate individuals, and document fate during missions (i.e., bird remained in the area, appearing unharmed; bird was foraging, bird left the area, bird received an injury from collision, direct strike, etc.). This observer would be in addition to marine mammal and sea turtle observers as directionality of observations would make collecting quality data by one individual difficult. Alternatively, the Navy could examine use of sonar to detect upwelling of fish, squid, and other prey species, as seabirds are attracted to these upwellings. If prey upwellings were detected, additional avoidance measures could be developed and implemented (i.e., targeting fire in a different direction, maneuvering ships away from the upwelling, etc.). Seabirds are often attracted to artificial lighting; therefore, we recommend you evaluate potential for reducing impacts from lighting to seabirds by exploring and implementing ways to minimize non-essential lighting while at sea. We recommend the Navy include a mitigation measure that researches and develops training materials (chaff, plastic caps, etc.) that when expended are biodegradable and do not pose an ingestion hazard for migratory birds and sea turtles.

FED3-37

Chapter 3.11 Terrestrial Species and Habitats. This chapter includes information regarding the ESA and listed, candidate, and delisted species and critical habitat. We recommend following information be incorporated into the EIS: (1) detailed analysis of impacts from noise, percussive force, and fire for these species; (2) discussion of habitat degradation and loss due to military training; (3) identification of the Guam National Wildlife Refuge (including overlay units); the Federal Aviation Administration mitigation parcel on Tinian, and other conservation areas within Guam and the CNMI on maps; (4) identification of locations of training on non-DoD land on Rota and the Marpi Maneuver area on Saipan; (5) discussion of areas and actions on Guam, Rota, and Saipan including a list of species that may be impacted as detailed for Tinian (see page 3.11-26); (6) correlation of the sizes of areas reported for habitat in Table 3.11-2 Vegetation Community Types on MIRC Lands on Guam with the discussion in preceding pages; (7) specific locations of live-fire training with use of bullet traps that may occur on Rota; (8) information on sea turtle basking on coastal habitat on Tinian and FDM and nesting on Tinian; and, (9) more complete and up-to-date species-specific information for several species because the text currently includes information that is not complete or current for several species, which may artificially over- or under-estimate current population levels. The USFWS may be able to assist in updating this population information.

We recommend inclusion of the definition of harm and harass within your definition of "take" and reevaluation if any of the potential affects will result in take based on harm or harassment. Please include an analysis of noise, percussive force, and fire as described above (see Airborne Noise and Air Quality) in relation to terrestrial species and their habitats. Also please include a discussion regarding habitat degradation and loss from military training activities as described above under ES -28 Irreversible or Irretrievable Commitment of Resources. We recommend revision of the discussion of actions on Guam, Rota, and Saipan to reflect species that may be impacted, such as the pair of nightingale reed-warblers at the Marpi Maneuver Area. Please revise either the discussion or Table 3.11-2 to reflect a consistent amount of habitat reported from each location and revise the Coastal Habitat Type Discussion for Tinian and FDM to reflect use by basking and or nesting sea turtles in these habitats or reference the sea turtle chapter. Also, please include a general vegetation map for FDM in this chapter.

We recommend revision of Table 3.11-4 (Threatened and Endangered Species within the MIRC Study Area) to indicate on which islands each species occur; include listed seabirds and sea

turtles as well or reference the relevant chapters. In addition, please revise habitat description for nightingale reed-warbler as this species nests in tangantangan and impacts to tangantangan habitat may adversely affect this species.

We recommend inclusion of a map and a status update related to the out-planted *Serianthes nelsonii* trees.

We recommend revising the species account for the nightingale reed-warbler to reflect new survey data, use of tangantangan habitat by the species, extirpation of the species on Guam and Pagan, and threats to the species from urban development.

We recommend updating the Mariana swiftlet species account to include population estimates from other islands, including Saipan.

We recommend inclusion of a discussion of the Guam National Wildlife Refuge Overlay and essential habitat for the Mariana crow, Guam Micronesian kingfisher, and Mariana fruit bat.

We recommend the Navy provide your quarterly survey data for Mariana common moorhen at Fena Reservoir on Guam and Lake Hagoi on Tinian to the Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii, including a description of the buffer zone, in terms of area protected, overflights, Surface Danger Zones, etc. for Hagoi. If the buffer zone is inadequate, Mariana common moorhen may be adversely affected by training.

We recommend most recent survey data collected for the Joint Guam Program Office project for butterflies and treesnails be included in the EIS along with information that ungulates and rats are likely threats to treesnails in the Mariana Islands as they are in Hawaii. We recommend you outplant host plants for the Mariana eight-spot butterfly within ungulate exclosures that will be built on Andersen AFB.

We recommend inclusion of a conservation and mitigation measure to improve moorhen habitat at Fena Reservoir, Agana Marsh, and Naval Station Marsh on Guam, and at Lake Hagoi on Tinian to increase the abundance of moorhen in these areas.

FED3-38

Page 3.11-4, Table 3.11-1. Summary of Potential Stressors to Terrestrial Species and Habitats. The stressors used in analyses in Chapter 3 (Table 3.11-1) are direct impacts only (e.g., noise, trampling nests, direct strikes on wildlife). Analyses need to include indirect impacts caused by these actions, specifically results of disturbances caused by foot and vehicle traffic and exploding ordnances. These create ground and canopy disturbances, which are conducive to establishment of invasive species. Commensurately, transport of equipment and personnel provide vectors for organisms and propagules to be introduced to these sites. The EIS needs to address these potential impacts, and describe biosecurity measures to prevent transport and establishment of invasive plants, invertebrates and microorganisms. Particular attention should be given to undeveloped areas such as the Tinian Exclusive Military Use Area, and Northwest Field and the Ordinance Annex on Guam.

We suggest that Table 3.11-1 indicate which activities pose risk of invasive species introduction. For example, Surveillance and Reconnaissance, Field Training Exercise, Ship to Objective Maneuver, Operational Maneuver, Assault Support, Reconnaissance and Surveillance, Naval Special Warfare, Amphibious Warfare, Combat Search and Rescue, ISR, and REDHORSE all

have potential to cause disturbance and disperse invasive plant, invertebrate, and microbial species that could negatively impact vegetative communities.

FED3-39

Pages 3.11-60-62, Section 3.11.3.1.2. Explosive Ordnance and Practice Munitions. Ground and canopy disturbance caused by explosive ordnance and munitions can create conditions conducive to establishment of invasive plants and subsequent alteration of native forest. We recommend the EIS address this impact and describe measures to prevent it.

FED3-40

Page 3.11-62, Section 3.11.3.1.3. Bivouac and Land Navigation. Ground disturbance caused by land-based training can assist in creating conditions conducive to establishment of invasive plants and subsequent alteration of native forest. We recommend the EIS address this impact and describe measures to prevent it. In particular, efforts to prevent dispersal of invasive species need to be discussed.

FED3-41

Page 3.11-66, Section 3.11.3.2.1. Alternative 1 - All Stressors. Increased training activities near areas where endangered *Serianthes nelsonii* is extant, or could potentially grow, are of particular concern from an invasive species perspective. We recommend the EIS describe efforts associated with training activities that will be taken to prevent introduction of invasive plants that could compete with *S. nelsonii* seedlings. Similarly, we recommend the EIS describe efforts to prevent creation of additional trails associated with training that could facilitate additional ungulate access.

FED3-42

Page 3.11-66, Section 3.11.3.2.2. Conservation Measures. We appreciate the Conservation Measures discussed in this section. We recommend the EIS also include Conservation Measures to minimize introduction of plant, invertebrate and microbial invasive species through disturbance and transport during training exercises. Section 6.2.4 (pages 6 - 23-24) provides a preliminary summary of efforts that could be implemented to reduce invasive plant introductions.

FED3-43

Pages 3.11-66-67, Section 3.11.3.2.2 (Brown Treesnake Conservation Measures). We appreciate the Brown Treesnake Conservation Measures discussed in this document. However, we are unable to assess effectiveness of brown treesnake measures without having specific measures enumerated. We recommend the EIS be more specific about Brown Treesnake Conservation Measures. Further detail related to implementation of measures should be discussed in the MIRC Biological Opinion.

We recommend that brown treesnake interdiction and control efforts described within the EIS equal those implemented by the Air Force in the ISR Biological Opinion. Language that can be paraphrased can be found in the Air Force ISR Strike Biological Opinion (pages 14-15). This information is provided below.

"Brown Treesnake Interdiction and Control – To prevent brown treesnakes from leaving Guam in any Air Force cargo, vehicles, munitions, household goods, and other items the Air Force will program for and facilitate a 100 percent inspection rate for all of these items departing for Andersen AFB or other sites on Guam where they are staged for departure from Guam (see Appendix C of Air Force 2006b). The Air Force will implement this effort by providing funds to support sustained brown treesnake trapping, capture, and toxicant use efforts by U.S. Department of Agriculture – Wildlife Services (Wildlife Services) in the vicinity of sites where Andersen AFB cargo munitions, vehicles, and other items are staged stored, or packed prior to departing

Guam. To insure adequate funding is available for the 100 percent inspection rate during periods of peak movement of Air Force cargo, munitions, household goods, and other items shipped from Guam, the Air Force will develop a mechanism with Wildlife Services and the Service, that will forecast program funding with the Air Force's or Andersen AFB's annual budgeting cycle to ensure adequate funding is available for Wildlife Services to maintain a 100 percent inspection level for these items at least 18 months in advance. Also, to insure that orders to inspect cargo meet the Department of Defense's Defense Transportation Regulations, Chapter 505 protocols of these regulations should be incorporated into the Andersen Air Force AFB 36 WG Instruction 32-7004, Brown Tree Snake Management (Appendix C of Air Force 2006b)."

Subsequent to a paragraph on Research support, the document continues as follows: "Finally, to evaluate the effectiveness of the inspection program, the Air Force will have Wildlife Service provide monthly reports on their operations. In addition, the Air Force will review the status of the inspection program quarterly with the Service and Wildlife Services and at the annual brown treesnake meeting in Honolulu, Hawaii. The monthly reports will provide details on which cargo was inspected or un-inspected, potential level of risk of cargo type, and where the cargo was shipped (mainland United State, United States Territories, Hawaii). The report will also provide a simple explanation why specific cargo shipments were missed and document snake detections by canines or other high risk incident. This report will be submitted to the Service, Air Force (Pacific Air Forces, Andersen AFB Commander, and Environmental Flight), State of Hawaii (Department of Agriculture and Department of Land and Natural Resources), Commonwealth of the Northern Mariana Islands (Division of Fish and Wildlife) and Air Force Cooperators."

FED3-44 Page 3.11-67, Section 3.11.3.2.2 (Brown Treesnake Conservation Measures). We appreciate the Navy proposing to support rapid response efforts related to brown treesnake sightings associated with MIRC activities within the CNMI and Hawaii. We recommend the Navy provide additional information on type and level of support for rapid response (e.g., numbers and type of personnel, amount of funding etc.).

FED3-45 Page 3.11-67, Section 3.11.3.2.2 (Brown Treesnake Conservation Measures). We appreciate that the Navy proposes to fund an additional project within the BTS Control Plan. We recommend the Navy provide additional information on type and level of support proposed.

FED3-46 Page 3.11-67, Section 3.11.3.2.2 (Brown Treesnake Conservation Measures). We appreciate that the Navy proposes to provide BTS awareness training for all personnel involved in training activities. We recommend the Navy provide addition information on specific type(s) of training.

FED3-47 Page 3.11-67, Section 3.11.3.2.2 (Rat eradication on FDM). We appreciate that the Navy is considering rat eradication on FDM as a potential conservation measure. The description of this measure suggests that rat eradication "is possible" but does not state if the Navy is committed to implementing this conservation measure. We recommend the Navy clearly state its intention for this activity.

FED3-48 Page 3.11-67, Section 3.11.3.2.2 (Maintain buffers around sensitive ecological features). Training near Mariana swiftlet caves and wetland areas has potential to impact listed species. Therefore, we recommend the EIS describe size, location and adequacy of "already identified buffers" around these sites. We recommend that this additional information be provided in the text or shown in Figure 3.11-12.

FED3-49 Page 3.11-67-68, Section 3.11.3.3. Alternative 2 – All Stressors. The increased use of explosive ordinance and ground-based training activities described in the EIS poses increased risks of invasive species introductions and establishment. We recommend analysis of Alternative 2 address these issues.

FED3-50 Page 3.11-70, Table 3.11-8. Summary of Environmental Effects of the Alternatives on Terrestrial Species and Habitats in the MIRC Study Area. The training activities described in this table increase likelihood of habitat disturbance and invasive species movement and establishment. We recommend the table reflect this issue.

FED3-51 Page 3.11-66, Section 3.11.3.2.2. Conservation Measures. We appreciate that the Navy is currently supporting eradication of ungulates on the island of Anatahan. We recommend the EIS include completion of ungulate eradication on Anatahan as a conservation action.

FED3-52 Chapter 5 Mitigation Measures. We appreciate that the Navy has implemented and continues to propose conservation and mitigation measures throughout the DEIS. We commend the Navy for adding new conservation measures to protect terrestrial species and their habitats. Throughout this letter we have suggested additional conservation and mitigation measures to further reduce impacts to trust resources. The mitigation measures section does not appear to incorporate measures from the sea turtle chapter regarding the avoidance of nesting and basking turtles, known nests, and hatchlings. The DEIS is also unclear regarding the presence of a "no wildlife disturbance area" on the northern portion of Farallon de Medinilla, Waterfront Annex, Ordnance Annex, and the Military Leaseback Area (MLA) on Tinian.

We recommend you incorporate our conservation and mitigation measures suggested within this letter into appropriate chapters and chapter 5 to further limit impacts to Federal trust resources. Please incorporate measures from the Sea Turtle chapter within chapter 5. Please clarify if "no wildlife disturbance" areas will still be applied to northern portion of Farallon de Medinilla, Waterfront Annex, Ordnance Annex, and the MLA on Tinian or suggest alternative means of avoiding impacts to trust resources, particularly species protected under the ESA, using habitats in these locations.

We recommend the brown treesnake conservation measures include interdiction for 100 percent of all training activities, not just large actions. We appreciate coordination regarding conservation measures to date and request the Navy continue coordinate with the Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii, to ensure brown treesnake measures, ungulate management plan, rat eradication plan, seabird monitoring, life history studies for Micronesian megapode, fire management plan, and buffer zones, achieve both Navy and USFWS goals.

FED3-53 Pages 5-22-23, Section 5.3.2.1. Measures Proposed to Reduce, Avoid, or Minimize Adverse Effects Associated with the Proposed Increase in Training Activities. Please refer to comments regarding Conservation Measures in Section 3.11.3.2.2

FED3-54 Chapter 7 References. This chapter did not include references for the Seabird and Shorebird chapter, nor the Terrestrial Species and Habitats chapter. We recommend you include these references in your final EIS. We further recommend that you provide us with an electronic copy of all references cited, particularly gray literature, survey reports, and personal communications within

Seabird and Shorebird, Terrestrial Species and Habitats, and Sea Turtles chapters. Your cooperation for future documents will also enable us to expedite portions of our review, commentary, and regulatory follow up (i.e., section 7 consultations).

FED 4

Western Pacific Regional Fishery Management Council

March 13, 2009

Mariana Islands Range Complex EIS
258 Makalapa Dr., Ste. 1000
Attn: EV2
Pearl Harbor, Hawaii 96860-3134

Dear Sir or Madam:

The Western Pacific Regional Fishery Management Council (Council) submits the following preliminary comments on the MIRC Draft Environmental Impact Statement (DEIS). We offer these as preliminary because we were provided the document late by the U.S. Navy (March 5, 2009), while in November 2008 we requested to be on the distribution list. The Council may provide additional comments after its next meeting occurring March 24-26, 2009 in American Samoa.

FED4-1

1. Under the preferred alternative, Alternative 1, it is proposed that a permanent 10 nm "danger zone/restricted area" around FDM would be established. Currently, or under the No Action Alternative, there is no permanent closed area around FDM, but during training exercises, there is a temporary 3 nm closure. FDM is approximately 54 nm from Saipan and an important bottomfish fishing and pelagic trolling area for the CNMI non-commercial and commercial fishing fleet. While the CNMI government does not require fish logbook reporting which would provide spatial catch information of the number fish that are harvested around FDM, anecdotal information suggests that FDM is a fishing area often visited by CNMI fishermen. Furthermore, FDM is the closest island north of Saipan, CNMI's most populated island. Like all islands in the Pacific, it aggregates fish, making it fertile fishing grounds for CNMI fishermen with vessels capable of making the trip.

   The DEIS does not provide any information on the impact of a permanent 10 nm closure around FDM, and based on our understanding of the importance of FDM to current and future CNMI fishery participants, the Council does not support a permanent 10 nm closure around FDM. The FEIS should provide the impact of such a closure, and if such a closure was implemented, the U.S. Navy should mitigate the current and future impact to CNMI fishermen by funding Fish Aggregation Devices around Saipan or other areas to make up for the loss of fishing area that a 10 nm permanent closure around FDM would produce.

FED4-2

2. The DSEIS states on Page 3.16-10 that: "Commercial fisheries in CNMI and Guam have remained relatively stable during current military training activities. The number of commercial fishing vessels has remained under 10 during the reporting period that is available. Given the size of the training area and the limited number of commercial fishing vessels, it is unlikely that the commercial fishing industry would realize an impact as it is unlikely that implementation of Alternative 1 would change or have an impact on commercial fishing."

   While there may be less than 10 fishing vessels in CNMI and Guam that are registered under U.S. Coast Guard regulations as "commercial," there are hundreds of vessels operated in CNMI and Guam that are used by part-time commercial fishermen. These vessels are not registered as "commercial" because they do not meet the criteria for "commercial" vessels under U.S. Coast Guard regulations.

   The FEIS should include accurate information on the number of part-commercial fishermen in CNMI and Guam and analyze the impacts of the alternatives those fishermen.

FED4-3

3. Section 3.9 of the DEIS identifies the direct and indirect impacts of the alternatives on fish and Essential Fish Habitat (EFH). The analysis generally concludes that the alternatives will only have short-term or localized impacts and no long-term significant impacts on fish or EFH. Similar conclusions are made about sea turtles, seabirds, and marine mammals in subsequent sections of the document.

   Section 6.2.3 of the DEIS discusses cumulative impacts to Marine Resources, but does so in a cursory manner, and does not provide an adequate cumulative analysis as called for under NEPA. For example, the cumulative impacts analysis does not consider impacts to the endangered Marianas Megapode, which occurs on FDM. As mentioned above, the direct and indirect analysis identifies short-term impacts, which when considered cumulatively, could have significant and long-term effects.

   Where appropriate, the cumulative impacts analysis in the FEIS should provide quantitative assessment and comprehensive discussion of cumulative impacts of MIRC activities over the course of the next 5-10 years or longer.

Thank you for considering these comments.

Sincerely,

Kitty M. Simonds
Executive Director

Western Pacific Regional Fishery Management Council

March 31, 2009

Marianas Islands Range Complex EIS
258 Makalapa Dr., Ste. 1000
Attn: EV2
Pearl Harbor, Hawaii 96860-3134

Dear Sir or Madam:

In addition to the comments provided on March 13, 2009, the Western Pacific Regional Fishery Management Council (Council) submits the following comments on the Marianas Islands Range Complex (MIRC) Draft Environmental Impact Statement (DEIS).

FED4-4

1. The DEIS does not address inshore and offshore seasonal fishing patterns and how carrying out training activities as proposed under the proposed action (and all alternatives) may impact such seasonal fishing conducted by the people in Guam and the Commonwealth of Northern Marianas Islands (CNMI). Furthermore, seasonal weather conditions on Guam often only allow fishing in wind-protected areas, and some of the best fishing areas are controlled by the U.S Navy (e.g. Orote Point). It is our understanding that these areas are sometimes closed without adequate notice to fishermen. Fishermen are forced to travel around these areas which can burn fuel and expose fishermen to dangerous sea conditions. The FEIS should address seasonal-related fishing impacts resultant from the continued and expanded operation scope of the MIRC both on Guam and in the CNMI.

FED4-5

2. The DEIS does not describe the impact the proposed action on CNMI's supply of fresh fish and how an permanent 10 nm closure around FDM could significantly impact the supply of fresh fish as it would eliminate an important fishing area for people of the CNMI. FDM is an important fishing area for the redgill emperor (or *mafute*) and the Council does not support a permanent 10 nm closure around FDM as it would significantly reduce community access to a culturally important resource as well as reduce the supply of locally-caught fresh fish.

FED4-6

3. The DEIS does not address the issue of community consultation and potential for community participation in the management of the MIRC. The combined effect of the recently established Marine National Monuments in the CNMI and the proposed expanded scope of the MIRC results in a significant percentage of land and ocean under control by the federal government. The U.S. Navy should consider establishing a community advisory committee that would advise the Navy on community issues associated with the ongoing operation of the MIRC.

Thank you for the opportunity to comment as well as for extending the comment period.

Sincerely,

Kitty M. Simonds

Kitty M. Simonds
Executive Director

MARINE MAMMAL COMMISSION
4340 East-West Highway, Room 700
Bethesda, MD 20814-4447

16 March 2009

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Attention: EV2
Pearl Harbor HI 96860-3134

To Whom It May Concern:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Navy's Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS) evaluating proposed activities in the Mariana Islands Range Complex. The complex includes approximately 501,873 nmi^2 of open ocean and coastal waters in the western Pacific Ocean from south of Guam to north of Pagan, Commonwealth of the Mariana Islands, and from the middle of the Philippine Sea to the Pacific Ocean east of the Mariana Islands. It also includes additional restricted land areas and air space as well as portions of the Marianas Trench National Monument. It does not include the territorial waters of the Commonwealth of the Mariana Islands (out to 12 nmi). The DEIS analyzes vessel movements, aircraft overflights, exercises using non-explosive practice munitions, use of mid-frequency antisubmarine sonar, and underwater detonations of high-explosive ordnance.

The DEIS describes three alternatives: one purportedly consistent with the levels of activity in prior years (the Navy's no-action alternative), another with an anticipated increase in activity (alternative 1), and a third with a further increase in activity (alternative 2). The Navy prefers alternative 2.

RECOMMENDATIONS

The Marine Mammal Commission recommends that the Navy—

FED5-1 • revise its DEIS by providing a comprehensive description of past activity levels in the Mariana Islands Range Complex so that the reader can judge whether the activity types and levels proposed under the no-action alternative are, indeed, consistent with past practices;

FED5-2 • revise its DEIS by incorporating a set of explicit and clear metrics that the Navy, the public, and decision-makers can use to make informed judgments about various levels of readiness based on their benefits and costs;

FED5-3 • revise its DEIS to include an alternative involving a reduction in activity types and levels to ensure that decision-makers are fully informed and presented with a full range of alternatives;

FED5-4 • revise its DEIS by limiting its scope to those proposed activities that can be described in sufficient detail to provide a reliable basis for assessing benefits and costs;

FED5-5 • subject its reviews of marine mammal density, distribution, behavior, and habitat use to scientific peer review; and

FED5-6

- develop and implement a plan to evaluate the effectiveness of monitoring and mitigation measures before beginning, or in conjunction with, operations under the final environmental impact statement and anticipated issuance by the National Marine Fisheries Service of an incidental harassment authorization.

RATIONALE

The Commission's rationale for its recommendations is as follows.

Describing Past Activity Levels

In an environmental impact statement, the no-action alternative provides an essential baseline to ensure that the full effects of a proposed action are described to the public and decision-makers. At its most basic level, "no-action" means just that—the action agency does not undertake the proposed action in any form. An action agency also can use the no-action alternative to represent its current level of activity. However, it should only do so if the effects of the current level of activity have been analyzed previously (the preferred approach) or are revealed by the current analysis.

In this DEIS the Navy is using the no-action alternative to represent past types and levels of activity. The implication of this approach is that under the no-action alternative, the environmental effects will be the same as those arising from past activities. However, past types and levels of activity are not described adequately in this DEIS, and it is therefore not possible for the public or decision-makers to verify that such is indeed the case.

On pages ES-9 and 2-24 of the DEIS, the Navy provides brief descriptions of past activities in the complex, but those descriptions are insufficient. For example, the 1999 document on military training describes activities taking place a decade ago but only addresses shoreside effects of land and air activities plus nearshore mine warfare and small explosive ordnance training. The other environmental analyses cited in the DEIS pertain to airborne activities and a single large-scale training exercise, Valiant Shield. It appears then that previous analyses do not evaluate a number of activities that are included in the no-action alternative in the DEIS.

Although regulations under the National Environmental Policy Act encourage the practice of referencing existing documents and building on previous analyses, this DEIS does not point clearly to the essential references. The DEIS only gives examples of analytic documents rather than listing the complete set that would be needed to fully inform readers. Furthermore, the Commission questions whether it is reasonable to expect readers to find other pertinent documents, synthesize the material in them, and then compare the result to the list in the DEIS to determine what was or was not covered in prior analyses. As the action agency, the Navy has the responsibility to provide the relevant information in a clear and comprehensive manner and, in this case, the Commission does not believe the Navy has done so.

Readers could simply assume that the activities described in the no-action alternative are consistent with those in past years. However, that assumption seems inconsistent with the recent increasing trend in naval activities generally and in the Mariana Islands Range Complex in particular. For example, the Commission understands that shoreside support services in the Philippines and Japan have increased in recent years.

For all of these reasons, the Commission believes that the DEIS falls short of providing the required analyses. Failure to do so seems inconsistent with the intent of the National Environmental Policy Act. Therefore, the Marine Mammal Commission recommends that the Navy revise its DEIS by providing a comprehensive description of past activity levels in the Mariana Islands Range Complex so that the reader can judge whether the activity types and levels proposed under the no-action alternative are, indeed, consistent with past practices.

Including Explicit and Clear Metrics for Evaluating the Alternatives

The underlying premise for this analysis (and similar analyses for other Navy ranges) is that certain levels of activity are essential to maintain national security readiness. The Commission assumes that the Navy uses certain explicit scaled metrics of readiness, but in this and previous DEISs the Navy does not describe those metrics. The Commission believes that the public and decision-makers can make informed decisions only if they have clear measures of benefits and costs over a suitably wide range of activity types and levels. Therefore, the Marine Mammal Commission recommends that the Navy revise its DEIS by incorporating a set of explicit and clear metrics that the Navy, the public, and decision-makers can use to make informed judgments about various levels of readiness based on their benefits and costs.

Including an Alternative that Reduces Activity Types and Levels

The Navy's DEIS for the Mariana Islands Range Complex limits the alternatives available to decision-makers. That is, a decision-maker informed solely by this DEIS would only be able to choose between maintaining the level of activity described as the status quo or increasing it. The option of decreasing activity types and levels is not evaluated, but such may be required under certain fiscal conditions, be reasonable under certain security-related conditions, or be necessary under certain environmental conditions. The reader is offered no analysis of the readiness consequences of such reductions in activity, whether for the purpose of reducing adverse environmental effects or for other reasons. The approach taken in this DEIS therefore constrains the public and decision-makers rather than enlightening them. To address this shortcoming, the Marine Mammal Commission recommends that the Navy revise its Mariana Islands Range Complex DEIS to include an alternative involving a reduction in activity types and levels to ensure that decision-makers are fully informed and presented with a full range of alternatives.

Limiting the Scope of the Analysis to Activities That Can Be Described in Detail

The Navy prefers alternative 2, which involves the highest level of activity but also is dependent upon factors not yet determined or reliably predictable (e.g., congressional direction and funding for additional fleet assets, internal Department of Defense strategic decisions, changes in anticipated national security concerns). It therefore seems premature, and out of keeping with the intent of the National Environmental Policy Act, to request the equivalent of a blank check for speculative increases in future activity. If future activities cannot be described in detail, then their environmental costs also cannot be described and decision-makers cannot make informed decisions about them. To comply with the National Environmental Policy Act, the Navy should base its alternatives only on those types and levels of activity that can be described in sufficient detail for a meaningful risk/benefit analysis. It can then supplement its analyses and any related permits or authorizations when future circumstances can be described with sufficient detail to inform decision-makers about the potential costs and benefits of alternative actions. History tells us that many of the factors that should be considered in determining the effects of future Navy actions (e.g., budget, threats to security, military technology, and environmental conditions) will change over time. Therefore, the Marine Mammal Commission recommends that the Navy revise its DEIS by limiting its scope to those proposed activities that can be described in sufficient detail to provide a reliable basis for assessing benefits and costs.

Scientific Peer Review of Marine Mammal Density and Distribution Estimates

The Navy has done a commendable job of reviewing the existing literature on marine mammal density, distribution, behavior, and habitat use in this and similar documents. This DEIS relies on information summarized in the "Mariana Islands Marine Resources Assessment" and "Marine mammal and sea turtle survey and density estimates for Guam and the Commonwealth of the Northern Mariana Islands," both Navy documents. These reviews are used to estimate animal density and distribution and therefore are an important element of the risk estimation procedure. However, they have not been subject to scientific peer review, which is an important part of the scientific process. The reliability of the Navy's decisions must be called into question if the Navy bases its training decisions, in part, on perceived risks to marine mammals but its use of existing data to estimate those risks has not been subjected to peer review. To reduce such uncertainty, the Marine Mammal Commission recommends that the Navy subject its reviews of marine mammal density, distribution, behavior, and habitat use to scientific peer review.

Monitoring and Mitigation

The Navy has established an Integrated Comprehensive Monitoring Plan to monitor, mitigate, and assess the effects of its activities over time. If properly implemented, the plan will improve both our understanding of the effects of sound from military activities and our ability to monitor and mitigate such effects. The Marine Mammal Commission strongly supports the development and implementation of this plan. Similarly, the Navy describes a commitment to an adaptive management approach (page 5-14 in the DEIS) that includes in its goals "an increase in the probability of detecting marine mammals." However, the Navy does not describe in quantitative

terms the probability of detecting marine mammals now, nor does it describe a plan for developing, evaluating, and implementing new monitoring and mitigation capabilities to increase the probability of detecting marine mammals.

In its current form, the DEIS seems inconsistent with an adaptive management approach because it does not describe the accuracy or reliability of its mitigation measures or plans to characterize such information. The Commission continues to believe that the probability of detecting marine mammals using existing monitoring measures, and the subsequent likelihood of implementing necessary source-level reductions and other mitigation measures, are far lower than are implied in the DEIS. The Commission also believes that the Navy is capable of conducting the tests needed to characterize the effectiveness of monitoring and mitigation measures. The knowledge gained from such tests would justify the relatively small effort and time required. Such assessments of system performance are standard Navy procedure, and the Navy has conducted such tests to evaluate the effectiveness of monitoring and mitigation measures for similar operations (e.g., SURTASS LFA). For these reasons, the Marine Mammal Commission recommends that the Navy develop and implement a plan to evaluate the effectiveness of monitoring and mitigation measures before beginning, or in conjunction with, operations under the final environmental impact statement and anticipated issuance by the National Marine Fisheries Service of an incidental harassment authorization. During the past year, the Commission has repeated this recommendation to the Navy but has not observed or been informed of positive steps in the recommended direction. The Commission would welcome an opportunity to discuss this matter with the Navy.

Please contact me if you have questions about any of our recommendations or comments.

Sincerely,

Timothy J. Ragen

Timothy J. Ragen, Ph.D.
Executive Director

Cc: Craig Johnson, NOAA/NMFS OPR
RADM Larry Rice, CNO N45
Hon. Donald Schregardus, DASN E

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

March 26, 2009

Nora Macariola-See
Project Manager, EV21
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

Subject: EPA comments on the Mariana Islands Range Complex (MIRC) Draft Environmental Impact Statement/Overseas Environmental Impact Statement, Mariana Islands (CEQ# 20090017)

Dear Ms. Macariola-See:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. Our detailed comments are enclosed.

FED6-1

Based on our review, we have rated the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (DEIS) as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "Summary of Rating Definitions"). The DEIS assesses the impacts from military training; research, development, testing, and evaluation activities; and range upgrades within the MIRC. We have concerns regarding potential impacts to coral reef ecosystems, water quality, and the threatened green sea turtle. We also believe the impact assessment approach does not fully assess all impacts, and that the DEIS frequently concludes that project impacts will not be significant without substantiating these conclusions.

The impact assessment approach focused on identifying impacts from individual training activities that occur at multiple training locations; however, the impact assessment did not fully consider stressors resulting from multiple training activities occurring at the same location. In addition, the DEIS does not sufficiently distinguish among the impacts of the alternatives, nor does it consider the cumulative impacts to resources from the training and other actions that will occur as part of the planned expansion of U.S. military facilities and relocation of U.S. military personnel to Guam and the Commonwealth of the Northern Mariana Islands (Guam military buildup).

We believe that a geography-based or training site-specific approach would improve the impact assessment, and could reveal significant impacts to resources at some potential training locations. Site-specific information regarding direct, indirect, and cumulative impacts is

important for decision-makers and the public, and should be considered in the selection of training sites for exercises. We recommend a geography-based approach be adopted for the Final EIS.

FED6-2

We also recommend an alternative be evaluated with additional mitigation measures. For example, we suggest a mitigated alternative that avoids, to the greatest extent possible, training activities in the Marianas Trench Marine National Monument, an area recognized for its biological and scientific importance.

EPA appreciates the opportunity to review this DEIS. When the Final EIS is released for public review, please send one copy to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or contact Karen Vitulano, the lead reviewer for this project, at 415-947-4178 or vitulano.karen@epa.gov.

Sincerely,

Kathleen M. Goforth, Manager
Environmental Review Office (CED-2)

Enclosure: Summary of EPA Rating Definitions
EPA's Detailed Comments

cc: Frank Rabauliman, Director, CNMI Division of Environmental Quality
Brian Bearden, CNMI Division of Environmental Quality
John Joyner, CNMI Office of Coastal Resources Management
Michael Molina, U.S. Fish and Wildlife Service
George Young, Frank Dayton, U.S. Army Corps of Engineers
Gerry Davis, National Marine Fisheries Service
Lorilee Crisostomo, Administrator, Guam Environmental Protection Agency
Mike Gawel, Guam Environmental Protection Agency

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT, MARIANA ISLANDS RANGE COMPLEX (MIRC), MARIANA ISLANDS, MARCH 26, 2009

Insufficient Disclosure of Impacts

FED6-3

EPA is concerned that the impacts from the proposed action are not properly disclosed in the DEIS; conclusions of insignificance are not substantiated; and the lack of knowledge regarding resource impacts is presented as indicative of no impact. These trends are evident throughout the document, and suggest that impacts may have been underestimated. A possible reason for these deficiencies could be the impact assessment approach, which was not geography-specific. The impact assessment identified possible impacts from each individual training action and then identified the locations where such an activity would occur. This approach failed to consider the multiple stressors occurring from the different activities occurring at the same location, and seems to have resulted in a piecemeal view of impacts. The result of this approach is a largely ineffective assessment of impacts that does not consider the cumulative impacts of the Guam military buildup[1] and associated training on some of the same locations, nor other cumulative impact stressors such as those resulting from climate change. A geography-based approach of assessing impacts to particular training locations would have been much more informative and could have considered cumulative impacts in an effective manner. As a result of the approach taken, the DEIS seems to have averaged the impacts over the very large training area of the MIRC[2] and concluded that impacts would be localized and temporary, and thus insignificant. Except for the open ocean, most training locations are distinct, and each should have received an impact assessment for the resources contained therein.

FED6-4

In addition to the insufficiencies described above, the comparison of alternatives does not meaningfully express the differences in impacts. Tables presented at the end of each impact section simply state that impacts of Alternatives 1 and 2 would be "more", "slightly more", or "similar to" the no action alternative (existing training levels), in some cases indicating that the impacts would be the same as the no action alternative, despite additional stressors acknowledged in the document. This falls short of the Council on Environmental Quality's (CEQ) direction in 40 CFR 1502.14 that the analyses "should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public".

The following are specific examples of the above concerns:

> Soil impacts. The DEIS well documents the substantial erosion that is occurring on Farrallon de Medinilla (FDM) and acknowledges that bombing is contributing to this impact. It states that most of the existing training locations have soil conditions that are degraded from ongoing military use (p. 3.1-23), and that many years of live fire training at the Tarague Beach small arms range has resulted in "severely degraded" geological resources (p. 3.1-22).

[1] Relocation of U.S. Marine Corps Forces to Guam, Enhancement of Infrastructure and Logistic Capabilities, Improvement of Pier/Waterfront Infrastructure for Transient U.S. Navy Nuclear Aircraft Carrier (CVN) at Naval Base Guam, and Placement of a U.S. Army Ballistic Missile Defense (BMD) Task Force in Guam

[2] 501,873 square nautical miles (nm^2) of ocean, 64 nm^2 of land across 5 islands, and 63,000 nm^2 of airspace

The DEIS concludes that surface soil changes would be minimal (p. ES-16) and that impacts to geological resources would not be significant (3.1-23) despite the impact assessment criteria that impacts would be significant if the action had the potential to increase erosion by training activities (p. 3.1-1).

Water quality impacts. The DEIS acknowledges unavoidable effects on ocean and surface water quality, including the introduction of hazardous materials from munitions, the contamination of surface drainage areas from runoff, siltation and sediment plumes, and disruption of sediments with above-average loads of organic materials and toxic metals offshore of training locations (p. 3.3-24), yet concludes that *no* short-term impacts or long-term impacts to water resources would occur (p. ES-17).

Sonar impacts on fish. The DEIS acknowledges that data regarding sonar impacts on fish is "exceedingly limited" (p. 3.9-54), documents a study that showed a statistically significant post-exposure mortality of 20 to 30%, notes that the problem with the assessment is that there are so many differences in the studies, including species, precise sound source, and spectrum of the sound, that it *is hard to even speculate* (p. 3.9-45) as to impacts, yet concluded that *no impacts* on fish are anticipated from sonar use (p. ES-23).

Impacts from noise. The DEIS concludes that no sensitive receptors (residential land uses, schools, libraries, hospitals and churches) are likely to be exposed to sound by sound-generating training events (p. 3.5-25) and that the impacts for the preferred Alternative 1 are the same as the no action alternative (p. 3.5-25, ES-17). This conclusion appears unsubstantiated, given that implementation of Alternative 1 would result in ISR/Strike aircraft events out of Andersen Air Force Base increasing by 45% over the current level (p. ES-11). The DEIS identifies an expanded noise contour showing a larger amount of off-base area impacted above 65 DNL[3], and a much larger area greater than 60 DNL. EPA recommends a DNL below 55 for outdoor noise levels.

> *Recommendation:* EPA recommends the impact analysis be training site-specific to facilitate more realistic and defensible impact conclusions. The Final EIS (FEIS) should attempt to discriminate among the impacts of the alternatives to a greater extent. For example, the FEIS could differentiate the degree to which erosion processes would be accelerated by each alternative, or the net deposition rate of training materials, etc, across the alternatives.

FED6-5

Mitigation disclosure and effectiveness

Mitigation measures are not well defined in the DEIS. There are references to protective measures, but specific actions are rarely identified, and when they are, no discussion of the effectiveness of mitigation generally occurs. It is important that mitigation measures be discussed, especially if they are the basis for concluding that impacts will not be significant or

[3] Day-Night Average A-Weighted Sound Level

not occur at all. Results of monitoring of training impacts would also be helpful to include in mitigation discussions.

> *Recommendation:* EPA recommends including in the FEIS a section in each resource chapter that identifies mitigation measures and discusses their effectiveness and likelihood of implementation. Monitoring efforts should be included. Information should also be provided regarding how destruction, loss, or injury from Department of Defense activities will be monitored in the Marianas Trench Marine National Monument per the requirement in the Presidential Proclamation that requires coordination with the Department of Interior or Commence, and mitigation/restoration (p. 3.6-20).

Marine Communities/Corals

FED6-6

Insufficient Impact Assessment

The Draft Environmental Impact Statement (DEIS) evaluates impacts to marine communities, including coral communities and reefs (Section 3.6); however, the evaluation is insufficient for the following reasons:

Coral resources were not fully identified. There are no maps of these resources included; the DEIS includes only vague narrative descriptions of locations which tend to underestimate the value of the resource. Areas with coral coverage, even in low percentages, constitute coral reef ecosystems, and impacts to these ecosystems should be disclosed in the EIS. The DEIS does not mention coral communities in waters surrounding FDM[4] at all.

Impacts to coral reefs from amphibious vehicles, especially Landing Craft Air Cushion (LCAC) vehicles, were not discussed. We are aware from personal communications with EPA staff and the National Marine Fisheries Service that previous exercises on Dadi Beach in Guam have resulted in substantial damage to corals. Impacts from LCAC vehicles to coral communities and reefs should be identified under vessel movements and assessed. Impacts for all alternatives were deemed to be the same (p. 3.6-2) despite the fact that Alternative 1 will include 6 additional amphibious landing activities, as well as over the beach training, at landing locations on Tinian and Guam (3.10-35).

Indirect impacts from sedimentation were not fully assessed. Sedimentation impacts were mentioned for some activities, but not considered in the impact assessment. Sedimentation impacts from: increases in the number and size of underwater detonations at Agate Bay (from 10 net exposive weight (NEW) to 20 NEW); erosion from the "severely degraded" geological resources at Tarague Beach from the live fire range (p. 3.1-22); and the substantial erosion at Farrallon de Medinilla (FDM) (3.1-17, 23), would continue to contribute to ongoing erosion, runoff, and sediment pluming, and would impact offshore coral reefs.

[4] Spalding et al. 2001. World Atlas of Coral Reefs, 2001, and http://ccmaserver.nos.noaa.gov/products/biogeography/us_pac_terr/htm/maps/33_cover.pdf

Cumulative impacts from the dredging expected for the new CVN berth as part of the Guam military build-up were not considered. The Navy is actively planning for the proposed CVN berth in Apra Harbor, which will involve substantial dredging and coral impacts. These impacts are reasonably foreseeable and should be discussed. No section discussing marine communities exists in the cumulative impacts chapter, and discussion of all cumulative impacts associated with the Guam buildup is deferred to the Joint Guam Program Office EIS; this is not consistent with 40 CFR 1502.16 and 1508.8.

> *Recommendation:* EPA recommends improvements to the impact assessment for marine communities, including coral communities and reefs per the comments above. All indirect and cumulative impacts should be identified and assessed. Mitigation measures to avoid impacts should be discussed, and we recommend their inclusion in the proposed action. For scheduled events, we recommend the Navy avoid training activities that result in sediment disturbance during coral spawning periods.
>
> The DEIS states in the fish impacts chapter that "Navy mitigation measures include avoidance of areas of high productivity, discussed in Section 3.6 (Marine Communities), where some fish species tend to concentrate, further reducing the probability of habitat disturbance and injury or mortality" (p. 3.9-59). There is no mention of this mitigation in Section 3.6 (Marine Communities) or elsewhere in the DEIS; however, we strongly support this mitigation. Please clarify this mitigation measure.

Avoid LCAC and amphibious training on Dankulo Beach

We recommend the Navy amend the proposed action such that Unai Dankulo (Long Beach) is not utilized for amphibious landing activities, especially LCAC landings. The DEIS states that only Unai Chulu has been used for LCAC training (p. 3.11-27), but the preferred Alternative 1 proposes to increase amphibious landing activities and over the beach training by 6 annual training events and repeatedly notes that Unai Dankulo has the capability to support LCAC landings with craft landing zone and beach improvements (p. 2-8).

Amphibious landings are likely to impact coral reefs by physical contact and propeller wash. Such impacts would be minimized by confining amphibious landings to a minimum number of beaches previously used for these landings. The DEIS indicates that Unai Dankulo is the largest beach on Tinian and has a continuous reef crest across the entire run of the beach (3.1-14). An online map also shows coral reef and hardbottom extending the entire beach (http://www.coris.noaa.gov/activities/coral_demographics/05_CNMI.pdf). Avoiding new training-related impacts to this resource would be more protective than utilizing it, even with protective measures, and would be more consistent with Executive Order 13089 – Coral Reef Protection. Additionally, the DEIS does not identify the needed beach improvements that would accompany the use of Unai Dankulo, nor the impacts associated with these improvements.

The DEIS states that Navy mitigation measures include avoidance of areas of high productivity (p. 3.9-59). The DEIS identifies the region surrounding Tinian as showing elevated primary production (p.3.6-10).

Finally, since Unai Dankulo is a known nesting location for the threatened green sea turtle (p. 3.8-25), and is one of the beaches most often utilized by the turtles (p. 3.8-16), avoiding use of this beach will also provide better protection for this species, more so than would the implementation of protective measures. Green sea turtle populations, including those within the MIRC, are in serious decline throughout the Pacific Ocean (p. 3.8-15).

> *Recommendation:* Confine amphibious landings to a minimum number of beaches previously used for these landings, and avoid training and beach improvements on Unai Dankulo (Long Beach).

Water Quality

FED6-7

Impacts from munitions

The DEIS identifies the potential for contamination from munitions components including various heavy metals releases from sonobouys (p. 3.1-21), leaching of hazardous bomb materials (p. 3.2-15), release of cyanide from torpedoes (p. 3.2-17), various explosives compounds such as ammonium perchlorate, picric acid, etc. (p. 3.2-19), and organic chemicals from underwater detonations (p. 3.2-20). The Navy concludes that there would be no long-term degradation of water resources and no short-term impacts (p. ES-17) because contaminants would be diluted in the ocean (p. 3.2-15).

We understand the assumption regarding ocean dilution; however, the assumption should be substantiated with monitoring data. Because of the cumulative impacts to ocean water quality, good stewardship can no longer assume that the size of the ocean will dilute and disperse all pollutants to safe levels, especially considering that metals such as copper and lead bioaccumulate in marine organisms. We recommend monitoring of range areas to validate the Navy's conclusions that impacts would not result in long-term degradation of water resources. A good example is the Air Force assessment of the environmental effects of radio-frequency chaff (p. 3.2-23), which included toxicity tests using marine organisms. Designated activity zones for underwater detonations, which the DEIS states would concentrate contamination (p. 3.1-21), are possible study sites for monitoring, as are sediments offshore of training locations, which the DEIS identifies as having above-average loads of organic materials and certain toxic metals (p. 3.3-24).

The DEIS does not adequately assess the potential water quality impacts from the existing and proposed increases in munitions contaminants on FDM. The Range Condition Assessment (RCA) identifies FDM as a significant source of munitions contaminants from historic bombing. The RCA and DEIS conclude that, while there are no data nor modeling to predict transport or transformation of munitions constituents, no further analysis is required since there are no human receptors on the island. This does not speak to impacts to ecological receptors. We disagree that no further analysis is required to assess the risk of off-range release of munitions constituents (3.2-15), since eco-receptors were not considered.

Finally, the DEIS identifies the Clean Water Act as an applicable law with which the armed services must comply (p. ES-8, 1-16), and part of the impact assessment methodology includes "whether the proposed activities would violate laws or regulations adopted to protect or manage the water resource system" (p. 3.3-1). We agree that training practices should be carried out in compliance with requirements of the Clean Water Act. The EIS should describe this compliance more clearly. The DEIS states that water pollutants associated with Navy training activities are released into the ocean and that their release is regulated in accordance with appropriate regulatory permits (p. 3.3-8), but it is not clear to which permits this statement refers.

> *Recommendation*: The Navy should conduct the necessary monitoring to substantiate the assumptions being made regarding the lack of impacts from munitions releases into the ocean environment and from FDM as a source of munitions contaminants.
>
> In the FEIS, clarify the manner in which the proposed action will comply with the Clean Water Act and other laws or regulations adopted to protect or manage the water resource system. Identify the type(s) of permits that regulate the release of water pollutants associated with Navy training activities into the ocean.

Disclosure of SINKEX contaminants

FED6-8

The DEIS references the General Permit issued by EPA under the Marine Protection, Research, and Sanctuaries Act (MPRSA) for the sinking exercise (SINKEX). It should be noted that the requirements of both the 1999 EPA/Navy agreement and the SINKEX General Permit under 40 CFR 229.2 are to be met in order to comply with the MPRSA SINKEX General Permit. The 1999 agreement letter, which contains specific requirements, is not mentioned.

The DEIS refers to the potential for floating non-hazardous expended material to be lost (to become persistent seabed litter) or washed ashore as flotsam (p. 3.2-22). It should be noted that the SINKEX general permit under the MPRSA states that "Before sinking, appropriate measures shall be taken by qualified personnel at a Navy or other certified facility to remove to the maximum extent practicable all materials which may degrade the marine environment, including without limitation removing from the hulls other pollutants and all readily detachable material capable of creating debris or contributing to chemical pollution." If the sinking exercise could create floating non-hazardous expended material that will create persistent marine debris or has the potential to wash ashore, the Navy should attempt to remove such material from the marine environment.

Additionally, while disposal of materials during SINKEX is a permitted activity, the EIS should disclose the amount of polychlorinated biphenyls (PCBs) that would be disposed into the ocean under each of the project alternatives.

> *Recommendations:* The General Permit and EPA/Navy agreement required initial monitoring data. EPA recommends a summary of these data, as well as an estimate of PCBs that would be left in place under each project alternative, be included in the Final EIS for disclosure.

EPA also recommends that specific text be provided detailing the environmental preparation the Navy undertakes to minimize the impacts that SINKEX may have on the marine environment. More specifically, there should be a discussion pertaining to how the Navy meets the conditions of the MPRSA General Permit (which includes the requirements in the 1999 Navy/EPA agreement).

Finally, we recommend the following changes to the document text:

FED6-9

- On p.3.3-22, under the heading "3.2.2.3.3 Aerial and Surface Targets," there is text that states "The vessels used as targets are selected from a list of CNO approved vessels that have been cleaned in accordance with USEPA guidelines." This sentence should be re-written as follows: "The vessels used as targets are selected from a list of CNO approved vessels that have been cleaned ~~in accordance with USEPA guidelines~~ according to the requirements set forth under Section 102 of the Marine Protection, Research, and Sanctuaries Act (40 CFR § 229.2) and the August 1999 Navy/EPA Agreement that details vessel preparation requirements to address PCBs under the SINKEX permit."

FED6-10

- On p. ES-8, the Marine Protection, Research and Sanctuaries Act (MPRSA) should be added to the list of applicable environmental requirements.

FED6-11

Limited Range of Alternatives

The DEIS evaluates a limited range of alternatives. The alternatives analysis of this DEIS would be much improved by including alternatives that represent a more diverse level and mix of training instead of formulating alternatives that simply build upon one another. The inclusion of an alternative with additional appropriate mitigation (40 CFR 1502.14(f)) would also expand the range of alternatives. The use of geographic and/or temporal exclusions can potentially be effective in reducing impacts to marine resources. EPA recommended, in our scoping comments (letter dated July 16, 2007), that such a mitigated alternative be evaluated. We note that the DEIS did not even consider this suggestion in the section discussing alternatives considered but dismissed (Section 2.2.2).

Recommendation: EPA recommends an alternative with additional mitigation measures be developed in the Final EIS, and that an alternative with geographic and/or temporal exclusions be considered. We recommend the identification of geographic areas where training exclusions would be especially beneficial to environmental resources, such as the Marianas Trench Marine National Monument[5] and discussion of how excluding such an area would affect training goals and the underlying purpose and need.

[5] The Presidential Proclamation did not prohibit Department of Defense activities in the Marianas Trench Marine National Monument, however, the value of its marine resources should prompt the Navy to avoid impacts to the greatest extent practicable.

FED6-12

Impacts to Marine Mammals from Mid-frequency Active (MFA) Sonar

EPA has concerns regarding increased impacts to marine mammals from MFA sonar over historic exposure levels. The DEIS estimates that the preferred Alternative 1 will increase the number of behaviorally harassed animals by 9,543 (from 67,872 to 77,415); increase the number of animals experiencing temporary hearing loss lasting several minutes to several days by 149 (from 1,097 to 1,246); and double the animals experiencing permanent hearing loss (from 1 to 2) (pp. 3.7-181 – 3.7-182). The proposed action will also include low-frequency active sonar (LFA), which unlike MFA sonar, can travel great distances. Impacts from LFA sonar were evaluated in the Surveillance Towed Array Sensor System (SURTASS) Low Frequency Active (LFA) EIS.

We are also concerned that the impact assessment methodology seemed to assume a uniform distribution of animals. The DEIS states that "Uniform animal distribution is overlaid onto the calculated sound fields to assess if animals are physically present at sufficient received sound levels to be considered "exposed" to the sound" (p. 3.7-62). In its descriptions of the distribution of various marine mammals in the MIRC, based on the Mariana Islands Sea Turtle and Cetacean Survey (2007), marine mammals appear to be concentrated in certain areas, mainly associated with the Marianas Trench or other bathymetric relief (Section 3.7.2). Additionally, the assessment methodology does not seem sufficiently conservative since it does not estimate indirect impacts/secondary effects, and counts a maximum of a single take within a 24 hour period regardless of additional harassment (p. 3.2-68).

The DEIS recognizes that there are many unknowns in assessing the effects and significance of marine mammal responses to sound exposures but concludes that no significant impacts to marine mammals will occur for all the project alternatives (p. 3.7-181). Applying the criteria for assessing significance under the Council on Environmental Quality (CEQ) Regulations, especially the degree to which the effects on the quality of the human environment are likely to be highly (scientifically) controversial, the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks, and the degree to which the action may adversely affect endangered or threatened species (40 CFR 1508.27(4),(5) and (9) respectively), these impacts are potentially significant under NEPA. We understand the Navy is working with the National Marine Fisheries Service to obtain a Letter of Authorization under the Marine Mammal Protection Act.

> *Recommendation:* We recommend the Navy consider the scientific controversy, uncertain/unknown risks, and presence of threatened and endangered species in assessing significance of impacts from MFA sonar on marine resources. EPA recommends the Navy not exceed the historic exposure levels in the MIRC, and operate sonar at the lowest practicable level to achieve mandated training levels. We recommend the approach taken for the Hawaii Range Complex be utilized, where an additional alternative was created for the Final EIS that held sonar use at existing levels while increasing training activity.
>
> The DEIS should recognize the Marianas Trench as an areas of greater biological significance and avoid this area to the greatest extent practicable.

Additional Comments

FED6-13

Biological Resources. EPA has concerns regarding the potential introduction of the invasive brown-tree snake (BTS) to Tinian or other locations in the Northern Mariana Islands. The DEIS states that, for Tinian and Saipan, sightings in shipments and in the wild have increased through the 1990s and early 2000s, and a reliable sighting was reported from Saipan in April 2008 (p. 3.11-55). We encourage the Navy to work closely with the U.S. Fish and Wildlife Service (USFWS) to ensure the BTS Interdiction Plans are adequate to mitigate this potential impact and are sufficiently funded.

Additionally, we have concerns regarding impacts to wildlife and threatened and endangered species in the MIRC training areas. The Navy should work with USFWS and the National Oceanic and Atmospheric Service (NOAA) to address impacts to these resources through the Section 7 consultations and additional interagency coordination as necessary to gain concurrence from these agencies regarding project impact assessment and mitigation.

FED6-14

Paleontological resources. The DEIS states that "Because the location, extent and quality of paleontological resources in the MIRC are unknown and the impacts of training, if any, on these resources can be mitigated, this resource will not be evaluated herein" (p. 3.1-1). It is not clear how impacts to these resources can be mitigated if they are unknown.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
2007-FA-0116

JUL 30 2007

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134
Attn: EV2

Dear Sir or Madam:

The U.S. Fish and Wildlife Service (Service) has reviewed the Notice of Intent (NOI) published by the Department of Defense (DoD) on June 1, 2007, to develop an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Mariana Islands Range Complex (MIRC). The proposed action would upgrade and modernize the capabilities of the MIRC, which encompasses land, air and sea training ranges in the Mariana Islands. MIRC supports local military units, multi-national exercises and facilitates the rapid deployment of U.S. defense forces, as necessary. This proposed action is intended to fulfill and improve U.S. government national security and alliance requirements in the Western Pacific Region and increase the strategic defense role of Guam and the Commonwealth of the Northern Mariana Islands (CNMI). These comments are provided in accordance with the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852] (NEPA);]; and other authorities mandating concern for environmental resources including the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 et seq.; 48 Stat. 401], as amended (FWCA); the Federal Clean Water Act [33 U.S.C. 1251 *et seq.*; 62 stat. 1155], as amended (CWA); the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended (ESA); and the Sikes Act of 1960 [16 USC *et seq.*;74 stat. 1052], as amended;

FED7-1

Little specific detail has been provided in the NOI, supporting documentation distributed at public meetings, or the military's informational website; therefore, we provide only general comments related to the proposed action. The proposed EIS/OEIS is large in scope, complex and includes numerous actions that may have significant impacts on fish and wildlife resources in the Mariana Islands. Specific information is required in order to assess and adequately disclose these impacts, including the nature, duration, and specific location of training activities and infrastructure improvements. Because this information is currently unavailable, we recommend that DoD begin coordination with us and other relevant resource agencies at the earliest possible

time in the planning process to ensure concerns for threatened and endangered and other Federal trust species have been adequately addressed in planning and development of the EIS/OEIS.

FED7-2

A cooperative agreement between the U.S. Air Force and the Service for the establishment and management of the Guam National Wildlife Refuge (dated March 10, 1994) states that the Air Force will provide for consultation with us for actions that may impact habitat of endangered or threatened species even if those species are extirpated from the affected area, but are not extinct. The conditions of this agreement remain valid as the planning process advances, and appropriate consideration for listed species and their habitat will be given in the EIS/OEIS to these Refuge overlay lands.

Federally Listed Species, Candidate Species and other Federal trust resource

Many threatened and endangered plant and animal species occur in the Mariana Islands. Pursuant to section 7 of the ESA, if you determine that your proposed action may affect listed species you should either initiate formal consultation or seek written concurrence from us that the proposed action is not likely to adversely affect listed species. We are concerned that proposed facility and live fire range construction, base expansion and alteration projects, and military training activities may result in habitat loss and physical disturbance that may adversely affect listed species. Additionally, the proposed action has the potential to result in substantial indirect impacts on threatened and endangered species from infrastructure, commercial, residential, and industrial growth and development within the Mariana Islands for support services that are not funded by the military. Although some of these actions may not have a federal nexus, they all should be considered in a cumulative impact analysis within the scope of section 7 consultation under the ESA (see also cumulative impact section below).

In addition to green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricate*) sea turtles, for which we share joint responsibility with National Marine Fisheries Service (NMFS), other federally listed marine species, including both permanent and seasonally resident species, occur in ocean waters surrounding the Mariana Islands and may be adversely impacted by activities associated with the proposed action. We recommend that the Navy consult with NMFS to ensure that the proposed infrastructure improvements and expanded training activities are adequately addressed for these species in marine waters.

Because the NOI is not specific about the location of proposed base expansion activities, including expanded live fire ranges and enhanced training activities, we have provided a list of U.S. threatened and endangered species occurring within the Mariana Islands (Enclosure 1). Recovery plans with detailed information on these species can be obtained from our office in Honolulu or via the worldwide web at http://www.fws.gov/endangered/recovery/index.html.

Numerous other Federal trust resources occur in the Marianas Islands, including migratory birds, wetlands, and coral reefs. Please refer to Executive Orders 13186, 11990, and 13089, which

instructs Federal agencies to use their programs and authorities to avoid and minimize impacts to these resources from their activities. We are concerned that the proposed facility constructions and military training activities may result in disturbance, damage, or harm to these resources.

Numerous species have been identified as Species of Concern, including candidate species for listing under the ESA, species listed by the Territory of Guam and the CNMI as threatened or endangered, identified by us as Birds of Conservation Concern, and species with restricted ranges (see Enclosure 2). We recommend that an analysis of potential impacts to these Species of Concern resulting from the proposed action be included in the EIS/OEIS.

The Tinian Monarch (*Monarcha takatsukasae*) has been delisted, and we are in the process of a 5-year post-delisting monitoring project (Federal Register: December 13, 2004 (Volume 69, Number 238). This monitoring is intended to ensure that our decision to delist was appropriate and that the threats to this species have been removed. Increased military activity on Tinian may result the loss of large areas of secondary tangantangan (*Leucaena leucocephala*) forest and may increase the likelihood of brown tree snake becoming established, both of which could adversely impact the Tinian monarch. Declines in the species' population could require us to re-evaluate the status of this species. We recommend that impacts and appropriate compensatory mitigation for the Tinian monarch be considered in the EIS/OEIS.

FED7-3

Potential impacts from the proposed activities on federally listed species, candidate species and other Federal trust resources may include:

- Habitat destruction from expansion of installations, including live fire ranges, and from training exercises. Birds may be adversely affected by disturbance or destruction of breeding colonies, the destruction of intact native forest, and the construction of artificial wetlands or the alteration of natural wetlands associated with expanded installations and training grounds. Wetlands, including coral reefs, may be adversely affected by dredging and filling and increased terrestrial inputs via runoff resulting from expanded installations and training exercises that employ large vehicles and live munitions training. Live fire ranges may promote increased occurrences of wildland fires. These fires and associated soil erosion and coastal sedimentation are serious threats to federally listed bird and plant species and resting sea turtles. Damage may occur to sea turtle nesting beaches as a result of amphibious training and coral reefs may be impacted by training exercises that require vessels to operate on or near the shallow fringing reefs prevalent around most of the Mariana Islands. Training activities that release contaminants directly or indirectly into the marine environment may also adversely impact coral reef species, many of which show significant adverse affects at concentrations well below established U.S. Environmental Protection Agency (EPA) levels.
- Disturbance of or collision with marine life during nearshore training exercises. Damage to the marine environment may occur from the mooring of buoy arrays or dredging of shallow areas to facilitate new or expanded training support installations.

MIRC TAP EIS 4

- Disturbance by aircraft overflights and land-base training activities. These activities cause noise and physical motion that may disrupt foraging and nesting by forest birds and nesting by sea turtles.
- Introduction of invasive alien species, especially brown tree snake (*Boiga irregularis*). The brown tree snake is known to be a significant troublesome predator of native forest bird in the Mariana Island chain. In addition, cats, rats, plants, insects, ungulates, and other non-native species are known to adversely impact federally listed birds, nesting sea turtles, and plants.
- Increased vandalism, illegal hunting, and disturbance resulting from increased human access into previously inaccessible areas. Cave vandalism, resulting from increased human visitation may have significant impacts on cave dwelling. Illegal hunting is already a significant problem for the Mariana fruit bat (*Pteropus mariannus*), and expansion of installations may increase access to bat roosting trees and provide opportunities for bat poaching.

Potential impacts from the indirect and cumulative effects of activities associated with the proposed action may be similar to those listed above but occurring on more discrete or localized scales. We recommend that the impacts to federally listed species, candidate species and other Federal trust species be analyzed and that appropriate conservation measures (including avoidances of unnecessary impacts, minimization, and compensation of unavoidable resource loses) be fully described in the EIS/OEIS. We recommend that coordination with the Service be initiated early in the planning process to ensure that these resource concerns are adequately addressed.

Invasive alien species

With increased traffic and the movement of personnel and materials into, within, and out of the Mariana Islands, new invasive alien species may be introduced to numerous areas across the Pacific. The potentially adverse impacts of these introductions are difficult to predict or quantify, but they may prove significant and could represent the single largest threat to the native species in the Mariana Islands and other islands in the Pacific (*e.g.*, consider the brown tree snake effect on Guam).

- Training operations conducted in the Mariana Islands that include forces originating from outside the region, including U.S. flag and foreign vessels and troops, increase the risk of new species introductions to the Mariana Islands.
- Active training by forces stationed within the Mariana Islands, and specifically on Guam, that requires movement among the islands of the archipelago increases the risk of invasive species introductions on islands where they are currently not present. This is a concern particularly for the Northern Islands of the CNMI, which historically have been seldom visited due to their relative isolation and are currently free of many of the invasive

species present on the southern islands. We are particularly concerned that the brown tree snake may spread from Guam to islands throughout the CNMI.

- The movement of training equipment and forces from the Mariana Islands to other regions of the Pacific increases the risk of spreading destructive invasive species that are currently present only in the Mariana Islands to other jurisdictions, especially other U.S. islands with military activity (*e.g.*, Wake, Kwajalein etc.) and the State of Hawaii. For example, the introduction of the brown tree snake to Hawaii may lead to their establishment which would likely result in the devastation of avifauna, including many federally listed species.

Invasive species of concern are not restricted to one specific taxonomic group, and may include:

- Terrestrial vertebrates – brown tree snake (covered in detail below), goats, pigs, deer, rats, mice, cats, shrews, frogs, and non-native skinks and geckos.
- Terrestrial invertebrates – flatworms (*e.g.*, *Platydemus manokwari*), snails (*e.g.*, giant African snail, *Achitina fulica*, and the rosy wolfsnail, *Euglandina rosea*), and insects (*e.g.*, erythrina gall wasp, *Quadrastichus erythrinae*, and Asian cycad scale *Aulacaspis yasumatsui*).
- Terrestrial plants – scarlet gourd (*Coccinia grandis*), vines (*e.g.*, *Merremia* sp.), and fire promoting grasses.
- Aquatic and Marine species – algae, invertebrates, and fish.

The inadvertent introduction of one or a few of these species could adversely affect threatened and endangered species and other Federal trust species within the Mariana Islands and elsewhere across the Pacific. Once established, new invasive species are often difficult and costly to eradicate, and prevention is the best way to reduce this potential threat.

The proposed action includes numerous avenues for transporting invasive species, including stowaway of individuals in cargo or equipment, import of individuals or seeds with landscaping materials, transport of seeds or eggs via soil trapped in vehicle tires, tracks and personnel footwear, and transport of individuals or larvae in marine ballast water or as hull fouling. We recommend that the EIS/OEIS outline inspection and sanitary procedures to avoid introducing invasive species to any islands upon which they are not currently found. Additionally the EIS/OEIS should identify techniques and funding mechanisms for the early detection and eradication of incipient invasive species introduced as a result of the MIRC activities.

Brown tree snake control and interdiction

The accidental introduction of the brown tree snake on Guam in the 1940s resulted in the extinction and extirpation of most of the island's native forest bird species. This snake has also become a significant economic problem, agricultural pest, and public health concern. Because Guam is a focal point of trans-shipment of air and sea cargo, the risk exists for the inadvertent

transport of the brown tree snake to other islands and continental U.S. sites as a stowaway in cargo or transportation vehicles.

The brown tree snake may cause similar ecological and socioeconomic problems elsewhere. For example, in Hawaii there are at least 30 endangered avian species and 1 endangered mammal, the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) that may be adversely affected if the brown tree snake becomes established. All of the avian and mammalian species of the CNMI would be vulnerable to brown tree snakes if they became established on these islands.

With the increase in military personnel and training activities, as well as infrastructure expansion and improvements, military and civilian traffic and cargo shipment via air and sea ports will likely increase. We are concerned that existing control and containment activities for brown tree snakes at air and sea ports will not be adequate to screen the increase in cargo and personnel that will be transported from Guam to other high-risk destinations (*e.g.*, Hawaii, CNMI etc.). We recommend that an analysis of the risks associated with brown tree snake dispersal from Guam to other Pacific Islands such as the CNMI and Hawaii as a result of activities associated with the proposed action be included in the EIS/OEIS. This is particularly critical considering the proposed expansion of training facilities and activities in the islands of the CMNI.

The best way to reduce the risk of brown tree snake dispersal from Guam is likely through long-term support of snake suppression on a landscape level on Guam. We recommend that the Navy assure that funding is available to consistently sustain a 100 percent inspection rate of all military cargo, vehicles, munitions, household goods and other items departing Guam. Support for brown tree snake quarantine efforts by United States Department of Agriculture's Wildlife Services (USDA-WS) should be based on the staff levels required to maintain programmatic integrity during peak periods of cargo and vehicle movement off Guam. We recommend that the Navy adequately support sustained brown tree snake trapping, capture, and toxicant use by USDA-WS in the vicinity of sites where Navy cargo, munitions, vehicles, and other items are staged, stored, or packed prior to departing Guam. We also recommend that the Navy, USDA-WS, and the Service cooperatively develop a mechanism that estimates the cost for USDA-WS brown tree snake interdiction efforts at a 100 percent level for all Navy cargo and vehicles departing Guam. This estimated level of funding should be requested and funded annually as part of the Navy operations budget. The Navy should develop a brown tree snake control plan for all facilities in the Marianas similar to the Andersen Air Force Base Brown Tree Snake Control Plan. We recommend that this document be an Appendix of the Final EIS/OEIS and incorporate DoD's Defense Transportation Regulation 505 and 506 protocols. The importance of adequate, consistent, and long-term office and kennel space for USDA – WS brown tree snake interdiction efforts on DoD facilities is essential. Efforts should be made to identify and secure long-term permanent space for this program.

We recommend that DoD provide sustained base funding for applied brown tree snake research efforts by USDA-WS National Wildlife Research Center (NWRC). The applied research efforts

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funded by DoD should focus on: 1) development of aerial broadcast techniques for snake toxicants; 2) development of artificial lures and attractants for brown tree snakes; 3) development of more cost-effective strategies to control or eliminate brown tree snakes from quarantine and field situations; and 4) detection and capture of brown tree snakes at low densities. We suggest that the research scope and direction of NWRC efforts be determined by DoD, USDA-WS, NWRC, and our staff through identification of annual and multi-year, discrete, and finite goals. It should be emphasized that the development and implementation of these research goals will increase the effectiveness of the interdiction program, support large-scale control programs for listed species, and ultimately reduce the cost while increasing the geographic scale of brown tree snake control on Guam.

We recommend that DoD provide sustained supplemental funding for applied research efforts by the United States Geological Survey's Biological Resource Division Fort Collins Science Center (FORT) to support both research and operation efforts to detect and capture low snake populations. Development and refinement of this program is essential to addressing brown tree snake sightings off Guam.

Because of the high potential risk of brown tree snake introduction from Guam to the Northern Mariana Islands, we recommend that the Navy support, and or establish, enhanced brown tree snake quarantine and containment efforts in the CNMI in sites where Navy activities are anticipated. Such activities would include: 1) construction of quarantine facilities for all goods and vehicles imported from Guam; 2) appropriate staffing of such facilities; 3) enhancement of regional capacity to respond to and capture brown tree snakes reported off the island of Guam; and 4) long-term support for the development of techniques to detect and eradicate incipient populations of snakes.

We recommend that DoD and the Navy refer to the independent Review of the Brown Treesnake Problems and Control Programs, dated March 2005, as this issue is addressed. This report can be found on the web at http://biology.usgs.gov/pierc/Invasive Species/Review of Brown Treesnake problems and control review.pdf. We also recommend you refer to Executive Order 13112 section 2 (3), which instructs Federal agencies to take all feasible and prudent measures to minimize risk of harm from invasive species.

Other Concerns

Some of the Mariana Islands are relatively unaffected by invasive species and human-caused habitat destruction. The biological integrity of Aguiguan (Goat Island) and the northern islands of the CNMI (Farallon de Medinilla north to Farallon de Uracas) are particularly important. These islands constitute a string of nearly uninhabited high islands that, owing to their extreme isolation, provide refugia for native biota and ecosystems of the Mariana Islands. The importance of connectivity among islands in maintaining archipelago-wide populations has been long recognized as a fundamental principle of metapopulation dynamics and island

biogeography. Many Federal trust species may require populations on multiple islands in order to persist or recover. These remote Mariana Islands offer an irreplaceable opportunity to recover endangered species, restore and protect the natural communities of the archipelago, and conserve important breeding populations of widespread taxa.

Since 1998, DoD has supported the eradication of ungulates from the island of Sarigan as part of a mitigation project for take of Micronesian megapodes (*Megapodius laperouse*) on Farallon de Medinilla. The efforts of DoD, in partnership with the CNMI government and our office, has lead to the eradication of ungulates from the island, resulting in a positive effect on the megapode and other Federal trust species. Sarigan is now believed to have the largest population of Micronesian megapodes in the Mariana Islands, and the humped snail (*Partula gibba*) and Slevin's skink (*Emoia slevini*) may have also benefited from the increase in native vegetation that has occurred as a result of ungulate removal.

The specific locations for the proposed training actions are not well defined at this early stage of the planning process and assessing the potential impacts of the proposed action is difficult. Areas harboring Federal trust species and important habitats occur on all islands in the Mariana archipelago and all proposed actions will be reviewed by us on a case by case basis as specific details are made available. We recommend that DoD coordinate with us at the earliest possible time in the planning process so we can provide timely recommendations to reduce the potential impacts resulting from the proposed actions on Federal trust species and assist with development of appropriate compensatory mitigation.

Cumulative Impacts

FED7-4

In addition to the proposed relocation of U.S. Marine Corps forces to Guam, other planned military projects (*e.g.*, Northwest Field Beddown and Global Strike Task Force expansions of Anderson Air Force Base) and private developments (*e.g.*, casino and homestead development on Tinian and inter-island ferry service) should be included in the cumulative impacts analysis for the proposed project. Specific issues may include increased traffic among islands, increasing the probability of transporting invasive species to new locations, and continued habitat destruction due to concurrent development projects. We recommend that all possible cumulative effects associated with the proposed project be considered within the EIS/OEIS.

Assistance from the Service

FED7-5

Any action requiring the discharge of dredge and fill material into the water will require a CWA section 404 permit from the U.S. Army Corps of Engineers. This permit will require coordination with us under the ESA and the FWCA. Previous Navy coordination with the Service on water resource development projects aimed at infrastructure improvement in the Mariana Islands have begun late in the project planning and EIS development process, and has

resulted in delays. Therefore, we recommend that coordination with the Service be initiated early in the planning process to ensure that our resource concerns are adequately addressed.

We also recommend early coordination with us and other resource agencies to help develop survey needs and methodologies to adequately assess potential affects of the proposed action. We offer our expertise and assistance in developing resource surveys that may be necessary for a comprehensive analysis of the potential impacts to flora and fauna resulting from the proposed action. We look forward to working closely with Navy environmental staff in Hawaii and Guam on this and future proposed Navy actions.

We appreciate the opportunity to comment on the published NOI for this EIS/OEIS. If you have questions regarding these comments please contact Fish and Wildlife Biologist Dwayne Minton at 808-792-9445.

Sincerely,

for Patrick Leonard
Field Supervisor

Enclosures:
1. Status of Federally Listed and Candidate Species
2. Terrestrial Species of Concern

cc:
Mr. Vajai N. Rai, OEPC, Washington D.C.
Ms. Patricia Port, OEPC, Oakland
Mr. Don Steffeck, USFWS, Region 1, Portland
EPA Region 9, Honolulu
NMFS – PIRO, Honolulu
DFW, CNMI
DEQ, CNMI
CRMO, CNMI
DAWR, Guam
GEPA, Guam
CZM, Guam

ENCLOUSRE 1

The Status of Federally Listed and Candidate Species in Republic of the Marshall Islands, Territory of Guam, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, and Republic of Palau. Resident Status: X = Present, U = Status Uncertain.

Species	Federal Listing Status	Territory of Guam	Commonwealth of the Northern Mariana Islands													
			Rota	Aguiguan	Tinian	Saipan	Farallon de Medinilla	Anatahan	Sarigan	Guguan	Alamagan	Pagan	Agrihan	Asuncion	Maug	Uracus
Mariana Fruit Bat (*Pteropus mariannus*)	Threatened	X[1]	X	X	X	X		X	X	X	X	X	X	X	X	
Little Mariana Fruit Bat (Pteropus tokudae)	Endangered	PE														
Nightingale Reed-warbler (*Acrocephalus luscinia*)	Endangered			U		X					X	U				
Mariana Swiftlet (*Aerodramus bartschi*)	Endangered	X		X		X										
Mariana Crow (*Corvus kubaryi*)	Endangered	X	X													
Mariana Common Moorhen (*Gallinula chloropus guami*)	Endangered	X	X		X	X						U				
Guam Micronesian Kingfisher (*Halcyon cinnamomina cinnamomina*)	Endangered	C														
Micronesian Megapode (*Megapodius laperouse*)	Endangered			X	X	X	X	U	X	X	X	X	X	X	X	X
Guam Rail (*Gallirallus owstoni*)	Endangered	C	XP													
Guam Bridled White-eye (*Zosterops consipicillatus conspicillatus*)	Endangered	PE														
Rota Bridled White-eye (*Zosterops rotensis*)	Endangered		X													

Species	Federal Listing Status	Territory of Guam	Commonwealth of the Northern Mariana Islands														
			Rota	Aguigan	Tinian	Saipan	Farallon de Medinilla	Anatahan	Sarigan	Guguan	Alamagan	Pagan	Agrihan	Asuncion	Maug	Uraeus
Green Sea Turtle (*Chelonia mydas*)	Threatened	X	X		X	X						X				
Hawksbill Turtle (*Eretmochelys imbricate*)	Endangered	X	X		X	X						X				
Nesogenes rotensis (No Common Name)	Endangered		X													
Osmoxylon marianneuse (No Common Name)	Endangered		X													
Serianthes nelsonii (Hayun Lagu (Guam), Tronkon guafi (Rota))	Endangered	X	X													

ENCLOSURE 2

Distribution of Resident Non-Federally Listed Species Protected Under the Migratory Bird Treaty Act and Territory of Guam (Guam) and Commonwealth of the Northern Mariana Islands (CNMI) Legislation and Candidates for Federal Listing. Resident Status: X = Present, U = Status Uncertain.

Species	Protection Status	Territory of Guam	Commonwealth of the Northern Mariana Islands													
			Rota	Aguiguan	Tinian	Saipan	Farallon de Medinilla	Anatahan	Sarigan	Guguan	Alamagan	Pagan	Agrihan	Asuncion	Maug	Uracus
Sheath-tailed Bat (*Emballonura semicaudata*)	Guam and CNMI Listed, Candidate for Federal Listing			X												
Wedge-tailed Shearwater (*Puffinus pacificus*)	Migratory Bird Treaty Act					X										
White-tailed Tropicbird (*Phaethon lepturus*)	Migratory Bird Treaty Act		X	X	X	X	X	U	X	X	X	X	X	X	X	X
Red-tailed Tropicbird (*Phaethon rubricauda*)	Migratory Bird Treaty Act		X	X	X	X	X		X	X		X	X	X	X	X
Masked Booby (*Sula dactylatra*)	Migratory Bird Treaty Act					X	X	U		X					X	X
Brown Booby (*Sula leucogaster*)	Migratory Bird Treaty Act		X	X	X	X	X	U	X	X	X	X	X	X	X	X
Red-footed Booby (*Sula sula*)	Migratory Bird Treaty Act		X				X			X		X		X	X	
~~Great Frigatebird~~ (Fregata minor)	~~Migratory Bird~~ Treaty Act						X									
Little Tern (*Sterna albifrons*)	Migratory Bird Treaty Act					X										
Spectacled Tern (*Sterna lunata*)	Migratory Bird Treaty Act					U		U	X	X						X
Bridled Tern	Migratory Bird						X									

Species	Protection Status	Territory of Guam	Commonwealth of the Northern Mariana Islands													
			Rota	Aguiguan	Tinian	Saipan	Farallon de Medinilla	Anatahan	Sarigan	Guguan	Alamagan	Pagan	Agrihan	Asuncion	Maug	Uracus
(*Sterna anaethetus*)	Treaty Act															
Sooty Tern (*Sterna fuscata*)	Migratory Bird Treaty Act					X				X				X		X
Brown Noddy (*Anous stolidus*)	Migratory Bird Treaty Act	X	X	X	X	X	X	U	X	X	X	X	X	X	X	X
Black Noddy (*Anous minutus*)	Migratory Bird Treaty Act			X	X		X			X		X	X		X	
White Tern (*Gygis alba*)	Migratory Bird Treaty Act	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow Bittern (*Ixobrychus exilis*)	Migratory Bird Treaty Act	X	X	X	X	X										
Pacific Reef Heron (*Ardea sacra*)	Migratory Bird Treaty Act	X	X	U	X	X	U	U	U	U	U	X	U	U	U	
Mariana Fruit Dove (*Ptilinopus roseicapilla*)	Bird of Conservation Concern (BCC)		X	X	X	X										
White-throated Ground Dove (*Gallicolumba xanthonura*)	Guam Listed, BCC		X	X	X	X		U	X	X	X	X	X	X		
Guam Micronesian Starling (*Aplonis opaca guami*)	Guam Listed	X														
Tinian Monarch (*Monarcha takatsukasae*)	CNMI Listed, BCC				X											
Rufous Fantail (*Rhipidura rufifrons*)	Guam Listed, BCC		X	X	X	X										
Micronesian Honeyeater (*Myzoniela rubratra*)	Guam Listed, BCC		X	X	X	X		U	X	X	X	X	X	X	X	
Golden White-eye (*Cleptornis marchei*)	BCC			X		X										
Bridled White-eye (*Zosterops conspicillatus*)	BCC			X	X	X										

Species	Protection Status	Territory of Guam	Commonwealth of the Northern Mariana Islands													
			Rota	Aguiguan	Tinian	Saipan	Farallon de Medinilla	Anatahan	Sarigan	Guguan	Alamagan	Pagan	Agrihan	Asuncion	Maug	Uracas
Oceanic Gecko (*Gehyra oceania*)	Guam Listed	X	X	X	X	X				X	X			X		
Micronesian Gecko (*Perochirus ateles*)	CNMI and Guam Listed	X	X		X	X										
Pacific Slender-toed Gecko (*Nactus pelagicus*)	Guam Listed	X	X					U	X		X					
Snake-eyed Skink (*Cryptoblepharus poecilopleurus*)	Guam Listed	X	X	X	X	X		U	X	X	X		X	X	X	
Tide-pool Skink (*Emoia atrocostata*)	Guam Listed	X	X	X		X				X	X					
Azure-tailed Skink (*Emoia cyanura*)	Guam Listed	X														
Slevin's Skink (*Emoia slevini*)	Guam Listed	U	U		U				X	X	X	X	U	X	X	
Moth Skink (*Lipinia noctua*)	Guam Listed	X														
Mariana Wandering Butterfly (*Vagrans egestina*)	Candidate for Federal Listing	U	X													
Mariana Eight Spot Butterfly (*Hypolimnus oticula*)	Candidate for Federal Listing	X				U										
Humped Tree Snail (*Partula gibba*)	Candidate for Federal Listing	X	X	X	U	X		U	X		X	X				
Langford's Tree Snail (*Partula langfordi*)	Candidate for Federal Listing			U												
Guam Tree Snail (*Partula radiolata*)	Candidate for Federal Listing	X														
Mariana Islands Fragile Tree Snail (*Samoana fragilis*)	Candidate for Federal Listing	X	X													
Heritiera longipetiolata (Ufa-halomtano)	Guam Listed	X	X		X	X										

Species	Protection Status	Territory of Guam	Commonwealth of the Northern Mariana Islands														
			Rota	Aguiguan	Tinian	Saipan	Farallon de Medinilla	Anatahan	Sarigan	Guguan	Alamagan	Pagan	Agrihan	Asuncion	Maug	Uracus
Cyathea lunulata (Tsalsa)	Guam Listed	X														
Lycopodium phlegmaria var. *logifolium* (Disciplina Fern)	CNMI Listed	X	X														

STG-1

MARIANA ISLANDS RANGE COMPLEX EIS/OEIS

BUREAU OF STATISTICS AND PLANS

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Hafa Adai:

The following are the Bureau of Statistics and Plans (BSP) comments in the review of the Draft Environmental Impact Statement/Overseas Impact Statement (DEIS/OEIS) for the proposed Mariana Islands Range Complex (MIRC) dated January 2009:

STG1-1

I – CZMA Federal Consistency Requirement

1.5.3. Coastal Zone Management Act was listed as one of the other Environmental Requirements considered in the DEIS. However, no Federal consistency determination, analysis, or even the timeline to accomplish the requirement was addressed. A consistency determination must include a detailed description of the activity, its coastal zone effects, and comprehensive data and information sufficient to support such determination. Therefore, a Consistency determination must be submitted to the BSP's Guam Coastal Management Program for review as mandated by the Coastal Zone Management Act (CZMA) of 1972, 16 USC § 1456 (c) (1), the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) Public Law 101-508. Any action proposed by a Federal agency that will have a reasonably foreseeable effect on any land or water sue or natural resource of a State's coastal zone, which in CZMA context is the Island of Guam in its entirety, must be consistent to the maximum extent practicable with the enforceable policies of State's federally approved CZMA programs, Section 307(c)(1)(A), 15 CFR Part 930, unless compliance is prohibited by existing law applicable to the federal agency's operations. BSP has to either concur or object to the proposed activity. Changes must be made before the Federal activity is permitted. There is no categorical exemption for any federal activity. However, under certain circumstances the President may exempt a specific federal activity. (see 16 U.S.C. 1456(c)(1)(b). Federal consistency requirement for Federal activities are detailed at 16 U.S.C. 1456©(1) and (2) and at 15 CFR Part 930 subpart C.

STG1-2 **II – Issues and Concerns:**

- Flight exercises should not be allowed over populated areas of Guam at any time. Catastrophic effects of aircraft accident due to increase in volume of air traffic expose people and properties to potential accident. Although, the risk to people on the ground of being killed or injured by aircraft accidents is small, an aircraft accident is a high consequence event and the result is often catastrophic. The 1998 US Air force AICUZ Report (April 1998) states that the Air Force determined that 75% of the accidents had definable debris impact areas, although they varied in size by type of accident. Of the 369 major USAF accidents 1968-1972, 70 percent occurred in daylight and fighter and training aircraft accounted for 80 percent.

STG1-3 **Cumulative Impacts:**

- Our coastal marine and terrestrial habitat will be affected by training exercises within the ocean surface and undersea areas, i.e. training explosions in Apra Harbor. The cumulative wastes and discharges from continued training explosions will generate pollutants and threaten our estuarine and reefs.

STG1-4 What assurances are there that our designated Northern Aquifer will not be impacted?

STG1-5 • Any type of land disturbing activity increases the potential for erosion to occur resulting in loss of shorelines that will eventually lead to damages to our coral reefs and disturbance of marine habitat.

STG1-6 • The cumulative impacts from continued firing range exercises will affect our native forests and wetland areas. What measures are there to ensure that this type of activity does not pose unreasonable risks to the health, safety or welfare of the people of Guam?

STG1-7 • Impacts from air traffic will have an effect on our community most especially on the elderly who will live in fear with the sounds of ammunition going off. This will affect their health to cause memories of war time and all the hardships endured by it, and cause them to live in fear from the constant loud sound of airplanes etc

STG1-8 • What assurances are there to protect our native birds, marine animals and disturbance to our native forests? Our marine environment will be subjected to continuous trauma from the military exercise leaving our marine animals defenseless.

STG1-9

2.2.1. This DEIS lacks a range of reasonable alternatives and does not provide an adequate explanation as to why other alternatives were eliminated from full consideration. As such, we believe the DEIS does not fulfill the requirement to "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated (40 CFR §1502.14)." Our analysis of the alternatives in the DEIS leads us to believe that other alternatives may have been foreclosed prematurely, without adequate explanation regarding their elimination from the range of alternatives analyzed in the EIS. While some explanation is provided regarding the three alternatives that were eliminated from consideration, the categorical exclusion of these alternatives, without considering potential combinations of components of these broad alternatives (e.g., some training conducted elsewhere in the region, increased use of simulated training for certain activities, and possible combined use of certain sites in order to reduce the total number of training sites) resulted in essentially one alternative (see below for our opinion on why alternative 2 is not a reasonable alternative). It is difficult to accept that a proper analysis of all possible reasonable alternatives was conducted when we are left with essentially one alternative.

2.2.1. The authors of the MIRC DEIS indicate that the paucity of alternatives is the end result of a process that eliminated all other alternatives. While the criteria for determining the reasonableness of an alternative are provided, the decision making process that led to the elimination of a range of possible alternatives was not a process open to public input nor was it properly documented in the DEIS, and thus cannot be considered as fulfilling the requirements of the NEPA process. Alternatives analysis should clearly indicate why and how the particular range of project alternatives was developed, including what kind of public and agency input was used. In addition, alternatives analysis should explain why and how alternatives were eliminated from consideration. It must be made clear what criteria were used to eliminate alternatives, at what point in the process the alternatives were removed, who was involved in establishing the criteria for assessing alternatives, and the measures for assessing the alternatives' effectiveness. It is general practice by many federal agencies that in the preparation of NEPA documents, project sponsors should be candid about the rationale for generating, evaluating, and eliminating alternatives. If alternatives are eliminated from further consideration because they "do not meet the purpose and need," the action proponent must adequately explain how or why this alternative doesn't meet the purpose and need. We do not believe these criteria were met.

2.2.1. The Navy's Environmental and Natural Resources Program Manual provides examples of the types of alternatives that should be included in an EIS, including 1) taking no action, 2) postponing action, and 3) selecting actions of a significantly different nature that would meet mission and project objectives with different environmental impacts. We believe that Alternative 1 and Alternative 2 are not sufficiently different, leaving reviewers with essentially one action alternative (which, then, is not an "alternative" at all), and thus a range of reasonable alternatives is not offered for evaluation of environmental impacts. Alternatives should address alternate designs, site locations, etc. when establishing the selection criteria.

2.2.1. In general, it appears as though the information used to support conclusions about the impacts of various activities under the No Action Alternative were based on the information presented in the 1999 Military Training in the Marianas EIS. While the level of training would remain relatively consistent under the No Action Alternative, this approach does not take into account changes in the environment that may have occurred since the 1999 EIS. For example, a recent survey of immigrants to Guam conducted by the U.S. Census Bureau and the Government of Guam indicated that the population of immigrants from the Freely Associated States increased from about 10,000 in 2003 to over 18,000 in 2008. There have also been increases in other demographic groups over this period, pushing the total population significantly higher. There are various direct and indirect effects of population increases, such as changes in land use, recreational use, resource condition, etc., that may result in impacts different than those determined in the 1999 EIS. There may also have been changes to laws, rules, and regulations that may call for a different analysis of the current level of training. We have also learned a lot more about climate change and its expected impacts to coastal resources and coastal communities over the last 10 years. Our improved understanding of these impacts would likely result in a different analysis of impacts of the current level of training activity. It is not reasonable to apply the results of impact analysis conducted more than 10 years ago to the current EIS process, so a new analysis of impacts of activities under the No Action alternative should be carried out for inclusion in the FEIS. And because the No Action alternative serves as the baseline for Alternative 1 and Alternative 2, the impacts of these alternatives must also be re-evaluated.

STG1-10

3.3.4. The authors of the MIRC DEIS claim that unavoidable impacts to water quality are only temporary and would not result in adverse effects. However, Government of Guam biologists have witnessed highly turbid water apparently related to the nearby LCAC activity while snorkeling at Jade Shoals on February 2, 2009 that was severe enough to raise concern about the veracity of that statement. A sediment plume was visible in the immediate vicinity of the craft near relatively shallow areas, and the water quality appeared to diminish as one approached the landing beach, indicating that the shallow water near the landing beach was the main source of the suspended solids. While temporary, these impacts should not be considered insignificant, especially if the intensity of these activities will increase. While the poor water quality observed at Jade Shoals would not likely cause the mortality of corals and other reef organisms directly, it does place upon the reef community a level of stress that would not otherwise occur but for the activity of the LCACs. Corals, for example, would have to expend additional energy removing sediment that would not otherwise occur, potentially resulting in reduced fecundity, reduced growth rates, and increased susceptibility to pathogens. Many of the reefs of Guam are subject to intense anthropogenic impacts, and as such many are in poor to fair condition. Additional impacts to corals and other reef organisms should be considered within this context, especially within the larger context of climate change and the expected impacts to reefs; the cumulative impacts of the myriad of impacts caused by human activity should be considered in this analysis. This section does not provide sufficient support for the claim that there will be no significant impacts to water quality by training activities described in this DEIS.

STG1-11 **3.5.4.** We find it hard to believe that so few residences will be impacted by the increase in aircraft events. Part of the impact analysis should include interviews with current residents in order to calibrate the models results (what the community thinks is disruptive/annoying vs. some other standard). Even if additional analysis indicates the relatively few residents will indeed be affected by airborne noise, mitigation (e.g., soundproofing their windows, A/C units, etc.) should be offered to these residents similar to the mitigation offered to residents affected by airborne noise associated with the International Airport.

STG1-12 **3.7.3.1.8.** A recent publication (Parsons et al. 2008) that was not cited in the DEIS raises concern about sonar impacts to marine mammals, particularly as a result of injuries resulting from behavioral impacts of active sonar use. Secondary, or indirect effects, such as injury or mortality sustained from disrupted behavior or physiology are not considered because consideration of secondary effects "would result in much Level A harassment being considered Level B harassment, and vice versa, since much injury (Level A harassment) has the potential to disrupt behavior (Level B harassment), and much temporary or physiological or behavioral disruption (Level B) could be conjectured to have the potential for injury (Level A)" and thus "considerations of secondary effects would lead to circular definitions of harassment." While admitting that secondary effects are possible, the authors of the DEIS claim that these injuries "can only be reliably predicted in circumstances where the responses have been well documented." Such an approach seems to exclude the consideration of one the main suspected mechanisms by which marine mammals could be injured – namely, through a physiological injury resulting from behavioral changes spurred by the presence of anthropogenic acoustic sources. If the end result of a cascade resulting in the reduced fitness or death of a marine mammal (behavior change-physiological injury-reduced fitness or behavior change-physiological injury-mortality), than it seems as though it should be considered Level A harassment as it is not a temporary, recoverable physiological effect. Parsons et al. (2008) claim that there is sufficient circumstantial evidence to raise serious concern about the potential for active sonar to injure marine mammals, and they raise concern over the inappropriateness of the most commonly used impact analyses in estimating potential impacts. We request that the preparers respond to these and other points raised in Parsons et al. (2008).

Reference: Parsons, E.C.M., S.J. Dolman, A.J. Wright, N.A. rose, and W.C.G. Burns. 2008. Navy sonar and cetaceans: Just how much does the gun need to smoke before we act? Marine Pollution Bulletin 56: 1248-1257.

STG1-13 **3.7.4.** We are concerned about the impact of landing craft exercises on the dolphins that reside in Agat Bay. LCAC's, for example, are very loud and have a high potential to disturb the natural behavior of the dolphin pod that resides in Agat Bay. There is also the chance of injury resulting from vessel collisions. Repeated temporary disturbances may result in long term impacts, such as abandonment of that area. The apparently high potential for disturbance/injury to cetaceans as a result of increased intensity of exercises involving amphibious vehicle suggests that there will be unavoidable impacts, a conclusion not shared by the authors of the DEIS.

STG1-14 **3.7.3.8.3.** We are also concerned about the impacts of UNDET activities on dolphins and other cetaceans. What assurances can be provided that marine mammals will not be impacted during an UNDET exercise, particularly in Agat Bay?

STG1-15 **3.7.3.1.16.** The authors of the DEIS claim that there has been no stranding of beaked whales in Marianas associated with sonar use. However, the Guam Department of Agriculture's Division of Aquatic and Wildlife Resources responded to a stranding of a live Cuvier's beaked whale on August 30, 2007, two weeks after Operation Valiant Shield was conducted between August 7-14. The animal was disoriented and appeared to have injured itself by impact with the reef, but was deemed to be in sufficient condition to be escorted to deeper water and released. While the cause(s) of the stranding cannot be determined conclusively, especially without a detailed examination of a carcass, the circumstances of the stranding are highly suspicious. A handful of marine mammal strandings have occurred on Guam in the last decade, but only in the incident associated with the Valiant Shield exercise was it known to local resource agencies that mid-frequency sonar was being used. Another suspicious stranding incident occurred on April 11, 2007, and involved a dolphin and a false killer whale stranding at approximately the same time and at separate locations on the island. It would be interesting to examine the dates of the strandings with known Navy sonar activity, especially in instances involving beaked whales. We highly recommend contacting with the Department of Agriculture for information regarding strandings, as well as other marine and terrestrial resource-related data/information that are integral to ensuring that adequate impact assessments are carried out.

STG1-16 **3.8.3.1.3.** We disagree with the conclusion that sea turtles would not be affected by landing craft training activities conducted in the MIRC. We are concerned about the direct threat to turtles by vessel collision, disturbance of natural behavior, and impacts to the nesting habitat as a result of repeated landing events. Increased compaction, erosion, and other impacts will likely result from this activity, causing the beach to become less suitable or unsuitable for turtle nesting activity. We feel that these potential impacts are not adequately addressed in the DEIS, and request that more information be provided regarding these impacts.

STG1-17 **3.9.3.2.2.** We are very concerned about the impacts of LCAC and AAV activity on coral reef habitat at Tipalao, Dadi, and areas within Apra Harbor. While the shallow benthic habitat at Tipalao does not possess a large amount of living coral, this does not mean that EFH will not be impacted. Living coral is not the only type of EFH. Impacts that alter the structure of the reef, whether covered with living coral, crustose coralline algae, turf algae, macroalgae, etc. can also be considered impacts to EFH. For example, the repeated use of AAVs in the shallow waters at Tipalao would likely alter the reef structure, possibly reducing rugosity and thus affecting its suitability to certain fish species. We also have concern about the impact of LCAC use at Dadi Beach and in the area near Dry Dock Island. As mentioned above, the resuspended sediments resulting from LCAC operation in shallow water has the potential to stress corals and associated reef life. In addition, the improper use of these craft could directly impact shallow coral reef habitat. For example, anecdotal reports from a past LCAC demonstration at Dadi Beach indicate that large coral colonies were disturbed (e.g., detached from substrate) when an LCAC was brought down in the shallow water just beyond the beach, and then raised again to bring the craft

upon the beach. What measures will be implemented so that this type of impact does not occur? And what type of mitigation will occur if this impact does occur?

STG1-18 **3.11.** A major concern voiced to us by residents of Yigo is the current impact of low-flying helicopters along the cliffline in Yigo to native wildlife, particularly the Marianas fruit bat. These activities are not described in the EIS, and it is assumed they are not considered allowable activities, but yet they still occur. Who is accountable for these deviations from protocol and who does the community contact in order to address these concerns?

STG1-19 **3.11.** There appears to be a lack of a biosecurity plan to prevent introduction of invasive species and to prevent spread of species (e.g., brown tree snake) to other islands as a result of vessel/aircraft movement during training activities.

STG1-20 **3.12.2.4.2.** Andersen Air Force Base: Practice takeoffs/landings and instrument approaches, and base maintenance runup activities conducted during normal working hours (scheduled between 0600 and 2200); GCMP suggest to conduct activities during the hours of 8:00a.m. to 5:00p.m. and that the community be notified.

STG1-21 **3.16.** The section describing the impacts to Guam's economy does not adequately address the potential impacts to commercial fishing and tourist operators or to Guam's tourism economy as a whole. Even short term impacts to commercial fishing and tourism operations result in lost income. This is especially true for areas that have been identified in a recent coral reef valuation study conducted by an international team of researchers as being exceptionally valuable (e.g. Western Shoals, Gab Gab II, Blue Hole, Hap's Reef, and Double Reef). Access to sites that are already restricted when training activities are conducted will be further restricted, while sites not currently restricted may experience restrictions as a result of landing craft training or some other type of training. It is also difficult to understand how the preparers reached the conclusion that there will be no impacts or that impact will be unlikely when access to important fishing grounds such as Galvez and Santa Rosa banks and Double Reef will be restricted more frequently. Repeated incidences, and cumulative impacts of other activities, could cause substantial impact on the viability of certain commercial operations. This is especially true if repeated training activity, such as UNDET exercises or exercises involving landing craft, disturb the resident dolphin pod(s) in Agat Bay to the point of abandoning the site. These potential impacts are not recognized within the DEIS, and thus mitigation for these impacts are not addressed in any way. The claims that there will be no impacts or that impacts will be unlikely to commercial fishing, recreational and subsistence fishing, and tourism are unsubstantiated. Some suggestions are to obtain creel data from DAWR to determine how much use these areas receive and interview fishermen and commercial operators to find out how often they are restricted from important areas and how that impacts their businesses. The potential cumulative impacts of increased intensity/frequency of training activities, in combination with an overall increase in U.S. military presence on Guam, on the tourism economy should also be carried out. It seems reasonable to be concerned about the potential impacts to a tourism economy largely dependent on Japanese tourists. Was there any survey of the Japanese tourists' perceptions of the U.S. military and how

an increased presence may alter their perception of Guam and perhaps change their willingness to visit the island?

STG1-22 **3.16.2.2.** The supposedly greater "ripple effect" of defense spending versus recreational spending is not a justification for displacing current recreational spending, and is unsubstantiated and is actually quite offensive. Is this statement suggesting that the displacement of recreational spending is beneficial to the economy, thus justifying any impacts to Guam's tourism sector? Do you really think that the people of Guam would rather replace a self-sustaining, locally-managed tourism industry with increased federal defense spending over which they have no control?

STG1-23 **3.17.** The Recreation section is perhaps one of the weakest sections in the MIRC EIS, and includes what could be described as a cursory analysis of potential impacts. It appears as no interviews with local agencies (e.g., Department of Parks and Recreation or the Guam Coastal Management Program) or with individual recreational users were conducted. As a result, we strongly feel that this section does not adequately address the range of potential impacts to recreational use on Guam. A few of the many examples of potential impacts to recreational users include restricted fishing access to the offshore banks occurring within area W-517, restricted access to the Double Reef and Haputo Bay areas by fishermen, divers, boaters, and other recreators, and restricted access to/disturbance of fishermen, divers, boaters, and other recreators in Apra Harbor and Agat Bay. While temporary, these impacts can be significant when they occur regularly, which is already a concern under the current training regime. While access to these areas is already restricted while training activities are underway under the current level of training, access will be further restricted if either of the action alternatives is adopted. We would also like to reiterate our concern about the inappropriateness of using the 1999 EIS to evaluate the impacts of the current level of training intensity within the present day context. The claim that there will be no significant impact to recreational use is not substantiated, and in contrast we believe that there will indeed be significant impacts to recreational users, especially when considering the cumulative impacts of other military activities.

General Comments:

STG1-24 Based on input provided to us by mayors, vice mayors, and other community members in Agat and Yigo, where the bulk of the training activity impacts would occur, there is concern about the lack of proper notification for a range of exercises that occur in the vicinity of residents. The mayor's office in Agat, for example, was not provided advance notice of training activities occurring off shore of their community, including insertions and extractions involving helicopters. The vice mayor was not personally alarmed by this activity, but was concerned about the potential reaction of some of the residents and the lack of respect demonstrated by the lack of advanced notification. Similar concerns were raised by the Yigo Mayor's Office, which voiced concern over low-flying helicopter activity in residential areas. Concern was also voiced over the potential impact of helicopters flying very low, and along the cliffline, producing loud noise, disturbing wildlife, and potentially harming native vegetation. Helicopter activity was also reported at night from several locations around the island. It is our understanding that

training activities typically occur in daylight hours. There were several other reports of activities occurring without proper notification.

STG1-25 The above concern brings up a larger issue that was commented upon by several community members: who is accountable for deviations from protocol established for various training activities? Where do community members turn when they observe activities that they believe deviate from protocol and cause disruption to their quality of life or cause harm to wildlife or habitat? We have heard numerous reports of activities that appear to be against protocol, but no one – including the mayors - knew what they should do about it. Also, who is accountable in the event of an accident (e.g., plane crash) – the risk of which will increase as the frequency of aircraft events increases? Concern was also raised about the potential for debris to fall from aircraft into residential areas.

STG1-26 The preparers appear to treat all of area W-517 as open ocean, but offshore banks (e.g. Galvez and Santa Rosa banks) occur in this area. These banks are important to fishing and may serve as an important source of larvae for Guam's near shore reefs. Impacts of concern include vessel collision, explosive use, anchoring, and the restriction of access for fishermen.

STG1-27 We wish to emphasize that the Bureau does not agree with DEIS/OEIS conclusion (last paragraph page ES-30) that, "The proposed Action would not be expected to result in any impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or the general welfare of the public. The comments and concerns that were received from the Natural Resources agencies and the public are too important to ignore in the development of the Final EIS/OEIS.

Sincerely,

ALBERTO A. LAMORENA V
Director

cc: Guam Environmental Protection Agency
Department of Agriculture/DAWR
Department of Parks & Recreation/Historic Preservation
Department of Land Management
UOG/Guam Soil & Water Conservation

Other Comments Received by the Bureau of Statistics and Plans:

1. Name: Roland J. Quitugua, Chairman
Organization/Affiliation: Northern Guam Soil & Water Conservation Districts
Address: UOG College of Natural & Applied Sciences, UOG Station
City/State/Zip: Mangilao, Guam 96923

Comments:

STG1-28

- The primary concerns that I have related to the impacts the increased military exercises and aircraft noise will have on the farming community on the Northern part of the island, particularly on the farmland and farm animals located on Tract I. With the slow down in the economy many of our local residents are returning to farming activities and will be raising more livestock. The noise from military planes and helicopters can disturb livestock operations. Island residents have also made complaints about low flying helicopters that create a noise and safety hazards. What protection measures will be put in place to address these concerns? I am also concerned about the impacts on endangered species such as the Marianas Fruit Bat and native and indigenous plants and trees. What will be done to protect these resources?

STG1-29

- I am also concerned that a clear line of communication does not exist to insure that the local community is informed about military exercises that are occurring in our villages. Island residents should be able to report and relay their concerns to an identified military liaison. The activities require inspection to access any damages such as in the case of underwater exercises in Agat Bay that impact our coral, fish and other marine resources. This has not been the standard operating procedure in the past but should be put in place for future exercise activities. I would like to know why these protocols have not been followed in the past.

2. Name: Tim de la Cruz
Organization/Affiliation: UOG
Address: UOG Station
City/State/Zip: Mangilao, Guam 96923

Comments:

STG1-30

- The expansion of the Mariana Islands Range Complex, despite its obvious threats to the environment and our people, is another example of the enormous burden placed upon us in the name of national security and peace. I am not convinced, despite the US Military's commitment to minimizing the effects these activities will have on the environment and human health, that it will be enough to prevent the real threats to our water supply and our limited natural resources. How will the increased military activities associated with the range reduce threats to human life and the

environment? You minimize risk by minimizing the activities. This proposal offers more, not less military activity.

3. Name: Marceline U. Maratita
Organization/Affiliation: Resident of Barrigada
Address: P.O. Box 24074 GMF
City/State/Zip: Barrigada, Guam 96921

Comments:

STG1-31

- The military needs to assure the people of Guam that whatever they might damage, be it the coral reefs, the ocean environment, the air, the land, that they will invest whatever it takes – money and personnel – to fix, replace or replenish. The burden on the island community is not just for those currently living here, but for those generations from now. I would like peace of mind to know that part of any legacy I leave behind for my family includes clean air, clean water and viable land.

4. Name: Antoinette Cruz
Organization/Affiliation: Guam Soil & Water Conservation Districts
Address: University of Guam, College of Natural & Applied Sciences
City/State/Zip: UOG Station, Mangilao, Guam 96923

Comments:

STG1-32

- I would appreciate ample public notice prior to any training exercises occurring in and around Guam. Public information has not been adhered to by the military, and in many instances the island community – primarily through the village mayors – try to obtain information when they see military personnel jumping out of airplanes, helicopters, amphibious vehicles, or they hear rounds of ammunition. The village mayors have to peel layers of bureaucracy, from the local level up, in order to find out what's going on. There needs to be better, and more open and frequent communication between the military and the island community.

STG1-33

- Another concern is the damage that <u>can</u> occur to all habitats whether in the waters around Guam or on the land itself. Once coral is destroyed, there is no way to mitigate that. When fish habitat are damaged or destroyed, how long will it take for mitigation and who shoulders that burden – the military or the island people? When wildlife habitats are disturbed, how does that get fixed – and again whose burden does it become? When natural resources are damaged, depleted, destroyed the long-term impacts are exactly that –long term. Whatever potential damage military training might have on any living thing, there is a ripple effect, e.g., social impact, economic impact, health and welfare impact, and the list is long. At the end of the day, those left with the spoils are the ones who suffer the greatest impact.

5. Name: Dominic Duenas
Organization/Affiliation: University of Guam, Cooperative Extension Service
Address: UOG Station
City/State/Zip: Mangilao, Guam 96932

Comments:

STG1-34

- Having these range complex, or geographic areas designated for training, research, and conduct operation, through my opinion, may present a harmful impact on the land mass/watering area in which these exercises are being conducted. Most especially in concerns to the island of Guam and its neighboring islands of the Northern Marianas. The military has stated notions of practicing the range complex idea in and around the Mariana's island for decades, without causing any physical stress on the environment that is only in regard for now. I believe that collectively throughout the years, the idea of trying to optimize the military national defenses; will have the price of disrupting the areas natural defenses. Coral reefs, for example area a vital resources that compliments to Guam's beaches and protecting it from dangerous natural events. Also Guam depends on it's a biotic and biotic factors that invest in both its culture and life style.

6. Name: April Guzman
Organization/Affiliation: University of Guam, Cooperative Extension Service
Address: UOG Station
City/State/Zip: Mangilao, Guam 96932

Comments:

- This was all nonsense from the beginning. Not only is it away of polluting our surrounding & natural resources, its harming ourselves as well. Did they even think of any outcomes that may occur while doing this? This could possibly affect the air we breathe and the seafood we eat.

STG1-35

STG-2

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Felix P. Camacho
Governor

Michael W. Cruz, M.D.
Lieutenant Governor

16 MAR 2009

Mariana Island Range Complex
Draft Environmental Impact Statement
258 Makalapa Drive Suite 100
Pearl Harbor HI 96860-3134

Attn: EV2

Via email: Marianas.tap.eis@navy.mil

Subject: Comment on Draft Environmental Impact Statement/ Overseas Impact Statement, Mariana Islands Range Complex

Hafa Adai! Thank you for the opportunity to comment on the Navy's Mariana Islands Range Complex Draft Environmental Impact Statement. More specific comments on individuals sections of this large document will be provided by individual Government of Guam agencies, while these comments are a broader overview of concerns expressed by the public during the outreach process.

General Comments

The people of Guam are fully aware of the military's need to support its mission through vigorous and regular training exercises. The island has long been used for such programs, but the increase in number and size of these events raises some serious concerns.

STG2-1 Mayors of Yigo and Agat, the two villages where much of the increased activity would occur, voiced strong opinions about inadequate notification to residents about training activities. This issue was repeatedly raised by residents of these villages and others, who have asked for a more reliable notification process for training events. The potential for harm to the public, military personnel and the environment is too great to ignore this need and set up a better notification system for the training events.

STG2-2 In addition to a more effective public outreach process, residents are concerned that there is no easy way to report problems or threats associated with the training exercises. Activities that are not discussed in the EIS itself – and are presumably counter to protocol as they are never mentioned in the 1,000 plus page document – have been reported with some frequency by residents near the training events. The public wishes to have the Navy set up a system that would allow such concerns to be reported and addressed in a timely

fashion. I concur with the mayors and these concerned citizens that a system should be put in place to answer public calls and direct changes, where necessary, without the delay and confusion of calling Hawaii, or being transferred among commands to find resolution.

STG2-3

Invasive Species

The draft EIS does not mention a biosecurity plan, which is critical to Guam, the Northern Marianas, and our neighbors in the region. Guam has already had catastrophic experiences with introduced species, such as the infamous brown tree snake and the recently introduced coconut rhinoceros beetle. Increases in activity will require new measures to ensure that the island does not receive new pests, and conversely, to ensure that our neighbors do not receive those pests that have already been established here on Guam.

STG2-4

Marine Impacts

Marine based training activities occur in a wide range of areas around Guam, including numerous important fishing areas. The draft EIS does not adequately address the impacts to local fishermen and boaters, and instead glosses over increased activities as having no significant impact. Many fishers are already restricted by weather conditions and other factors, so any additional closure of valuable fishing grounds could have potentially severe impacts on these users. Additionally, permanent harm from some of the military activities, which could kill fish, larvae and eggs, could result from the training, leading to reduced fishing success overall and having a broader impact than the periodic closures.

The document also does not provide any mitigation suggestions for the impacts of closures and other indirect effects on the fishing grounds. Alternatives that minimize these problems, or some sort of compensatory mitigation, should be considered.

STG2-5

Recreational Activity

Many areas used by the military also are frequented by boaters, including fishermen, divers and other recreational users. There is no clear indication of how extensive these closures will be – do such events last for an hour, or a day, or a week? Again, the notification process will be critical, and every attempt should be made to reduce impacts to the existing community of users.

The training activities themselves present additional challenges that may alter the landscape far beyond the closure period. The potential loss of marine life, whether through injury, mortality or simply scaring them out of the area, presents significant problems, especially for tour operators who rely on a health population of marine animals to support their tours. The underwater detonations, for example, could lead to the relocation of Agat Bay's resident dolphin pod, disrupting the dolphin watch boats and other tours.

In general, the draft EIS makes very little mention of the potential impacts associated with these activities and makes even less mention of mitigation options that may be viable. I request that these areas be revisited and more effort made to either find alternatives that will cause fewer impacts, or to provide environmental and compensatory mitigation to offset these issues.

STG2-6

Economic Impacts

The MIRC undoubtedly supports Guam's economy due to the volume of defense spending during the exercise events, the preparation for such projects and other costs associated with maintaining operations on island. However, I am disappointed by comments in this draft EIS that minimize the value of other contributions to Guam's economy, perhaps as a justification to allow the military to increase its operations.

Section 3.16.2.2 states that defense spending has a greater ripple effect than visitor dollars. Does this imply that the military should be allowed to harm the environment and disrupt existing activities because defense money is worth more? The people of Guam are prepared to do their part to support the nation – but our nation depends on strong, vital communities, which we cannot achieve without the ability to pursue independent industries that do not rely on federal dollars alone.

I strongly recommend that you revisit the economic impacts referenced in this document and prepare a more accurate review of the true costs of these exercises to existing tourism activities, fishing pursuits, and recreational users. Such impacts should be evaluated more thoroughly and more realistic and fair alternatives or mitigation should be discussed.

Conclusion

On behalf of the people of Guam, thank you again for the opportunity to raise concerns associated with the use of Guam and the Mariana Islands for continued training operations. I look forward to a final Environmental Impact Statement that more effectively addresses local concerns about threats to our environment, our economy and our quality of life here on Guam

Sinseru yan Magåhet,

FELIX P. CAMACHO
I Maga' låhen Guåhan
Governor of Guam

Department of Agriculture
Dipåttamenton Agrikottura
163 Dairy Road, Mangilao, Guam 96913

Felix P. Camacho
Governor

Michael W. Cruz, M.D.
Lt. Governor

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Plant Nursery	734-3949	
Plant Inspection Station	475-1426/1427	Fax 477-9487

Paul C. Bassler
Director

Joseph D. Torres
Deputy Director

March 16, 2009

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Pearl Harbor, Hawaii 96860-3134
Attn: EV2

Email: Marianas.tap.eis@navy.mil

Subject: Comments on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS.OEIS) for the Mariana Islands Range Complex.

Dear Sir/Madam:

The Guam Department of Agriculture (DoAgri) has reviewed the Draft Environment Impact Statement / Overseas Environment Impact Statement (EIS/ OEIS) for the Mariana Islands Range Complex (MIRC). The purpose of the Draft EIS/OEIS for the MIRC is to achieve and maintain military services (Services) readiness using the MIRC to support and conduct current, emerging, and future training and Research, Development, Test and Evaluation (RDT&E) activities, while enhancing training resources through investment in Guam and the Commonwealth of the Northern Mariana Islands. Though DoAgri had requested a two-week extension the March 16, 2009 deadline, but did not receive notification whether it was approved.

The comments address general concerns of the DoAgri in regards to the MIRC for consideration in the Final EIS/OEIS. We submit the comments in table format and request they be addressed in the Final EIS/OEIS.

Thank you providing the opportunity to provide these comments. Please do not hesitate to contact Mr. Celestino Aguon, at 735-3955/3956, with the DoAgri's Division of Aquatic and Wildlife Resources, if you have any questions.

Sincerely,

PAUL C. BASSLER

Enclosure(s): MIRC DEIS/DOEIS comment matrix.

cc: Bureau of Statistics and Plans
Guam Environmental Protection Agency (GEPA)
NAVFAC Marianas
Andersen Air Force Base
NOAA, Pacific Islands Regional Office
U S Army Corps of Engineers (Frank Dayton)
U S Fish and Wildlife Service (USFWS), Ecological Services, Honolulu
Department of Parks & Recreation

Comment Matrix to Draft EIS/OEIS for MIRC

#	Location			Comment	Reviewer	Response
	Page	Line	Section			
0	*1*	*10*	*5.2.1*	*Remove last sentence in paragraph.*	*JD*	*Text revised per comment.*
STG3-1 1	ES-21		Table ES-3	The impacts to sea turtles are possible, how is the claim of no nest failures made? Would the increased activity impact sea turtle feeding, mating, etc.	DAWR	
STG3-2 2	ES-23		Table ES-3	Underwater detonation would result in the injury or death of fish eggs or larvae.	DAWR	
STG3-3 3			Chapter 2	The Description of Proposed Action and Alternatives will need to include specific time of day (night/day hours) for training. For example; training at CATM/EOD, Pati Point will occur during daytime hours only. Due to the lack of information, our comments are limited. – Provide detail schedule of actions in Chapter 2.	DAWR	
STG3-4 4	2-18		Table 2.3	Pati Point CATM/EOD Pit Detail/Description does not indicate time of day training will occur at CATM/EOD range. Mariana Fruit Bat colony is located East of the training site. Bats have been observed flying above the training site at night to forage. Training at night may cause bats to alter their normal behavior/activities at night due to "new" stressor. Bats at the colony are habituated to activities at CATM/EOD range during the day. Night hours may have an impact on their normal behavior.	DAWR	
STG3-5 5			Chapter 2	The EIS/OEIS does not mention any monitoring on resources during training activities at the training sites. A Monitor Plan on Resources should be included in the EIS/OEIS. Monitoring is required to determine impacts to natural resources during training activities. EIS/OEIS will need to include monitoring efforts at all training sites.	DAWR	
STG3-6 6	2-6, 2-18		Table 2-2	EIS/OEIS will need to provide detailed schedule of detonations at OAEDS, NAVY and EOD, AAFB. Detonation activities will most likely affect breeding behavior and natural behavior of native species (moorhens, swiftlets, fruit bats) in Navy and (fruit bats, crows) AAFB property.	DAWR	
STG3-7 7	2-6,2-7, 2-2-18		Table 2-2	Activities at Firing Range in Orote Point, NavMag, and Finegayan will pose a threat to recreational users near the area. Orote Point and Finegayan shooting range is situated where bullets are fired towards the ocean. The EIS/OEIS will need to address proficiency when notifying the public with training exercise, for the safety of local fishermen and tourist companies.	DAWR	

Comment Matrix to Draft EIS/OEIS for MIRC

	#	Location			Comment	Reviewer	Response
		Page	Line	Section			
STG3-8	8	2-7, 2-13		Table 2-2, Figure 2-5	The EIS/OEIS will need to address the impacts to Mariana Common Moorhen and Island Swiftlet regarding the Sniper Range, OADR, and SLNA located in Navy Magazine. Moorhen nesting and swiftlet foraging behavior may be impacted during activities in this site.	DAWR	
STG3-9	9	2-12		Figure 2-4	Field training exercises such as beach landing by small craft at Polaris Point Field would not be compatible with the Sasa Bay Marine Protected Area.	DAWR	
STG3-10	10	2-48		Table 2-8	Amphibious Raid Special Purpose. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	DAWR	
STG3-11	11	3.1-8		3.1.2	The OEIS zone outer reef and banks of Guam, such as Santa Rosa Reef must be addressed in the OEIS and will be impacted by training. These banks need to be described and BMPs during training exercises and mitigation listed to protect the resources and the local fishing dependent on these sites.	DAWR	
STG3-12	12	3.10-2	Para-graph 1	3.10.1.1	Armed Forces must confer and cooperate with the USFWS re; adverse effect on a population of a migratory bird species. Mitigation to provide a predator-free breeding site for the breeding seabirds and shorebirds found on Guam and CNMI to compensate birds that were harmed or killed during military readiness activities	DAWR	
STG3-13	13	3.10-34		3.10.3.2	Alternative 1 is the preferred Alternative for the EIS/OEIS. However, the effects described to seabirds are vague in the section. A more detail understanding will need to be addressed in the EIS/OEIS under Alternative 1.	DAWR	
STG3-14	14			Chapter 3.11	Potential Impacts to Terrestrial habitats is not fully discussed in the EIS/OEIS. Most of the "prestine" limestone forest is located in military lands where MIRC activities will take place. Preserving the forest will be beneficial for the recovery of Guam's Threatened and Endangered Species.	DAWR	
STG3-15	15	3.11-38		3.11.2.2.7	Change local name for Mariana common moorhen from Sasangat/ Sasangal to Palattat/Ghereel bweel.	DAWR	

Comment Matrix to
Draft EIS/OEIS for MIRC

	#	Location			Comment	Reviewer	Response
		Page	Line	Section			
STG3-16	16	3.11-48	Para-graph 1	3.11.2.2.12	**Population Status and Distribution**: Historical data has been described in the EIS/OEIS for terrestrial species and habitats. Current information is needed to make appropriate comments. In addition, fruit bats observed only once at FDM should not be a basis for determining no impact at the training site. Presence of fruit bat at FDM should not be ruled out in the decision-making.	DAWR	
STG3-17	17	3.11-51		3.11.2.4.1	A survey for the rare partulids on Guam must be conducted to determine presence/absence at the Finegayan Small Arms Firing Range, and other MIRC training sites (Orote, NAVMAG, AAFB, etc).	DAWR	
STG3-18	18	3.11-53	Para-graph 3	3.11.2.5.1	**Periodic Weather Events**; *Trisiropis obtusangula* is misspelled. Change to *Tristiropsis obtusangula*	DAWR	
STG3-19	19	3.11-3.2			There is no mention of conservation measures for Threatened and Endangered species (swiftlets, crows, fruit bats, partulids, etc.) that will be impacted on guam MIRC sites	DAWR	
STG3-20	20	3.11-66		3.11.3.2.2	**Conservation Measures:** For the seabirds and shorebirds known to reside on Guam, The Navy should fund BTS control to allow for successful reproduction to occur. In addition, Andersen AFB should implement BTS (and other predator) control measures at Pati Point fruit bat colony. A Biosecurity Plan must be developed and approved by Guam DAWR, USDA-WS, CNMI-DFW and USFWS before implementation for interdiction.	DAWR	
STG3-21	21	3.11-67		3.11.3.2.2	**Quarterly seabird population monitoring at FDM**: monthly monitoring should occur at FDM after the conclusion of MIRC activities until there is an indication that the population of seabirds are close to the numbers prior MIRC activities.	DAWR	
STG3-22	22	3.3-16		3.3-16	Cyanide is going to be released into marine environments from torpedo testing. No study to show the long-term effects of this? Why are no action alternative levels being used for these?	DAWR	
STG3-23	23	3.3-16		3.3-16	Lead weights being released not the substrate. This lead is still accessible to burrowing organisms, and thus still able to enter the food chain	DAWR	
STG3-24	24	3.3-17			2.46 tons of material annually from sonobuoy deployments. No cumulative impacts?	DAWR	

Comment Matrix to
Draft EIS/OEIS for MIRC

	#	Location			Comment	Reviewer	Response
		Page	Line	Section			
STG3-25	25	3.3-18			0.86 tons of residue from pyrotechnics. Why are no action alternative levels being used for these?	DAWR	
STG3-26	26	3.3-21			Piti mine neutralization site in 125 feet of water. In the MPA? If this is taking place in the Piti MPA, this is not compatible with the function of the MPA	DAWR	
STG3-27	27	3.3-21			100 pound and 500-pound NEW explosives use in W-517. Why the increase to 500 pounds. What will the effect be on marine mammals and reptiles? What guarantees are there these explosives will not be used near offshore banks that fall within W-517? How will fishermen be notified when these detonations are going to occur?	DAWR	
STG3-28	28	3.4- 9		Table 3.4-2	Number of exercises in w-517. Increased impact to fishermen who use southern banks. Risk of physical damage to marine resources	DAWR	
STG3-29	29	3.6-5		Table 3.6-1	Underwater explosions. The probability is that more than plankton will be affected. Current operations have led to fish mortalities, and increased levels of operation would probably lead to increased levels of mortality.	DAWR	
STG3-30	30	3.6-5		Table 3.6-1	Accumulation in substrate. Accumulation of expended materials in substrate exposes benthic communities to unknown risks, and can still expose the food chain to accumulations of toxic materials	DAWR	
STG3-31	31	3.6-6		Table 3.6-1	Collision with coral reef habitat. Amphibious craft, while potentially not colliding with reef directly, can cause sedimentation and pressure waves that do damage corals.	DAWR	
STG3-32	32	3.6-8		Table 3.6-1	Underwater demolitions in Agat. Potential to injure marine mammals and disrupt dolphin-watching tourism. Even without direct injury, increased noise and activity could alter dolphin behavior, causing them to leave the area.	DAWR	
STG3-33	33	3.6-9		Table 3.6-1	Release of chaff. Ingestion of chaff by marine organisms and birds is a concern. Concern for damage is more physical than chemical	DAWR	
STG3-34	34			3.6- 17	FADs. What measures are being taken to eliminate interactions between FADs and Navy vessels?	DAWR	
STG3-35	35			3.6-26	Detonations over soft bottoms. Soft bottoms are habitat for a number of species of ecological as well as fishery resource importance	DAWR	
STG3-36	36	3.6-30		Table 3.6-2	Underwater detonations and ordnance. Detonations do kill benthic organisms, including fish, on soft substrates. Additionally there is a risk for injury or death for mobile marine organisms, including marine mammals and reptiles.	DAWR	

Comment Matrix to Draft EIS/OEIS for MIRC

	#	Location			Comment	Reviewer	Response
		Page	Line	Section			
STG3-37	37	3.7-8		Table 3.7-1	All activities using underwater explosions. Number of exercises in w-517. Increased impact to fishermen who use southern banks. Risk of physical damage to marine resources. Potential for level A harassment of marine mammals. Level B harassment of marine mammals may disrupt recreational and commercial activities. Potential for harm to marine reptiles	DAWR	
STG3-38	38	3.7-13		Table 3.7-1	Underwater demolition. Potential for level A harassment of marine mammals.	DAWR	
STG3-39	39	3.7-18			Dugongs. Dugongs have been recorded from Guam. UOGML Technical Report 17, from 1975.	DAWR	
STG3-40	40	3.7-19			Marine mammal survey. Weather conditions were rough during this survey, resulting in conditions not favorable for marine mammal viewing. Counts probably underestimate true marine mammal abundance.	DAWR	
STG3-41	41	3.7-45			Cuvier's Beaked Whale. A Cuvier's beaked whale stranded alive in Piti in August 2007. This was two weeks after a major military exercise utilizing mid-range sonar was conducted in the area. In January, 2008, a beaked whale, species indeterminate due to advanced state of decomposition, washed ashore in Piti.	DAWR	
STG3-42	42	3.7-46			Dwarf Sperm Whale. A young Dwarf Sperm Whale was found floating in Cocos Lagoon in August 2002.	DAWR	
STG3-43	43	3.7.2.3.5			Sperm whales have been photographed and videotaped giving birth in waters near Facpi Point Guam in June 2001 (Google Search: sperm whales guam). Any detonations in this area can potentially disrupt birthing of this E.S.A listed species. Sperm whales were also the most frequently cited cetacean in the waters around the Mariana islands in a recent marine mammal survey chartered by DoN. (DoN 2007). Based on the frequency of sightings, this E.S.A. listed species is the most likely to be impacted by detonations in waters off the coast of Guam.	DAWR	
STG3-44	44	3.7-119			Sperm whales. The increased boat activity greatly increases the potential for boat strike of sperm whales. As this was the cetacean sighted most frequently in a recent survey of marine mammals, the likelihood of vessel strikes seems to be high for this E.S.A. listed species	DAWR	

Comment Matrix to
Draft EIS/OEIS for MIRC

	#	Location			Comment	Reviewer	Response
		Page	Line	Section			
STG3-45	45	3.7-121			Parachutes. Sea turtles are well known for their propensity to ingest materials such as balloons and plastic bags that they mistake for food items. There is risk that a parachute could result in a similar incident.	DAWR	
STG3-46	46	3.7-124		Table 3.7-10	Marine mammal table. This table only examines the effects of sonar on the hearing of marine mammals. The potentially greater threat is the alteration in mammal behavior. Sudden sonar noise can lead to uncontrolled ascents, causing a condition similar to the bends in whales, especially beaked whales.	DAWR	
STG3-47	47	3.7-129			Sperm whales. Only noise levels are looked regarding damage to whales. The risk of injury or death due to alteration in swimming behaviour is potentially greater. Additionally, sonar use could disrupt pupping behaviour in sperm whales.	DAWR	
STG3-48	48	3.7-132			Cuvier's beaked whales. Cuvier's beaked whales strandings have been strongly associated with mid range sonar use around the world. On Guam, in August, 2007, a Cuvier's beaked whale was stranded two weeks after major military exercises in the area that used mid range sonar.	DAWR	
STG3-49	49	3.7-180			Take of beaked whales. In spite of the statement that the Navy does not anticipate that marine mammal strandings or mortality will result from conducting MIRC training activities within the Study Area, the Navy is requesting for the take of 10 beaked whales in the MIRC study area. This seems a contradiction, though take of beaked whales seems likely, with the relatively strong correlation between mid range sonar use and strandings of beaked whales around the world, including Guam.	DAWR	
STG3-50	50	3.8-5		Table 3.8-1	Inner harbor detonations. Sea turtles are frequently seen in inner Apra harbor. Poor visibility in the inner Apra harbor makes it likely that a turtle would be missed by observers, and take could result. Additionally, there is an increased risk of mortality due to ingestion of expended materials	DAWR	
STG3-51	51	3.8-8		Table 3.8-1	Amphibious craft. Sea turtles have nested in Apra Harbor, both historically and recently. The use of amphibious craft in Apra harbor could impact sea turtle nesting sites.	DAWR	

Comment Matrix to Draft EIS/OEIS for MIRC

	#	Location			Comment	Reviewer	Response
		Page	Line	Section			
STG3-52	52	3.9-10		Table 3.9-1	Detonations in inner Apra harbor. The Navy currently conducts anti mine detonations in Apra harbor. There has been a 100% mortality rate with these operations (every operation has led to the death of fish). Additionally, these detonations have taken place over soft muddy or sandy substrates. These substrates are habitat to a diverse fauna, and any detonation on this habitat will seriously impact these organisms.	DAWR	
STG3-53	53	5-22		5.3.2.1	No mitigation measures addressed for terrestrial and marine habitats, and terrestrial species (fruit bat, crow, moorhen, land snails, etc.). EIS/OEIS would need to address specific mitigation measures for species of concern and their habitats	DAWR	
STG3-54	54	5-1 thru 5-25		Chapter 5	Chapter 5 Mitigation measures- focuses more on Best Management Practices and Standard Operating Procedures. Mitigation is lacking for impacts resulting from MIRC activities.	DAWR	
STG3-55	55	5-14		5.2.3.1	Conservation Measure- Adaptive Management – Mitigation will need to include impacts to terrestrial species & habitats. DEIS/OEIS documents mitigation on marine mammal habitats.	DAWR	
STG3-56	56	5-14		5.2.3.1	Increase monitoring will need to occur for the probability of detecting the locally endangered Mariana fruit bat at the MIRC study area, especially at Firing Ranges.	DAWR	
STG3-57	57	5-23		5.3.2.1	Nowhere in the DEIS/DOEIS mentions ungulates, or impacts caused by ungulates. It is unclear why the Navy proposes Ungulate Management Plan on Navy Lands? A description of the problem (s) caused by these animals need to be included.	DAWR	
STG3-58	58	5-23		5.3.2.1	Navy will need to request for a revocable permit from the Department of Agriculture to remove ungulates in Navy lands.	DAWR	
STG3-59	59	6-23		6.2.4	The Final EIS/OEIS will need to focus on minimizing the potential spread of 'ALL' invasive species entering and exiting Guam and CNMI.	DAWR	
STG3-60	60	6-23		6.2.4	The Final EIS/OEIS will need to define, in detail, impacts associated with the implementation of the preferred Alternative on terrestrial ecosystem	DAWR	

Comment Matrix to Draft EIS/OEIS for MIRC

#	Location			Comment	Reviewer	Response
	Page	Line	Section			
STG3-61 61	6-23		6.2.4	Mitigation plans must be developed and implemented for terrestrial ecosystem to less than significant levels.	DAWR	

Reviewer: Please provide your name, title, commercial phone number, and date of comments;

DAWR -- Jeffrey Quitugua, (671) 735-3955, 26 February 2009, jeff_quitugua73@yahoo.com, and

Brent Tibbatts (671) 735-3987/3955, brent.tibbatts@gmail.com

Department of Parks, Recreation & Historic Preservation
Government of Guam
490 Chalan Palasyo
Agana Heights, Guam 96910
Director's Office: (671) 475-6296/97
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Parks Division: (671) 475-6288/89
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Felix P. Camacho
Governor

Michael W. Cruz, MD
Lt. Governor

Joseph W. Dueñas
Director

In reply refer to:
RC2009-0391

February 12, 2009

Mariana Islands Range Complex EIS/OEIS
Nora Macariola-See, Project Manager, Code EV21
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

Dear Ms. Macariola-See,

We have reviewed the *Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement* that you submitted (EIS) to our office for comment. We have only one concern in regard to the draft EIS.

STG4-1 In Section 3.13.2.2 Guam Offshore and Section 3.13.3.1 Guam Offshore, reference is made to Carrell et al.1991 as the only submerged archeological survey conducted on Guam. However, a recent submerged archaeological resources survey in support of the Joint Guam Build-up was conducted in Agat Bay and Tipalao Bay by Southeastern Archaeological Research, Inc. based in Gainesville, Florida. If a preliminary report from this survey can be acquired the results should be included, particularly if submerged resources were discovered in the course of the survey. We have no other comments or concerns regarding the *Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement*.

If you have any questions with regard to our comments, please feel free to contact our office at 475-6295.

Sincerely,

Joseph W. Dueñas
State Historic Preservation Officer

Senator Judith Paulette Guthertz, DPA
Assistant Majority Leader

I Mina'Trenta na Liheslaturan Guåhan
Thirtieth Guam Legislature

CHAIRPERSON, COMMITTEE ON THE GUAM MILITARY BUILDUP AND HOMELAND SECURITY
155 Hesler Place, Hagåtña, Guam 96910 • Phone: (671) 472-JUDI (5834) • Fax: (671) 472-3547 • judiguthertz@pticom.com

March 10, 2009

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Attn: EV2
Pearl Harbor, HI 96860-3134

This letter provides my comments regarding the Mariana Islands Range Complex EIS. I attended the briefing by the team at the Guam Legislature. I am the Chairperson of the Committee on the Guam Military Buildup and Homeland Security.

I have two comments. First, is the matter of noise pollution. Back in 1994 the Navy was conducting touch and go landings and take-offs at the Naval Air Station, Agana, now known as the Tiyan airfield. The jet aircraft were flying directly over the Tumon hotel row and the civilian hospital, Guam Memorial Hospital, as well as the Mental Health Facility.

STG5-1

When video proof of this fact was presented to the Admiral, COMNAVMARIANAS, he learned that he had been lied to by the squadron commander who had presented, falsely, that his planes were avoiding these routes. Still, however, the Admiral responded to the complaint with an official written position that no laws or regulations were violated by the flights although they would; of course, continue to strive to avoid disturbing anyone.

The noise was deafening, preventing the sick and newborn from sleeping. If such noise was legal and did not violate any regulations, then those regulations need to be changed.

More recently, when the latest generation of aircraft, the stealth planes, came to this area, they broke the sound barrier over Saipan, breaking several windows. Again, the official position was that no regulations were broken.

The MIRC EIS needs to rectify this situation.

My second comment regards the future firing ranges for the Marines coming to Guam. Although we were informed that the MIRC EIS pertains only to current and anticipated training excluding the Marine buildup, we should recognize the obvious. They are coming and they are coming in the near future.

STG5-2

The Marines are looking at obtaining the use of additional land for live firing ranges in addition to the 26 percent of the island already owned by the military.

Letter from Sen. Judith Guthertz
To: MIRC EIS COMMENTS
March 10, 2009
Page no. 2

This is very controversial in light of the land takings by the military after World War II. I have recently come into information that the three current firing ranges on island could be expanded to meet the needs envisioned for our Marines. The Terague Beach firing range, in particular, could be expanded to meet the MK19 hand grenade training requirements if the firing arcs are oriented properly.

I understand that a firing range plan was developed many years ago by the office in charge of Pacific area firing ranges at Schofield Barracks, Hawaii, for Guam which shows how this orientation could be done to enable the expansion of the Terague Beach range.

I strongly recommend that the MIRC EIS include this Schofield Barracks plan and consider its adoption for the anticipated needs of our Marines commencing about 2014.

Thank you for providing the opportunity for me to provide official comments for inclusion in the MIRC EIS.

Senseramente:

Judith P. Guthertz, D.P.A.

GEDA
GUAM ECONOMIC DEVELOPMENT AUTHORITY
Aturidåd Inadilånton Ikunumihan Guahan

I Maga' Lahen Guahan
I Segundo Na Maga' Lahen Guahan
Adminastradot

March 16, 2009

Mariana Islands Range Complex EIS/OESIS
Nora Macariola-See
Project Manager, Code EV1
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

RE: Comments on the MIRC EIS/OEIS

Hafa Adai:

The Guam Economic Development Authority is charged by local law to assist in the implementation of an integrated program for economic development by performing such authorized activities as promoting and encouraging the expansion and development of markets for the products of Guam and the location and development of new businesses and the retention and expansion of existing businesses. It is from the perspective of this requirement that GEDA provides comments on the draft Mariana Islands Range Complex draft Environmental Impact Statement/Overseas Environmental Impact Statement.

STG6-1

As an economic development agency, GEDA generally supports military presence on island. This support recognizes that training on island and in the surrounding area is an essential element of military presence and that the integrity of training areas needs to be assured if the military is to remain a pillar of Guam's economy. As in other geographic areas, the military contributes to the economy through taxes, spending in local business establishments and contracting with local companies. With specific regard to contracting, our analysis shows that only 7% of the local businesses undertake contracts let by federal and military components. Part of the reason for this low participation rate is the inability to plan well in advance of procurements. The Environmental Impact Statement (EIS) does not help correct this problem nor are we able to verify its findings that there will be minor irretrievable allocation of resources as it does not specifically identify the improvements and modifications (and their costs) needed for the training ranges to satisfy the objectives established under the preferred alternative. The absence of this information increases the difficulty of understanding impacts on the community. As stated in the EIS/OEIS, training ranges already in place will continue to be used and no additional ranges will be established and that military construction projects are not planned. If existing ranges will continue to be used and milcon projects are not planned,

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STG6-2

additional impacts would not be expected above and beyond the impacts already experienced. However, the EIS does mention that improvements and upgrades to the ranges will be made and it is these improvements and upgrades that need to be specifically identified and assessed.

STG6-3

In addition, the EIS should evaluate secondary impacts of the preferred alternative including the extent to which on-island spending is increased (or decreased) by military personnel as well as other impacts (e.g., crime, and other social issues) upon completion of training. It is no secret that training events usually result in an increase in Guam's population soon after training ends. Socio-economic impacts of post-training events must be evaluated in the EIS.

Due to the deficiencies noted above, the Guam Economic Development Authority supports requests from other agencies and jurisdictions to extend the deadline for review and completion of the EIS as it is important for the local community to fully understand all aspects of military training on Guam and the surrounding area based upon the provision of adequate information on which to make informed decisions. Thank you for the opportunity to provide comments.

Put Respetu,

for ANTHONY C. BLAZ
Administrator

Cc: Director, Bureau of Statistics and Plans
Administrator, Guam Environmental Protection Agency

GUAM ENVIRONMENTAL PROTECTION AGENCY
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MICHAEL W. CRUZ
LT. GOVERNOR OF GUAM

March 31, 2009

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134
ATTN: EV2
Email: Marianas.tap.eis@navy.mil

SUBJECT: Revised Comments on Draft EIS/OEIS, Mariana Islands Range Complex

Dear Madam/ Sir:

Please accept this letter and its attachments as the final formal comments of Guam Environmental Protection Agency (Guam EPA) on the Draft EIS/OEIS for the Mariana Islands Range Complex.

Guam EPA had submitted comments on the Draft EIS/OEIS for the Mariana Islands Range Complex before the announced deadline of March 16, 2009. On February 9, 2009, we had formally requested extension of review time by two weeks because of the exceedingly large size of the Draft EIS/OEIS. On March 16 we received a letter, dated March 4, from Captain J.P. Rios noting that "Extensions of time to prepare comments are not granted to individual organizations" and "a general extension of the comment period for all can not be accommodated for this project."

We have since been informed otherwise, that a general extension for submitting comments to March 31, 2009, has been approved. Therefore, we request that our previously submitted comments be replaced by the enclosed revised comments and that that they be addressed in the Final EIS/OEIS.

Thank you for the opportunity to submit these revised comments. Please contact Guam Environmental Protection Agency's Chief Planner, Mike Gawel, at (671) 646-4361 or email Mike.Gawel@guamepa.net if there are questions on these comments or more information is needed.

Sincerely,

LORILEE T. CRISOSTOMO
Administrator

Enclosures
Cc: Director, BS&P
Director, Dept. Agriculture
Paul Shintaku, Lt. Governor's Office

"ALL LIVING THINGS OF THE EARTH ARE ONE"

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-1	ES	Tbl ES-3 P. ES-16	3.1	Besides impacts on sandy beaches That "would be similar to that from normal wave actions", the compaction of the sand by military craft and vehicles must be addressed.
STG7-2	ES	ES-26,Table ES-3		Table ES-3: Section 3.16, Any increase in training will result in the loss of subsistence and recreational fishing. What are DoDs plans to compensate this loss of fishing activities?
STG7-3	ES	Table ES-1		The table does not show the date and location of public scoping. Specific attendees and public comments during the scoping should be referenced as an attachment or appendix.
STG7-4	ES	Tbl ES-3 P. ES-19	3.7	Under "Sonar Use",beyond the modelling, how will harm or mortality to marine manmals be monitored during actual training exercises?
STG7-5	ES	Tbl ES-3 P. ES-21	3.8 <12 nm	Have adequate assessments been made to support the claim that "No nest failures have occurred within the MIRC"? How is this claim justified?
STG7-6	ES	Tbl ES-3 P. ES-23	Table 2-2 P. 2-4	Underwater detonation injures and kills more than "fish eggs and larvae". Mine countermeasure training in Apra Harbor has regularly resulted in mortality of numbers of adult fishes. Increased training will increase numbers of fishes killed . An estimate should be provided of numbers of fishes to be killed by future increased activities, based on projections of past mortalities due to detonations during trainings. The projections should be compared to estimated populations of vulnerable species in the impact zone of this training.
STG7-7	ES	Tbl ES-3 P. ES-25	3.`4	Foreign fishing boats passing through the MIRC or fishing within it (such as the Asian tuna long-liners in the FSM EEZ), do not stay within shipping lanes nor read the Notice to Mariners. How will impacts on these vessels be avoided?
STG7-8	ES	Tbl ES-3 P. ES-26	3.17	There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals.
STG7-9	ES	P. ES-27 ES-8		The Navy is justifying no impacts by indicating that the training area is large so there will not be one location accumulating the waste. Is DoD proposing the solution to pollution is dilution?
STG7-10	ES 8	P. ES-27 ES 8 Cumulative Impact		The cumulative impact of both military and civilian construction in the foreseeable future may require quarry materials to be imported from off island if the local quarries can not meet demand. If these quarry shipments will arrive at the Guam Port where will these materials be staged assuming the ships carrying the material have to disembark right away due to the increase shipping and berthing activities at the port. It is likely that valuable space near and around the port will be scarce. Will these shipments be certified at point of origin prior to arriving? Currently Guam EPA inspects sand and quarry materials coming into port and may be overwhelmed by increases in shipment.
STG7-11	ES	ES-28,ES9.2		ES 9.2: 2nd paragraph, Will DoD provide a plan and schedule to accomplish this documentation?
STG7-12	ES	ES-28,ES9.2		ES 9.3: Why isn't the loss of coral from groundings or sediment displacement listed in this section?
STG7-13	ES	ES-28,ES9.2		ES 9.5: Does this take into account all air emissions and is this listed in the GEPA air permit?
STG7-14	ES	ES-31		Please include the identification of Guam's fishing banks in this MIRC.
STG7-15	ES	Fig ES-2 P. ES-32		Mapped area of "Floating Mines Demolition Area". There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals.
STG7-16	ES	Fig ES-5 P. ES-35		Mapped area of UNDET and Mine Neutralization Areas in Agat Bay. There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-17	ES	Fig ES-5 P. ES-35		Field training exercises such as beach landing by small craft at the Polaris Point Field would be incompatible with the Marine Protected Area status of Sasa Bay.
STG7-18	1	1.2		The Strategic mission of MIRC is to provide training venues for the following warfare functional area: AW, AMW, SUW, ASW, MIW, STW, EC and NSW. Granted realistic training contributes to the operational readiness of any unit, but with the limited real estate on the island the consideration of employing simulators and synthetic training to provide early skills will be more suitable. The realistic training can be performed with many training excersise scheduled in the Pacific ie.. Cobra Gold, Foal Eagle, Balikatan, Tandem Thrust, and Cope Tiger to name a few.
STG7-19	1	1-7	46	Agat Bay is **south** of Main Base, not east of it.
STG7-20	2	Table 2-2 P. 2-4		Agat Bay. Underwater detonation must not be allowed here because it would have a significant impact on daily dolphin observation cruises for tourists and residents as well as probable harrassment or harm to these marine mammals.
STG7-21	2	Table 2-2 P. 2-4		Tipalao Bay. This site would suffer less environmental damage from LCAC training than Dadi Beach, which was once proposed as a LCAC training site. Trial LCAC landing at Dadi showed damage to live coral and a fish kill. AAV landings at Tipalao would probably damage living corals and reef organisms and should be avoided there.
STG7-22	2	Table 2-2 P. 2-4		Piti Floating Mine Neutralization Area. There could be a probable harrassment or harm to dolphins that frequent this areadue to such training.
STG7-23	2	Table 2-2 P. 2-4		Outer Apra Harbor. Underwater detonation training in Apra Harbor has regularly resulted in mortality of numbers of adult fishes. Increased training will increase numbers of fishes killed . An estimate should be provided of numbers of fishes to be killed by future increased activities, based on projections of past mortalities due to detonations during trainings. The projections should be compared to estimated populations of vulnerable species in the impact zone of this training.
STG7-24	2	Table 2-2 P. 2-5		Polaris Point Field. Field training exercises such as beach landing by small craft at the Polaris Point Field would be incompatible with the Marine Protected Area status of Sasa Bay.
STG7-25	2	Table 2-2 P. 2-7		Finegayan. Finegayan Small Arms Range has a danger zone extending over important fishing and diving areas. Therefore its use should be discontinued.
STG7-26	2	Fig. 2-4 P. 2-12		Agat Bay UNDET and Mine Neutralization Area. There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals.
STG7-27	2	Fig. 2-1 P. 2-9		Mapped area of "Floating Mines Demolition Area". There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals.
STG7-28	2	Fig. 2-4 P. 2-12		Outer Apra Harbor. Underwater detonation training in Apra Harbor has regularly resulted in mortality of numbers of adult fishes. Increased training will increase numbers of fishes killed . An estimate should be provided of numbers of fishes to be killed by future increased activities, based on projections of past mortalities due to detonations during trainings. The projections should be compared to estimated populations of vulnerable species in the impact zone of this training.
STG7-29	2	Fig. 2-4 P. 2-12		Field training exercises such as beach landing by small craft at the Polaris Point Field would be incompatible with the Marine Protected Area status of Sasa Bay.
STG7-30	2	Fig. 2-6 P.2-14		Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-31	2	Table 2-3 P. 2-18		Northwest Field. What are impacts of "chemical attack/response" exercises? Would these and pyrotechnic firing be a risk to Guam's Sole Source designated Northern Aquifer, below this site?
STG7-32	2	Table 2-3 P. 2-18		Pati Point. Are inert shells and projectiles recovered and removed?
STG7-33	2	Table 2-3 P. 2-18		Pati Point. Aren't firing and EOD activities detrimental to endangered species, including the last remaining roost for fruitbats on Guam?
STG7-34	2	Fig. 2-9 P. 2-19		Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.
STG7-35	2	Fig. 2-9 P. 2-19		Pati Point. Aren't firing and EOD activities detrimental to endangered species, including the last remaining roost for fruitbats on Guam? How are areas on shore and in the water to be cleaned of accumulated projectile deposits?
STG7-36	2	P. 2-24	2.2.1	No Action Alternative should reflect current level of activities. This current activity does not include LCAC and AAV landings at Tipalao or Dadi, outside of Apra Harbor. What is actual frequency of these activities historically? What damage has been identified from these activities? What mitigation is being proposed for current damage and increased damage under Alternative 1?
STG7-37	2	P. 2-24	2.2.1	No Action Alternative should reflect current level of activities. Does current activity include mine demolition in Agat Bay, outside of Apra Harbor? What is actual frequency of these activities historically? What damage has been identified from these activities? What mitigation is being proposed for current damage and increased damage under Alternative 1? Could recognition of the Sasa Bay Marine Preserve and support of its purpose be an appropriate mitigation action?
STG7-38	2	P. 2-25	2.2.1	Mitigation actions for some anticipated or actual damages to resources are missing in this DEIS, for some of the activities, such as the AAV and LCAC landings.
STG7-39	2	P. 2-28	2.2.2.3	Need to expand justification for eliminating this alternative. Show existing numbers of users and frequencies and times the ranges are actually in use to prove that additional use cannot be scheduled. Instead of 7 to 21 days per use, can't 7 to 14 be done or instead of 1 to 2 days, can't one day suffice, as in Table 2-8?
STG7-40	2	P. 2-32	AW	Chaff/flare. What are risks and damages of chaff being ingested by seabirds and marine life?
STG7-41	2	P. 2-33		SINKEX. Name the permit from US EPA and describe the permit process. Provide a list of the approved Guam SINKEX permits since 1999 in the MIRC.
STG7-42	2	P. 2-35		Direct Action. How many times has this exercise actually in the MIRC been done since 1999?
STG7-43	2	P2-36		Marksmanship. Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.
STG7-44	2	2-36		Expeditionary Raid. How many individual LCAC landings were done in 2003? How many each successive year?

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-45	2	2-37		Area of UNDET in Agat Bay. There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals. Also fish kills would occur. How often has this exercise been done in Agat Bay since 1999? What notifications were given to regulatory agencies? What impacts had been monitored?
STG7-46	2	2-37		Underwater Demolition. How many Floating Mine Neutralizations have been done at Agat and Piti since 1999? What kind of monitoring and notification was done?
STG7-47	2	Tables 2-7 & 2-8		Increases under Alternative 2 are extremely excessive, especially in regard to sonar use. Actions and impacts under this alternative should be decreased.
STG7-48	2	Table 2-8 P. 2-45		Mine Warfare. How many Mine Neutralizations and Detonations have been done at Agat and Piti since 1999? What kind of monitoring and notification was done? Smaller charges less than 10 lb. should be used as a maximum, to decrease fish kills while still providing trainees with real expl;osions, if needed.
STG7-49	2	Table 2-8 P. 2-45		SINKEX. Name the permit from US EPA and describe the permit process. Provide a list of the approved Guam SINKEX permits since 1999 in the MIRC.
STG7-50	2	Table 2-8 P. 2-47		BOMBEX. How many bombs have actually been dropped at FDM annually since 1999?
STG7-51	2	Table 2-8 P. 2-48		Amphibious Raid Special Purpose. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-52	2	Table 2-8 P. 2-52		NEO. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-53	2	Table 2-8 P. 2-52		HADR. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-54	2	Table 2-9 P. 2-54		FDM No Action. How many bombs have actually been dropped at FDM annually since 1999?
STG7-55	2	Table 2-9 P. 2-55		W-517. How many shells, canisters and missiles were actually released in W-517 annually since 1999?
STG7-56	2	Table 2-9 P. 2-56		Agat Bay and Apra UNDET. In Apra, smaller charges less than 10 lb. should be used as a maximum, to decrease fish kills while still providing trainees with real expl;osions, if needed. No UNDET should be done in Agat Bay because there would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harrassment or harm to these marine mammals. Also fish kills would occur.
STG7-57	2	Table 2-9 P. 2-57		SINKEX. Name the permit from US EPA and describe the permit process. Provide a list of the approved Guam SINKEX permits since 1999 in the MIRC. Did this really occur annually?
STG7-58	3	3.1.1.1 P. 3.1-2		Don't the CWA, CAA, CZMA, CRCA and other Federal laws apply to imacts on geology here, as in erosion and deposit of non-recovered materials?
STG7-59	3	3.1.1.2 P. 3.1-2		Don't the Guam water pollution control, solid waste, UIC, excavation, clearing and grading and other laws and regulations apply to imacts on geology here, as in erosion and deposit of non-recovered materials?

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-60	3	Table 3.1-1 P. 3.1-5	OTB	NSW, Polaris Point Field. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-61	3	Table 3.1-1 P. 3.1-5		Expeditionary Raids and Hydro Survey landings impacts require mitigation, especially at Tipalao..
STG7-62	3	P. 3.1-7	3.1.2	Was 1993 earthquake at level 8.1, as noted on P. 3.1-11, not 7.8?
STG7-63	3	P. 3.1-8	3.1.2	The OEIS zone includes outer reefs and banks of Guam, such as Santa Rosa Reef, which must be addressed in this OEIS and will be impacted by the MIRC Training. These banks need to be described and BMP during training exercises and mitigation listed to protect the resources and the local fishing dependent on these sites. They may also be critical to recruitment of stocks to the coastal reefs of Guam. Destructive anchoring should not be done at these coral reefs.
STG7-64	3	P. 3.1-11	3.1.2	Ruby Volcano and Esmeralda Bank are not "east of Saipan"
STG7-65	3	P. 3.1-11	3.1.2.1	Was 1993 earthquake at level 8.1?
STG7-66	3	P. 3.1-12 Para. 4		Guam Northern Aquifer is not the "only" drinking water aquifer, but is legally designated by US EPA as a "sole source aquifer".
STG7-67	3	P. 3.1-12 Para. 6		Many corrections needed in this paragraph. The spur and grooves do not have grooves parallel to shore and are not on the reef flat or back reef and do not create pools in the back reef.
STG7-68	3	P. 3.1-13 Para. 1		The unique barrier reef and deep lagoon condition at Apra and Luminao need to be described.
STG7-69	3	P. 3.1-13 Para. 3		Is correct spelling : Mt. Jumullong Manglo?
STG7-70	3	P. 3.1-14	4	"formed **from** sediment eroded…"
STG7-71	3	P. 3.1-17	3.1.2.3	Change "cyclones" to "typhoons"
STG7-72	3	P. 3.1-20	3.1.2.6	The protective measures that would be used for landings on Guam would need to be developed, not just ones for Tinian.
STG7-73	3	P. 3.1-20	Last	Collisions by submarines and deposits of training materials do affect geological resources. They cannot be disregarded.
STG7-74	3	P. 3.1-21 Para. 2		What mitigation is being done for this past degradation?
STG7-75	3	P. 3.1-21 Para. 5		This use of 10 lb. charges for neutralization should remain a maximum. Why increase it to 20 lb.?
STG7-76	3	P. 3.1-21 Para. 6		Because of cumulative impacts, sonobuoys should be recovered and not dumped.
STG7-77	3	P. 3.1-21 Para. 8		Even buried lead and other contaminants from torpedoes would be exposed to burrowing benthic organisms and the food chain. Such impacts must be noted and mitigated.
STG7-78	3	P. 3.1-23 Para. 1		Beach landing activities create more negative geological effects than normal wave action because of their compacting sand.
STG7-79	3	P. 3.1-24 Para. 1		Use of new criteria of doubling weight of explosive charges is not necessary and not acceptable.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-80	3	P. 3.1-24 Last Para.		Buildup of expended materials would be more than an aesthetic concern, especially after years of increased training as proposed. Additional clean-up practices must be planned for accumulated materials, especially plastics and metals.
STG7-81	3	Table 3.1-2		No Action Alt. needs to note the additional compaction of sandy beaches.
STG7-82	3	P. 3.2-1	Last	Although some laws and regulations do not apply beyond 3 nm, the same effects of actions occur and similar environmental protection and BMP's should be applied during training there.
STG7-83	3.2.1.1.1 International Treaties	P. 3.2-2		U.S. Navy Annex V treaty covers nonfood marine pollution solid waste. The recent classification of the Marianas Trench Monument may add this to the "Special Areas" requirements for ocean waste disposal.
STG7-84	3	P. 3.2-2	Last	Add "biological and chemical agents"
STG7-85	3	P. 3.2-3 and 3.2 -4		Add Federal and Territorial Pesticide Laws and Regulations.
STG7-86	3.2.1.2	P. 3.2-5		General approach to analysis training material including gun ammunition that are expended are not recovered. It should be noted that small firing ranges in the North are located in the Sole Source Aquifer for the island's drinking water and that a stricter recovery of lead base bullet should be implemented.
STG7-87	3	3.5-14 First Para.		Question basis of needing noise modelling at NW Field. DEIS does not account for projected aircraft activities.
STG7-88	3	Table 3.2-1 P. 3.2-9		Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-89	3	Table 3.2-1 P. 3.2-10		Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms.
STG7-90	3	P. 3.2-12	3.2.2.1	Will non-US participants in training in MIRC apply the same controls on hazardous materials and conform to US regulations, even on-board the foreign vessels?
STG7-91	3	P. 3.2-13	First	Is it true that "No live fire or tracer rounds will be used on Tinian."?
STG7-92	3	P. 3.2-13	7 & 8	The 10 lb. maximum noted here must be applied throughout the DEIS.
STG7-93	3	P. 3.2-13	17	Will foreign ships, craft, aircraft and vehicles used in exercises conform to using hazardous chemical warning labels in English?
STG7-94	3	P. 3.2-14	First	Currents will not adequately disperse contaminants added to sediments within Apra Harbor. These will accumulate and create environmental problems. How will this problem be addressed?
STG7-95	3	P. 3.2-21 Para. 3		In parts of Apra Harbor, currents will not adequately disperse contaminants added to sediments. These will accumulate and create environmental problems. How will this problem be addressed?
STG7-96	3	P. 3.2-22 Para. 4	3.2.2.3.3	What records and reporting are kept for SINKEX? Are these available to the regulatory agencies?
STG7-97	3	P. 3.2-23 Para. 3	3.2.2.3.6	What are risks and impacts of chaff being ingested by seabirds and marine organisms?
STG7-98	Section 3.3 Water Quality	Table ES3 Summary of Environmental Impact		Surface and Marine Waters may be indirectly impacted by muddied vehicles transversing highways to and from exercise sites; leaving mud on the roads that may eventually wash into surface or marine waters or be conveyed into storwater systems. The use of four wheel drive vehicles and other tractor vehicles may impact the landscape also causing erosion which may degrade the watershed in that location.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-99	3	P. 3.3-1	Above 3.3.1.1	Deposits on soils will affect ground water, as well as surface water resources.
STG7-100	3.3	Table 3.3-3		The 4th column mentioned contamination to drainage areas from runoff. Is there a plan in the document that shows the locations of the drainage systems that will be affected?
STG7-101	3.3			In general, there are paragraphs that have conflicting statements on impact to water quality, .
STG7-102	3.3	3.3.4		Unavoidable Significant Environmental Effects. The paragraph discussed the impact to water quality due to surface water contamination however, there was no plan or discussion on the protection or mitigation.
STG7-103	3.3	3.3.2		Affected Environment. The context of the paragraph is more on general statements (excerpts taken from different manuals or documents) rather than specifically discussing the impact of the new development.
STG7-104	3	P. 3.3-5 First Para.		Guam EPA is not "responsible for providing sewage treatment". It permits and regulates sewage facilities. Guam Water Quality Standards are set to limit pollutants that would detract from designated uses of Guam waters, including the support of the health of aquatic and marine organisms. The Guam EPA web page listed is incorrect.
STG7-105	3	Table 3.3-3 P. 3.3-7		NSW and OTB. Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-106	3	Table 3.3-3 P. 3.3-7		AMW. Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms.
STG7-107	3	P. 3.3-9 Para. 3		Water associated with sediments in parts of Apra Harbor is contaminated.
STG7-108	3	P. 3.3-9 Para. 4		"coastal regions contain surface water bodies **ranging from pristine high quality** to low quality."
STG7-109	3	P. 3.3-10 to 3.3-14		This whole Groundwater section should be better organized and rewritten. Aquifers are not "uplifted" by volcanics but are perched above them. The Northern Aquifer is not well protected by natural filtration and surface contaminants can rapidly reach it. Recharge is supported by approximately 100 inches per year of rain. The "depth" of the lens does not depend on depth of limestone above it. Southern Guam rocks do not derive just from ash, but from lava flows. Thickness of the lens, its recharge dynamics and potential yields should be described.
STG7-110	3	P. 3.3-13		"The military's remediation actions" (air stripping of TCE and PCE) for AAFB have been discontinued for many years.
STG7-111	3	Table 3.3-4		How would release of "classified " hazardous materials be recorded and reported and how would this be mitigated and monitored?
STG7-112	3	P. 3.3-17 Para. 4		Are fluorocarbon releases being assessed and reported? Doesn't the Montreal Protocal require this?
STG7-113	3	P. 3.3-18 Para. 1		What are risks and damages of chaff being ingested by seabirds and marine life?
STG7-114	3	Table 3.3-9		Are projectiles with depleted uranium being used on land or within 3 nm.?
STG7-115	3	P. 3.3-21	2 & 3	Are Piti Neutralization explosions done at 125 ft.? Are Agat Bay underwater detonations being done in spite of the threats to dolphins and impacts on the dolphin watching industry? Will charges of less than 10 lb.always be used and can these be made smaller?

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-116	3	P. 3.3-21		How many missiles with explosive warheads have been fired annually and how many more will be used under Alternative 1?
STG7-117	3	P. 3.3-22	3.3.3.1.2	Besides altering shoreline topography, landing craft compact beaches and destroy infauna and vegetation that controls erosion.
STG7-118	3	P. 3.3-23 Para. 7		All vessels, even foreign ones, training in the MIRC should prohibit discharges of solid waste in spite of the lesser restrictions shown in Table 3.3-2.
STG7-119	3	P. 3.3-26	4	Increased training will have very serious impacts on public uses of coastal waters but Guam Water Quality Standards must support the existing and designated public uses of waters.
STG7-120	3	Table 3.4-2		LCAC generate much sand and dust pollution on land.
STG7-121	3.5 Airborne Noise			Has noise study taken into account existing fixed wing and helicopter sorties and anticipated aircraft stated for Red Horse, Special Force Exercises, and other cumulative airflight related exercises in the MIRC with existing and future land use activities outside these exercise areas?
STG7-122	3	P. 3.5-10 First Para.		Rewrite this paragraph. Increased aircraft activities (up 45%) at AAFB will have very noticeable noise impacts outside the base. Statistics quoted on annoyance levels outside of Guam do not apply to the relatively quiet environment of Guam. Instead of 12 to 22% the number would be expected to approach 100%. Land uses in the AAFB AICUZ area are increasing and are not restricted for noise compatibility.
STG7-123	3	P. 3.5-12 Last Para.		The relatively quiet environment of Guam will lead to numerous complaints from very disturbed residents about increased noises of helicopter overflights. These must be minimized beyond non-DOD properties, especially at night.
STG7-124	3	P. 3.5-14 Para. 2		Helicopter noise impacts on the civilian population and on engangered birds must be avoided and highly mitigated. Mitigation should be described in the EIS.
STG7-125	3	P. 3.5-24 and Table 3.5-4		There will be substantial effects on human receptors from the proposed 45% increase in aircraft activities and this will be seriously exacerbated by the proposed transfer of Marines and its further increase of aircraft noises.
STG7-126	3	3.6-4		Table 3.6-1: STOM-vessel movements, DoD should add the loss of coral from sediment displacement.
STG7-127	3	3.6-5		Table 3.6-1: ASW-vessel movements etc., The mortality to plankton may also result in the loss or reduction of fish populations. What does the Navy propose to ensure this does not occur?
STG7-128	3	3.6-5		Table 3.6-1: ASW-vessel movements etc., will the Navy conduct monitoring of plankton and fish population levels?
STG7-129	3	3.6-6		Table 3.6-1: STW-expended materials, will the Navy monitor the accumulation of expended materials?
STG7-130	3	3.6-7		Table 3.6-1: OTB and FIREX Land, will monitoring and notification of incidents be conducted by DoD?
STG7-131	3	3.6-8		Table 3.6-1: EOD-Explosive ordnance, etc., the sandy bottom areas are home to garden eels in the Agat Bay area. Does the Navy have a mitigation plan for this marine life?
STG7-132	3	3.6-11		Table 3.6.2.2, Does DoD plan to conduct a long term survey of the secondary production communities?
STG7-133	3	Table 3.6.1 P. 3.6-6		NSW. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-134	3	Table 3.6.1 P. 3.6-7		AMW. Because of effects to shallow coral reef, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms. If any such exercises have been done at Tipalao, what are the results of impact monitoring and damage assessment?

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-135	3	Table 3.6.1 P. 3.6-5		AW, SUW and ASW. These exercises must avoid the outer coral reefs and banks, such as Santa Rosa Reef, Galvez Banks, White Tuna Bank, etc. No anchoring or other actions that would damage the coral reef ecosystems should be allowed during training. These reefs support local fishing and may be a source of recruitment of corals and other organisms to the fringing and barrier reefs of Guam.
STG7-136	3	Table 3.6.1 P. 3.6-8		EOD UNDET at Agat Bay. Are Agat Bay underwater detonations being done in spite of the threats to dolphins and impacts on the dolphin watching industry? What are observed impacts and damage assessments? Have fish kills and marine mammal "taking" occurred? Will charges of less than 10 lb.always be used and can these be made smaller?
STG7-137	3	Table 3.6.1 P. 3.6-8		Have amphibious landings been monitored for impacts at Reserve Craft Beach? Has damage to marine life been from this been assessed?
STG7-138	3	P. 3.6-14 First Para.		Offshore coral reef banks used by Guam fishermen are within the MIRC, including Santa Rosa Reef, Galvez Banks, White Tuna Bank. They are very large relative to all Guam coral reefs. They need to be described and discussed in this EIS. No anchoring or other actions that would damage the coral reef ecosystems should be allowed during training. These reefs support local fishing and may be a source of recruitment of corals and other organisms to the fringing and barrier reefs of Guam and other islands.
STG7-139	3	P. 3.6-16 Para. 2		Four seagrass species are listed from Guam but not *Cymodocea.* Need to add *Halodule uninervis* and *Halophila sp. (cf., H. minor)*.
STG7-140	3	P. 3.6-16 Para. 4		The 88.7 acres of mangroves at "Apra Inner Harbor" are not at Inner Apra Harbor but are in the Marine Preserve of Sasa Bay and should be identified as such. This is the largest stand of mangroves on US soil in the entire Pacific and needs special recognition as such. The protection of this Marine Protected Area should be championed and supported by the US Federal Government, including the Department of Defense.
STG7-141	3	P. 3.6-26 Para. 4		What studies have shown that "There is no deep water coral located in the area where SINKEX is typically conducted."?
STG7-142	3	P. 3.6-28 Para. 4		UNDET. Explosions underwater, as planned under all alternatives, could have significant impacts on marine communities. They already have been observed to kill fishes with every detonation and harm other organisms. If a school of popular food fish such as the large schools of atulai in Agat Bay swam through the imact zone during a detonation they all could be killed. Detonations could result in unintended "takes" of protected marine mammals and endangered turtles.
STG7-143	3	Table 3.6-2		Amphibious landings over fringing reefs such as Tipalao would have long term effects in localized areas.
STG7-144	3	3.7-1		Marine Mammals, The training activities would adversely affect the marine mammals in the area. Monitoring of incidents and beaching should be documented and used in re-evaluation of training activities.
STG7-145	3	3.7		Although this chapter on Marine Mammals provides much new information, there are very serious gaps in the knowledge of the status of most species in the MIRC area and impacts on protected species from the various proposed training activities. Substitution of data from other ocean areas for projection of MIRC area resources cannot be accepted as conclusive. Measurements of impacts on MIRC species are full of unknowns. Further work and monitoring of impacts on marine mammals during ongoing exercises in the MIRC are required and modifications of activities need to be implemented based on such findings. Such modifications should not be delayed for five years until the next EIS but should be implemented expeditiously.
STG7-146	3	P. 3.7-18		Dugong. This commentator and his SCUBA partner personally observed an adult dugong less than ten feet away while diving in Cocos Lagoon, Guam. This sighting by two scientists is documented in the University of Guam Marine Laboratory Technical Report No. 17, 1975, done for the US Army Corps of Engineers. This errant individual dugong is believed to have been killed and eaten by unknown poachers. But there is not a resident population of dugongs on Guam.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-147	3	P. 3.7-19 Para. 4		Since visual sitings were recorded in the MISTCS during higher sea states (up to BSS 6), this may have decreased the numbers that would have been sighted in lower seas and skewed density estimates to lower values.
STG7-148	3	P.3.7-34 Para. 6		Sp. :Chamorro Seamounts
STG7-149	3	P. 3.7-38 Para. 4		Since Sperm Whales have exhibited reaction to active sonar, will use of the active sonar be stopped in the presence of these whales, even if the acoustic energy is low level and exposures are of short duration?
STG7-150	3	P. 3.7-61 Para. 3		The information on impacts of active sonar to marine mammals in the MIRC is not adequate to assure that protected species will be protected from harmful impacts during exercises. Therefore a precautionary approach must be taken and procedures modified constantly as new information becomes avail;able to allow protection of these resources. Current procedures for mitigation should not remain in place for five years if they can be improved at any time.
STG7-151	3	P. 3.7-78 Para. 3		Movement of the animal after an explosion might be to another site of explosions, during a large exercise, rather than avoiding additive impacts by escaping other explosions.
STG7-152	3	P. 3.7-90		These controlled experiments lack relevance because the species are different from key MIRC species and they were not done for MFA sonar.
STG7-153	3	P. 3.7-94		The risk function application is not based on conclusive data . Therefore a precautionary approach must be taken and procedures modified constantly as new information becomes avail;able to allow protection of these resources. Current procedures for mitigation should not remain in place for five years if they can be improved at any time.
STG7-154	3	P. 3.7-104 Para. 5		The stranding of a beaked whale at Piti, Guam, documented by Guam DAWR just over a year ago, occurred coincidentally with a large Navy multi-ship exercise including an aircraft carrier. We believe this unusual stranding may have been associated with sonar use, contrary to this DEIS statement.
STG7-155	3	P. 3.7-111 Para. 3		This DEIS blanket statement denying association of beaked whale stranding and MFA sonar seems contradicted by the stranding of a beaked whale at Piti, Guam, documented by Guam DAWR just over a year ago, which occurred coincidentally with a large Navy multi-ship exercise including an aircraft carrier. We believe this unusual stranding may have been associated with sonar use.
STG7-156	3	P. 3.7-111 Para. 3		Navy findings here may need revision because of likely involvement of sonar from training exercises in the grounding and injury of a Cuvier beaked whale on Guam.
STG7-157	3	P. 3.7-138 Para. 6		Isn't there a risk that detonations in Agat Bay will interfere with the daily dolphin watching cruises and perhaps cause the dolphins to no longer be available for this established tourist industry? UNDET should not be allowed in Agat Bay.
STG7-158	3	P. 3.7-152 Para. 8		Navy findings here may need revision because of likely involvement of sonar from training exercises in the grounding and injury of a Cuvier beaked whale on Guam.
STG7-159	3	P. 3.7-170 First Para.		Navy findings here may need revision because of likely involvement of sonar from training exercises in the grounding and injury of a Cuvier beaked whale on Guam.
STG7-160	3	3.8-1 to 16		Sea Turtles, Who will survey and determine the causes of sea turtle injury and/or mortality, if any, due to the exercises done within the MIRC?
STG7-161	3	3.8-1 to 16		Sea Turtles, Who will determine what mitigation will occur if there is mortality or injury?
STG7-162	3	3.8-1 to 16		Sea Turtles, Make sure that USFWS, NMFS, and local resource agency (DAWR) is involved in the process of assessing sea turtle injury and/or mortality.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-163	3	P. 3.8-2 Sec. 3.8.1.2.3		When are the mentioned future surveys to be done for the MIRC? Will they provide data for improving protection of marine animals from exercises impacts before the next EIS is done for MIRC?
STG7-164	3	3.9-3 and 4		Why was Guam Fisherman's Coop Association not consulted? It's members will be greatly impacted by the proposed training.
STG7-165	3	3.9-5		DoD should provide the amount of contaminates released (at least semi-annually) in lieu of disregarding the amounts as negligible due to vastness of marine areas.
STG7-166	3	3.9-7		Table 3.9.1 STOM, any major vessel(s) movement may cause stress in feeding, spawning, and or sleep patterns due to noise levels.
STG7-167	3	3.9-8		Table 3.9.1 Direct Fires Orote Pt, ATCAA 3A, activity may cause stress in feeding, spawning, and or sleep patterns due to noise levels.
STG7-168	3	3.9-9		Table 3.9.1 Vessel movements, major vessel(s) movement may cause stress in feeding, spawning, and or sleep patterns due to noise levels.
STG7-169	3	3.9-9		Table 3.9.1 ASW Underwater explosions, may cause EFH destruction or disturbance. Even shallow sandy bottoms are EFH.
DUP	3	3.9-10		Table 3.9.1 MIW Underwater explosions, may cause EFH destruction or disturbance. Even shallow sandy bottoms are EFH.
STG7-170	3	3.9-11		Table 3.9.1 SUW Expended materials, DoD should monitor seafloor, numerous training events will build up debris on floor bottom.
STG7-171	3	3.9-11		Table 3.9.1 STW Explosive ordnance, will DoD conduct surveys of fish mortality?
STG7-172	3	P. 3.16-10 Sec 3.16.3.2		Foreign fishing boats passing through the MIRC or fishing within it (such as the Asian tuna long-liners in the FSM EEZ), do not stay within shipping lanes nor read the Notice to Mariners. How will impacts on these vessels be avoided? If warned to stay out of naval exercise zones, they may stop using Guam shore facilities and Apra Harbor and negatively impact their suppliers of goods and services on Guam.
STG7-173	3	P. 3.10-26 Para. 6		Since sonar impacts on seabirds is unknown, will observers during exercises be recording and documenting any evidence of impacts on seabirds and will the results of such observations be used to modify exercise procedures to protect seabirds?
STG7-174	3	P. 3.10-29 Para. 2		AMW. Because of effects to shallow coral reef, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms. If any such exercises have been done at Tipalao, what are the results of impact monitoring and damage assessment?
STG7-175	3	P. 3.10-30 Para. 2		Why say "small number of bombs and missiles", when 1800 inert training bombs=<2,000lbs each and 1,600 high explosive bombs 750/1,000 lbs/2,000 lbs are allowed?
STG7-176	3	3.3.3.1		"Expended materials entering the ocean could affect marine wate quality".The use of different training materials in the ocean such as, pyrptechnics, chaff, sonobuyos, otto fuel II, topedoes, ordnance, underwater explosives, and missiles all reflect that residues, chemicals leached, and spills will be realeased into the ocean but because of the large ocean volume the substance will be diluted so it will be ok. In other words dilution is the solution to pollution.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-177	3	P. 3.10-33 Para. 3		The toxicity of the chaff should not be the concern, but what about the physical blocking of digestive tracts by the chaff? What evidence is there that this should not be a concern?
STG7-178	3	Table3.11-1 P. 311-10		ISR. The abandonment of the only remaining endangered fruitbat colony on Guam should not be an acceped risk. What will be done to prevent this?
STG7-179	3	P. 3.11-13 Para. 10		Polaris Pt. Field. . No amphibious landings, especially with LCAC and AAV, but even smallere craft, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.
STG7-180	3	P. 3.11-14 Last Para.		What are past and projected impacts of exercise landings in the Haputo Ecological Reserve Area? Isn't such use contrary to an ERA established for compensatory mitigation?
STG7-181	3	P. 3.11-14 Last Para.		Arms range. Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.
STG7-182	3	P. 312-15		A RAICUZ Plan may be needed for AAFB because of the increased developments in zones outside the Base that are impacted by increasing flight exercises.
STG7-183	3	P. 3.13-41 Para. 2		Tipalao Cove listed as "offshore", but amphibious landings there would impact archeological sites on shore.
STG7-184	3	Table 3.13-3 P. 3.13-44		Tipalao shore is believed to have archeological values which must be assessed before training activities cause damage.
STG7-185	3	Table 3.16-1		Same effects in all items listed. Why have a table?
STG7-186	3	P. 3.16-10 Para. 5 & 8		Commercial and Recreational fishing importance of outer banks and reefs has not been addressed. Data should be shown and impacts of existing and expanded exercises discussed.
STG7-187	3	Table 3.16-4		There are impacts on commercial and recreational fishing of outer banks and reefs. This has not been addressed. Data should be shown and impacts of existing and expanded exercises discussed.
STG7-188	3	P. 3.17-13 First Para.		Sp. "natural preserve"
STG7-189				While reviewing the MRIC it is percived that the Military with the increase of training areas and the increase of frequency that they will be dictating the how, what, where, and when we could use the ocean around our island. The area identified as w517 is a prime fishing grounds as a few banks are located in this area. With the addition of the floating mines demolition area and the agat bay DZ will futher affect the current use of area.
STG7-190	3	P. 3.17-13 Para. 5		Commercial and Recreational fishing importance of outer banks and reefs has not been addressed. Data should be shown and impacts of existing and expanded exercises discussed.
STG7-191	4	Table 4-1		Must add Executive Order 13089 for protection of Coral Reefs
STG7-192	5	5.2		Sea Turtles and Marine Mammals. If exercises are carried out in high waves, visual detction is decreased and risks increase for un-spotted animals. How is this mitigated?
STG7-193	5	5.2.1.1		Must implement procedures and budget for multi-lingual program to train non-US participants before exercises, and have formal agreements to support mitigation measures, even beyond 12 miles.
STG7-194	5	5.2.2.9.3		Post-exercise Surveys and reporting must include seabirds as well.
STG7-195	5	5.2.2.10		Who has granted permits for SINKEX? How many Sinkex exercises have been done since 1999? What post exercise impact assessments have been made?
STG7-196	6	Table 6-1		Navy Base Facility Construction. Is this part of MIRC activities? If in Guam waters, require CWA 401 permits.

comment #	SECTION	Page or Fig/Tbl #	Line #	Comment
STG7-197	6	P. 6-11 First Para.		Fibropapillomatosis is a problem in Hawaiian *Chelonia midas* , but not such a problem in Mariana Islands.
STG7-198	6	P. 6-18 Para. 5		Whale watching. This is very wrong! Cumulative impacts will definitely arise.
STG7-199	6	P. 6-19 Para. 3&4		Should take a pre-cautionary approach when imacts are not clearly known and be prepared to modify exercises when negative impacts are observed.
STG7-200	6	P. 6-25 Para. 5		Noise levels and noise impacts on residents and wildlife from increased flights at AAFB will be significant.
STG7-201	G			Different surface visibility occurs with different sea states (over BSS 4). The MIRC study was too rushed and included sightings at higher BSS, but did not factor in the difference of being able to sight in those conditions. Populations could have been underestimated.
STG7-202	G	G.7.1		Dugong. A current Guam EPA staff, former marine biologist, and his SCUBA partner personally observed an adult dugong less than ten feet away while diving in Cocos Lagoon, Guam. This sighting by two scientists is documented in the University of Guam Marine Laboratory Technical Report No. 17, 1975, done for the US Army Corps of Engineers. This errant individual dugong is believed to have been killed and eaten by unknown poachers. But there is not a resident population of dugongs on Guam.

Commonwealth of the Northern Mariana Islands
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Division of Fish and Wildlife
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FW-09-L-045

March 16, 2009

Marianas Island Range Complex EIS
258 Makalapa Drive Suite 100
Attn EV2
Pearl Harbor, Hawaii 96860-3134

Dear Sir or Madam,

Thank you for providing our office with copies of the Mariana Islands Range Complex Draft EIS for review. The Commonwealth of the Northern Mariana Islands (CNMI) Division of Fish and Wildlife (DFW) understands the need for our Armed Forces to train and be at a ready state. The Division of Fish and Wildlife therefore would like express its willingness to work cooperatively on addressing the needs and issues by providing programs and staff at the base and local level to maintain and preserve our natural resources.

STM1-1

One of the major concerns for the DFW is the potential usage of the DoD (Department of Defense) leaseback/leased lands on the island of Tinian for a temporary or permanent training installment. The movement of vessels (aircraft and marine) and associated cargo from the island of Guam to Tinian would increase the risk of invasive species introductions, namely the brown treesnake (BTS), to Tinian if appropriate measures are not considered. It is understood that DoD has shipping/quarantine protocols in place that include language regarding the control and interdiction of BTS. It is also understood that a BTS Interdiction Plan is currently being developed to address this issue and we look forward to reviewing the document and providing comments as soon as possible.

Attached is a spread sheet that includes several comments from the Division of Fish and Wildlife.
We look forward to seeing these comments addressed in the MIRC-EIS.

Sincerely,

3/16/09
for Sylvan Igisomar
Director, CNMI Division of Fish and Wildlife

#	Page or Fig/Tbl #	Line #	Command or Org.	Commenter (last name)	Comment Type (mechanics, contextual, technical, tonal*)	Comment	Response	Done
2	3.8-14	26	DFW	Ruak	Technical	The DFW Sea Turtle Program has not been privy to data collected by the Navy on Tinian green turtle nesting beaches. It is asked that this information be shared with the DFW Sea Turtle Program so that we are able to make better informed decisions regarding turtle conservation and management in the CNMI.	STM1-2	
3	3.8-16	16	DFW	Ruak	Technical	The DFW Sea Turtle Program has a copy of the report by Kessler and Vogt (2002) on the attachment of satellite transmitters to green turtles on Tinian, however, this report simply covers the preliminary actions taken to attach the transmitters. However, the study results and the final destinations for the satellite tagged turtles was never expounded on or published for public consumption. Considering the fact that the Navy paid $20,000 for these satellite tags as stated in the preliminary report, certainly the Navy has the data regarding these animals to share with the DFW Sea Turtle Program. The DFW Sea Turtle Program would like to obtain this migration data and share it with turtle programs Pacific-wide, as this is critical information that has widespread implications not only in the CNMI but to the entire Pacific region for sea turtle management and conservation efforts.	STM1-3	
4	3.8-25	22	DFW	Ruak	Technical	The amphibious landings on Unai Chulu and Unai Dankulo (Long Beach) are a concern for the DFW Sea Turtle Program. Long Beach especially, as this beach was documented to support what appears to be one of the highest green turtle nesting density beaches in the CNMI by Susan Pultz (1999) as compared to other surveyed beaches, including those on Saipan. The DFW Sea Turtle Program believes therefore, that mitigative measures should be taken to significantly reduce the amount of take incurred on these critical nesting beaches. The beaches in question may well provide habitat to a remnant nesting green turtle population currently in danger of extirpation in the CNMI. Is it possible to restrict amphibious landings during the periods when turtle nesting & hatching does not occur? If the first nest was observed by Pultz on Jan 31 and the last nest on July 31 combined with a mean nest incubation time of 62 days, (last evidence of hatching would therefore occur around September 30th) this would leave October 1 through January 31 for amphibious landings to occur with minimum impact to nesting turtles. (However, the Pultz data are dated and more recent data would be helpful to make more	STM1-4	
5	3.8-1; 3.8-26	6	DFW	Igisomar	Technical	Table 3.8-1 fails to include the potential activity effect that amphibious landings may create deep track ruts that may "entrap" hatchlings on their journey from the nest to the sea allowing them to become exhausted or taken by predators (Lutz, et al 1997). The MIRC also fails to mention how the LCAC or vehicle tracks will be "smoothed out". Will this involve heavy machinery or will they be raked out by hand? Will the beach profile or slope be changed by Naval activities, possibly affecting turtle nesting behavior? *The Biology of Sea Turtles. (1997) Lutz, P., Musick, J.A., & Wyneken, J. CRC Press. pp 432.*	STM1-5	
6	3.8-2	3	DFW	Igisomar	Contextual	This statement makes reference to the fact that DFW Sea Turtle Program receives Federal assistance for our program through a Section 6 agreement with USFWS. However, this is a false statement as the DFW Sea Turtle Program unfortunately has not received funding through this avenue to better enable the Program to perform regular surveys on Tinian.	STM1-6	
7	3.8-1	10	DFW	Igisomar	Technical	Tinian Harbor and the Marina Channel provide foraging habitat for juvenile and subadult green turtles as it is believed they feed on the algae laden rocks in that particular area. Up to eight turtles were observed at one time within the narrow confines of the Channel (Kessler & Vogt 2002). DFW Sea Turtle Program is concerned that since turtles have been documented as having strong site fidelity for many years, that the turtles that prefer Tinian Harbor and Marina Channel may be affected and possibly permanently displaced by disturbance from Naval activities.	STM1-7	
8	5-24; 3.8-26	28-30; 16	DFW	Igisomar	Technical	Although there are beach access roads onto Unai Chulu and Unai Dankulu, this does *not* infer that driving is legal or encouraged on these beaches. CNMI Public Law No. 11-61, code 9 CMC Section 5807 (b) states "it is unlawful for any motor vehicle to enter or go upon any beach area or historic site or tourist site within the Commonwealth." Therefore ingress or egress by military or recreational vehicles onto Tinian beaches is strongly discouraged due to the occurance of green turtle nesting. It states in 3.8-26 that there will be areas within Unai Chulu and Unai Dankulu that are designated as "No Widlife Disturbance" and "No Training" areas where troop and vehicle movement is restricted to roads and trails, it is unclear if this includes beaches? Or if these areas restrict amphibious landings from occurring?	STM1-8	

#	Page or Fig/Tbl #	Line #	Command or Org.	Commenter (last name)	Comment Type (mechanics, contextual, technical, tonal*)	Comment	Response	Done
9	5-21:5-24		DFW	Igisomar	Technical	There is absolutely no mention of mitigation measures for sea turtles in this chapter. The DFW Sea Turtle Program requests that the entirety of Unai Dankulu (Long beach) be considered a "No Wildlife Disturbance" and "No Training" buffer zone similar to those established for the swiftlet caves. We also suggest that funds be appropriated for periodic marine debris removal by divers to prevent the potential build-up of entangement or ingestion hazards posed to turtles while in the water.	STM1-9	
10	3.8-4 & 3.8-5		DFW	Igisomar	Technical	The DFW Sea Turtle Program hestitates to comment on behalf of hawksbill turtles until the "monthly data" that Navy personnel has been collecting thus far is revealed. Since hawksbill turtles are endangered in the Pacific, *if* nesting activity has been confirmed on Tinian it would prove essential information, as there has been no recent confirmed Hawksbill nests in the CNMI. It would thus be recommended that critical habitat designation immediately be pursued for the nesting beach in question.	STM1-10	
11	All	All	DFW	Rounds & Williams	General	Please use page numbers instead of section numbers (i.e.. 3.11-44). This would make it much easier for the reader to navigate the large document.	STM1-11	
12	Table 2-8	all	DFW	Rounds & Williams	Technical	Tinian: We are assuming that all activities that Tinian lands are mentioned in will take force at the full scale described in the EIS as there are no details per site provided. The table does indicate PRI - Primary and SEC - Secondary; however without further description these designations have no meaning. Based on this assumption we have calculated that there are over 700 days of activities on Tinian. Several of these activities would be overlapping and therefore encompass the whole Military area (EMU and MLB). It appears the military would like to have the options to conduct many of these training activities on Tinian; however they need to decide what are the maximum number of events of each activity that will occur so that it will be covered by the EIS. Since it is not possible to determine the environmental consequences or the cumulative effects of such vague activities we have to assume that all actives will occur in the upper two thirds military area. Given that there are bombing and land demolition activities proposed for 120 days this could impact much habitat for Micronesian megapodes, Tinian monar	STM1-12	
13	Table 2-8 and Appendix D		DFW	Rounds & Williams	Technical	Many of the definitions of the range activities in Appendix D that are referenced in Table 2-8 are vague and it is difficult to understand the full extent of the activities. We would like to see more definitions.	STM1-13	
14	Table 2-9 and Table 3.11-1	all	DFW	Rounds & Williams	Technical	Table 2-9 does not mention Tinian, therefore we would assume there will be no ordinance used on Tinian. However, in Table 2.11-1 there are rows (for example 1st row on page 3.11-4) that say explosive ordnance for activities on Tinian MLA. This has implications on impact analysis for the Tinian monarch and Micronesian megapode. Please be clear about whether ordnance use will occur on Tinian, and what the potential impacts are. In addition, on page 3.11-60 it says that land-based ordnance training would occur within the EMUA on Tinian.	STM1-14 note: table numbering skipped #15	
16	Table 2-7 and 2-8		DFW	Rounds & Williams	Technical	The exercises listed for Tinian in Table 2-7 do not cross-reference in name and description to the range activities listed in Table 2-8.	STM1-15	
17	Tables in section 2		DFW	Rounds & Williams	Technical	The Tables in general need to have better explanations or a key to the abbreviations and reference to where more detailed descriptions of the activities might be found. For example the abbreviations PRI and SEC in the Location column in Table 2-8 are not easily deciphered.	STM1-16	
18	MLA or LBA		DFW	Rounds & Williams	Technical	These two terms are used interchangeably throughout the document for lands on Tinian. Please chose one for the whole document.	STM1-17	
19	3.10-13		DFW	Rounds & Williams	Technical	This table includes a column for Rota. However, it is not clear to me what impacts from the proposed activities will occur in Rota. In the environmental consequences section there is no mention of Rota. If Rota seabirds are not going to be affected at all by the proposed actions then there is no reason to include Rota in the affected environment section of this chapter (like Saipan, which is not included).	STM1-18	
20	3.10-28	12	DFW	Rounds & Williams	Technical	"dispersed nature of the over flights." How dispersed are these flights? What is the frequency? It is hard to decide if there are short or long term effects without this information.	STM1-19	
21	3.10-29	last paragraph	DFW	Rounds & Williams	Technical	"These training events are often preceded by some other type of human activity in the general area." Are these other "human activities" analyzed somewhere else in this chapter?	STM1-20	
22	3.10-32	3	DFW	Rounds & Williams	Technical	How often are targets at FDM missed and the special use areas hit?	STM1-21	
23	3.10-35	3.10.3.2	DFW	Rounds & Williams	Technical	Aircraft Over flights - This is a large increase (almost 3 times) in aircraft over flights on FDM. I think there needs to be more discussion on why behavioral reactions to these flights would be the same as under the No Action Alternative. Do you have any evidence for this claim? At some point a threshold might be reached on seabird tolerance of over flights.	STM1-22	

#	Page or Fig/Tbl #	Line #	Command or Org.	Commenter (last name)	Comment Type (mechanics, contextual, technical, tonal*)	Comment	Response	Done
24	3.10-39	Table 3.10-3	DFW	Rounds & Williams	Technical	At some point short-term behavioral responses may become long-term or permanent responses. These responses may not have population level effects, but repeated bombing may well have a permanent behavioral response from the seabirds. It is hard to believe that the increase by three fold of over flights let alone in bombing activity at FDM does not elicit a more permanent behavioral response or permanent population decline.	STM1-23	
25	x	Table of Contents	DFW	Rounds & Williams	Technical	The Cumulative Analysis for terrestrial species is completely inadequate and incomplete. The Table of Contents for Cumulative Analysis the Onshore Biological Resources section does not include a subsection for Terrestrial Species. This needs to be added. The current discussion of cumulative impacts to terrestrial resources only mentions invasive species; this is inadequate for the Tinian monarch and Micronesian megapode. Cumulative impacts should include discussion of habitat loss on Tinian due to developments, population effects of frequent disturbances island-wide, habitat loss due to fire, and the potential introduction of the Brown Tree Snake. These impacts should be looked at to determine how they cumulatively effect Tinian monarch and Micronesian megopode populations.	STM1-24	
26	Table 3.11-1		DFW	Rounds & Williams	Technical	We need the frequency and duration of activities to determine whether behavioral disturbances from military activities are temporary or permanent. Without this information it is impossible to determine. Please provide an estimate of the amount of "potential for inadvertent trampling of vegetation" to determine potential habitat loss. Please include the Tinian monarch in all analysis for impacts on Tinian. The Tinian monarch only occurs on Tinian and population numbers have been declining.	STM1-25	
27	Table 3.11-1		DFW	Rounds & Williams	Technical	As mentioned above for Table 3.10-3, at some point temporary behavioral disturbance may become permanent. For example, if a bird is temporarily disturbed every day the response may be to permanently move out of the area. Repeated temporary disturbances may have a longer-term response.	STM1-26	
28	Table 3.11-1		DFW	Rounds & Williams	Technical	Please discuss whether use of explosive ordnance on Tinian has the potential to start forest fires, and how that would impact native birds.	STM1-27	
29	3.11-24	Marpi Maneuver Area	DFW	Rounds & Williams	Technical	Nightingale reed warblers have been known to nest in elephant grass when it reaches a height of 2m. There is potential, therefore, that nightingale reed warblers could be using this area. Please address this concern. Have surveys ever been conducted at this property? Activities in this area may also affect the endangered nightingale reed warbler on adjacent properties. Nightingale reed warblers are known in areas adjacent to Cow Town, so it is possible that activities may affect nightingale reed warblers on adjacent properties.	STM1-28	
30	Table 3.11-4; page 3.11-32	Birds	DFW	Rounds & Williams	Technical	The Nightingale reed warbler also is found in tangantangan forests, and in tall grasslands. Tangantangan is an important habitat for the reed warbler on Saipan. Please update this information.	STM1-29	
31	3.11-36	3-10	DFW	Rounds & Williams	Technical	Tangantangan needs to be added as a habitat type in the first section. Nightingale reed warblers are widely distributed on Saipan in many habitats. The second sentence seems to be taken from Mosher (2006) thesis - please take the "a" out- i.e. a native reed wetland. There may be more than one wetland used for nesting. These are just the habitats examined in one study, not all the potential habitats used for nesting. Nests have been found in swordgrass as well.	STM1-30	
32	3.11-36	Threats	DFW	Rounds & Williams	Technical	Threats to nightingale reed warblers also include development (i.e. resorts, homesteads etc).	STM1-31	
33	3.11-38	Rota crows	DFW	Rounds & Williams	Technical	More recent data for crows on Rota should be included than 1999.	STM1-32	
34	3.11-45	Threats	DFW	Rounds & Williams	Technical	Threats to Micronesian megapodes also includes introduction of feral chickens.	STM1-33	
35	3.11-48	Pop status	DFW	Rounds & Williams	Technical	There is no information on the population of bats on Rota in this section. If activities occur on Rota this information should be included	STM1-34	

#	Page or Fig/Tbl #	Line #	Command or Org.	Commenter (last name)	Comment Type (mechanics, contextual, technical, tonal*)	Comment	Response	Done
36	3.11-52	Threats	DFW	Rounds & Williams	Technical	Development and feral animals are also threats.	STM1-35	
37	3.11-53	Threats	DFW	Rounds & Williams	Technical	Development is also a significant threat to the Tinian monarch.	STM1-36	
38	3.11-55	3.11.2.9	DFW	Rounds & Williams	Technical	Include feral chickens as they may compete with Micronesian megapodes.	STM1-37	
39	3.11-61	2nd pp	DFW	Rounds & Williams	Technical	This section mentions that wildland fires ignited by military training activities have reduced the amount of suitable habitat for the 'elepaio, and indicate that this could also effect Tinian monarchs. Please include a more detailed analysis of this threat. How much Tinian monarch habitat could be destroyed? How many Tinian monarch pairs would this affect? What fire precautions and fire-fighting capabilities are present? Please include fire impacts in a separate paragraph than noise. Since the Tinian monarch only occurs on Tinian, any habitat loss from fire could be a serious threat that should be considered in the analysis to determine if the species should be re-listed. Fires could also impact habitat of Micronesian megapodes and Mariana fruit bats. Please include this as well.	STM1-38	
40	3.11-61	Micronesian Megapode	DFW	Rounds & Williams	Technical	USFWS have permitted the Navy one take of a megapode nest per year. How is this monitored? Has take occurred in previous years?	STM1-39	
41	3.11-62	3.11.3.1.3	DFW	Rounds & Williams	Technical	USFWS have permitted the Navy one take of a megapode nest per year. How is this monitored? Has take occurred in previous years?	STM1-40	
42	3.11-66	3.11.3.2.1	DFW	Rounds & Williams	Technical	Please include Tinian monarchs in this analysis. If they are re-listed the military will want to have included a thorough analysis of impacts to the species. Mariana fruit bats are also not included.	STM1-41	
43	3.11-70	Table 3.11-8	DFW	Rounds & Williams	Technical	Please include summary of potential impacts to Tinian monarchs.	STM1-42	
44	5-23		DFW	Rounds & Williams	Technical	There are no conservation measures listed for Tinian Monarch. Conservation measures for the Tinian Monarch should mitigate for potential impacts from habitat loss, increased risk of fire, potential for Brown Tree Snake introduction, and frequent harassment and disturbance. The Tinian Monarch occurs only on Tinian and the military leases about 2/3 of the island. Therefore military use of Tinian has a potential to seriously impact, either positively or negatively, the Tinian Monarch population. The Tinian Monarch is currently delisted; however, it is a locally protected species, and future population losses could potentially lead to re-listing. Preliminary results from the island-wide bird surveys in 2008 show that the Tinian Monarch population has declined by 27% since 1982 (USFWS 2008 study - under review). Therefore, we encourage the military to include conservation measures for the Tinian Monarch in their plans. Conservation measures should include 1) a conservation area, and 2) a life history study and captive rearing program, and 3) quarterly surveys to monitor impacts to Tinian monarchs from military actions (r	STM1-43	
45	5-23		DFW	Rounds & Williams	Technical	We feel that the proposed Micronesian megapode life history study is not adequate to compensate for potential impacts to the very rare species. Additional mitigation could include 1) a native forest conservation area within the whole military use area (EMUA and LBA) and 2) feral chicken eradication within EMUA and LBA.	STM1-44	

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46	5-23		DFW	Rounds & Williams	Technical	In the draft Marianas Fruit Bat Recovery Plan, for the southern islands bat numbers must be stable or increasing on 3 of the 5 islands for full recovery. While Tinian does not currently support fruit bats (due to poaching and other threats), potential habitat does exist. We proposed a native forest conservation area (same as Micronesian megapode) to preserve potential habitat for the Mariana fruit bat recovery. A military area restricted from poaching provides a good opportunity for Mariana fruit bat recovery.	STM1-45	
47	Table 6-1	Table 6-2	DFW	Rounds & Williams	Technical	There are three additional projects that are scheduled and have been permitted or are in the process of being permitted. The Tinian monarch is impacted by all these projects as is potentially the Micronesian megapode. The projects are as follows: 1. Matua Bay Development (located on SW shore south of Puntan Diapblo). The project is 136.5 ha, of which 115 ha are forest. The Environmental Assessment stated that 185 Tinian monach pairs were detected on point count surveys conducted every 100m. If habitat and average territory is used there will be 1,929 Tinian monarchs impacted by this development. This development was permitted by CNMI-CRMO in 2008. 2. FPA Pacific Corp Quarry, 4.9 ha and 23 Tinian monarchs detected and reported in the Environmental Assessment and permitted by CNMI-CRMO in 2008. 3. Resources Management Quarry , 5.84 ha, in the process of obtaining development permit. Additionally, of the listed future actions the current Tinian Landfill is 12ha and with 100 Tinian monarchs; the Tinian Wastewater Treatment plant is 4.94 ha and has 82 Tinian monarchs. Neither the Tinian Landfill or the Wastewater treatment facility were adequately surveyed for Mic	STM1-46	
48	Section 6.1.1 pg 6-1	6.1.1	DFW	Rounds & Williams	Technical	The geographical boundary for the cumulative impacts analysis for terrestrial biological resources is not adequate. The cumulative impact analysis needs to include locations outside Navy controlled and managed areas for Tinian. The Tinian Monarch occurs only on Tinian and activities occurring on the southern third of the island can not be ignored in the cumulative effects analysis. In Table 6-1 activities outside the Navy controlled areas are included. However, the cumulative effects from these projects combined with military activities is not analyzed. Please provide an analysis of the cumulative effects of the projects listed in Table 6-1. The island is one whole ecosystem and impacts in the two thirds of the area used by the Military could affect resources island-wide. Therefore, the cumulative effects of all the actions need to be recognized and addressed. The cumulative effects to the Tinian monarch could be especially devastating. The total forest area in the combined military area is 4623 ha which represents 65% of the total forested land on Tinian. The Tinian monarch population in the Military use area i	STM1-47	
49	ES-1	4th paragraph	DFW	Hawley	Technical	Does the prosed action include an increase in the frequency of training exercises? If so I would think that this would be an extensive change to the MIRC activities.	STM1-48	
50	ES-1	4th paragraph	DFW	Hawley	Technical	Please provide a definition of military construction projects. Does this include improvements to existing infrasture and facilities?	STM1-49	
51	ES-11	FDM Paragraph	DFW	Hawley	Technical	Beyond a 30nm radius or greater from FDM will include portions of Anatahan. Will the Military be providing notice to residents of Anatahan as well as evacuation support.	STM1-50	
52	Table ES-3	Airborne Noise	DFW	Hawley	Technical	There is a need to address wether airborne noise will effect terristrial wildlife species.	STM1-51	
53	Table ES-3	Seabirds and Shorebirds	DFW	Hawley	Technical	Please provide the supporting evidence regarding the limited effects to populations.	STM1-52	
54	Table ES-3	Cultural Resources	DFW	Hawley	Technical	Please address limited access to cultural sites especially on the island of Tinian to tour operators and local residents during training exercises.	STM1-53	
55	Table ES-3	Recreation	DFW	Hawley	Technical	Address limited access to recreational fishing and other water activites espcially during training exercises on Tinian.	STM1-54	
56	ES	Historical	DFW	Hawley	Technical	Address how access to historical and cultural sites are not considered to be substantially affected under the no action and number one alternative.	STM1-55	
57	Table 2-5	Saipan Commonwealth Port Authority	DFW	Hawley	Technical	Please include in map the 100acres of Port Authority area that may be utilized.	STM1-56	
58	Table 2-5	Rota Commonwealth Port Authority	DFW	Hawley	Technical	Currently there are no facilities on Angyuta Island will facilities be constructed to provide refueling and/or maintenance support, further more will areas need to be cleared to support these activities. It also mentions that leased space is used, is this existing leased space or proposed lease space?	STM1-57	
59	Table 2-7	all	DFW	Hawley	Technical	Address how climatic change and storm frequency may effect training in the MIRC, please include frequency modifications and seasonal adjustments. Note that modifications may have severe impacts to potential fire and invasive species risks.	STM1-58	
60	Table 3.1-1	all	DFW	Hawley	Technical	It is pertanent to address the the potential advancement of invasive species introductions due to vehicular and troop movement.	STM1-59	

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61	3.1.2	3.1-7	DFW	Hawley	Technical	Anatahan was volcanically active in 2003 should be updated as this volcano was last active by USGS on Feb 3, 2008 with ash plumes extending for 60 miles. Pagan has also been reported to produce ashfall as recent as 2006 by the Hawaiian Volcano Observatory. It is requested that the most recent information be provided for this section.	STM1-60	
62	3.5-9	3rd line	DFW	Hawley	Technical	Considerations should be made to include the sheath-tailed bat (emballonura semicaudata) and the marianas swiftlet (Aerodramus bartschi) as populations are present on proposed MIRC Training Islands and/or adjacent islands.	STM1-61	
63	3.5-9	Aircraft Overflights last line	DFW	Hawley	Technical	Indicate where the impact of helicoptor activities will be addressed that may occur below large commercial jet aircraft altitudes (2200-2600ft). Include the effects to wildlife in realtion to frequency of aircraft fly-overs and/or troop deployments, including refueling runs to Saipan.	STM1-62	
64	all	all	DFW	Hawley	Technical	It is pertanent to indicate the level of training that has occurred under the no action alternative including but not limited to number of troops, vehicles, aircraft, days, land use, type of training, etc. over the last five years.	STM1-63	
65	3.1.2.3	FDM Paragraph	DFW	Hawley	Technical	Provide a more elborate discussion on the erosional processes of FDM and how the detonation of air-to-surface munitions has contributed to this process. Also include a resource on the vegetation regeneration process to justify the "typically reestablishes quickly" statement in paragraph 2.	STM1-64	
66	3.1.2.3	3rd paragraph	DFW	Hawley	Technical	Incude to what extant shore bombardments have weakened the exposed limestone and contributed to erosion.	STM1-65	
67	3.10	all	DFW	Hawley	Technical	A level of effort should be considered in retrieving current data from annual brid surveys from regional and local environmental agencies.	STM1-66	
68	3.10-21	1st paragraph	DFW	Hawley	Technical	Please cited reference for shear-waters to breed on Bird Island. Known populations are present to breed on Managaha and possibly Naftan Rock.	STM1-67	
69	all	all	DFW	Hawley	Technical	Consider describing (in a table) the past to current (1997-2009) MIRC Training values/frequency and the current No Action Alternative values/frequency such as troops, vehicles, days. This will aid the reader in establishing a baseline for the previous events and the range proposed under No Action.	STM1-68	
70	3.10.2	all	DFW	Hawley	Technical	Climate change may effect the forging behaviors of Seabirds and Shorebirds by effecting ocean currents, etc. Please discuss how forging will be monitored to aviod striking or disturbing these animals.	STM1-69	
71	3.10-26	2nd paragraph	DFW	Hawley	Technical	Discuss which BTS interdiction protocols will be adhered to, are these local protocols or operational instruction? It would be beneficial to include these protocols in an appendex.	STM1-70	
72	3.10.3.2	all	DFW	Hawley	Technical	Please discuss the impact of fire caused from high explosive ordinances on Seabird and Shorebird nesting habitat.	STM1-71	
73	3.11.1.5.2	all	DFW	Hawley	Technical	Consider dropping DLNR and replacing it with CNMI Gov. as DFW is the only agenciy involved in permittting under DLNR. The other agencies DEQ and CRM fall under the Executive Office of the Gov. of the CNMI.	STM1-72	
74	table 3.11.-1	all	DFW	Hawley	Technical	Consider discussing, as an impact, how vehicular and troop movements may accelerate invasive species introductions by spreading them from their initial point of introduction.	STM1-73	
75	table 3.11-1	all	DFW	Hawley	Technical	Consider including the potential increase in introducing invasive species to and from various training sites with in the MIRC and how potential introductions will effect terrestrial species and habitats.	STM1-74	
76	table 3.11-4	Birds	DFW	Hawley	Technical	Please update *Acrocephalus luscinia* to include tangantagan forest, secondary forests, and various grasses including but not limited to elephant grass.	STM1-75	
77	table 3.11-4	all	DFW	Hawley	Technical	Consider researching surveys and reports from CNMI DFW to update information in this table espcially habitat types utilized by the species discussed.	STM1-76	
78	3.11.2.2.4	Threats	DFW	Hawley	Technical	Please include the unintentional release of pets including avian species that may compete with NGRW for resources or may be vectors of avian diseases.	STM1-77	
79	3.11.2.2.5	Threats	DFW	Hawley	Tonal	Consider replacing "blamed" to "known" for reducing…this was indicated in the previous sentence.	STM1-78	
80	3.11.2.2.6	Pop status	DFW	Hawley	Technical	Consider updating Crow Population numbers with recent data.	STM1-79	
81	3.11.2.2.6	Threats	DFW	Hawley	Technical	Include rats, drongo harassment, monitor lizards as additional predators, as well as habitat modifications (agriculture, homesteads)	STM1-80	
82	3.11.2.2.7	Threats	DFW	Hawley	Tonal	Consider replacing "blamed" to "known" for declines….	STM1-81	
83	3.11.2.2.12	Threats	DFW	Hawley	Technical	BTS would also be a threat to fruit bat on Saipan and any other island it may be inroduced.	STM1-82	
84	3.11.2.4.1	Candidate Species	DFW	Hawley	Technical	Mariana wandering butterfly (*Vagrans egistina*) is also a candidate species under USFWS and should be included, espcially since its home range includes (	STM1-83	

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85	3.11.2.5.2	Human-Induced Mortality	DFW	Hawley	Technical	Discuss the relationship between natural mortality and human-induced mortality especially how weather events may effect the operational integrety of quarantine programs and may increase the risk of introductions of invasive species. Discuss what types of protocols and safeguards will be inplace when moving troops/supplies (including emergency supplies) to and from islands.	STM1-84	
86	3.11.2.8	Exotic Predator Introductions	DFW	Hawley	Technical	Change "one" to "two" brown trees snakes were discovered on nearby Rota on Nov 22, 1991.	STM1-85	
87	3.11.2.8	Exotic Predator Introductions	DFW	Hawley	Technical	Replace the third sentence of paragraph two with the following quote from the same source. "Repeated BTS sightings on Saipan indicate that an incipient population is now present there." The original quote was taken from a section of the review panel report that was not relevent to the discussion.	STM1-86	
88	3.11.2.8	Exotic Predator Introductions	DFW	Hawley	Technical	Consider reviewing SYSTEMATIC RODENT MONITORING A Study of the Introduced Small Mammals of the Mariana Islands Final Report to the USGS Brown Treesnake Project, Fort Collins Science Center Fort Collins, CO submitted by Andrew S. Wiewel, Amy A. Yackel Adams, and Gordon H. Rodda to update the information.	STM1-87	
89	3.11.2.9	Exotic Pest Introductions	DFW	Hawley	Technical	Include the latest distribution ranges of the introduced rhino beetle on Guam. One may argue that this is an estbalished pest on Guam.	STM1-88	
90	3.11.3.1.2	Micronesian Megapode	DFW	Hawley	Technical	Explain the monitoring protocol that ensures only one nest is taken per year as permitted to the Navy by USFWS.	STM1-89	
91	3.11.3.2.2	Conservation Measures-BTS	DFw	Hawley	Technical	Second bullet should include Hawaii and the Western Pacific.	STM1-90	
92	Table 3.11-8	All, but specifically land-based movements	DFW	Hawley	Technical	Consider discussing, as an impact, how vehicular and troop movements may accelerate invasive species introductions by spreading them from their initial point of introduction.	STM1-91	
93	3.16.2	Affected Environment Industry 3.16.2.1	DFW	Hawley	Technical	Update the grament industry data to reflect the current situation. Also discuss the projected impacts on tourism due to Federalizing Immigration in the CNMI.	STM1-92	
94	table 3.16-2	total	DFW	Hawley	Technical	Review the values for the totals 2 million or 22 million?	STM1-93	
95	3.16.2.6.2	all	DFW	Hawley	Technical	Please include crabbing activities, specifically coconut crabbing and how training activities under each alternative would impact access to coconut crab hunting grounds (Tinian).	STM1-94	
96	6.2.4 Onshore Biological Resources		DFW	Hawley	Technical	Consider dropping plant from the phrase"invasive plant species is high... "	STM1-95	

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS
Office of the Mayor
Municipality of Saipan
Afetna Square, San Antonio

JUAN BORJA TUDELA
Mayor of Saipan

February 24, 2009

Ms. Nora Macariola-See
Project Manager, Code EV 21
Mariana Islands Range Complex EIS/OEIS
Naval Facilities Engineering Command-Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

Dear Ms. Macariola-See:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Marianas Islands Range Complex (MIRC) regarding the need to support and conduct current, emerging, and future training and research, development, test, and evaluation training activities in the Mariana Islands Study Area. The proposed action would result in critical enhancements to increase training capabilities, especially in the undersea and air warfare areas, that are necessary if the military services are to maintain a state of military readiness commensurate with the national defense mission.

The MIRC is characterized by a unique combination of attributes that make it a strategically important range complex for the services. These attributes include the following: Location within U.S. territory; Live-fire ranges on the islands of Guam, Tinian and Farrallon de Medinilla (FDM), Support for all Navy warfare areas and numerous other service roles, missions, and tactical tasks; Support to homeported Navy, Army, USCG, and USAF units based at military installations on Guam and CNMI; Training support for deployed forces; Westpac Theatre training venue for Special Warfare Forces; Ability to conduct joint and combined force exercises; and Rehearsal area for Westpac contingencies.

The range complex consists of three major components: ocean surface and undersea areas, special use airspace, and training land areas. The ocean surface and undersea areas extend from the international waters south of Guam near the Federated States of Micronesia, to north of Pagan, and from the Pacific Ocean east of the Marianas to the middle of the Philippine Sea to the west. Portions of the Marianas Trench Marine National Monument, which was established in January 2009 by Presidential Proclamation, lie within the study area. The range complex includes land ranges and training areas and facilities on Guam, Rota, Tinian, Saipan, and Farrallon de Medinilla (FDM). Special use airspace consists of warning area 517, restricted airspace over FDM, and Air Traffic Control Assigned Airspace.

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Tel: (670) 234-7444 Fax: (670) 234-1190

STM2-1

Regarding the major exercises planned under the EIS, the Office of the Mayor of Saipan is concerned about the airborne noise that may exist from increased training activities associated with the 45 percent increased activities out of Anderson AFB on all the current training areas, which will include the Saipan International Airport where the military has joint-use rights. The increased strike force will consist of up to 48 fighter, 12 aerial refueling, six bomber, and four unmanned aircraft. According to the study, noise levels in excess of 90 decibels can occur. However, it also states that sustainable range management practices are in place that protect and conserve natural and cultural resources as well as preserve access to training areas for current and future training requirements.

STM2-2

In addition, we are also concerned about continued public access to FDM where such access may be strictly prohibited with no commercial and/or recreational activities on or near the island. During training exercises, marine vessels are restricted within a five-km radius and the public may be restricted from beyond five to 56 km radius or greater for certain training events. We are also concerned that as usage of FDM increases in the future, a permanent safety danger zone and restricted area will be established restricting all private and commercial vessels.

STM2-3

Another area of concern is marine mammals where the much potential exists for injury or mortality from vessel collisions with whales and dolphins. This has unfortunately been the case in and around such exercises in Hawaii where mammal behavioral responses have resulted in the past. Sonar use has also had effects such as mammal behavioral disturbances that result from increased harassment dangers to the spotted dolphin and sperm whale. Such exposures have proven in the past to result in mammal mortality. According to the EIS, critical habitat for such marine mammals has not been designated within the MIRC Study Area. Because these mammals are supposedly protected under the Endangered Species Act, it is important for the Navy to consult with the National Marine Fisheries Service regarding such disturbances to marine mammals and related behavior disturbances.

STM2-4

These mammals will also be exposed to impacts associated with sonar, underwater detonations, and explosive ordinance use that could seriously endanger them. In this connection, the Navy must work with the National Marine Fisheries Service to ensure proper compliance and safety for such mammals.

STM2-5

Amphibious landings also could result in danger to nesting female sea turtles. Protective measures need to be employed to avoid or reduce potential adverse effects to nesting near turtles and habitat. In addition, underwater detonations and explosive ordinance have potential danger to sea turtles and efforts must be made to protect them. In this connection, the Navy must continue to work with the National Marine Fisheries Service to avoid negative effects to sea turtles in the marine environment. The potential also exists for ingestion of flare caps, marine markers, and entanglement of sea turtles in parachutes and other military-related debris.

STM2-6

Impacts to seabirds and shorebirds as a result of vessel movements, aircraft over flights, amphibious landings, weapons firing and other ordinance use including underwater

detonations present potential for injury or death from collisions, primarily at night. Such activities present increased danger to shorebirds and seabirds, especially at sites like FDM.

STM2-7

Regarding these and other problems, it is our hope that the Navy is committed to furthering understanding of these forms of wildlife and mammals, and make every effort to develop ways to lessen or eliminate the impacts of such training activities on animals.

STM2-8

In closing, the Office of the Mayor of Saipan looks forward to working closely with the military services to develop ways to mitigate the negative effects of military activities on fish, birds, mammals, and other wildlife in implementing the proposed action. Ways must be developed to minimize such impacts on the environment within the lands and waters of the Mariana Islands to lessen or eliminate the impacts of training activities on these animals.

Sincerely,

JUAN BORJA TUDELA
Mayor of Saipan

STM-3

Draft EIS/OEIS Comment Form

Mariana Islands Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

Please use this form to record your comments on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

All comments must be received no later than March 16, 2009, to ensure they become part of the official record. All timely comments will be responded to in the Final EIS/OEIS.

You may submit your comments by:

1) Depositing this form in the comment box before you leave tonight
2) Mailing this form to:
   Mariana Islands Range Complex EIS
   258 Makalapa Drive, Suite 100
   Attn: EV2
   Pearl Harbor, HI 96860-3134
3) E-mailing your comments to: marianas.tap.eis@navy.mil
4) Completing the online comment form at: www.MarianasRangeComplexEIS.com

☑ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: U.S. Atalig Martin S. Atalig Resident Department Head

Organization/Affiliation: Department of Public Works

Address:* P.O.Box 511801

City, State, Zip Code: Rota, CNMI 96951

Comments: The presence of the military service and training in our Western Pacific region is very important. The military will ensure our freedom and safety whether through land, air or at sea. We fully support the Mariana Islands Range Complex. The range complex is needed inorder to advance and increase military trainings and capability within the Western Pacific region. Our environment and resources will surely be protected as the military training enhances in our region. Our infrastructures and economic development will advance toward revitalization and diversification through military presence and assistance. Hopefully the military personnel and dependants will make CNMI especially Rota island as their pleaseant and relaxation destination.

STM3-1

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

Public Hearing Multi-Purpose Center (February 23rd 20009, 7pm)

Comments by Rep. Tebuteb
Chairman 16th CNMI House of Representative

Good Evening ~~Mr. Wescom~~,

Thank you for the opportunity to engage our general public to submit comments with respect to the Mariana Island Range Complex.

The letter I received from the Department of Navy dated January 29th of this year is certainly most appreciated. In view of the constant change in our Global defense technology and the need for our U.S. military to fulfill her training and testing requirement, I assert my support as such. Like most of our community members in this region, I also have family members and a daughter presently serving in our Armed Forces.

However, I would like to ask the Department of Defense, through this initiative, to engage with other relevant Department and agencies to consider two things.

1. To consider our fishermen who avail the FDM area as prime fishing grounds. There is a need to strike a balance most especially within the exceptional seasons bound with positive catches from January to June. Further clarifications can be most specific with our U.S. and CNMI Division of F&WL. As you all may know, the area specific is one of the most sought out fishing grounds to our small time commercial fishermen.

STM4-1

2. Submerge Lands. Although our CNMI Representative Greg Sablan submitted HR 934 for US Congress to grant CNMI the 3 miles "jurisdiction", I am one who has reservation as such. Other similar attempts since 1995 have failed.

STM4-2

Although the US Federal Supreme Clause under the US Constitution (Article VI, clause 2) over ownership of submerge lands may prevail, I ask that consideration is also given to Article VIII, section 801 with respect to potentiality of being granted,

Again, although the U.S and other nations did not sign the UN Convention on the Law of the Sea, I ask that the 1983 and 1988 Presidential Proclamation No#'s 5030 and 5928 respectively, be not compromise.

With these said, I am mused to say, "if the CNMI owns the waters around FDM as stipulated in the Lease Agreement, are we then now the lesser of a U.S. citizen incognito.

In all these, I strongly believe that the security of our nation be the utmost priority no more no less. The terms, jurisdiction, ownership, control are all in my opinion semantics. It ought to be a "shared" responsibility benefiting all. The politics of it should be left alone.

The Mariana Island Range Complex is a need we all must embrace. Your time and consideration is most appreciated. Thank you.

Art. VIII Sec 1 801 – mineral rights, jurisdict
– U.S. granting lands & waters around it –
(– FSM – example)

5030 – 12 miles (coastal & territorial jurisdict)
5928 – EEZ (minerals & others – shared)

STM-5

Rota

Draft EIS/OEIS Comment Form

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☐ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: Frank M. Aflig

Organization/Affiliation: TJ Enterprises / Rota Municipal Treasurer

Address:* P.O. 1007

City, State, Zip Code: Rota MP 96951

STM5-1

Comments: The people of Rota is in support of the U.S. Military activities. However, we would like to see Military activity to assist in positive economic impact through project that will help the community. In the 1960's and 1970's, the military cargo plane used to pick-up Farm produce for military consumption providing important income to the farmers, and at the same time saving the farmers from paying for freight. Perhaps the same arrangement can be brought back.

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

STM-6

Rota

Draft EIS/OEIS Comment Form

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Please use this form to record your comments on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

All comments must be received no later than March 16, 2009, to ensure they become part of the official record. All timely comments will be responded to in the Final EIS/OEIS.

You may submit your comments by:

1) Depositing this form in the comment box before you leave tonight
2) Mailing this form to:
   Mariana Islands Range Complex EIS
   258 Makalapa Drive, Suite 100
   Attn: EV2
   Pearl Harbor, HI 96860-3134
3) E-mailing your comments to: marianas.tap.eis@navy.mil
4) Completing the online comment form at: www.MarianasRangeComplexEIS.com

☐ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: Tom Glenn A. Quitugua

Organization/Affiliation: MAYOR'S ADVISOR

Address:* P.O.B. 1398

City, State, Zip Code: ROTA MP 96951

STM6-1

Comments: My concern would be if these impact assessments done in 1999 thru the present would be available and the various findings or impacts are significant ~~as well~~ to warrant stricter adherence. And lastly is this type of information readily available

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

Marianas Islands Range Complex
Draft Environmental Statement
Overseas Environmental Impact Statement

Comment

Good Evening:

I am happy to welcome our distinguish guest from the United States Navy to our beautiful island of Rota, "Natures Treasure Island"! Commander Andrew Henderson, Lt. Commander Randall Vavra and Company. To our Legislative Delegation, my colleagues from the 12th Rota Municipal Council, department and agency heads and most especially our viewing public. Thank you for joining us.

First, I would like to commend the US Department of the Navy for coming up with this Draft Environmental Impact Statement. The Commonwealth of the Northern Mariana Islands as we know it has a special relationship with the United States of America. Because of that we are thankful that we fall under their security umbrella. To that end, Rota supports the idea of conducting current, emerging and future trainings to ensure our forces with combat readiness.

While the ~~Economic~~ Environmental Impact Statement and the Overseas Environmental Impact Statement is in its draft stage, we generally support its action plan as described on tables ES 3.1 to 3.19 with respect to Mariana Islands Range Complex, (MIRC). However, I must challenge the Department of the Navy to implement its alternative action with integrity to commit itself to safeguarding our precious natural resources within the MIRC and to take responsibility should an environmental catastrophe occurs as a result of any MIRC operation and not to turn a blind eye. Lastly, I would like to venture to inquire if there any economic benefits Rota would we receive out of the Mariana Islands Range Complex (MIRC). Currently, Saipan and Tinian appear to be enjoying the economic benefits out of the military preposition ships and port of calls.

STM7-1

Once again, we support the idea of keeping our arm forces well trained and combat ready at all times.

Thank You!

Roy James A. Masga
Chairman - 12th Rota Municipal Council
Acting Mayor of Rota

Commonwealth of the Northern Mariana Islands
Office of the Mayor
The Northern Islands Municipality
P.O. Box 502859 CK
Saipan, MP 96950
Tel. (670) 234-7392 or 6720
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E-mail: mayor@northernislands.net
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VALENTIN I. TAISAKAN
Mayor of the Northern Islands

March 9, 2009

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Attn: EVA
Pearl Harbor, Hawaii 96860-3134

Subject: Northern Islands Mayor's Comments on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Mariana Islands Range Complex

Attn: Officer in Charge:

Gentlemen:

The Northern Islands Mayor's Office acknowledges receipt of informational materials on the Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Mariana Islands Range Complex (MIRC). These materials, inclusive of information provided in the disc, comprises of about more than 500 hundreds pages. Since March 16, 2009 is the dead line to receive our comment on the EIS/OEIS, unfortunately, that does not give ourselves ample time to review and digest the said statements; nonetheless, it is important that we present our concerns on these issues with hope that they will be given serious consideration. They are as follows:

STM8-1

(1). Farallon de Medinilla Target Range: During the EIS/OEIS presentation on February 23, 2009, it was made known to us that the military is planning to expand it target area from the present 3 miles to 10 miles of the water surrounding that island. It was not clear whether the additional 10 miles being proposed is inclusive of the 3 miles or an extension from the 3 miles limit. This must be made clear. While there may be a need by the military for such expansion for their warfare exercises now or in the immediate future, the total area of such expansion shall not exceed 206 acres or 83 hectares as agreed upon under Section 802 of the Covenant; otherwise, the military or the U.S. Department of Defense must officially consult with the CNMI Government and negotiate for conditions of such expansion.

(2). Commercial, Sports and Local Fishermen: The water surrounding Farallon de Medinilla is considered by these fishermen as one of the best area to fish. With the possibility of furthering military exercises 10 miles beyond the current 3 miles target practice area at Farallon de Medinilla, utilizing the most advanced military weaponry, and equipments, scheduling of such exercises may restrict, prevent or limit fishing operations and activities of these fishermen - hurting their livelihood and families. Definitely, such military exercises will greatly affect the amount of catch by commercial fishermen contributing to our local economy. This is a legitimate concern the U.S. military should take into serious consideration.

STM8-2

(3). Harmful/Deadly Materials-Debris and Fallout; etc... The MIRC and EIS/OEIS Study Area cover the entire land and water of the Mariana Islands. And within this study area, it includes and identifies zones for the Air Traffic Control Assigned Airspace(ATCAA) and Special Use Airspace for the military. This information indicates that beside the aerial target practice on Farallon de Medinilla, the military is planning to launch a more advanced and aggressive marine, land, surface and air training exercises as may be required for their preparedness and readiness at any time in the defense of our country. While we may have no objection to such training and exercises; we will expostulate, oppose and object strongly against usage and utilization of any machinery, equipments, tools, materials and such weaponry that uses any chemical or nuclear devise harmful and deadly to the people and the environment. In such training and exercises, the military must at all time carefully monitor them, take notes and make studies of whatever debris, gases or fallouts of everything and anything, including from jets' stream coming from air training, suspected of carrying and spreading air particles not seen by the naked eye, and any other objects and things that maybe harmful to people's health and environment. If such studies find absolute proof that these debris or fallouts did in fact contained such harmful and deadly matters, objects and other things of which they may have spread in the water, on land, or in the air, the military must immediately suspend all of their military training and exercises in the interest of protecting the health and lives of the people affected. These military training and exercise may continue at such time that an all cleared signal is issued and safe.

STM8-3

(4) Public Notice. The military should at all times be responsible to issue public announcement for any military training in the MIRC and EIS/OEIS Study Area once such training and exercise are to be commenced. A thirty (30) day "notice" shall be required to be posted prior to performing any such training and exercise announcing to the general public, particularly to airliners, mariners and fishermen as regard to the actual date and time for such military training and exercises. This requirement shall apply to the present bombing exercise and target on Farallon de Medinilla and the adjacent waters within the

STM8-4

STA-1

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD09/3094

February 9, 2009

J.D. Rios
Mariana Islands Range Complex DEIS
258 Makalapa Drive, Suite 100
Attn: EV2
Pearl Harbor, Hawai'i 96880-3134

RE: Request for comments on the Mariana Islands Range Complex (MIRC) draft environmental impact statement notice (DEIS).

Aloha e J.D. Rios,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated January 15, 2009. OHA has reviewed the project and offers the following comments.

STA1-1

OHA does express concern over impacts to resources of this state that are also significant to our beneficiaries. OHA sees that occurrences of large numbers of level B harassment events and potential level A exposures are expected to marine mammals. We ask how these exercises differ from those taking place in the Hawai'i Range Complex and also point out that these animals do migrate and, therefore, may be exposed to cumulative effects.

STA1-2

Of additional concern is the harassment of sea turtles. The potential for applicant actions to cause nesting failures must be clarified and mitigated in this environmental review. We ask that the consultations with the Navy and the National Marine Fisheries Service regarding the negative effects to sea turtles be included in the EIS.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold by phone at (808) 594-0263 or e-mail him at granta@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

NATURAL RESOURCES DEFENSE COUNCIL

By Electronic and Regular Mail

March 16, 2009

Mariana Islands Range Complex EIS
Attn: EV2
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134
Email: marianas.tap.eis@navy.mil

Re: Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for the Mariana Islands Range Complex

Dear Nora Macariola-See:

On behalf of the Natural Resources Defense Council ("NRDC"), International Fund for Animal Welfare, The Humane Society of the United States, Animal Welfare Institute, International Ocean Noise Coalition, Ocean Mammal Institute, Whale and Dolphin Conservation Society, Cetacean Society International, Ocean Futures Society, and Jean-Michel Cousteau, and our millions of members and activists, I appreciate the opportunity to submit comments regarding the Navy's Draft Environmental Impact Statement/ Overseas Environmental Impact Statement ("DEIS") for the Mariana Islands Range Complex ("MIRC"). *See* 74 Fed. Reg. 5646 (Jan. 30, 2009). Please include these comments and attachments in the administrative record.[1]

ORG1-1 At the outset we must note that the potential effects on marine mammals are one of the primary concerns associated with this proposal. Unfortunately, the paucity of information provided has severely curtailed the public's ability to meaningfully evaluate and comment upon the environmental impacts and effects of the proposal. Simply stated, there is a dearth of scientific surveys or research to support the Navy's environmental analysis and take estimate in the MIRC. Only one dedicated cetacean survey has ever been conducted around the Commonwealth of the Northern Marianas

[1] We aware that comments may be submitted separately by government agencies, individual scientists, environmental organizations, and the public. All of these comments are hereby incorporated by reference. The comments that follow do not constitute a waiver of any factual or legal issue raised by any of these organizations or individuals and not specifically discussed herein.

Islands ("CNMI"). We recommend that, at a minimum, the Navy obtain additional data on cetacean distribution in the MIRC, re-analyze its impacts analysis and take estimates accordingly, and reissue its DEIS.

ORG1-2 We must also note that the Navy fails to adequately examine impacts from the proposed use of its Surveillance Towed-Array Sensor System (SURTASS) low-frequency active (LFA) sonar. While noting that LFA will be used in the MIRC, the Navy fails to disclose how often it will be used, what mitigation measures will be used, the adequacy of the protective measures currently in place, and whether it will avoid using LFA in areas of the ocean that are especially important habitat. The paucity of information on the Navy's proposed use of LFA makes meaningful comment difficult. Thus, we incorporate by reference our comments on the Navy's Draft Supplemental Environmental Impact Statement for SURTASS LFA and our comments on NMFS' Proposed Rule for the Navy's SURTASS LFA. A copy of each comment letter is attached.

ORG1-3 We must also object to the Navy's piecemealing of expansion projects in Guam and CNMI. *See, e.g.*, Joint Guam Program Office, Guam and CNMI Military Relocation EIS/ OEIS (relocating over 8,552 marines and 9,000 dependents to Guam by 2014); U.S. Air Force, Intelligence, Surveillance, and Reconnaissance/Strike EIS; and U.S. Navy, Kilo Wharf Extension EIS. The Navy is attempting to improperly segment the MIRC DEIS and the other proposed relocation and expansion projects. However, these projects are connected to one another both geographically and operationally. The National Environmental Policy Act, 42 U.S.C. 4321 *et seq.*, prohibits the Navy from segmenting these types of connected actions in different analyses and requires consideration of the impacts of such connected actions together in one EIS that comprehensively considers environmental effects. 40 C.F.R. § 1508.25(a)(1) (ii), (iii); id. § 1502.4(a).

The proposed increase in training activities within the MIRC include intensive, year-round exercises employing active sonar as well as a battery of other acoustic sources and explosives detonations in ocean surface and undersea areas, special use airspace, and training land areas. Located in the Western Pacific, the range encompasses 501,873 square nautical miles in the Philippine Sea and Pacific Ocean and 14,000 square nautical miles of undersea space. The MIRC spans from south of Guam to north of Pagan (CNMI) and from the Pacific Ocean east of the Mariana Islands to the middle of the Philippine Sea to the west. The MIRC also subsumes the Marianas Trench Marine National Monument, which was established in January 2009 by Presidential Proclamation. The Navy's preferred alternative would dramatically increase the amount of training in the MIRC, including developing a new Portable Underwater Tracking Range and increasing the number of major exercises, aircraft operations and training.

The Navy's envisioned MIRC expansion would pose significant risk to whales, fish, and other wildlife that depend on sound for breeding, feeding, navigating, and avoiding predators—in short, for their survival. Many of the exercises proposed would employ

mid-frequency active sonar, which has been implicated in mass injuries and mortalities of whales around the globe.[2] The same technology is known to affect marine mammals in countless other ways, inducing panic responses, displacing animals, and disrupting crucial behavior such as foraging. The MIRC expansion would also affect fisheries and essential fish habitat, damage hard-bottom habitat and coral reefs, and release a variety of hazardous materials into coastal waters.

The National Environmental Policy Act requires the Navy to employ rigorous standards of environmental review, including a full explanation of potential impacts, a comprehensive analysis of all reasonable alternatives, a fair and objective accounting of cumulative impacts, and a thorough description of measures to mitigate harm. Unfortunately, the DEIS released by the Navy falls far short of these standards.

ORG1-4

The Navy's DEIS does not properly analyze the environmental impacts of the limited alternatives it has proposed. Its analysis also substantially understates the potential effects of sonar on marine wildlife. For instance, the Navy fails to acknowledge risks posed to a wide range of marine species and impacts to the Marianas Trench Marine National Monument from the increased activities, or from actions necessary to support the proposed increase in training.

ORG1-5

Further, the Navy concludes that only one sperm whale and one Pantropical spotted dolphin would suffer serious injury or die during the many hours of proposed sonar and other training in its preferred alternative. The Navy reaches this conclusion by excluding relevant information adverse to its interests, using approaches and methods that are unacceptable to the scientific community and ignoring entire categories of impacts. As discussed in detail in Appendix C and the attached critique by Dr. David Bain, the Navy's assessment of acoustic impacts is highly problematic.

ORG1-6

Moreover, the Navy's analysis entirely fails to account for cumulative impacts for the years of anticipated activity. The Navy merely recites a list of potential impacts without actually taking the next step of analyzing the effects of those impacts. The Navy's repeated platitude that any impacts are short-term in nature and thus would not combine to produce cumulative effects not only lacks scientific validity, but also grossly misapprehends the definition of cumulative impacts under NEPA. 40 C.F.R. § 1508.7.

ORG1-7

The failure to meaningfully assess these kinds of risks also necessarily infects the Navy's proposed mitigation measures and alternatives. The Navy fails to consider a variety of other options, alternatives, and common-sense mitigation measures – some employed by the Navy itself in previous training – that would reduce the impacts. What the Navy presents instead is an alternatives analysis and mitigation strategy so narrowly defined that it effectively disregards the environment.

[2] Military sonar generates intense sound that can induce a range of adverse effects in whales and other species – from significant behavioral changes to injury and death. The most widely reported and dramatic of these events are the mass strandings of beaked whales and other marine mammals that have been associated with military sonar use. A brief summary of the stranding record appears in Appendix B.

ORG1-8

The Navy can, and must, adopt meaningful measures to reduce the harmful impacts of sonar, including spatial and temporal restrictions for its training exercises. As described in detail in Appendix A and Section IV below, these measures should, at a minimum, include protecting the following areas:

- Coastal waters between the shoreline and the 200 meter depth contour
- Waters to 2,000 meter isobath
- The Marianas Trench Marine National Monument

In sum, we urge the Navy to revise its impacts analysis consistent with federal law and to produce a mitigation plan – which includes protected areas – that truly maximizes environmental protection given the Navy's actual operational needs. We also urge the Navy to make available to the public the data and modeling on which its analysis is based.

I. Legal Framework: The National Environmental Policy Act

The National Environmental Policy Act of 1969 ("NEPA") "declares a broad national commitment to protecting and promoting environmental quality." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). NEPA establishes a national policy to "encourage productive and enjoyable harmony between man and his environment" and "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321. In order to achieve its broad goals, NEPA mandates that "to the fullest extent possible" the "policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with [it]." 42 U.S.C. § 4332. To that end, NEPA requires that the potential environmental impacts of any "major Federal actions significantly affecting the quality of the human environment" be considered through the preparation of an environmental impact statement ("EIS"). *Robertson*, 490 U.S. at 348; 42 U.S.C. § 4332. This directive is known as a "set of action-forcing procedures" that require decision makers to take "a 'hard look' at environmental consequences." *Robertson*, 490 U.S. at 349 (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 410, n.21 (1976)).

Central to NEPA is its requirement that, before any federal action that "*may* significantly degrade some human environmental factor" can be undertaken, agencies must prepare an EIS. *Steamboaters v. F.E.R.C.*, 759 F.2d 1382, 1392 (9th Cir. 1985) (emphasis in original). The requirement to prepare an EIS "serves NEPA's action-forcing purpose in two important respects." *Robertson*, 490 U.S. at 349. First, "the agency, in reaching its decision, will have available, and will *carefully consider*, *detailed information* concerning significant environmental impacts[,]" and second, "the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision." *Id.* (emphasis added). As the Supreme Court explained: "NEPA's instruction that all federal agencies comply with the impact statement requirement…'to the fullest extent possible' [cit. omit.] is neither accidental nor hyperbolic. Rather the phrase is a

deliberate command that the duty NEPA imposes upon the agencies to consider environmental factors not be shunted aside in the bureaucratic shuffle." *Flint Ridge Development Co. v. Scenic Rivers Ass'n*, 426 U.S. 776, 787 (1976).

The fundamental purpose of an EIS is to force the decision-maker to take a "hard look" at a particular action – at the agency's need for it, at the environmental consequences it will have, and at more environmentally benign alternatives that may substitute for it – before the decision to proceed is made. 40 C.F.R. §§ 1500.1(b), 1502.1; *Baltimore Gas & Electric v. NRDC*, 462 U.S. 87, 97 (1983). This "hard look" requires agencies to obtain high quality information and accurate scientific analysis. 40 C.F.R. § 1500.1(b). "General statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Klamath-Siskiyou Wilderness Center v. Bureau of Land Management*, 387 F.3d 989, 994 (9th Cir. 2004) (*quoting Neighbors of Cuddy Mountain v. United States Forest Service*, 137 F.3d 1372, 1380 (9th Cir. 1998)). The law is clear that the EIS must be a pre-decisional, objective, rigorous, and neutral document, not a work of advocacy to justify an outcome that has been foreordained.

In nearly every respect, the Navy's DEIS fails to meet the high standards of rigor and objectivity required under NEPA.

II. The Navy Fails to Properly Analyze Impacts on Marine Mammals

ORG1-9

As set forth in further detail in Appendix A, there is a dearth of dedicated cetacean surveys in the area. Nonetheless, a general review of the region's marine mammals and habitat indicates that the Navy's impacts analysis underestimates actual impacts on species.

A. Impacts on Wildlife and the Marianas Trench Marine National Monument

The MIRC engulfs portions of the Marianas Trench Marine National Monument, a region of great biological diversity. The Mariana Trench is approximately 940 nautical miles long and 38 nautical miles wide within the United States Exclusive Economic Zone and contains the deepest known points in the global ocean. The Mariana Volcanic Arc contains objects of scientific interest, including the largest active mud volcanoes on Earth. The Champagne vent, located at the Eifuku submarine volcano, produces almost pure liquid carbon dioxide. This phenomenon has only been observed at one other site in the world. The Sulfur Cauldron, a pool of liquid sulfur, is found at the Daikoku submarine volcano. The only other known location of molten sulfur is on Io, a moon of Jupiter. Unlike other reefs across the Pacific, the northernmost Mariana reefs provide unique volcanic habitats that support marine biological communities requiring basalt. Maug Crater represents one of only a handful of places on Earth where photosynthetic and chemosynthetic communities of life are known to come together.[3]

[3] See Presidential Proclamation Establishing the Marianas Trench Marine National Monument, 74 Fed. Reg. 1557 (Jan. 12, 2009).

The waters of the northern islands are among the most biologically diverse in the Western Pacific and include the greatest diversity of seamount and hydrothermal vent life yet discovered. These volcanic islands are ringed by coral ecosystems with very high numbers of apex predators, including large numbers of sharks. They also contain one of the most diverse collections of stony corals in the Western Pacific. The northern islands and shoals have large fish biomass, including apex predators, and support some of the largest biomass of reef fishes in the Mariana Archipelago. These relatively pristine coral reef ecosystems are objects of scientific interest and essential to the long-term study of tropical marine ecosystems.[4]

Several geographic features in this region may result in localized hotspots of productivity, providing a base for prey species of marine mammals. These include the steep topography of seamounts, the passage of the northern equatorial current through the Mariana island chain, and the narrow channels found between some of the islands including Tinian and Saipan. Unfortunately, data on cetacean distribution for this region is extremely sparse, as only one dedicated cetacean survey has ever been conducted around the Marianas or CNMI. NEPA requires agencies to make every attempt to obtain and disclose data necessary to their analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. *See* 40 C.F.R. § 1502.22(a).

ORG1-10

Despite this paucity of information, the DEIS dismisses or improperly minimizes any significant risk to marine mammals, fish and wildlife in this area. At a minimum, the Navy must provide cetacean distribution information, as well as a detailed analysis of the impacts on marine species in the Marianas Trench Marine National Monument. Further, given the federally-protected status of the Monument and its importance to wildlife, the Navy should prepare and evaluate an alternative that excludes the Marianas Trench Marine National Monument from training exercises.

B. Acoustic Impacts

To comply with NEPA, agencies must ensure the "professional integrity, including scientific integrity," of the discussions and analyses that appear in environmental impact statements. 40 C.F.R. § 1502.24. To that end, they must make every attempt to obtain and disclose data necessary to their analysis. The agency cannot simply assert that "no information exists," for unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. *See* 40 C.F.R. § 1502.22(a). Agencies are further required to identify their methodologies, indicate when necessary information is incomplete or unavailable, acknowledge scientific disagreement and data gaps, and evaluate indeterminate adverse impacts based upon approaches or methods "generally accepted in the scientific community." 40 C.F.R. §§ 1502.22(2), (4), 1502.24. Such requirements become acutely important in cases where, as here, so much about a program's impacts depend on newly emerging science.

[4] Id.

ORG1-11 In this case, the Navy's assessment of impacts is consistently undermined by its failure to meet these fundamental responsibilities of scientific integrity, methodology, investigation, and disclosure. As set forth in greater detail in Appendix C and the attached critique by Dr. Bain, the DEIS disregards a great deal of relevant information adverse to the Navy's interests, uses approaches and methods that would not be acceptable to the scientific community, and ignores whole categories of impacts. In short, it leaves the public with an analysis of harm—behavioral, auditory, and physiological—that is at odds with established scientific authority and practice. The Navy must revise its acoustic impacts analysis, including its thresholds and risk function, to comply with NEPA.

C. Impacts of SURTASS LFA Sonar

LFA is a relatively new type of sonar technology that locates enemy vessels by bombarding the ocean with low-frequency sound waves. The intense, low-frequency signals produced by LFA have raised environmental concerns in the international scientific community in part because of the extraordinary distance they propagate. The Navy's use of LFA sonar has been enjoined on two occasions by a federal court after findings that its proposed use likely violated various environmental laws, including NEPA and the MMPA. The Court in *NRDC v. Gutierrez* found it "clear that marine mammals, many of whom depend on sensitive hearing for essential activities like finding food and mates and avoiding predators, will at a minimum be harassed by the extremely loud and far travelling LFA sonar." *Natural Resources Defense Council, Inc. v. Gutierrez*, No. C-07-04771 EDL, 2008 WL 360582 *30 (Feb. 6, 2008). Nonetheless,
ORG1-12 despite acknowledging that LFA may cause "temporary behavioral disturbances" (DEIS at 3.7-8), the Navy fails to estimate the impact of such use as required by NEPA and as it does for its use of MFA and other acoustic sources.

The Navy also fails to discuss appropriate mitigation for its use of LFA sonar. As noted by the Court in *NRDC v. Gutierrez*, to comply with the MMPA the Navy must not use sonar during training exercises in "areas of the ocean that are especially important habitat." *NRDC v. Gutierrez*, 2008 WL 360582 *32. Nonetheless, the Navy does not state that it will not use SURTASS LFA in the Marianas Trench Marine National Monument, which is encompassed by the MIRC. The Marianas Trench Mariana National Monument was created by President George W. Bush and covers "waters of
ORG1-13 the [Mariana] archipelago's northern islands [that] are among the most biologically diverse in the Western Pacific." 74 Fed. Reg. 1557. In accord with the MMPA, the Navy must not use LFA sonar during training exercises in such areas.

D. Other Impacts on Marine Mammals

ORG1-14 The activities proposed for the MIRC may have impacts that are not limited to the effects of ocean noise. Unfortunately, the Navy's analysis of these other impacts is cursory and inadequate.

First, the Navy fails to adequately assess the impact of stress on marine mammals, a serious problem for animals exposed even to moderate levels of sound for extended periods.[5] DEIS at 3.7-65 to 66. As the Navy has previously observed, stress from ocean noise—alone or in combination with other stressors, such as biotoxins—may weaken a cetacean's immune system, making it "more vulnerable to parasites and diseases that normally would not be fatal."[6] Moreover, according to studies on terrestrial mammals, chronic noise can interfere with brain development, increase the risk of myocardial infarctions, depress reproductive rates, and cause malformations and other defects in young—all at moderate levels of exposure.[7] Because physiological stress responses are highly conservative across species, it is reasonable to assume that marine mammals would be subject to the same effects, particularly—as appears to be the case here—if they are resident animals exposed repeatedly to a variety of stressors in the MIRC. Yet despite the potential for stress in marine mammals and the significant consequences that can flow from it, the Navy unjustifiably assumes that such effects would be minimal.

Second, the Navy fails to consider the risk of ship collisions with large cetaceans, as exacerbated by the use of active acoustics. DEIS 3.7-116 to 120. For example, right whales have been shown to engage in dramatic surfacing behavior, increasing their vulnerability to ship strikes, on exposure to mid-frequency alarms above 133 dB re 1 μPa (SPL)—a level of sound that can occur many tens of miles away from the sonar systems slated for the range.[8] DEIS 3.7-89. A conservative approach would assume that other large whales (which, as the DEIS acknowledges, are already highly susceptible to vessel collisions) are subject to the same hazard. The DEIS fails to discuss even the potential for mortality or injury to whales from ship strikes. NEPA's hard look requires the Navy to undertake a far more detailed examination of this potentially significant source of mortality under even the no action alternative, as well as from the increase in vessel traffic that would occur under alternatives 1 and 2.

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[5] See National Research Council, Ocean Noise and Marine Mammals.

[6] Navy, Hawaii Range Complex Draft Environmental Impact Statement/ Overseas Environmental Impact Statement at 5-19 to 5-20 (2007). Additional evidence relevant to the problem of stress in marine mammals is summarized in A.J. Wright, N. Aguilar Soto, A.L. Baldwin, M. Bateson, C.M. Beale, C.Clark, T. Deak, E.F. Edwards, A. Fernández, A. Godinho, L. Hatch, A. Kakuschke, D. Lusseau, D. Martineau, L.M. Romero, L. Weilgart, B. Wintle, G. Notarbartolo di Sciara, and V. Martin, Do marine mammals experience stress related to anthropogenic noise?, 20 International Journal of Comparative Psychology, 274-316 (2007); see also T.A. Romano, M.J. Keogh, C. Kelly, P. Feng, L. Berk, C.E. Schlundt, D.A. Carder, and J.J. Finneran, Anthropogenic Sound and Marine Mammal Health: Measures of the Nervous and Immune Systems Before and After Intense Sound Exposure, 61 Canadian Journal of Fisheries and Aquatic Sciences 1124, 1130-31 (2004).

[7] See, e.g., E.F. Chang and M.M. Merzenich, Environmental Noise Retards Auditory Cortical Development, 300 Science 498 (2003) (rats); S.N. Willich, K. Wegscheider, M. Stallmann, and T. Keil, Noise Burden and the Risk of Myocardial Infarction, European Heart Journal (2005) (Nov. 24, 2005) (humans); F.H. Harrington and A.M. Veitch, Calving Success of Woodland Caribou Exposed to Low-Level Jet Fighter Overflights, 45 Arctic vol. 213 (1992) (caribou).

[8] Nowacek et al., North Atlantic Right Whales, 271 Proceedings of the Royal Society of London, Part B: Biological Sciences at 227.

Third, in the course of its training activities, the Navy would release a host of toxic chemicals, hazardous materials and waste into the marine environment that could pose a threat to local wildlife over the life of the range. Nonetheless, the DEIS fails to adequately consider the cumulative impacts of these toxins on marine mammals from past, current, and proposed training exercises. DEIS 6-24. Indeed, the DEIS dismisses the effects of hazardous materials and waste in a single paragraph. Careful study is needed into the way toxins might disperse and circulate within the area and how they may affect marine wildlife. The Navy's assumption that toxics would "degrade, corrode, and become incorporated into the sediments" leads to a blithe conclusion that releases of hazardous material would have "no serious environmental impacts." DEIS 6-24. Given the level of training exercise increases proposed in the action alternatives, and the amount of ordnance and other hazardous materials necessary for that training, this discussion is inadequate under NEPA.

Finally, the Navy's analysis cannot be limited only to direct effects, *i.e.*, effects that occur at the same time and place as the training exercises that would be authorized. 40 C.F.R. § 1508.8(a). It must also take into account the activity's indirect effects, which, though reasonably foreseeable (as the DEIS acknowledges), may occur later in time or are further removed. 40 C.F.R. § 1508.8(b). This requirement is particularly critical in the present case given the potential for sonar exercises to cause significant long-term impacts not clearly observable in the short or immediate term (a serious problem, as the National Research Council has observed).[9] Thus, for example, the Navy must not only evaluate the potential for mother-calf separation but also the potential for indirect effects—on survivability—that might arise from that transient change. 40 C.F.R. § 1502.16(b).

Without further consideration of these impacts, and mitigation and alternatives developed to address those impacts, the DEIS does not pass NEPA muster.

E. Other Impacts on Wildlife

As discussed above, the Navy's proposed training activities pose risks to marine life other than that associated with ocean noise, such as injury or death from collisions with ships, bioaccumulation of toxins, and stress. These same concerns that apply to marine mammals apply to sea turtles, birds and other biota as well. The Navy must adequately evaluate impacts and propose mitigation for each category of harm. 40 C.F.R. §§ 1502.14, 1502.16.

ORG1-15

The effects of mid-frequency active sonar on sea turtles are glossed over on the grounds that their best hearing range appears to occur below 1 kHz. DEIS at 3.8-13 to 14. But having their best acoustic sensitivity in this range does not mean that sea turtles are

[9] "Even transient behavioral changes have the potential to separate mother-offspring pairs and lead to death of the young, although it has been difficult to confirm the death of the young." National Research Council, Ocean Noise and Marine Mammals at 96.

oblivious to noise at higher frequencies. As the Navy admits, juvenile and adult loggerheads hear sounds all the way up to 1 kHz, suggesting that they continue to detect sounds at higher levels, including potentially the lower end of the intense mid-frequency sources intended for the range. Furthermore, they have been shown to engage in startle and escape behavior – behavior that may involve diving and surfacing – and to experience heightened stress in response to vessel noise. Thus, a more rigorous analysis of potential impacts of mid-frequency sonar is necessary. In addition, the Navy's specious reasoning that the "lack of scientific data" regarding LFA's effect on turtles means that impacts on turtles will be "negligible" (DEIS at 3.8-38) is not only at odds with the scientific literature, but also grossly misapprehends the requirements of NEPA. 40 C.F.R. §§ 1502.22, 1502.24.

ORG1-16

Nor is the Navy's reasoning with regard to seabirds any more sound. Although the Navy acknowledges that "[i]nformation regarding the effects from sonar on seabirds is virtually unknown" (DEIS at 3.10-26), it then inexplicably concludes that, "[i]n general, birds are less susceptible to both TTS and PTS than are mammals." Id. Such reasoning does not bear up to any serious scrutiny. Seabirds occur in the MIRC, dive underwater (in some cases to depths of hundreds of feet), and are sensitive to same frequencies used by the Navy's acoustic sources. They must receive further analysis in the DEIS, both for the direct impacts they may suffer on exposure to the Navy's acoustic sources and for the impacts they may incur indirectly through depletion of prey species and hard bottom habitat. 40 C.F.R. § 1502.16(a), (b).

Without further consideration of these species, the Navy's review is incomplete.

III. The Navy Fails to Analyze the Impacts on Fish and Fisheries

ORG1-17

The DEIS also fails to evaluate the impacts of anthropogenic sound on fish and fisheries.[10] Though the architecture of their ears may differ, fish are equipped, like all vertebrates, with thousands of sensory hair cells that vibrate with sound; and a number of specialized organs like the abdominal sac, called a "swim bladder," that some species possess which can boost hearing. Fish use sound in many of the ways that marine mammals do: to communicate, defend territory, avoid predators, and, in some cases, locate prey.[11]

One series of recent studies showed that passing airguns can severely damage the hair cells of fish (the organs at the root of audition) either by literally ripping them from their base in the ear or by causing them to "explode."[12] Fish, unlike mammals, are

[10] The DEIS also fails to fully evaluate the impacts on fish and thus on the species that depend on fish as prey.

[11] See, e.g., A.N. Popper, Effects of Anthropogenic Sounds on Fishes, 28(10) Fisheries 26-27 (2003); M.C. Hastings & A.N. Popper, Effects of Sound on Fish 19 (2005) (Report to the California Department of Transportation, Contract No. 43A0139), p., 19; D.A. Croll, Marine Vertebrates and Low Frequency Sound—Technical Report for LFA EIS 1-90 (1999).

[12] R. McCauley, J. Fewtrell, and A.N. Popper, High Intensity Anthropogenic Sound Damages Fish Ears, 113 Journal of the Acoustical Society of America 640 (2003).

thought to regenerate hair cells, but the pink snapper in these studies did not appear to recover within approximately two months after exposure, leading researchers to conclude that the damage was permanent.[13] It is not clear which elements of the sound wave contributed to the injury, or whether repetitive exposures at low amplitudes or a few exposures at higher pressures, or both, were responsible.[14]

Sound has also been shown to induce temporary hearing loss in fish. Even at fairly moderate levels, noise from outboard motor engines is capable of temporarily deafening some species of fish, and other sounds have been shown to affect the short-term hearing of a number of other species, including sunfish and tilapia.[15] For any fish that is dependent on sound for predator avoidance and other key functions, even a temporary loss of hearing (let alone the virtually permanent damage seen in snapper) will substantially diminish its chance of survival.[16]

Hearing loss is not the only effect that ocean noise can have on fish. For years, fisheries in various parts of the world have complained about declines in their catch after intense acoustic activities (including naval exercises) moved into the area, suggesting that noise is seriously altering the behavior of some commercial species.[17] A group of Norwegian scientists attempted to document these declines in a Barents Sea fishery and found that catch rates of haddock and cod (the latter known for its particular sensitivity to low-frequency sound) plummeted across a 1600 square-mile area surrounding an airgun survey; in another experiment, catch rates of rockfish were similarly shown to decline.[18]

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[13] Id. at 641 (some fish in the experimental group sacrificed and examined 58 days after exposure).

[14] Id.

[15] A.R. Scholik and H.Y. Yan, Effects of Boat Engine Noise on the Auditory Sensitivity of the Fathead Minnow, *Pimephales promelas*, 63 Environmental Biology of Fishes 203-09 (2002); A.R. Scholik and H.Y. Yan, The Effects of Noise on the Auditory Sensitivity of the Bluegill Sunfish, Lepomis macrochirus, 133 Comparative Biochemisty and Physiology Part A at 43-52 (2002); M.E. Smith, A.S. Kane, & A.N. Popper, Noise-Induced Stress Response and Hearing Loss in Goldfish *(Carassius auratus)*, 207 Journal of Experimental Biology 427-35 (2003); Popper, Effects of Anthropogenic Sounds at 28.

[16] See Popper, Effects of Anthropogenic Sounds at 29; McCauley et al., High Intensity Anthropogenic Sound Damages Fish Ears, at 641.

[17] See "'Noisy' Royal Navy Sonar Blamed for Falling Catches," Western Morning News, Apr. 22, 2002 (sonar off the U.K.); Percy J. Hayne, President of Gulf Nova Scotia Fleet Planning Board, "Coexistence of the Fishery & Petroleum Industries," www.elements.nb.ca/theme/fuels/percy/hayne.htm (accessed May 15, 2005) (airguns off Cape Breton); R.D. McCauley, J. Fewtrell, A.J. Duncan, C. Jenner, M.-N. Jenner, J.D. Penrose, R.I.T. Prince, A. Adhitya, J. Murdoch, and K. McCabe, Marine Seismic Surveys: Analysis and Propagation of Air-Gun Signals, and Effects of Air-Gun Exposure on Humpback Whales, Sea Turtles, Fishes, and Squid 185 (2000) (airguns in general).

[18] A. Engås, S. Løkkeborg, E. Ona, and A.V. Soldal, Effects of Seismic Shooting on Local Abundance and Catch Rates of Cod *(Gadus morhua)* and Haddock *(Melanogrammus aeglefinus)*, 53 Canadian Journal of Fisheries and Aquatic Sciences 2238-49 (1996); J.R. Skalski, W.H. Pearson, and C.I. Malme, Effects of Sound from a Geophysical Survey Device on Catch-Per-Unit-Effort in a Hook-and-Line Fishery for Rockfish (Sebastes spp.), 49 Canadian Journal of Fisheries and Aquatic Sciences

Drops in catch rates in these experiments range from 40 to 80 percent.[19] A variety of other species, herring, zebrafish, pink snapper, and juvenile Atlantic salmon, have also been observed to react to various noise sources with acute alarm.[20]

In their comments on the Navy's DEIS for the proposed Undersea Warfare Training Range off North Carolina, several fishermen and groups of fishermen independently reported witnessing sharp declines in catch rates of various species when in the vicinity of Navy exercises.[21] These reports are indicative of behavioral changes, such as a spatial redistribution of fish within the water column, that could affect marine mammal foraging as well as human fisheries. In addition, as NMFS has observed, the use of mid-frequency sonar could affect the breeding behavior of certain species, causing them, for example, to cease their spawning choruses, much as certain echolocation signals do.[22] The repetitive use of sonar and other active acoustics could have significant adverse behavioral effects on some species of fish and those who depend on them.

Moreover, as the Navy is aware after recently completing consultation with both NMFS (for salmon) and the U.S. Fish and Wildlife Service (for bull trout) over its Explosive Ordinance Disposal ("EOD") training exercises in Puget Sound, underwater explosions are responsible for high direct mortality to fish species present in the area. Indeed, the underwater detonation of just five pounds of plastic explosives has been observed to kill over 5,000 fish with swim bladders, with more accurate estimates ranging as high as 20,000 fish. The DEIS's failure to analyze these effects in any detail is therefore stunning.

Although fish and wildlife agencies, as well as the studies detailed above, document impacts to fish from both noise and underwater explosions, the DEIS nonetheless concludes that there would be no significant impact on fish or essential fish habitat from its increased sonar training activities and explosive detonations. DEIS at 3.9-61, 65. Such a conclusion is at odds with the scientific literature.

1357-65 (1992). See also S. Løkkeborg and A.V. Soldal, The Influence of Seismic Exploration with Airguns on Cod (Gadus morhua) Behaviour and Catch Rates, 196 ICES Marine Science Symposium 62-67 (1993).

[19] Id.

[20] See J.H.S. Blaxter and R.S. Batty, The Development of Startle Responses in Herring Larvae, 65 Journal of the Marine Biological Association of the U.K. 737-50 (1985); F.R. Knudsen, P.S. Enger, and O. Sand, Awareness Reactions and Avoidance Responses to Sound in Juvenile Atlantic Salmon, Salmo salar L., 40 Journal of Fish Biology 523-34 (1992); McCauley et al., Marine Seismic Surveys at 126-61.

[21] See comments compiled by the Navy and posted on the Undersea Warfare Training Range EIS site, *available at* http://www.projects.earthtech.com/USWTR (e.g., comments of S. Draughon, S. Fromer, L. and F. Gromadzki, D. Pendergrast, and North Carolina Watermen United).

[22] Letter from Miles M. Croom, NMFS Southeast Regional Office, to Keith Jenkins, Navy (Jan. 31, 2006); see also J.J. Luczkovich, "Potential Impacts of the U.S. Navy's Proposed Undersea Warfare Training Range on Fishes" (2006) (presentation to Navy).

The Navy's conclusion also ignores the literature on noise exposure and fish development. A number of studies, including one on non-impulsive noise, show that intense sound can kill eggs, larvae, and fry outright or retard their growth in ways that may hinder their survival later.[23] Significant mortality for fish eggs has been shown to occur at distances of 5 meters from an airgun source; mortality rates approaching 50 percent affected yolksac larvae at distances of 2 to 3 meters.[24] With respect to mid-frequency sonar, the Navy itself has noted that "some sonar levels have been shown [in Norwegian studies] to be powerful enough to cause injury to particular size classes of juvenile herring from the water's surface to the seafloor."[25] Also, larvae in at least some species are known to use sound in selecting and orienting toward settlement sites.[26] Acoustic disruption at that stage of development could have significant consequences.[27] Although the Navy acknowledges that eggs and larvae may be more susceptible to sound, it caveats that acknowledgement with the excuse that "such studies need to be replicated." DEIS at 3.9-52. However, NEPA does not allow the Navy to ignore the valid scientific studies that have already been conducted simply because they are contrary to its interest.

The Navy attempted to avoid further analysis by arguing that "data are limited and it would be very difficult to extrapolate to other species." DEIS 3.9-52. It then capriciously dismisses the potential for adverse impacts on fish. DEIS 3.9-61, 65. This lack of analysis does not meet the requirements of NEPA. The Navy must rigorously analyze the potential for behavioral, auditory, and physiological impacts on fish, including the potential for population-level effects, using models of fish distribution and population structure and conservatively estimating areas of impact from the available literature. 40 C.F.R. § 1502.22. It must also provide appropriate mitigation measures, such as avoidance of spawning grounds and of important habitat for fish species, especially hearing specialists.

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[23] See, e.g., C. Booman, J. Dalen, H. Leivestad, A. Levsen, T. van der Meeren, and K. Toklum, Effecter av luftkanonskyting på egg, larver og yngel (Effects from Airgun Shooting on Eggs, Larvae, and Fry), 3 Fisken og Havet 1-83 (1996) (Norwegian with English summary); J. Dalen and G.M. Knutsen, Scaring Effects on Fish and Harmful Effects on Eggs, Larvae and Fry by Offshore Seismic Explorations, in H.M. Merklinger, Progress in Underwater Acoustics 93-102 (1987); A. Banner and M. Hyatt, Effects of Noise on Eggs and Larvae of Two Estuarine Fishes, 1 Transactions of the American Fisheries Society 134-36 (1973); L.P. Kostyuchenko, Effect of Elastic Waves Generated in Marine Seismic Prospecting on Fish Eggs on the Black Sea, 9 Hydrobiology Journal 45-48 (1973).

[24] Booman et al., Effecter av luftkanonskyting på egg, larver og yngel at 1-83.

[25] Navy, Draft Environmental Impact Statement/ Overseas Environmental Impact Statement for the Southern California Range Complex 3.7-66 to 3.7-67 (2008). On the Mariana Islands range, the Navy would operate sonar at higher levels than those used in the Norwegian studies.

[26] S.D. Simpson, M. Meekan, J. Montgomery, R. McCauley, R., and A. Jeffs, Homeward Sound, 308 Science 221 (2005).

[27] Popper, Effects of Anthropogenic Sounds at 27.

IV. The Proposed Mitigation Measures Fail to Protect Marine Wildlife

ORG1-18

To comply with NEPA, an agency must discuss measures designed to mitigate its project's impact on the environment. *See* 40 C.F.R. § 1502.14(f). "In order to be effective, a mitigation measure must be supported by analytical data demonstrating why it will constitute an adequate buffer against the negative impacts that may result from the authorized activity." *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815, 828 (9th Cir. 2008). There is a large and growing set of options for the mitigation of noise impacts to marine mammals and other marine life, some of which have been imposed by foreign navies[28]—and, more importantly, by the Navy itself in other contexts—to limit harm from high-intensity sonar exercises. Yet here the Navy does little more than set forth an abbreviated set of measures, dismissing effective measures out of hand.

All of the mitigation that the Navy has proposed for sonar impacts boils down to the following: a very small safety zone around the sonar source, maintained primarily with visual monitoring by personnel with other responsibilities, with aid from shipboard passive monitoring when personnel are already using such technology. Under the proposed scheme, operators would power-down the system if a marine mammal is detected within 1,000 yards and shut-down the system if a marine mammal is detected within 200 yards. DEIS at 5-6 to 7.

This mitigation scheme disregards the best available science on the significant limits of visual monitoring. Visual detection rates for marine mammals generally approach only 5 percent. Moreover, the species perhaps most vulnerable to sonar-related injuries, beaked whales, are among the most difficult to detect because of their small size and diving behavior. It has been estimated that in anything stronger than a light breeze, only one in fifty beaked whales surfacing in the direct track line of a ship would be sighted; as the distance approaches 1 kilometer, that number drops to zero.[29] The Navy's reliance on visual observation as the mainstay of its mitigation plan is therefore profoundly misplaced.

Further, the Navy's assurances that it will "consider," when planning exercises, several conditions that contribute to marine mammal stranding events provides no reassurance. Among the conditions the Navy will "consider" include: (1) areas of 1,000 m depth near a shoreline where there is a rapid change in bathymetry; (2) multiple ships or submarines operating sonar; (3) chokepoints and embayments; and (4) the historical presence of strong surface ducting conditions. DEIS at 5-7 to 8. While we applaud the Navy for recognizing these conditions of concern, NEPA requires more. The Navy must impose concrete mitigation measures rather than rhetorical issues of concern.

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[28] See S.J. Dolman, C.R. Weir, and M. Jasny, Comparative Review of Marine Mammal Guidance Implemented during Naval Exercises, __ Marine Pollution Bulletin __ (Dec. 12, 2008).

[29] J. Barlow and R. Gisiner, Mitigating, Monitoring, and Assessing the Effects of Anthropogenic Noise on Beaked Whales, 7 Journal of Cetacean Research and Management 239-249 (2006).

The Navy's ineffective mitigation measures are all the more remarkable given its adoption of more protective measures during previous training. For example, the Atlantic Fleet has repeatedly sited exercises beyond the continental shelf and Gulf Stream, relocated exercises out of important habitat and to avoid certain species, and used a technique called "simulated geography" to avoid canyons and near-shore areas on at least three of its major ranges. It has also restricted sonar use at night when marine mammals are harder to detect, as well as minimized the use of sonar from multiple sources at the same time.[30]

In this light, the Navy's claims that it cannot implement more protective mitigation measures ring false. DEIS at 5-16 to 21. Although the Navy goes to some pain to describe "alternative mitigation measures considered but eliminated" —primarily for "training effectiveness" reasons—its previous adoption of the same measures belies its argument. Clearly the Navy has done more to mitigate the harmful effects of sonar in previous exercises than what it proposes for the MIRC. It can, and must, do more to mitigate the harm on marine wildlife.

A. Protection Zones

ORG1-19

To mitigate sonar's harmful effects on marine wildlife, the Navy should adopt protection zones in which sonar activity will be banned. Based on our preliminary analysis of marine mammal densities and habitat in the MIRC, we call for the following exclusion areas for sonar:

1) Coastal exclusion to 200 meter depth contour – This area is important habitat for coastal cetaceans, including humpback whales, spinner dolphins and dugongs. To protect these sensitive species and near-coastal habitat, a robust buffer zone should be applied beyond the 200 m contour, and exercises should be planned to eliminate or minimize ship movements towards shore when sonar systems are active.

2) Exclusion to 2000 meter isobath – This area represents important areas for beaked and sperm whale sightings, including a sperm whale calving event.

3) Marianas Trench Marine National Monument – As noted in Section II.A and Appendix A, waters here are among the most biologically diverse in the Western Pacific and include the greatest diversity of seamount and hydrothermal vent life yet discovered. The northern islands are ringed by coral ecosystems with very high numbers of apex predators, including large numbers of sharks. They also contain one of the most diverse

[30] Final Comprehensive Overseas Environmental Assessment for Major Atlantic Fleet Training Exercises February 2006, Prepared for United States Fleet Forces Command in accordance with Chief of Naval Operations Instruction 5090.1B pursuant to Executive Order 12114; *See also* Atlantic Fleet Exercises Using Mid-Frequency Sonar Mitigation Chart.

collections of stony corals in the Western Pacific. The northern islands and shoals support some of the largest biomass of reef fishes in the Mariana Archipelago. These relatively pristine coral reef ecosystems are objects of scientific interest and essential to the long-term study of tropical marine ecosystems.[31] Any Navy plan for the training range must include measures to eliminate or very substantially limit the number of exercises taking place in Monument waters.

B. Other Mitigation Measures

ORG1-20

In addition to the specific protection zones set forth above, the Navy should adopt the following measures:

1) Seasonal avoidance of marine mammal feeding grounds, calving grounds, and migration corridors;

2) Avoidance of or extra protections in other federal and local marine protected areas, including the Piti Bomb Holes Marine Preserve, Tumon Bay Marine Preserve and Sasa Bay Marine Preserve.

3) Avoidance of bathymetry likely to be associated with high-value habitat for species of particular concern, including submarine canyons and large seamounts, or bathymetry whose use poses higher risk to marine species;

4) Avoidance of fronts and other major oceanographic features, such as the warm core rings and other areas with marked differentials in sea surface temperatures, which have the potential to attract offshore concentration of animals, including beaked whales;[32]

5) Avoidance of areas with higher modeled takes or with high-value habitat for particular species;

6) Concentration of exercises to the maximum extent practicable in abyssal waters and in surveyed offshore habitat of low value to species;

7) Use of sonar and other active acoustic systems at the lowest practicable source level, with clear standards and reporting requirements for different testing and training scenarios;

[31] See Presidential Proclamation Establishing the Marianas Trench Marine National Monument, 74 Fed. Reg. 1557 (Jan. 12, 2009).

[32] See, e.g., Carretta et al., U.S. Pacific Marine Mammal Stock Assessments: 2007 at 142 (reporting that "Baird's beaked whales have been seen primarily along the continental slope from late spring to early fall.").

8) Expansion of the marine species "safety zone" to a 4km shutdown, reflecting international best practice, or 2 km, reflecting the standard prescribed by the California Coastal Commission;[33]

9) Suspension of relocation of exercises when beaked whales or significant aggregations of other species are detected by any means within the orbit circle of an aerial monitor or near the vicinity of an exercise;

10) Use of simulated geography (and other work-arounds) to reduce or eliminate chokepoint exercises in near-coastal environments, particularly within canyons and channels, and use of other important habitat;

11) Avoidance or reduction of training during months with historically significant surface ducting conditions, and use of power-downs during significant surface ducting conditions at other times;

12) Use of additional power-downs when significant surface ducting conditions coincide with other conditions that elevate risk, such as during exercises involving the use of multiple systems or in beaked whale habitat;

13) Planning of ship tracks to avoid embayments and provide escape routes for marine animals;

14) Suspension or postponement of chokepoint exercises during surface ducting conditions and scheduling of such exercises during daylight hours;

15) Use of dedicated aerial monitors during chokepoint exercises, major exercises, and near-coastal exercises;

16) Use of dedicated passive acoustic monitoring to detect vocalizing species, through established and portable range instrumentation and the use of hydrophone arrays off instrumented ranges;

17) Modification of sonobuoys for passive acoustic detection of vocalizing species;

18) Suspension or reduction of exercises outside daylight hours and during periods of low visibility;

19) Use of aerial surveys and ship-based surveys before, during, and after major exercises;

[33] California Coastal Commission, Adopted Staff Recommendation on Consistency Determination CD-08606 (2007); Approved Letter from M. Delaplaine, California Coastal Commission, to Rear Adm. Len Hearing, Navy (Jan. 11, 2007).

20) Use of all available range assets for marine mammal monitoring;

21) Use of third-party monitors for marine mammal detection;

22) Establishment of long-term research, to be conducted through an independent agent such as the National Fish and Wildlife Foundation, on the distribution, abundance, and population structuring of species in the MIRC, with the goal of supporting adaptive geographic avoidance of high-value habitat. Notably, additional high-value habitat is likely to be identified in the MIRC, and research should be undertaken to identify this critical habitat;

23) Application of mitigation prescribed by regulators, by the courts, by other navies or research centers, or by the U.S. Navy in the past or in other contexts;

24) Avoidance of fish spawning grounds and of important habitat for fish species potentially vulnerable to significant behavioral change, such as wide-scale displacement within the water column or changes in breeding behavior;

25) Evaluating before each major exercise whether reductions in sonar use are possible, given the readiness status of the strike groups involved;

26) Dedicated research and development of technology to reduce impacts of active acoustic sources on marine mammals;

27) Establishment of a plan and a timetable for maximizing synthetic training in order to reduce the use of active sonar training;

28) Prescription of specific mitigation requirements for individual classes (or sub-classes) of testing and training activities, in order to maximize mitigation given varying sets of operational needs; and

29) Timely, regular reporting to NOAA, state coastal management authorities, and the public to describe and verify use of mitigation measures during testing and training activities.

Consideration of these measures is minimally necessary to satisfy the requirements of NEPA, and we note that similar or additional measures may be required under the Marine Mammal Protection Act, Endangered Species Act, and other statutes.

V. The Navy Fails to Properly Analyze Cumulative Impacts

ORG1-21

In order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. It is not enough, for purposes of this discussion, to consider the proposed action in isolation, divorced from other public and private activities that impinge on the same resource; rather, it is incumbent on the Navy to assess cumulative impacts as well, including the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." *Id.* § 1508.7. A meaningful cumulative impact analysis must identify (1) the area in which the effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, present, proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate. *Grand Canyon Trust v. FAA*, 290 F.3d 339, 345 (D.C. Cir. 2002) (quotation and citation omitted). The Navy "cannot treat the identified environmental concern in a vacuum." *TOMAC v. Norton*, 433 F.3d 852, 863 (D.C. Cir. 2006) (*quoting Grand Canyon Trust*, 290 F.3d at 345).

The Navy's cumulative impact analysis fails to meet these basic requirements. The Navy's analysis merely recites a list of "reasonably foreseeable future actions." DEIS 6-2 to 8. Nowhere in its cumulative impact analysis does the Navy consider—let alone reach the conclusion—that the *sum* of the various environmental impacts that are enumerated will be limited. DEIS at 6-1 to 26. Indeed, the Navy's analysis cannot provide such support because the Navy fails to explain what the sum of these impacts is expected to be. NEPA requires more than just a recital of possible impacts: it requires the Navy to actually analyze the overall impact of the accumulation of individual impacts. *Grand Canyon Trust*, 290 F.3d at 345. The DEIS fails to make this analysis.

For instance, the Navy must consider the full effects of its sonar training. Instead, it simply assumes that all behavioral impacts are short-term in nature and cannot affect individuals or populations through repeated activity—even though the anticipated takes at its preferred alternative would affect the same populations.

Nor does the Navy consider the potential for acute synergistic effects from sonar training. Although the DEIS discusses the potential for ship strike in the training area (DEIS 6-14 to 15), it does not consider the greater susceptibility to vessel strike of animals that have been temporarily harassed or disoriented by certain noise sources. The absence of analysis is particularly glaring in light of an incident in 2003 involving the Navy's use of mid-frequency active sonar, in which killer whales and other marine mammals were observed fleeing away from the sonar vessel at high speeds.[34] Neither

[34] Christopher Dunagan, Navy Sonar Incident Alarms Experts, Bremerton Sun, May 8, 2003. *See* Appendix B for a further description of this incident, which took place in Haro Strait, and other sonar related strandings.

does the Navy consider the synergistic effects of noise with other stressors in producing or magnifying a stress-response.[35] For these reasons alone, the Navy should have concluded that the cumulative and synergistic impacts from sonar training are significant and focused its efforts to analyze and develop mitigation measures to avoid those impacts.

ORG1-22

The Navy also acknowledges that the MIRC is crowded with human and military activities, many of which introduce noise, chemical pollution, debris, and vessel traffic into the habitat of protected species. DEIS at 6-15 to 23. Yet it inexplicably fails to conclude what the cumulative effects will be for all those activities.

ORG1-23

Given the scope of the proposed action, the deficiencies of the Navy's cumulative impacts assessment represents a critical failure of the DEIS. At a minimum, the Navy must evaluate the potential for cumulative impacts on populations that would occur in and near the MIRC, clearly define the extent of expected cumulative impacts, and assess the potential for synergistic adverse effects (such as from noise in combination with ship-strikes).

VI. The Navy Fails to Properly Analyze Reasonable Alternatives

NEPA requires agencies to consider alternatives to their proposed actions. To comply with NEPA, an EIS must "inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This alternatives requirement has been described in regulation as "the heart of the environmental impact statement." *Id.* § 1502.14. The courts describe the alternatives requirement equally emphatically, citing it as the "linchpin" of the EIS. *Monroe County Conservation Council v. Volpe*, 472 F.2d 693 (2d Cir. 1972). The agency must therefore "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." 40 C.F.R. § 1502.14(a). Consideration of alternatives is required by (and must conform to the independent terms of) both sections 102(2)(C) and 102(2)(E) of NEPA. Here, the Navy's alternatives analysis misses the mark.

ORG1-24

[35] A.J. Wright, N. Aguilar Soto, A.L. Baldwin, M. Bateson, C.M. Beale, C.Clark, T. Deak, E.F. Edwards, A. Fernández, A. Godinho, L. Hatch, A. Kakuschke, D. Lusseau, D. Martineau, L.M. Romero, L. Weilgart, B. Wintle, G. Notarbartolo di Sciara, and V. Martin, Do marine mammals experience stress related to anthropogenic noise?, 20 International Journal of Comparative Psychology, 274-316 (2007); see also Andrew J. Wright, Natacha Aguilar Soto, Ann L. Baldwin, Melissa Bateson, Colin M. Beale, Charlotte Clark, Terrence Deak, Elizabeth F. Edwards, Antonio Fernández, Ana Godinho, Leila Hatch, Antje Kakuschke, David Lusseau, Daniel Martineau, L. Michael Romero, Linda Weilgart, Brendan Wintle, Giuseppe Notarbartolo-di-Sciara, and Vidal Martin, Anthropogenic noise as a stressor in animals: a multidisciplinary perspective, 20 International Journal of Comparative Psychology, 250-273 (2007).

A. Failure to Identify Environmental Impact-Based Alternatives

ORG1-25

The Navy claims it assesses "the potential environmental effects" while executing its responsibilities under federal law, including NEPA. DEIS at 1-1. But the Navy's alternatives were not selected to "inform decision-makers and the public" of how the Navy could "avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. Instead, as discussed in the DEIS and below, the Navy chose alternatives based on factors unrelated to the proposed action's environmental impacts.

Further, at no point in the DEIS does the Navy discuss how the alternatives pose different environmental choices for the public and decisionmakers. The DEIS fails entirely to comply with NEPA's regulations, requiring the Navy to "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among option by the decisionmaker and the public." 40 C.F.R. § 1502.14. The Navy fails to sharply define the environmental issues applicable to each alternative and include these differences in a comparison of alternatives. There is simply no comparison of the risks and benefits of each alternative site showing what is and is not known and what species and habitats would be most at risk from each alternative.

B. Identification of Alternative Sites

ORG1-26

The DEIS does not include any discussion of alternative sites, instead proposing a No Action alternative (maintaining the current level of activities), the preferred Alternative 1 (increasing training activities, range enhancements and upgrades), and Alternative 2 (increasing training activities, range enhancements and upgrades, as well as increasing major at-sea exercises and training). The Navy's analysis is devoid of geographic alternatives. The information the Navy does include indicates that factors of convenience and cost dominated the decision. Factors of mere convenience alone cannot dictate an agency's choice of alternatives to evaluate in an EIS. An agency must discuss all reasonable alternatives—those that will accomplish the purpose and need of the agency and are practical and feasible—not simply those it finds most convenient. 40 C.F.R. § 1502.14. "The primary purpose of the impact statement is to compel federal agencies to give serious weight to environmental factors in making discretionary choices." *I-291 Why? Ass'n v. Burns*, 372 F.Supp. 233, 247 (D. Conn. 1974). If an agency is permitted to consider and compare the environmental impacts of its proposed action with only equally convenient alternatives—and permitted to omit from such analysis any alternatives that are less convenient, no matter that they might result in significant environmental benefits—this purpose would be thwarted.

Carefully siting the activities proposed to occur in the range to avoid concentrations of vulnerable and endangered species and high abundances of marine life is the most critical step the Navy can take in reducing the environmental impacts of this project. Because the Navy has failed to undertake an alternatives analysis that allows it to make an informed siting choice, however, the DEIS is inadequate and must be revised.

ORG1-27

C. Other Reasonable Alternatives

The DEIS fails to consider any alternatives beyond increasing the level of training. Therefore, many reasonable alternatives are missing from the Navy's analysis that might fulfill that purpose while reducing harm to marine life and coastal resources. For example:

(1) The DEIS fails entirely to consider seasonal restrictions on the use of the range. Instead, all of the action alternatives propose year-round use without regard to seasonal variations in marine mammal and fish abundance. This is true despite seasonal migrations of numerous marine mammals. Yet the DEIS fails even to consider the feasibility of avoiding seasonal habitat, or any other seasonal variation in marine life abundance (such as migration routes). Omitting even the mere *consideration* of any alternative that recognizes the need to protect endangered and sensitive marine life is unacceptable.

(2) The DEIS fails to include a range of mitigation measures among its alternatives. Many such measures have been employed by the U.S. Navy in other contexts, as discussed in Section IV; and there are many others that should be considered. Such measures are reasonable means of reducing harm to marine life and other resources on the proposed range, and their omission from the alternatives analysis renders that analysis inadequate.

(3) The Navy declines to consider a reduction in the level of proposed training in the MIRC. Yet the Navy's assumption that sonar exercises must occur at the level proposed may well be an artifact of the Navy's Tactical Training Theater Assessment and Planning Program (TAP) process, which, in requiring separate environmental analysis of existing ranges and operating areas, seems to assume *a priori* that exercises cannot be reapportioned.

(4) The Navy's statement of purpose and need contains no language that would justify the limited set of alternatives that the Navy considers (or the alternative it ultimately prefers). Yet it is a fundamental requirement of NEPA that agencies preparing an EIS specify their project's "purpose and need" in terms that do not exclude full consideration of reasonable alternatives. 40 C.F.R. § 1502.13; *City of Carmel-by-the-Sea v. United States Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997) (*citing Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991)). "The existence of a viable but unexamined alternative renders an environmental impact statement inadequate," *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1519 (9th Cir. 1992), and an EIS errs when it accepts "as a given" parameters that it should have studied and weighed. *Simmons v. U.S. Army Corps of Eng'rs*, 120 F.3d 664, 667 (7th Cir. 1997).

In sum, the DEIS shortchanges or omits from its analysis reasonable alternatives that might achieve the Navy's core aim of testing and training while minimizing environmental harm. For these reasons, we urge the Navy to revise its DEIS to adequately inform the public of all reasonable alternatives that would reduce adverse impacts to whales, fish, and other resources. 40 C.F.R. § 1502.1.

VII. The Navy Fails to Analyze the Impacts on Wildlife Viewing Interests

ORG1-28

Just as it fails to consider the direct, indirect, and cumulative impacts of the MIRC on the region's marine mammals and other fish and wildlife, the DEIS does not adequately consider the MIRC's effects on wildlife viewing and other wildlife-dependent recreational interests. The DEIS makes no mention of the value lost from the harm to marine mammals that attract a number of our organizational members and members of the public to the potentially affected areas of the MIRC. One of NEPA's explicit purposes is to "assure esthetically and culturally pleasing surroundings," 42 U.S.C. 4331(b)(2), and caselaw makes clear that an agency must adequately consider such recreational impacts in its NEPA analysis. *See, e.g., Lujan v. NWF*, 497 U.S. 871, 887 (1990) ("no doubt that recreational use and aesthetic enjoyment are among the sorts of interests NEPA [was] specifically designed to protect"); *LaFlamme v. FERC*, 852 F.2d 389, 401 (1988) (because "there were substantial questions raised regarding whether the project may significantly affect recreational use in the project area, and that FERC failed to explain or discuss" these impacts, the court found that "this record reflects a decision which is neither 'fully informed or well-considered,'" and therefore concluded the agency's decision not to prepare an EIS was unreasonable).

VIII. Project Description and Meaningful Public Disclosure

ORG1-29

Disclosure of the specific activities contemplated by the Navy is essential if the NEPA process is to be a meaningful one. *See, e.g., LaFlamme v. F.E.R.C.*, 852 F.2d 389, 398 (9th Cir. 1988) (noting that NEPA's goal is to facilitate "widespread discussion and consideration of the environmental risks and remedies associated with [a proposed action]"). As several groups and individuals identified in their scoping comments, the overall level of detail about the Navy's actions revealed in this process is a far cry from previous EISs and is so general as to undermine the ability to provide meaningful comment.[36]

ORG1-30

With regard to noise-producing activities, for example, the Navy must describe source levels, frequency ranges, duty cycles, and other technical parameters relevant to determining potential impacts on marine life. The DEIS provides some of this information, but it fails to disclose sufficient information about active sonobuoys, acoustic device countermeasures, training targets, or range sources that would be used during the exercises. DEIS Appendix D-28 to 31. And the DEIS gives no indication of

[36] *See* Scoping Comments from United States Department of the Interior (July 2007); Guam Environmental Protection Agency (July 2007); Guam Department of Agriculture (July 2007).

platform speed, pulse length, repetition rate, beam widths, or operating depths—that is, most of the data that the Navy used in modeling acoustic impacts.

The Navy—despite repeated requests—has not released or offered to release CASS/GRAB or any of the other modeling systems or functions it used to develop the biological risk function or calculate acoustic harassment and injury. *See, e.g.*, DEIS at Appendix D.

These models and requests for information must be made available to the public, including the independent scientific community, for public comment to be meaningful under NEPA and the Administrative Procedure Act. 40 C.F.R. §§ 1502.9(a), 1503.1(a) (NEPA); 5 U.S.C. § 706(2)(D) (APA). In addition, guidelines adopted under the Data (or Information) Quality Act also require their disclosure. The Office of Management and Budget's guidelines require agencies to provide a "high degree of transparency" precisely "to facilitate reproducibility of such information by qualified third parties" (67 Fed. Reg. 8452, 8460 (Feb. 22, 2002)); and the Defense Department's own data quality guidelines mandate that "influential" scientific material be made reproducible as well. We encourage the Navy to contact us immediately to discuss how to make this critical information available.

IX. Scope of Review

ORG1-31

We are also concerned about the Navy's understanding of its obligations under applicable law. The Navy indicates that its analysis of "extraterritorial" activities, those activities that would take place outside U.S. territorial waters, was prepared under the authority of Executive Order 12114 rather than under NEPA. *See* DEIS at ES-7. Not only is this position on the scope of review inconsistent with the order (*see, e.g.*, *Environmental Defense Fund v. Massey*, 968 F.2d 528 (D.C. Cir. 1994) and *NRDC v. Navy*, No. CV-01-07781, 2002 WL 32095131 at *9-12 (C.D. Cal. Sept. 19, 2002)), but, insofar as it represents a broader policy, it provides further indication that current operations are likewise out of compliance. Most of the area used for sonar training is sited beyond the 12nm territorial boundary, within the U.S. Exclusive Economic Zone. If, as we expect, activities currently taking place there have not received their due analysis in a prior environmental impact statement, then the Navy is operating in ongoing violation of NEPA.

X. Compliance With Other Applicable Laws

A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following:

ORG1-32

(1) The Marine Mammal Protection Act ("MMPA"), 16 U.S.C. § 1361 et seq., which requires the Navy to obtain a permit or other authorization from NMFS or the U.S. Fish and Wildlife Service prior to any "take" of marine mammals. The Navy must apply for an incidental take permit under the

MMPA, and NRDC will submit comments regarding the Navy's application to NMFS at the appropriate time.

ORG1-33

(2) The Endangered Species Act, 16 U.S.C. § 1531 et seq., which requires the Navy to enter into formal consultation with NMFS or the U.S. Fish and Wildlife Service, and receive a legally valid Incidental Take Permit, prior to its "take" of any endangered or threatened marine mammals or other species, including fish, sea turtles, and birds, or its "adverse modification" of critical habitat. *See, e.g.*, 1536(a)(2); *Romero-Barcelo v. Brown*, 643 F.2d 835 (1st Cir. 1981), *rev'd on other grounds, Weinberger v. Romero-Carcelo*, 456 U.S. 304, 313 (1982). Given the scope and significance of the actions and effects it proposes, the Navy must engage in formal consultation with NMFS and the U.S. Fish and Wildlife over the numerous endangered and threatened species in the MIRC.

ORG1-34

(3) The Coastal Zone Management Act, and in particular its federal consistency requirements, 16 U.S.C. § 1456(c)(1)(A), which mandate that activities that affect the natural resources of the coastal zone—whether they are located "within or outside the coastal zone"—be carried out "in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs."

ORG1-35

(4) The Magnuson-Stevens Fisheries Conservation and Management Act, 16 U.S.C. § 1801 et seq. ("MSA"), which requires federal agencies to "consult with the Secretary [of Commerce] with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken" that "may adversely affect any essential fish habitat" identified under that Act. 16 U.S.C. § 1855 (b)(2). In turn, the MSA defines essential fish habitat as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." 16 U.S.C. § 1802 (10). As discussed at length above, anti-submarine warfare exercises alone have the significant potential to adversely affect at least the waters, and possibly the substrate, on which fish in the MIRC depend. Under the MSA, a thorough consultation is required.

ORG1-36

(5) The Marine Protection, Research and Sanctuaries Act, 33 U.S.C. § 1401 et seq., which requires federal agencies to consult with the Secretary of Commerce if their actions are "likely to destroy, cause the loss of, or injure any sanctuary resource." 16 U.S.C. § 1434(d)(1). Since the Navy's exercises would cause injury and mortality of species, consultation is clearly required if sonar use takes place either within or in the vicinity of a sanctuary or otherwise affects its resources. Since sonar may impact sanctuary resources even when operated outside its bounds, the Navy should indicate how close it presently operates, or foreseeably plans to operate, to any such sanctuary and consult with the Secretary of Commerce as required.

In addition, the Sanctuaries Act is intended to "prevent or strictly limit the dumping into ocean waters of any material that would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities" (33 U.S.C. § 1401(b)), and prohibits all persons, including Federal agencies, from dumping materials into ocean waters, except as authorized by the Environmental Protection Agency. 33 U.S.C. §§ 1411, 1412(a). The Navy has not indicated its intent to seek a permit under the statute.

ORG1-37

(6) The Migratory Bird Treaty Act, 16 U.S.C. § 703 et seq. ("MBTA"), which makes it illegal for any person, including any agency of the Federal government, "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory birds except as permitted by regulation. 16 U.S.C. § 703. After the District Court for the D.C. Circuit held that naval training exercises that incidentally take migratory birds without a permit violate the MBTA, (see *Center for Biological Diversity v. Pirie*, 191 F. Supp. 2d 161 (D.D.C. 2002) (later vacated as moot)), Congress exempted some military readiness activities from the MBTA but also placed a duty on the Defense Department to minimize harms to seabirds. Under the new law, the Secretary of Defense, "shall, in consultation with the Secretary of the Interior, identify measures-- (1) to minimize and mitigate, to the extent practicable, any adverse impacts of authorized military readiness activities on affected species of migratory birds; and (2) to monitor the impacts of such military readiness activities on affected species of migratory birds." Pub.L. 107-314, § 315 (Dec. 2, 2002). As the Navy acknowledges, migratory birds occur within the MIRC. The Navy must therefore consult with the Secretary of the Interior regarding measures to minimize and monitor the effects of the proposed range on migratory birds, as required.

ORG1-38

(7) Executive Order 13158, which sets forth protections for marine protected areas ("MPAs") nationwide. The Executive Order defines MPAs broadly to include "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." E.O. 13158 (May 26, 2000). It then requires that "[e]ach Federal agency whose actions affect the natural or cultural resources that are protected by an MPA shall identify such actions," and that, "[t]o the extent permitted by law and to the maximum extent practicable, each Federal agency, in taking such actions, shall avoid harm to the natural and cultural resources that are protected by an MPA." *Id*. The Navy must therefore consider and, to the maximum extent practicable, must avoid harm to the resources of all federally- and state-designated marine protected areas.

ORG1-39

The proposed activities also implicate the Clean Air Act and Clean Water Act as well as other statutes protecting the public health. The Navy must comply with these and other laws.

XI. Conflicts with Federal, State and Local Land-Use Planning

ORG1-40

NEPA requires agencies to assess possible conflicts that their projects might have with the objectives of federal, regional, state, and local land-use plans, policies, and controls. 40 C.F.R. § 1502.16(c). The Navy's training and testing activities may affect resources in the coastal zone and within other state and local jurisdictions, in conflict with the purpose and intent of those areas. The consistency of Navy operations with these land-use policies must receive more thorough consideration.

XII. Conclusion

For the reasons set forth above, we urge the Navy to satisfy its obligations under NEPA and other applicable laws. To that end, the Navy should revise its DEIS, improving its impacts and alternatives analysis and establishing temporal and geographic protection zones to mitigate the harmful impacts of its training.

Thank you for your consideration of our comments, and we welcome the opportunity to discuss this matter with you at any time.

Sincerely,

Taryn Kiekow
Staff Attorney

APPENDIX A

RECOMMENDATIONS FOR MARINE PROTECTION ZONES IN THE MARIANA ISLANDS RANGE COMPLEX

The Mariana Island chain represents a series of seamounts in an oceanic region of low overall productivity. Guam represents the biggest and most southerly island in the Mariana Island chain. It is bordered to the east by the Mariana Trench, the deepest oceanic trench known, and to the south by the Western Pacific Warm Pool (WPWP). The WPWP has been called the "engine room of the earth's climate" and has the warmest mean annual temperatures of the world's oceans (>28ºC). Movements of the WPWP have been linked with ENSO evens and the monsoon systems of Asia, Australia and East Africa (Hastenrath et al. 1993). Several geographic features in this region may result in localized hotspots of productivity, providing a base for prey species of marine mammals. These include the steep topography of seamounts, the passage of the northern equatorial current through the Mariana island chain, and the narrow channels found between some of the islands including Tinian and Saipan.

Cetacean records for the small nation of Guam include some stranding records. More specifically, the following species have been reported in a stranding or beaching event: 'Bryde's-like' whale, pygmy sperm whale, dwarf sperm whale, orca, melon-headed whale, sperm whale, striped dolphin, and spinner dolphin (Eldredge 1991, Kami and Lujan 1976, Reeves et al. 1999, Trianni and Kessler 2002). For some of these species, it is difficult to be certain whether they inhabit Guam on a regular basis as they may have been washed ashore.[37]

With regard to the Northern Mariana Islands, spinner dolphins are among the most common species. Horwood (1987) reported that two sei whales (most likely misidentified as Bryde's whales) were tagged near the vicinity. Japanese sighting surveys and tuna vessels have also recorded short-finned pilot whales, Risso's and rough-toothed dolphins within this area (Patterson and Alverson 1986, Miyashita et al. 1995). A recent encounter again confirmed rough-toothed dolphins associated with a large (500-700 individuals) group of melon-headed whales (Jeffersen et al. 2006). More dated records provide evidence that Cuvier's beaked whale, common dolphin and false killer whale have been observed in the Mariana and Bonin Islands areas (Masaki 1972).

[37] According to one eyewitness account, a Cuvier's beaked live stranded near Cabras power plant on the west side of Guam on August 30, 2007. It was reportedly tired and suffering from scrapes and scratches, presumably from coral, when it was spotted by some local divers in the early morning. The animal was helped back out to sea beyond the barrier reef by the divers and others and was not seen again, though searches were made. Another Cuvier's beaked whale stranding occurred on January 27, 2008, when a decomposed whale washed up near the commercial port on the west side of Guam on Luminao reef/breakwater. These two incidents are significant given the rarity of whale strandings on Guam and especially given the lack of any previous reports of beaked whale strandings. See personal communication with Susan Millward, Animal Welfare Institute (Mar. 13, 2009).

UNEP-WCMC (2003) notes Northern Mariana Islands as part of the geographic range of *Kogia breviceps*, while Kami and Lujan (1976) noted an anecdotal report of small sperm whales (species not given) being driven from a shallow lagoon onto shore. The UNEP-WCMC (2003) also includes the Northern Mariana Islands as part of the geographic range of bottlenose dolphins and humpback whales.

Japanese whalers took sperm whales from around the NMI area in the 1980s, (Kasuya and Miyashita 1988). Surveys around this region indicated that orca and striped dolphin had been observed, although both of the species identifications were made in locations close to the outer boundary of the NMI EEZ (Miyashita et al. 1995 and 1996).

SPECIES OF PARTICULAR CONCERN

Data on cetacean distribution for this region is extremely sparse, as few dedicated cetacean surveys have been conducted around the Marianas or CNMI. Available information about the distribution of cetacean species from other sources is provided below. Based on this information, there are 20 species of cetaceans that occur regularly within the MIRC (including 2 endangered species, humpback and sperm whales), with an additional 9 species that may occur occasionally.

Beaked whales

No dedicated surveys for beaked whales have been carried out in this area. This region falls within the known distribution of three species of beaked whales including Blainville's, Cuvier's and Longman's beaked whales. Other beaked whale species that have been observed in the waters of Micronesia include Stejneger's beaked whale and ginko-toothed beaked whale. Dalebout et al. (2007) identified a highly divergent lineage of Mesoplodon in the tropical central Pacific. This lineage, which may represent a new species of beaked whale, was defined based on specimens which stranded in the Gilbert Islands, Republic of Kiribati (1ºN, 173ºE) and more distant Palmyra Atoll (5ºN, 162ºW). Nothing is known about the broader distribution of this taxon throughout the tropical Pacific. At least one species of beaked whale (Cuvier's beaked whale), has been directly reported from the Mariana and Bonin Islands area (Masaki 1972).

Baleen whales

Baleen whales observed or stranded in Guam and the Marianas include Bryde's whales (Davis 1978), humpback whales, and sei whales (Masaki 1972; Horwood 1987). Reports of sei whales may have been misidentified Bryde's whales since the latter is much more common in the tropics. While distinct breeding areas for humpback whales have not been identified in this area, animals thought to be members of the western North Pacific stock which winters from the Bonin (Ogasawara Islands) south to the Marianas are sighted in this region during the breeding season (January through May). Humpback whales have been sighted near Guam, including a mother and calf observed traveling together (Eldredge 2003), Rota and Saipan (Darling and Mori 1993; Eldredge 1991, 2003). While this species is generally found in shallower waters during the breeding season, humpback whales can also be found in deeper offshore waters (e.g. Swartz et al. 2002). Humpback whale presence has been confirmed by recent

observation (Miller 2007). Bryde's whales are broadly distributed throughout the tropics and have been sighted close to shore and in lagoons around the Marianas region (Ohizumi et al. 2002). At least one stranding has been reported, which occurred in 1978 (Eldrege 1991). This species can occur in both deeper and shallower habitats.

Additional species of conservation concern

Other species of conservation concern that have been observed in the waters of Guam include sperm whales, spinner dolphins, which have been observed swimming in Saipan Lagoon area (Trianni and Kessler 2002), Risso's dolphin (Miyazaki and Wada 1978) and short-finned pilot whales (Birkeland 1977). Reports of short-beaked common dolphins from this area may be misidentifications as this species is relatively rare in tropical waters (T. Jefferson, pers comm.).

Sperm whales are frequently sighted around Micronesia, and whaling records confirm the year-round presence of this species especially around the Marianas, Pohnpei and Kosrae (Townsend 1935). In 2001, eight sperm whales including a newborn calf were sighted by divers off of Guam (Eldredge 2003). This species is typically found in deep water with high bathymetric relief and high secondary productivity (e.g. Waring et al. 2001), but in some areas males consistently use waters shallower than 100m (Garrigue and Greaves 2001). Stranded specimens of dwarf and pygmy sperm whales have also been recorded from Guam, including one apparently stillborn dwarf sperm whale calf (Radway 2002).

Spinner dolphins are found throughout the Marianas region. This species uses lagoons for daytime resting, and in the Marianas region they are found in Saipan and Cocos Lagoons (Trianni and Kessler 2002). In Guam, areas of concentration include Bile Bay, Tumon Bay, Double Reef, north Agat Bay, and Merizo (Eldredge 1991; Amesbury et al. 2001).

Finally, several sightings of dugongs (*Dugong dugon*) have been reported from Guam (Eldredge 2003); this species is widely distributed across the Indo-Pacific region.

MARINE PROTECTED AREAS

In addition to the recent Marianas Trench National Marine Monument, several smaller reserves are present. Guam has five coastal MPAs (marine preserves) (Gombos et al. 2007). Two of these are believed to provide marine mammal habitat: Piti Bomb Holes Marine Preserve, and Tumon Bay Marine Preserve. Also nearby Guam are several additional marine reserves including the Sasanhaya Fish Reserve of the Commonwealth of the Northern Mariana Islands (located at 145 10'00" E, 14 07'05" N (USGS topo NAD83/WGS84) see http://effectivempa.noaa.gov/sites/sasanhaya.html).

RECOMMENDATIONS FOR PROTECTION ZONES

There are many protected areas around the world that provide some measure of protection of important habitat for marine mammals (see Hoyt 2005). Such areas, large and small, exist in at least 102 different coastal and even some land-locked countries (see Hoyt 2005). Based on our preliminary analysis, we call for the following exclusion areas for sonar in the MIRC:

1) Coastal exclusion to 200 meter depth contour – This area is important habitat for coastal cetaceans, including humpback whales, spinner dolphins and dugongs. To protect these sensitive species and near-coastal habitat, a robust buffer zone should be applied beyond the 200 m contour, and exercises should be planned to eliminate or minimize ship movements towards shore when sonar systems are active.

2) Exclusion to 2000 meter isobath – This area represents important areas for beaked and sperm whale sightings, including a sperm whale calving event.

3) Marianas Trench Marine National Monument – waters here are among the most biologically diverse in the Western Pacific and include the greatest diversity of seamount and hydrothermal vent life yet discovered. The northern islands are ringed by coral ecosystems with very high numbers of apex predators, including large numbers of sharks. They also contain one of the most diverse collections of stony corals in the Western Pacific. The northern islands and shoals support some of the largest biomass of reef fishes in the Mariana Archipelago. These relatively pristine coral reef ecosystems are objects of scientific interest and essential to the long-term study of tropical marine ecosystems.[38] Any Navy plan for the training range must include measures to eliminate or very substantially limit the number of exercises taking place in Monument waters.

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APPENDIX B

IMPACTS OF SONAR

Strandings and Mortalities Associated with Sonar

Scientists agree, and the publicly available scientific literature confirms, that the intense sound generated by active sonar can induce a range of adverse effects in whales and other species, from significant behavioral changes to stranding and death. By far the most widely-reported and dramatic of these effects are the mass strandings of beaked whales and other marine mammals that have been associated with military sonar use.

Over the last decade, the association between military active sonar and whale mortalities has become a subject of considerable scientific interest and concern. That interest is reflected in the publication of numerous papers in peer-reviewed journals, in reports by inter-governmental bodies such as the IWC's Scientific Committee, and in evidence compiled from a growing number of mortalities associated with sonar. Yet the DEIS only glosses over these stranding incidents.

In March 2000, for example, sixteen whales from at least three species— including two minke whales—stranded over 150 miles of shoreline along the northern channels of the Bahamas. The beachings occurred within 24 hours of Navy ships using mid-frequency sonar in those same channels.[39] Post-mortem examinations found, in all whales examined, hemorrhaging in and around the ears and other tissues related to sound conduction or production, such as the larynx and auditory fats, some of which was debilitative and potentially severe.[40] It is now accepted that these mortalities were caused, through an unknown mechanism, by the Navy's use of mid-frequency sonar.

The Bahamas event is merely one of numerous mortality events coincident with military activities and active sonar that have now been documented, only some of which the Navy discusses:[41]

> (1) Canary Islands 1985-1991 – Between 1985 and 1989, at least three separate mass strandings of beaked whales occurred in the Canary Islands, as reported in *Nature*.[42] Thirteen beaked whales of two species were killed in the

[39] Commerce and Navy, Joint Interim Report at iii, 16.

[40] Id.

[41] The following is not a complete list, as other relevant events have been reported in Bonaire, Japan, Taiwan, and other locations. See, e.g., R.L. Brownell, Jr., T. Yamada, J.G. Mead, and A.L. van Helden, Mass Strandings of Cuvier's Beaked Whales in Japan: U.S. Naval Acoustic Link? (2004) (IWC SC/56E37); J.Y. Wang and S.-C. Yang, Unusual Cetacean Stranding Events of Taiwan in 2004 and 2005, 8 Journal of Cetacean Research and Management 283-292 (2006); P.J.H. van Bree and I. Kristensen, On the Intriguing Stranding of Four Cuvier's Beaked Whales, Ziphius cavirostris, G. Cuvier, 1823, on the Lesser Antillean Island of Bonaire, 44 Bijdragen tot de Dierkunde 235-238 (1974).

[42] M. Simmonds and L.F. Lopez-Jurado, Whales and the Military, 337 Nature 448 (1991).

February 1985 strandings, six whales of three species stranded in November 1988, and some twenty-four whales of three species stranded in October 1989—all while naval vessels were conducting exercises off shore.[43] An additional stranding of Cuvier's beaked whales, also coinciding with a naval exercise, occurred in 1991.[44] It was reported that mass live strandings occurred each time exercises took place in the area.[45]

(2) Greece 1996, 1997 – In 1996, twelve Cuvier's beaked whales stranded along 35 kilometers on the west coast of Greece. The strandings were correlated, by an analysis published in *Nature*, with the test of a low- and mid-frequency active sonar system operated by NATO.[46] A subsequent NATO investigation found the strandings to be closely timed with the movements of the sonar vessel, and ruled out all other physical environmental factors as a cause.[47] The following year saw nine additional Cuvier's beaked whales strand off Greece, again coinciding with naval activity.[48]

(3) Virgin Islands 1999 – In October 1999, four beaked whales stranded in the U.S. Virgin Islands as the Navy began an offshore exercise. A wildlife official from the Islands reported the presence of "loud naval sonar."[49] When NMFS asked the Navy for more information about its exercise, the Department's response was to end the consultation that it had begun for the exercise under the Endangered Species Act.[50] In January 1998, according to a NMFS biologist, a beaked whale "stranded suspiciously" at Vieques as naval exercises were set to commence offshore.[51]

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[43] Id.

[44] V. Martín, A. Servidio, and S. Garcia, Mass Strandings of Beaked Whales in the Canary Islands, in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 33-36 (2004).

[45] Simmonds and Lopez-Jurado, Whales and the Military, 337 Nature at 448.

[46] A. Frantzis, Does Acoustic Testing Strand Whales? 392 Nature 29 (1998).

[47] See SACLANT Undersea Research Center, Summary Record, La Spezia, Italy, 15-17 June 1998, SACLANTCEN Bioacoustics Panel, SACLANTCEN M-133 (1998).

[48] Id.; A. Frantzis, The First Mass Stranding That Was Associated with the Use of Active Sonar (Kyparissiakos Gulf, Greece, 1996), in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 14-20 (2004).

[49] Personal communication of Dr. David Nellis, U.S. Virgin Island Department of Fish and Game, to Eric Hawk, NMFS (Oct. 1999); personal communication from Ken Hollingshead, NMFS, to John Mayer, Marine Acoustics Inc. (March 19, 2002).

[50] Letter from William T. Hogarth, Regional Administrator, NMFS Southeast Regional Office, to RADM J. Kevin Moran, Navy Region Southeast (undated); personal communication from Ken Hollingshead, NMFS, to John Mayer, Marine Acoustics Inc. (March 19, 2002).

[51] Personal communication from Eric Hawk, NMFS, to Ken Hollingshead, NMFS (Feb. 12, 2002).

(4) Bahamas 2000 – As described above.

(5) Madeira 2000 -- In May 2000, four beaked whales stranded on the beaches of Madeira while several NATO ships were conducting an exercise near shore. Scientists investigating the stranding found that the whales' injuries—including "blood in and around the eyes, kidney lesions, pleural hemorrhage"—and the pattern of their stranding suggest "that a similar pressure event [*i.e.*, similar to that at work in the Bahamas] precipitated or contributed to strandings in both sites."[52]

(6) Canary Islands 2002 – In September 2002, at least fourteen beaked whales from three different species stranded in the Canary Islands. Four additional beaked whales stranded over the next several days.[53] The strandings occurred while a Spanish-led naval exercise that included U.S. Navy vessels and at least one ship equipped with mid-frequency sonar was conducting anti-submarine warfare exercises in the vicinity.[54] The subsequent investigation, as reported in the journals *Nature* and *Veterinary Pathology*, revealed a variety of traumas, including emboli and lesions suggestive of decompression sickness.[55]

(7) Washington 2003 – In May 2003, the U.S. Navy vessel USS *Shoup* was conducting a mid-frequency sonar exercise while passing through Haro Strait, between Washington's San Juan Islands and Canada's Vancouver Island. According to one contemporaneous account, "[d]ozens of porpoises and killer whales seemed to stampede all at once . . . in response to a loud electronic noise echoing through" the Strait.[56] Several field biologists present at the scene reported observing a pod of endangered orcas bunching near shore and engaging in very abnormal behavior consistent with avoidance, a minke whale "porpoising" away from the sonar ship, and Dall's porpoises fleeing the vessel in large numbers.[57] Eleven harbor porpoises—an abnormally high number

[52] D.R. Ketten, Beaked Whale Necropsy Findings 22 (2002) (paper submitted to NMFS); L. Freitas, The Stranding of Three Cuvier's Beaked Whales Ziphius Cavirostris in Madeira Archipelago—May 2000, in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 28-32 (2004).

[53] Vidal Martin et al., Mass Strandings of Beaked Whales in the Canary Islands, in Proceedings of the Workshop on Active Sonar and Cetaceans 33 (P.G.H. Evans & L.A. Miller eds., 2004); Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-57.

[54] Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446; K.R. Weiss, Whale Deaths Linked to Navy Sonar Tests, L.A. Times, Oct. 1, 2002, at A3.

[55] Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-57; Jepson et al., Gas-Bubble Lesions, 425 Nature at 575-76.

[56] Christopher Dunagan, Navy Sonar Incident Alarms Experts, Bremerton Sun, May 8, 2003.

[57] NMFS, Assessment of Acoustic Exposures at 6, 9.

given the average stranding rate of six per year—were found beached in the area of the exercise.[58]

(8) Kauai 2004 – During the Navy's conduct of a major training exercise off Hawaii, called RIMPAC 2004, some 150-200 whales from a species that is rarely seen near shore and had never naturally mass-stranded in Hawaii came into Hanalei Bay, on the island of Kaua'i. The whales crowded into the shallow bay waters and milled there for over 28 hours. Though the whales were ultimately assisted into deeper waters by members of a local stranding network, one whale calf was left behind and found dead the next day. NMFS undertook an investigation of the incident and concluded that the Navy's nearby use of sonar in RIMPAC 2004 was the "plausible, if not likely" cause of the stranding.[59]

(9) Canary Islands 2004 – In July 2004, four dead beaked whales were found around the coasts of the Canary Islands, within one week of an NATO exercise. The exercise, Majestic Eagle 2004, was conducted approximately 100 kilometers north of the Canaries. Although the three whale bodies that were necropsied were too decomposed to allow detection of gas embolisms, systematic fat embolisms were found in these animals.[60] The probability that the whales died at sea is extremely high.[61]

(10) North Carolina 2005 – During and just after a U.S. training exercise off North Carolina, at least thirty-seven whales of three different species stranded and died along the Outer Banks, including numerous pilot whales (six of which were pregnant), one newborn minke whale, and two dwarf sperm whales. NMFS investigated the incident and found that the event was highly unusual,

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[58] NMFS, Preliminary Report: Multidisciplinary Investigation of Harbor Porpoises (Phocoena phocoena) Stranded in Washington State from 2 May – 2 June 2003 Coinciding with the Mid-Range Sonar Exercises of the USS Shoup 53-55 (2004) (conclusions unchanged in final report). Unfortunately, according to the report, freezer artifacts and other problems incidental to the preservation of tissue samples made the cause of death in most specimens difficult to determine; but the role of acoustic trauma could not be ruled out. Id.

[59] B.L. Southall, R. Braun, F.M.D. Gulland, A.D. Heard, R.W. Baird, S.M. Wilkin, and T.K. Rowles, Hawaiian Melon-Headed Whale *(Peponacephala electra)* Mass Stranding Event of July 3-4, 2004 (2006) (NOAA Tech. Memo. NMFS-OPR-31); See also R.L. Brownell, Jr., K Ralls, S. Baumann-Pickering and M.M. Poole, Behavior of melon-headed whales, *Pepnoncephalia electra*, near oceanic islands, Marine Mammal Science, (publication pending 2009).

[60] A. Espinosa, M. Arbelo, P. Castro, V. Martín, T. Gallardo, and A. Fernández, New Beaked Whale Mass Stranding in Canary Islands Associated with Naval Military Exercises (Majestic Eagle 2004) (2005) (poster presented at the European Cetacean Society Conference, La Rochelle, France, April 2005); A. Fernández, M. Méndez, E. Sierra, A. Godinho, P. Herráez, A. Espinosa de los Monteros, F. Rodríguez, F., and M. Arbelo, M., New Gas and Fat Embolic Pathology in Beaked Whales Stranded in the Canary Islands (2005) (poster presented at the European Cetaecan Society Conference, La Rochelle, France, April 2005).

[61] Id.

being the only mass stranding of offshore species ever to have been reported in the region, and that it shared 'a number of features' with other sonar-related mass stranding events (involving offshore species which stranded alive and were atypically distributed along the shore). NMFS concluded that sonar was a possible cause of the strandings and also ruled out the most common other potential causes, including viral, bacterial, and protozoal infection, direct blunt trauma, and fishery interactions.[62]

(11) Spain 2006 – Four Cuvier's beaked whales stranded on the Almerian coast of southern Spain, with the same suite of bends-like pathologies seen in the whales that stranded in the Canary Islands in 2002 and 2004.[63] A NATO response force was performing exercises within 50 miles at the time of the strandings.

Some preliminary observations can be drawn from these incidents. For example, beaked whales, a group of deep-water species that are seldom seen and may in some cases be extremely rare, seem to be particularly vulnerable to the effects of active sonar. A 2000 review undertaken by the Smithsonian Institution, and reported and expanded by the IWC's Scientific Committee and other bodies, supports this conclusion, finding that every mass stranding on record involving multiple species of beaked whales has occurred with naval activities in the vicinity.[64] Indeed, it is not even certain that some beaked whale species naturally strand in numbers.

But the full magnitude of sonar's effects on these species—or on other marine mammals—is not known. Most of the world lacks networks to identify and investigate stranding events, particularly those that involve individual animals spread out over long stretches of coastline, and therefore the mortalities that have been identified thus far are likely to represent only a subset of a substantially larger problem. For example, most beaked whale casualties (according to NMFS) are bound to go undocumented because of the remote siting of sonar exercises and the small chance that a dead or injured animal would actually strand.[65] It is well understood in terrestrial ecology that dead and dying animals tend to be grossly undercounted given their rapid assimilation into the environment, and one would of course expect profound difficulty where offshore

[62] A.A. Hohn, D.S. Rotstein, C.A. Harms, and B.L. Southall, Multispecies Mass Stranding of Pilot Whales (Globicephala macrorhynchus), Minke Whale *(Balaenoptera acutorostrata)*, and Dwarf Sperm Whales *(Kogia sima)* in North Carolina on 15-16 January 2005 (2006) (NOAA Tech. Memo. NMFS-SEFSC-53).

[63] International Whaling Commission, Report of the Scientific Committee, Annex K at 28 (2006) (IWC/ 58/Rep1).

[64] Marine Mammal Program of the National Museum of Natural History, Historical Mass Mortalities of Ziphiids 2-4 (Apr. 6, 2000); see also 2 J. Cetacean Res. & Mgmt., Supp., Annex J at § 13.8 (2000) (report of the IWC Scientific Committee, Standing Working Group on Environmental Concerns).

[65] J.V. Carretta, K.A. Forney, M.M. Muto, J. Barlow, J. Baker, and M. Lowry, U.S. Pacific Marine Mammal Stock Assessments: 2006 (2007).

marine species are concerned.[66] Along the eastern seaboard and in the Gulf of Mexico, all beaked whale sightings during NMFS shipboard surveys have occurred at considerable distances from shore.[67]

Furthermore, although the physical process linking sonar to strandings is not perfectly understood, the record indicates that debilitating and very possibly lethal injuries are occurring in whales exposed to sonar at sea—only some of which may then strand. As first reported in the journal *Nature*, animals that came ashore during sonar exercises off the Canary Islands, in September 2002, had developed large emboli in their organ tissue and suffered from symptoms resembling those of severe decompression sickness, or "the bends."[68] It has been proposed that the panic led them to surface too rapidly or pushed them to dive before they could eliminate the nitrogen accumulated on previous descents. This finding has since been supported by follow-on papers, by published work in other fields, and by expert reviews.[69] In any case, the evidence is considered "compelling" that acoustic trauma, or injuries resulting from behavioral responses, has in some way led to the deaths of these animals.[70]

Other Harmful Effects of Sonar

Strandings and mass mortalities, though an obvious focus of much reporting and concern, are likely only the tip of the iceberg of sonar's harmful effects. Marine mammals are believed to depend on sound to navigate, find food, locate mates, avoid

[66] See, e.g., G. Wobeser, Investigation and Management of Disease in Wild Animals 13-15 (1994); P.A. Alison, C.R. Smith, H. Kukert, J.W. Deming, B.A. Bennett, Deep-Water Taphonomy of Vertebrate Carcasses: A Whale Skeleton in the Bathyal Santa Catalina Basin, 17 Paleobiology 78-89 (1991).

[67] G.T. Waring, E. Josephson, C.P. Fairfield, and K. Maze-Foley, eds., U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments—2006 at 232-33, 238, 288, 292, 296 (2007) (NOAA Tech. Memo. NMFS NE 201) (data from NMFS surveys, showing all beaked whales sightings at significant distances from shore).

[68] See P.D. Jepson, M. Arbelo, R. Deaville, I.A.P. Patterson, P. Castro, J.R. Baker, E. Degollada, H.M. Ross, P. Herráez, A.M. Pocknell, F. Rodríguez, F.E. Howie, A. Espinosa, R.J. Reid, J.R. Jaber, V. Martín, A.A. Cunningham, A. Fernández, Gas-Bubble Lesions in Stranded Cetaceans, 425 Nature 575-576 (2003); Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 415.

[69] E.g., Cox et al., Understanding the Impacts. Of course it would be a mistake to assume that an animal must suffer bends-like injury or some other sort of acoustic trauma in order to strand. Some may die simply because the noise disorients them, for instance. See, e.g., NMFS, Assessment of Acoustic Exposures at 9-10.

[70] Cox et al., Understanding the Impacts; see also P.G.H. Evans and L.A. Miller, Concluding Remarks, in Proceedings of the Workshop on Active Sonar and Cetaceans 74 (2004); K.C. Balcomb and D.E. Claridge, A Mass Stranding of Cetaceans Caused by Naval Sonar in the Bahamas, 8(2) Bahamas Journal of Science 1 (2001); D.E. Claridge, Fine-Scale Distribution and Habitat Selection of Beaked Whales (2006) (M.Sc. thesis); E.C.M. Parsons, S.J. Dolman, A.J. Wright, N.A. Rose, and W.C.G. Burns, Navy Sonar and Cetaceans: Just How Much Does the Gun Need to Smoke before We Act? 56 Marine Pollution Bulletin 1248 (2008).

predators, and communicate with each other. Flooding their habitat with man-made, high-intensity noise interferes with these and other functions. In addition to strandings and non-auditory injuries, the harmful effects of high-intensity sonar include:

- temporary or permanent loss of hearing, which impairs an animal's ability to communicate, avoid predators, detect and capture prey, and avoid ship strikes;
- avoidance behavior, which can lead to abandonment of habitat or migratory pathways;
- disruption of biologically important behaviors such as mating, feeding, nursing, or migration, or loss of efficiency in conducting those behaviors;
- aggressive (or agonistic) behavior, which can result in injury;
- masking of biologically meaningful sounds, such as the call of predators or potential mates;
- chronic stress, which can compromise viability, suppress the immune system, and lower the rate of reproduction;
- habituation, causing animals to remain near damaging levels of sound, or sensitization, exacerbating other behavioral effects; and
- declines in the availability and viability of prey species, such as fish and shrimp.

Over the past 20 years, a substantial literature has emerged documenting the range of effects of ocean noise on marine mammals.[71]

Marine mammals are not the only species affected by undersea noise. Impacts on fish are of increasing concern due to several recent studies demonstrating hearing loss and widespread behavioral disruption in commercial species of fish and to reports, both experimental and anecdotal, of catch rates plummeting in the vicinity of noise sources. Further, the death of species not protected by federal law reduces prey available to listed species. And noise has been shown in several cases to kill, disable, or disrupt the behavior of invertebrates, many of which possess ear-like structures or other sensory mechanisms that could leave them vulnerable. It is clear that intense sources of noise are capable of affecting a wide class of ocean life.

[71] For a review of research on behavioral and auditory impacts of undersea noise, see, e.g., L.S. Weilgart, The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management, 85 Canadian Journal of Zoology 1091-1116 (2007); W.J. Richardson, C.R. Greene, Jr., C.I. Malme, and D.H. Thomson, Marine Mammals and Noise (1995); National Research Council, Ocean Noise and Marine Mammals (2003); Whale and Dolphin Conservation Society, Oceans of Noise (2004).

APPENDIX C

CRITIQUE OF THE NAVY'S ACOUSTICS ANALYSIS

The Navy's assessment of acoustic impacts disregards a great deal of relevant information adverse to its interests, uses approaches and methodologies that would not be acceptable to the scientific community, and ignores whole categories of impacts.

Thresholds of Injury, Hearing Loss and Behavioral Change

At the core of the Navy's assessment of acoustic impacts are the thresholds it has established for physiological and behavioral effects. There are gross problems with the Navy's thresholds, as discussed below.

1. Permanent Threshold Shift

The Navy sets the threshold for permanent threshold shift ("PTS"), which is the highest threshold for direct physical injury, at 215 dB re 1 μPa^{2}•s. DEIS at 3.7-83. This threshold is inconsistent with the scientific literature.

For instance, the Navy disregards data gained from actual whale mortalities. The best available scientific evidence, as reported in the peer-reviewed literature, indicates that sound levels at the most likely locations of beaked whales beached in the Bahamas strandings run far lower than the Navy's threshold for injury here: approximately 150-160 dB re 1 μPa for 50-150 seconds, over the course of the transit.[72] A further modeling effort, undertaken in part by the Office of Naval Research, suggests that the mean exposure level of beaked whales, given their likely distribution in the Bahamas' Providence Channels and averaging results from various assumptions, may have been lower than 140 dB re 1 μPa.[73] Factoring in duration, then, evidence of actual sonar-related mortalities would compel a *maximum* energy level threshold for serious injury on the order of 182 dB re 1 μPa^{2}•s, at least for beaked whales. Indeed, to pay at least some deference to the literature, the Navy—under pressure from NMFS—has previously assumed that non-lethal injury would occur in beaked whales exposed above 173 dB re 1 μPa^{2}•s.[74]

In addition, the DEIS glosses over published research on bubble growth in marine mammals, which separately indicates the potential for injury and death at levels far

[72] J. Hildebrand, "Impacts of Anthropogenic Sound," in T.J. Ragen, J.E. Reynolds III, W.F. Perrin, and R.R. Reeves, Conservation beyond Crisis (2005). See also International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.3.

[73] J. Hildebrand, K. Balcomb, and R. Gisiner, Modeling the Bahamas Beaked Whale Stranding of March 2000 (2004) (presentation given at the third plenary meeting of the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, 29 July 2004).

[74] See, e.g., Navy, Joint Task Force Exercises and Composite Training Unit Exercises Final Environmental Assessment/ Overseas Environmental Assessment at 4-44, 4-46 to 4-47 (2007).

lower than what the Navy proposes. DEIS at 3.7-99 to 100. According to the best available scientific evidence, as represented by multiple papers in flagship journals such as *Nature* and *Veterinary Pathology*, gas bubble growth is the causal mechanism most consistent with the observed injuries;[75] in addition, it was singularly and explicitly highlighted as plausible by an expert panel convened by the Marine Mammal Commission, in which the Navy participated.[76] Yet the Navy dismisses such research, claiming that "there is considerable disagreement among scientists." DEIS at 3.7-100. The Navy concludes: "Because evidence supporting it is debatable, no marine mammals addressed in this [DEIS] are given special treatment due to the possibility for acoustically mediated bubble growth." Id. NEPA, however, requires agencies to evaluate all "reasonably foreseeable" impacts, which include "impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 40 C.F.R. § 1502.22. The scientific literature supporting bubble growth rises far above this standard, and the Navy's failure to incorporate it into its impact model is arbitrary and capricious. Thus, the Navy's refusal to consider these impacts is insupportable under NEPA. 40 C.F.R. §§ 1502.22, 1502.24.

Finally, the Navy's exclusive reliance on energy flux density levels ("ELs") as a unit of analysis is misplaced. DEIS at 3.7-81. It is appropriate for the Navy to set dual thresholds for behavioral effects, one based on ELs and one based on sound exposure levels ("SELs").

2. Temporary Threshold Shift

The DEIS sets its threshold for temporary hearing loss and behavioral effects, or "temporary threshold shift" ("TTS"), at 195 dB re 1 $\mu Pa^2 \bullet s$. DEIS at 3.7-83. It bases this threshold primarily on a synthesis of studies on two species of cetaceans, bottlenose dolphins and beluga whales, conducted by the Navy's SPAWAR laboratory in San

[75] See, e.g., A. Fernández, J.F. Edwards, F. Rodríguez, A. Espinosa de los Monteros, P. Herráez, P. Castro, J.R. Jaber, V. Martín, and M. Arbelo, 'Gas and Fat Embolic Syndrome' Involving a Mass Stranding of Beaked Whales (Family Ziphiidae) Exposed to Anthropogenic Sonar Signals, 42 Veterinary Pathology 446 (2005); P.D. Jepson, M. Arbelo, R. Deaville, I.A.P. Patterson, P. Castro, J.R. Baker, E. Degollada, H.M. Ross, P. Herráez, A.M. Pocknell, F. Rodríguez, F.E. Howie, A. Espinosa, R.J. Reid, J.R. Jaber, V. Martín, A.A. Cunningham, and A. Fernández, Gas-Bubble Lesions in Stranded Cetaceans, 425 Nature 575-576 (2003); R.W. Baird, D.L. Webster, D.J. McSweeney, A.D. Ligon, G.S. Schorr, and J. Barlow, Diving Behavior of Cuvier's (Ziphius cavirostris) and Blainville's (Mesoplodon densirostris) Beaked Whales in Hawai'i," 84 Canadian Journal of Zoology 1120-1128 (2006).

[76] T.M. Cox, T.J. Ragen, A.J. Read, E. Vos, R.W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernández, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P.D. Jepson, D. Ketten, C.D. MacLeod, P. Miller, S. Moore, D. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, and L. Benner, Understanding the Impacts of Anthropogenic Sound on Beaked Whales, 7 Journal of Cetacean Research & Management 177-87 (2006).

Diego and, to a lesser extent, by researchers at the University of Hawaii. DEIS at 3.7-79.

Notably, the Navy's extrapolation of data from bottlenose dolphins and belugas to all cetaceans is not justifiable. Given the close association between acoustic sensitivity and threshold shift, such an approach must presume that belugas and bottlenose dolphins have the best hearing sensitivity in the mid-frequencies of any cetacean. However, harbor porpoises and killer whales are more sensitive over part of the mid-frequency range than are the two species in the SPAWAR and Hawaii studies.[77] Furthermore, the animals in the studies may not represent the full range of variation even within their own species, particularly given their age and situation: the SPAWAR animals, for example, have been housed for years in a noisy bay.[78]

3. "Risk Function" for Behavioral Effects

There are many glaring problems with the Navy's adoption of an acoustic risk function to estimate the probability of behavioral effects. Dr. Bain sets forth a detailed critique, which is attached to this letter. Several problems are discussed below.

In contrast to the Navy's 2005 DEIS for the Undersea Warfare Training Range (which established a threshold of 190 dB re 1 $\mu Pa^{2\bullet}s$) and the threshold which NMFS insisted the Navy adopt during RIMPAC 2006 and subsequent exercises off California and Hawaii (173 dB re 1 $\mu Pa^{2\bullet}s$), here the Navy redefines its position by applying a dose-response risk function to measure behavioral effects that begins at 120 dB re 1 μPa and reaches its mean at 165 dB re 1 μPa. DEIS at 3.7-91. Agencies are not entitled to substantial deference under the Administrative Procedure Act when they reverse previously held positions. Some of the more significant problems with the Navy's new position include misusing SPAWAR and Haro Strait data, as well as failing to include data from the Hanalei Bay incident.

Once again, the Navy relies on studies of temporary threshold shift in captive animals for its primary source of data. DEIS 3.7-88 to 89. Marine mammal scientists have long recognized the deficiencies of using captive subjects in behavioral experiments, and to blindly rely on this material, to the exclusion of copious data on animals in the wild, is not supportable by any standard of scientific inquiry. Cf. 40 C.F.R. § 1502.22. The problem is exacerbated further by the fact that the subjects in question, roughly two belugas and five bottlenose dolphins, are highly trained animals that have been working in the Navy's research program in the SPAWAR complex for years.[79] Indeed, the

[77] Richardson et al., Marine Mammals and Noise at 209.

[78] M.L.H. Cook, Behavioral and Auditory Evoked Potential (AEP) Hearing Measurements in Odontocete Cetaceans (2006) (Ph.D. thesis).

[79] See, e.g., S.H. Ridgway, D.A. Carder, R.R. Smith, T. Kamolnick, C.E. Schlundt, and W.R. Elsberry, Behavioral Responses and Temporary Shift in Masked Hearing Threshold of Bottlenose Dolphins, *Tursiops truncatus*, to 1-Second Tones of 141 to 201 dB re 1 μPa (1997) (SPAWAR Tech. Rep. 1751, Rev. 1).

disruptions observed by Navy scientists, which included pronounced, aggressive behavior ("attacking" the source) and avoidance of feeding areas associated with the exposure, occurred during a research protocol that the animals had been rigorously trained to complete.[80] The SPAWAR studies have several other major deficiencies that NMFS, among others, has repeatedly pointed out. In relying so heavily on them, the Navy has once again ignored the comments of numerous marine mammal behaviorists, which sharply criticized the Navy for putting any serious stock in them.[81]

In addition, the Navy appears to have misused data garnered from the Haro Strait incident—one of only three data sets it considers—by including only those levels of sound received by the "J" pod of killer whales when the USS *Shoup* was at its closest approach. DEIS at 3.7-89. These numbers represent the maximum level at which the pod was harassed; in fact, the whales were reported to have broken off their foraging and to have engaged in significant avoidance behavior at far greater distances from the ship, where received levels would have been orders of magnitude lower.[82] Not surprisingly, then, the Navy's results are inconsistent with other studies of the effects of various noise sources, including mid-frequency sonar, on killer whales. We must insist that the Navy provide the public with its propagation analysis for the Haro Strait event, and also describe precisely how this data set, along with results from the SPAWAR and Nowacek et al. studies, were factored into its development of the behavioral risk function.

The Navy also fails to include data from the July 2004 Hanalei Bay event, in which 150-200 melon-headed whales were embayed for more than 24 hours during the Navy's Rim of the Pacific exercise. According to the Navy's analysis, predicted mean received levels (from mid-frequency sonar) inside and at the mouth of Hanalei Bay ranged from 137.9 dB to 149.2 dB.[83] The Navy has from the beginning denied any connection between its major international exercise and the mass stranding. However, the Navy's specious reasoning is at odds with the stranding behavior observed during the event and with NMFS' report on the matter, which ruled out every other known potential factor

[80] C.E. Schlundt, J.J. Finneran, D.A. Carder, and S.H. Ridgway, Temporary Shift in Masked Hearing Thresholds of Bottlenose Dolphins, Tursiops truncatus, and White Whales, Delphinapterus leucas, after Exposure to Intense Tones, 107 Journal of the Acoustical Society of America 3496, 3504 (2000).

[81] See comments from M. Johnson, D. Mann, D. Nowacek, N. Soto, P. Tyack, P. Madsen, M. Wahlberg, and B. Møhl, received by the Navy on the Undersea Warfare Training Range DEIS. These comments are hereby incorporated into this letter. See also Letter from Rodney F. Weiher, NOAA, to Keith Jenkins, Naval Facilities Engineering Command Atlantic (Jan. 30, 2006); Memo, A.R. document 51, NRDC v. Winter, CV 06-4131 FMC (JCx) (undated NOAA memorandum).

[82] See,. e.g., NMFS, Assessment of Acoustic Exposures on Marine Mammals in Conjunction with *USS Shoup* Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington—5 May 2003 at 4-6 (2005).

[83] Navy, 2006 Supplement to the 2002 Rim of the Pacific (RIMPAC) Programmatic Environmental Assessment D-1 to D-2 (May 2006).

and concluded that sonar was the "plausible if not likely" cause.[84] The Navy's failure to incorporate these numbers into its methodology as another data set is unjustifiable.

Furthermore, the risk function should have taken into account the social ecology of some marine mammal species. For species that travel in tight-knit groups, an effect on certain individuals can adversely influence the behavior of the whole. (Pilot whales, for example, are prone to mass strand for precisely this reason; the plight of the 200 melon-headed whales in Hanalei Bay, and of the "J" pod of killer whales in Haro Strait, and the most recent stranding of melon-headed whales in the Philippines may be pertinent examples.) Should those individuals fall on the more sensitive end of the spectrum, the entire group or pod can suffer significant harm at levels below what the Navy would take as the mean. In developing its "K" parameter, the Navy must take account of such potential indirect effects. 40 C.F.R. § 1502.16(b).

We must also note that the Navy's exclusive reliance on sound pressure levels ("SPLs") in setting a behavioral threshold is misplaced. The discussion in the DEIS speaks repeatedly of uncertainty in defining the risk function and recapitulates, in its summary of the earlier methodology, the benefits implicit in the use of a criterion that takes duration into account. It is therefore appropriate for the Navy to set dual thresholds for behavioral effects, one based on SPLs and one based on energy flux density levels ("ELs").

Finally, the Navy's threshold is applied in such a way as to preclude any assessment of long-term behavioral impacts on marine mammals. It does not account, to any degree, for the problem of repetition: the way that apparently insignificant impacts, such as subtle changes in dive times or vocalization patterns, can become significant if experienced repeatedly or over time.[85]

In sum, the Navy has established thresholds and a risk function that are fundamentally inconsistent with the scientific literature on acoustic impacts and with marine mammal science in general. Indeed, using these thresholds to support a final EIS would violate NEPA.

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[84] B.L. Southall, R. Braun, F.M.D. Gulland, A.D. Heard, R.W. Baird, S.M. Wilkin, and T.K. Rowles, Hawaiian Melon-Headed Whale *(Peponacephala electra)* Mass Stranding Event of July 3-4, 2004 (2006) (NOAA Tech. Memo. NMFS-OPR-31); See also R.L. Brownell, Jr., K Ralls, S. Baumann-Pickering and M.M. Poole, Behavior of melon-headed whales, *Pepnoncephalia electra*, near oceanic islands, Marine Mammal Science, (publication pending 2009).

[85] The importance of this problem for marine mammal conservation is reflected in a recent NRC report, which calls for models that, inter alia, translate such subtle changes into disruptions in key activities like feeding and breeding that are significant for individual animals. National Research Council. Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects 35-68 (2005).

Modeling of Acoustic Impacts

The Navy bases its calculation of marine mammal impacts on a series of models that determine received levels of sound within a limited distance of a sonar array and then estimate the number of animals that would therefore suffer injury or disruption. It is difficult to fully gauge the accuracy and rigor of these models with the limited information that the DEIS provides; but even from the description presented here, it is clear that they are deeply flawed. Among the non-conservative assumptions that are implicit in the model:

(1) As discussed above, the thresholds established for injury and behavioral effects are inconsistent with the available data and are based, in part, on assumptions not acceptable within the field;

(2) The Navy does not properly account for reasonably foreseeable reverberation effects (as in the Haro Strait stranding incident),[86] giving no indication that its modeling sufficiently represents areas in which the risk of reverberation is greatest;

(3) The model fails to consider the possible synergistic effects of using multiple sources, such as ship-based sonars, in the same exercise, which can significantly alter the sound field. It also fails to consider the combined effects of multiple exercises, which, as NMFS indicates, may have played a role in the 2004 Hanalei Bay strandings;[87]

(4) In assuming animals are evenly distributed, the model fails to consider the magnifying effects of social structure, whereby impacts on a single animal within a pod, herd, or other unit may affect the entire group;[88] and

(5) The model, in assuming that every whale encountered during subsequent exercises is essentially a new whale, does not address cumulative impacts on the breeding, feeding, and other activities of species and stocks.

Before issuing a final EIS, the Navy must revise its flawed modeling systems and make them available to the public.

[86] NMFS, Assessment of Acoustic Exposures on Marine Mammals in Conjunction with *USS Shoup* Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington, 5 May 2003 (2005).

[87] Southall et al., Hawaii Melon-Headed Whale at 31, 45.

[88] The effects of this deficiency are substantially increased by the Navy's use of a risk function, rather than an absolute threshold, to estimate Level B harassment.

NATURAL RESOURCES DEFENSE COUNCIL

By Electronic and Overnight Mail

July 24, 2007

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Re: Proposed Rule for the Navy's SURTASS LFA System

Dear Mr. Payne:

On behalf of the Natural Resources Defense Council ("NRDC"), the International Fund for Animal Welfare, Whale and Dolphin Conservation Society, the Humane Society of the United States, Oceana, Cetacean Society International, European Coalition for Silent Oceans, League for Coastal Protection, and Ocean Futures Society and its founder, Jean-Michel Cousteau, and our millions of members, we are writing to submit comments on NMFS' Proposed Rule for the SURTASS LFA system. See 72 Fed. Reg. 37403 (July 9, 2007).[1]

We say at the outset that our comments are necessarily limited by the outrageously short period that NMFS has set, in the middle of summer, for public comment. It is our understanding, from the numerous complaints we have heard these past two weeks, that others in the environmental and scientific communities have had difficulty in responding as well. As we observed in our July 10 letter, a comment period of 15 days—used only twice before in more than 20 years of incidental take permitting under the MMPA—cannot be countenanced given the ongoing public controversy over this technology, the complexity of the issues to be analyzed, and the severity and scope of the potential impacts to marine wildlife.

[1] NRDC is aware that comments are being submitted independently by conservation organizations, scientists, and the public. The comments that follow do not constitute a waiver of any factual or legal issue raised by any of these organizations or individuals and not specifically discussed herein.

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For the reasons discussed below, we believe that the Proposed Rule, and the Supplemental Environmental Impact Statement that would accompany it,[2] fail to meet the standards prescribed by the Marine Mammal Protection Act ("MMPA"), 16 U.S.C. § 1361 et seq., and National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4321 et seq., and fail to meet the requirements imposed on the Navy in the case of NRDC v. Evans, 279 F.Supp.2d 1129 (N.D. Cal. 2003). Indeed, in our view these documents reflect a dismaying disdain for the Court's concerns and for the very idea of minimizing the impacts of the LFA system on the marine environment.

SURTASS LFA generates intense noise capable of propagating across entire ocean basins. The Court in NRDC v. Evans found it "indisputable that marine mammals, many of whom depend on sensitive hearing for essential activities like finding food and mates and avoiding predators, and some of whom are endangered species, will at a minimum be harassed by the extremely loud and far traveling LFA sonar." Id. at 1188. Recognizing the great risks in allowing LFA training virtually anywhere in the world's oceans without sufficient environmental review and mitigation, the Court held inadequate NMFS' original permit for this system and required that the Navy strengthen its mitigation and monitoring measures. The result was an injunction expressly tailored to both "reduce the risk to endangered species and marine mammals" and allow the Navy to test and train with LFA in a variety of ocean conditions. Id. at 1190.

Although the Navy's SEIS and NMFS' Proposed Rule have nominally been prepared in response to the Court's concerns, they, in fact, respond very little, especially in their consideration and adoption of mitigation measures. Incredibly, the only new mitigation offered is NMFS' proposal to keep received sound levels below 180 dB at one additional U.S. National Marine Sanctuary and in one area important to beaked whales off Canada—a measure that falls far short of what the law and the environment require. The agencies reject each and every additional mitigation measure urged by the Court. They flatly refuse to include an alternative that would restrict the Navy's training to areas with reduced risk of harm to marine life. Instead, the Navy resubmits the identical operational area map it previously proposed—literally referring to the map included in its original EIS—which opens more than 70% of the world's oceans to training with LFA.
The agencies also reject or simply fail to consider additional protections that the Court found were feasible and necessary to ensure safe operation of LFA, such as extending coastal exclusion zones, employing shutdown procedures for fish, and using aerial surveys or observational vessels for missions close to shore.

Moreover, the Navy proposes to retreat from many of the mitigation measures that have been in place since 2002. In its operation of LFA today, the Navy may train with LFA only in a limited area of the western Pacific; under the Proposed Rule, it could operate virtually anywhere in the world. As it stands, the Navy is required to respect a coastal exclusion

[2] Chief of Naval Operations, Final Supplemental Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar (2007) (hereinafter cited as "SEIS"). The Navy's 2005 draft SEIS will be cited as DSEIS.

zone of at least 30 nautical miles around coasts and islands (60 nautical miles or more in some cases), within which received sound pressure levels do not exceed 180 dB; under the Proposed Rule, it would revert to the originally proposed (and rejected) zone of 12 nautical miles. And the Navy is currently required to train at frequencies below 330 Hz, to reduce the likelihood of injuries and narrow the range of marine mammal species that LFA might affect; under the Proposed Rule, that restriction, too, would be eliminated.

All of this is proposed along with a doubling of the number of LFA ships to be deployed and of planned active transmissions per year. And these choices are supported by a document that, in a number of critical respects, fails to take account of developments in the scientific literature since January 2001, when the original EIS was released.

Given the escalating public and scientific concern about the dangers of intense ocean noise, as well as the clear holdings of the Court concerning protective measures that are required to ensure the safe operation of LFA, NMFS' deferral to the Navy represents an unacceptable step backwards. Part of the problem lies with the extraordinary structure of the permit, which unnecessarily eschews the concrete analysis of environmental impacts in particular areas for an abstract worldwide authorization. We urge NMFS to withdraw its proposed rule and to hold the Navy to the highest standard of mitigation and environmental review, as the law demands.

I. BACKGROUND

A. The LFA System

LFA is a relatively new type of sonar technology that locates enemy vessels by bombarding the ocean with low-frequency sound waves. While passive sonar is designed to detect the sounds that other vessels produce, active systems such as LFA generate their own sound waves and then decipher the echo they receive from distant targets. The LFA system was conceived during the Cold War to address the threat of deep-sea Soviet submarines, exploiting the ability of intense low-frequency sound to cover vast areas of ocean and depending on the relatively uncluttered environment of deep water for its detection ability.

The intense, low frequency signals produced by LFA have raised environmental concerns in the international scientific community in part because of "the extraordinary distance they propagate."[3] The active component of LFA is an array of eighteen loudspeakers lowered several hundred feet from a ship's hull into the ocean; sounding in tandem, their signals combine a few hundred meters from the source, creating zones of focalized sound that can extend many hundreds of miles in all directions.[4] Each speaker has a maximum output of

[3] See Statement of Concern (statement signed by internationally prominent scientists, submitted to NMFS in first administrative process).

[4] Chief of Naval Operations, Final Overseas Environmental Impact Statement and Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar, Vol. 1 at 2-3, 4.2-33 (2001) [hereinafter cited as "2001 FEIS"].

215 dB, but for purposes of calculating the intensity of the signal beyond a few hundred meters, where the vast majority of environmental impacts are expected to occur, the system is understood to function as one enormous acoustic source, producing as much as 240 dB of sound. Id. at B-7. During the next 5-year period, the Navy plans to introduce three lighter-weight, smaller versions of the system, known as Compact LFA, or "CLFA"; but the operational characteristics of the two systems are reportedly comparable, with the newer system tending to use a slightly higher portion of the same frequency band. 72 Fed. Reg. 37405-06. Low-frequency sound waves travel very efficiently in seawater, and it is this property that accounts for its geographic reach.

For example, the Navy has estimated that as far as 35 miles in all directions from the LFA source, marine mammals could be exposed to a received level of 165 dB — a level the Navy admits will cause a "significant change in biologically important behavior" in half of the animals exposed. 67 Fed. Reg. 46712, 46761 (July 16, 2002). During one test of the LFA system, the Navy calculated sound intensity levels at approximately 140 dB (an intensity over 100 times greater than the level known to disturb gray whales) more than 400 miles away.[5] Indeed, an independent analysis of some of the Navy's own data found that, during trials off the coast of California in the mid-1990s, the LFA signal was clearly audible at sites across the North Pacific Ocean.[6] For a number of reasons, the Navy's monitoring over the past five years has been inadequate to gauge the impact the system is having on marine mammals and other species in the western Pacific. See NRDC v. Evans, 279 F.Supp.2d at 1189 (rejecting Navy claims of low impact based on LFA monitoring data).

B. Impacts of High-Intensity Sonar on Marine Mammals

Scientists agree, and the publicly available scientific literature confirms, that the intense sound generated by mid-frequency active sonar can induce a range of adverse effects in whales and other species, from significant behavioral changes to stranding and death. By far the most widely-reported and dramatic of these effects are the mass strandings of beaked whales and other marine mammals that have been associated with military sonar use. Associated strandings have occurred in Greece, during the trial of a NATO sonar system; on the islands of Madeira and Porto Santo, during a NATO event involving subs and surface ships; in the U.S. Virgin Islands, during a training exercise for Navy battle groups; in the Bahamas, the Canaries, Japan, Hawaii, Alaska, and other spots around the world. On several occasions, bodies have been recovered in time to give evidence of acoustic trauma. In a 2004 symposium at the International Whaling Commission, more than 100 whale biologists concluded that the association between sonar and beaked whale

[5] Chief of Naval Operations, Environmental Assessment for Use of Surveillance Towed Array Sensor System Low Frequency Active in Connection with a Submarine Security and Technology Program Test [CNO Project K154-4] (July 1997).

[6] Letter from Mark McDonald, Whale Acoustics, to Donna Wieting, NMFS (Apr. 2001) (comments submitted on 2001 Proposed Rule).

deaths "is very convincing and appears overwhelming."[7] In the United States, an expert report commissioned by the Navy said much the same thing.[8]

Mass mortalities, though an obvious focus of much reporting and concern, are likely only the tip of the iceberg of sonar's harmful effects. Marine mammals are believed to depend on sound to navigate, find food, locate mates, avoid predators, and communicate with each other. Flooding their habitat with man-made, high-intensity noise interferes with these and other functions. In addition to strandings and non-auditory injuries, the harmful effects of high-intensity sonar include:

- temporary or permanent loss of hearing, which impairs an animal's ability to communicate, avoid predators, and detect and capture prey;
- avoidance behavior, which can lead to abandonment of habitat or migratory pathways;
- disruption of biologically important behaviors such as mating, feeding, nursing, or migration, or loss of efficiency in conducting those behaviors;
- aggressive (or agonistic) behavior, which can result in injury;
- masking of biologically meaningful sounds, such as the call of predators or potential mates;
- chronic stress, which can compromise viability, suppress the immune system, and lower the rate of reproduction;
- habituation, causing animals to remain near damaging levels of sound, or sensitization, exacerbating other behavioral effects; and
- declines in the availability and viability of prey species, such as fish and shrimp.

Over the past 20 years, a substantial literature has emerged documenting the range of effects of ocean noise on marine mammals.[9]

C. The First Failed Administrative Process

Despite the potential for SURTASS LFA to harm whales, fish, and other marine life, the Navy has a long history of noncompliance with federal law with respect to its deployment. Documents reveal that the Navy was aware of its obligations under NEPA as early as 1988, the year it committed itself to develop the LFA system, and under the MMPA and ESA no

[7] International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.4 (2004).

[8] H. Levine, Active Sonar Waveform 1 (2004) (JASON Group Rep. JSR-03-200) (describing evidence of sonar causation as "completely convincing").

[9] For a review of research on behavioral and auditory impacts of undersea noise, see, e.g., W.J. Richardson, C.R. Greene, Jr., C.I. Malme, and D.H. Thomson, Marine Mammals and Noise (1995); National Research Council, Ocean Noise and Marine Mammals (2003); P. Tyack, Behavioral Impacts of Sound on Marine Mammals, Presentation to the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals (February 4, 2004); Whale and Dolphin Conservation Society, Oceans of Noise (2004). As these references indicate, marine mammals are by no means the only species affected by undersea noise.

later than 1990.[10] Indeed, the Navy discussed these obligations in a series of internal meetings and communications, beginning in August 1988.[11] Yet, for the next eight years, from 1988 through 1996, the Navy conducted over twenty trials of LFA in marine habitat as rich and diverse as the southern California bight, the Mediterranean Sea, and coastal Nova Scotia without attempting to meet its responsibilities under these environmental statutes.

It was not until 1996, once the project came under public pressure from the environmental and the scientific communities, that the Navy agreed to prepare an environmental impact statement under NEPA, apply for a small take authorization under the MMPA, or consult with NMFS under ESA regarding its program. In 1999, the Navy applied to NMFS for a five-year small take authorization, under section 101(a)(5)(A) of the MMPA, for the taking of marine mammals incidental to the deployment of LFA throughout approximately 75% of the world's oceans. It simultaneously undertook steps to comply with NEPA by analyzing, in an EIS, the environmental effects of its proposed deployment, and released its Final Environmental Impact Statement for the LFA system in January 2001. But the Navy's proposal, and NMFS' apparent willingness to abide it, aroused an extraordinary degree of public concern. Comments were submitted by the Marine Mammal Commission, conservation groups, independent scientists, legislators, and tens of thousands of citizens, all alerting the agencies to the terrible deficiencies in their plan. Nonetheless, in July 2002, the Navy issued its Record of Decision supporting deployment of the LFA system with limited geographic restrictions and monitoring (67 Fed. Reg. 48145, 48153 (July 23, 2002)); and NMFS issued regulations permitting the corresponding take of marine mammals (67 Fed. Reg. 46712 (July 16, 2002) ("Final Rule")).

Recognizing the clear flaws in the Navy's 2001 FEIS and in NMFS' Final Rule, NRDC, together with the Humane Society of the United States, the League for Coastal Protection, Cetacean Society International, and Ocean Futures Society and its founder Jean-Michel Cousteau, filed suit in federal court in 2002, alleging multiple violations of ESA, NEPA, and the MMPA. We alleged that NMFS violated the MMPA by issuing a small take authorization that did not meet the statute's requirements; that NMFS and the Navy violated NEPA by finalizing an EIS that failed to analyze adequately the environmental impacts of LFA; and that NMFS and the Navy violated ESA by ignoring the best available science on the impacts of LFA on fish and by issuing inadequate (or no) incidental take statements.

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[10] Memo from Bill E[llison] to Steve H[ollis] and John S. (Jul. 27, 1988) (re: Aug. 11, 1988 ONR-sponsored meeting on marine mammals); memo from Bill E[llison] to Steve Hollis (Aug. 26, 1988) (re: ONR Aug. 11, 1988 Marine Mammal Meeting notes and recommendations); talking points for CST/LFA/ONR discussion on marine mammals (Dec. 19, 1990) (all included in the administrative record of NRDC v. Evans, 279 F.Supp.2d 1129 (N.D. Cal. 2003)).

[11] Memo from Bill E[llison] to Steve Hollis (Aug. 26, 1988) (re: ONR Aug. 11, 1988 Marine Mammal Meeting notes and recommendations); talking points for CST/LFA/ONR discussion on marine mammals (Dec. 19, 1990).

On August 26, 2003, the District Court ruled in favor of NRDC on summary judgment and, in a 72-page opinion, found that defendants had violated multiple provisions of NEPA, the MMPA, and ESA. See NRDC v. Evans, 279 F.Supp.2d 1129 (N.D. Cal. 2003). Among other things, the Court held:

- NMFS violated the MMPA by issuing a small take authorization that was not limited to a "specified geographic region" (id. at 1146-47);
- NMFS violated the MMPA by issuing a small take authorization authorizing take of more than "small numbers" of marine mammals, in some cases up to 12% each year of any species or stock (id. at 1152-53);
- NMFS violated the MMPA by issuing a small take authorization that failed to require adequate mitigation and monitoring of impacts to marine mammals (id. at 1163-64);
- NMFS and the Navy violated NEPA by failing to consider a full set of reasonable alternatives in their EIS (id. at 1166-67);
- NMFS and the Navy violated NEPA by failing to take a hard look at the impacts to fish species in their EIS, among other things, ignoring the only direct study of low-frequency sonar on fish (id. at 1171-72);
- NMFS violated ESA by failing to consider the "best available science," and the Navy violated ESA by withholding from NMFS the most relevant study on impacts to fish (id. at 1179-80);
- NMFS violated ESA by failing to issue an incidental take statement in association with its May Biological Opinion (id. at 1184-85); and
- NMFS violated ESA by failing to specify the amount or extent of take for all species for which take was authorized in the incidental take statement accompanying its August Biological Opinion (id. at 1188).

Rather than enjoin the Navy's deployment of LFA outright, the Court requested that the parties negotiate a balanced agreement that would accommodate the Navy's interest in continued training and NRDC's interest in protecting global natural resources. In response, the parties negotiated an agreement that restricted the Navy's training to an area of the western Pacific, with additional exclusion zones for the protection of important marine habitat. The Court incorporated the terms of this agreement into a permanent injunction that remains in force today and governs the Navy's current use of the system.

As a result of restrictions imposed by the Court's injunction and by NMFS, in its operation of LFA today the Navy is required to take significant steps to reduce the potential for harm. It may train with LFA only in a limited area of the western Pacific, not throughout the world's oceans as originally proposed. It is required to respect a wide coastal exclusion zone, of at least 30 nautical miles around coasts and islands, within which received sound pressure levels are not to exceed 180 dB. In the Philippine Sea, this coastal exclusion zone is expanded to 60 nautical miles or 30 nautical miles seaward of the 200-meter isobath, whichever is greater. In all areas, the Navy must cease LFA transmissions if a marine mammal is detected within a buffer zone extending 1 kilometer further than the zone

ensonified to 180 dB. And the Navy cannot train with LFA at frequencies above 330 Hz, in order to reduce the likelihood of injuries and narrow the range of marine mammal species that LFA might affect.

D. The 2004 National Defense Authorization Act

In fall 2003, Congress amended the MMPA to alter requirements applicable to "military readiness activities," such as training with LFA. See Nat'l Defense Authorization Act for Fiscal Year 2004, Pub.L. No. 108-136, Sec. 319 (Nov. 24, 2003). The amendments affected three requirements relevant to the Navy's operation of LFA and to the Court's holdings with respect to those requirements. First, the amended law clarified the standard for "harassment" of marine mammals pursuant to military readiness activities. 16 U.S.C. § 1362(18). Second, the amended law requires that a determination of "least practicable adverse impact" include, for military readiness activities, consideration of factors such as "personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity." 16 U.S.C. § 1371(a)(5)(A)(ii). Third, the amended law exempts military readiness activities from the general requirement that take permits be issued only for activities "within a specified geographic region" that affect "small numbers" of animals. 16 U.S.C. § 1371(a)(5)(F).

Based on these changes to the law, the Court amended its judgment to make clear that "Plaintiff's claims based on the 'small numbers' and 'specified geographic region' provisions of the MMPA no longer constitute a basis for the October 14, 2003 permanent injunction, and are dismissed." NRDC v. Evans, No. C-02-03805, Order Granting Defendants' Rule 60(b) Motion at 2-3 (N.D. Cal. 2004). The Court declined, however, to vacate or amend any portion of its original Opinion. Id. It was not asked to disturb, and did not disturb, the Permanent Injunction. Needless to say, these amendments do not affect the Court's holdings with respect to other violated MMPA provisions, including the need for additional mitigation, and do not touch the Court's holdings with respect to NEPA or the Endangered Species Act, which the agencies also violated. Compare SEIS at 1-16 fn. 5 with NRDC v. Evans, 279 F.Supp.2d at 1158-1164.

II. NMFS' COMPLIANCE WITH THE MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act was adopted more than thirty years ago to ameliorate the consequences of human impacts on marine mammals. Its goal is to protect and promote the growth of marine mammal populations "to the greatest extent feasible commensurate with sound policies of resource management" and to "maintain the health and stability of the marine ecosystem." 16 U.S.C. § 1361(6). A careful approach to management was necessary given the vulnerable status of many of these populations (a substantial percentage of which remain endangered or depleted) as well as the difficulty of measuring the impacts of human activities on marine mammals in the wild. 16 U.S.C. § 1361(l), (3). "[I]t seems elementary common sense," the House Committee on Merchant Marine and Fisheries observed in sending the bill to the floor, "that legislation should be adopted to require that we act conservatively—that no steps should be taken regarding

these animals that might prove to be adverse or even irreversible in their effects until more is known. As far as could be done, we have endeavored to build such a conservative bias into the [Marine Mammal Protection Act]." Report of the House Committee on Merchant Marines and Fisheries, reprinted in 1972 U.S. Code Cong. & Admin. News 4148.

The heart of the MMPA is its so-called "take" provision, a moratorium on the harassing, hunting, and killing of marine mammals. 16 U.S.C. § 1362(13). Under the law, NMFS may grant exceptions to the take prohibition, provided it determines, using the best available scientific evidence, that such take would have only a negligible impact on marine mammal populations and stocks. There are two types of general exemptions available through the MMPA for activities that incidentally "take" marine mammals: five-year permits and one-year incidental harassment authorizations. Regardless of which process is used, NMFS must prescribe "methods" and "means of effecting the least practicable impact" on protected species as well as "requirements pertaining to the monitoring and reporting of such taking." 16 U.S.C. §§ 1371(a)(5)(A)(ii), (D)(vi).

As discussed below, the Navy's proposal, if adopted by NMFS, would violate the law in several critical ways.

A. Mitigation Requirements

In authorizing "take" under the general authorization provision of the MMPA, NMFS has the burden of meeting the Act's high standard for mitigation. Specifically, the agency must prescribe "methods" and "means of effecting the least practicable impact" on marine mammals and set additional "requirements pertaining to the monitoring and reporting of such taking." 16 U.S.C. §§ 1371(a)(5)(A)(ii), (D)(vi). While NMFS is required to consult with the Department of Defense before making a determination under this provision (id.), the "least practicable impact" standard is, in any event, a rigorous one. NRDC v. Evans, 279 F.Supp.2d 1129, 1158-64 (N.D. Cal. 2003); NRDC v. Navy, 857 F.Supp. 734, 737-39 (C.D. Cal. 1994). As discussed below, it is clear that, in several respects, the MMPA's mitigation standard has not been met. Nor has the agency prescribed mitigation sufficient to make an affirmative finding of negligible impact, as required by 16 U.S.C. §§ 1371(a)(5)(A)(i), (D)(i)(I).

The 2002 Final Rule, according to the Court, did not go far enough in imposing mitigation measures on the Navy's use of LFA. The Court held "that defendants acted arbitrarily and capriciously in failing to (1) extend the coastal exclusion zones in all areas except for those few coastal areas where close to shore training is necessary, (2) use aerial surveys or observational vessels for LFA sonar missions operated close to shore, and (3) designate additional off-limit areas or seasons and OBIAs." NRDC v. Evans, 279 F.Supp.2d at 1164. Indeed, the Court found these measures necessary not only to satisfy the MMPA's mitigation provision but also to ensure that impacts are negligible. Id. at 1159. Yet NMFS' proposed rule, following on the Navy's SEIS, fails to adopt or severely shortchanges each of these mitigation measures, and also fails to consider additional

mitigation measures that would mitigate LFA's impact on marine species, including but not limited to the following.

(1) Coastal Exclusion Zones

NMFS fails to extend the coastal exclusion zone as required, instead responding to this holding by disputing its premise that greater coastal exclusion zones would be beneficial to marine species. SEIS at ES-19, 4-75. The Court has already held that that it was unlawful for NMFS and the Navy to reject increased coastal exclusion zones, and the agencies have failed to present sufficient modeling and analysis to show that their conclusion as to the merits of an expanded zone is correct. The modeling presented in the Navy's EIS, in its abstract treatment of marine mammal densities, ignores several obvious factors that would be essential to showing that more harm to marine species would, indeed, occur with an exclusion zone of 25 nm, including but not limited to the following: (1) failing to account for differences in the densities of individual species across the three habitat types considered (shelf, shelf-break, and pelagic); (2) failing to account for the relative sensitivities of animals that will be exposed to the highest and most dangerous levels of LFA sound, treating all species as equivalently vulnerable to acoustical harms; (3) failing to account for the additional risk of strandings and embayments posed by near-shore operations; (4) assuming that propagation loss from the LFA source is spherical for the first 1,000 m from the source and cylindrical beyond that range, even in shallow waters; and (5) treating all three shelf-break scenarios (at 5 nm, at 15 nm, and at 80 nm from the shore) as equally likely to occur in LFA operational areas.

Aside from applying a deficient model, the agencies fail to consider all reasonable alternatives for expanding its coastal exclusion zones, instead limiting their analysis to the 12 nm and 25 nm scenarios. Other alternatives that should have been considered include a dual-criteria alternative like the one used in the Permanent Injunction (which sets a coastal exclusion zone in the Philippine Sea of 60 nautical miles or 30 nautical miles seaward of the 200 meter isobath, whichever is greater), which, in basing the exclusion in part on the 200 meter isobath, takes the shelf break directly into account; a variety of coastal exclusions reflecting biological and operational differences within the LFA operations area, again like those used in the Permanent Injunction; zones greater than 25 nm and large enough to shield shelf and shelf-break species, but still narrow enough to permit training with LFA, like the zone of at least 60 nm now employed in the Philippine Sea; and a variable coastal exclusion zone that would put the areas of highest impact to coastal species, as defined by the Navy's coastal zone exclusion modeling, off-limits to training.

(2) Offshore Exclusion Areas

NMFS and the Navy have done very little to respond to the Court's holding with respect to additional offshore exclusion areas (also called Offshore Biologically Important Areas, or "OBIAs," during the first administrative process). Recognizing the

importance of shielding crucial offshore areas from exposure to LFA, the Court concluded that NMFS and the Navy had not done enough to identify such areas and to put them off-limits to LFA training. Though NMFS' rule adds six locations to the list of OBIAs, four of these areas were already included, in the 2002 Final Rule, among those places where received levels were capped at 180 dB—and thus are not additional mitigations at all. Compare 72 Fed. Reg. 37416-37417 with 50 C.F.R. § 216.184(e)-(f). Moreover, all but one of the additions is an existing National Marine Sanctuary within U.S. waters (72 Fed. Reg. 37416-37417); and even taking this cribbed approach, NMFS' analysis is incomplete.

With the lone exception of the Gully, no new OBIA outside U.S. waters is even considered by NMFS. For example, the Navy's analysis does not consider any of the areas specifically mentioned in the Court's Opinion as potential OBIAs, such as the southern end of the Oyashio/Kuroshio region off Kamchatka and the area where the Emperor Seamount Chain intersects the Aleutian Rise. Id. at 1163. Nor does NMFS consider any marine protected areas ("MPAs") established by countries other than the U.S., such as any of Canada's nine existing MPAs with cetaceans (again with the exception of the Gully), Australia's 38 existing MPAs with cetaceans, or Brazil's 16 existing MPAs with cetaceans—or, indeed, any of the non-U.S. protected areas discussed in the recent, relevant assessment, Marine Protected Areas for Whales, Dolphins and Porpoises: A World Handbook for Cetacean Habitat Conservation.[12] Nor does the Navy consider any of the biologically significant, globally representative areas compiled in the 1990s by the World Conservation Union ("IUCN"), in conjunction with the World Bank and Great Barrier Reef Marine Park Authority; a recent published assessment of beaked whale hotspots, which identifies more than 20 areas of significant global concern based on currently available evidence; the 14 areas identified by SMRU, as part of its Behavioral Response Study planning process, as leading sites for beaked whale presence; habitat described in NMFS' own stock assessments and recovery plans, and in species analyses contained within the IUCN Red List; areas recommended for protection by regional seas bodies, such as the ACCOBAMS Scientific Committee; areas placed off-limits by various countries to the use of mid-frequency sonar; the wealth of data on marine mammal distribution available through Duke University's OBIS (Ocean Biogeographic Information System)-SEAMAP database, the Navy's LMRIS system, the IWC Scientific Committee, and other sources; and considerable recent modeling work on marine mammal biodiversity, density, and habitat

[12] E. Hoyt, Marine Protected Areas for Whales, Dolphins and Porpoises: A World Handbook for Cetacean Conservation Table I.1 and passim (2005). Hoyt's review of cetacean MPAs include but are in no way limited to the Channel Islands and Santa Barbara Channel (California); the Gulf of Alaska; the Hawaiian Islands; the Marshall Islands; the Great Barrier Reef (Australia); the Gulf of Carpentaria (Australia); the Yaeyama Archipelago (Japan); the Korea Strait; Bohai Bay (China); the Fernando de Noronha archipelago (Brazil); the Atol das Rocas (Brazil); archipelagos west of Iceland; the Milieuzone Noordzee (Netherlands); the Western Mediterranean North for Protection of International Waters for Cetaceans (France, Italy, Corsica); the Gulf of Gabes (Tunisia); the Gulf of Sirte (Libya); and the Aegean Sea (Greece, Turkey).

preferences.[13] All of this material must be considered and assiduously and comprehensively applied.

Nor has NMFS considered establishing larger buffer zones around even the few exclusion areas it has identified, allowing ensonification in these areas up to 180 dB even though significant impacts on marine mammal behavior are expected well below this level and would rise, according to the Navy's risk function, as pressure levels increase. Allowing the Navy to place the LFA system directly outside the Monterey Bay National Marine Sanctuary (for example) does not, by any argument, reduce impacts on marine mammals in the Sanctuary to the maximum extent practicable.[14]

Because NMFS has done very minimal work to identify off-limit areas outside U.S. waters and has ignored clear candidates for the OBIA designation, it has failed to assume the burden of identifying additional OBIAs, as required by the Court. Its failure to consider and prescribe additional OBIAs remains arbitrary and capricious, and NMFS would again violate the MMPA in finalizing this proposed rule.

(3) Site Selection

One of the central flaws of the Navy's 2001 FEIS was its failure to consider concentrating training with LFA into specific, low-impact areas, rather than spreading it throughout the globe. NRDC v. Evans, 279 F.Supp.2d at 1166. Instead of correcting this flaw (*see* SEIS at 10-117 to 10-118), the SEIS that NMFS plans to adopt proposes only alternatives that would allow training with LFA throughout the same 70% or more

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[13] See, e.g., Great Barrier Reef Marine Park Authority, World Bank, and IUCN-World Conservation Union, A Global Representative System of Marine Protected Areas (1995); World Database on Protected Areas Consortium, 2005 World Database on Protected Areas (2005) (available at sea.unep-wcmc.org/wdbpa); C.D. MacLeod and G. Mitchell, Key Areas for Beaked Whales Worldwide, 7 J. Cetacean Res. Manage. 309 (2006); ACCOBAMS, Report of the Fourth Meeting of the Scientific Committee 34-39 (2007); B. Worm, M. Sandow, A. Oschlies, H.K. Lotze, and R.A. Myers, Global Patterns of Predator Diversity in the Open Oceans, 309 Science 1365 (2005); K. Kaschner, R. Watson, A.W. Trites, and D. Pauly, Mapping World-Wide Distributions of Marine Mammal Species Using a Relative Environmental Suitability (RES) Model, 316 Mar. Ecol. Prog. Ser. 285 (2006); K. Kaschner, Modelling and Mapping Resource Overlap between Marine Mammals and Fisheries on a Global Scale (2004) (Ph.D thesis). Also see the discussion of omitted habitats and MPAs in the letter submitted to the Navy during its DSEIS comment period by Dr. E.C.M. Parsons of George Mason University. He notes the omission of Xiamen Marine National Park and Conservation Area (Fujian Province), a nationally recognized protected area since 2000, designated specifically for cetaceans and located immediately opposite Taiwan on the Chinese mainland; portions of the Sargasso Sea gyre, a crucial offshore habitat for juvenile and hatchling sea turtles; the Far Eastern Marine Nature Reserve (Zapovednik) in Peter the Great Bay, Sea of Japan; the Vostok Bay National Comprehensive Marine Sanctuary; the Siargao Island Protected Land and Seascape; the Batanes Island Protected Land and Seascape; the Calayan Island Protected Area; and the Sierra Madre Natural Park. The latter two are known to include breeding humpback whales in their waters, and Calayan Island is considered to be the most diverse cetacean habitat in the Philippines. Letter from E.C.M. Parsons, George Mason University, to J.S. Johnson, SURTASS LFA Sonar EIS Program Manager 8 (Feb. 10, 2006).

[14] See National Marine Sanctuary Program, Policy Statement: Human-Induced Acoustic Impacts on Marine Life (2007).

of the world's oceans as proposed in the 2001 FEIS. None of the considered alternatives engages in the central and essential tasks of identifying potential areas of lesser harm and analyzing the impacts to the environment that would result from restricting all, or even a portion, of the Navy's planned training to those areas; nor would the Navy's process of avoiding areas that result in takes "above the required restrictions" (SEIS at 2-12 to 2-13) necessarily select areas presenting the lowest practicable impact. The consideration of training in areas that present a reduced risk of harm to marine life is all the more critical since experts agree that proper siting and geographic mitigation are among the most effective ways to lessen harm from acoustic sources.[15] NMFS must consider prescribing this measure.

(4) Frequency Restriction

Without explanation, NMFS has apparently withdrawn the frequency restriction that it imposed in its 2002 Final Rule to restrict the system's use above 330 Hz. As the SEIS indicates, NMFS' original basis for applying this measure was two-fold: first, to reduce the risk of injury from acoustic resonance; and second, to potentially narrow the range of marine mammal species that the LFA system could affect.

No evidence has emerged since 2002 to suggest that marine mammals are not vulnerable to resonance effects. The Navy has argued that there is no need to mitigate for resonance effects since an expert group, convened that year (and indeed before the Final Rule was issued), ruled out resonance as a likely cause of beaked whale mortalities. SEIS at 2-10 to 2-11. In fact, that group did not rule out resonance, although it considered lung resonance less promising than other pathologies such as bubble growth, and, in fact, called for further research on the subject—particularly on structures other than the lungs, which was the only structure it considered.[16] Meanwhile, an expert group convened more recently, by the Marine Mammal Commission, reached similar conclusions and made similar recommendations for further research.[17] Whether or not resonance played a role in the beaked whale pathologies seen thus far, it is clear from studies of terrestrial mammals submerged underwater—precisely for purposes of assessing potential impacts from LFA—that resonance effects can lower the threshold for both direct injury and vestibular

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[15] See, e.g., International Whaling Commission, 2004 Report of the IWC Scientific Committee, Annex K at § 6.4 (2004) (recommending steps to protect large whale critical habitat worldwide from noise impacts); J. Barlow and R. Gisiner, Mitigating, Monitoring and Assessing the Effects of Anthropogenic Sound on Beaked Whales, 7 J. Cetacean Res. Manage. 239 (2006); 67 Fed. Reg. 46782.

[16] NMFS, Report of the Workshop on Acoustic Resonance as a Source of Tissue Trauma in Cetaceans (2002).

[17] T.M. Cox, T.J. Ragen, A.J. Read, E. Vos, R.W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernández, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P.D. Jepson, D. Ketten, C.D. MacLeod, P. Miller, S. Moore, D. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, and L. Benner, Understanding the Impacts of Anthropogenic Sound on Beaked Whales, 7 J. Cetacean Res. Manage. 177 (2006).

performance by more than one order of magnitude, even (with respect to vestibular decrements) at received pressure levels as low as 160 dB. 72 Fed. Reg. 37410. Given that acoustic resonance increases the risk of injury and vestibular dysfunction at lower thresholds (whether above or below the NMFS' 180 dB criterion), NMFS' frequency restriction must be preserved.

As the SEIS observes, NMFS' frequency restriction was based explicitly on a statement made in 2001 at Congressional hearings on SURTASS LFA: to wit, that "[t]he consensus of data is that virtually all marine mammal species are potentially impacted by sound sources with a frequency of 300 Hz or higher." SEIS at 2-10; *see also* 67 Fed. Reg. 46750, 46756. This statement, as the Navy accurately notes, did not in fact refer primarily to resonance effects but rather to marine mammal hearing (SEIS at 2-10), based on morphological and audiometric data indicating that virtually all marine mammals can hear sounds down to 300 Hz. For purposes of mitigation, the clear suggestion is that limiting the frequency range potentially narrows the range of species that the system could affect through the auditory system, whether by causing threshold shifts, inducing behavioral change, or limiting perceptual abilities through masking. Yet neither NMFS nor the Navy has apparently taken such factors into account. For this reason as well, NMFS' proposal to remove the frequency restriction, and indeed to exclude any limitation on frequency, would violate the MMPA. 16 U.S.C. § 1371(a)(5)(A)(ii).

(5) Safety Zone

Although NMFS has maintained its 1 km buffer zone surrounding the 180 dB isopleth (72 Fed. Reg. 37416, as it must to satisfy the MMPA's mitigation requirements, it does not consider enlarging the mitigation zone beyond the current distances. As other navies, such as the Royal Australian Navy, have employed still wider exclusion zones for mid-frequency sonar exercises, zones larger than the present one should also be considered.[18]

(6) Other Mitigation Measures

Finally, there is no indication that NMFS has even considered prescribing a broad range of other mitigation measures available for the protection of marine life, including but not limited to ramp-up of the LFA source; modification of signal characteristics;[19]

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[18] Royal Australian Navy, "Maritime Exercise Areas Environmental Management Plan," Procedure S-1 (June 9, 2004).

[19] In Europe, the Norwegian and Dutch navies have begun to experiment with the characteristics of their mid-frequency systems, endeavoring to find an alternative that would prove less hazardous to beaked whales. J.J. Lok, Green Issues Loom Larger in Future Blue-Water Active Sonar Operations, Jane's International Defense Review 44-47 (Aug. 2004). In the United States, an expert panel, commissioned by the Office of Naval Research, advised the Navy to explore the use of complex waveforms that would retain Doppler sensitivity but produce lower peak amplitudes. H. Levine, Active Sonar Waveform 27 (2004) (JASON Group Rep. JSR-03-200).

explicit avoidance of enclosed areas and coastal areas with complex, steep seabed topography, with which the Navy concurs (SEIS at 10-133); use of lower power levels in conditions that may produce surface ducting and within certain geographic or other conditions, such as shallow coastal waters; shut-down or relocation of exercises if certain species or aggregations of species are detected outside the safety zone; monitoring for periods of 30 minutes and more before commencement or resumption of an exercise, to reduce risk to species with longer dive times;[20] and operational procedures in coastal areas to provide escape routes and avoid embayment of marine species.[21] Remarkably, NMFS' proposal includes no mitigation, beyond adding a single exclusion area, for the specific protection of beaked whales.

(7) Monitoring Methods

The Navy refuses to adopt small-craft pre-operational surveys for marine mammals in missions close to shore. The Court held that such surveys are necessary to protect marine life, but the Navy rejects this option and concludes, among other things, that such surveys are "not practicable" and "not effective." SEIS at 5-8. The Court's direct conclusions to the contrary after review of the record, however, are dispositive of these issues. Evidence since the Court's ruling in 2003 has only strengthened the justifications cited by the Court for requiring such surveys. Moreover, even if the Court's holding were not dispositive, the Navy's analysis on these points is flawed. The Navy does not consider, for example, any of the following in its analysis:

- The option of using boats launched from shore, rather than from LFA ships (since only operations close to shore are at issue);
- The fact that any minor disturbance to marine mammals from small planes and small boats would be far outstripped by the risk of serious injury and death that might result if marine mammals (and sea turtles) remain undetected in the zone of highest impact when the LFA system is activated;

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[20] See, e.g., R.W. Baird, D.L. Webster, D.J. McSweeney, A.D. Ligon, G.S. Schorr, and J. Barlow, Diving Behavior of Cuvier's (Ziphius cavirostris) and Blainville's (Mesoplodon densirostris) Beaked Whales in Hawai'i, 84 Canadian J. Zoo. 1120 (2006). Currently, the Navy proposes to resume sonar transmissions just 15 minutes after last sighting a whale in the safety zone.

[21] The Australian Navy, for example, goes much further than the Navy in its training protocols for mid-frequency sonar and, in doing so, suggests the practicability of these methods. When training with a mid-frequency sonar system, Australia requires seasonal and geographic restrictions on the use of the system at its highest power levels; use of lower power levels in conditions that may produce surface ducting and within certain geographic conditions such as shallow marine embayments; pre-operational and operational monitoring of a much larger safety zone (4000 yards) than the Navy considers; and mandatory shut-down of sonar transmissions if a whale is sighted within that safety zone. See Royal Australian Navy, "Maritime Activities Environmental Management Plan," Procedure S-1 and Planning Guide 16 (July 8, 2005). See also NATO Undersea Research Centre, Human Diver and Marine Mammal Risk Mitigation Rules and Procedures (2006) (NURC-SP-2006-008); ICES, Report of the Ad-hoc Group on the Impacts of Sonar on Cetaceans and Fish 33-36 (2005) (ICES CM 2005/ACE:06) (additional mitigation measures). For a discussion of other mitigation measures, see Letter from Joel Reynolds and Michael Jasny, NRDC, to Steve Leathery and Michael Payne 2-12 (May 24, 2006).

- The option of using more than a single small boat, if a single small boat is insufficient to the task;
- The fact that the effectiveness of any visual monitoring program, including the one embraced by the Navy, is diminished by high sea states, low visibility, and diving habits of whales—making additional mitigation more, not less, important;[22] or
- The comparative cost of operating LFA in a manner that exposes coastal marine mammals to a higher risk of stranding and other injuries.

In addition, NMFS should consider prescribing the following monitoring methods, inter alia, in support of mitigation: suspension of acoustic exercises outside daylight hours and during periods of low visibility; aerial surveillance for marine mammals; passive acoustic monitoring using the Navy's existing acoustic nodes in certain ranges and operating areas and using various other external platforms, including passive gliders, such as the one already developed by Defence Research and Development Canada and reportedly used by the Australian government;[23] and third-party monitoring by marine biologists. These methods should be prescribed wherever they are not impracticable, even if certain technologies (such as range instrumentation) are available in only a portion of the operating area.

The mitigation and monitoring measures that the Navy does propose are not well calculated to protect marine species from the LFA system and do not satisfy the requirements of the MMPA and NEPA. NMFS must prescribe significant additional measures.

B. Environmental Review under the MMPA and NEPA

NMFS can authorize exceptions to the take moratorium only upon making an affirmative finding that an activity will have no more than a "negligible impact" on a species or stock. 16 U.S.C. §§ 1371(a)(5)(A)(i), (D)(i)(I). "Negligible impact" has been further defined by the agency as one "that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species of stock through effects on annual rates of recruitment or survival" (50 C.F.R. § 216.103); or, as the agency translates, one that is "not likely to reduce annual rates of adult survival or recruitment" (71 Fed. Reg. 21003). The extraordinary number of takes expected to come of the next five years of LFA deployment should give caution that the effects of deployment could exceed the bounds that Congress intended. Unfortunately—and absent significant additional mitigation measures (NRDC v.

[22] The Navy fails to explain why, in these conditions, its proposed deck-based observers would be able to see cetaceans more effectively than aerial surveyors, given that the boat-based observers would be positioned at even greater distances from the animals than helicopter observers.

[23] Asian News International, "Now, an underwater robot to spy on whales and protect them from ships," Apr. 29, 2007.

Evans, 279 F.Supp.2d at 1159)—the analysis presented in NMFS' Proposed Rule and the Navy's SEIS fails to support a finding of negligible impact.[24]

It also fails to meet the Navy and NMFS' responsibilities under NEPA. Fundamental to satisfying NEPA's requirement of fair and objective review, agencies must ensure the "professional integrity, including scientific integrity," of the discussions and analyses that appear in environmental impact statements. 40 C.F.R. § 1502.24. To this end, they must make every attempt to obtain and disclose data necessary to their analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. See 40 C.F.R. § 1502.22(a). Agencies are further required to identify their methodologies, indicate when necessary information is incomplete or unavailable, acknowledge scientific disagreement and data gaps, and evaluate indeterminate adverse impacts based upon approaches or methods "generally accepted in the scientific community." 40 C.F.R. §§ 1502.22(2), (4), 1502.24. Such requirements become acutely important in cases where, as here, so much about a program's impacts depend on newly emerging science.

1. Thresholds of Injury, Hearing Loss, and Significant Behavioral Change

At the core of the agencies' impact assessment are the thresholds the Navy has established for non-auditory physical injury, hearing loss, and significant behavioral change, the levels above which meaningful effects on marine mammals are expected to occur. For each threshold, however, the Navy fails to take account of significant new information that has emerged since January 2001, when its FEIS was produced. NMFS cannot base its analysis under the MMPA or NEPA on these thresholds.

a. Injury Threshold

NMFS (following the Navy) sets its threshold for injury at 180 dB re 1μPa (RMS), such that exposure to a single, 100-second "ping" at that level or above is considered physically injurious. It bases this threshold, at least for non-auditory effects, largely on an internal white paper that the Navy prepared in 2002, which summarizes the results of tests on small terrestrial mammals that had been submerged just beneath the water's surface and exposed to low-frequency sound, and on a published paper that followed from that research (Laurer et al. 2002); yet it discounts the growing literature on acoustic injuries and mortalities in marine mammals.

NMFS' analysis underestimates the potential for injury in several ways. First, it fails to take proper account of published research on bubble growth in marine mammals, which indicates the potential for injury and death at levels far lower than the Navy proposes. It also grossly mischaracterizes the support that the bubble-

[24] Our comments on the Navy's SEIS were also sent to NMFS and are hereby incorporated by reference.

growth theory—and, more broadly, the mechanism of behaviorally-mediated injury—has received in the scientific literature; and, with respect to noise-activated bubble growth, offers only a partial interpretation of the literature, overlooking what has been published in the field since 1996.[25] Second, NMFS ignores the best available scientific evidence on exposure levels in sonar-related mass strandings, particularly that the whales beached in the Bahamas stranding were exposed to no more than 160-65 dB re 1μPa of mid-frequency sonar for 30 seconds (well below the duration of a 100-second LFA ping) and are likely to have been exposed to less. NMFS' attempt to discount the likelihood of strandings, injuries, and mortalities from use of the SURTASS LFA system fails to consider: the reported connection of other low-frequency sound sources to stranding events; the lack of any meaningful data on the potential for mortalities given the novelty of the system, its general operation in open ocean and remote locations, and relative ignorance of sound-related strandings before 2000; the consensus that some of the pathologies seen in sonar-related strandings occurred at sea; and studies of responses of beaked whales and other odontocetes to low-frequency sounds.[26] Third, the Navy's standard does not adequately reflect the potential for other non-auditory physiological impacts, as from stress, on which new data on marine mammals and other species have emerged.

b. Hearing Loss Threshold

NMFS (again following the Navy) sets its threshold for hearing loss, or "threshold shift" ("TS"), at 180 dB re 1μPa (RMS) for a single, 100-second "ping" of exposure. Its analysis—unchanged since the 2001 FEIS—is based on two arguments, one extrapolating from data on humans and other terrestrial mammals

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[25] For the former, see the next footnote. For the latter, see, e.g., D.S. Houser, R. Howard, and S. Ridgway, "Can Diving-Induced Tissue Nitrogen Supersaturation Increase the Chance of Acoustically Driven Bubble Growth in Marine Mammals?" 213 Journal of Theoretical Biology 183, 190 (2001); L.A. Crum, M.R. Bailey, J. Guan, P.R. Hilmo, S.G. Kargl, T.J. Matula, and O.A. Sapozhnikov, "Monitoring Bubble Growth in Supersaturated Blood and Tissue ex vivo and the Relevance to Marine Mammal Bioeffects," 6(3) Acoustics Research Letters Online 214 (2005); J.R. Potter, "A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms in Deep-Diving Marine Mammals" (paper presented at the IEEE International Symposium on Underwater Technology 2004, Taipei, Taiwan, April 2004).

[26] See, e.g., P.D. Jepson, M. Arbelo, R. Deaville, I.A.P. Patterson, P. Castro, J.R. Baker, E. Degollada, H.M. Ross, P. Herraez, A.M. Pocknell, F. Rodriguez, F.E. Howie, A. Espinosa, R.J. Reid, J.R. Jaber, V. Martin, A.A. Cunningham, and A. Fernández, "Gas Bubble Lesions in Stranded Cetaceans," 425 Nature 575 (2003); A. Fernández, J.F. Edwards, F. Rodriguez, A. Espinosa de los Monteros, P. Herraez, P. Castro, J.R. Jaber, V. Martin, and M. Arbelo, "'Gas and Fat Embolic Syndrome'" Involving a Mass Stranding of Beaked Whales (Family Ziphiidae) Exposed to Anthropogenic Sonar Signals, 42 Veterinary Pathology 446-457 (2005); Baird et al., 84 Canadian J. Zoo. at 1120-28; N.A. Soto, M. Johnson, P.T. Madsen, P.L. Tyack, A. Bocconcelli, and J.F. Borsani, "Does Intense Ship Noise Disrupt Foraging in Deep-Diving Cuvier's Beaked Whales (Ziphius cavirostris)?" 22 Marine Mammal Science 690-99 (2006); letter from Dr. N.A. Soto to K. Jenkins, Navy (Jan. 27, 2006) (comments on USWTR); J. Hildebrand, "Impacts of Anthropogenic Sound," in T.J. Ragen, J.E. Reynolds, W.F. Perrin, R.R. Reeves, and S. Montgomery, Marine Mammal Research: Conservation beyond Crisis 101, 119-120 (2006); Cox et al., 7 J. Cetacean Res. Manage. at 177-87.

and the other relying on a limited set of data on marine mammals. Both arguments are flawed. First, in calculating a threshold for marine mammals based on human studies, the Navy both disregards new data and fails to account for expert criticism of the Navy's approach made during the first take authorization process. Second, it has become clearer that the Navy has misapplied the hearing loss data taken directly from marine mammals, given its broad extrapolation from two species whose acoustic sensitivity even at tested frequencies is poorer than that of other cetaceans (e.g., harbor porpoises and killer whales).

c. Threshold for Significant Behavioral Change

NMFS has adopted the Navy's sliding scale for behavioral impacts, such that 50% of all marine mammals exposed to a single LFA transmission at 165 dB re 1μPa are expected to undergo significant change in a biologically important activity, with the potential for impact rapidly increasing or decreasing as the received level departs from that mean. Yet the risk function devised by the Navy is at odds in several respects with recent developments in the literature.

First, the Proposed Rule and SEIS fail to incorporate recent studies on the effects of anthropogenic sound on various marine mammal species, all of which demonstrate impacts in large whales and other species at received levels lower than those meaningfully covered by the Navy's risk function.[27] Second, the Navy's standard fails to take proper account of chronic impacts, from behavioral change as well as from certain non-auditory physiological impacts such as stress, which may occur at considerably lower levels than those that would induce the types of behavioral change studied by the Navy in its mid-1990s Scientific Research Program. In this regard, the agencies have failed to consider cumulative impacts on populations of animals exposed repeatedly to the LFA source over several seasons (cf. SEIS at 4-66 to 4-68), a scenario that is only more likely to occur given the proposed doubling in LFA deployment. Third, the Navy and NMFS disregard recent evidence indicating the potential for masking or cessations in vocalization to interfere with long-distance mating behavior in mysticetes such as the fin whale, again at received levels far lower than those effectively covered by the Navy's standard.[28] Fourth,

[27] See, e.g., Weller et al. (2002): Influence of Seismic Surveys on Western Gray Whales off Sakhalin Island, Russia in 2001; Independent Scientific Review Panel (2005): Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and Related Biodiversity; D.P. Nowacek, M.P. Johnson, and P.L. Tyack, "North Atlantic Right Whales (Eubalaena glacialis) Ignore Ships but Respond to Alerting Stimuli," 271 Proc. R. Soc. Lond. B 227-31; Soto, Intense Ship Noise, 22 Marine Mammal Science at 690-99; see also passim through these comments.

[28] D.A. Croll, C.W. Clark, A. Acevedo, B. Tershy, S. Flores, J. Gedamke, and J. Urban, Only Male Fin Whales Sing Loud Songs, 417 Nature 809 (2002); International Whaling Commission, 2004 Report of the IWC Scientific Committee, Annex K at § 6 (2004); NMFS, Assessment of Acoustic Exposures on Marine Mammals; S.L. Nieukirk, K.M. Stafford, D.K. Mellinger, R.P. Dziak, and C.G. Fox, Low-Frequency Whale and Seismic Airgun Sounds Recorded in the Mid-Atlantic Ocean. 115 J. Acoust. Soc. Am. 1832 (2004); P. Tyack, Behavioral Impacts of Sound on Marine Mammals (2004) (presentation at the First Plenary of the Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, Bethesda,

the Navy's standard is out of step with how the potential for behavioral impacts has been assessed in other contexts.[29] Fifth, the agencies do not meaningfully consider the impact that behavioral changes in prey species such as fish, which have been widely observed with other low-frequency sources and with mid-frequency sonar, may have on marine mammal foraging.[30] Sixth, the agencies do not consider using sound energy levels as another measure of behavioral change, in order to account for multiple exposures during a single exercise, as has been done for environmental review and authorization of Navy mid-frequency sonar exercises.

2. Strandings, Injuries, and Mortalities Associated with Naval Sonar

Since the publication of the Navy's original FEIS in 2001, the association between military active sonar and whale mortalities has been strengthened and has dramatically increased as a subject of scientific interest and concern. That interest is reflected in the publication of numerous papers in peer-reviewed journals, in reports by inter-governmental bodies such as the IWC's Scientific Committee, and in evidence compiled from a growing number of mortalities associated with sonar. Much of this information is summarized in our comment letter on the Navy's SEIS.[31]

In this light, the agencies' assessment of the risk of marine mammal injury and mortality from LFA use is seriously deficient. While some relevant papers are referenced in the SEIS and Proposed Rule, overall the analysis proceeds as though little has happened since the publication of the 2001 FEIS. Among the most significant errors:

Md., Feb. 4, 2004); C. Clark and G.C. Gagnon, Considering the Temporal and Spatial Scales of Noise Exposures from Seismic Surveys on Baleen Whales (2006) (IWC Scientific Committee Doc. No. SC/58/E9). See also S.C. Stearns and R. Hoekstra, Evolution: An Introduction (2000) (indicating that animals would not be expected to make calls louder than necessary to achieve their function); J.L. Miksis-Olds and J.H. Miller, Transmission Loss in Manatee Habitats, 120 J. Acoust. Soc. Am. 2320 (correlating manatee habitat use with relatively high propagation loss of low-frequency boating noise).

[29] See, e.g., Letter from Rodney F. Weiher, NOAA, to Keith Jenkins, Naval Facilities Engineering Command Atlantic (Jan. 30, 2006).

[30] See, e.g., "'Noisy' Royal Navy Sonar Blamed for Falling Catches," Western Morning News, Apr. 22, 2002 (sonar off the U.K.); R.D. McCauley, J. Fewtrell, A.J. Duncan, C. Jenner, M.-N. Jenner, J.D. Penrose, R.I.T. Prince, A. Adhitya, J. Murdoch, and K. McCabe, Marine Seismic Surveys: Analysis and Propagation of Air-Gun Signals, and Effects of Air-Gun Exposure on Humpback Whales, Sea Turtles, Fishes, and Squid 185 (2000); A. Engås, S. Løkkeborg, E. Ona, and A.V. Soldal, Effects of Seismic Shooting on Local Abundance and Catch Rates of Cod (Gadus morhua) and Haddock (Melanogrammus aeglefinus), 53 Canadian J. of Fisheries and Aquatic Sciences 2238-49 (1996); J.R. Skalski, W.H. Pearson, and C.I. Malme, Effects of Sound from a Geophysical Survey Device on Catch-Per-Unit-Effort in a Hook-and-Line Fishery for Rockfish (Sebastes spp.), 49 Canadian J. of Fisheries and Aquatic Sciences 1357-65 (1992); S. Løkkeborg and A.V. Soldal, The Influence of Seismic Exploration with Airguns on Cod (Gadus morhua) Behaviour and Catch Rates, 196 ICES Marine Science Symposium 62-67 (1993); S.D. Simpson, M. Meekan, J. Montgomery, R. McCauley, R., and A. Jeffs, Homeward Sound, 308 Science 221 (2005).

[31] See Letter from Joel Reynolds, NRDC, to J.S. Johnson, SURTASS LFA Sonar EIS Program Manager 14-21 (Feb. 10, 2006).

(1) The problems with NMFS and the Navy's calculation of thresholds for injury and behavioral disturbance, discussed above, carry through to their analysis of the risk of injury and are incorporated here.

(2) The agencies wrongly dismiss mechanisms of sonar injury to marine mammals that would cause harm independent of stranding events.

First, NMFS and the Navy portray a leading theory about the mechanism of sonar-related injuries—the theory that whales suffer from bubble growth in organs that is similar to decompression sickness, or "the bends" in human divers—as a controversial hypothesis without much support among researchers. 72 Fed. Reg. 37410. But the Navy (and NMFS) cannot simply elide the numerous published, peer-reviewed papers—in dive behavior, veterinary pathology, and molecular biology—that support this theory, or disregard the recognition bubble growth has received from expert panels, such as the one convened in 2004 by the Marine Mammal Commission to review sonar-related strandings.[32] In any case, the law requires agencies to evaluate all "reasonably foreseeable" impacts, which, by definition, include "impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 42 C.F.R. § 1502.22. The scientific literature supporting bubble growth rises far above this standard, and the Navy's discounting of this theory in its analysis of injuries to marine mammals is arbitrary and capricious.

Second, the agencies' analysis of injuries to whales leaves out a possibility for which strong evidence exists in the literature: i.e., that some of the observed injuries are a result of behavioral changes, such as rapid surfacing or premature diving, that sonar could induce in whales at sea. This mechanism of injury would also result in injury apart from strandings and should be considered. These omissions result in an unwarranted discounting by the Navy of the evidence that sonar is causing severe injuries to whales at sea, whether or not those whales strand.[33]

(3) In its Proposed Rule, NMFS wrongly dismisses the possibility that whales may be severely injured by sonar at great distances from the source, in order to argue that the Navy's scant 12 nm coastal exclusion would eliminate the risk of strandings. 72 Fed.

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[32] Cox et al., Understanding the Impacts (highlighting particular plausibility of gas-bubble disease as one of 2 major findings of workshop).

[33] Cox et al., Understanding the Impacts, 7 J. Cetacean Res. Manage. at 177-187; Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-457; International Whaling Commission, Report of the Scientific Committee Annex K at 27-28 (2006); P.A. Allison, C.R. Smith, H. Kukert, J.W. Denning, B.A. Bennett, "Deep-Water Taphonomy of Vertebrate Carcasses: A Whale Skeleton in the Bathyal Santa Catalina Basin," 17 Paleobiology 78-89 (1991); G. Wobeser, Investigation and Management of Disease in Wild Animals (2007).

Reg. 37411. But from the few events that have been modeled, the 2000 Bahamas event and, to a lesser extent, the 1996 incident in Greece, it is evident that even mid-frequency sonar arrays, using sonar that propagates significantly less well than LFA, can induce strandings from tens of miles offshore and are likely to seriously affect animals at tens of miles' distance.[34] To properly evaluate the potential impacts of LFA, the agencies must account for the reasonably foreseeable possibility that injuries similar to those seen in the Bahamas, the Canaries, and other events may occur at great distances from LFA use. To do otherwise is to arbitrarily disregard the preponderance of the evidence in this field.

(4) To support their conclusion that LFA would not cause the strandings and injuries observed in beaked whales, NMFS and the Navy rely heavily on a set of features identified by the MMC workshop as "common" to observed strandings. 72 Fed. Reg. 37411. In fact, in summarizing these features, the workshop was careful to observe that whether any contributory factors were needed (in addition to the high-intensity noise source) was unknown.[35] We do not doubt that certain factors, such as the use of sonar in channels, can increase the risk of harm; but the agencies' closed position on the matter is unsupported by the literature.

(5) The agencies have failed to consider most of the mass beaked whale strandings that have been identified for their association, or possible association, with sonar. See 72 Fed. Reg. 37410-11; SEIS at 4-53 to 4-56. Indeed, the only incidents that the authors appear to acknowledge are the 2000 strandings in the Bahamas, the 2000 strandings off Madiera, the 2002 strandings in the Canaries, and the 1996 strandings off Greece. Yet the list reported by the IWC's Scientific Committee and other expert bodies is far broader than this review would suggest, and should be considered by NMFS.[36]

(6) NMFS fails to account for the fact that some marine mammal species, aside from beaked whales, are especially vulnerable to acoustical injuries. For example, it does not give special consideration to minke whales, even though two minkes stranded in the Bahamas event, another died in the 2005 North Carolina incident, and at least one was

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[34] Commerce and Navy, Joint Interim Report at 7-11; SACLANT Undersea Research Centre, Summary Record SACLANTCEN Bioacoustics Panel, La Spezia, Italy, 15-17 June 1998 at 2-6, 2-35 to 36 (1998); International Whaling Commission, Report of the Scientific Committee Annex K at 27-28 (2006).

[35] Cox et al., Understanding the Impacts, 7 J. Cetacean Res. Manage. at 179; see also Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-457; International Whaling Commission, Report of the Scientific Committee Annex K at 27-28 (2006); B. Taylor, J. Barlow, R. Pitman, L. Balance, T. Klinger, D. DeMaster, J. Hildebrand, J. Urban, D. Pacacios, and J. Mead, "A Call for Research to Assess Risk of Acoustic Impact on Beaked Whale Populations" (2004) (IWC SC/56/E36).

[36] See, e.g., International Whaling Commission, 2004 Report of the IWC Scientific Committee, Annex K at Tab. 1; R.L. Brownell, Jr., T. Yamada, J.G. Mead, and A.L. van Helden, Mass Strandings of Cuvier's Beaked Whales in Japan: U.S. Naval Acoustic Link at Tab 1 (2004) (IWC Doc. SC/56/E37); J. Hildebrand, Impacts of Anthropogenic Sound on Cetaceans at Tab. 5 (2004) (IWC Doc. SC/56/E13); Taylor et al., A Call for Research at Tab. 1; ICES, Report of the Ad-Hoc Group at 21-22.

observed to engage in dramatic "porpoising" behavior in reaction to sonar use in Haro Strait, Washington.[37] Nor does it properly consider harbor porpoises, which stranded at Haro Strait;[38] or pygmy sperm whales, which stranded along with two species of beaked whales during naval exercises off the Canary Islands in November 1988;[39] or sperm whales and other deep-diving cetaceans, despite anatomical evidence of their susceptibility to bubble lesions and the concern raised by numbers of scientists that these animals stand at greatest risk of damage from bubble growth.[40] The potential for serious injury of these species is "reasonably foreseeable" and must be considered in the NMFS' evaluation of impacts. 42 C.F.R. § 1502.22.

(7) NMFS overestimates the importance of the fact that the long history of strandings associated with military sonar, discussed above, has usually implicated another type of sonar commonly employed by navies, known as mid-frequency sonar. 72 Fed. Reg. 37411. Mid-frequency sonar has been in widespread use for many decades and is used by navies around the globe; LFA, by contrast, is a new technology that was tested only in secret, then deployed in limited, mostly pelagic areas of the Western Pacific. Indeed, the Navy has been operating in portions of the Western Pacific at considerable distances (at least 30 to 60 nm) from shore, distant enough to limit observation of strandings and also distant enough that whales injured at sea might not strand. Furthermore, most areas in which the Navy operates lack stranding networks or other means to detect and disseminate information about strandings. The Navy and NMFS cannot properly rely on a lack of stranding reports for LFA to show anything but its fairly recent vintage and, to date, its tightly controlled usage. Moreover, many in the scientific community, including NMFS biologists, have expressed concern—based on

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[37] Commerce and Navy, Joint Interim Report at 1, 15-16 (Bahamas); NMFS, Report on Marine Mammal Unusual Mortality Event UMESE0501Sp: Multispecies Mass Stranding of Pilot Whales (Globicephala macrorhynchus), Minke Whale (Balaenoptera acutorostrata), and Dwarf Sperm Whales (Kogia sima) in North Carolina on 15-16 January 2005 (2006) (NOAA Tech. Memo. NMFS SEFSC-537); NMFS, Assessment of Acoustic Exposures at 9 (Washington).

[38] In dismissing the connection to harbor porpoises, the Navy argues that necropsies of animals stranded in association with sonar use in Haro Strait "found no evidence of acoustic trauma." DSEIS at 3.2-45. This statement is misleading. In fact, the NMFS investigation was inconclusive given the poor condition of the bodies and the failure to adequately preserve them for tissue analysis. NMFS, Preliminary Report: Multidisciplinary Investigation of Harbor Porpoises (Phocoena phocoena) Stranded in Washington State from 2 May – 2 June 2003 Coinciding with the Mid-Range Sonar Exercises of the USS Shoup at 53-55 (2004) (conclusions unchanged in final report). In any case, as NMFS indicated in a further assessment, it is possible that behavioral reactions, rather than acoustic trauma, were responsible for the strandings. NMFS, Assessment of Acoustic Exposures at 10.

[39] V. Martín, A. Servidio, and S. Garcia, Mass Strandings of Beaked Whales in the Canary Islands, in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 33-36 (2004).

[40] Moore and Early, Cumulative Sperm Whale Bone Damage, 306 Science at 2215; Jepson et al., Gas Bubble Lesions, 425 Nature at 575; D.S. Houser, Can Diving-Induced Tissue Nitrogen Supersaturation, 213 Journal of Theoretical Biology at 183; J.R. Potter, A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms; International Whaling Commission, 2004 Report of the IWC Scientific Committee, Annex K at § 6.3.

the best available evidence—that low-frequency sound could potentially induce similar effects.[41]

(8) NMFS attempts to discount the well-established link between sonar use and marine mammal injuries and mortalities by suggesting (based on data compiled when acoustic impacts were not generally considered as a potential cause of strandings) that a majority of marine mammal strandings are related to natural causes. 72 Fed. Reg. 37410. This fact, however, does not lessen the Navy's and NMFS' burden to discuss and prevent marine mammal strandings that do relate to sonar.

(9) NMFS states, remarkably, that "there are no new data that contradict the conclusions made in the Potential Impacts on Marine Mammals (Chapter 4) in the [2001] Final EIS." 72 Fed. Reg. 37409. To the contrary, and as referenced throughout this letter, new data exists inter alia linking whale strandings to naval sonar; linking non-stranding injuries in marine mammals to naval sonar; describing mechanisms of harm to marine mammals from sonar; showing unexpectedly high propagation of noise in shallow waters; finding that intense noise sources can affect whale calls over great distances, sometimes thousands of square kilometers; and revealing the difficulties of mitigating for noise impacts.

3. Modeling of Acoustic Impacts

It is impossible to comment fully on the Acoustic Integration Model ("AIM"), the program used by the Navy (and adopted by NMFS) to calculate the system's impacts, because that model has not been released to the public. Indeed, disclosure of the model must occur for public comment to be meaningful under NEPA and the Administrative Procedure Act, and for guidelines adopted under the Data (or Information) Quality Act to be met. Nonetheless, based on the limited information contained in the SEIS and related documents, a number of serious problems can be identified, beyond the use of improper thresholds, that result in underestimations of impacts.

First, the models used by the Navy in its applications for Letters of Authorization ("LOA") to assess its actual work in the Pacific, and in its Final EIS to estimate impacts in sample coastal areas, in large part assume a fairly even distribution of marine mammals across a wide area of ocean, failing to take the possibility that certain animals, like beaked whales and sperm whales, may be concentrated in particular habitat.[42] With regard to beaked whales, there is no indication that the Navy has

[41] Taylor et al., A Call for Research; International Whaling Commission, 2004 Report of the IWC Scientific Committee. See also N.A. Soto, M. Johnson, P.T. Madsen, P.L. Tyack, A. Bocconcelli, J.F. Borsani, Does Intense Ship Noise Disrupt Foraging in Deep-Diving Cuvier's Beaked Whales (Ziphius cavirostris)? 22 Marine Mammal Science 690 (2006); Crum et al., Monitoring Bubble Growth; Hildebrand, Impacts of Anthropogenic Sound.

[42] See, e.g., S.E. Moore, W.A. Watkins, M.A. Daher, J.R. Davies, M.E. Dahlheim, Blue Whale Habitat Associations in the Northwest Pacific: Analysis of Remotely-Sensed Data Using a Geographic Information System, 15 Oceanography 20 (2002); S. Ohsumi, Further Analysis of the Baird's Beaked Whale Stock in the

conducted research on habitat preferences in the areas actually used for operations, as strongly recommended by NMFS in the 2002 Final Rule, for the 5-year period that is about to expire; and if it has conducted research, that information has not apparently been incorporated into its impact analysis or site planning, as NMFS called for. 67 Fed. Reg. 46782. Second, in the limited modeling we have before us, the Navy frequently assumes that populations of marine mammals are relatively unstructured, such that individual animals are improbably considered part of region-wide, basin-wide, or even worldwide stocks.[43] Third, in general, the Navy's stock assessments in its LOA applications are based on incomplete and out-of-date information, leading to a significant underestimation of species abundance and therefore impacts.[44] Fourth, the Navy incorrectly claims that significant impacts on stocks and populations, as modeled for its LOA applications, would necessarily occur at percentages lower than those assumed in the Navy's modeling of coastal areas and NMFS' Final Rule, even disregarding the underestimates of take resulting from the other errors described here.[45] Fifth, the Navy's approach to modeling behavioral impacts from multiple exposures is not conservative.[46] Sixth, the Navy's estimates (and its assumption that animals would not be exposed at levels above its 180 dB criterion for injury) depend on a gross overestimation of its abilities to detect marine mammals within the mitigation zone. Seventh, the estimates taken by NMFS to represent the numbers of takes authorized under the permit (72 Fed. Reg. 37405, 37411) are based on a projected operating year in the Western Pacific and do not correspond to the scope of the proposed permit.

Western North Pacific, 34 Rep. Int'l Whaling Comm. 587 (1984); C.H. Townsend, The Distribution of Certain Whales as Shown by Logbook Records of American Whaleships, 19(1) Zoologica 1 (1935).

[43] Cf., e.g., M.L. Dalebout, K.M. Robertson, A. Frantzis, D. Engelhaupt, A.A. Mignucci-Giannoni, R.J. Rosario-Delestre, and C. Scott Baker, Worldwide Structure of mtDNA Diversity among Cuvier's Beaked Whales (Ziphius cavirostris): Implications for Threatened Populations, 11 Molecular Ecology 3353 (2005) (population structure in Ziphiids); W.F. Perrin, M.L.L. Dolar, M. Amano, and A. Hayano, Cranial Sexual Dimorphism and Geographic Variation in Fraser's Dolphin, Lagenodelphis hosei, 19 Marine Mammal Science 484 (2003) (suggesting genetic differences among Fraser's dolphins off the Philippines and off Japan, as one example of differentiation among species in these two areas); H. Yoshida and H. Kato, Phylogenetic Relationships of Bryde's Whales in the Western North Pacific and Adjacent Waters Inferred from Mitochondrial DNA Sequences, 15 Marine Mammal Science 1269 (1999). See also R.W. Baird, G.S. Schorr, D.L. Webster, D.J. McSweeney, and S.D. Mahaffy, Studies of Beaked Whale Diving Behavior and Odontocete Stock Structure in Hawai'i in March/April 2006 (2006) (report to NMFS Southwest Fisheries Science Center).

[44] Cf., e.g., P. Rudolph and C. Smeenk, Indo-West Pacific Marine Mammals, in W.F. Perrin, B. Würsig, and J.G.M. Thewissen, Encyclopedia of Marine Mammals 617-25 (2002); E.C.M. Parsons, Review of the Navy's 2003 LOA Application for the SURTASS LFA System (2003).

[45] Compare SEIS at 4-43 to 4-51 and 67 Fed. Reg. 46780.

[46] See, e.g., D. Kastak, B.L. Southall, R.J. Schusterman, C.R. Kastak, Underwater Temporary Threshold Shift in Pinnipeds: Effects of Noise Level and Duration, 118 J. Acous. Soc. Am. 3154, 3161 (2005); Navy, Draft Overseas Environmental Impact Statement/ Environmental Impact Statement: Undersea Warfare Training Range (2005); Letter from P.J.O. Miller, Woods Hole Oceanographic Institution, to Donna Wieting, NMFS (May 31, 2001).

Under these circumstances, NMFS' finding that impacts from LFA use would be negligible is arbitrary and capricious.

4. Cumulative Impacts

In order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. It is not enough, for purposes of this discussion, to consider the proposed action in isolation, divorced from other public and private activities that impinge on the same resource; rather, it is incumbent on the Navy to assess cumulative impacts as well, including the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." Id. § 1508.7. Thus, for example, it will be necessary to consider the impacts of the Navy's training with LFA alongside those of existing naval activities, as well as those of industrial and commercial activities such as fishing, shipping, and geophysical research.

The Navy and NMFS seem to believe that they can satisfy the requirement to assess cumulative impacts by cataloging the ways in which impacts from LFA are small compared with the totality of threats faced by marine mammals and the totality of anthropogenic noise being generated in the oceans. SEIS at 4-59 to 4-62.[47] Not only is this approach factually insupportable given the lack of any quantitative assessment of long-term effects in the SEIS—but it misapprehends the definition of "cumulative impact," which, according to NEPA's regulations, "can result from individually minor but collectively significant actions taking place over a period of time." 42 C.F.R. § 1508.7. The SEIS' assumption that impacts from the LFA system are short-term in nature and would not produce cumulative effects is plainly insupportable, especially given the Navy's reuse of certain areas for its exercises; and the SEIS' treatment of synergistic effects is improperly limited to the probability of constructive interference, ignoring the potential for a complex sound field formed of disparate, high-intensity sources, such as ships and sources used by the U.S. and other navies.

In short, the Navy and NMFS must (1) assess the potential for synergistic adverse effects, as from noise in combination with bycatch and ship-strikes;[48] (2) properly assess the foreseeable, long-term cumulative impacts of the LFA program both within

[47] The Navy relies in particular on a noise budget prepared by Dr. John Hildebrand, indicating that the energy output from LFA sources is 1 order of magnitude lower than that of supertankers and mid-frequency sonar. SEIS at 4-63. This ignores the obvious fact that the obvious fact that supertankers and mid-frequency sonar vessels are far greater in number than the two LFA systems; indeed, the Hildebrand budget indicates the relatively large amount of low-frequency energy that is concentrated in LFA.

[48] For example, the 2004 Report of the IWC Scientific Committee emphasizes the importance of evaluating the synergistic impacts of ocean noise and other stressors, such as toxins. IWC, 2004 Report of the IWC Scientific Committee, Annex K at § 6.4 and App. 2 (noting studies of terrestrial animals that demonstrate significant adverse synergistic effects). Exposure to some manmade sounds may increase the risk of ship-strikes. Nowacek et al., Right Whales Ignore Ships, 271 Proceedings of the Royal Society of London, Part B: Biological Sciences at 227.

and beyond the five-year window of a new take permit, particularly in re-exposed populations; and (3), even if (contrary to reason) the Navy finds that the long-term impacts of the proposed use of LFA itself are likely to be small, consider whether other activities could combine with this use to produce a significant effect.

C. NMFS' Responsibilities under NEPA

With its supplemental EIS, the Navy hopes not only to correct the deficiencies identified by the Court in the 2001 FEIS, but also to fulfill its NEPA requirement for an analysis of the environmental impacts of its second five years of LFA operation, from 2007 through 2012. SEIS at ES-2. NMFS' issuance of a new small take permit, however, cannot be supported by the Navy's inadequate SEIS. 42 U.S.C. § 4332.

This is especially true since the Navy proposes to alter both the scale and the nature of its operations with LFA under its next small take permit. It proposes doubling the number of ships and the hours of active transmission from the amounts allowed under the original 5-year rule. Moreover, it proposes equipping three of these ships with a different LFA system, called Compact LFA ("CLFA"), the characteristics of which are said to be "comparable to" existing LFA systems but which are not revealed in the SEIS. SEIS at 2-2. Yet some passages of the SEIS indicate that CLFA systems may operate in somewhat higher frequencies than LFA systems (SEIS at 2-10); and the Navy's brief explanation for its transition to CLFA suggests that it may be used in shallow littoral areas more often than is the present LFA system. SEIS at 2-2. Each of these differences would preclude a new small take permit without an independent analysis, in a full-fledged EIS, of the environmental effects of CLFA. Moreover, considerable new information on ocean noise has emerged since the text of the original FEIS was finalized, in January 2001.

Additionally, we note that NEPA applies in full to any environmental review that NMFS undertakes in support of its rulemaking under the MMPA. In the 2001 FEIS, the Navy conducted its environmental analysis for the "extraterritorial" portion of the LFA program, that part which lies outside U.S. territorial waters, under the authority of Executive Order 12114 rather than under NEPA; and the SEIS indicates that the Navy persists in this view. SEIS at 10-12 to 10-13. This position on the scope of review is inconsistent with the statute. See, e.g., Environmental Defense Fund v. Massey, 968 F.2d 528 (D.C. Cir. 1994) and NRDC v. Navy, No. CV-01-07781, 2002 WL 32095131 at *9-12 (C.D. Cal. Sept. 19, 2002).

Finally, NMFS cannot rely on a substantively deficient EIS, see supra at § II.B, to support its own rulemaking. For all these reasons, we urge NMFS to complete—or require the Navy to prepare—a separate, comprehensive, and up-to-date EIS of the impacts of its application for a second small take permit.

D. Additional Requirements under the MMPA and NEPA

1. Letters of Authorization

The MMPA requires the agency to provide notice and public comment for activities permitted under the Act's "incidental take" exemption. 16 U.S.C. § 1371(a)(5)(A). Yet, once again, NMFS proposes to issue letters of authorization for the LFA program each year without providing any opportunity for comment. 72 Fed. Reg. 37418. NMFS proposes to do so even though each year's authorization will involve new take and negligible impact analyses and potentially new exercise areas—the latter of which would, under the terms of the proposed rule, not justify a new comment period even if the new areas differ entirely from those modeled in the SEIS. Id. In deferring these specific analyses and decisions to a closed process, NMFS would violate the MMPA. 16 U.S.C. § 1371(a)(5)(A).

2. Public Disclosure under NEPA and the MMPA

Disclosure of the specific activities contemplated by the Navy is essential if the NEPA process is to be a meaningful one. See, e.g., LaFlamme, 852 F.2d at 398 (noting that NEPA's goal is to facilitate "widespread discussion and consideration of the environmental risks and remedies associated with [a proposed action]"). With regard to noise-producing activities, for example, NMFS must describe source levels, frequency ranges, duty cycles, and other technical parameters relevant to determining the potential impacts of an MMPA authorization.

The Navy's SEIS provides some of this information, but it fails to disclose key data that the Navy presumably used in modeling acoustic impacts. Just as important, the Navy has not released or offered to release any of the modeling systems (including the AIM system) it used to calculate acoustic harassment and injury. These models must be made available to the public, including the independent scientific community, for public comment to be meaningful under NEPA and the Administrative Procedure Act, which also governs decisions made under the MMPA. 42 C.F.R. §§ 1502.9(a), 1503.1(a) (NEPA); 5 U.S.C. § 706(2)(D) (APA). And guidelines adopted under the Data (or Information) Quality Act also require their disclosure. The Office of Management and Budget's guidelines require agencies to provide a "high degree of transparency" precisely "to facilitate reproducibility of such information by qualified third parties" (67 Fed. Reg. 8452, 8460 (Feb. 22, 2002)); and NOAA's data quality guidelines commit the agency to that standard.[49]

That the information in question derives from another federal agency does not relieve NMFS of its responsibility to provide it to the public. We encourage NMFS to contact us immediately to discuss how to make this critical information available.

3. Public Comment under the MMPA

[49] NOAA, National Oceanic and Atmospheric Administration Information Quality Guidelines Pt. II (Sept. 30, 2002) ("Objectivity").

Finally, we want to take note again of the exceptionally short comment period that NMFS has prescribed for this permit process.

It simply defies logic that the comment period would be shorter, by half, than the statutorily mandated 30-day period for comment on proposed Incidental Harassment Authorizations, whose duration and scope are vastly more limited. 16 U.S.C. § 1371(a)(5)(D)(iii). Congress could not have intended the comment period for that streamlined process to outstrip the time allowed for five-year regulatory permitting – and especially not on a matter as controversial as SURTASS LFA. Additionally, agencies are mandated by Executive Order to provide a meaningful opportunity to comment on proposed regulations, which is defined to be, in most cases, not less than 60 days. Exec. Order No. 12866, 58 Fed. Reg. 51735, at § 6(a)(1).

Again, the only plausible explanation for NMFS' action here is its desire to finalize its Rule before August 16, when the Navy's authority to use the system will expire. This, too, suggests not only a pre-decided outcome on the substance of the permit, but a dismaying disregard for public process and for the agency's fundamental responsibility to fairly and impartially administer the law.

III. CONCLUSION

The rule that NMFS has proposed is inconsistent with federal law, incompatible with the Court's decision in NRDC v. Evans, and regressive in its approach to marine mammal protection. For these reasons, we urge NMFS to reject the Navy's application.

Very truly yours,

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CRITIQUE OF THE RISK ASSESSMENT MODEL EMPLOYED TO CALCULATE TAKES IN THE HAWAII RANGE COMPLEX SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

David E. Bain, Ph.D.

Abstract

Rather than using a fixed received level threshold for whether a take is likely to occur from exposure to mid-frequency sonar, the Navy proposed a method for incorporating individual variation. Risk is predicted as a function of three parameters: 1) a basement value below which takes are unlikely to occur; 2) the level at which 50% of individuals would be taken; and 3) a sharpness parameter intended to reflect the range of individual variation. This paper reviews whether the parameters employed are based on the best available science, the implications of uncertainty in the values, and biases and limitations in the model. Data were incorrectly interpreted when calculating parameter values, resulting in a model that underestimates takes. Errors included failure to recognize the difference between the mathematical basement plugged into the model, and the biological basement value, where the likelihood of observed and predicted takes becomes non-negligible; using the level where the probability of take was near 100% for the level where the probability of take was 50%; and extrapolating values derived from laboratory experiments that were conducted on trained animals to wild animals without regard for the implications of training; and ignoring other available data, resulting in a further underestimation of takes. In addition, uncertainty, whether due to inter-specific variation or parameter values based on data with broad confidence intervals, results in the model being biased to underestimate takes. The model also has limitations. For example, it does not take into account social factors, and this is likely to result in the model underestimating takes. This analysis has important management implications. First, not only do takes occur at far greater distances than predicted by the Navy's risk model, the fact that larger areas are exposed to a given received level with increasing distance from the source further multiplies the number of takes. This implies takes of specific individuals will be of greater duration and be repeated more often, resulting in unexpectedly large cumulative effects. Second, corrections need to be made for bias, and corrections will need to be larger for species for which there are no data than for species for which there are poor data. Third, the greater range at which takes would occur requires more careful consideration of habitat-specific risks and fundamentally different approaches to mitigation. The value of the model is that it provides a focus for future research on the effects of noise on marine mammals. In particular, the sensitivity analysis indicates the primary need for data is determining response probabilities of a wide range of species when exposed to received levels near the level at which 50% of individuals respond.

Introduction

The Navy distinguishes two types of takes: Level A, in which there is immediate injury or death; and Level B, in which there is no immediate injury, but cumulative exposure may lead to harm at the population level. However, in certain contexts, Level B harassment may lead to Level A takes through indirect mechanisms.

The population effects of Level A takes on populations are relatively easy to assess, as individuals that are killed are obviously removed from the population, and those that are injured are more likely to die whenever the population is next exposed to stress.

Calculating the population effects of Level B takes is a topic of contemporary research (Trites and Bain 2000). For example, Bain (2002a) explored using energetic consequences of behavior change in conjunction with population dynamics models to estimate population effects of Level B takes. Stress concurrent with Level B harassment would have additional population consequences. Stress may occur in the absence of behavioral change, or the absence of change in significant behavioral patterns such as foraging or nursing, or exclusion from optimal habitat. Lusseau et al. (2006) concluded disturbance caused a decline in and posed a significant threat to the survival of the bottlenose dolphin population in Doubtful Sound, New Zealand. While they noted vessel strikes were occurring (Level A takes), cumulative behavioral effects (Level B takes) were believed to be the primary threat to the population.

Models relating acoustic exposure to takes thus are not sufficient by themselves to interpret the effects of noise on populations. It is likely that different magnitudes of effect, whether physical harm, behavioral change that leads to physical harm, disruption of significant behavioral activities, or behavioral changes that pose negligible risk to populations when they occur only rarely but can become significant when exposure is prolonged or repeated, will have different relationships to noise. The different magnitudes of takes will have different population consequences. Thus it will be challenging to synthesize results of multiple studies, as different measured endpoints may belong on different curves relating them to noise, and different endpoints will have different population consequences. Further, the population consequences can depend on the health of the population (Bain 2002a). All these factors need to be considered when evaluating the environmental consequences of exposing marine mammals to noise.

Unconditional effects

Temporary Threshold Shifts in captive marine mammals are commonly used as an index of physical harm (e.g., Nachtigall et al. 2003, Finneran et al. 2002 and 2005, Kastak et al. 2005). Limiting experimental noise exposure to levels that cause temporary effects alleviates ethical concerns about deliberately causing permanent injury. However, repeated exposure to noise that causes temporary threshold shifts can lead to permanent hearing loss. In fact, chronic exposure to levels of noise too low to cause temporary threshold shifts can cause permanent hearing loss. Animal models (e.g., rats, cats,

monkeys, chinchillas) have been used for tests of noise causing permanent physical harm (Henderson et al. 1991, Gao et al. 1992, Blakeslee et al. 1978, Clark 1991). Damage to hearing from noise exposure is an example of unconditional injury from noise. OSHA (2007) requires limiting human exposure to noise at 115 dB above threshold (equivalent to 145 dB re 1 μPa for killer whales, Szymanski et al. 1999) to 15 minutes.

Stress reactions are another available index (e.g., Romano et al. 2004). Ayres (personal communication) found evidence suggesting that whale watching results in increased levels of stress hormones in wild killer whales.

Conditional effects

Changes in behavior resulting from noise exposure could result in indirect injury in the wild. A variety of mechanisms for Level B harassment to potentially lead to Level A takes have been identified.

Gas bubble lesions have been observed in beaked whales (Jepson et al. 2003, Fernandez et al. 2005, Cox et al. 2006). A variety of mechanisms have been proposed for this. While some have proposed these may be due to acoustically mediated bubble growth, and hence are an unconditional consequence of noise exposure (Crum and Mao 1996), it is more likely that these result from decompression sickness. That is, changes in dive behavior may prevent clearance of nitrogen gas from the body, resulting in larger bubbles than would occur in undisturbed dive patterns. One possible change is that beaked whales may remain submerged for an unusually long period of time, and then rapidly ascend. The rapid ascent is a change in behavior that prevents nitrogen from remaining in solution in the blood. Zimmer and Tyack (2007) questioned whether the rapid ascent mechanism would actually result in lesions, and proposed another behavior change that might occur is interruption of deep dives. Deep dives allow the lungs to collapse, preventing nitrogen from reaching the body. Further, a series of rapid breaths at the surface can be used to clear nitrogen absorbed under pressure. Interruption of the normal surface interval can allow nitrogen to build up over time. Changes in depths of dives are of more concern than rapid ascents as this mechanism would be applicable to a wide range of species, while if the rapid ascent mechanism is involved, it would be primarily a concern for deep diving species (Zimmer and Tyack 2007).

While failure to flee may lead to injury in beaked whales, flight may lead to injury in other species. Minke whales have been found stranded after sonar exercises (NOAA and Navy 2001). A minke whale was observed traveling at high speed during exposure to mid-frequency sonar in Haro Strait in 2003. It is easy to see how such behavior would lead to stranding when a beach is located in front of the whale, as minke whales lack echolocation and visibility is limited underwater. Exhaustion from rapid flight leading to heart or other muscle damage (Williams and Thorne 1996) could also account for increased mortality such as was observed in harbor porpoises following sonar exercises in Juan de Fuca and Haro Straits in April and May of 2003. Harbor porpoises, in contrast to

Dall's porpoises, rarely engage in sustained high energy activities such as rapid swimming or bow riding, and hence are less adapted to long distance flight responses.

Even successful flight may have negative survival consequences. In the absence of disturbance, individuals will tend to occupy optimal habitat. Displacement from optimal habitat will have consequences that will depend on the duration of the displacement, the quality of the alternate habitat, and the condition of the individuals at the time of displacement.

Separation of individuals from social units is another consequence of noise exposure that may lead to mortality. In 2003 in Haro Strait, some killer whales responded to mid-frequency sonar by seeking shelter behind a reef. Others chose to flee, resulting in splitting of a pod that historically spent all of its time together as a single unit. While no deaths resulted from this particular incident, other killer whales have been observed separated from their social units resulting in death prior to reunion or requiring human intervention to restore the individual to its social unit (Schroeder et al. 2007).

Temporary threshold shifts may conditionally lead to harm. Impaired hearing ability increases vulnerability to ship strike. In 2003, blunt force trauma was identified as a cause of death in the investigation of harbor porpoise mortalities following exposure to mid-frequency sonar in Washington State. A minke whale was nearly struck by a research vessel in the area where one had been observed fleeing mid-frequency sonar exposure. These species are familiar with boats in that area, and normally avoid them by a wide margin when they can hear them coming.

Impaired auditory ability may also increase predation risk. For example, Dahlheim and Towell (1994) reported an attack by killer whales on white-sided dolphins. The approach by the whales went undetected due to the noise of the research vessel. Further, impaired hearing may impair foraging ability and communication (Bain and Dahlheim 1994).

The Risk Function Model

The risk function uses three parameters. B is the received level at which the most sensitive individuals start to respond with changes in significant behaviors such as foraging. K is the difference in received level between the level at which half of individuals respond and the level at which the most sensitive individuals respond. That is, B+K is the level at which 50% of individuals respond. A is a shape parameter that attempts to capture the variability in responsiveness of the population. That is, are essentially all the individuals the same and the bulk of them become responsive when the received level is near B+K, in which case a simple threshold model would provide a good approximation, or is there a lot of variation in the population, in which case many individuals become responsive when received levels are near B?

The model is based on the hypothesis that some individuals start to respond at lower levels than others. It anticipates that some individuals will hold out until very high levels

before responding. The model includes parameters that allow it to be applied appropriately to species with differing noise tolerance. However, the Navy used one set of parameter values to predict the responses of all species. This paper reviews the accuracy of the choice of parameter values, the implications of using the wrong parameter values, and whether the model makes unbiased predictions when uncertainty in the parameter values exists.

Limitations

Like many models, the risk model has limitations. It fails to take into account social interactions. For example, the model anticipates that individuals may move away from a source at different exposure levels, but fails to recognize that this would result in individuals becoming separated from the group. This is likely to lead to the curve becoming asymmetrical, with the "holdouts" responding to the behavior of their schoolmates rather than the sound. As the area exposed to lower levels of noise is larger than the area exposed to higher levels of noise, this would result in more individuals being affected than the model predicts for social species.

The model does not account for multiple sources. Kruse (1991), Williams and Ashe (2007) and Bain et al. (2006) noted that killer whale responses to vessels varied with the number of vessels present. The magnitude of certain responses increased on the order of 10% per source, although Williams and Ashe (2007) noted that large numbers of sources could result in changes in the opposite direction of small numbers of sources, potentially canceling out the effect. That is, rather than a risk function that simply identifies how likely a response is to occur, one that takes into account the magnitude of the response would be ideal.

Pingers have been used to reduce entanglement in gillnets. Kraus et al. (1997) were able to reduce entanglement of harbor porpoises by 90%. Gearin et al. (1996, 2000) used more pingers, and were able to reduce entanglement by 95%. While this could be accounted for by the fact that more pingers increase the minimum sound level at the net (Bain 2002b), Laake et al. (1997, 1998, 1999) found porpoises typically remained much farther from the net than the spacing between pingers, even after the avoidance response declined due to habituation. Thus, the effect of multiple sources seems larger than the effect of fewer sources. Pingers have also been successful in protecting other species from nets (Barlow and Cameron, 1999; Cameron 1999, Stone et al. 1997).

In addition to quantitative changes in response to multiple sources, there may be a qualitative change in the response. For example, noise is used in drive fisheries of many odontocete species to cause stranding or near strandings. That is, multiple sources were used to displace individuals in a particular direction, and the consequences (stranding) were more serious than displacement from the source alone as would result from exposure to a single source.

The risk to the population of qualitatively different responses varies not only with the type of response, but the circumstances. If the response is going ashore, fatalities are highly likely to result. If the response is slowly moving away for a short period of time, no fatalities are likely to result. However, if the response is to slowly move away from a prime feeding area for an extended period of time, and the population is food limited, fatalities may result, and the number is likely to be related directly to the duration of exclusion from the feeding area, and only indirectly to the cumulative sound energy received.

Finally, the model assumes that marine mammals behave independently from each other. This is not likely to be the case. Even species that are normally solitary, like harbor seals, have been observed to school in response to high energy noise (personal observation). To remain a member of a group, individuals must remain in geographic proximity to each other. As more sensitive individuals move away, others who are not sufficiently disturbed by the sound itself would need to move as well to remain members of the group. The result is likely to be a step function at moderate exposure levels rather than the gradual increase in risk predicted by the model. The result would be that risk is underestimated. The proportion of individuals necessary to lead all individuals to respond in a similar manner to noise is likely to vary among species, and propensity to mass strand may be a good predictor of the importance of this effect.

Datasets

The Navy chose to rely upon three datasets.

Captive cetaceans

Studies of captive marine mammals provide an excellent setting for identifying direct effects of sound. E.g., one of the datasets employed by the Navy consists of studies relating short-term exposure of bottlenose dolphins and belugas to high levels of noise to Temporary Threshold Shifts. The Navy (Dept. Navy 2008b, p 3-7) noted aggressive behavior toward the test apparatus, suggesting stress was another consequence of the test (see also Romano et al. 2004). Such effects would be unconditional results of noise exposure.

However, extrapolation of the level at which aggression was observed to the level at which behaviorally mediated effects might occur in the wild is problematic, as this depends on how well trained the subjects were. For example, the Navy has been a leader in training dolphins and other marine mammals to cooperate with husbandry procedures. Tasks like taking blood, stomach lavage, endoscopic examination, collection of feces, urine, milk, semen and skin samples, etc. once required removing individuals from the water and using several people to restrain them. With training, painful and uncomfortable procedures can be accomplished without restraint and with a reduction in stress that has significantly extended lifespans of captive marine mammals (Bain1988).

That is, the absence of avoidance or aggressive behavior does not imply an absence of physical harm, much less the absence of potential for behavior changes that may lead to indirect harm.

Physical harm may occur in the wild without avoidance responses as well. Yano and Dahlheim (1995) found killer whales continued to predate on longlines despite being physically injured by deterrents such as gunshots. Reeves et al. (1996) reviewed other examples from fishery interactions of injurious approaches to deterrence failing.

If belugas and bottlenose dolphins are like killer whales, and the 50% risk level is about 15 dB below the 50% risk level for behavioral change in trained animals (see below), this would put their value around 170 dB re 1 µPa. Even this is likely to be an overestimate, as boat motors with a source level of 165 dB re 1 µPa can cause behavioral changes in bottlenose dolphins (Nowacek et al. 2001.) This new value, 170 dB re 1 µPa, averaged with the other Navy datasets, would drop the average 50% risk level to 160 dB re 1 µPa.

Killer whales

The second dataset is killer whales exposed to mid-frequency sonar from the USS Shoup in Haro Strait, Washington, in May, 2003. The level quoted in the HRC SDEIS (Dept. Navy 2008b) is an estimate of the received levels experienced when mid-frequency sonar was transmitted from about 3 km away. This level caused major behavioral changes in 100% of exposed whales (Risk=1 for Level B takes of a magnitude that in other contexts or species could lead indirectly to physical harm), but was not to believed to have caused Level A takes (the whales did not strand, and received levels were estimated to be too low to have caused threshold shifts, NMFS OPR 2005) in any individuals (Risk = 0). However, much more data are available from the May, 2003 Shoup incident. Behavioral changes were first observed at 47 km (where the received level was estimated to be 121 dB). The behavioral response was tail slapping by about 25% of the individuals observed, which is consistent with observed responses to vessel noise at a similar level. At a distance greater than 22 km, the direction of travel changed away from a feeding area, and hence foraging behavior was disrupted. At this distance, the received level may have increased to the neighborhood of 135 dB re 1 µPa with about 6 dB of reduced spreading loss and 6 dB reduced absorption. This would be comparable to a vessel traveling at low speed approaching to within 10 m, which is very difficult to accomplish without causing whales to turn away. 100% of killer whales responded by abandoning their feeding ground and moving away from the noise source at this received level. While vessels cause diversion from straight-line paths, they have not been observed to displace killer whales from feeding areas (vessels have been observed to displace killer whales from resting areas, but this is likely mediated by presence rather than noise, as the effect is observed in the presence of silent vessels, Trites et al. 1995). Thus it is not surprising that a qualitatively different behavioral response was exhibited. The peak exposure level was estimated to be 175 dB re 1 µPa (HRC SDEIS, although NMFS noted that estimated levels tended to overestimate measured levels by 1-10 dB [NMFS OPR 2005], so the peak exposure level may have been only 165 dB). In addition to changing

travel patterns, the pod split, with approximately 50% of the pod continuing to shelter in an acoustic shadow zone, and the other 50% fleeing at high speed. Such behavior has not been observed in the presence of vessels alone. It should be emphasized that 100% of killer whales exhibited a disruption of a significant life process, foraging, at a level that may have been less than 135 dB re 1 µPa, in contrast to the value used in the SDEIS, 169.3 dB re 1 µPa for a 50% response.

Additional datasets are available for killer whale responses to noise. E.g., in Bain and Dahlheim's (1994) study of captive killer whales exposed to band-limited white noise in a band similar to that of mid-frequency sonar at a received level of 135 dB re 1 µPa, abnormal behavior was observed in 50% of the individuals. This is far lower than the level observed in bottlenose dolphins. In addition, Bain (1995) observed that 100% of wild killer whales appeared to avoid noise produced by banging on pipes (fundamental at 300 Hz with higher harmonics) to the 135 dB re 1 µPa contour. This indicates the difference between wild and captive killer whales (non-zero risk in captive marine mammals might correspond to 100% risk in wild individuals of the same species), as well as implying that risk of 100% may occur by 135 dB re 1 µPa for this genus in the wild.

Further, killer whales begin responding to vessel traffic at around 105-110 dB re 1 µPa with minor behavioral changes. By 135 dB re 1 µPa, disruption of foraging may approach 100%. Received level appears to be more important than proximity (Bain 2001). For risk to increase from near 0 at 105 dB re 1 µPa to near 100% by 135 dB re 1 µPa, with A=10, the 50% risk level would need to be about 120 dB re 1 µPa. Substituting 120 for 169 dB re 1 µPa reduces the average level for 50% risk by about 16 dB to 144 dB re 1 µPa. Substituting 135 dB re 1 µPa would reduce the average by 8 dB to 157 dB re 1 µPa.

Finally, the Navy's characterization of the killer whale dataset is incorrect. They indicate the effects observed in the presence of mid-frequency sonar in Haro Strait were confounded by the presence of vessels. However, the effects of vessels on killer whales have been extensively studied (e.g., Kruse 1991, Williams et al. 2002ab, Bain et al. 2006). Behavioral responses attributed to mid-frequency sonar are qualitatively different than those observed to vessels alone. While the observations are anecdotal, they were not inconsistent. The sonar signal was blocked from reaching the whales with full intensity by shallow banks or land masses during three segments of the observation period. The "inconsistencies" can be attributed to differences in behavior depending on whether there was a direct sound path from the Shoup to the whales. It should be noted there was extensive study of this population prior to exposure (see Bigg et al. 1990 and Olesiuk et al. 1990 for a description of typical research protocols), as well as extensive post-exposure monitoring (e.g., Bain et al. 2006).

Right whales

Similarly, the right whale data relied upon are of limited value. While they clearly illustrate that the value at which 50% of animals are influenced is below 135 dB re 1 µPa

and are therefore helpful in determining the upper limits of the B+K value, they lack sufficient low level exposures needed to fit the low end of the curve. As with killer whales, the Navy misused the data. They averaged values which resulted in 100% response. Thus the average value exceeds the level resulting in a 50% risk.

Right whales exposed to alerting devices consistently responded when received levels were above 135 dB re 1 μPa. Due to the small sample size (six individuals), it is unclear whether this is close to the 50% risk, the 100% risk level, or both. These data do not allow identification of B, as lower exposure levels were not tested. In mysticetes exposed to a variety of sounds associated with the oil industry, typically 50% exhibited responses at 120 dB re 1 μPa. Thus right whales may be similar to killer whales.

The consequences of using incorrect values can be seen by comparing the observed results of the right whale exposures to alert signals (Nowacek et al. 2004) with those predicted by the Navy model. Using the values of B=120, K=45, and A=10 in the HRC SDEIS (Dept. Navy 2008b), the probability of responses for the exposed whales are shown in column two of Table 1. The formula underestimated the number of takes by a factor of over 500. The Navy proposed using A=8 for mysticetes in recognition of this, and the results are shown in column 3. While improved, the model still underestimated takes by a factor of 183. One could try B=105 and K=15. Using A=10 provides a reasonable approximation, overestimating takes by 20% (column 4). A better approximation is provided by A=2, which predicts the number of takes within 2% (column 5). While the probability of all four right whales exposed to the highest alert signals responding is much less than one in a billion based on the Navy model and allows one to unequivocally reject the Navy's choice of parameter values as applying to that species, numerous other combinations of parameter values would fit the data as well as the values shown in the table here. Substituting 120 dB re 1 μPa for 139 dB re 1 μPa results in an average 6 dB lower at 159 dB re 1 μPa.

Table 1. Risk for right whales (model vs. observed)

Received Level (dB re 1 μPa)	RISK B=120,K=45,A=10	RISK B=120,K=45,A=8	RISK B=105,K=15,A=10	RISK B=105,K=15,A=2
Responded				
148	0.008647	0.022021	0.999973	0.891548
143	0.001217	0.004641	0.999908	0.86521
137	5.92E-05	0.000415	0.999488	0.819864
135	1.7E-05	0.000153	0.999026	0.800039
133	4.06E-06	4.86E-05	0.998059	0.777052
No Response				
134	8.52E-06	8.79E-05	0.998633	0.788974
Error Factor	502	183	0.83	1.01

Datasets not considered

The Navy incorrectly concludes that additional datasets are unavailable. In addition to the other killer whale datasets mentioned above, data illustrating the use of acoustic harassment and acoustic deterrent devices on harbor porpoises illustrate exclusion from foraging habitat (Laake et al. 1997, 1998 and 1999, Olesiuk et al. 2002). Data are also available showing exclusion of killer whales from foraging habitat (Morton and Symonds 2002), although additional analysis would be required to assess received levels involved. The devices which excluded both killer whales and harbor porpoises had a source level of 195 dB re 1 μPa, a fundamental frequency of 10 kHz, and were pulsed repeatedly for a period of about 2.5 seconds, followed by a period of silence of similar duration, before being repeated. Devices used only with harbor porpoises had a source level of 120-145 dB re 1 μPa, fundamental frequency of10 kHz, a duration on the order of 300 msec, and were repeated every few seconds. Harbor porpoises, which the Navy treats as having a B+K value of 120 dB re 1 μPa (with A large enough to yield a step function) in the AFAST DEIS (Dept.Navy 2008a), 45 dB lower than the average value used in the HRC SDEIS, may be representative of how the majority of cetacean species, which are shy around vessels and hence poorly known, would respond to mid-frequency sonar. Even if harbor porpoises were given equal weight with the three species used to calculate B+K, including them in the average would put the average value at 154 dB re 1 μPa instead of 165 dB re 1 μPa.

Harbor porpoise responses to various acoustic devices have been documented in captivity and the wild. Pingers with a source level of 130 dB re 1 μPa displace wild harbor porpoises to a distance of at least 100-1000 m, where the received level was likely in the

neighborhood of 80-90 dB re 1 µPa. Studies of harbor porpoises in captivity also found responses to acoustic deterrent devices, but could not be tested at such distances due to limitations in facility size (Kastelein et al. 1997, 2001). This is another example of how studies with captive cetaceans can produce misleading results. Airmar devices with a source level of 195 dB re 1 µPa displaced an estimated 95% of harbor porpoises to a distance of 3 km. While received levels were not measured, they could have been in the neighborhood of 120-130 dB re 1 µPa. These findings are well modeled with a B value of 70 dB re 1 µPa, a K value of 25, and an A value of 4.

Many species are poorly known, due in part to difficulties approaching them from boats and in part because they do not fare well in captivity. Species that may exhibit vulnerability to noise comparable harbor porpoises include many species of Stenella (e.g., striped dolphins), beaked whales, sperm whales (which are best studied from sailboats rather than motorized vessels, and show disruption of foraging at levels below 130 dB re 1 µPa, Jochens et al. 2006), and numerous poorly known species. In contrast, Dall's porpoises are known to bow ride, and appear far less easily disturbed by noise from airguns than harbor porpoises (Calambokidis et al. 1998). They may be an example of a relatively noise tolerant species like the bottlenose dolphins included in the SDEIS.

There are also data that are based on other noise sources. E.g., effects of vessel traffic on whale and dolphin behavior could be interpreted in terms of received levels. While engine noise tends to be continuous rather than intermittent like sonar, in a reverberant environment, mid-frequency sonar may be received as a nearly continuous sound (personal observation).

Likewise, records of marine mammal responses to broadband noise sources like airguns are also likely to be informative. While it may be difficult to extrapolate levels resulting in takes due to potential differences in perception of broadband and narrowband signals, and pulses rather than continuous sounds, they can give an idea of the range of intra-specific and inter-specific variation in B and K values and be applicable to determining the A parameter.

E.g., Calambokidis et al. (1998) found harbor seal responses to airguns typically consisted of visually orienting at received levels from 143 to 158 dB re 1 µPa and moving away at received levels from 158 dB to 185 dB re 1 µPa. However, one harbor seal oriented at 163 dB re 1 µPa rather than moving away. The highest measured received levels for Dall's porpoises were about 170 dB re 1 µPa, but only about 142 dB re 1 µPa for harbor porpoises. Similarly, the highest received levels measured for California sea lions were about 180 dB re 1 µPa, but only about 160 dB re 1 µPa for Steller sea lions. The highest measured received level was also 160 dB re 1 µPa for gray whales. That is, closely related species pairs may differ in their responsiveness to noise by over 20 dB, and taxonomically diverse species pairs may exhibit similar responsiveness.

TTS data similar to those available for cetaceans have been collected from harbor and elephant seals, and California and Steller sea lions (Kastak et al. 1999, 2005). As with cetaceans, field data suggest the Navy parameter values will underestimate takes of some

pinniped species, though they may provide a reasonable approximation for harbor seals and California sea lions (e.g., the data described above). Pinniped hearing in species studied to date is less sensitive than in cetaceans (e.g., California sea lions, Schusterman et al. 1972; Steller sea lions, Kastelein et al. 2005; harbor seals, Møhl 1968; northern fur seals, Moore et al. 1987; odontocetes, Au 1993), and it is commonly assumed they are less vulnerable to noise as a result. However, comparisons of Steller sea lions with Dall's porpoises and gray whales exposed to airgun noise indicates this is not always the case. A detailed consideration of pinnipeds is beyond the scope of this paper.

Using the datasets discussed above, 50% risk levels based on trained cetaceans may be 165 dB re 1 μPa, 120 dB re 1 μPa for killer and right whales, and 95 dB re 1 μPa for harbor porpoises. The average of 95, 120, 120 and 165 is 125 dB, 40 dB lower than the 50% risk value of 165 dB used in the Navy model. Even if one uses more stringent criteria for what constitutes takes (120 dB for harbor porpoises, 135 dB for killer and right whales, and 170 dB for bottlenose dolphins), the average would be 140 dB, which is 25 dB lower than the Navy model. Setting B to 100, K to 40, and A to 10 would result in roughly 40 times the number of takes than the model predicts using the Navy's parameter values.

Parameter values

The use of default values for model parameters is problematic. The available data are likely to be biased toward noise tolerant species. That is, species that are intolerant of noise are difficult to approach closely enough to study. They tend to fare poorly in captivity. E.g., spinner dolphins and harbor porpoises showed very poor survivorship in captivity, in contrast to bottlenose dolphins (Bain 1988). Thus averages based on available data are likely to underestimate effects on species for which data are not available.

While the Navy has proposed assuming noise tolerance is predictable along taxonomic lines, which correlate with hearing ability, empirical data do not support this assumption (Bain and Williams 2006). Likewise, there is interspecific variation in noise tolerance in fish (Kastelein 2008).

B Value

The basement value should be set low enough that the risk function predicts takes at the lowest of the level resulting in unconditional injuries, the level at which behaviorally mediated injuries are possible, and the level resulting in minor behavioral changes or stress that can have population level effects with sustained or repeated exposure.

An important property of the model is that the biologically observed basement value is different than the mathematical basement value. The Navy proposes using 120 dB re 1 μPa as the basement value. They indicate the selection of this value is because it was commonly found in noise exposure studies. However, 120 dB re 1 μPa has broadly been

found as the value at which 50% of individuals responded to noise, not a small percentage. Further, a mathematical B of 120 dB corresponds to a risk of less than 2% at 150 dB (with K=45 and A=10), which would be difficult to detect in empirical studies. That is, the studies should be re-evaluated to determine the level at which a small percentage of individuals responded, and then a further correction for the difference between mathematical B and the empirically determined biological B would be needed.

However, further consideration should be given to the nature of the responses used in those studies to determine whether they represent significant behavioral changes or are only likely to have a population scale effect with sustained or repeated exposure.

For example, many looked at changes in migration routes resulting from noise exposure, and found that 50% of migrating whales changed course to remain outside the 120 dB re 1 μPa contour (Malme et al. 1983, 1984). These results might be interpreted in several ways. They could be seen as minor changes in behavior resulting in a slight increase in energy expenditure. Under this interpretation, they would not qualify as changes in a significant behavior, and are irrelevant to setting the basement value. They could be interpreted as interfering with migration, even though the whales did not stop and turn around, and hence 120 dB would make an appropriate B+K value rather than B value. Third, the change in course could have been accompanied by a stress response, in which case the received level at which the course change was initiated rather than the highest level received (120 dB re 1 μPa) could be taken as the biological basement value.

As discussed above, sensitive species like harbor porpoises may be significantly affected by levels below 100 dB re 1 μPa (Kastelein et al. 1997, 2000, 2001). Foraging behavior of killer whales can be disrupted by levels on the order of 105-110 dB re 1 μPa or less (Williams et al. 2002ab, data in Bain et al. 2006). These are far below the 120 dB re 1 μPa level proposed, and as mentioned above, the mathematical B value needed to predict detectable changes at 110 dB would be far lower than 110 dB. For example, B=80, K=45, and A=10 predicts a risk of less than 2% at 110 dB.

K Value

The K value reflects the difference between the mathematical B value and the level at which 50% of individuals respond. Since determining the B value has problems of its own, this critique will focus on determining the B+K value. The 50% risk level is relatively easy to determine, and has been commonly reported in the literature, as noted in the SDEIS. However, the most common value was 120 dB re 1 μPa, as noted in the SDEIS, yet these studies were not used to calculate B+K. Instead, other datasets were used, and the numbers derived were not the 50% risk levels. As mentioned above, there are problems with extrapolation of responses in trained animals to wild animals, and the right and killer whale values were based on levels that resulted in nearly 100% risk, not 50% risk. (It may not be possible to determine a level at which 50% risk occurred in killer whales, but perhaps collaboration among killer whale researchers, whale watch operators, and the Navy might identify the B+K level for that event).

The 50% risk level is the median level at which individuals begin to respond, not the mean as calculated in the SDEIS. While there are data suggesting risk of threshold shift is related to duration of exposure, and hence the consequences of exposure to continuous noise sources would be different than exposure to intermittent sources, there are no such data for behaviorally mediated effects. Many species strongly avoid motorized vessels, and hence are more vulnerable to noise than the average of the species considered above. Such species are likely to include those in the sperm and beaked whale families, Pacific right whales, blue whales, melon-headed and pygmy killer whales, right whale dolphins, and Clymene, striped and rough-toothed dolphins. A smaller number of species, like Dall's porpoises, are more tolerant of noise sources than the average of the species considered above. Thus it is unlikely that the average value of B+K across cetacean species would be above 120 dB re 1 μPa, although the value would vary across species.

A value

While the A value is described as relating to the sharpness of the risk function, it also influences the symmetry of the function. As A increases, risk is redistributed from low noise levels to higher noise levels. The relative risk to the population, as opposed to risk to individuals, can be described as the risk to individuals at a given received level times the relative number of individuals receiving that level. As the sound spreads to larger areas, more individuals are exposed to lower levels of noise. The shape of the risk function and the spreading loss model determine the received level that poses the most risk to the population. At high received levels, the risk to the population may be small, because although the risk to individuals is high, the number of individuals likely to be exposed is small. At low levels, the risk to the population may be again small, because although the number of individuals exposed is high, the risk to those individuals is low. At intermediate values, the population experiences the most risk. When A is low, the risk to the population peaks near B, and at high A values, the risk is concentrated near B+K.

The choice of A value appears arbitrary. The Navy indicated they wanted to allow for more response at low levels, and adjusted the A value to accomplish this. However, this would have been better accomplished by lowering the B and B+K values as suggested above.

The significance of an A value underestimating the number of individuals responding to low levels of noise and overestimating the number of individuals responding to high levels of noise is that the area exposed to low levels of noise is larger than the area exposed to high levels of noise, so the calculation would lead to an underestimate of takes.

Calambokidis et al. (1998) employed an appropriate methodology for obtaining data for calculating A values of marine mammals exposed to airguns. They used a small vessel which moved toward and away from the seismic survey vessel, and hence were able to observe behavior and measure received values at distances of over 70 km as well as close

to the seismic survey vessel. Thus they were able to observe normal behavior in the presence of low levels of noise, as well as identify levels above which 100% of individuals exhibited behavioral change, and note inter-specific variation in response curves.

Interaction of Terms

It appears that B+K is a stronger predictor of the number of takes than either factor separately. As a result, similar risk curves can be generated for many different pairs of B and K as long as the sum is held constant. K and A together determine the range over which risk rises from 5% to 95%. Similarly, pairs of K and A over a range of values can generate similar risk curves.

With B=120, K=45, and A=10, the risk function predicts risk is near zero at received levels near 120, and that over 99.9% of takes will occur above 138 dB re 1 μPa. Even with A = 8, 99.9% of takes occur at levels above 135 dB. With A values this large, B is better described as the level at which the risk function is undefined (it requires dividing by 0) rather than the level at which risk becomes negligible. That is, the mathematical basement value and the biological basement value are different. The level at which data from marine mammals show barely detectable risk will be far above the mathematical basement value when K is 45 and A is 8 or 10. When K or A are small, the mathematical and biological B values become similar.

Another way of looking at the difference between the mathematical and biological basement value is to ask how much risk is detectable. In field studies, it will be difficult to distinguish responses that occur in only 5% of individuals from baseline behavior. Even if a study were sensitive enough to detect this, the received level to cause 5% risk is more than 30 dB above the mathematical B value for B=120, K =45 and A=8 or 10. That is, if risk becomes biologically detectable at 120 dB, the B value used in the equation for risk should be far lower. When the model uses the biological B value as the mathematical B value, it does not accurately predict the observed pattern of takes.

Long range effects

The Navy expressed uncertainty over whether there would be long distance effects, even when sound levels were received that are known to cause effects at close range. While I am not aware of observations at 65 nautical miles, responses at over 20 miles have been observed in killer whales to mid-frequency sonar, as well as at over 15 miles to mid-frequency sonar in Dall's porpoises, and harbor porpoises appeared to respond to airguns at over 40 nm (personal observation). The porpoises were responding at distances greater than they would respond to natural predators (killer whales), which are not believed to be detectable at those ranges.

Further evidence of long range responses to noise can be seen in differences in detection rates of some species using acoustic means and ship-based observations. Such studies indicate that species like Pacific right whales and blue whales avoid motorized vessels at distances which place them over the horizon (Wade et al. 2006, Širović 2006).

Uncertainty and Bias

To assess the effects of uncertainty in the parameter values (B, K, and A) on bias in the estimated number of takes, the following method was used. Two spreading loss models were used. A spherical spreading loss model was used, although this was likely to underestimate received levels, particularly at long distances. The other was spherical spreading at close range followed by a cylindrical spreading loss at longer distances model. An accurate model would depend on actual conditions, which would vary from one sonar exercise to another, both as bottom topography varies from place to place and the structure of the water column varies from time to time. The two models chosen should bracket actual conditions, and will serve for purposes of illustration at this stage. In both models, absorption at 3.5 kHz was used to correct for excess attenuation (Richardson et al. 1995). A source level of 235 dB re 1 µPa was assumed for purposes of illustration.

Individuals were assumed to be distributed uniformly with distance from the source, although in practice, action areas will be large enough that density could reasonably be expected to vary. The action area was divided into concentric rings 10 meters across. As the diameter of the ring increased, the area within the ring increased:

$$A = \pi r_o^2 - \pi r_i^2$$

where r_o is the outer diameter and r_i is the inner diameter of the ring.

The risk was calculated for individuals within the ring using the Navy equation, and the relative number of individuals experiencing that risk level was based on the area of the ring. As in the equation for the individuals, the cumulative impact on the population was normalized to 1 based on the Navy default parameters. The effects of uncertainty were observed by allowing the parameters to vary above and below the default values.

Using this model, the contributions of the innermost rings were small, due to their small area, and the contribution of the outermost rings were small, due to the low risk experienced by individuals in those ring. Figures 1-20 show the shape of the risk function and the relative numbers of takes that would occur as a function of received level for a variety of parameter value combinations.

Selected values of B, K and A were used to calculate relative effects, and the results are shown in Table 2 for a spherical spreading model, and Table 3 for a model that assumes spherical spreading for the first 2 km and then cylindrical spreading after that. The default values are shown in bold. Take numbers are based on Alternative 3 in the Hawaii

Range Complex SDEIS (Dept. Navy 2008b), which in turn is based on the No Action Alternative, Table 3.3.1-1. Where the number of takes approaches the size of the population, the actual number of takes will be smaller than shown in the table. However, individuals will be taken multiple times and the duration of takes will be longer than if the calculated number of takes were small. Presumably, longer and more frequent takes of individuals will have more impact on the population than takes due to single exposures.

Table 2. Sensitivity Analysis based on a spherical spreading model

B	K	A	Spreading Model	Relative Effect	Humpback takes	Striped Dolphin takes	Basis
80	45	10	Inv. Square	185.29	2,826,414	867,898	Vary B
90	45	10	Inv. square	75.25	1,147,864	352,471	Vary B
100	45	10	Inv. square	23.92	364,876	112,041	Vary B
110	45	10	Inv. square	5.68	86,643	26,605	Vary B
120	**45**	**10**	**Inv. square**	**1.00**	**15,254**	**4,684**	**SDEIS**
130	45	10	Inv. square	0.14	2,136	656	Vary B
140	45	10	Inv. square	0.02	305	94	Vary B
120	5	10	Inv. Square	167.18	2,550,164	783,071	Vary K
120	15	10	Inv. square	62.22	949,104	291,439	Vary K
120	25	10	Inv. square	18.33	279,606	85,858	Vary K
120	35	10	Inv. square	4.47	68,185	20,937	Vary K
120	**45**	**10**	**Inv. square**	**1.00**	**15,254**	**4,684**	**SDEIS**
120	55	10	Inv. square	0.23	3508	1077	Vary K
120	65	10	Inv. square	0.06	915	281	Vary K
120	75	10	Inv. square	0.01	153	47	Vary K
120	45	1	Inv. square	42.40	646,770	198,602	Vary A
120	45	5	Inv. square	3.27	49,881	15,317	Vary A
120	45	8	Inv. square	1.40	21,356	6,558	Vary A
120	**45**	**10**	**Inv. square**	**1.00**	**15,254**	**4,684**	**SDEIS**
120	45	12	Inv. Square	0.80	12,203	3,747	Vary A
120	45	20	Inv. Square	0.52	7,932	2,436	Vary A
120	45	100	Inv. Square	0.39	5,949	1,827	Vary A
120	**45**	**10**	**Inv. square**	**1.00**	**15,254**	**4,684**	**SDEIS**
105	15	10	Inv. square	251.39	3,834,703	1,177,511	*Orcinus*
105	15	8	Inv. square	250.96	3,828,144	1,175,497	
70	25	10	Inv. square	1070.25	16,325,594	5,013,051	*Phocoena*
70	25	8	Inv. square	1067.49	16,283,492	5,000,123	*Phocoena*

Table 3. Sensitivity analysis based on a model with spherical spreading for 2 km followed by cylindrical spreading.

B	K	A	Spreading Model	Relative Effect	Humpback takes	Striped Dolphin takes	Basis
80	45	10	Hybrid	132.20	2,016,579	619,225	Vary B
90	45	10	Hybrid	65.31	996,239	305,912	Vary B
100	45	10	Hybrid	25.30	385,926	118,505	Vary B
110	45	10	Hybrid	6.67	101,744	31,242	Vary B
120	**45**	**10**	**Hybrid**	**1.00**	**15,254**	**4,684**	**SDEIS**
130	45	10	Hybrid	0.08	1,220	325	Vary B
140	45	10	Hybrid	.005	76	23	Vary B
120	5	10	Hybrid	127.23	1,940,771	595,947	Vary K
120	15	10	Hybrid	59.67	910,213	279,496	Vary K
120	25	10	Hybrid	21.39	326,238	100,177	Vary K
120	35	10	Hybrid	5.37	81,901	25,149	Vary K
120	**45**	**10**	**Hybrid**	**1.00**	**15,254**	**4,684**	**SDEIS**
120	55	10	Hybrid	0.18	2,724	836	Vary K
120	65	10	Hybrid	0.04	570	175	Vary K
120	75	10	Hybrid	0.01	143	44	Vary K
120	45	1	Hybrid	34.16	521,077	160,005	Vary A
120	45	5	Hybrid	3.65	55,665	17,093	Vary A
120	45	8	Hybrid	1.51	23,016	7,067	Vary A
120	**45**	**10**	**Hybrid**	**1.00**	**15,254**	**4,684**	**SDEIS**
120	45	12	Hybrid	0.73	11,103	3,409	Vary A
120	45	20	Hybrid	0.35	5,353	1,644	Vary A
120	45	100	Hybrid	0.17	2,593	796	Vary A
120	**45**	**10**	**Hybrid**	**1.00**	**15,254**	**4,684**	**SDEIS**
105	15	10	Hybrid	171.9	2,622,166	805,181	*Orcinus*
105	15	8	Hybrid	171.3	2,612,718	802,279	
70	25	10	Hybrid	516.41	7,877,318	2,418,864	*Phocoena*
70	25	8	Hybrid	514.46	7,847,573	2,409,731	*Phocoena*
80	45	10	Hybrid	132.20	2,016,579	619,225	"Average"species
100	40	10	Hybrid	40.88	623,525	191,464	Stringent criteria
120	45	10	Social75	1.004	15,315	4,703	75% step
120	45	10	Social50	1.06	16,169	4,965	50% step
120	45	10	Social25	1.49	22,728	6,979	25% step
120	45	10	Social10	3.02	46,067	14,146	10% step

An interesting characteristic of the Navy model is that uncertainty causes it to be biased to underestimate risk. The reason for this bias is that the area receiving higher than the level of sound associated with a 50% risk based on default values is smaller than the area receiving lower levels. Thus if a species is 10 dB more sensitive than predicted (the B value), the cumulative risk is underestimated by a factor of 5.68, while if it is overestimated by 10 dB the correction is 0.14. Similarly, if the error is 20 dB, the correction factors are 23.92 and 0.02, respectively. However, the values average to 6.15, not 1 as would be the case if the default values provided an unbiased estimate. Errors in K show a similar pattern.

Likewise, if the default value of A is too low, it makes little difference in the estimated number of takes. However, if the default value of A is higher than the actual value, the effect on the population can be seriously underestimated when default values are used.

It should also be noted that the bias increases with increasing uncertainty.

Another source of uncertainty is propagation. As noted above, there is uncertainty over propagation that depends on the structure of the water column. Expectations can be based on historical measurements, and actual conditions can be measured to allow re-running propagation models with actual conditions. However, when received levels as a function of distance are higher than predicted, the result is asymmetrical relative to an error of the same magnitude in the opposite direction, as is the case for errors in the receiver parameters. E.g., when a sound channel forms, the area receiving enough noise to cause takes will dramatically increase.

Finally, the magnitude of the difference between parameter values based on reanalysis of the datasets used by the Navy (with harbor porpoises added, a species included in the AFAST Draft DEIS, Dept. Navy 2008a), and the Navy analysis should be emphasized. The number of takes predicted for an average species differs by a factor of more than 100. For humpbacks, this suggests individuals would be taken an average of about 250 times. Of course, when refresh times are taken into account, the number of retakes would be below this number, but the duration of takes would go up as a result. The cumulative effect on the population is likely to be far higher with the increased number and duration of takes predicted when more realistic parameters are used than when the Navy parameters are used.

SEL vs. SPL

Studies with captive marine mammals suggest that SEL provides a good predictor of Temporary Threshold Shift. That is, there is a tight relationship among signal strength, duration, and TTS. However, for behaviorally mediated effects, this relationship is likely to be different. SPL is likely to qualitatively determine the response for signals longer than 1 ms in duration. As long as signals are produced sufficiently often, the duration from the first signal to the last is likely to be more important than the SEL. That is, for

low received levels, one second signals produced every 40 seconds for 120 minutes are likely to have more impact than a continuous signal that lasts 10 minutes, even though the latter contains far more sound energy (600 seconds versus 180 seconds), as a behavioral response will be sustained for hours rather than minutes.

When attempting to predict effects of takes on the population, a take table with multiple columns should be developed. One based on SEL could be used to characterize direct effects such as threshold shifts. The next two should be based on SPL. The first of these should be analyzed to evaluate the total number of individuals that would change their behavior as a result of noise exposure, with particular attention paid to exposure in high risk areas (canyons, near shore, near shipping lanes) for potential indirect injuries. The third analysis would consider duration of exposure (in hours of exercise rather than in the SEL sense) to determine whether factors such as stress, displacement from preferred habitat, changes in foraging success and predation risk, etc., would result in cumulative effects that would alter population growth in a manner equivalent to lethal removals (Bain 2002a).

Summary

In summary, development of a function that recognizes individual variation is a step in the right direction. However, the selected equation is likely to produce underestimates of takes. This is due both to social factors increasing the likelihood of a response at low exposure levels, and asymmetries in the number of individuals affected when parameters are underestimated and overestimated due to uncertainty. Thus it will be important to use the risk function in a precautionary manner.

The sensitivity analysis reveals the importance of using as many datasets as possible. First, for historical reasons, there has been an emphasis on high energy noise sources and the species tolerant enough of noise to be observed near them. Exclusion of the rarer datasets demonstrating responses to low levels of noise biases the average parameter values, and hence underestimates effects on sensitive species. In particular, exclusion of the Navy's own interpretation of harbor porpoise data resulted in an increase of B+K by 11 dB, and a reduction in estimated takes by a factor of about 5. Second, uncertainty is correlated with bias. That is, even if a representative set of noise exposure-response data are used to calculate parameter values, the statistical uncertainty resulting from small samples results in biased parameter estimates that lead to underestimation of effects. Thus when estimating takes, it will be important to correct for bias. When estimating population effects on poorly known species, it will be important to be precautionary.

An important error in the selection of parameter values was in interpretation of existing data. Extrapolating behavioral changes in beluga and killer whales and bottlenose dolphins trained to tolerate physical harm that is in their long-term best interest to the threshold for onset of any physical harm in wild individuals is problematic. A similar mistake was made with the right whale data. The level at which 100% of individuals responded was used as the value at which 50% of individuals responded (B+K).

Likewise, the level at which 100% of killer whales responded to mid-frequency sonar is less than the value derived for B+K in the HRC SDEIS (Dept. Navy 2008b).

The "broad overview" of studies reported responses to received levels of 120 dB re 1 μPa by 50% of individuals. That is, 120 dB re 1 μPa should be taken as a "default" value for B+K, not B. Studies which looked at the level at which statistically significant changes were observed, rather than the level at which 50% of individuals responded found lower levels for B. As a result, B is overestimated, and B+K (the level at which risk is 50%) is as well. The use of data from trained dolphins and white whales biased the average B+K value upward. The exclusion of the effects of AHD's and ADD's on harbor porpoises further biases these values, though the sensitivity analysis suggests that using average values to extrapolate takes is unlikely to be accurate due to the broad range of inter-specific variation.

It is likely that biological B values should be in the range from just detectable above ambient noise to120 dB re 1 μPa. The resulting mathematical B value could be tens of dB lower, not the 120 dB re 1 μPa proposed. For many species, risk may approach 100% in the range from 120-135 dB re 1 μPa, putting K in the 15-45 dB range. A values do not seem well supported by data, and in any case, are likely to be misleading in social species as the risk function is likely to be asymmetrical with a disproportionate number of individuals responding at low noise levels. Re-evaluating the datasets identified by the Navy and including harbor porpoises, an average B+K value of 125 dB was found, and the over-representation of species that fare well in captivity likely biases the average above what it would be for all species. Rather than one equation fitting all species well, parameters are likely to be species typical. As realistic parameter values are lower than those employed in the HRC SDEIS (Dept. Navy 2008b), AFAST DEIS (Dept. Navy 2008a) and related DEIS's, take numbers should be recalculated to reflect the larger numbers of individuals likely to be taken. The difference between the parameter values estimated here and those used in the SDEIS suggests takes were underestimated by two orders of magnitude.

The large number of takes predicted when more sensitive species are used as sources of the parameters indicates that many individuals are likely to be taken many times, and the potential for population scale effects to result from small behavioral changes becomes significant.

Assuming spherical spreading out to 2 km followed by cylindrical spreading, B=120, K=45 and A=10 (the Navy values), most takes occur where the received level is greater than 157 dB re 1 μPa and the distance is less than 13 km. With stringent criteria for what constitutes a take derived in the reanalysis (B=120, K=20, A=10), most takes would occur where the received level is below 145 db re 1 μPa and the distance is over 43 km. With the average values calculated here (B=80, K=45, and assuming A=10), most takes would occur where the received level is below 135 dB re 1 μPa and the distance is over 80 km. These values predict over 100 times more takes as the Navy values, as well as the need for very different approaches to mitigation.

The Navy recognizes that the occurrence of conditional effects is important to assessing the impact of noise exposure. As such effects are the result of both received levels and environmental conditions, permit conditions will be important in determining these. The potential for conditional harm suggests using mitigation to limit the potential for actual harm. E.g., the risk of causing stranding can be minimized by restricting exercises to areas far from shore. Limiting the duration of exposure can limit the consequences of long-term displacement, risk of injury from prolonged flight, and limit cumulative effects. The risk of causing gas bubble lesions can be minimized by restricting use near canyons, for extended periods of time, and limiting the number of sources. The absolute effects can be minimized by conducting exercises in areas where population density is low, or at times of year when species of concern are absent.

Finally, it will be important to assess the cumulative effects of noise combined with other factors and population status (Wade and Angliss 1997) to assess the likely effects of sonar exercises on marine mammal populations.

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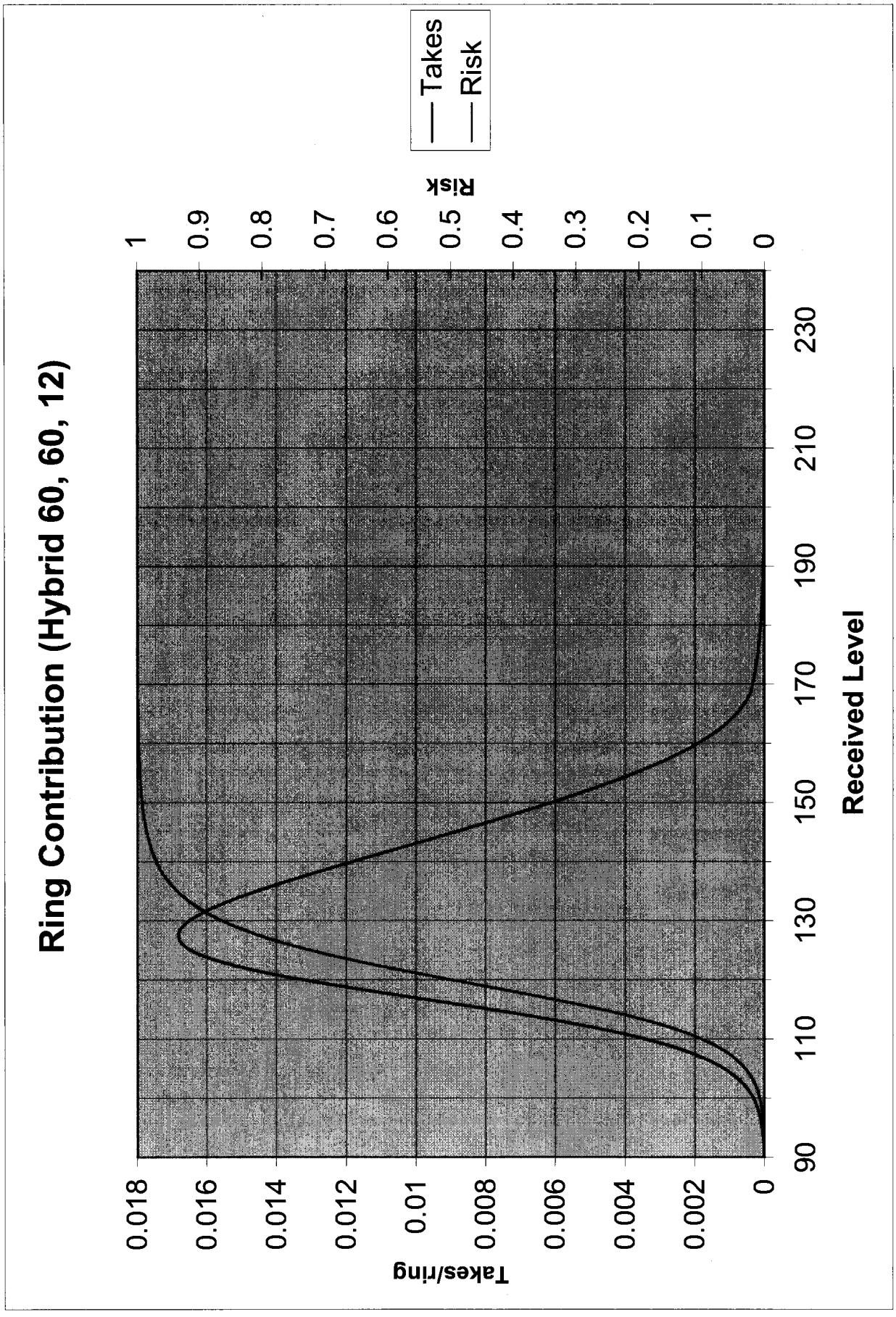
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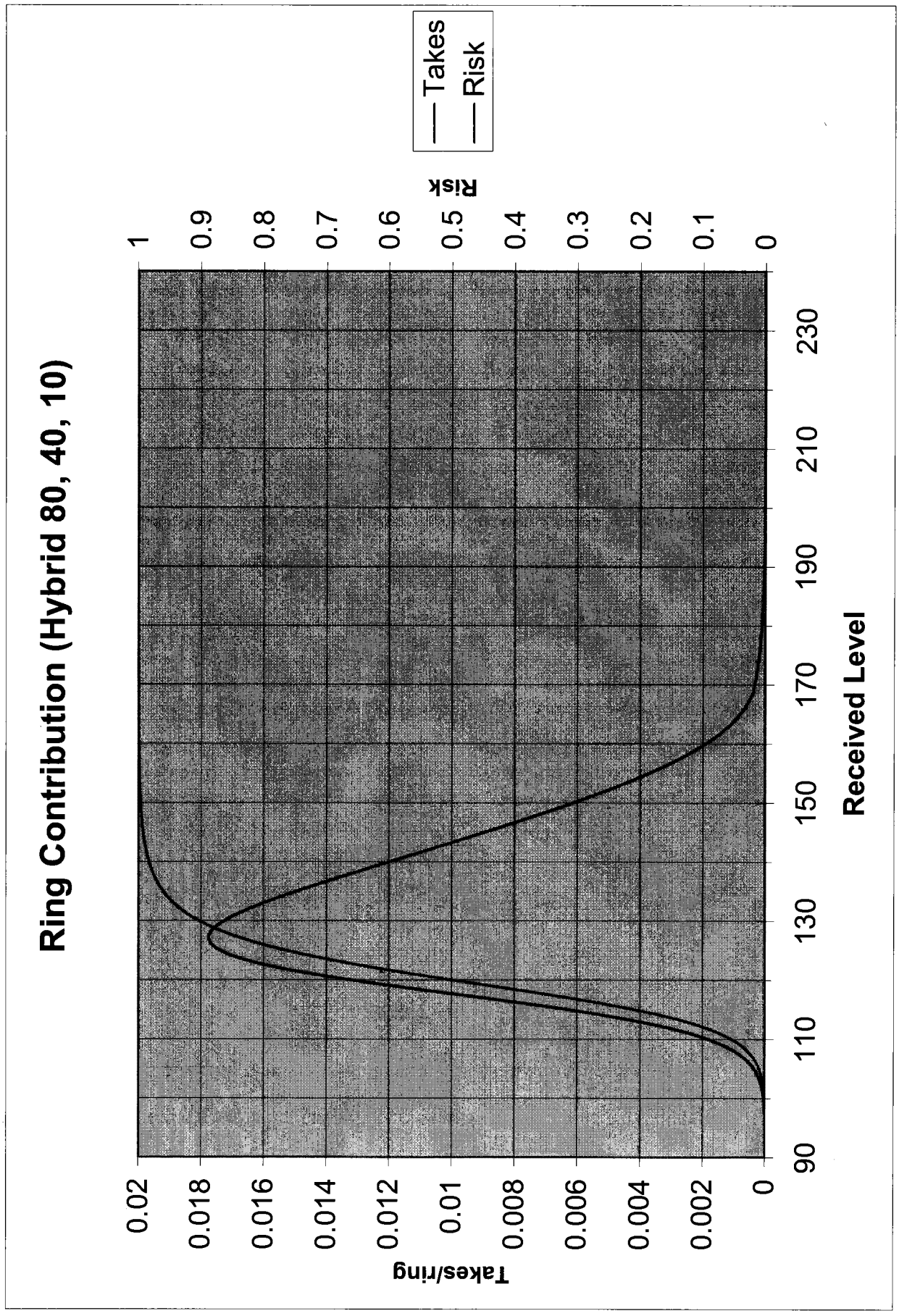
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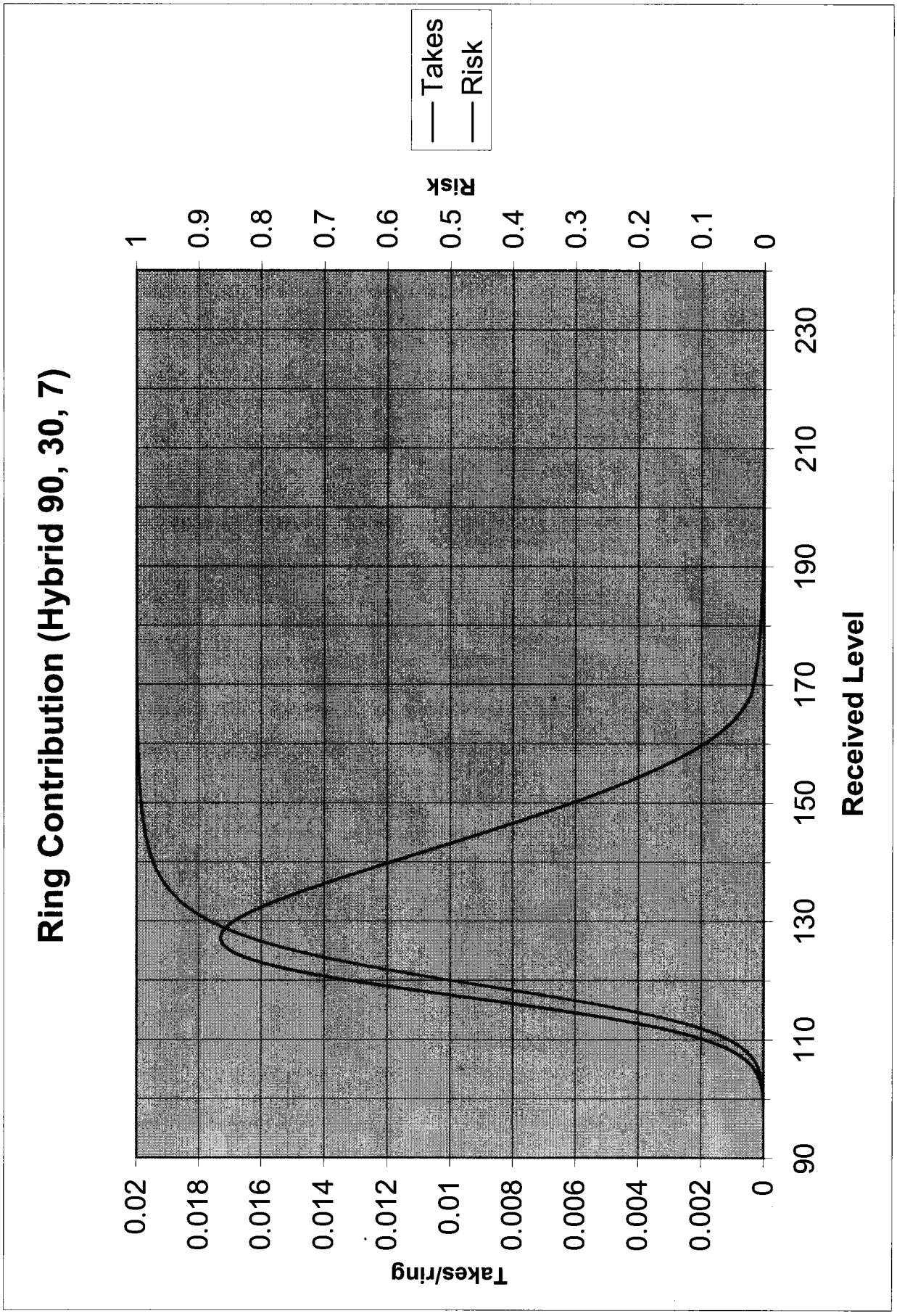
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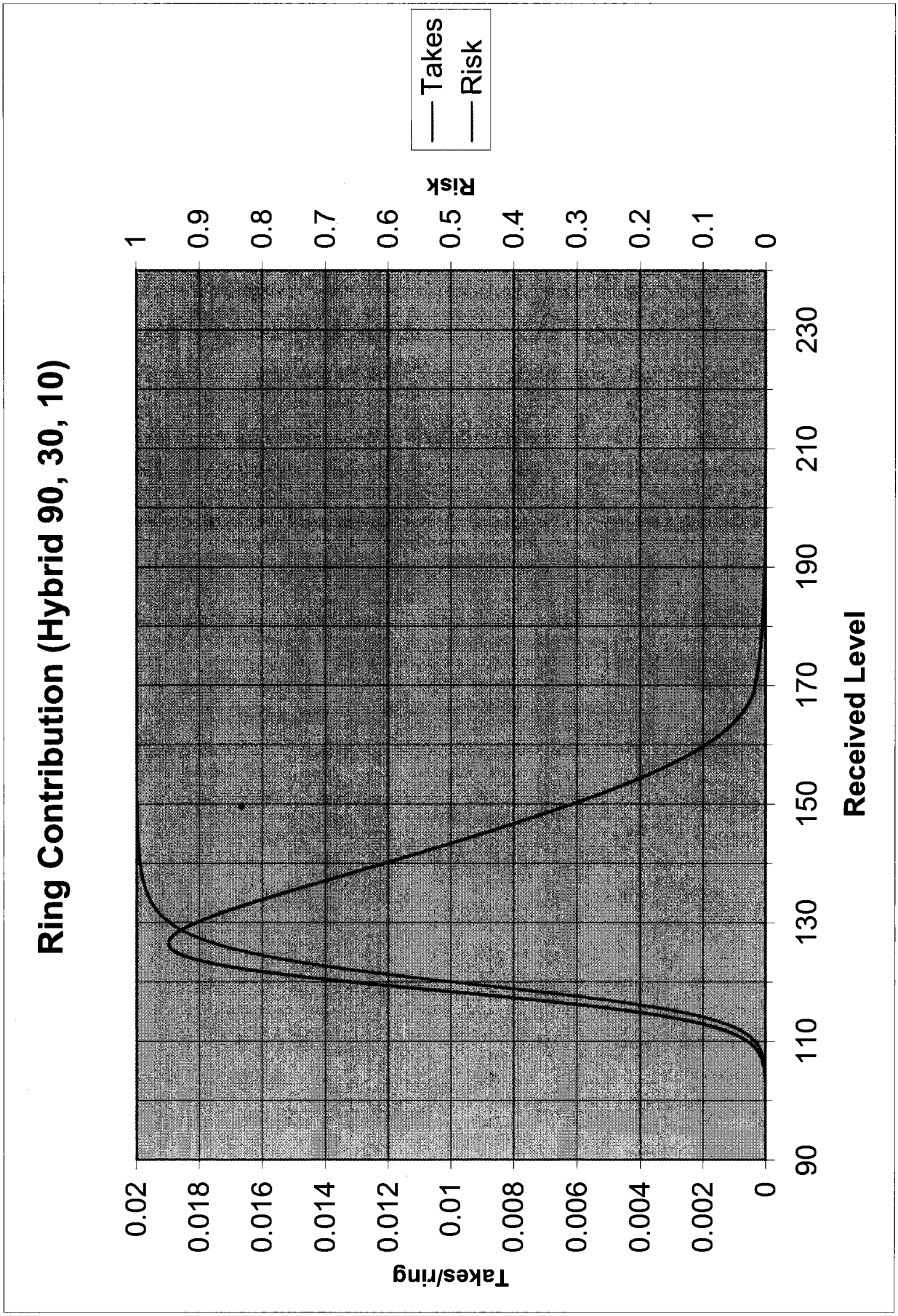
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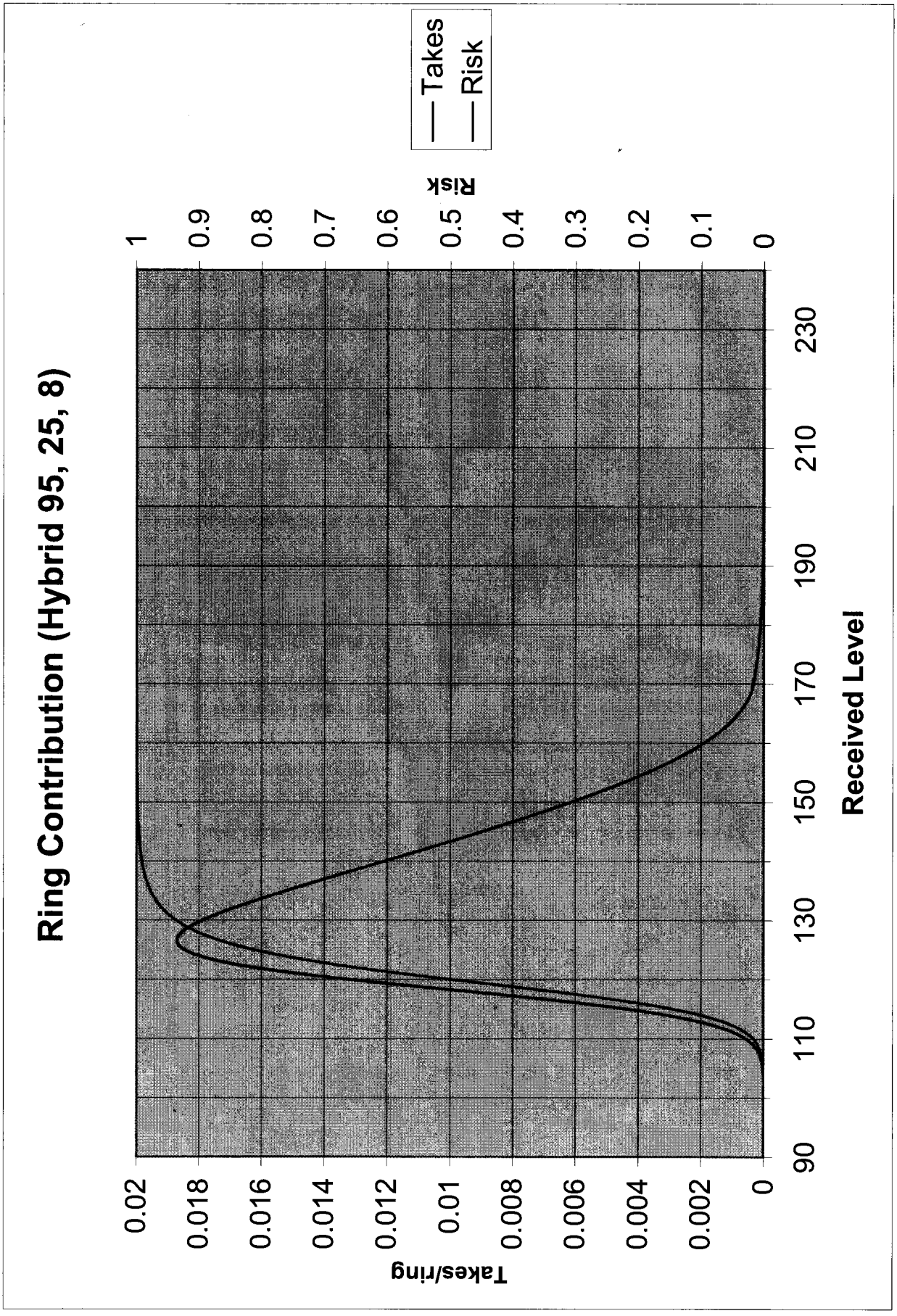
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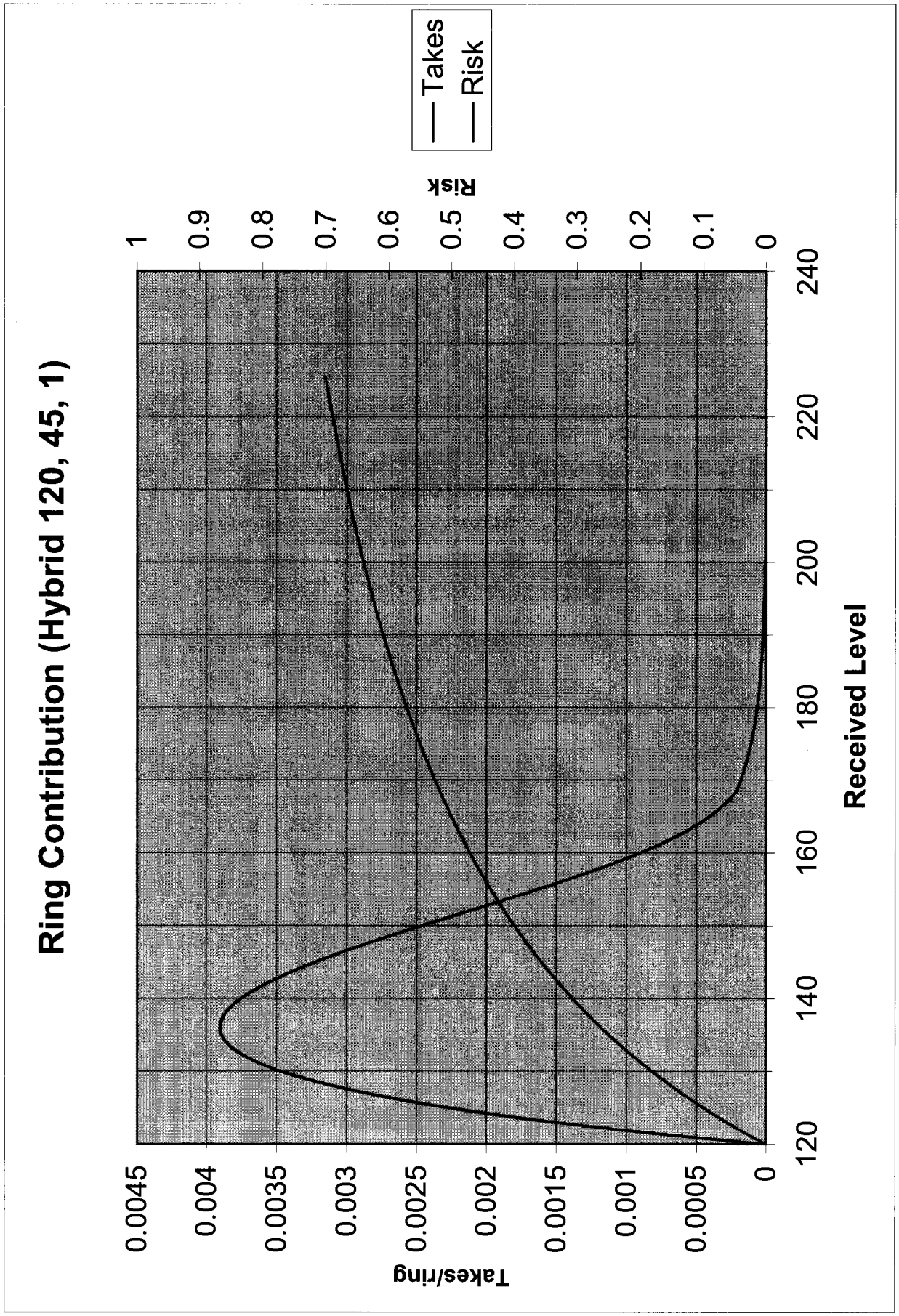
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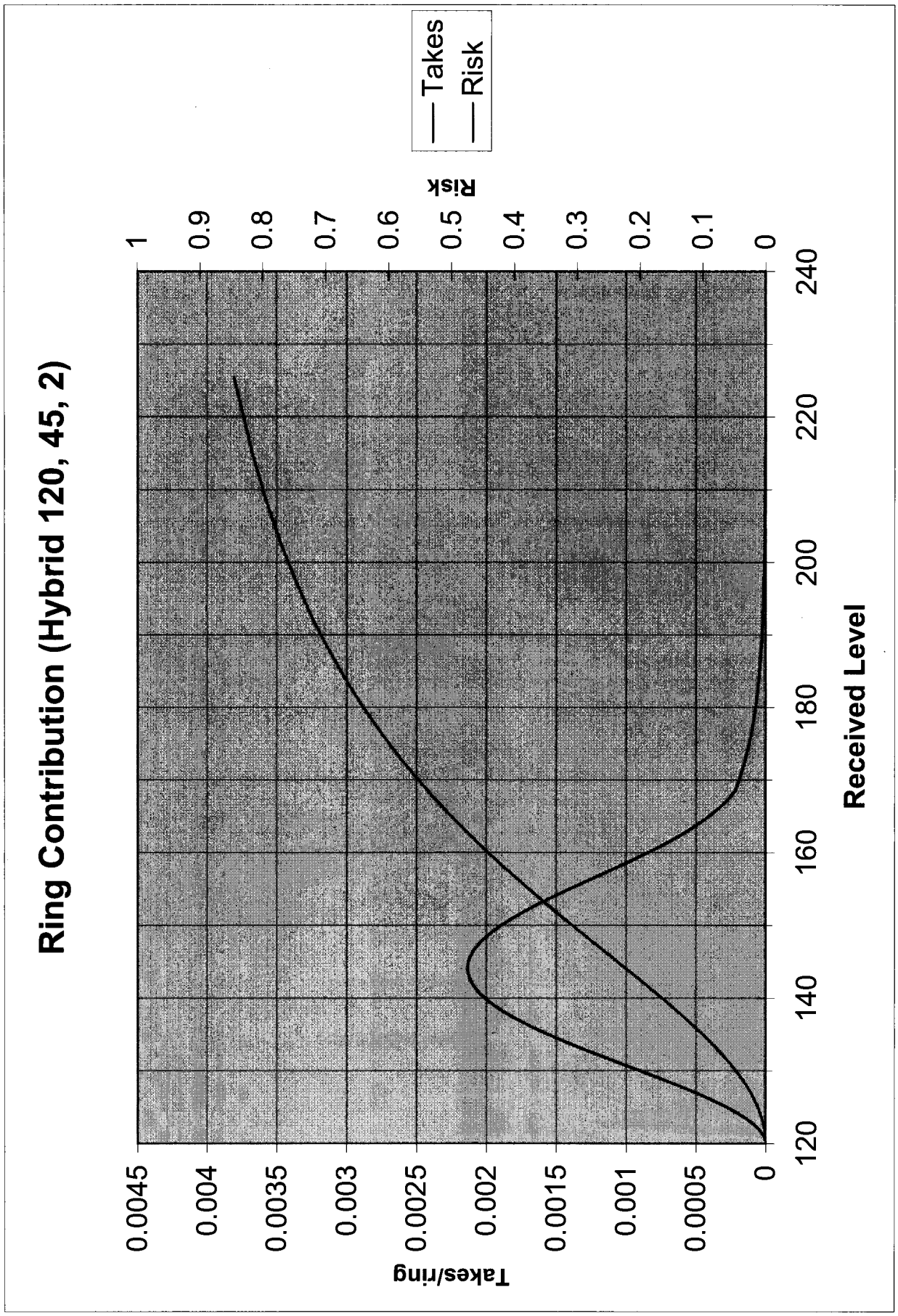
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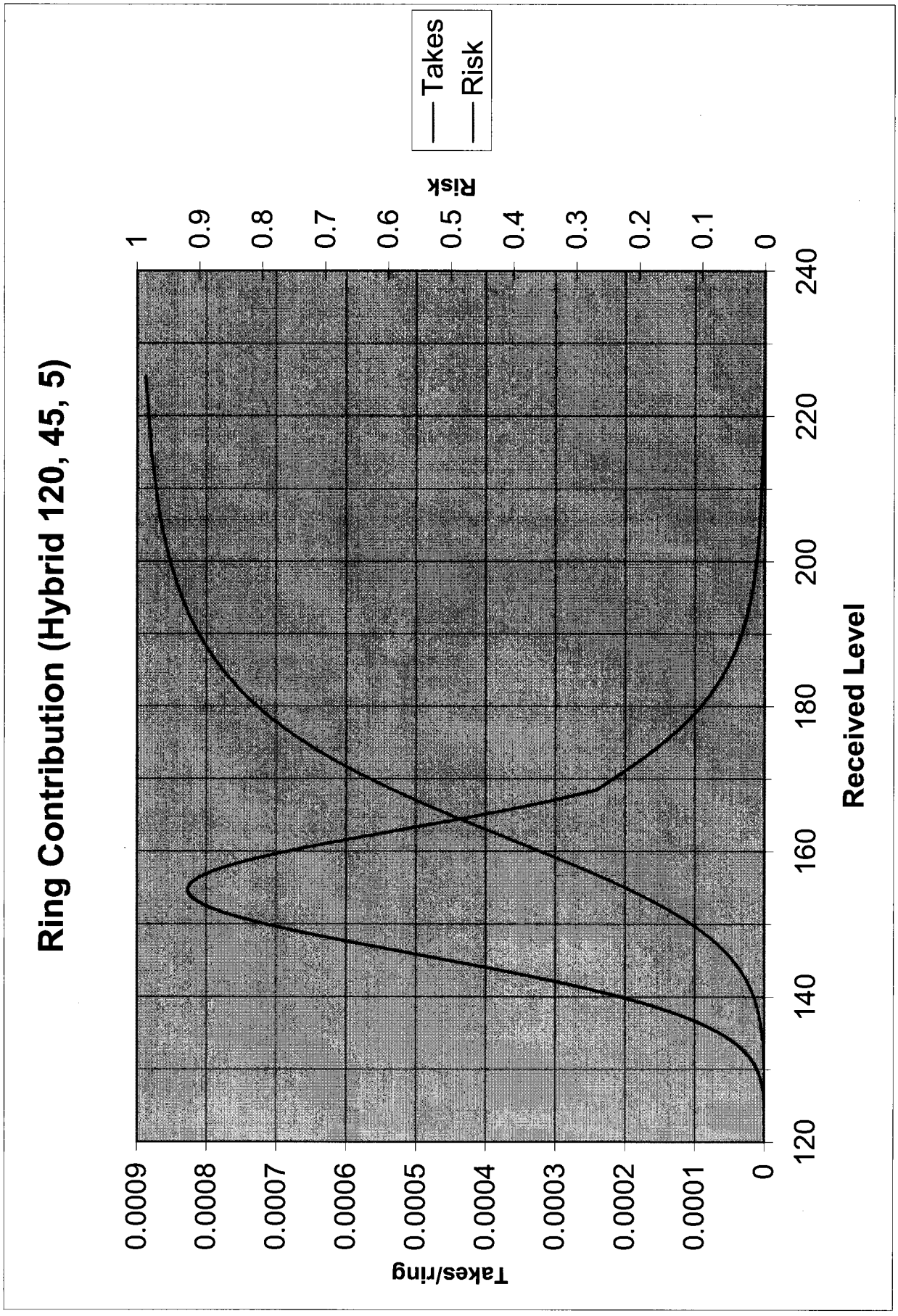
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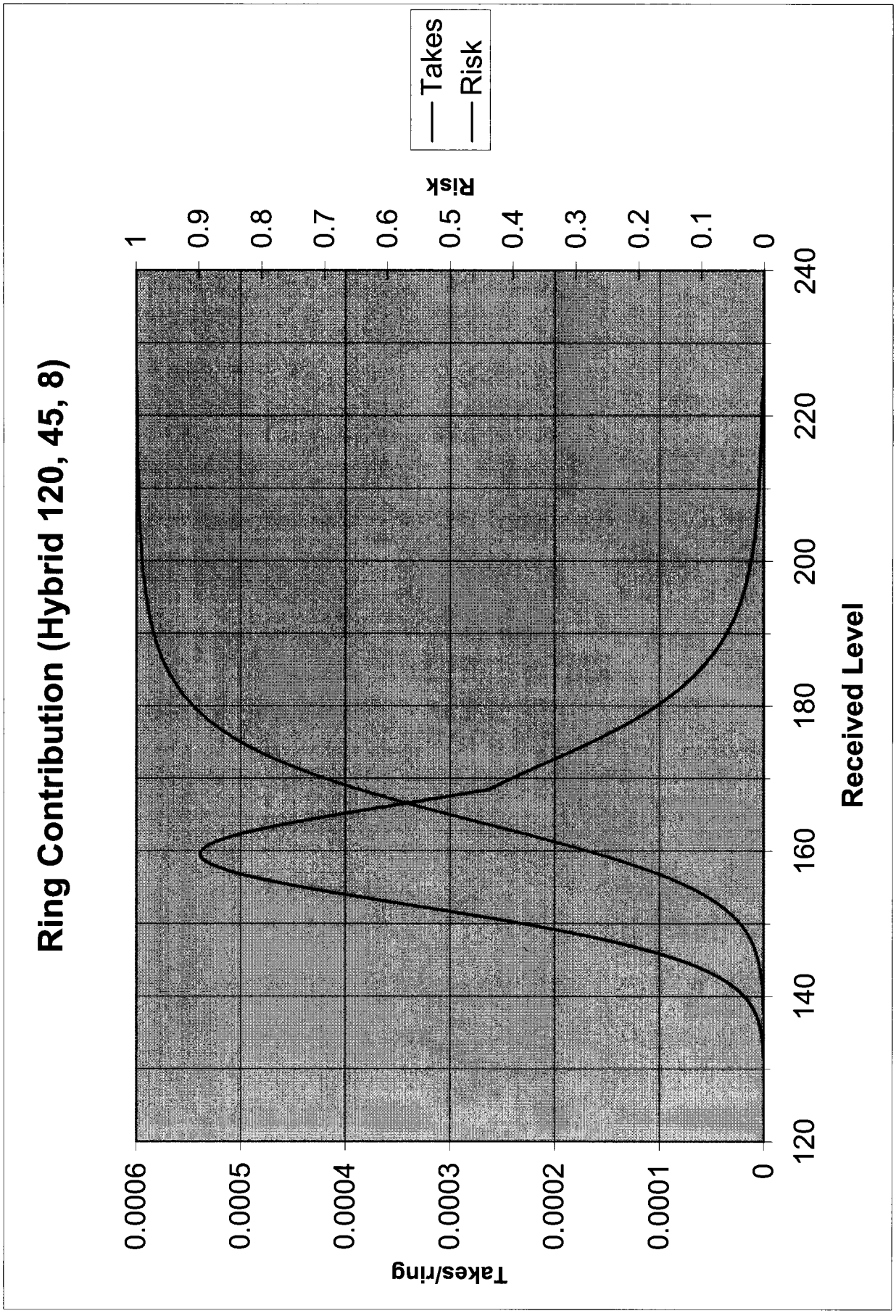
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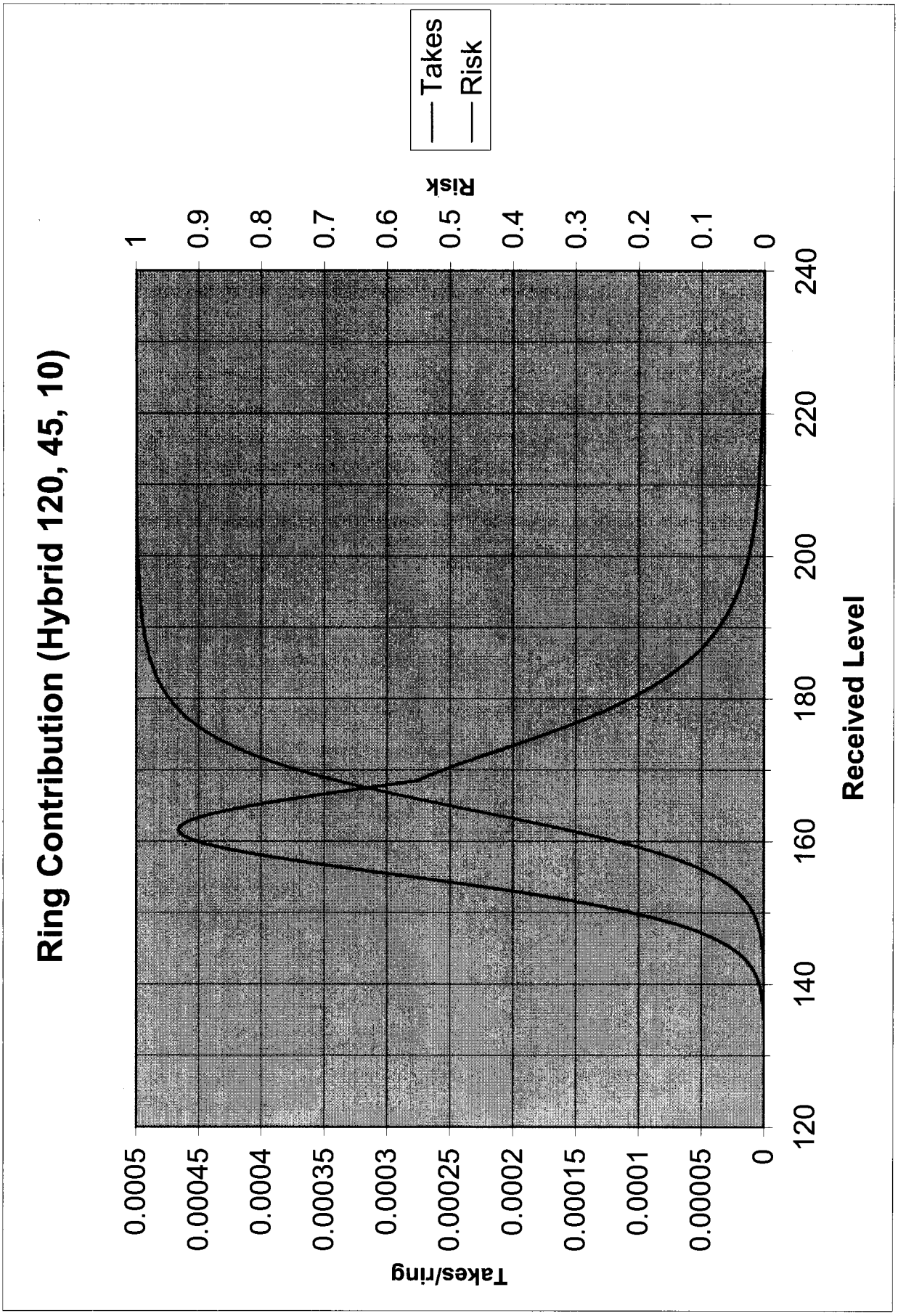
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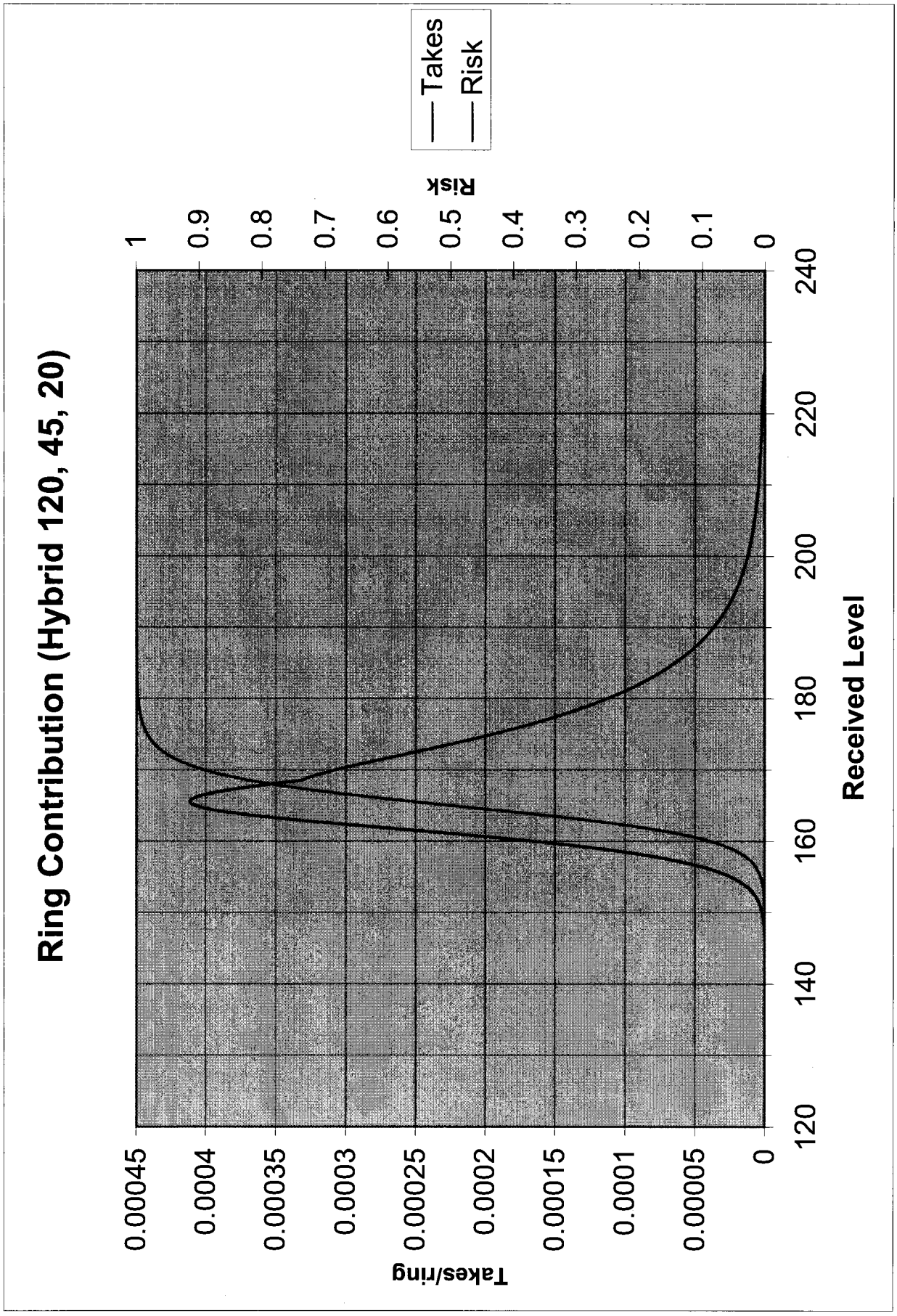
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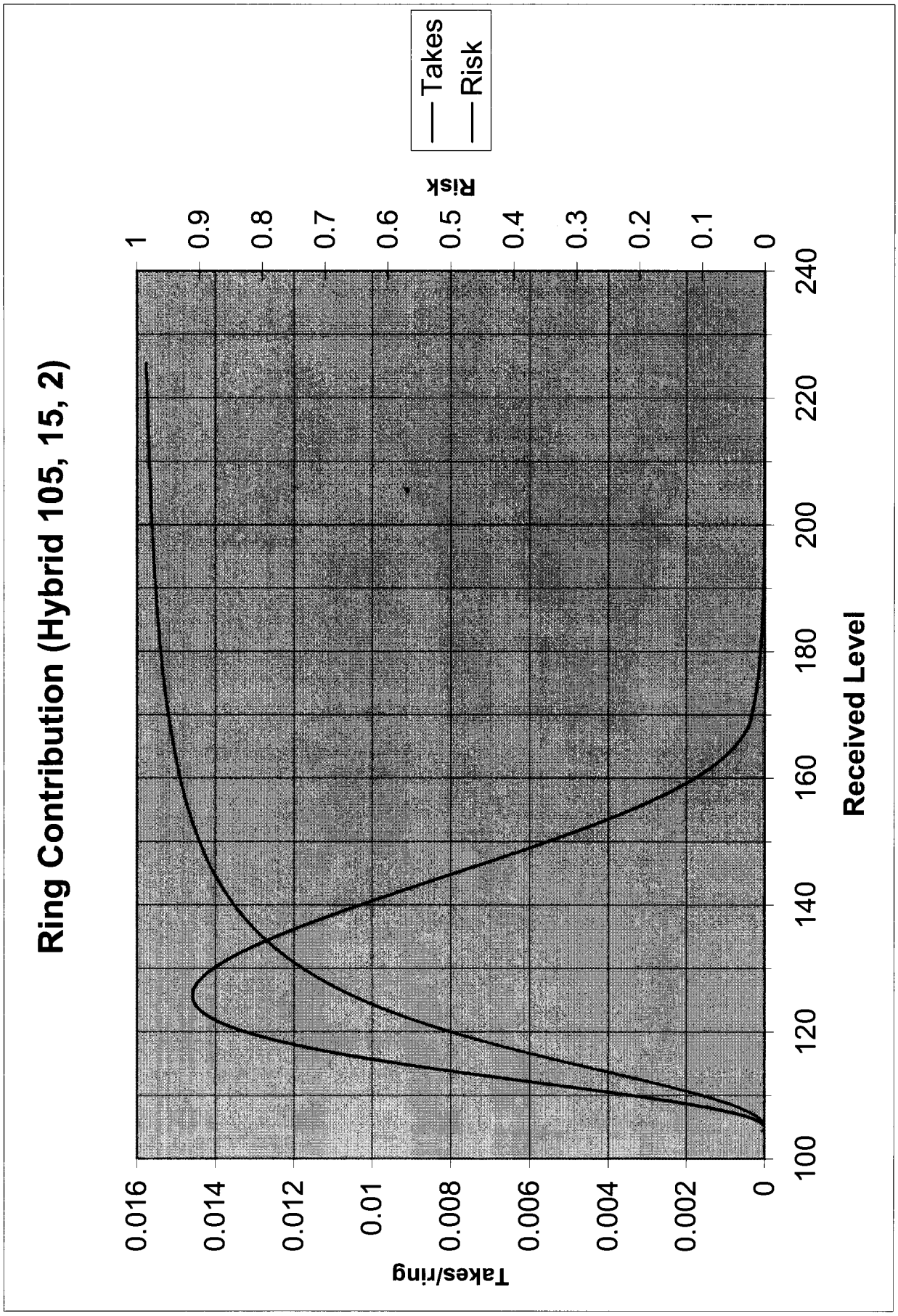
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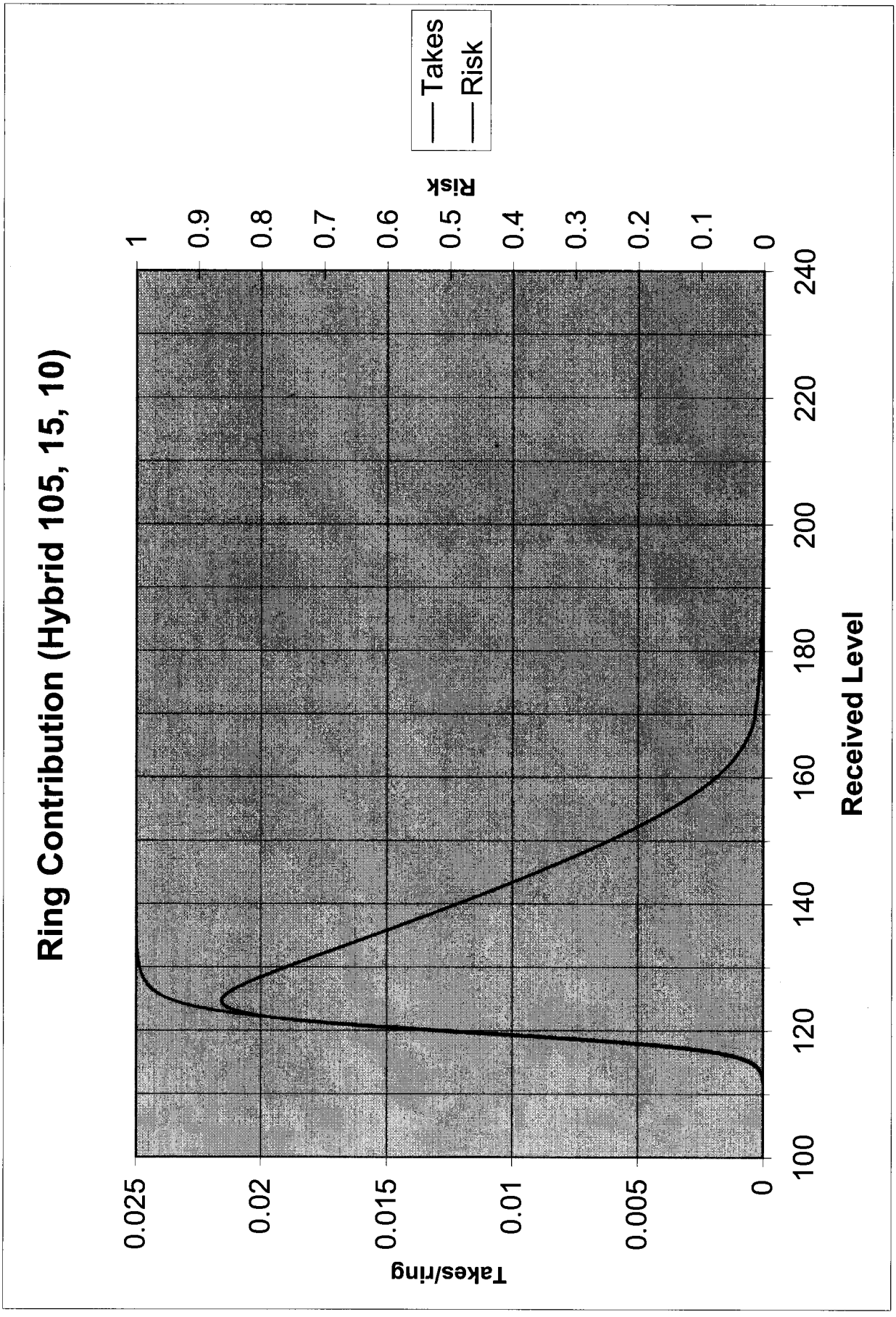
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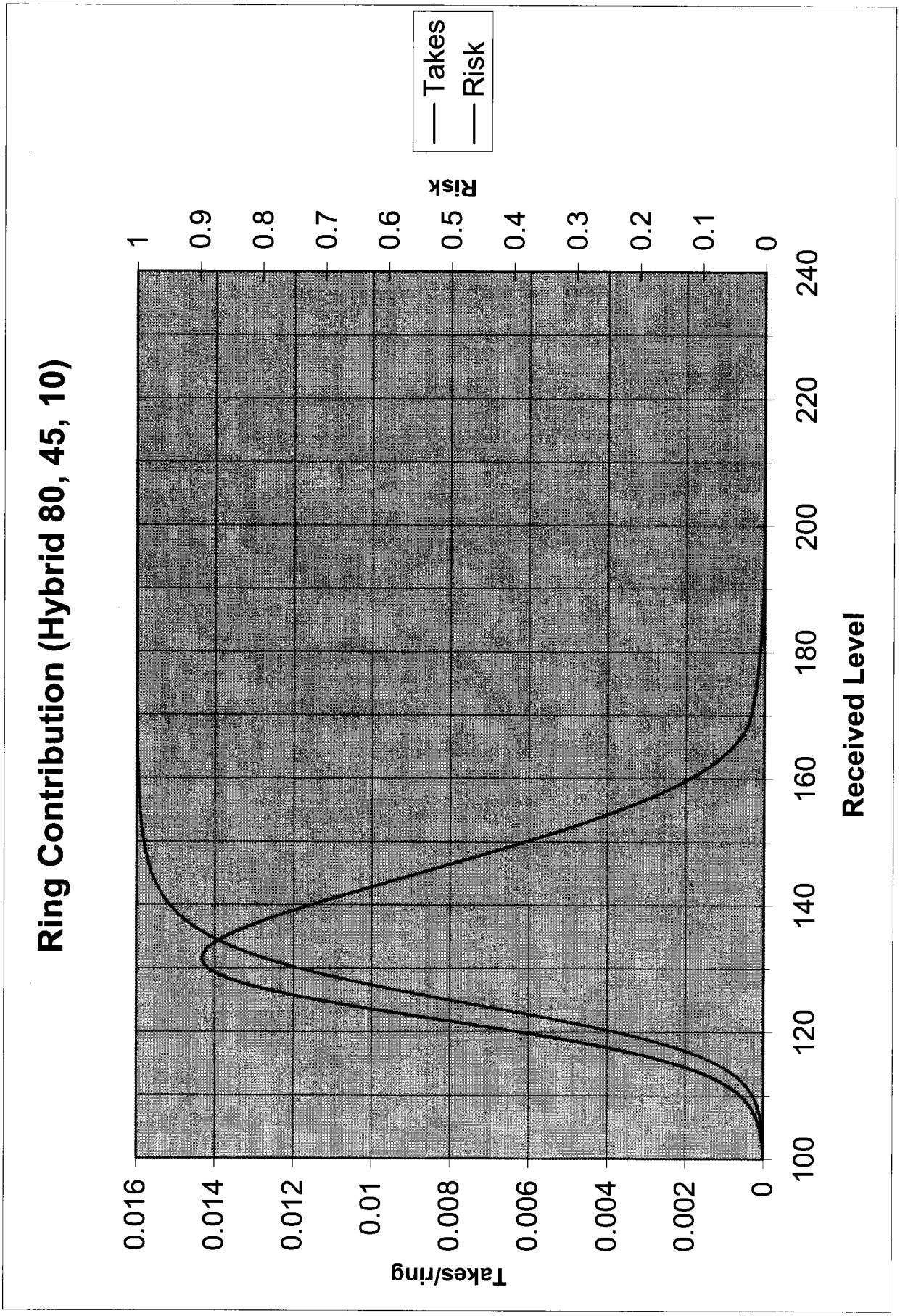
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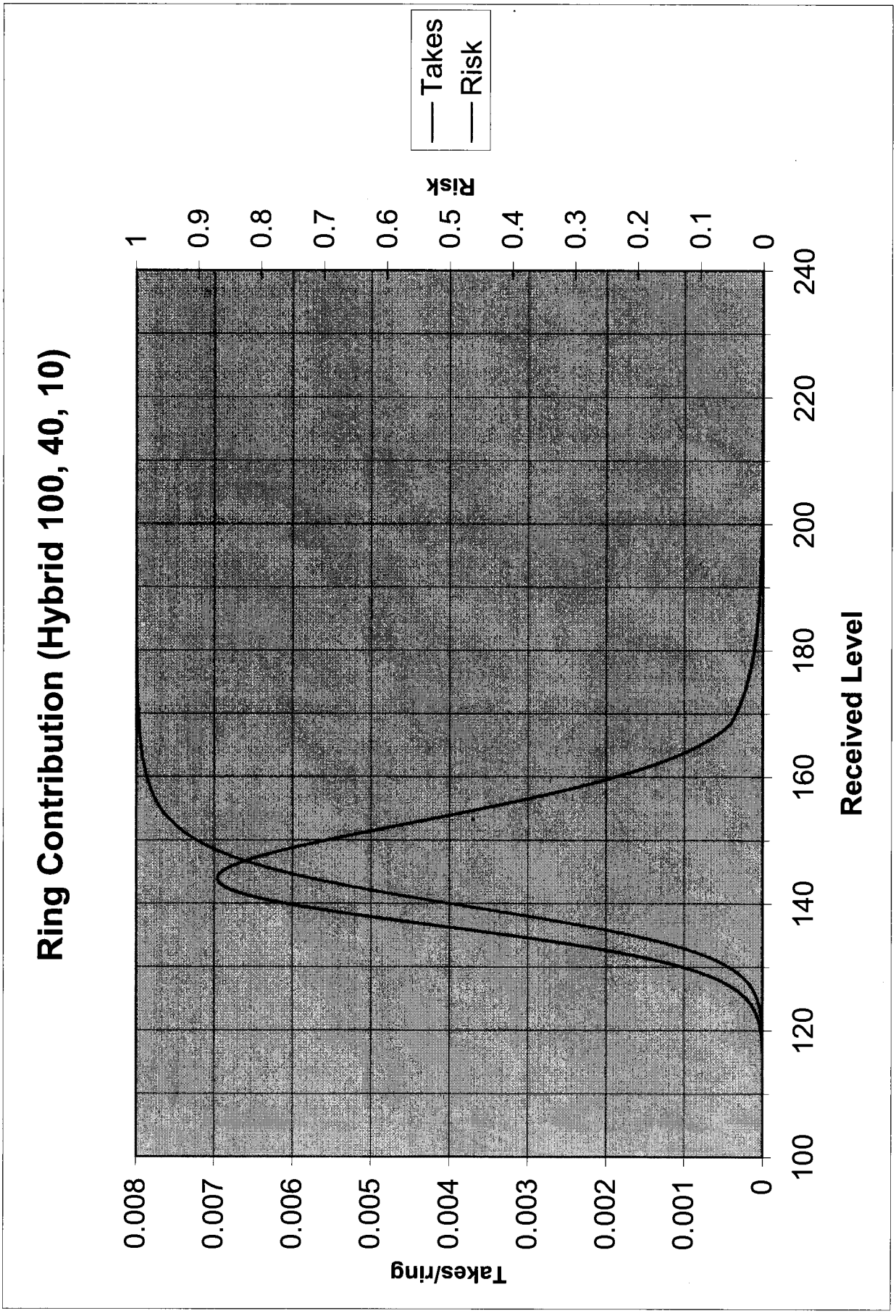
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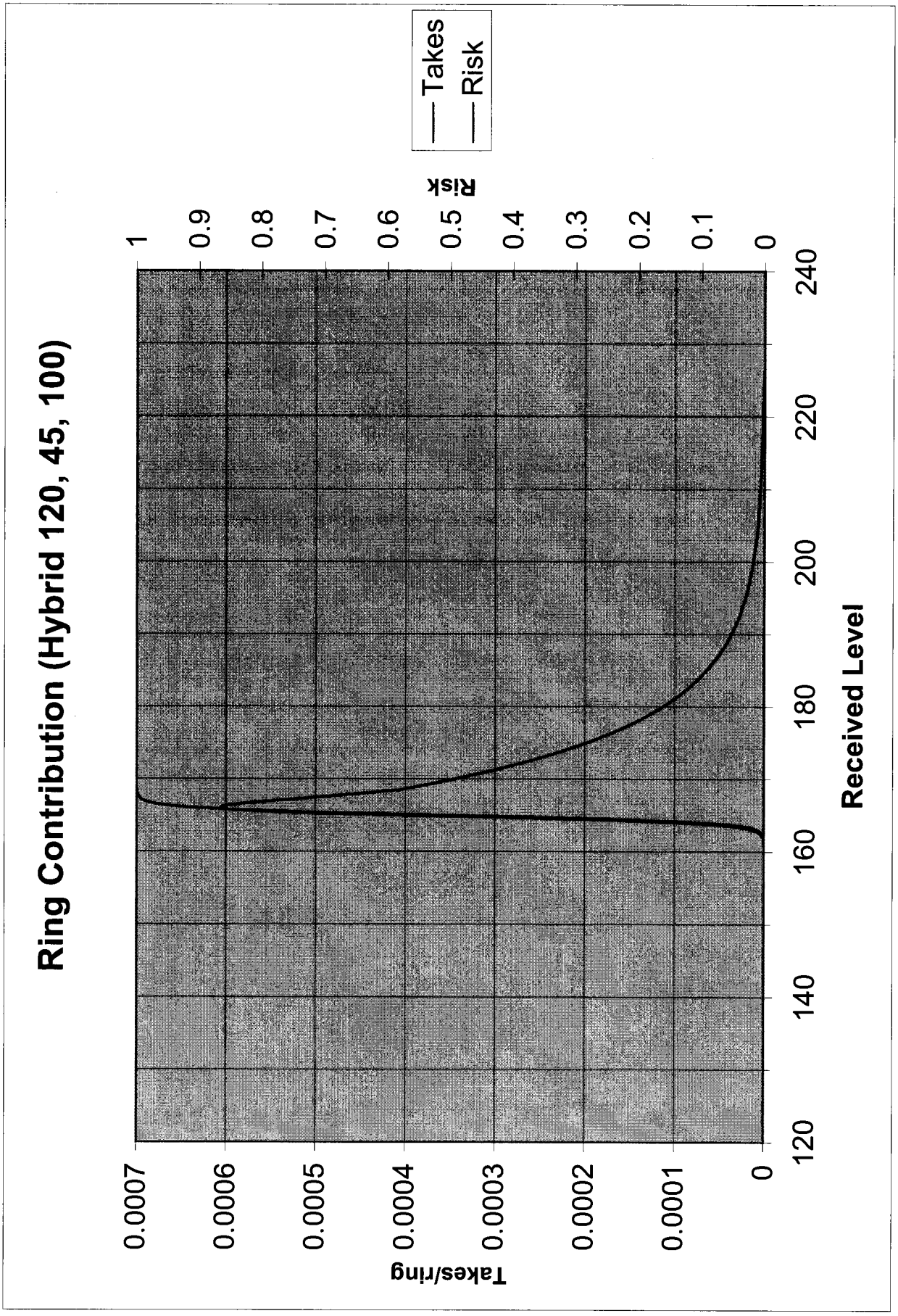
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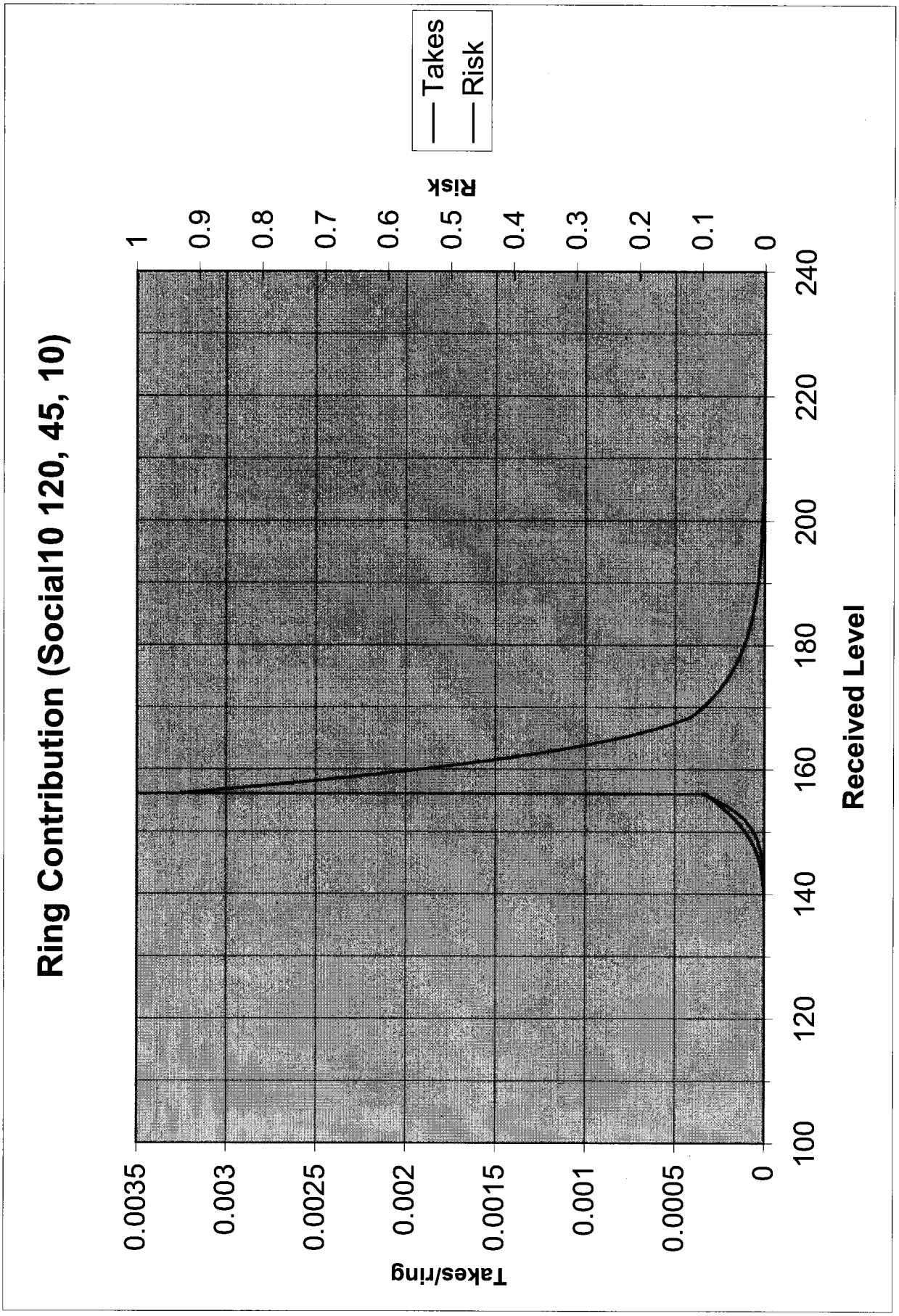
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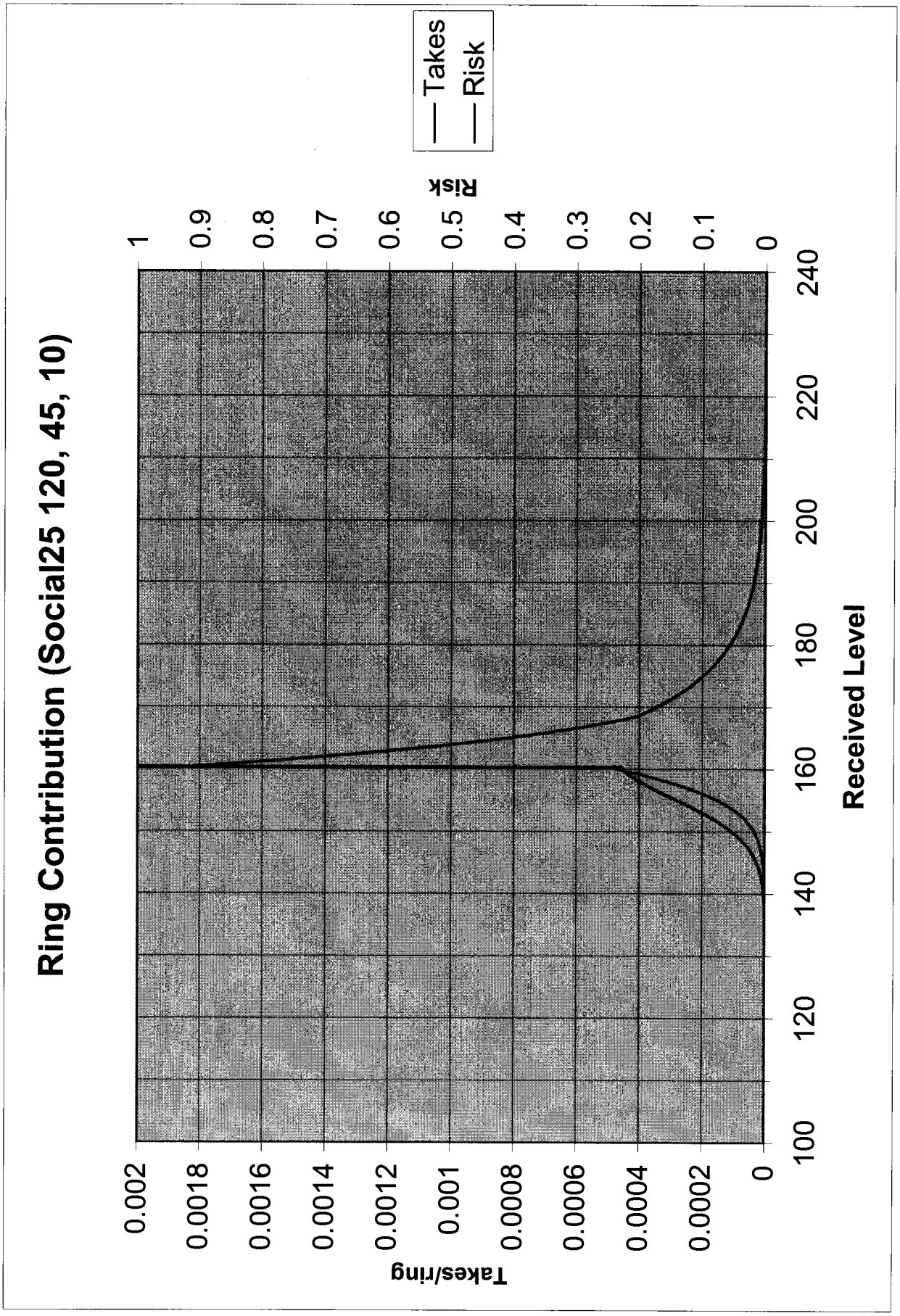
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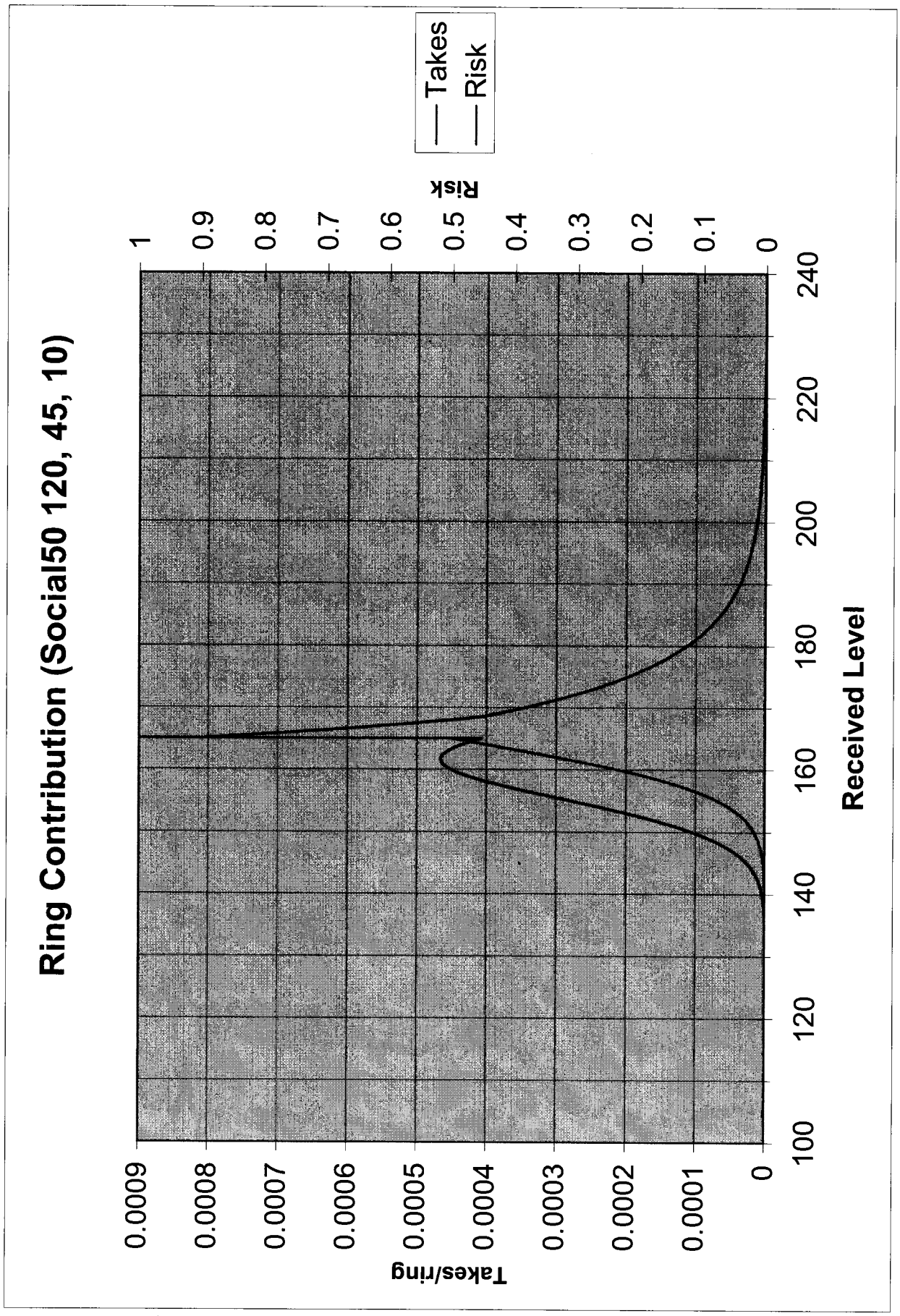
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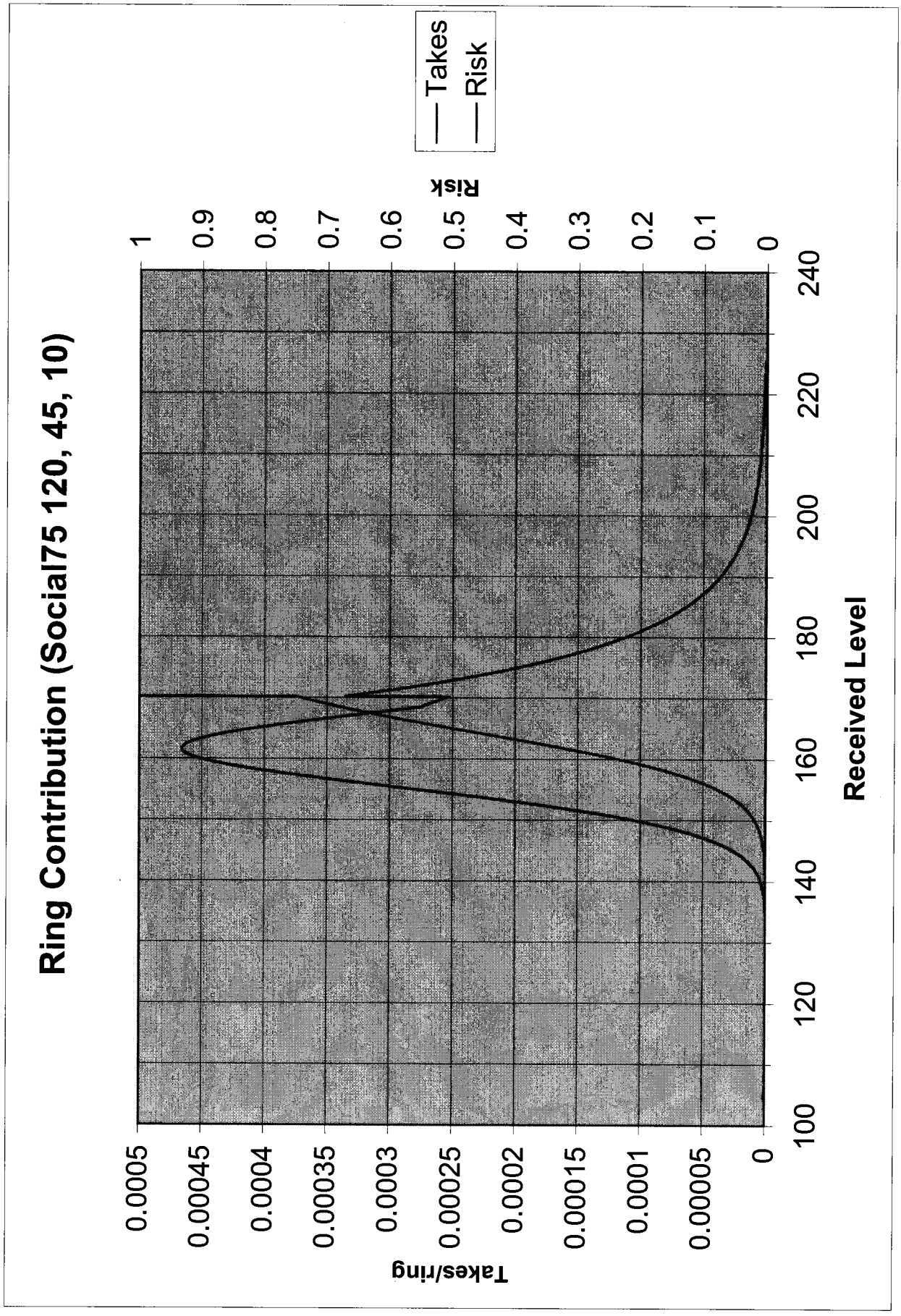
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NATURAL RESOURCES DEFENSE COUNCIL

Via Email and Overnight Mail

February 10, 2006

Mr. J. S. Johnson
Attn: SURTASS LFA Sonar EIS Program Manager
4100 Fairfax Drive, Suite 730
Arlington, VA 22203

By email to: eisteam@mindspring.com

Re: Draft Supplemental Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar

Dear Mr. Johnson:

On behalf of the Natural Resources Defense Council ("NRDC") and our more than 650,000 members, we are writing to submit comments on the Navy's Draft Supplemental Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar ("DSEIS"). See 70 Fed. Reg. 69526 (Nov. 16, 2005).[1] For the reasons discussed in detail below, we believe that the DSEIS fails to meet the environmental review standards prescribed by the National Environmental Policy Act ("NEPA"), 42 U.S.C. 4321 et seq., and fails to meet the requirements imposed on the Navy in the case of Natural Resources Defense Council, Inc., et al. v. Evans, 279 F.Supp. 2d 1129 (N.D. Cal. 2003). In our view and for the reasons discussed in detail below, the document reflects a dismaying disdain for the court's concerns, for available protective measures, and for the wide range of impacts of LFA to marine life. Accordingly, we believe that the document must be thoroughly revised and reissued as a draft for further public review and comment.

[1] We submit this comment letter also on behalf of the Cetacean Society International, Humane Society of the United States, League for Coastal Protection, Ocean Futures Society, and Jean Michel Cousteau. NRDC is aware that comments are being submitted independently by a substantial number of government agencies, individual scientists, environmental organizations, and the public. The comments that follow do not constitute a waiver of any factual or legal issue raised by any of these organizations or individuals and not specifically discussed herein.

For ease of reference, we enclose with this letter two copies of a CD containing non-Navy reference materials cited herein. These materials are included for consideration by the Navy and should be a part of any administrative record created with respect to the Navy's decision to finalize this DSEIS or related documents. The administrative record should also include all documents that were considered by the Navy in its development and finalization of the 2001 FEIS, and all documents that were submitted to the court in NRDC v. Evans.

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LFA sonar systems generate intense noise capable of propagating across entire ocean basins. The court in NRDC v. Evans found it "indisputable that marine mammals, many of whom depend on sensitive hearing for essential activities like finding food and mates and avoiding predators, and some of whom are endangered species, will at a minimum be harassed by the extremely loud and far traveling LFA sonar." Id. at 1188. Other marine species, including fish and sea turtles, have also been shown to be harmed by intense sonar. Understanding the great risks in allowing LFA training throughout the world's oceans without sufficient environmental review and mitigation, the court held inadequate the Navy's original EIS for this system and required that the Navy strengthen its mitigation and monitoring measures in order to protect marine wildlife.

Although the DSEIS has been prepared in response to the court's concerns, it, in fact, responds very little, especially in its consideration and adoption of measures to protect marine life. The only new mitigation offered is the Navy's proposal to keep received sound levels below 180 dB at one additional U.S. National Marine Sanctuary and one proposed U.S. National Marine Sanctuary – a measure that is laudable but that is just one of many steps that can and must be taken to reduce environmental impacts from the deployment of LFA. The Navy rejects each and every additional mitigation measure urged by the court. It flatly refuses to include an alternative that would restrict the Navy's training to areas with reduced risk of harm to marine life, as required. Instead, the Navy resubmits the identical operational area map as previously proposed—literally referring to the map included in its original EIS—which opens more than 75% of the world's oceans to training with LFA. It also rejects or simply fails to consider additional protections that the court found were feasible and necessary to ensure safe operation of LFA, such as extending coastal exclusion zones, employing shutdown procedures for fish, and using aerial surveys or observational vessels for missions close to shore.

Moreover, the Navy proposes to retreat from the mitigation measures that it currently uses to protect marine life. In its operation of LFA today, the Navy may train with LFA only in a limited area of the western Pacific. It is required to respect a wide coastal exclusion zone of at least 30 nautical miles around coasts and islands (60 nautical miles or more in some cases), within which received sound pressure levels shall not exceed 180 dB. It must cease LFA transmissions if a marine mammal is detected within a buffer zone extending 1 kilometer further than the zone ensonified to 180 dB. And it cannot train with LFA at frequencies above 330 Hz, in order to prevent resonance-related injuries to marine mammals.

The DSEIS proposes to abandon or severely curtail each of these protections. Every one of its alternatives would allow the Navy to train with LFA throughout 75% the world's oceans. It retreats from an expanded coastal exclusion zone, reverting to its originally-proposed (and rejected) zone of 12 nautical miles. It shrinks the safety zone around transmitting ships, removing three-quarters of the buffer zone required by NMFS. It eliminates the restriction imposed by NMFS to operate at less than 330 Hz. All of this is proposed along with a doubling of the number of LFA ships to be deployed and of the planned active transmissions per year, as compared with the Navy's 2001 proposal. And

these choices are supported by a document that, in a number of critical respects, fails to take account of developments in the scientific literature since 2001, when the Navy's original EIS was released.

Given the escalating public and scientific concern about the dangers of intense ocean noise, as well as the clear holdings of the court concerning protective measures that are required to ensure the safe operation of LFA, the Navy's approach in this DSEIS is an unacceptable step backwards. We believe that the document must be thoroughly revised and reissued as a draft for further public review and comment.

I. BACKGROUND

A. The LFA System

LFA is a relatively new type of sonar technology that locates enemy vessels by bombarding the ocean with low-frequency sound waves. While passive sonar is designed to detect the sounds that other vessels produce, active systems such as LFA generate their own sound waves and then decipher the echo they receive from distant targets. The LFA system was conceived during the Cold War to address the threat of deep-sea Soviet submarines, exploiting the ability of intense low-frequency sound to cover vast areas of ocean and depending on the relatively uncluttered environment of deep water for its detection ability.

The intense, low-frequency signals produced by LFA have raised environmental concerns in the international scientific community in part because of "the extraordinary distance they propagate." (See "Statement of Concern" signed by internationally prominent scientists, enclosed on the CD submitted with this letter). The active component of LFA is an array of eighteen loudspeakers lowered several hundred feet from a ship's hull into the ocean; sounding in tandem, their signals combine a few hundred meters from the source, creating zones of focalized sound that can extend many hundreds of miles in all directions. 2001 FEIS at 2-3, 4.2-33. Each speaker has a maximum output of 215 dB, but for purposes of calculating the intensity of the signal beyond a few hundred meters, where the vast majority of environmental impacts are expected to occur, the system is understood to function as one enormous acoustic source, producing as much as 240 dB of sound. Id. at B-7.[2] Low-frequency sound waves travel very efficiently in seawater, and it is this property that accounts for its geographic reach.

For example, the Navy estimates that as far as 35 miles in all directions from the LFA source, marine mammals could be exposed to a received level of 165 dB — a level the Navy admits will cause a "significant change in biologically important behavior" in half

[2] The decibel scale is like the Richter scale: it expresses force in logarithmic terms, rising in increasing orders of magnitude from a baseline value. Each ten-decibel rise along the scale corresponds to a ten-fold increase in power; thus, a sound measuring 130 dB is considered ten times more intense than a 120 dB sound, a sound of 140 dB is 100 times more intense, and a sound of 150 dB is 1,000 times more intense.

of the animals exposed. 67 Fed. Reg. 46712, 46761 (July 16, 2002). During one test of the LFA system, the Navy calculated sound intensity levels at approximately 140 dB (an intensity over 100 times greater than the level known to disrupt gray whales) more than 400 miles away.[3] Indeed, an independent analysis of some of the Navy's own data found that, during trials off the coast of California in the mid-1990s, the LFA signal was clearly audible at sites across the North Pacific Ocean.

B. Impacts of High-Intensity Sonar

Scientists agree, and the publicly available scientific literature confirms, that the intense sound generated by military active sonar can induce a range of adverse effects in whales and other species, from significant behavioral changes to stranding and death. By far the most widely-reported and dramatic of these effects are the mass strandings of beaked whales and other marine mammals that have been associated with military sonar use. Associated strandings have occurred in Greece, during the trial of a NATO sonar system; on the islands of Madeira and Porto Santo, during a NATO event involving subs and surface ships; in the U.S. Virgin Islands, during a training exercise for Navy battle groups; in the Bahamas, the Canaries, Japan, Hawaii, Alaska, and other spots around the world.[4] On several occasions, bodies have been recovered in time to give evidence of acoustic trauma. In a 2004 symposium at the International Whaling Commission, more than 100 whale biologists concluded that the association between sonar and beaked whale deaths "is very convincing and appears overwhelming."[5] In the United States, an expert report commissioned by the Navy said much the same thing.[6]

Mass mortalities, though an obvious focus of much reporting and concern, are likely only the tip of the iceberg of sonar's harmful effects. Marine mammals are believed to depend on sound to navigate, find food, locate mates, avoid predators, and communicate with each other. Flooding their habitat with man-made, high-intensity noise interferes with these and other functions. In addition to strandings and non-auditory injuries, the harmful effects of high-intensity sonar include:

- temporary or permanent loss of hearing, which impairs an animal's ability to communicate, avoid predators, and detect and capture prey;
- avoidance behavior, which can lead to abandonment of habitat or migratory pathways;

[3] Chief of Naval Operations, Environmental Assessment for Use of Surveillance Towed Array Sensor System Low Frequency Active in Connection with a Submarine Security and Technology Program Test [CNO Project K154-4] (July 1997).

[4] A summary of the strandings record appears below at Section II(B)(2)(a) ("Strandings and Mortalities Associated with Naval Sonar").

[5] International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.4 (2004).

[6] H. Levine, Active Sonar Waveform 1 (2004) (JASON Group Rep. JSR-03-200) (describing evidence of sonar causation as "completely convincing").

- disruption of biologically important behaviors such as mating, feeding, nursing, or migration, or loss of efficiency in conducting those behaviors;
- aggressive (or agonistic) behavior, which can result in injury;
- masking of biologically meaningful sounds, such as the call of predators or potential mates;
- chronic stress, which can compromise viability, suppress the immune system, and lower the rate of reproduction;
- habituation, causing animals to remain near damaging levels of sound, or sensitization, exacerbating other behavioral effects; and
- declines in the availability and viability of prey species, such as fish and shrimp.

Over the past 20 years, a substantial literature has emerged documenting the range of effects of ocean noise on marine mammals.[7]

Marine mammals are not the only species affected by undersea noise. Impacts on fish are of increasing concern due to several recent studies demonstrating hearing loss and widespread behavioral disruption in commercial species of fish and to reports, both experimental and anecdotal, of catch rates plummeting in the vicinity of noise sources.[8] Sea turtles, most of which are considered threatened or endangered under federal law, have been shown to engage in escape behavior and to experience heightened stress in response to noise.[9] And noise has been shown in several cases to kill, disable, or disrupt the behavior of invertebrates, many of which possess ear-like structures or other sensory mechanisms that could leave them vulnerable.[10] It is clear that intense sources of noise are capable of affecting a wide class of ocean life.

C. The Flawed FEIS and Final Rule

Despite the potential for LFA to harm whales, fish, and other marine life, the Navy has a long history of noncompliance with federal law with respect to its deployment. Documents reveal that the Navy was aware of its obligations under NEPA as early as 1988, the year it committed itself to develop the LFA system, and under the MMPA and

[7] For a review of research on behavioral and auditory impacts of undersea noise, see, e.g., W.J. Richardson, C.R. Greene, Jr., C.I. Malme, and D.H. Thomson, Marine Mammals and Noise (1995); National Research Council, Ocean Noise and Marine Mammals (2003); and P. Tyack, Behavioral Impacts of Sound on Marine Mammals, Presentation to the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals (February 4, 2004); Whale and Dolphin Conservation Society, Oceans of Noise (2004).

[8] See the discussion below, at section II(C)(1) ("Acoustic Impacts on Fish").

[9] See below at section II(D) ("Impacts on Sea Turtles").

[10] See below at section II(E) ("Species Excluded from Risk Analysis").

ESA no later than 1990.[11] Indeed, the Navy discussed these obligations in a series of internal meetings and communications, beginning in August 1988.[12] Yet, for the next eight years, from 1988 through 1996, the Navy conducted over twenty trials of LFA in marine habitat as rich and diverse as the southern California bight, the Mediterranean Sea, and coastal Nova Scotia without attempting to meet its responsibilities under these environmental statutes.

It was not until 1996, once the project came under public pressure from the environmental and the scientific communities, that the Navy agreed to prepare an environmental impact statement under NEPA, apply for a small take authorization under the MMPA, or consult with NMFS under ESA regarding its program. In 1999, the Navy applied to NMFS for a five-year small take authorization, under section 101(a)(5)(A) of the MMPA, for the taking of marine mammals incidental to the deployment of LFA throughout approximately 75% of the world's oceans. It simultaneously undertook steps to comply with NEPA by analyzing, in an EIS, the environmental effects of it proposed deployment, and released its Final Environmental Impact Statement for the LFA system in January 2001 ("2001 FEIS").

But the 2001 FEIS was sorely deficient. With respect to fish, the Navy deliberately ignored studies that undermined its conclusion that these species would not be significantly harmed. In its alternatives analysis, it provided only one alternative to unrestricted operation of the LFA system and did not evaluate a number of other measures pertaining to monitoring, duty cycle, and geographic avoidance that, for example, had been used or proposed in earlier LFA trials.

Despite these flaws, in July 2002 the Navy issued its Record of Decision, implementing the preferred alternative identified in the FEIS, which allowed deployment of the LFA system with limited geographic restrictions and monitoring. 67 Fed. Reg. 48145, 48153 (July 23, 2002). The Navy denied Plaintiffs' request for a supplemental EIS, refusing to consider significant new information arising out of the sonar-caused mass stranding of whales in the Bahamas in March 2000. Id. at 48150-52. And in the same month, NMFS published federal regulations issuing the requested small take authorization for LFA deployment over 75% of the world's oceans. 67 Fed. Reg. 46712 (July 16, 2002) ("Final Rule").

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[11] Memo from Bill E. to Steve H. and John S., dated Jul. 27, 1988 re: Aug. 11, 1988 ONR sponsored meeting on marine mammals; memo from Bill E. to Steve Hollis, dated Aug. 26, 1988 re: ONR Aug. 11, 1988 Marine Mammal Meeting notes and recommendations; Talking points for CST/LFA/ONR discussion on marine mammals, Dec. 19, 1990 (all included in the administrative record of NRDC v. Evans, 279 F.Supp. 2d 1129 (N.D. Cal. 2003)).

[12] Memo from Bill E. to Steve Hollis, dated Aug. 26, 1988 re: ONR Aug. 11, 1988 Marine Mammal Meeting notes and recommendations; Talking points for CST/LFA/ONR discussion on marine mammals, Dec. 19, 1990 (included in the administrative record of NRDC v. Evans, 279 F.Supp. 2d 1129 (N.D. Cal. 2003)).

One month later, NMFS issued an LOA approving the first year of LFA's deployment over 14 million square miles of the Pacific Ocean in five massive geographic "provinces." 67 Fed. Reg. 55818 (Aug. 30, 2002).

D. NRDC's Litigation and the Requirements Set Forth by the District Court

Recognizing the clear flaws in the Navy's 2001 FEIS and in NMFS's approval of the Navy's proposed plan of deployment, NRDC, together with the Humane Society of the United States, the League for Coastal Protection, Cetacean Society International, the Ocean Futures Society, and its founder Jean Michel Cousteau, filed suit in federal court in 2001, alleging multiple violations of ESA, NEPA, and the MMPA. We alleged that NMFS violated the MMPA by issuing a small take authorization which did not meet that statute's requirements; that NMFS and the Navy violated NEPA by finalizing an EIS that failed to analyze adequately the environmental impacts of LFA; and that NMFS and the Navy violated ESA by ignoring the best available science on the impacts of LFA on fish and by issuing inadequate (or no) incidental take statements.

On August 26, 2003, the District Court ("Court") ruled in favor of NRDC on summary judgment and found that defendants had violated multiple provisions of NEPA, the MMPA, and ESA. See Natural Resources Defense Council, Inc., et al. v. Evans, 279 F.Supp. 2d 1129 (N.D. Cal. 2003) ("District Court Opinion"). Among other things, the Court held:

- NMFS violated the MMPA by issuing a small take authorization that was not limited to a "specified geographic region" (id. at 1146-47);
- NMFS violated the MMPA by issuing a small take authorization authorizing take of more than "small numbers" of marine mammals, in some cases up to 12% each year of any species or stock (id. at 1152-53);
- NMFS violated the MMPA by issuing a small take authorization that failed to require adequate mitigation and monitoring of impacts to marine mammals (id. at 1163-64);
- NMFS and the Navy violated NEPA by failing to consider a full set of reasonable alternatives in their EIS (id. at 1166-67);
- NMFS and the Navy violated NEPA by failing to take a hard look at the impacts to fish species in their EIS, among other things, ignoring the only direct study of low-frequency sonar on fish (id. at 1171-72);
- NMFS violated ESA by failing to consider the "best available science," and the Navy violated ESA by withholding from NMFS the most relevant study on impacts to fish (id. at 1179-80);

- NMFS violated ESA by failing to issue an incidental take statement in association with its May Biological Opinion (id. at 1184-85); and

- NMFS violated ESA by failing to specify the amount or extent of take for all species for which take was authorized in the incidental take statement accompanying its August Biological Opinion (id. at 1188).

Rather than enjoin the Navy's deployment of LFA outright, the Court requested that the parties negotiate a balanced agreement that would accommodate the Navy's interest in continued training with LFA and NRDC's interest in protecting global natural resources. In response, the parties negotiated an agreement that restricted the Navy's training to an area of the western Pacific, with exclusion zones for the protection of important marine habitat. The Court incorporated the terms of this agreement into a permanent injunction that remains in force today and governs the Navy's current use of LFA.

As a result of restrictions imposed by the Court's injunction and by NMFS, in its operation of LFA today the Navy is required to take significant steps to lessen the potential for harm. It may train with LFA only in a limited area of the western Pacific, not throughout the world's oceans as originally proposed. It is required to respect a wide coastal exclusion zone, of at least 30 nautical miles around coasts and islands, within which received sound pressure levels shall not exceed 180 dB. In the Philippine Sea, this coastal exclusion zone is expanded to 60 nautical miles or 30 nautical miles seaward of the 200 meter isobath, whichever is greater. In all areas, the Navy must cease LFA transmissions if a marine mammal is detected within a buffer zone extending 1 kilometer further than the zone ensonified to 180 dB. And the Navy cannot train with LFA at frequencies above 330 Hz, in order to prevent resonance-related injuries to marine mammals.

E. The 2004 National Defense Authorization Act and its consequences

In 2003, Congress amended the MMPA to alter requirements applicable to "military readiness activities," such as training with LFA. See Nat'l Defense Authorization Act for Fiscal Year 2004, Pub.L. No. 108-136, Sec. 319 (Nov. 24, 2003). The amendments affected three requirements relevant to the Navy's operation of LFA and to the Court's holdings with respect to those requirements.

First, the amended law clarified the standard for "harassment" of marine mammals pursuant to military readiness activities. 16 U.S.C. § 1362(18). Second, the amended law requires that a determination of "least practicable adverse impact" include, for military readiness activities, consideration of factors such as "personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity." 16 U.S.C. § 1371(a)(5)(A)(ii). Third, the amended law exempts military readiness activities from the general requirement that take permits be issued only for

activities "within a specified geographic region" that affect "small numbers" of animals. 16 U.S.C. § 1371(a)(5)(F).

Based on these changes to the law, the Court amended its judgment to make clear that "Plaintiff's claims based on the 'small numbers' and 'specified geographic region' provisions of the MMPA no longer constitute a basis for the October 14, 2003 permanent injunction, and are dismissed." NRDC v. Evans, No. C-02-03805, Order Granting Defendants' Rule 60(b) Motion at 2-3 (N.D. Cal. 2004). The Court declined, however, to vacate or amend any portion of its original Opinion. Id. It was not asked to disturb, and did not disturb, the Permanent Injunction.

Needless to say, these amendments to the MMPA do not undermine the Court's holdings with respect to NEPA or the Endangered Species Act. It is also important to note that—contrary to the Navy's assertions in the DSEIS—the amendments leave intact several of the Court's holdings under the MMPA, including its holdings regarding additional required mitigation measures. Compare DSEIS at 1-15 fn. 4 with District Court Opinion at 1158-1164.

II. THE NAVY HAS FAILED TO COMPLY WITH THE NATIONAL ENVIRONMENTAL POLICY ACT AND HAS FAILED TO MEET THE REQUIREMENTS IMPOSED BY THE DISTRICT COURT

Enacted by Congress in 1969, NEPA establishes a national policy to "encourage productive and enjoyable harmony between man and his environment" and "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321. In order to achieve its broad goals, NEPA mandates that "to the fullest extent possible" the "policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with [NEPA]." 42 U.S.C. § 4332. As the Supreme Court explained,

> NEPA's instruction that all federal agencies comply with the impact statement requirement – and with all the requirements of § 102 – "to the fullest extent possible" [cit. omit.] is neither accidental nor hyperbolic. Rather the phrase is a deliberate command that the duty NEPA imposes upon the agencies to consider environmental factors not be shunted aside in the bureaucratic shuffle.

Flint Ridge Development Co. v. Scenic Rivers Ass'n, 426 U.S. 776, 787 (1976).

Central to NEPA is its requirement that, before any federal action that "may significantly degrade some human environmental factor" can be undertaken, agencies must prepare an environmental impact statement. Steamboaters v. F.E.R.C., 759 F.2d 1382, 1392 (9th Cir. 1985) (emphasis in original). The fundamental purpose of an EIS is to force the decision-maker to take a "hard look" at a particular action – at the agency's need for it, at the environmental consequences it will have, and at more environmentally benign alternatives that may substitute for it – before the decision to proceed is made. 40 C.F.R.

§§ 1500.1(b), 1502.1; Baltimore Gas & Electric v. NRDC, 462 U.S. 87, 97 (1983). The law is clear that the EIS must be a pre-decisional, objective, rigorous, and neutral document, not a work of advocacy to justify an outcome that has been foreordained.

Here, the Navy has failed to cure the deficiencies in the 2001 FEIS identified by the Court with respect to required alternatives and mitigation and is deficient in the following ways.

A. Statement of Purpose and Need

It is a fundamental requirement of NEPA that agencies preparing an EIS specify their project's "purpose and need." 40 C.F.R. § 1502.13. Not any statement of purpose and need will suffice: "An agency cannot define its objectives in unreasonably narrow terms" so as to exclude consideration of reasonable alternatives. City of Carmel-by-the-Sea v. United States Dep't of Transp., 123 F.3d 1142, 1155 (9th Cir. 1997) (citing Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190, 196 (D.C. Cir. 1991)). Instead, the statement must reflect the agency's core aim without foreclosing reasonable alternatives. Id.

Here, the Navy endeavors to fulfill its duty by referencing its interest in long-range detection of submarines (DSEIS at 1-2)—yet this simple, uncritical assertion is insufficient grounds, for decision-makers and private citizens alike, to discern whether LFA (or an alternative) actually meets the stated submarine threat, and, therefore, whether the environmental costs of the proposal are justified by its benefits. Thus, the EIS must go beyond identifying "need"; it must meaningfully address the long-term potential of the proposed project effectively to address that need.

B. Impacts on Marine Mammals

1. Thresholds of Injury, Hearing Loss, and Significant Behavioral Change

At the core of the Navy's impact assessment are the thresholds it has established for non-auditory physical injury, hearing loss, and significant behavioral change, the levels above which meaningful effects on marine mammals are expected to occur. For each threshold, however, the Navy fails to take account of significant new information that has emerged since January 2001, when its Final EIS was produced.

a. Injury Threshold

The Navy sets its threshold for injury at 180 dB re 1 μPa, such that exposure to a single, 100-second "ping" at that level or above is considered physically injurious. It bases this threshold, at least for non-auditory effects, on an internal white paper that the Navy prepared in 2002, which summarizes the results of tests on small terrestrial mammals that had been submerged just beneath the water's surface and

exposed to low-frequency sound; and yet discounts the growing literature on acoustic injuries and mortalities in marine mammals.

The Navy's analysis underestimates the potential for injury in several ways. First, the DSEIS fails to take proper account of published research on bubble growth in marine mammals, which indicates the potential for injury and death at levels far lower than the Navy proposes.[13] It also grossly mischaracterizes the support that the bubble growth theory has received in the scientific literature.[14] Second, the DSEIS ignores the best available scientific evidence on exposure levels in sonar-related mass strandings, particularly that the whales beached in the Bahamas stranding were exposed to no more than 160-65 dB re 1 μPa of mid-frequency sonar for 30 seconds (well below the duration of a 100-second LFA "ping") and are likely to have been exposed to less.[15] The Navy's attempt to discount the likelihood of strandings from use of the SURTASS LFA system fails to consider: the reported connection of other low-frequency sound sources to stranding events; the lack of any meaningful data on the potential for mortalities given the novelty of the system, its general operation in open ocean and remote locations, and relative ignorance of sound-related strandings before 2000; the consensus that

[13] D.S. Houser, R. Howard, and S. Ridgway, Can Diving-Induced Tissue Nitrogen Supersaturation Increase the Chance of Acoustically Driven Bubble Growth in Marine Mammals? 213 Journal of Theoretical Biology 183, 190 (2001); L.A. Crum, M.R. Bailey, J. Guan, P.R. Hilmo, S.G. Kargl, T.J. Matula, and O.A. Sapozhnikov, Monitoring Bubble Growth in Supersaturated Blood and Tissue ex vivo and the Relevance to Marine Mammal Bioeffects, 6(3) Acoustics Research Letters Online 214 (2005) See also J.R. Potter, A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms in Deep-Diving Marine Mammals (paper presented at the IEEE International Symposium on Underwater Technology 2004, Taipei, Taiwan, April 2004).

[14] See, e.g., id.; M.J. Moore and G.A. Early, Cumulative Sperm Whale Bone Damage and the Bends, 306 Science 2215 (2004); P.D. Jepson, R. Deaville, I.A.P. Patterson, A.M. Pocknell, H.M. Ross, J.R. Baker, F.E. Howie, R.J. Reid, A. Colloff, and A.A. Cunningham, Acute and Chronic Gas Bubble Lesions in Cetaceans Stranded in the United Kingdom, 42 Veterinary Pathology 291 (2005); A. Fernández, J.F. Edwards, F. Rodríguez, A. Espinosa de los Monteros, P. Herráez, P. Castro, J.R. Jaber, V. Martín, & M. Arbelo, 'Gas and Fat Embolic Syndrome' Involving a Mass Stranding of Beaked Whales (Family Ziphiidae) Exposed to Anthropogenic Sonar Signals, 42 Veterinary Pathology 446 (2005); T.M. Cox, T.J. Ragen, A.J. Read, E. Vos, R.W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernández, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P.D. Jepson, D. Ketten, C.D. MacLeod, P. Miller, S. Moore, D. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, & L. Benner, Report of a Workshop to Understand the Impacts of Anthropogenic Sound on Beaked Whales 2 (in press); P.D. Jepson, M. Arbelo, R. Deaville, I.A.P. Patterson, P. Castro, J.R. Baker, E. Degollada, H.M. Ross, P. Herráez, A.M. Pocknell, F. Rodríguez, F.E. Howie, A. Espinosa, R.J. Reid, J.R. Jaber, V. Martín, A.A. Cunningham, A. Fernández, Gas-Bubble Lesions in Stranded Cetaceans, 425 Nature 575-576 (2003). See also Letter from Dr. E.C.M. Parsons, George Mason University, to Joe Johnson, Navy (Feb. 10, 2006) (clarifying disagreement in Pathology: Whales, Sonar and Decompression Sickness, 428 Nature 1 (2004)).

[15] See, e.g., International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.3; J. Hildebrand, K. Balcomb, and R. Gisiner, Modeling the Bahamas Beaked Whale Stranding of March 2000 (2004) (presentation given at the third plenary meeting of the U.S. Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, 29 July 2004).

some of the pathologies seen in sonar-related strandings occurred at sea; and the requirements of NEPA to assess all "reasonably foreseeable" impacts. 42 C.F.R. § 1502.22.[16] Third, the Navy unaccountably rules out the potential for mechanisms of resonance other than those affecting the lungs.[17] Fourth, the Navy's standard does not reflect the potential for other non-auditory physiological impacts, as from stress, on which new data on marine mammals and other species have emerged.[18]

b. Hearing Loss Threshold

The Navy sets its threshold for hearing loss, or "threshold shift" ("TS"), at 180 dB re 1 μPa for a single, 100-second "ping" of exposure. Its analysis—completely unchanged since the FEIS—is based on two arguments, one extrapolating from data on humans and other terrestrial mammals and the other relying on a limited set of data on marine mammals. Both arguments are flawed. First, in calculating a threshold for marine mammals based on human studies, the Navy both disregards new data on critical ratios and fails to account for expert criticism of the Navy's approach made during the first take authorization process.[19] Second, it has become clearer that the Navy has misapplied the hearing loss data taken directly from marine mammals, given its broad extrapolation from two species

[16] See papers on bubble growth cited earlier in this section, particularly Cox et al., Report of a Workshop to Understand the Impact of Anthropogenic Sound; see also J.V. Carretta, K.A. Forney, M.M. Muto, J. Barlow, J. Baker, and M. Lowry, U.S. Pacific Marine Mammal Stock Assessments: 2003 at 147 (2004); B. Taylor, J. Barlow, R. Pitman, L. Balance, T. Klinger, D. DeMaster, J. Hildebrand, J. Urban, D. Palacios, and J. Mead, A Call for Research to Assess Risk of Acoustic Impact on Beaked Whale Populations (2004) (IWC Doc. SC/56/E36); M.H. Engel, M.C.C. Marcondes, C.C.A. Martins, F.O. Luna, R.P. Lima, and A. Campos, Are Seismic Surveys Responsible for Cetacean Strandings? An Unusual Mortality of Adult Humpback Whales in Abrolhos Bank, Northeastern Coast of Brazil (2004) (IWC Doc. SC/56/E28); J. Hildebrand, Impacts of Anthropogenic Sound on Cetaceans (2004) (IWC Doc. SC/56/E13); International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6 (2004).

[17] See NMFS, Report of the Workshop on Acoustic Resonance as a Source of Tissue Trauma in Cetaceans (2002); Cox et al., Report of a Workshop to Understand the Impact of Anthropogenic Sound.

[18] See, e.g., DEIS at 4.85 to 6 (citing several studies); T.A. Romano, M.J. Keogh, C. Kelly, P. Feng, L. Berk, C.E. Schlundt, D.A. Carder, and J.J. Finneran, Anthropogenic Sound and Marine Mammal Health: Measures of the Nervous and Immune Systems Before and After Intense Sound Exposure, 61 Canadian Journal of Fisheries and Aquatic Sciences 1124, 1130-31 (2004); B. Luttbeg and J.L. Kerby, Are Scared Prey as Good as Dead? 20 TRENDS Ecol. Evol. 416 (2005); E.F. Chang and M.M. Merzenich, Environmental Noise Retards Auditory Cortical Development, 300 Science 498 (2003); S.N. Willich, K. Wegscheider, M. Stallmann, and T. Keil, Noise Burden and the Risk of Myocardial Infarction, European Heart Journal (2005) (Nov. 24, 2005).

[19] B.L. Southall, Auditory Masking in Three Pinnipeds: Aerial Critical Ratios and Direct Critical Bandwidth Measurements, 114 J. Acoust. Soc. Am. 1660 (2003); B.L. Southall, Masking in Three Pinnipeds: Underwater, Low-Frequency Critical Ratios, 108 J. Acoust. Soc. Am. 1322 (2000); Letter from R.J. Schusterman, D. Kastak, B.L. Southall, and C.R. Kastak, University of California at Santa Cruz, to Donna Wieting, NMFS (May 2001); Correspondence between R. Gisiner, Office of Naval Research, and J.S. Johnson, Office of the Chief of Naval Operations (Aug. 6-9, 2001).

whose auditory sensitivity at tested frequencies is poorer than that of other cetaceans, and its mistaken substitution in the Final EIS of 1-second exposure thresholds for the 100-second LFA signal.[20]

c. Threshold for Significant Behavioral Change

The Navy has established a sliding scale for behavioral impacts, such that 50% of all marine mammals exposed to a single LFA transmission at 165 dB re 1 μPa are expected to undergo significant change in a biologically important activity, with the potential for impact rapidly increasing or decreasing as the received level departs from that mean. Unfortunately, the risk function devised by the Navy is at odds in several respects with recent developments in the literature.

First, the DSEIS fails to incorporate several recent studies on the effects of low-frequency sound on various marine mammal species, all of which demonstrate impacts in large whales at received levels lower than those meaningfully covered by the Navy's risk function.[21] Second, the DSEIS' standard fails to take proper account of chronic impacts, from behavioral change as well as from certain non-auditory physiological impacts such as stress, which may occur at considerably lower levels than those that would induce the types of behavioral change studies by the Navy in its Scientific Research Program.[22] In this regard, the Navy has failed to consider cumulative impacts on populations of animals exposed repeatedly to the LFA source over several seasons (cf. FEIS at 4.2-58), a scenario

[20] See, e.g., W.J. Richardson, C.R. Greene, Jr., C.I. Malme, and D.H. Thomson, Marine Mammals and Noise 209 (1995) (reporting auditory sensitivities). Compare FEIS at 1-27 and Navy, Draft Overseas Environmental Impact Statement/ Environmental Impact Statement: Undersea Warfare Training Range at 4.3-14 (2005) (producing risk function from beluga and bottlenose whale data). It should be noted that the function is somewhat arbitrarily drawn, and that dropping the line at least 5 dB lower would fit the underlying data just as well or better.

[21] See, e.g., D.W. Weller, Y.V. Ivashchenko, G.A. Tsidulko, A.M. Burdin, & R.L. Brownell, Jr., Influence of Seismic Surveys on Western Grey Whales off Sakhalin Island, Russia in 2001 (2002) (IWC Doc. SC/54/BRG14); Independent Scientific Review Panel. Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and Related Biodiversity (2005); D.P. Nowacek, M.P. Johnson, and P.L. Tyack, North Atlantic Right Whales (Eubalaena glacialis) Ignore Ships but Respond to Alerting Stimuli, 271 Proceedings of the Royal Society of London, Part B: Biological Sciences 227 (2004); P. Tyack (presentation at Mineals Management Service, Gulf of Mexico Region, Information Transfer Meeting, Kenner, La., Jan. 9-11, 2005).

[22] See, e.g., F.H. Harrington and A.M. Veitch, Calving Success of Woodland Caribou Exposed to Low-Level Jet Fighter Overflights, 45 Arctic vol. 213 (1992); L. Bejder, Linking Short and Long-Term Effects of Nature-Based Tourism on Cetaceans (2005); P. Lercher, G.W. Evans, and M. Meis, Ambient Noise and Cognitive Processes among Primary Schoolchildren, 35 Environment and Behavior 725 (2003). It is not necessarily the case that animals exposed to harmful levels of sound will leave an area over time. J.A. Gill, K. Norris, and W.J. Sutherland, Why Behavioural Responses May Not Reflect the Population Consequences of Human Disturbance, 97 Biol. Conserv. 265 (2001); R.A. Stillman and J.D. Goss-Custard, Seasonal Changes in the Response of Oystercatchers *Haematopus ostralegus* to Human Disturbance, 33 J. Avian Biol. 358 (2002).

that is only more likely to occur given the proposed doubling in LFA deployment. Third, the DSEIS disregards recent evidence indicating the potential for masking to interfere with long-distance mating behavior in mysticetes such as the fin whale, again at received levels far lower than those effectively covered by the Navy's standard.[23] Fourth, the Navy's standard is out of step with how the potential for behavioral impacts has been assessed in other contexts.[24] Fifth, the DSEIS does not consider the impact that behavioral changes in prey species such as fish may have on marine mammal foraging.[25]

2. Strandings and Mortalities Associated with Naval Sonar

a. Summary of Strandings Data

Since the publication of the Navy's original FEIS in 2001, the association between military active sonar and whale mortalities has been strengthened and has dramatically increased as a subject of scientific interest and concern. That interest is reflected in the publication of numerous papers in peer-reviewed journals, in reports by inter-governmental bodies such as the IWC's Scientific Committee, and in evidence compiled from a growing number of mortalities associated with sonar.

This quickening in interest was sparked by an event in March 2000, when sixteen whales from at least three species— including two minke whales—stranded over 150 miles of shoreline along the northern channels of the Bahamas. The beachings occurred within 24 hours of Navy ships using mid-frequency sonar (AN/SQS-53C and AN/SQS-56) in those same channels.[26] Post-mortem examinations found, in all whales examined, hemorrhaging in and around the ears and other tissues related to sound conduction or production, such as the larynx and auditory fats, some of which was debilitative and potentially severe.[27] It is

[23] D.A. Croll, C.W. Clark, A. Acevedo, B. Tershy, S. Flores, J. Gedamke, and J. Urban, Only Male Fin Whales Sing Loud Songs, 417 Nature 809 (2002); International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6 (2004); NMFS, Assessment of Acoustic Exposures on Marine Mammals in Conjunction with USS Shoup Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington, 5 May 2003 (2005); S.L. Nieukirk, K.M. Stafford, D.K. Mellinger, R.P. Dziak, and C.G. Fox, Low-Frequency Whale and Seismic Airgun Sounds Recorded in the Mid-Atlantic Ocean. 115 J. Acoust. Soc. Am. 1832 (2004); P. Tyack, Behavioral Impacts of Sound on Marine Mammals (2004) (presenation at the First Plenary of the Marine Mammal Commission Advisory Committtee on Acoustic Impacts on Marine Mammals, Bethesda, Md., Feb. 4, 2004). See also S.C. Stearns and R. Hoekstra, Evolution: An Introduction (2000) (indicating that animals would not be expected to make calls louder than necessary to achieve their function).

[24] See, e.g., Letter from Rodney F. Weiher, NOAA, to Keith Jenkins, Naval Facilities Engineering Command Atlantic (Jan. 30, 2006).

[25] See, e.g., papers on catch rate reduction cited infra in the section on fish and fisheries impacts.

[26] Commerce and Navy, Joint Interim Report at iii, 16.

[27] Id.

now accepted that these mortalities were caused, through an unknown mechanism, by the Navy's use of mid-frequency sonar.

The Bahamas event is one of numerous strandings coincident with military activities and active sonar that have now been documented:

(1) In January 2005, 34 whales of three species beached along the Outer Banks of North Carolina as the Navy conducted exercises offshore. A preliminary summary of NMFS's investigation of this stranding contains several findings suggesting the whales may have been injured by sonar. While a second, but still not final, summary released by the agency states that some of the lesions that had originally been observed, microemboli in the liver, "were not confirmed," it continues to note the presence of other lesions potentially indicative of sonar, such as hemorrhaging in the acoustic fats, and, indeed, finds that the number of animals exhibiting them have increased.[28] Both summaries rule out other potential causes of the strandings, including viral, bacterial, and protozoal infection, direct blunt trauma, and fishery interactions.[29] It has additionally been reported that the Navy may have been operating sonar as close as 50 nm to one of the stranding sites, about 90 nm south-southeast of Oregon Inlet.[30] This stranding has elicited great public concern and has generated considerable media attention to the harms caused by Navy sonar.[31]

(2) In July 2004, four dead beaked whales were found around the coasts of the Canary Islands, within one week of an NATO exercise. The exercise, Majestic Eagle 2004, was conducted approximately 100 kilometers north of the Canaries. Although the three whale bodies that were necropsied were too decomposed to allow detection of gas embolisms (see below), systematic fat

[28] NMFS, Preliminary Report on the Mass Stranding in North Carolina, January 15, 2005 and Updated Report on the January 14-15, 2005 Multi-Species Mass Stranding in North Carolina, enclosed in Letter from Michael J. Garcia, U.S. Attorney for the Southern District of New York, to Erin Tobin, Attorney, Meyer Glitzenstein & Crystal, at 2-3 (Jan. 17, 2006).

[29] Id.

[30] Kate Wiltrout, "Reports on Beached Whales Show Gap over Cause," Virginian-Pilot, Jan. 20, 2006; Marc Kaufman, "Whale Stranding in N.C. Followed Navy Sonar Use," Washington Post, Jan. 28, 2005.

[31] See, e.g., Marc Kaufman, "Reference to Sonar Deleted in Whale-Beaching Report," Washington Post, Jan. 20, 2006; Rex Dalton, Panel Quits in Row over Sonar Damage, 439 Nature 376, 377 (2006); Gareth McGrath, "Public Comment Period Likely Over," Wilmington Star-News, Jan. 25, 2006; Editorial, "Science Not Spin," Charlotte News & Observer, Jan. 23, 2006; Bo Petersen, "Report on Whale Deaths Criticized," Charleston Post and Courier, Jan. 21, 2006; Wade Rawlins, "Sonar's Role in Beaching Uncertain," Charlotte News & Observer, Jan. 19, 2006; Kate Wiltrout, "Reports on Beached Whales Show Gap over Cause," Virginian-Pilot, Jan. 20, 2006. The Washington Post story was subsequently published by papers around the country, including the Los Angeles Times (California), the Fort Worth Star Telegram (Texas), and the Bremerton Sun (Washington).

embolisms were found in these animals.[32] The probability that the whales died at sea is extremely high.[33]

(3) Also in July 2004, a pod of melon-headed whales exhibited extraordinary behavior just off Kaua'i, Hawai'i, within range of Japanese and U.S. Navy ships participating in the biennial Rim of the Pacific (RIMPAC) tactical naval exercises there.[34] Two hundred of the normally deep-water whales crowded into shallow waters very near shore, an event that apparently had never before been seen in Kaua'i. According to a biologist observer associated with NMFS, the pod appeared stressed, and, in the ensuing chaos, one juvenile member of the pod stranded and died. After learning of this unusual whale behavior, the Navy temporarily restricted its active sonar operations in the area.[35]

(4) In June 2004, six beaked whales were found stranded along the Gulf of Alaska, on the state's southern coast. The strandings coincided with a U.S. naval exercise called Northern Edge.[36]

(5) In May 2003, the U.S. Navy vessel USS Shoup was conducting a mid-frequency sonar exercise while passing through Haro Strait, off the coast of Washington. According to one contemporaneous account, "[d]ozens of porpoises and killer whales seemed to stampede all at once . . . in response to a loud electronic noise echoing through" the Strait.[37] Several field biologists present at the scene reported observing a pod of endangered orcas bunching near shore and engaging in very abnormal behavior consistent with avoidance, a minke whale "porpoising" away from the sonar ship, and harbor porpoises

[32] A. Espinosa, M. Arbelo, P. Castro, V. Martín, T. Gallardo, and A. Fernández, New Beaked Whale Mass Stranding in Canary Islands Associated with Naval Military Exercises (Majestic Eagle 2004) (2005) (poster presented at the European Cetaecan Society Conference, La Rochelle, France, April 2005); A. Fernández, M. Méndez, E. Sierra, A. Godinho, P. Herráez, A. Espinosa de los Monteros, F. Rodríguez, F., and M. Arbelo, M., New Gas and Fat Embolic Pathology in Beaked Whales Stranded in the Canary Islands (2005) (poster presented at the European Cetaecan Society Conference, La Rochelle, France, April 2005).

[33] Id.

[34] Navy, Update on Melon-Headed Whales Stranded in Hawaii (2004) (presentation given at the Third Plenary of the Marine Mammal Commission Advisory Committee on Acoustic Impacts on Marine Mammals, San Francisco, 29 July 2004).

[35] This account incorporates details as reported by Jan TenBruggencate in Whale Dies After Pod Returns to Sea, Honolulu Advertiser, July 7, 2004. See also Marc Kaufman, Whales' Plight Revives Sonar Theory, Washington Post, July 11, 2004 at A1 (detailing incident).

[36] S.E. Moore and K.M. Stafford, Habitat Modeling, Ambient Noise Budgets, and Acoustic Detection of Cetaceans in the North Pacific and Gulf of Alaska sl. 27-28 (2005) (presentation given at ECOUS 2005, Office of Naval Research, 16-18 Mar. 2005).

[37] Christopher Dunagan, Navy Sonar Incident Alarms Experts, Bremerton Sun, May 8, 2003.

fleeing the vessel in large numbers.[38] Eleven harbor porpoises—an abnormally high number given the average stranding rate of six per year—were found beached in the area of the exercise.[39]

(6) In September 2002, at least fourteen beaked whales from three different species stranded in the Canary Islands. Four additional beaked whales stranded over the next several days.[40] The strandings occurred while a Spanish-led naval exercise that included U.S. Navy vessels and at least one ship equipped with mid-frequency sonar was conducting anti-submarine warfare exercises in the vicinity.[41] The subsequent investigation, as reported in the journals Nature and Veterinary Pathology, revealed a variety of traumas, including emboli and lesions suggestive of decompression sickness.[42]

(7) In May 2000, four beaked whales stranded on the beaches of Madeira while several NATO ships were conducting an exercise near shore. Scientists investigating the stranding found that the whales' injuries—including "blood in and around the eyes, kidney lesions, pleural hemorrhage"—and the pattern of their stranding suggest "that a similar pressure event [*i.e.*, similar to that at work in the Bahamas] precipitated or contributed to strandings in both sites."[43]

(8) In October 1999, four beaked whales stranded in the U.S. Virgin Islands as the Navy began an offshore exercise. A wildlife official from the Islands reported the presence of "loud naval sonar."[44] When NMFS asked the Navy for more information about its exercise, the Department's response was

[38] NMFS, Assessment of Acoustic Exposures at 6, 9.

[39] NMFS, Preliminary Report: Multidisciplinary Investigation of Harbor Porpoises (Phocoena phocoena) Stranded in Washington State from 2 May – 2 June 2003 Coinciding with the Mid-Range Sonar Exercises of the USS Shoup 53-55 (2004) (conclusions unchanged in final report). Unfortunately, according to the report, freezer artifacts and other problems incidental to the preservation of tissue samples made the cause of death in most specimens difficult to determine; but the role of acoustic trauma could not be ruled out. Id.

[40] Vidal Martin et al., Mass Strandings of Beaked Whales in the Canary Islands, in Proceedings of the Workshop on Active Sonar and Cetaceans 33 (P.G.H. Evans & L.A. Miller eds., 2004); Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-57.

[41] Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446; K.R. Weiss, Whale Deaths Linked to Navy Sonar Tests, L.A. Times, Oct. 1, 2002, at A3.

[42] Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-57; Jepson et al., Gas-Bubble Lesions, 425 Nature at 575-76.

[43] D.R. Ketten, Beaked Whale Necropsy Findings 22 (2002) (paper submitted to NMFS); L. Freitas, The Stranding of Three Cuvier's Beaked Whales Ziphius Cavirostris in Madeira Archipelago—May 2000, in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 28-32 (2004).

[44] Personal communication of Dr. David Nellis, U.S. Virgin Island Department of Fish and Game, to Eric Hawk, NMFS (Oct. 1999); personal communication from Ken Hollingshead, NMFS, to John Mayer, Marine Acoustics Inc. (March 19, 2002).

to end the consultation that it had begun for the exercise under the Endangered Species Act.[45]

(9) In January 1998, according to a NMFS biologist, a beaked whale "stranded suspiciously" at Vieques as naval exercises were set to commence offshore.[46] Another beaked whale stranded in the same area and under similar circumstances in May 2000.[47]

(10) In 1996, twelve Cuvier's beaked whales stranded along 35 kilometers on the west coast of Greece. The strandings were correlated, by an analysis published in Nature, with the test of a low- and mid-frequency active sonar system operated by NATO.[48] A subsequent NATO investigation found the strandings to be closely timed with the movements of the sonar vessel, and ruled out all other physical environmental factors as a cause.[49] The following year saw nine additional Cuvier's beaked whales strand off Greece, again coinciding with naval activity.[50]

(11) Between 1985 and 1989, at least three separate mass strandings of beaked whales occurred in the Canary Islands, as reported in Nature.[51] Thirteen beaked whales of two species were killed in the February 1985 strandings, six whales of three species stranded in November 1988, and some twenty-four whales of three species stranded in October 1989—all while naval vessels were conducting exercises off shore.[52] An additional stranding of Cuvier's beaked whales, also coinciding with a naval exercise, occurred in 1991.[53] It was reported that mass live strandings occurred each time exercises took place in the area.[54]

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[45] Letter from William T. Hogarth, Regional Administrator, NMFS Southeast Regional Office, to RADM J. Kevin Moran, Navy Region Southeast (undated); personal communication from Ken Hollingshead, NMFS, to John Mayer, Marine Acoustics Inc. (March 19, 2002).

[46] Personal communication from Eric Hawk, NMFS, to Ken Hollingshead, NMFS (Feb. 12, 2002).

[47] Id.

[48] A. Frantzis, Does Acoustic Testing Strand Whales? 392 Nature 29 (1998).

[49] See SACLANT Undersea Research Center, Summary Record, La Spezia, Italy, 15-17 June 1998, SACLANTCEN Bioacoustics Panel, SACLANTCEN M-133 (1998).

[50] Id.; A. Frantzis, The First Mass Stranding That Was Associated with the Use of Active Sonar (Kyparissiakos Gulf, Greece, 1996), in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 14-20 (2004).

[51] M. Simmonds and L.F. Lopez-Jurado, Whales and the Military, 337 Nature 448 (1991).

[52] Id.

[53] V. Martín, A. Servidio, and S. Garcia, Mass Strandings of Beaked Whales in the Canary Islands, in P.G.H. Evans and L.A. Miller, Proceedings of the Workshop on Active Sonar and Cetaceans 33-36 (2004).

[54] Simmonds and Lopez-Jurado, Whales and the Military, 337 Nature at 448.

Some preliminary observations can be drawn from these incidents. For example, beaked whales, a group of deep-water species that are seldom seen and may in some cases be extremely rare, seem to be particularly vulnerable to the effects of active sonar. A 2000 review undertaken by the Smithsonian Institution, and reported and expanded by the IWC's Scientific Committee and other bodies, supports this conclusion, finding that every mass stranding on record involving multiple species of beaked whales has occurred with naval activities in the vicinity.[55] Indeed, it is not even certain that some beaked whales naturally strand in numbers.

But the full magnitude of sonar's effects on these species—or on other marine mammals—is not known. First, most of the world lacks networks to identify and investigate stranding events, particularly those that involve individual animals spread out over long stretches of coastline, and therefore the mortalities that have been identified thus far are likely to represent only a subset of a substantially larger problem. For example, most Cuvier's beaked whale casualties (according to NMFS) are bound to go undocumented because of the remote siting of sonar exercises and the small chance that a dead or injured animal would actually strand.[56]

Second, until recently, no one knew to look for a potential link between stranding events and nearby naval exercises. Now that such a link is strongly suspected, stranding incidents related to naval exercises are more likely to be recognized as such. This has been borne out by a recent re-examination of records of old strandings conducted by several prominent biologists. As reported by the Scientific Committee of the International Whaling Commission, the re-examination showed a concentration of mass beaked whale strandings along the Japanese coast near Yokosuka, one of the primary bases for U.S. naval activity in the western Pacific, with ten mass strandings reported since the late 1950s; an additional 64 beaked whales were reported to have stranded individually. By comparison, only two other possible mass strandings of beaked whales are known to have occurred over the rest of the entire Pacific coast of Japan. The authors concluded that a relationship between mass strandings and naval acoustics was "strongly suggest[ed]" by this record.[57]

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[55] Marine Mammal Program of the National Museum of Natural History, Historical Mass Mortalities of Ziphiids 2-4 (Apr. 6, 2000); see also 2 J. Cetacean Res. & Mgmt., Supp., Annex J at § 13.8 (2000) (report of the IWC Scientific Committee, Standing Working Group on Environmental Concerns).

[56] J.V. Carretta, K.A. Forney, M.M. Muto, J. Barlow, J. Baker, and M. Lowry, U.S. Pacific Marine Mammal Stock Assessments: 2003 at 147 (2004).

[57] R.L. Brownell, Jr., T. Yamada, J.G. Mead, and A.L. van Helden, Mass Strandings of Cuvier's Beaked Whales in Japan: U.S. Naval Acoustic Link (2004) (IWC Doc. SC/56/E37). As in the case of many of the other incidents discussed above, most of the animals involved in these incidents over the years were observed to have stranded live.

Furthermore, although the physical process linking sonar to strandings is not perfectly understood, the record indicates that debilitating, possibly lethal injuries are occurring in whales exposed to sonar at sea—only some of which may then strand. As first reported in the journal *Nature*, animals that came ashore during sonar exercises off the Canary Islands, in September 2002, had developed large emboli in their organ tissue and suffered from symptoms resembling those of severe decompression sickness, or "the bends."[58] It has been proposed that the panic led them to surface too rapidly or because it pushed them to dive before they could eliminate the nitrogen accumulated on previous descents, or because the sound itself precipitated the growth of nitrogen bubbles in the blood, which expanded to devastating effect. This finding has since been supported by follow-on papers, by published work in other fields, and by expert reviews.[59] In any case, the evidence is considered "compelling" that acoustic trauma, or injuries resulting from behavioral responses, has in some way led to the deaths of many of these animals.[60]

That beaked whales are suffering injury in larger numbers than are turning up on shore would be consistent with one of the most disturbing findings from the Bahamas, the only stranding event for which baseline survey data are available. Since the Navy passed through in March 2000, the cohort of Cuvier's beaked whales that had been photo-identified and recorded for years has virtually disappeared, leading researchers to conclude that nearly all of the animals died of physical injury or, at the very least, were driven to permanently abandon their habitat.[61] Five years later, the species is slowly returning but sightings are still far below what they had been.[62] Although not much is known about beaked whale ecology, the latest research suggests that some Cuvier's whales might aggregate

[58] See P.D. Jepson, M. Arbelo, R. Deaville, I.A.P. Patterson, P. Castro, J.R. Baker, E. Degollada, H.M. Ross, P. Herráez, A.M. Pocknell, F. Rodríguez, F.E. Howie, A. Espinosa, R.J. Reid, J.R. Jaber, V. Martín, A.A. Cunningham, A. Fernández, Gas-Bubble Lesions in Stranded Cetaceans, 425 Nature 575-576 (2003); Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 415.

[59] Cox et al., Report of a Workshop to Understand the Impacts of Anthropogenic Sound at 15-21, 23. For additional papers, see also the studies referenced at section II(B)(1)(a) ("Injury Threshold").

[60] P.G.H. Evans and L.A. Miller, Concluding Remarks, in Proceedings of the Workshop on Active Sonar and Cetaceans 74 (2004); see also Cox et al., Report of a Workshop to Understand the Impacts of Anthropogenic Sound at 2. Of course it would be a mistake to assume that an animal must suffer bends-like injury or some other sort of acoustic trauma in order to strand. Some may die simply because the noise disorients them, for instance. See, e.g., NMFS, Assessment of Acoustic Exposures at 9-10.

[61] Personal communication with Ken Balcomb, Center for Whale Research, June 2005; K.C. Balcomb and D.E. Claridge, A Mass Stranding of Cetaceans Caused by Naval Sonar in the Bahamas, 8(2) Bahamas Journal of Science 1 (2001).

[62] Personal communication with Ken Balcomb, Center for Whale Research, June 2005; International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.3; Balcomb and Claridge, A Mass Stranding of Cetaceans.

in small populations, taking up residence along the continental shelf.[63] Under the right conditions, even the transient sweep of a sonar vessel or other source could devastate a local population.[64] In the Bahamas, that is precisely what appears to have happened.

It should be noted that beaked whales are not the only species vulnerable to these severe effects. As the IWC's Scientific Committee has noted, a variety of other cetaceans have shown signs of stranding or significant distress in response to active sonar use.[65] Some species, such as minke whales (Bahamas 2000) and pygmy sperm whales (Canary Islands 1988), are known to have stranded concurrent with beaked whales in two of the events described above; others, such as long-finned pilot whales and dwarf sperm whales (North Carolina 2005), melon-headed whales (Hawaii 2004), and harbor porpoises (Haro Strait 2003), appear to have stranded in sonar-associated events that did not involve beaked whales at all. It is not known which other species are most vulnerable to these effects, but concern has been raised about deep-diving whales in particular since these animals, in theory, would stand at greatest risk of injury from bubble growth.[66] Some recent anatomical studies of sperm whales and other species indicate that *in vivo* bubble formation is indeed possible in cetaceans other than beaked whales.[67]

b. The DSEIS' Analysis

In this light, the Navy's assessment of the risk of marine mammal injury and mortality from LFA use is seriously deficient. While some relevant papers appear in the bibliography, overall its analysis proceeds as though little has happened since the publication of the 2001 FEIS. Among the most significant errors:

[63] T. Wimmer and H. Whitehead, Movements and Distribution of Northern Bottlenose Whales, Hyperoodon ampullatus, on the Scotian Slope and in Adjacent Waters, 82 Canadian Journal of Zoology 1782 (2004); M.L. Dalebout, K.M. Robertson, A. Frantzis, D. Engelhaupt, A.A. Mignucci-Giannoni, R.J. Rosario-Delestre, and C. Scott Baker, Worldwide Structure of mtDNA Diversity among Cuvier's Beaked Whales (Ziphius cavirostris): Implications for Threatened Populations, 11 Molecular Ecology 3353 (2005).

[64] See, e.g., Letter from Hal Whitehead, Dalhousie University, to Donna Wieting, NMFS (May 2001), p. 2 (comments submitted to NMFS concerning its environmental review of the Navy's SURTASS LFA system); see also Dalebout et al., Worldwide Structure at 3354.

[65] International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.3.

[66] D.S. Houser, R. Howard, and S. Ridgway, Can Diving-Induced Tissue Nitrogen Supersaturation, 213 Journal of Theoretical Biology at 183; J.R. Potter, A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms; L.A. Crum, M.R. Bailey, J. Guan, P.R. Hilmo, S.G. Kargl, T.J. Matula, and O.A. Sapozhnikov, Monitoring Bubble Growth, 6(3) Acoustics Research Letters Online at 214.

[67] Jepson et al., Gas-Bubble Lesions, 425 Nature at 575; Moore and Early, Cumulative Sperm Whale Bone Damage, 306 Science at 2215; Jepson et al., Acute and Chronic Gas Bubble Lesions, 42 Veterinary Pathology at 291.

(1) The problems with the Navy's calculation of thresholds for injury and behavioral disturbance, discussed above in section II(B)(1), carry through to its analysis of the risk of injury and are incorporated here.

(2) The Navy wrongly dismisses mechanisms of sonar injury to marine mammals that would cause harm independent of stranding events.

First, the Navy portrays a leading theory about the mechanism of sonar-related injuries—the theory that whales suffer from bubble growth in organs that is similar to decompression sickness, or "the bends" in human divers—as a controversial hypothesis without much support among researchers. DSEIS at 4-31 to 32.

But the DSEIS fails to take proper account of published research on bubble growth. According to a series of published, peer-reviewed articles (based both on accepted theoretical methods and on experimental research), gas bubbles could be activated in supersaturated marine mammal tissue on brief exposure to sounds of 150 dB (RMS) re 1 μPa or lower and then grow significantly, causing injury, as the animal rises toward the surface.[68] That work is supported by a number of other studies, also published in leading, peer-reviewed journals, demonstrating through anatomical evidence that in vivo bubble growth can occur in a variety of marine mammal species, from sperm whales to beaked whales to Risso's dolphins.[69] And this is not even to mention the investigation of the 2002 Canary Islands strandings, whose findings concerning fat and gas emboli were recently published at length in another major journal.[70] The Navy cannot simply elide the numerous published, peer-reviewed papers—in dive behavior, veterinary pathology, and molecular biology—that support this theory, or disregard the recognition

[68] D.S. Houser, R. Howard, and S. Ridgway, Can Diving-Induced Tissue Nitrogen Supersaturation Increase the Chance of Acoustically Driven Bubble Growth in Marine Mammals? 213 Journal of Theoretical Biology 183, 190 (2001); L.A. Crum, M.R. Bailey, J. Guan, P.R. Hilmo, S.G. Kargl, T.J. Matula, and O.A. Sapozhnikov, Monitoring Bubble Growth in Supersaturated Blood and Tissue ex vivo and the Relevance to Marine Mammal Bioeffects, 6(3) Acoustics Research Letters Online 214 (2005) See also J.R. Potter, A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms in Deep-Diving Marine Mammals (paper presented at the IEEE International Symposium on Underwater Technology 2004, Taipei, Taiwan, April 2004).

[69] M.J. Moore and G.A. Early, Cumulative Sperm Whale Bone Damage and the Bends, 306 Science 2215 (2004); P.D. Jepson, R. Deaville, I.A.P. Patterson, A.M. Pocknell, H.M. Ross, J.R. Baker, F.E. Howie, R.J. Reid, A. Colloff, and A.A. Cunningham, Acute and Chronic Gas Bubble Lesions in Cetaceans Stranded in the United Kingdom, 42 Veterinary Pathology 291 (2005).

[70] A. Fernández, J.F. Edwards, F. Rodríguez, A. Espinosa de los Monteros, P. Herráez, P. Castro, J.R. Jaber, V. Martín, & M. Arbelo, 'Gas and Fat Embolic Syndrome' Involving a Mass Stranding of Beaked Whales (Family Ziphiidae) Exposed to Anthropogenic Sonar Signals, 42 Veterinary Pathology 446 (2005).

bubble growth has received from expert panels, such as the one convened last year by the Marine Mammal Commission to review sonar-related strandings.[71]

In any case, the law requires agencies to evaluate all "reasonably foreseeable" impacts, which, by definition, includes "impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 42 C.F.R. § 1502.22. The scientific literature supporting bubble growth rises far above this standard, and the Navy's discounting of this theory in its analysis of injuries to marine mammals is arbitrary and capricious.

Second, the Navy's analysis of injuries to whales leaves out a possibility that has been widely noted in the literature: i.e., that some of the observed injuries are a result of behavioral changes, such as rapid surfacing or premature diving, that sonar could induce in whales at sea. This mechanism of injury would also result in injury apart from strandings and should be considered.

These omissions result in an unwarranted discounting by the Navy of the strong possibility that sonar is causing severe injuries to whales at sea, whether or not those whales strand.

(3) The Navy wrongly dismisses the possibility that whales may be severely injured by sonar at great distances from the source. But from the few events that have been modeled, the 2000 Bahamas event and, to a lesser extent, the 1996 incident in Greece, it is evident that even mid-frequency sonar arrays, using sonar that propagates significantly less well than LFA, can induce strandings from tens of miles offshore and are likely to affect animals at tens of miles' distance.[72] To properly evaluate the potential impacts of LFA, the Navy must account for the reasonably possibility that injuries similar to those seen in the Bahamas, the Canaries, and other events may occur at great distances from LFA use. To do otherwise is to arbitrarily disregard the preponderance of the evidence in this field.

(4) In describing the 2000 Bahamas stranding event, the Navy places undue reliance on a list of "contributory factors" that it feels make a similar

[71] T.M. Cox, T.J. Ragen, A.J. Read, E. Vos, R.W. Baird, K. Balcomb, J. Barlow, J. Caldwell, T. Cranford, L. Crum, A. D'Amico, G. D'Spain, A. Fernández, J. Finneran, R. Gentry, W. Gerth, F. Gulland, J. Hildebrand, D. Houser, T. Hullar, P.D. Jepson, D. Ketten, C.D. MacLeod, P. Miller, S. Moore, D. Mountain, D. Palka, P. Ponganis, S. Rommel, T. Rowles, B. Taylor, P. Tyack, D. Wartzok, R. Gisiner, J. Mead, & L. Benner, Report of a Workshop to Understand the Impacts of Anthropogenic Sound on Beaked Whales 2 (in press) (noting particular plausibility of gas-bubble disease as one of 2 major findings of workshop).

[72] Commerce and Navy, Joint Interim Report at 7-11; SACLANT Undersea Research Centre, Summary Record SACLANTCEN Bioacoustics Panel, La Spezia, Italy, 15-17 June 1998 at 2-6, 2-35 to 36 (1998).

event unlikely to reoccur. DSEIS at 4-54. In the first place, however, the Navy provides no assurance that its LFA training sites won't exhibit all of the same environmental characteristics. Moreover, the general significance of those factors has been outstripped by events. There is no indication that a surface duct, one of the named contributing factors, occurred during the subsequent strandings in the Canary Islands or, indeed, during any of the beaked whale mortalities later reported by the IWC's Scientific Committee and others as being associated with sonar; and few other stranding incidents have involved sonar ships passing through a narrow channel with limited egress.[73] We do not doubt that certain factors, such as the use of sonar in channels, can increase the risk of harm; but it is abundantly evident from the literature that has emerged since the government's Bahamas report appeared in 2001 that strandings may well occur in their absence.

(5) The Navy has failed to consider most of the mass beaked whale strandings that have been identified for their association, or possible association, with sonar. See DSEIS at 4-53 to 54. Indeed, the only incidents that the authors appear to acknowledge are the 2000 strandings in the Bahamas, the 2002 strandings in the Canaries, and the 1996 strandings off Greece. Yet the list reported by the IWC's Scientific Committee and other expert bodies is far broader than the Navy's review would suggest, and should be included and considered in the final document.[74]

(6) The Navy fails to account for the fact that some marine mammal species are especially vulnerable to acoustical injuries. For example, it does not give special consideration to minke whales, even though two minkes stranded in the Bahamas event, another died in the 2005 North Carolina incident still under investigation, and at least one was observed to engage in dramatic "porpoising" behavior in reaction to sonar use in Haro Strait, Washington.[75] Nor does it properly consider harbor porpoises, which stranded at Haro Strait;[76] or pygmy sperm whales, which stranded along with two

[73] See, e.g., Fernández et al., 'Gas and Fat Embolic Syndrome', 42 Veterinary Pathology at 446-457; International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at Tab. 1.

[74] See, e.g., International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at Tab. 1; Brownell et al., Mass Strandings of Cuvier's Beaked Whales in Japan at Tab. 1; J. Hildebrand, Impacts of Anthropogenic Sound on Cetaceans Tab. 5 (2004) (IWC Doc. SC/56/E13); B. Taylor, J. Barlow, R. Pitman, L. Balance, T. Klinger, D. DeMaster, J. Hildebrand, J. Urban, D. Palacios, and J. Mead, A Call for Research to Assess Risk of Acoustic Impact on Beaked Whale Populations Tab. 1 (2004) (IWC Doc. SC/56/E36). See also the studies on individual strandings referenced in this section; and Jasny, Sounding the Depths II at Tab. 1-3.

[75] Commerce and Navy, Joint Interim Report at 1, 15-16 (Bahamas); M. Kaufman, "Whale Stranding in N.C. Followed Navy Sonar Use," Washington Post, Jan. 28, 2005, Sec. A (North Carolina); NMFS, Assessment of Acoustic Exposures at 9 (Washington).

[76] In dismissing the connection to harbor porpoises, the Navy argues that necropsies of animals stranded in association with sonar use in Haro Strait "found no evidence of acoustic trauma." DSEIS at 3.2-45. This

species of beaked whales during naval exercises off the Canary Islands in November 1988;[77] or pilot whales and dwarf sperm whales, which stranded in the 2005 North Carolina incident;[78] or sperm whales and other deep-diving cetaceans, despite anatomical evidence of their susceptibility to bubble lesions and the concern raised by numbers of scientists that these animals stand at greatest risk of damage from bubble growth.[79] The potential for serious injury of these species is "reasonably foreseeable" and must be considered in the Navy's evaluation of impacts. 42 C.F.R. § 1502.22.

(7) The Navy overestimates the importance of the fact that the long history of strandings associated with military sonar, discussed above, has usually implicated another type of sonar commonly employed by navies, known as mid-frequency sonar. DSEIS at 4-55. Mid-frequency sonar has been in widespread use for many decades and is used by navies around the globe. LFA, by contrast, is a new technology that was tested only in secret for many years, then deployed only in a limited areas of the Western Pacific. The Navy cannot properly rely on a lack of stranding reports for LFA to show anything but its fairly recent vintage and, to date, its tightly controlled usage.

(8) The Navy places far too much confidence in its assertion that its use of SURTASS LFA sonar in the last few years has not resulted in marine mammal strandings. DSEIS at 4-53. The Navy has been operating in portions of the Western Pacific at considerable distances (at least 30 to 60 nm) from shore, distant enough to limit observation of strandings and also distant enough that whales injured at sea might not strand. Most areas in which the Navy operates lack stranding networks or other means to detect and disseminate information about strandings. Moreover, as the Navy itself argues elsewhere in the document, stranding reports from the Western Pacific suffer from "regional language differences between conservation programs and publications, cultural preferences, and some inherent media restrictions." DSEIS at 4-52. Even if the Navy could be confident that operations to date

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statement is misleading. In fact, the NMFS investigation was inconclusive given the poor condition of the bodies and the failure to adequately preserve them for tissue analysis. NMFS, Preliminary Report: Multidisciplinary Investigation of Harbor Porpoises at 53-55 (conclusions unchanged in final report). In any case, as NMFS indicated in a further assessment, it is possible that behavioral reactions, rather than acoustic trauma, were responsible for the strandings. NMFS, Assessment of Acoustic Exposures at 10.

[77] V. Martín et al., Mass Strandings of Beaked Whales in the Canary Islands at 35.

[78] M. Kaufman, "Whale Stranding in N.C. Followed Navy Sonar Use," Washington Post, Jan. 28, 2005, Sec. A.

[79] Moore and Early, Cumulative Sperm Whale Bone Damage, 306 Science at 2215; Jepson et al., Gas-Bubble Lesions, 425 Nature at 575; D.S. Houser, Can Diving-Induced Tissue Nitrogen Supersaturation, 213 Journal of Theoretical Biology at 183; J.R. Potter, A Possible Mechanism for Acoustic Triggering of Decompression Sickness Symptoms; International Whaling Commission, 2004 Report of the Scientific Committee, Annex K at § 6.3.

had not caused whales to strand, it ignores the fact that these operations have been undertaken using protective measures that the Navy now proposes to abandon—including increased coastal exclusion zones, frequency restrictions, and a 360 degree buffer zone.

(9) The Navy attempts to discount the well-established link between sonar use and marine mammal strandings by pointing out (based on data compiled when acoustic impacts were not generally considered as a potential cause of strandings) that a majority of marine mammal strandings are related to natural causes. DSEIS at 4-55. This fact, however, does not lessen the Navy's burden to discuss and prevent marine mammal strandings that do relate to sonar.

(10) The Navy states, incorrectly, that "there are no new data that contradict any of the assumptions or conclusions in the FOEIS/FEIS." DSEIS at 4-30. To the contrary, and as referenced throughout this letter, new data exists inter alia linking whale strandings to naval sonar; linking non-stranding injuries in marine mammals to naval sonar; describing mechanisms of harm to marine mammals from sonar; showing unexpectedly high propagation of noise in shallow waters; finding that intense noise sources can mask whale calls over great distances, sometimes thousands of square kilometers; and revealing the difficulties of mitigating for noise impacts.

3. Modeling of Acoustic Impacts

It is impossible to comment fully on the Acoustic Integration Model ("AIM"), the program used by the Navy to calculate the system's impacts, because that model has not been released to the public. Indeed, disclosure of the model must occur for public comment to be meaningful under NEPA and the Administrative Procedure Act, and for guidelines adopted under the Data (or Information) Quality Act to be met. Nonetheless, based on the limited information contained in the DSEIS and related documents, a number of serious problems can be identified that result in underestimations of impacts.

First, the models used by the Navy in its applications for Letters of Authorization ("LOA") to assess its actual work in the Pacific, and in its Final EIS to estimate impacts in sample coastal areas, in large part assume a fairly even distribution of marine mammals across a wide area of ocean, failing to take the possibility that certain animals, like beaked whales and sperm whales, may be concentrated in particular habitat.[80] With regard to beaked whales, there is no indication that the

[80] See, e.g., S.E. Moore, W.A. Watkins, M.A. Daher, J.R. Davies, M.E. Dahlheim, Blue Whale Habitat Associations in the Northwest Pacific: Analysis of Remotely-Sensed Data Using a Geographic Information System, 15 Oceanography 20 (2002); S. Ohsumi, Further Analysis of the Baird's Beaked Whale Stock in the Western North Pacific, 34 Rep. Int'l Whaling Comm. 587 (1984); C.H. Townsend, The Distribution of Certain Whales as Shown by Logbook Records of American Whaleships, 19(1) Zoologica 1 (1935).

Navy has conducted research on habitat preferences around the Navy's operation area, as strongly recommended by NMFS in the 2001 Final Rule; and if it has conducted research, that information has not apparenty been incorporated into its impact analysis or site planning, as NMFS called for. 67 Fed. Reg. 46782. Second, in the limited modeling we have before us, the Navy frequently assumes that populations of marine mammals are relatively unstructured, such that individual animals are improbably considered part of region-wide, basin-wide, or even world-wide stocks.[81] Third, in general, the Navy's stock assessments in its LOA applications are based on incomplete and out-of-date information, leading to a significant underestimation of species abundance and therefore impacts.[82] Fourth, the Navy incorrectly claims that significant impacts on stocks and populations, as modeled for its LOA applications, would necessarily occur at percentages lower than those assumed in the Navy's modeling of coastal areas and NMFS' Final Rule, even disregarding the underestimates of take resulting from the other errors described here.[83] Fifth, the Navy's approach to modeling behavioral impacts from multiple exposures is not conservative.[84]

C. Impacts on Fish and Fisheries

1. Acoustic Impacts on Fish

Though the architecture of their ears may differ, fish are equipped, like all vertebrates, with thousands of sensory hair cells that vibrate with sound; and a number of specialized organs like the abdominal sac, called a "swim bladder," that some species possess can boost hearing. Fish use sound in many of the ways that

[81] Cf., e.g., M.L. Dalebout, K.M. Robertson, A. Frantzis, D. Engelhaupt, A.A. Mignucci-Giannoni, R.J. Rosario-Delestre, and C. Scott Baker, Worldwide Structure of mtDNA Diversity among Cuvier's Beaked Whales (Ziphius cavirostris): Implications for Threatened Populations, 11 Molecular Ecology 3353 (2005) (population structure in Ziphiids); W.F. Perrin, M.L.L. Dolar, M. Amano, and A. Hayano, Cranial Sexual Dimorphism and Geographic Variation in Fraser's Dolphin, Lagenodelphis hosei, 19 Marine Mammal Science 484 (2003) (suggesting genetic differences among Fraser's dolphins off the Philippines and off Japan, as one example of differentiation among species in these two areas); H. Yoshida and H. Kato, Phylogenetic Relationships of Bryde's Whales in the Western North Pacific and Adjacent Waters Inferred from Mitochondrial DNA Sequences, 15 Marine Mammal Science 1269 (1999).

[82] Cf., e.g., P. Rudolph and C. Smeenk, Indo-West Pacific Marine Mammals, in W.F. Perrin, B. Würsig, and J.G.M. Thewissen, Encyclopedia of Marine Mammals 617-25 (2002); E.C.M. Parsons, Review of the Navy's 2003 LOA Application for the SURTASS LFA System (2003).

[83] Compare SDEIS at 4-43 to 4-51 and 67 Fed. Reg. 46780.

[84] See, e.g., D. Kastak, B.L. Southall, R.J. Schusterman, C.R. Kastak, Underwater Temporary Threshold Shift in Pinnipeds: Effects of Noise Level and Duration, 118 Journal of the Acoustical Society of America 3154, 3161 (2005); Navy, Draft Overseas Environmental Impact Statement/ Environmental Impact Statement: Undersea Warfare Training Range (2005); Letter from P.J.O. Miller, Woods Hole Oceanographic Institution, to Donna Wieting, NMFS (May 31, 2001).

marine mammals do: to communicate, defend territory, avoid predators, and, in some cases, locate prey.[85]

One series of recent studies showed that passing airguns can severely damage the hair cells of fish (the organs at the root of audition) either by literally ripping them from their base in the ear or by causing them to "explode."[86] Fish, unlike mammals, are thought to regenerate hair cells, but the pink snapper in those studies did not appear to recover within approximately two months after exposure, leading researchers to conclude that the damage was permanent.[87] It is not clear which elements of the sound wave contributed to the injury, or whether repetitive exposures at low amplitudes or a few exposures at higher pressures, or both, were responsible.[88] As with marine mammals, sound has also been shown to induce temporary hearing loss. Even at fairly moderate levels, noise from outboard motor engines is capable of temporarily deafening some species of fish, and other sounds have been shown to affect the short-term hearing of a number of other species, including sunfish and tilapia.[89] For any fish that is dependent on sound for predator avoidance and other key functions, even a temporary loss of hearing (let alone the virtually permanent damage seen in snapper) will substantially diminish its chance of survival.[90]

Nor is hearing loss the only effect that ocean noise can have on fish. For years, fisheries in various parts of the world have complained about declines in their catch after intense acoustic activities (including naval exercises) moved into the area, suggesting that noise is seriously altering the behavior of some commercial species.[91]

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[85] See, e.g., A.N. Popper, Effects of Anthropogenic Sounds on Fishes, 28(10) Fisheries 26-27 (2003); M.C. Hastings & A.N. Popper, Effects of Sound on Fish 19 (2005) (Report to the California Department of Transportation, Contract No. 43A0139), p., 19; D.A. Croll, Marine Vertebrates and Low Frequency Sound—Technical Report for LFA EIS 1-90 (1999).

[86] R. McCauley, J. Fewtrell, and A.N. Popper, High Intensity Anthropogenic Sound Damages Fish Ears, 113 Journal of the Acoustical Society of America 640 (2003).

[87] Id. at 641 (some fish in the experimental group sacrificed and examined 58 days after exposure).

[88] Id.

[89] A.R. Scholik and H.Y. Yan, Effects of Boat Engine Noise on the Auditory Sensitivity of the Fathead Minnow, Pimephales promelas, 63 Environmental Biology of Fishes 203-09 (2002); A.R. Scholik and H.Y. Yan, The Effects of Noise on the Auditory Sensitivity of the Bluegill Sunfish, Lepomis macrochirus, 133 Comparative Biochemisty and Physiology Part A at 43-52 (2002); M.E. Smith, A.S. Kane, & A.N. Popper, Noise-Induced Stress Response and Hearing Loss in Goldfish (Carassius auratus), 207 Journal of Experimental Biology 427-35 (2003); Popper, Effects of Anthropogenic Sounds at 28.

[90] See Popper, Effects of Anthropogenic Sounds at 29; McCauley et al., High Intensity Anthropogenic Sound Damages Fish Ears, at 641.

[91] See "'Noisy' Royal Navy Sonar Blamed for Falling Catches," Western Morning News, Apr. 22, 2002 (sonar off the U.K.); Percy J. Hayne, President of Gulf Nova Scotia Fleet Planning Board, "Coexistence of the Fishery & Petroleum Industries," www.elements.nb.ca/theme/fuels/percy/hayne.htm (accessed May 15, 2005) (airguns off Cape Breton); R.D. McCauley, J. Fewtrell, A.J. Duncan, C. Jenner, M.-N. Jenner, J.D. Penrose, R.I.T. Prince, A. Adhitya, J. Murdoch, and K. McCabe, Marine DSEISmic Surveys: Analysis and

A group of Norwegian scientists attempted to document these declines in a Barents Sea fishery and found that catch rates of haddock and cod (the latter known for its particular sensitivity to low-frequency sound) plummeted in the vicinity of an airgun survey across a 1600-square-mile area, an area larger than the state of Rhode Island; in another experiment, catch rates of rockfish were similarly shown to decline.[92] Drops in catch rates in these experiments range from 40 to 80 percent.[93] A variety of other species, herring, zebrafish, pink snapper, and juvenile Atlantic salmon, have been observed to react to various noise sources with acute alarm.[94]

Equally troubling are the high mortalities from noise exposure seen in developmental stages of fish. A number of studies, including one on non-impulsive noise, show that intense sound can kill eggs, larvae, and fry outright or retard their growth in ways that may hinder their survival later.[95] Increased mortality for fish eggs and larvae has been shown to occur at distances from an airgun source.[96] Also, larvae in at least some species are known to use sound in selecting and orienting toward settlement sites.[97] Acoustic disruption at that stage of development could have significant consequences.[98]

2. The DSEIS' Analysis

Propagation of Air-Gun Signals, and Effects of Air-Gun Exposure on Humpback Whales, Sea Turtles, Fishes, and Squid 185 (2000) (airguns in general).

[92] A. Engås, S. Løkkeborg, E. Ona, and A.V. Soldal, Effects of DSEISmic Shooting on Local Abundance and Catch Rates of Cod (Gadus morhua) and Haddock (Melanogrammus aeglefinus), 53 Canadian Journal of Fisheries and Aquatic Sciences 2238-49 (1996); J.R. Skalski, W.H. Pearson, and C.I. Malme, Effects of Sound from a Geophysical Survey Device on Catch-Per-Unit-Effort in a Hook-and-Line Fishery for Rockfish (Sebastes spp.), 49 Canadian Journal of Fisheries and Aquatic Sciences 1357-65 (1992). See also S. Løkkeborg and A.V. Soldal, The Influence of DSEISmic Exploration with Airguns on Cod (Gadus morhua) Behaviour and Catch Rates, 196 ICES Marine Science Symposium 62-67 (1993).

[93] Id.

[94] See J.H.S. Blaxter and R.S. Batty, The Development of Startle Responses in Herring Larvae, 65 Journal of the Marine Biological Association of the U.K. 737-50 (1985); F.R. Knudsen, P.S. Enger, and O. Sand, Awareness Reactions and Avoidance Responses to Sound in Juvenile Atlantic Salmon, Salmo salar L., 40 Journal of Fish Biology 523-34 (1992); McCauley et al., Marine DSEISmic Surveys at 126-61.

[95] See, e.g., C. Booman, J. Dalen, H. Leivestad, A. Levsen, T. van der Meeren, and K. Toklum, Effecter av luftkanonskyting på egg, larver og yngel (Effects from Airgun Shooting on Eggs, Larvae, and Fry), 3 Fisken og Havet 1-83 (1996) (Norwegian with English summary); J. Dalen and G.M. Knutsen, Scaring Effects on Fish and Harmful Effects on Eggs, Larvae and Fry by Offshore DSEISmic Explorations, in H.M. Merklinger, Progress in Underwater Acoustics 93-102 (1987); A. Banner and M. Hyatt, Effects of Noise on Eggs and Larvae of Two Estuarine Fishes, 1 Transactions of the American Fisheries Society 134-36 (1973); L.P. Kostyuchenko, Effect of Elastic Waves Generated in Marine DSEISmic Prospecting on Fish Eggs on the Black Sea, 9 Hydrobiology Journal 45-48 (1973).

[96] Booman et al., Effecter av luftkanonskyting på egg, larver og yngel at 1-83.

[97] S.D. Simpson, M. Meekan, J. Montgomery, R. McCauley, R., and A. Jeffs, Homeward Sound, 308 Science 221 (2005).

[98] Popper, Effects of Anthropogenic Sounds at 27.

In the face of this substantial evidence of a range of impacts to fish from intense acoustic sources, the Navy nevertheless concludes that impacts to fish are likely to be "minimal to negligible since only an inconsequential portion of any fish stock would be present within the 180-dB sound field at any given time." DSEIS at 4-21. Its analysis, however, fails to take into account several important points.

First, the Navy relies on three main studies in support of its conclusions about fish injuries: Popper in prep., examining rainbow trout exposed to LFA; Halvorsen in prep., examining catfish; and Wysocki in prep., examining fish behavior in both species. These studies are not yet published and are therefore not available for careful review, but the overview provided by the Navy shows 24 hours of significant hearing loss in catfish and rainbow trout after exposure to LFA. Id. at 4-15. Because fish use sound in many of the ways that marine mammals do—to communicate, defend territory, avoid predators, and, in some cases, locate prey—compromised hearing can have serious consequences for survival.[99] If a concentrated fish school were to suffer hearing loss for 24 hours, it might be vulnerable to predation and other threats that could have population-level effects.

Second, the Navy presumes an even distribution of fish when it states that it's unlikely that any portion of a fish stock will be within the zone of greatest impact. But fish often aggregate into very dense schools, often located around areas of productivity.[100] Because the Navy has failed to identify any new offshore biologically important areas outside U.S. waters, it can make no assurances about use of LFA in important fish habitat, where significant effects might be felt to a stock.

Third, the Navy's analysis of impacts to fish larvae and juvenile fish is inadequate. Despite the fact that some of the most significant effects from acoustical sources have been seen in fish eggs, larvae, and fry, all of the three studies conducted by the Navy, as best one can tell from the summary provided, tested LFA exclusively on adult fish. DSEIS at 4-13. Moreover, the Navy fails to discuss a recent work showing that fish larvae use noise for the selection of, and orientation to, suitable settlement sites.[101] Disruption of such behavior could be quite harmful. The significant threat to young fish is highlighted by a recent study cited by the Navy that found mortality rates of 20-30 percent in juvenile herring exposed to naval sonar signals. DSEIS at 4-17.

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[99] See, e.g., A.N. Popper, Effects of Anthropogenic Sounds on Fishes, 28(10) Fisheries 26-27 (2003); M.C. Hastings & A.N. Popper, Effects of Sound on Fish 19 (2005) (Report to the California Department of Transportation, Contract No. 43A0139), p., 19; D.A. Croll, Marine Vertebrates and Low Frequency Sound—Technical Report for LFA EIS 1-90 (1999).

[100] See page 9 of comments submitted on the DSEIS to the Navy from Dr. Linda Weilgart, dated on December 16, 2005.

[101] S.D. Simpson et al., Homeward Sound, Science 308:221 (2005).

Finally, the Navy's conclusion that commercial fish stocks and catches will not be affected by LFA simply does not follow from the studies it cites in support of this conclusion, which involved captive fish unable to display the type of behavioral response that might lead to reduced catch rates. DSEIS at 4-19 to 20. The studies of catch rates cited in the previous section, supra, provide better data on this point and suggest the opposite conclusion.

D. Impacts on Sea Turtles

Sea turtles, many of which are listed as endangered or threatened, appear to have their best sensitivity to sound in the frequency range employed by LFA. DSEIS at 4-26. Furthermore, they have been shown to engage in startle and escape behavior—behavior that may involve diving and surfacing—and to experience heightened stress in response to noise.[102]

In its analysis of impacts to turtles, the Navy concludes that there is only a very small probability, "if any," that a sea turtle could be found inside the LFA mitigation zone during an LFA sonar transmission. DSEIS at 4-29. But the severe difficulties in effectively monitoring the mitigation zone for sea turtles, discussed infra, together with the Navy's failure to designate offshore biologically important areas for sea turtles (such as the Sargasso Sea gyre) and its failure to expand its coastal exclusion zone, belie this assurance. Moreover, the Navy's conclusion about impacts rests on an assumption of "even distribution" of populations through the pelagic zone, despite the fact that even the Navy recognizes that turtles clump into "hot spots." DSEIS at 4-29 to 30. Given these factors, a more rigorous analysis of potential impacts is necessary.

E. Species Excluded from Risk Analysis

The Navy eliminates invertebrates from its consideration, justifying this decision by stating that "they do not have delicate organs or tissues" and "there is no evidence of auditory capability in the frequency range used by SURTASS LFA." DSEIS at ES-7. This decision overlooks the growing evidence that invertebrates are vulnerable to impacts from acoustic sources. Marine mammal echolocation has been shown to directly injure invertebrates, raising the question of whether lower-frequency sources can do the same.[103] The only audiogram available for an invertebrate species (the American lobster) shows sensitivity to sounds below several hundred Hertz, in the frequency range of LFA.[104]

[102] National Research Council, The Decline of Sea Turtles: Causes and Prevention (1990).

[103] See K. Norris and B. Møhl, Can Odontocetes Debilitate Prey with Sound? 122 The American Naturalist 85 (1983).

[104] G.C. Offutt, Acoustic Stimulus Perception by the American Lobster, Homarus americanus (Decapoda), 26 Experientia 1276 (1970).

Moreover, it has recently been observed that many species of invertebrates possess mechanosensors that bear resemblance to vertebrate ears, making it "important to examine the effect of anthropogenic sounds on a wider range of marine fauna."[105] Impacts have already been observed in a number of species: giant squid, which twice now have stranded in numbers in the vicinity of airgun surveys; brown shrimp, whose growth and reproduction were retarded from being raised in a noisy environment; and snow crabs, which, in some preliminary research, showed signs of ovary and liver damage on exposure to airgun noise.[106] The proper approach under NEPA is to acknowledge the lack of necessary data and to either obtain it (if the cost of doing so is not exorbitant) or to conduct a risk assessment based on methods generally accepted by the scientific community. 42 C.F.R. § 1502.22.

F. Cumulative Impacts

In order to satisfy NEPA, an EIS must include a "full and fair discussion of significant environmental impacts." 40 C.F.R. § 1502.1. It is not enough, for purposes of this discussion, to consider the proposed action in isolation, divorced from other public and private activities that impinge on the same resource; rather, it is incumbent on the Navy to assess cumulative impacts as well, including the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future significant actions." Id. § 1508.7. Thus, for example, it will be necessary to consider the impacts of the Navy's training with LFA alongside those of existing naval activities, as well as those of industrial and commercial activities such as fishing, shipping, and geophysical research.

The DSEIS's method for assessing cumulative impacts is deeply flawed. As it stands, the Navy does not consider cumulative impacts for any species other than marine mammals; and, as for marine mammals, it does little more than identify, in a summary way, some of the leading threats they face globally. DSEIS at 4-61 to 63. It does not attempt to examine any specific marine mammal population affected by LFA, so that, for example, one cannot ascertain what the combined effects of LFA use, ship-strikes, and

[105] A.N. Popper, Effects of Anthropogenic Sounds on Fishes, 28(10) Fisheries 24, 30 (Oct. 2003).

[106] A. Guerra, A.F. Gonzalez and F. Rocha, A Review of Records of Giant Squid in the North-Eastern Atlantic and Severe Injuries in Architeuthis dux Stranded after Acoustic Exploration (2004) (paper presented to the Annual Science Conference of the International Council for the Exploration of the Sea, Vigo, Spain, 22-25 Sept. 2004) (giant squid); J.P. Lagardère, Effect of Noise on Growth and Reproduction of Crangon crangon in Rearing Tanks, 71 Marine Biology 177 (1982) (brown shrimp); Fisheries and Oceans Canada, Potential Impacts of Seismic Energy on Snow Crab (2004) (Maritime Provinces Regional Habitat Status Report 2004/Draft) (snow crab). See also R.D. McCauley, J. Fewtrell, A.J. Duncan, C. Jenner, M.-N. Jenner, J.D. Penrose, R.I.T. Prince, A. Adhitya, J. Murdoch, & K. McCabe, Marine Seismic Surveys: Analysis and Propagation of Air-Gun Signals, and Effects of Air-Gun Exposure on Humpback Whales, Sea Turtles, Fishes, and Squid 185 (2000) (squid).

fishing entanglements on threatened whale populations might be; nor does it contemplate that LFA activities might work synergistically with other threats to affect them.[107]

The Navy also seems to believe that it can satisfy the requirement to assess cumulative impacts by cataloging the ways in which impacts from LFA are small compared with the totality of threats faced by marine mammals and the totality of anthropogenic noise being generated in the oceans. DSEIS at 4-57 to 63. Not only is this approach factually insupportable given the lack of any quantitative assessment of long-term effects in the DSEIS—but it misapprehends the definition of "cumulative impact," which, according to NEPA's regulations, "can result from individually minor but collectively significant actions taking place over a period of time." 42 C.F.R. § 1508.7. It cannot be reconciled, for example, with the Navy's own account of the long-term effects of stress, a reasonably foreseeable impact that does not otherwise receive attention in the document.

In short, the Navy must (a) consider cumulative impacts on species other than marine mammals, such as fish and sea turtles, (b) evaluate the potential for cumulative impacts, (c) assess the potential for synergistic adverse effects, as from noise in combination with ship-strikes,[108] (d) properly assess the long-term cumulative impacts of the activities actually covered by the DSEIS, and (e), even if (contrary to reason) the Navy finds that the long-term impacts of the proposed use of LFA itself are likely to be small, consider whether other activities could combine with this use to produce a significant effect.

G. Alternatives Analysis

At bottom, an EIS must "inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This requirement has been described in regulation as "the heart of the environmental impact statement." Id. § 1502.14. The agency must therefore "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." Id. § 1502.14(a). Consideration of alternatives is required by (and must conform to the independent terms of) both sections 102(2)(C) and 102(2)(E) of NEPA.

Here, the Navy's alternatives analysis is significantly flawed. First, it fails to meaningfully consider focusing its training into areas of reduced risk. One of the central flaws of the Navy's 2001 FEIS was its failure to consider concentrating training with

[107] For example, as discussed above, exposure to some manmade sounds may increase the risk of ship-strikes of the critically endangered right whale. See Nowacek et al., Right Whales Ignore Ships, 271 Proceedings of the Royal Society of London, Part B: Biological Sciences at 227.

[108] The 2004 Report of the IWC's Scientific Committee emphasizes the importance of evaluating the synergistic impacts of ocean noise and other stressors, such as toxins. IWC, 2004 Report of the IWC Scientific Committee, Annex K at § 6.4 and App. 2 (noting studies of terrestrial animals that demonstrate significant adverse synergistic effects).

LFA into specific, low-impact areas, rather than spreading it throughout the globe. District Court Opinion at 1166. Instead of correcting this flaw, the Navy proposes only alternatives that would allow training with LFA throughout the same 75% of the world's oceans as proposed in the 2001 FEIS. None of the considered alternatives engages in the central and essential tasks of identifying potential areas of lesser harm and analyzing the impacts to the environment that would result from restricting all, or even a portion, of the Navy's planned training to those areas. The consideration of training in areas that present a reduced risk of harm to marine life is all the more critical since experts agree that proper siting and geographic mitigation are among the most effective ways to lessen harm from acoustical sources.[109]

Second, it fails to meaningfully consider extending shutdown procedures to fish. The Court held the 2001 FEIS deficient because it failed to consider suspending LFA operations when schools of fish are detected within the LFA buffer zone. District Court Opinion at 1165-66. But the Navy's attempt to comply with the Court's directive here is grudging at best. Though it does include the extension of shutdown procedures to fish among its alternatives considered, it dismisses this alternative in one paragraph, with the core of its argument being that impacts to fish will be negligible and that "active acoustics would give so many false alarms that the impact on the effectiveness of the military readiness activity (and, hence impact on National Security) would be intolerably high." DSEIS at 2-11.

As further discussed in section II(C) ("Impacts to Fish and Fisheries"), supra, we disagree that impacts to fish will be negligible. Given the potential for serious harm to fish from exposure to LFA, and further given the Court's clear concern about reducing this potential, the Navy's dismissal of mitigation opportunities remains far too casual. The Navy offers only a conclusory statement that the use of active acoustics to detect fish would yield too many false alarms, without justifying this conclusion with any information that would allow the public, or the Court, to judge its reasonableness.

Third, it fails to propose additional OBIAs other than seven national marine sanctuaries within U.S. waters—five of which are already included, in the 2002 Final Rule, among areas where the Navy is required to limit received levels to below 180 dB. This is discussed further in section II(H) ("Mitigation Measures").

Fourth, it fails to consider all reasonable alternatives for expanding coastal exclusion zones, instead limiting its analysis to the 12 nm and 25 nm scenarios. The Navy provides no explanation for its choice of 25 nm as the sole alternative coastal zone considered. Other alternatives that should have been considered include a dual-criteria alternative like

[109] See J. Barlow and R. Gisiner, Mitigation and Monitoring of Beaked Whales During Acoustic Events, Journal of Cetacean Research and Management (in press) (discussing the importance of geographic mitigation); IWC, 2004 Report of the IWC Scientific Committee, Annex K at § 6.4 (recommending steps to protect large whale critical habitat worldwide from noise impacts); 67 Fed. Reg. 46782.

the one used in the Permanent Injunction (which sets a coastal exclusion zone in the Philippine Sea of 60 nautical miles or 30 nautical miles seaward of the 200 meter isobath, whichever is greater); zones greater than 25 nm and large enough to shield shelf and shelf-break species, but still narrow enough to permit training with LFA, like the zone of at least 60 nm now employed in the Philippine Sea; and an "inverse" coastal exclusion zone—perhaps called a coastal shelf exclusion zone—that puts the areas of highest impact to coastal species, as defined by the Navy's coastal zone exclusion modeling, off-limits to training.

Fifth, it omits the reasonable alternatives of maintaining its current 330 Hz frequency restriction and its 360-degree, 1-km buffer zone. Each of these is discussed further below, in II(H) ("Mitigation Measures"). Both would avoid or minimize adverse impacts, have been shown to be practicable, and should have been considered.

The Navy's failure to consider these reasonable alternatives to the proposed action, all of which would decrease harm from LFA and several of which were specifically ordered by the Court, is arbitrary and capricious.

H. Mitigation Measures

To comply with NEPA, an agency must discuss measures designed to mitigate its project's impact on the environment. See 42 C.F.R. § 1502.14(f). When marine mammals are among the impacted species, an independent set of mitigation requirements applies through the MMPA. 16 U.S.C. § 1371(a)(5). There is a large and growing set of options for the mitigation of noise impacts to marine mammals and other marine life, several of which were urged upon the Navy by the Court. But the Navy fails to discuss or rejects most of the protective measures urged by the Court and by NMFS to safeguard marine life, retreating even from the mitigation measures under which the Navy has been operating for years. What few measures the Navy does embrace are fraught with difficulties and will not, realistically, protect marine life from LFA's most intense and harmful noise levels.

The 2001 Final Rule, according to the Court, did not go far enough in imposing mitigation measures on the Navy's use of LFA. The Court held "that defendants acted arbitrarily and capriciously in failing to (1) extend the coastal exclusion zones in all areas except for those few coastal areas where close to shore training is necessary, (2) use aerial surveys or observational vessels for LFA sonar missions operated close to shore, and (3) designate additional off-limit areas or seasons and OBIAs." District Court Opinion at 1164. Yet here, the Navy's preferred alternative fails to adopt or severely shortchanges each of these mitigation measures, and also fails to consider additional mitigation measures that would mitigate LFA's impact on marine species, including but not limited to the following.

1. The Navy fails to extend the coastal exclusion zone as required, instead responding to this holding by disputing its premise that greater coastal exclusion

zones would be beneficial to marine species. DSEIS at ES-19, 4-75. But the Court has already held that that it was unlawful for NMFS and the Navy to reject increased coastal exclusion zones, and the Navy cannot reopen this debate. Even if it could, the Navy has failed to present sufficient modeling and analysis to show that its conclusion as to the merits of an expanded zone is correct. Its modeling fails to account for several factors that are key to showing that more harm to marine species will, indeed, occur with an exclusion zones of 25 nm, including but not limited to the following:

- The model fails to consider or account for the absolute number of animals affected within each of the three zones studied (shelf, shelf-break, and pelagic). Instead, for every species considered it assumes a normalized density of 4 animals per square nm in the species' prime habitat. DSEIS at 4-71. This methodology makes it very difficult to weigh the real-world impact of the two scenarios analyzed. The Navy concedes, for example, that increasing the coastal standoff zone decreases harm to marine animals closest to shore (i.e., shelf species). Id. at 4-75. If there are many more animals on the shelf than in the shelf-break or pelagic zones, any increased risk for pelagic and shelf-break species might be outweighed by the decreased risk for shelf species. The analysis does not provide sufficient information, however, to allow this comparison.
- Relatedly, the model fails to account for the absolute number of animals that will be exposed to the most dangerous levels of LFA sound. The central difference between the two alternatives is the location of the area of intense sound in relation to the shelf break. In comparing these alternatives, therefore, one crucial question is whether more or fewer marine animals are likely to be found within the area of most intense ensonification. This is a questions that the model never asks or answers, since it never compares abundances of shelf, shelf break, and pelagic species, as discussed in the previous bullet.
- The model likewise fails to account for the types of animals that will be exposed to the highest and most dangerous levels of LFA sound, treating all species as equivalently vulnerable to acoustical harms. In fact, we know that some species found along the coast are particularly vulnerable, such as harbor porpoises.[110] Failure to take into account especially sensitive species and their likely habitats is a significant flaw.

[110] See, e.g., R.A. Kastelein, H.T. Rippe, N. Vaughan, N.M. Schooneman, W.C. Verboom, and D. de Haan, The Effects of Acoustic Alarms on the Behavior of Harbor Porpoises in a Floating Pen, 16 Marine Mammal Science 46 (2000); P.F. Olesiuk, L.M. Nichol, M.J. Sowden, and J.K.B. Ford, Effect of the Sound Generated by an Acoustic Harassment Device on the Relative Abundance of Harbor Porpoises in Retreat Passage, British Columbia, 18 Marine Mammal Science 843 (2002); J. Calambokidis, D.E. Bain, and S.D. Osmek, Marine Mammal Research and Mitigation in Conjunction with Air Gun Operation for the USGS 'SHIPS' Seismic Surveys in 1998 (1998) (report to Minerals Management Service); NMFS, Assessment of Acoustic Exposures on Marine Mammals in Conjunction with USS Shoup Active Sonar Transmissions in the Eastern Strait of Juan de Fuca and Haro Strait, Washington, 5 May 2003 at 10 (2005).

- The model assumes that the propagation loss from the LFA source is spherical for the first 1,000 m from the source and cylindrical beyond that range. DSEIS at 4-67. Propagation loss in shallow coastal waters is not, however, necessarily spherical for that duration, and reverberations can play a significant role in increasing received levels.[111] Because coastal shelf widths vary greatly, both the 12 nm and the 25 nm coastal exclusion zones will sometimes permit LFA use in coastal waters less than 200 m deep—as the Navy itself acknowledges by including, in its model, a shelf break 80 nm off shore. Thus, the Navy should update its propagation loss model to account for shallow water propagation effects.
- The model treats all three shelf-break scenarios (at 5 nm, at 15 nm, and at 80 nm from the shore) as equally likely to occur in LFA operational areas. The placement of the shelf break, however, has a significant effect on the harm to which species are exposed in each scenario analyzed. DSEIS at Table 4.7-7. Rather than assume an equal likelihood for each shelf-break type, the DSEIS should therefore make an estimate, based on best available science, as to the proportion in which these three types occur in LFA operational areas.

Moreover, the DSEIS should have considered zone widths in addition to 12 and 25 nm and other reasonable alternatives for the coastal exclusion zone, as discussed further in section II(G) ("Alternatives Analysis").

2. The Navy refuses to adopt small-craft pre-operational surveys for marine mammals in missions close to shore. The Court held that such surveys are necessary to protect marine life, but the Navy rejects this option and concludes, among other things, that such surveys are "not practicable" and "not effective." DSEIS at 5-9. The Court's direct conclusions to the contrary after review of the record, however, are dispositive of these issues. Evidence since the Court's ruling in 2003 has only strengthened the justifications cited by the Court for requiring such surveys.[112] Moreover, even if the Court's holding were not dispositive, the Navy's analysis on these points is flawed. The Navy does not consider, for example, any of the following in its analysis:

- The possibility of using boats launched from shore, rather than from LFA ships (since only operations close to shore are at issue);

[111] Tolstoy, M., Diebold, J.B., Webb, S.C., Bohnenstiehl, D.R., Chapp, E., Holmes, R.C. and Rawson, M. Broadband calibration of R/V Ewing seismic sources. 2004. *Geophysical Research Letters* 31 (L14310): 1-4; NMFS, Assessment of Acoustic Exposures.

[112] Evidence of coastal strandings due to Navy sonar use has mounted, as have studies showing the inefficacy of visual and other monitoring schemes related to safety zones. Recent research has shown that in anything stronger than a light breeze, only one in fifty beaked whales surfacing in the direct track line of a ship would be sighted through visual monitoring. J. Barlow and R. Gisiner, Mitigation and Monitoring of Beaked Whales During Acoustic Events, Journal of Cetacean Research and Management (in press) (number cited is based on draft text). See also discussion of additional coastal strandings associated with Navy sonar since 2003, in section II(B)(2)(a) ("Summary of Strandings Data").

- The fact that any minor disturbance to marine mammals from small planes and small boats would be far outstripped by the risk of serious injury and death that might result if marine mammals and sea turtles remain undetected in the zone of highest impact when the LFA system is activated;
- The possibility of using more than a single small boat, if a single small boat is insufficient to the task;
- The fact that the effectiveness of any visual monitoring program, including the one embraced by the Navy, is diminished by high sea states, low visibility, and diving habits of whales—making additional mitigation more important, not less important. (The Navy fails to explain why, in these conditions, its proposed boat-based observers would be able to see cetaceans more effectively than aerial surveyors. The boat-based observers would be positioned at even greater distances from the animals than helicopter observers.); or
- The comparative cost of operating LFA in a manner that exposes coastal marine mammals to a higher risk of stranding and other injuries.

3. The Navy has done very little to respond to the Court's holding with respect to additional OBIAs. Recognizing the importance of shielding crucial offshore areas from exposure to LFA, the Court concluded that NMFS and the Navy had not done enough to identify such areas and to put them off-limits to LFA training. Though the Navy's preferred alternative adds seven locations to the list of OBIAs, five of these areas were already included, in the 2002 Final Rule, among places where the Navy is required to limit received levels to below 180 dB—and thus are not additional mitigations at all. Compare DSEIS Table 2-4 with 50 C.F.R. § 216.184(e)-(f). Moreover, every one of the seven areas is an existing or proposed National Marine Sanctuary within U.S. waters. DSEIS at 2-14, Table 2-4. No new OBIA outside U.S. waters is even considered in the DSEIS. Id.

For example, the DSEIS does not consider any of the areas specifically mentioned in the District Court Opinion as potential OBIAs. It does not consider any marine protected areas ("MPAs") established by countries other than the U.S., such as any of Canada's nine existing MPAs with cetaceans, Australia's 38 existing MPAs with cetaceans, or Brazil's 16 existing MPAs with cetaceans[113]—or, indeed, any of the non-U.S. protected areas discussed in the recent and highly relevant assessment of this topic entitled Marine Protected Areas for Whales, Dolphins and Porpoises: A World Handbook for Cetacean Habitat Conservation.[114] Nor does the DSEIS

[113] E. Hoyt, "Marine Protected Areas for Whales, Dolphins and Porpoises: A World Handbook for Cetacean Conservation." p.12 Table I.1 (2005).

[114] E. Hoyt, "Marine Protected Areas for Whales, Dolphins and Porpoises: A World Handbook for Cetacean Conservation." (2005). Also see the discussion of key omitted habitats and MPAs in the letter submitted to the Navy during this comment period by Dr. E.C.M. Parsons of George Mason University. He notes the omission of Xiamen Marine National Park and Conservation Area (Fujian Province), a nationally recognized protected area since 2000, designated specifically for cetaceans and located immediately

consider any of the biologically significant, globally representative areas have already been compiled by the World Conservation Union ("IUCN"), in conjunction with the World Bank and Great Barrier Reef Marine Park Authority. See IUCN et al., A Global Representative System of Marine Protected Areas (1995).

Even the Navy's consideration of waters along the U.S. coast is incomplete. Not mentioned, for example, are the Channel Islands National Marine Sanctuary off southern California, home to a tremendous diversity of marine species and a major gray whale migration path; or the gray whale migratory paths outside the Olympic Coast National Marine Sanctuary off the coast of Washington State, specifically discussed by the Court as a potential OBIA. District Court Opinion at 1163.

Because the Navy has done very minimal work to identify off-limit areas outside U.S. waters and has ignored clear candidates for the OBIA designation, it has failed to take on the burden of identifying additional OBIAs, as required by the Court. Its failure to consider and adopt additional OBIAs remains arbitrary and capricious. To begin with, we propose that during the SEIS process the regional and national priority areas implicated by the IUCN's report and in Dr. Hoyt's review of cetacean MPAs be reviewed. These areas include but are in no way limited to: the Channel Islands and Santa Barbara Channel (California); the Gulf of Alaska; the Hawaiian Islands; the Marshall Islands; the Great Barrier Reef (Australia); the Gulf of Carpentaria (Australia); the Yaeyama Archipelago (Japan); the Korea Strait; Bohai Bay (China); the Fernando de Noronha archipelago (Brazil); the Atol das Rocas (Brazil); archipelagos west of Iceland; the Milieuzone Noordzee (Netherlands); the Western Mediterranean North for Protection of International Waters for Cetaceans (France, Italy, Corsica); the Gulf of Gabes (Tunisia); the Gulf of Sirte (Libya); and the Aegean Sea (Greece, Turkey). Further recent work on offshore biodiversity and habitat preferences should also be considered and applied.[115]

4. The Navy rejects NMFS's 360-degree, one-kilometer buffer zone extending out from the 180 dB isopleth. See 50 C.F.R. Sec. 216.184(b). Without explanation or analysis, the Navy now proposes shutting down LFA transmissions only when species are sited within this zone and within 45 degrees of either side of the bow—effectively shrinking this buffer zone by 75%. DSEIS at Table 5-1. This proposal is somewhat

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opposite Taiwan on the Chinese mainland; portions of the Sargasso Sea gyre, a crucial offshore habitat for juvenile and hatchling sea turtles; the Far Eastern Marine Nature Reserve (Zapovednik) in Pter the Great Bay, Sea of Japan; the Vostok Bay National Comprehensive Marine Sanctuary; the Siargao Island Protected Land and Seascape; the Batanes Island Protected Land and Seascape; the Calayan Island Protected Area; and the Sierra Madre Natural Park. The latter two are known to include breeding humpback whales in their waters, and Calayan Island is considered to be the most diverse cetacean habitat in the Philippines.

[115] See, e.g., B. Worm, H.K. Lotze, and R.A. Myers, Predator Diversity Hotspots in the Open Ocean, 100 Proccedings of the National Academy of Sciences 9884 (2003); B. Worm, M. Sandow, A. Oschlies, H.K. Lotze, and R.A. Myers, Global Patterns of Predator Diversity in the Open Oceans, 309 *Science* 1365 (2005).

baffling given the horizontally omnidirectional nature of the LFA signal and given the proven practicability of the more protective zone.

5. It also rejects the 330 Hz frequency restriction imposed by NMFS to protect marine mammals from resonance effects. The Navy now argues that there is no need to mitigate for resonance effects since an expert group, convened in 2002 by NMFS, rules out resonance effects as a likely problem. DSEIS at 2-9 to 2-10. In fact, that group did not rule out resonance, though it considered lung resonance in particular less promising than other pathologies such as bubble growth, and, in fact, called for further research on the subject—particularly on structures other than the lungs, which was the only structure it considered. NMFS, Report of the Workshop on Acoustic Resonance as a Source of Tissue Trauma in Cetaceans (2002). Meanwhile, an expert group convened more recently, by the Marine Mammal Commission, concluded that resonance remained a potential cause and made similar recommendations for further research. Cox et al., Report of a Workshop to Understand the Impacts of Anthropogenic Sound at 13, 22-23. Under NEPA, damage from resonance remains a "reasonably foreseeable" impact that must be considered in the Navy's environmental review and mitigation. 42 C.F.R. § 1502.22.

6. The mitigation measures that remain are not well calculated to protect marine species from LFA. First, the coastal exclusion zone is relatively narrow and untied to the width of the continental shelf at any given location, leaving coastal species in many parts of the world vulnerable. Second, the efficacy of the safety zone in preventing injury is inherently tied to the ability of the Navy to monitor that zone; but the limits of visual and acoustical monitoring for marine mammals are well-established.[116] These limits adhere even when the observers are marine biologists assigned only to the task of wildlife monitoring. Sighting rates will only decrease with non-biologist observers whose attention is divided between several mission tasks, so the Navy must provide more detail about the implementation of its visual monitoring program. Third, the Navy fails to explain how it will monitor the safety zone for sea turtles, which are small and which spend considerable time under water but do not vocalize. Fourth, in mitigating for human divers, the Navy applies a 40m coastal contour rule that is a gross oversimplification and fails to account for popular diving sites, like wrecks and reefs, that may be in water deeper than 40m. Fifth, the Navy's proposal to resume sonar transmissions just 15 minutes after last sighting a whale in the safety zone is inappropriate given dive times of large whales and turtles; cetaceans can remain submerged for over an hour.

[116] See, e.g., J.W.W. Hain, S.L. Ellis, R.D. Kenney, and C.K. Slay, Sightability of Right Whales in Coastal Waters of the Southeastern United States with Implications for the Aerial Monitoring Program, in G.W. Garner, S.C. Amstrup, J.L. Laake, B.F.J. Manley, L.L. McDonald, and D.G. Robertson, Marine Mammal Survey and Assessment Methods 191 (1999); J. Barlow and R. Gisiner, Mitigation and Monitoring of Beaked Whales During Acoustic Events, Journal of Cetacean Research and Management (in press).

7. Finally, the Navy simply fails to consider a broad range of mitigation measures available for the protection of marine life, including but not limited to ramp-up of the LFA source; use of third-party marine biologist visual observers; acoustic monitoring using the Navy's existing acoustic nodes and other external platforms; modification of the sonar signal characteristics;[117] the avoidance of enclosed areas and coastal areas with complex, steep sea bed topography; use of lower power levels in conditions that may produce surface ducting and within certain geographic or other conditions, such as shallow marine embayments; wider safety zones; operational procedures in coastal areas to provide escape routes and avoid embayment of marine species; and, of course, meaningful geographic restrictions that would avoid biological hot-spots and focus training in areas of low risk.[118]

I. Project Description and Meaningful Public Disclosure

Disclosure of the specific activities contemplated by the Navy is essential if the EIS process is to be a meaningful one. See, e.g., LaFlamme v. F.E.R.C., 852 F.2d 389, 398 (9th Cir. 1988) (noting that NEPA's goal is to facilitate "widespread discussion and consideration of the environmental risks and remedies associated with [a proposed action]"). With regard to noise-producing activities, for example, the Navy must describe source levels, frequency ranges, duty cycles, and other technical parameters relevant to determining potential impacts on marine life.

The DSEIS provides some of this information, but it fails to disclose key data that the Navy presumably used in modeling acoustic impacts. Just as important, the Navy has not released or offered to release any of the modeling systems it used to calculate acoustic harassment and injury. These models must be made available to the public, including the independent scientific community, for public comment to be meaningful under NEPA and the Administrative Procedure Act. 42 C.F.R. §§ 1502.9(a), 1503.1(a) (NEPA); 5 U.S.C. § 706(2)(D) (APA). And guidelines adopted under the Data (or Information) Quality Act also require their disclosure. The Office of Management and Budget's

[117] In Europe, the Norwegian and Dutch navies have begun to experiment with the characteristics of their mid-frequency systems, endeavoring to find an alternative that would prove less hazardous to beaked whales. J.J. Lok, Green Issues Loom Larger in Future Blue-Water Active Sonar Operations, Jane's International Defense Review 44-47 (Aug. 2004). In the United States, an expert panel, commissioned by the Office of Naval Research, advised the Navy to explore the use of complex waveforms that would retain Doppler sensitivity but produce lower peak amplitudes. Levine, Active Sonar Waveform at 27.

[118] The Australian Navy, for example, goes much further than the Navy in its training protocols for sonar and, in doing so, demonstrates the practicability of these methods. When training with a mid-frequency sonar system, Australia requires seasonal and geographic restrictions on the use of the system at its highest power levels; use of lower power levels in conditions that may produce surface ducting and within certain geographic conditions such as shallow marine embayments; pre-operational and operational monitoring of a much larger safety zone (4000 yards) than the Navy considers; and mandatory shut-down of sonar transmissions if a whale is sighted within that safety zone. See Royal Australian Navy "Maritime Exercise Areas Environmental Management Plan," Procedure S-1 (June 9, 2004).

guidelines require agencies to provide a "high degree of transparency" precisely "to facilitate reproducibility of such information by qualified third parties" (67 Fed. Reg. 8452, 8460 (Feb. 22, 2002)); and the Defense Department's own data quality guidelines mandate that "influential" scientific material be made reproducible as well.[119] We encourage the Navy to contact us immediately to discuss how to make this critical information available.

J. Scope of Review

In the 2001 FEIS, the Navy conducted its environmental analysis for the "extraterritorial" portion of the LFA program, that part which lies outside U.S. territorial waters, under the authority of Executive Order 12114 rather than under NEPA. DSEIS at ES-2. Nothing in the DSEIS suggests that the Navy has altered this decision. This position on the scope of review is inconsistent with the statute (see, e.g., Environmental Defense Fund v. Massey, 968 F.2d 528 (D.C. Cir. 1994) and NRDC v. Navy, No. CV-01-07781, 2002 WL 32095131 at *9-12 (C.D. Cal. Sept. 19, 2002)), and we urge the Navy to revisit it and to conduct a full NEPA analysis LFA training activities regardless of locale.

K. Compliance with Other Applicable Laws

The Navy has stated its intention to apply for an Incidental Harassment Authorization under the Marine Mammal Protection Act authorizing LFA use beginning in 2007, and to consult with NMFS regarding that action. NRDC will submit comments regarding the Navy's MMPA and ESA compliance at the appropriate time. But other statutes and conventions also apply to the Navy's proposal and include:

1. The Coastal Zone Management Act, and in particular its federal consistency requirements, 16 U.S.C. § 1456(c)(1)(A), which mandate that activities that affect the natural resources of the coastal zone—whether they are located "within or outside the coastal zone"—be carried out "in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs."

2. The Magnuson-Stevens Fisheries Conservation and Management Act, 16 U.S.C. § 1801 et seq. ("MSA"), which requires federal agencies to "consult with the Secretary [of Commerce] with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken" that "may adversely affect any essential fish habitat" identified under that Act. 16 U.S.C. § 1855 (b)(2). In

[119] Navy, Ensuring the Quality of Information Disseminated to the Public by the Department of Defense: Policy and Procedural Guidance § 3.2.3.1 (Feb. 10, 2003). The Defense Department defines "influential" to mean "that the Component can reasonably determine that dissemination of the information will have or does have clear and substantial impact on important public policies or important private sector decisions"—which is clearly the case here, in the Navy's first NEPA review of mid-frequency sonar exercises. See Ensuring the Quality of Information Disseminated to the Public by the Department of Defense: Definitions § 3 (Feb. 10, 2003).

turn, the MSA defines essential fish habitat as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." 16 U.S.C. § 1802 (10).

3. The Migratory Bird Treaty Act, 16 U.S.C. § 703 et seq. ("MBTA"), which makes it illegal for any person, including any agency of the Federal government, "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory birds except as permitted by regulation. 16 U.S.C. § 703. After the District Court for the D.C. Circuit held that naval training exercises that incidentally take migratory birds without a permit violate the MBTA, see Center for Biological Diversity v. Pirie, 191 F. Supp. 2d 161 (D.D.C. 2002) (later vacated as moot), Congress exempted some military readiness activities from the MBTA but also placed a duty on the Defense Department to minimize harms to seabirds. Under the new law, the Secretary of Defense, "shall, in consultation with the Secretary of the Interior, identify measures--(1) to minimize and mitigate, to the extent practicable, any adverse impacts of authorized military readiness activities on affected species of migratory birds; and (2) to monitor the impacts of such military readiness activities on affected species of migratory birds." Pub.L. 107-314, § 315 (Dec. 2, 2002).

4. The Marine Protection, Research and Sanctuaries Act, 33 U.S.C. § 1401 et seq., which has as its purpose to "prevent or strictly limit the dumping into ocean waters of any material that would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." 33 U.S.C. § 1401(b). The Act prohibits all persons, including Federal agencies, from dumping materials into ocean waters, except as authorized by the Environmental Protection Agency. 33 U.S.C. §§ 1411, 1412(a).

5. Executive Order 13158, which sets forth protections for marine protected areas ("MPAs") nationwide. The Executive Order defines MPAs broadly to include "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." E.O. 13158 (May 26, 2000). It then requires that "[e]ach Federal agency whose actions affect the natural or cultural resources that are protected by an MPA shall identify such actions," and that, "[t]o the extent permitted by law and to the maximum extent practicable, each Federal agency, in taking such actions, shall avoid harm to the natural and cultural resources that are protected by an MPA." Id. The Navy must therefore consider and, to the maximum extent practicable, must avoid harm to the resources of all federally- and state-designated marine protected areas potentially affected by its activities.

6. The United Nations Convention on the Law of the Sea and other international conventions, treaties, and agreements that aim to reduce marine pollution from energy or noise.

Operation of the LFA system cannot legally be undertaken without compliance with these laws.

L. Alternatives Analysis Under Section 102(2)(E) of NEPA

Above and beyond the EIS requirement, NEPA directs agencies to "study, develop, and describe appropriate alternatives" to any project that presents "unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). Courts have concluded that this duty is "both independent of, and broader than, the EIS requirement." Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1229 (9th Cir. 1988), cert. denied, 109 S.Ct. 1340 (1989). Because its LFA proposal presents "unresolved conflicts" about the proper use of "available resources," the Navy must explicitly address its separate and independent obligations under section 4332(2)(E).

M. Application of the DSEIS to the Navy's next five-year small take permit

With this supplemental EIS, the Navy hopes not only to correct the deficiencies identified by the Court in the 2001 FEIS, but also to fulfill its NEPA requirement for an analysis of the environmental impacts of its second five years of LFA operation, from 2007 through 2012. DSEIS at ES-1. The Navy's application for a new small take permit, however, is a separate final agency action from its original application and, absent the sort of tiering that has not been conducted here, it requires its own EIS. 42 U.S.C. § 4332.

This is especially true since the Navy proposes to alter both the scale and the nature of its operations with LFA under its next small take permit. It proposes doubling the number of ships and the hours of active transmission from the amounts proposed in the 2001 FEIS. DSEIS at 4-1 to 4-2. Moreover, it proposes equipping three of these ships with a different LFA system, called Compact LFA ("CLFA"), the characteristics of which are said to be "comparable to" existing LFA systems but which are not revealed in the DSEIS. DSEIS at 2-2. Some passages of the DSEIS indicate that CLFA systems may operate in somewhat higher frequencies than LFA systems. DSEIS at 2-9 ("the frequency requirements for the Compact LFA (CLFA) to be installed onboard the smaller VICTORIOUS Class [ship] are somewhat higher, but still below 500 Hz.") The Navy's brief explanation for its transition to CLFA suggests that it may be used in shallow littoral ocean regions more than is LFA. DSEIS at 2-2. Each of these differences would preclude application for a new small take permit without an independent analysis of the environmental effects of CLFA.

Even if combined analysis were acceptable, NEPA requires agencies to prepare a supplemental analysis, and release it for public comment, if "significant new circumstances or information relevant to environmental concerns" happen to emerge. 42 C.F.R. § 1502.9(c)(1)(ii). Given the pace of research into acoustical impacts on marine life, significant new information is almost certain to arise between now and the Navy's application. Already much of the analysis in the 2001 FEIS—which has been

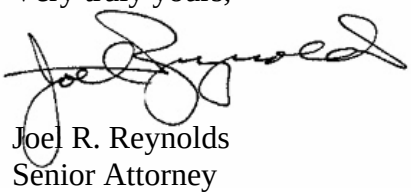
incorporated into the DSEIS—is simply outdated and should not be relied upon to judge impacts of a small take permit that will run through 2012.

We therefore urge the Navy to complete a separate, comprehensive, and up-to-date analysis of the impacts of its application for a second small take permit, when and if the Navy applies for such a permit.

III. CONCLUSION

Given the escalating public and scientific concern about the impacts of sonar on marine life, the clear concerns of the Court with respect its deployment, and the failure of the Navy to adopt available protective measures, the Navy's approach in this DSEIS is an unacceptable step backwards. We believe that the document must be thoroughly revised and reissued as a draft for further public review and comment.

Very truly yours,



Joel R. Reynolds
Senior Attorney
Director, Marine Mammal Protection Project

Cc: Hon. Donald C. Winter (Navy)
Donna Wieting (NMFS)
Steve Leathery (NMFS)

Encl. (with hard copy only)

ORG-2

From: Guam Fishermen's Co-op [mailto:gfca@ite.net]
Posted At: Friday, March 13, 2009 17:19
Posted To: MARTAPEIS
Conversation: Comments on the Draft EIS for the Marianas Range Complex
Subject: Comments on the Draft EIS for the Marianas Range Complex

GUAM FISHERMEN'S COOPERATIVE ASSOCIATION

P.O. Box 24023
GMF, GUAM 96921
Tel: 671-472-6323

Comments on the Draft EIS for the Marianas Range Complex:

Environmental Stewardship:

1. Monitoring of endangered and threatened species:
   The areas of northern Guam are documented to have the largest nesting sites for sea turtles. The existing range complex extends over these known as well as unknown areas. The concern is the military activity during seasonal fish arrivals both the in-shore and off-shore species. Examples are as follows:

ORG2-1

   a. In-shore:

Species:	Months:
Juvenile rabbit fish	April and August
Juvenile Skipjacks	June to September
Big eye Scad	Year round

   b. Off-shore:

Species:	Months:
Mahi-Mahi	November-April
Skipjack Tuna	Year round (July-November)
Marlin	Year round (June-October)
Wahoo	Year Round (Full Moon)

ORG2-2

2. Personnel Trained to handle the issues pertaining to the protected species:
   The personnel may be trained to handle protected species but there exist a greater need for personnel to be trained in impacts to the island's supply of fresh fish.

3. Minimizing or avoiding exercises around traditional fishing areas during fishing seasons:

ORG2-3

   a. Areas surrounding the island up to 30 nautical miles and 15 nautical miles around seamounts should be excluded from the designated Marine Range Complex which should include the western seamounts. The area on the eastern side of Guam past 30 nautical miles would minimize user conflicts.

ORG2-4

b. The seasonality of off-shore and inshore species coupled with environmental factors (water temperature and currents) make it difficult to ascertain the exact time and favorable location. One week the fish may be found up north this week south and another week around the island itself.

ORG2-5

c. A factor of equal importance but often over-looked is the recruitment of the fish's food fish otherwise known as bait fish. The military exercises may highly impact the migratory travels.

ORG2-6

d. The issue that the military exercises would be occurring in areas (sandy bottoms) where allegedly impacts are minimized does not address the upper layers of the habitat where the migratory fish travel.

ORG2-7

e. The belief that reef fish exist only in areas understood to be Essential Fish Habitat (EFH) is false. The reef fish larval distribution extends to the all parts of the ocean for 30 to 60 days and then return (currents permitting) to occupy these EFH areas (reefs).

ORG2-8

f. A hundred million dollars was spent on protected species research but little if any funds where allocated to food fish impacts on the community.

The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resource prior to any designation.

ORG2-9

4. Surveying of training areas for the presence of marine resources utilized by the community:

a. The designated Range Complex encompassing ATCAA5, ATCAA2 and ATCAA 6 are all traditional and historically identified marine resource areas.

ORG2-10

i. ATCAA5 encompasses the western seamounts where the marine resources are harvested on occasion as weather permits.

ORG2-11

ii. ATCAA2 encompasses the southern seamounts which contributes nearly 80% of the bottom fish and 60% of the pelagic fish harvested.

ORG2-12

iii. ATCAA6 encompasses the island of Guam where near-shore marine activities will be greatly affected. Marine Activities from Dolphin Watching, Charter Fishing, recreational SCUBA diving near shore harvesting and so forth will be further burdened by large military activities.

ORG2-13

iv. The current small scale military exercises have already impacted the marine community. There many reported incidents of military vessels either traveling through or situated on a seamount traditionally used by fishermen resulting in the fishing day curtailed or changed. These unconscionable incidents reflect the lack of community dialogue. A fisherman spends a day preparing his vessel, equipment and gear. This coupled with a several hundred dollars of direct expenses, movement and planning is not a simple

task. Upon arriving at the fishing area the unannounced military exercise sends the fisherman packing.

ORG2-14

v. Religious commitments will be impacted. On an island where 80% are Roman Catholic and the practice of eating fish during lent is guarded ritual. The irony in a recent incident at Orote Point where a fisherman was told to leave the area after he was already bottom fishing due to a live fire exercise held on the plateau above. This fisherman was catching fish for his brother who is a priest and his family in an area that was safe due rough sea conditions.

ORG2-15

vi. The area seaward of Orote Point is often closed without warning hampering all water related activities. During rough weather conditions users often rely on these safe and calmer areas to conduct their marine activities.

ORG2-16

vii. The impact by the noise and disturbance caused by the surface and sub-surface vessels has not been studied. The movement of the small boats on a school of fish has an impact what more vessels many times larger.

ORG2-17

5. Military exercises should be halted during seasonal and poor weather conditions (Nov.-April) near in-shore areas.

ORG2-18

i. Seasonal runs of Mahi and Wahoo occur during these months occurring near-shore.

ORG2-19

ii. The poor weather conditions only allow for users to fish near-shore to include bottom fishing.

iii. Mitigation should be worked out with the fishing community to lessen the impacts.

6. Consultation on the proposed military range complex:

ORG2-20

i. There has been no consultation with the organization responsible for the management of the federal waters, namely the Western Pacific Regional Fishery Management Council except for a report on the proposed Complex.

ORG2-21

ii. There has been no consultation with the only fishing organization on Guam, the Guam Fishermen's Cooperative Association on the proposed Complex.

ORG2-22

iii. Public meetings were held at venues that did not reach out to the fishermen. The public meeting appears to provide a semblance of community in-put but lacks sincerity in truly gathering active participation.

ORG2-23

7. DEIS alternative:

i. The alternatives should have included a no action alternative meaning no marine military activities to include past activities due to the aforementioned impacts and concerns.

ORG2-24

In closing, the impact of the military range complex is far reaching and would severely curtail the island community ability to consume fresh fish. The community would be greatly impacted both culturally and economically. Again, we emphasize the main concerns:

ORG2-25

1. No military activities around the island for 30 miles or as prescribed by the Western Pacific Regional Fishery Management Council 50 miles from the islands for vessels greater than 50 feet.

ORG2-26

2. No military activities around any of the seamounts for a radius of 15 miles.

ORG2-27

3. Mitigation for the use of the marine resource by establishing a Fish Aggregating Device Program to provide for alternative fishing areas during military activities.

ORG2-28

4. No use of explosives in the waters of the Marianas except for the established areas such as FDM in order not to disturb the migratory distribution of the coral reef fish larvae and travels of seasonal fish stocks.

ORG2-29

5. No study was ever funded to address the impact on the marine resources. We on Guam do not eat whales.

ORG2-30

The DEIS fails to address user conflicts, resource impacts, cultural impacts, economic impacts, social impacts, religious impacts and many more. The fact that addresses protected species issues, terrestrial issues and cultural legacies is insufficient and proves the document to be highly flawed and incomplete. The fact that there seems to be top-down approach reflects this major flaw. There has been no continuous consultation or dialogue with the fishing community which would most impacted by any military marine activity in the proposed complex. Thank you for the opportunity to submit our concerns, should you have any questions or concerns please feel free to contact me.

Sincerely,

Manuel P. Duenas II
President

ORG-3

Taotaomona Native Rights

GMF - P. O. Box 24295. Barrigada. GU 96921 Tel: (671) 477-0638: Cell: 689-1856

March 16, 2009

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Attn: EV2
Pearl Harbor, Hawaii 96860-3134

FAX: (808) 474-5419
Email: marianas.tap.eis@navy.mil

SUBJECT: WRITTEN COMMENTS ON DRAFT MIRC EIS/OEIS

ORG3-1

The Mariana Islands Range Complex is pointed out in the Draft EIS/OEIS as encompassing land, air, and sea training areas in the Mariana Islands and that "these areas are ideal for training local military units, supporting multi-national exercises, and facilitating the rapid deployment of U.S. Defense forces when necessary." That you regard these areas are "ideal", they are "ideal" from your perspective but not from our perspective. These are the lands of the Chamoru people, my Chamoru people of the entire Marianas. These islands have been divided by the U.S. politically and administratively, but they are still the lands and seas of the Chamoru people, historically, and still presently.

ORG3-2

The environment, both lands and sea waters around the Mariana archipelago, will be grossly, negatively, impacted by the continued use of the U.S. military and its manuvers and training activities, using live shells and bombs (even inert bombs do damages) and other ammunitions, aircrafts and ships hovering in combat training in the sky and around its ocearn waters, polluting with loud, deafening noises, bomb detonations and explosions, surface to air missile exercises, and the multitude of bunkers and bunkers storage of ammos, toxic chemical contaminants and pollutions, the oils and gas spillages, metal scraps from ships, vehicles and bomb shells, and destruction of the environment from training activities on the environments of the Mariana islands, both on land and on inland and ocean waters. A good example is that which happened in Puerto Rico. On Guam, the dump sites and continuous toxic contaminants seeping into our Guam waters such as that of Orote Point happening up until now, have not been cleaned up, mainly because the cleanup work is too much and too expensive for the U.S. military. The Urunao dump is being worked on but has taken already several years, the Agana Power Plant's cleanup has been worked on also for several years but still not finished. The U.S. military has had a poor record of leaving places they occupied clean. Their usual practice is to bury, cover up dumpsites, and then grow vegetation on top and then designate these places good only for parks, never to be used as residential or commercial lands.

ORG3-3

Most important is human life! The Chamoru people and their cultural way of life and their island homeland -- the Mariana Islands and its surroundings, will be devastatingly affected The animals, land and water animals, the marine life - all plants and animals -- big or minute sizes will be wiped out or destroyed tremendously to no degree of recovery. What the ultimate objective? Is it military for might? Is it military might for destruction of human lives, of plants and animals, and of the environments of our planet Earth? NOT IN OUR MARIANAS!

By Trini Torres,
Pilong - Maga' Haga of Taotaomona Native Rights and
Chairman, Task Force for Independence for Guam of the Decolonization Commission

ORG-4

18 Phillip T Mendiola-Long Tinian Chamber of Commerce PO Box 800 2/25/2009 Tinian MP 96952

ORG4-1

The MIRC does not address access rights to the residents of Tinian during exercise activities. What is the plan for public access to tourist, historical, hunting, fishing and recreational sites in the Northern part of Tinian?

Since lack of access to the environment is a major impact to a community, I believe the MIRC MUST address the impacts of any restrictions to access of the Northern part of Tinian.

Draft EIS/OEIS Comment Form

Mariana Islands Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

Please use this form to record your comments on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

All comments must be received no later than March 16, 2009, to ensure they become part of the official record. All timely comments will be responded to in the Final EIS/OEIS.

You may submit your comments by:

1) Depositing this form in the comment box before you leave tonight
2) Mailing this form to:
   Mariana Islands Range Complex EIS
   258 Makalapa Drive, Suite 100
   Attn: EV2
   Pearl Harbor, HI 96860-3134
3) E-mailing your comments to: marianas.tap.eis@navy.mil
4) Completing the online comment form at: www.MarianasRangeComplexEIS.com

☑ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: Phillip Mendiola-Long

Organization/Affiliation: Tinian Chamber of Commerce

Address:* PO Box 800

City, State, Zip Code: TINIAN, MP 96952

ORG4-2

Comments: There are comments in the MIRC that address possible introduction of invasive species such as the brown tree snake, however the MIRC continues on that it sees no significant impact. What if any, are the mitigation plans for prevention of the introduction of the brown tree snake. What are the mitigation plans for possible disturbance to the turtle nesting? Can there be funding for a turtle hotelling conservation fund.

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

Draft EIS/OEIS Comment Form

Mariana Islands Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

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You may submit your comments by:

1) Depositing this form in the comment box before you leave tonight
2) Mailing this form to:
   Mariana Islands Range Complex EIS
   258 Makalapa Drive, Suite 100
   Attn: EV2
   Pearl Harbor, HI 96860-3134
3) E-mailing your comments to: marianas.tap.eis@navy.mil
4) Completing the online comment form at: www.MarianasRangeComplexEIS.com

☒ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: Phillip T. Mendiola-Long

Organization/Affiliation: Tinian Chamber of Commerce

Address:* PO Box 800

City, State, Zip Code: TINIAN, MP 96952

Comments:

ORG4-3

After reviewing the 1,500 pages and seeing the multiple references to several studies, I have noticed that some of the references date back to 1998 and some to 1986. It would be appropriate for the MIRC to conduct new baseline studies with referred studies that reflect data that is not reliable, which is what studies are that date back 10-20 years old.

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CSWAB

Citizens for Safe Water Around Badger
E12629 Weigand's Bay South - Merrimac, WI 53561
Phone (608) 643-3124 - Fax (608) 643-0005
Email: info@cswab.org - Website: www.cswab.org

Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Attn: EN2
Pearl Harbor, Hawaii 96860-3134
E-mail: marianas.tap.eis@navy.mil

SENT BY ELECTRONIC MAIL

March 4, 2009

Thank you for the opportunity to submit public comments on the January 2009 Draft Environmental Impact Statement (EIS) for the Mariana Island Range Complex. The Study Area is located in the Western Pacific and consists of three primary components: ocean surface and undersea areas, special use airspace, and training land areas. Portions of the Marianas Trench Marine National Monument, which was established in January 2009 by Presidential Proclamation under the authority of the Antiquities Act (16 U.S.C. 431), lie within the Study Area. The range complex includes land ranges and training area/facilities on Guam, Rota, Tinian, Saipan, and Farrallon de Medinilla, encompassing 64 nm^2 (220 km^2) of land.

ORG5-1

Of great overall concern is the highly presumptive approach used in the assessment of ecological and environment risk. The draft EIS, for example, states that no studies have been conducted to evaluate the effects of chaff ingestion on sea turtles or other reptiles and yet concludes that the effects are expected to be "negligible." In such cases when potential harm to specific species and natural systems is unknown, sound science and appropriate risk management dictate that a LACK of harm cannot be presumed.

Again, concerning permanent hearing loss (3.8-38), to certain marine species, the draft EIS states: "Given the lack of scientific data on PTS (Permanent Threshold Shift) in sea turtles caused by LF (Low Frequency) sound and the effects conclusion for injury, the potential for SURTASS LFA (Surveillance Towed-Array Sensor System Low Frequency Active) sonar to cause PTS in sea turtles must be considered to be negligible." Again, in cases where the degree of harm is unknown, the legitimate presumption, AT BEST is "indeterminate" – as is the degree of potential harm.

Consequently, as numerous such presumptions are found throughout the document, the draft EIS holds great potential for under-estimating risks to marine mammals and ecosystems, and especially so when compounded in assessing cumulative risk.

ORG5-2

Additionally, the draft EIS identifies ongoing and proposed activities that will result in the release of hazardous materials from expended training materials and deposition of Unexploded Ordnance (UXO). Historically both fresh water ranges, as in the Great Lakes, and oceanic water ranges have not been cleaned up by the Department of

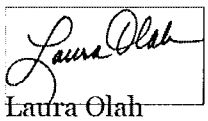
Defense. Countless abandoned UXO, such as those already found in the ocean around Saipan, currently pose a significant toxic and physical risk to human health and the environment.

ORG5-3

It is therefore IMPERATIVE that environmental documentation for current and future military training activities include a discussion of technologies that are economically feasible, environmentally sound, and technologically capable of remedying expected environmental insults. Without a viable remedy in hand, the proposed action is tantamount to an unrelenting and uncontrolled hazardous waste release to the land and seas.

Thank you for your time and consideration of our comments.

Sincerely,



Laura Olah
Executive Director

3. Name: Marceline U. Maratita
Organization/Affiliation: Resident of Barrigada
PUG-1 Address: P.O. Box 24074 GMF
City/State/Zip: Barrigada, Guam 96921

Comments:

PUG1-1
- The military needs to assure the people of Guam that whatever they might damage, be it the coral reefs, the ocean environment, the air, the land, that they will invest whatever it takes – money and personnel – to fix, replace or replenish. The burden on the island community is not just for those currently living here, but for those generations from now. I would like peace of mind to know that part of any legacy I leave behind for my family includes clean air, clean water and viable land.

Draft EIS / OEIS Comments
Agat Village Meeting
March 11, 2009 (Wed) @ 7:00 p.m.

PUG-2

1. Name: Erlinda J. Baldevia
Organization/Affiliation: none given
Address: P.O. Box 7007
City/State/Zip: Agat, Guam 96928

Comments:

PUG2-1

- I am concerned about the toxicity of the many chemicals entering the air and water due to the military activities. My house is very close to Naval Magazine where they explode bombs and even a little smoke cause's severe lung irritation – my doctors think these bomb explosions may have contributed to my condition.

PUG-3

2. Name: Pacifico Martir
Organization/Affiliation: Mayor's Council, Agat Resident
Address: P.O. Box 8626
City/State/Zip: Agat, Guam 96926

Comments:

PUG3-1

- I know we're in an era of challenges of world peace. I know that military need to practice and be better on what they do. Military need to know also that there are human beings here on island. They need the land and water to survive/live. Can they use another area that don't have much impact to the island's water environment & land?

PUG-4

3. Name: Mary Jane Q. Cruz
Organization/Affiliation: Self
Address: 324 Santa Rosa Ave.
City/State/Zip: Santa Rosa, Guam 96915

Comments:

PUG4-1

- We should require the military to provide ample notification of any exercise (regardless of type of exercise) that impacts local activities (fisherman; recreational events). Notification should be via Public Media i.e. PDN, Notice to Mayor's Office & Marina's throughout Guam.

PUG4-2

- How about any info regarding any potential exercise near Cetti Bay (Southern Guam)

PUG-5

4. Name: Cecilia T. Solidum
Organization/Affiliation: Agat MPC
Address: P.O. Box 8797

City/State/Zip: Agat, Guam 96928

Comments:

PUG5-1

- The people of Guam love to eat fish enjoy the beaches and water activities. With the upcoming military activities, these will all be eliminated. What are the plans of the military to avoid all of these from happening? We need to preserve our aquatic & wildlife for us and our young generation to enjoy.

PUG-6

5. Name: Mr. Chaco
Organization/Affiliation: none given
Address: none given
City/State/Zip: none given

PUG6-1

Comments:

- Notification of exercises – Vice Mayor wasn't notified of activity.
- Request notification of exercise
- Called Resue
- Fish Advisory – PCB

PUG-7

6. Name: none given
Organization/Affiliation: none given
Address: none given
City/State/Zip: none given

PUG7-1

Comments:

- live fire will impact
- if not doing it now
- shorting
- keep people out of area not asked
- cost for not using the area
- Land:
  - contamination
  - use of H20 quality (marine/fuel)
  - noise
- Hazardous material
- Cultural Historic Resources
- Economic Impact on tourism
- Environmental justice
  - Minority community
- Toxic
  - clean up
  - year / year accumulation
- Ocean View High School
  - to Navy Mag
- Notification – recreational activity

Draft EIS / OEIS Comments
Yigo Village Meeting
March 12, 2009 (Thurs) @ 6:30 p.m.

PUG-8

1. Name: Dionisio De Leon
Organization/Affiliation: none given
Address: P.O. Box 3631 (Fern Terrace, NCS, Dededo)
City/State/Zip: Hagatna, Guam 96932 - 3631

PUG8-1 Comments:

- Air exercises must be away from residential area
- Concern on noise impact
- notification to the residents of exercise schedules is important

PUG-9

2. Name: Mark Ganeb
Organization/Affiliation: UOG Student
Address: 240, Kiko Isabel Loop
City/State/Zip: Yigo, Guam 96929

PUG9-1 Comments:

- With chaff release and shooting ranges, harmful chemicals are exposed more to the environment around Guam. What type of mitigation can be provided to stop this exposure to the harmful substances to the environment? Also with the detonation off shore that could affect dolphin habitats, what alternatives can be done to prevent this?

PUG-10

3. Name: Joel P. Verango
Organization/Affiliation: U.O.G.
Address: none given
City/State/Zip: none given

Comments:

PUG10-1

- A representative from the U.S. Navy should be available to provide feedback on the MIRC.

PUG10-2

- The U.S. military needs to provide habitants of Guam incentives, benefits, consideration, and protection for using the environment and its resources.

PUG10-3

- This military training & operations will have an impact not only on the environment and wildlife but also on the cultural preservation and economic status of Guam.

PUG-11

4. Name: Kristel Aganon
Organization/Affiliation: none given
Address: P.O. Box 27S4S GMF

City/State/Zip: Barrigada, Guam 96921

Comments:

PUG11-1

- By the presentation of MIRC, it gives us a clear view about the military activities that is happening in the surrounding of Guam such as in land & water. I think the military should be more concern about Guam's land, environment, water, animal etc. They should also notify the resident of Guam. Trees & animals are affected by this. It will also damage the economy. We should give credits to MIRC for letting us know what's happening.

PUG-12

5. Name: Marie Garcia
Organization/Affiliation:
Address: 259 Aurora St. Kaiser
City/State/Zip: Dededo, Guam 96929

Comments:

PUG12-1

- If the MIRC prevents fishermen & ships in certain areas due to activity more specifically the gun ranges in the North & in the South I know the island will be notified but what about those who aren't notified. How will you let the public know about the activities because not everyone reads the newspaper or watches the local channels?

PUG12-2

- About the helicopter activity I believe that the military should utilize what time the local residents aren't usually home for example most people on the island have an 8 to 5 job or go to school from 8 am – 3 pm.

PUG12-3

- In regard with notifying the public what was done for the public for them to be aware of what is happening.

PUG-13

Draft EIS/OEIS Comment Form

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Mariana Islands Range Complex EIS
258 Makalapa Drive, Suite 100
Attn: EV2
Pearl Harbor, Hawaii 96860-3134

X *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

2) E-mailing your comments to: marianas.tap.eis@navy.mil
3) Completing the online comment form at: www.MarianasRangeComplexEIS.com

Name: Valerie Brown

Organization/Affiliation:

Address:* PO BOX 27031

City, State, Zip Code: Barrigada, GU 96921

Comments: Please see attached seven pages

Visit www.MarianasRangeComplexEIS.com for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

Comments Regarding
Mariana Islands Range Complex
Environmental Impact Statement /
Overseas Environmental Impact Statement

General Comments:

PUG13-1 This Draft EIS was inaccessible by the general public of Guam. It was much too large and difficult to understand and the review period was too short. The public comment sessions glossed over the potential impacts painting a rosy picture and did not accurately portray the true impacts of the planned training activities on the environment, the resources, and more importantly, the people who live here. The DoD needs to do a better job of communicating the facts to the public and soliciting meaningful comments, rather than simply fulfilling the NEPA requirements. While the scoping sessions, and presentations are a step in the right direction, these forums still lack substance and targeted information – they still do not relate the information to the general populace in a meaningful way and the DoD needs to invest in new ways to engage the people of the Marianas.

PUG13-2 The characterization of the W-517 area as being located as 50nm south of Guam is inaccurate and misleading as the upper reaches of this area are clearly located much closer – approximately 10-12nm south of Guam and are located over Guam's two most heavily used fishing banks, Galvez and Santa Rosa Banks. This misleading statement needs to be corrected throughout the document. Also, for the sake of clarity, these offshore banks should be illustrated on the maps.

PUG13-3 There are numerous statements throughout the document noting the impacts of previous and ongoing training, however, these statements also note that the impacts are not quantified and that the extent of the impacts is unknown (ex. Tarague Beach Small Arms Range p. 174). The DoD needs to do a better job of monitoring the impacts of their training exercises to determine the true impacts – rather than the conjecture offered in this document. This information should then be used to refine their environmental management specific to the Mariana Islands Range to avoid impacts in the future.

Specific Comments:
Table 2-2
W-517

PUG13-4 The description "relatively free of vessel traffic" does not apply to the northern reaches of the W-517 area. This area is frequented by the local bottom fishing fleet. Most of the bottom fish catch for Guam comes from the Galvez and Santa Rosa Banks which are wholly contained by the W-517 area. It is not uncommon to see a number of vessels in this area when the weather permits the journey for smaller boats.

2.2.21 Alternative Range Complex Locations

PUG13-5 It appears that the relocation of range components was rejected out of hand as not meeting the criteria of the Proposed Action. However, DoD needs to carefully weigh the needs of residents in the face of increased training activity and exercises, particularly where there might be a high level of user conflict such as the southern fishing banks, certain sites in Apra Harbor, and Agat Bay, and consider slight adjustments to the range alignments. Particularly in the W-517 area,

shifting the northern “handle” portion of this area away from the banks would decrease the chance of fatal interactions and impacts to this important resource and should have been considered in the analysis, particularly given the broad range of training expected to occur in the area. For example, the many artillery exercises to be conducted in the W-517 area would have serious detrimental effects if conducted over Galvez and Santa Rosa Banks, due to the shallow coral reef habitat found in these areas. Take the banks out of the W517 area and shift it South to the 50nm you state in the text or East if the close proximity to the island is necessary - this should be reassessed and addressed in the FDEIS/OEIS. (A western shift would not be recommended due to the pelagic fisheries in that area around the FADs – eastern access is more restricted and the waters are less hospitable for small craft most of the year).

2.2.2.3 Concentrating to fewer sites

PUG13-6

This paragraph does not adequately address the concern that was raised by the public. There is no evidence of a thorough assessment of this issue. If there was a full assessment conducted, please reference it and provide it for review. Given the small size of this island and the fact that these ranges may impact sensitive wildlife communities or fragile habitats, such as the Marianas fruitbat and remaining limestone forest or coral reefs, it would be better to consolidate ranges or move sites that might impair resources to less sensitive areas – particularly as there is the potential for some larger caliber weaponry and more frequent use of the ranges. In addition, it is clear from the discussion that the existing impacts both inside and outside the ranges are not fully quantified and it is better to take a precautionary approach with these limited natural resources.

2.2.3 Proposed Action and Alternatives Considered

PUG13-7

This 5 yr review offers an excellent opportunity for the DoD to review the impacts that existing training has had on the environment in the MIRC and determine if that level is acceptable or if perhaps it should be reduced due to the impacts it is having. There should be an alternative related to reducing training - even if it is not preferred. Contrary to the many "no Significant Impacts" findings in this document, there appears to be numerous impacts from these activities that should be weighed against the benefits of training.

Section 3. 1 Geology, Soils, and Bathymetry
p. 175

PUG13-8

The document states that LCACs may resuspend sediment similar to wave events. Recent experience suggests that they resuspend sediment at a rate greater than all but perhaps the most extreme wave events and do so even in areas that are normally not heavily disturbed by wave events (Jade Shoals February 2009). The Navy should consider funding monitoring to determine the extent of these impacts and then develop better mitigation practices to avoid these impacts or provide compensatory mitigation. While corals have some capacity to remove sediments, repeated impacts, particularly at increased frequencies can have deleterious impacts on survival and reproduction. The timing of these events can also be critical, particularly if the landing occur during the spawning periods as the sediment can impact the release of gametes from adults, the survival of larvae, and the timely settling of coral recruits. This needs to be addressed in the mitigation and environmental management plans.

3.1.3.2Alternative 1
p. 175

PUG13-9

This section states that no construction would be required, although facilities would be improved. Unai Dankulu would require some serious “improvements” that would in some cases

be defined as construction for use as a landing beach by LCACs. These improvements are not clearly defined, yet were listed as modification of the reef, trees, rocks, possibly the beach. Please clarify this statement or define what improvements you will make as these might have significant impacts to the area.

3.1.4 Unavoidable Adverse Environmental Effects

PUG13-10 What are these erosion control measures, structures, and procedures that "could" minimize increases in erosion and what assurance is there that they will be used? There are already a number of areas that are highly disturbed within DoD properties.

Table 3.1-2

PUG13-11 Alternative 1 & 2 – how much greater will intensity of impacts be and what level of management can be expected to prevent erosion?

3.2.3.2 No Action Alternative

p.201

PUG13-12 This section notes that while unlikely, expended training materials may become physical hazards to marine life or to navigation over time. This would be more likely if training exercises occurred often in the same area. This is something that is not addressed in the document – how far do the vessels travel to do their training? Do they truly use the full range of the MIRC or do they tend to focus on certain areas that are closer to the island or perhaps due to bottom topography, distance, lack of vessel traffic, etc? Is there a higher probability for accumulations in certain places than in other places? Were actual vessel tracks, practice areas, etc. analyzed and used in the development of this document?

If they do frequent areas, could this facilitate reclamation of expended materials from specific confined range areas, rather than scattering materials all over the MIRC area and therefore, limit the dispersal of potentially hazardous materials?

Table 3.3-3

PUG13-13 Contamination of surface drainage areas from runoff at various ranges – will this runoff be contained and treated or be discharged into the marine waters or released onto the ground to seep into the aquifer? There are existing PCB accumulations in Apra due to past drainages on DoD property, please address this more clearly.

PUG13-14 Mine Warfare/Landing Craft etc. may cause sediment resuspension in the harbor. There is much concern about toxins in the harbor sediment such as PCB and heavy metals released from previous DoD and shipyard operations (see Navy RAB documents). These exercises may cause additional exposure to these toxins, to humans and to other organisms, possibly reducing the fecundity of coral and other organisms. This EIS does not sufficiently address this exposure. What toxins are in the sediment at these areas and what are the exposures? What level of sediment suspension is expected – quantify it – there are sensors commercially available that can measure suspended solids in situ to determine the actual impacts of these activities. The data can then be used to strengthen environmental planning and facilitate improved stewardship by DoD.

3.3.3 Environmental Consequences

PUG13-15 "Expended materials entering the ocean could affect marine water quality." The hazardous components of these expended materials can have serious deleterious effects on marine life,

particularly coral larvae and fish larvae. Guam's reefs have witnessed a tremendous drop in coral recruitment over the last twenty years. We have yet to pinpoint the cause, but pollution is a likely cause as larvae are particularly susceptible to pollutants. Are there any plans to minimize or avoid training during key coral spawning periods to prevent impacts to the long term viability of Guam's coral reef ecosystems?

PUG13-16

p. 220 Torpedo Expended Materials

Where will torpedo training take place? How deep do torpedos run? Will training take place over the Galvez and Santa Rosa Banks areas where corals may be impacted by the cyanide wake of the torpedo? How will the DoD ensure that important resources such as tuna and other fisheries resources are not impacted by these activities? What is the failure rate of the torpedos being used?

PUG13-17

p. 221 Sonobuoys

While the dispersal calculations given here are reassuring, it is unrealistic to assume that the buoys will be dropped in a large area. What is the normal range of operations for training with the sonobuoys? How many are used at a time? In how large of an area? What is a realistic concentration of these materials during a normal training operation? Please provide realistic, meaningful analysis.

Also, as with other weapons, this would have serious deleterious effects if used over banks, or other submerged reefs. More details about their use or a statement that they will not be used in areas populated by coral reef resources is necessary.

PUG13-18

p. 221 Chaff

What happens to chaff in the marine environment? An earlier section stated that it is neutrally buoyant, so it will not sink, but will merely float around. Is it not consumed by organisms? Has it been studied in tropical food chains? Could there be bioaccumulation of any of its components in the local food chain? Effects on human health?

PUG13-19

p. 224 Ordnance

Recent observations throughout the Pacific have documented phase shifts due to accumulations of metals in coral reef environments after impacts to reefs (ex. Ship groundings). In some cases this is believed to be due to increased availability of iron and other metals in a metal limited environment. The accumulation of metals from expended ordnance could have similar effects on a micro scale affecting environments particularly as more and more builds up. The EIS needs to assess the potential impacts of phase shifts and likelihood of accumulation of materials within the range areas.

3.3.3.1.2 Effects on Water Resources

p.226

PUG13-20

Please describe more fully what is meant by "minor alteration" of beaches and explain how they will be restored back to pre-existing conditions. How temporary will the alterations from landing craft be? What type of modifications are expected? How will this affect water quality?

PUG13-21

p. 228 last paragraph of no action/ p. 229 last paragraph Alt. 1

What is the spacing of these exercises? Depending on the spacing, particularly with an increased number of exercises it may become a chronic impact to the coral reef habitat in the area, resulting in decreased reef health. What are the specific measures that will be used to protect water quality?

p. 284 Table 3.6-1 Summary of Potential Stressors to Marine Communities

PUG13-22 Please quantify the level of disturbance, injury, and mortality to plankton, benthic community features, and possible collisions with coral communities in both territorial and non-territorial waters – also please clearly delineate where these impacts may occur. Due to the fluid nature of the ocean, reefs in non-territorial waters may be the source of larvae for Guam and CNMI's nearshore reefs, damage to these areas may result in decreased coral recruitment to territorial reefs and may also impair fisheries resources if the direct impacts take place at sites used by fisheries stocks. Frequency, area, and intensity of damage are all relevant and should be included. Soft bottom habitat impacts should be included as well as hard bottom.

p. 297 Artificial Reefs

PUG13-23 Further monitoring of the artificial reefs cited in this section clearly indicated that the projects did not enhance fish habitat or overall fish abundance or diversity and Guam's artificial reef program was ended. Further studies have indicated instead that these artifical surfaces provide a foothold for non-native possibly invasive species. See Guam DAWR annual reports from the 1980s and Gustav Paulay and Lisa Kirkendale's work on Marine Invasive Species for more information.

p.307 Artificial Reefs

PUG13-24 The construction of artifical reefs is not a practice that is embraced in this region - it is a key pathway for the introduction of invasive species and does not result in substantial benefits to native reef species. This is not a good justification for leaving these expended materials and should be struck from the document.

Also, not all of the areas are soft bottom - for instance Guam's most heavily used banks are located within the W517 training area and practices, expended projectiles on these and other submerged reef habitats can damage coral and other benthic structures.

p. 310 Table 3.6-2 Summary of Environmental Effects

PUG13-25 Amphibious Landings – Surge wave generated by slow moving craft could break off coral heads – this could be a long term affect for some slow growing coral species that are limited in range / distribution. Recommend consultation with local coral experts to ensure that areas of impact do not include any rare species that are likely to be severely impacted. According to Richard Randall there are some rare, slow growing species that have been found at only a few locations in the reef margins of Guam.

PUG13-26 Overall comments on table – there is not enough analysis to make the blanket statements of no long-term population or community-level effects. The impacts are too poorly defined to make a definitive analysis given the possible impacts listed. This needs to be reassessed with additional information provided.

3.7 Marine Mammals

PUG13-27 The surveys for this assessment were conducted in subpar conditions in only one small window of time, they did not assess the nearshore environments, and they did not collect information from local mariners and other sources of information – for example it neglects the birth of a Sperm Whale documented just off of Apra Harbor. Additional effort should have been made to collect data on marine mammals to provide a more robust data set.

The no significant impact determination given the assessment's findings of a high number of

temporary impacts and a PTS level impact for an endangered whale under Alternative 1 are troubling, particularly given the limited sampling effort for the marine mammal assessment.

The sonar impacts are even more troubling given the number of marine mammals that have washed up on shore over the last year, particularly the two beaked whales, one that stranded within 2 weeks after a large joint force exercise that used MFA sonar.

In addition, the assessment does not appear to fully address the impacts to resident spinner dolphins located in Agat Bay and other coastal locations that might be impacted by increased training. The EIS should include mitigation actions to assure their well being during landings, detonations, hydrographic surveys, etc. that will occur in the vicinity of their resting area in Agat off of Dadi Beach adjacent to Tipalao and the Agat Det areas.

PUG13-28

3.9 Fisheries and EFH

The analysis presented in the summary table for this section is inadequate. The impacts that are listed have the potential to be adverse effects, but the document does not provide clear information about the frequency, intensity, and duration of the impacts to make a reasonable determination. The information provided in earlier sections would suggest that there is the potential for adverse effects to EFH and that this needs closer investigation and analysis.

The description of EFH is lacking a full description of Coral Reef EFH. This should be added to the document as it is a key element of fisheries in this area and needs to be fully considered in the analysis.

PUG13-29

3.9.2.3 Sensitivity of Fish to Acoustic Energy

I did not see any references to large schooling pelagic fish (tunas, mahi, wahoo) or to the smaller pelagic schooling fish that they follow. Given the economic benefit these fish provide to local residents, the impacts training might have on their migratory routes is a serious concern. Has the DoD funded any research to address this issue or do they plan to as part of the mitigation for these training activities?

PUG13-30

3.9.3.2.2p. 597 Amphibious Landings

The statements about Unai Culu and Unai Dankulo are misleading – while certain areas are predominantly turf, the reef margin and other areas that would have to be transited by the landing craft have very high coral densities, or what would be deemed as high coral densities compared to other reefs in the region. Landings at these sites would result in serious impacts to coral habitats that would be lasting in the areas used. The training descriptions provided in this document do not provide sufficient detail on how these impacts will be minimized or mitigated to justify these comments. Please provide a more detailed, accurate description of these areas and provide information about the paths to be used by the landing craft.

Please provide documentation of your description of Tipalao as having less than one percent coral cover including locations of where that metric came from, as personal experience from that area suggests something more on the order of 10-30%. Also, please provide more information about impact zones, intensity levels, duration, impacts from hydrographic surveys and other planned operations in that area.

Please provide documentation to support your statement that the impacts of amphibious landings, hydrographic surveys, and OTB training on fish, fish populations, and EFH would be temporary and localized. There is not enough in this document to substantiate this claim given

the statements made in the tables about coral collisions, sediment suspension, number of trainings, etc.

Recommend that you provide maps of each landing beach indicating data on coral densities and intended impact zones for landing. Also, include data on frequency and duration of expected events.

3.9.3.2.4 Explosive Ordnance and Underwater Detonations

PUG13-31

The Piti, Agat, and Apra Detonation locations appear to be relatively close to shore and areas frequented not only by important fisheries resources including dolphins and sea turtles, but also recreational users. The Piti site is also near the territorial Piti Bomb Hole Marine Preserve. Has the DoD considered moving these sites to other locations further offshore that might have fewer resource conflicts? There are resident dolphin pods in Agat and Piti, high levels of recreational use near all three sites, and also relatively high levels of fish and turtles near all three sites, which raise the likelihood of impacts.

3.9.3.2.6 Expended Materials

PUG13-32

Please see comments above about expended materials as pathways for invasive species introductions, the ineffectiveness of artificial reefs in Guam, and other concerns. Depending on the accumulation, size, and location of impact, expended materials may have significant impacts on EFH, however, the analysis presented in this document is insufficient for a final determination.

Table 3.9-3 Summary of Environmental Effects

PUG13-33

The findings in this table are generally not supported by the data presented in this document. Based on knowledge of the subject area I would expect there to be at least some reduction in the quality or quantity of EFH due to the activities described in this document. This section needs further analysis and refinement. Also, the impacts to habitat need to be more clearly defined.

12	Prudencio	Flores	Meno	retired	POB 24970	Barrigada	2/10/2009	Guam	GU	96921	I do support your efforts to explore suitable areas on Guam to conduct weapons firing exercises. Keep in mind that the majority of people of Guam are behind the buildup. I encourage you to continue with the planning because this buildup is mutually beneficial to both the military and the civilian population in defense of U.S. interest and its territories. My family owns property near Andy South bordering the eastside shoreline of the island. The possibility of its use as a small arms firing range could be explored for range complex consideration. My family also owns property in the south a few miles from Inarajan Village. I figured it could be used for jungle warfare training operations. Hopefully, other private landowners have offered their lands for such purposes. Because I strongly believe in this buildup, I offer any assistance or input that will help push the process forward.

PUG14-1

13	Prudencio	F.	Meno	Retired military/public school teacher	POB 24970	2/20/2009	Barrigada	GU	96921	PUG14-2

Since H.Clinton reaffimed the Japan-U.S. pact to relocate 8000 Marines to Guam, it is imperative that planning stages accelerate to meet the 2014 goal. All military sectors in my opinion have greatly gathered input from the community. The Civilian Military Task Force under Governor Camacho has been very effective in cooperating with JGPO. The vast majority of Guam do support the move, and understand the strategic value of this island.

We believe there are mitigation processes in place to respond to any environmental concern to our mutual satisfaction. Furthermore, I hope the military maximizes the full potential of weapon range possibilities on this island. And if necessary, obtain private or public lands at fair value in order to accomplish their training objectives. So keep up the good work; of course they will be bumps/opposition from vocal minority groups along the way, but that is expected.

14	Richard	Clayton	Brown	Aviation Services, Ltd. dba Freedom Air	P.O. BOX 1578	2/22/2009	Hagatna	GU	96932

PUG15-1

I need more specific information regarding the way in which air traffic in and out of West Tinian airport (PGWT) will be affected. This is in reference to 3.14.4.2 in the impact study.

Also, the runway length at PGWT is 8600 feet, and is being designed for large jet airline traffic as well as the current commuter traffic that currently serves the island.

The ferry service that connects Tinian with Saipan is not sufficient to handle the daily needs of both local and tourist traffic. The air service provided by Freedom Air is a necessity for passengers, cargo and mail. Serious disruption of this traffic will cause hardships to the community.

Our flight pattern is pretty much determined by Federal Air Regulations, that is, we cannot deviate significantly without violating both regulations and safety. As we operate single-engine aircraft, we are required to stay in gliding distance of land at all times. This limits our routing most of all, and to maintain gliding distance, we must stay between 1300 and 1800 feet altitude. As we operate under Visual Flight Rules (VFR), we must stay below cloud layers, and that often limits us to an altitude below 2000 feet. This best describes the limits in which Freedom Air operates between Saipan and Tinian.

The exact information I need to know is:
1. Will plans for military exercises impact our routing so as to require us to cancel flights?

2. How often will these exercises occur?

3. For how long a period of the day will they negatively impact our operations?

Please send me data on this.

15	Richard	Clayton	Brown	Aviation Services, Ltd. dba Freedom Air	P.O. BOX 1578	2/22/2009	Hagatna	GU	96932

PUG15-2

In my previous comment, I forgot to add my email address:

safety@freedomairguam.com

Thank you,

Richard Brown, Director of Safety

PUG-16

Draft EIS/OEIS Comment Form

Mariana Islands Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

Please use this form to record your comments on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

All comments must be received no later than March 16, 2009, to ensure they become part of the official record. All timely comments will be responded to in the Final EIS/OEIS.

You may submit your comments by:

1) Depositing this form in the comment box before you leave tonight
2) Mailing this form to:
   Mariana Islands Range Complex EIS
   258 Makalapa Drive, Suite 100
   Attn: EV2
   Pearl Harbor, HI 96860-3134
3) E-mailing your comments to: marianas.tap.eis@navy.mil
4) Completing the online comment form at: www.MarianasRangeComplexEIS.com

☐ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: Cheri Dauterman

Organization/Affiliation:

Address:*

City, State, Zip Code:

Comments:

PUG16-1

Thank you for the awareness you are trying to share to the people of Guam. I just hope marine preservation will be to the utmost.

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

PUG-17

Draft EIS/OEIS Comment Form

Mariana Islands Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

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☐ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: ERIC J. UNTALAN

Organization/Affiliation: SMALL BUSINESS OWNER

Address:* 227 SOUTH SABANA

City, State, Zip Code: BARRIGADA, GUAM 96921

Comments: THANK YOU FOR PROVIDING THIS FORUM FOR THE EXCHANGE OF INFORMATION. I WOULD LIKE TO SEE A

PUG17-1

MORE AGGRESSIVE EFFORT TO PROVIDE CORRECT FACTS ABOUT D.O.D. AND RELATED ACTIVITIES IN ORDER TO PUT TO REST THE MISINFORMATION AND NEGATIVE EFFECTS OF A RUMOR MILL WHICH PITS FACTIONS OF THE COMMUNITY AGAINST EACH OTHER. THE MILITARY DOES HAVE A CONTINUING POSITIVE IMPACT ON THE COMMUNITY. I SUPPORT THAT. YET SILENCE IN RESPONSE TO MUDSLINGING CAUSES DOUBT IN THOSE WHO MAY OTHERWISE BE SUPPORTIVE.

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

PUG-18

Draft EIS/OEIS Comment Form

Mariana Islands Range Complex Environmental Impact Statement / Overseas Environmental Impact Statement

Please use this form to record your comments on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

All comments must be received no later than March 16, 2009, to ensure they become part of the official record. All timely comments will be responded to in the Final EIS/OEIS.

You may submit your comments by:

1) Depositing this form in the comment box before you leave tonight
2) Mailing this form to:
   Mariana Islands Range Complex EIS
   258 Makalapa Drive, Suite 100
   Attn: EV2
   Pearl Harbor, HI 96860-3134
3) E-mailing your comments to: marianas.tap.eis@navy.mil
4) Completing the online comment form at: www.MarianasRangeComplexEIS.com

☐ *Please check the box if you would like to receive a CD copy of the Final EIS/OEIS. Provide your mailing address below.*

Name: PATRICK WOLFF Esq.

Organization/Affiliation: INAFA' MAOLEK CONCILIATION

Address:* P.O. Box CE

City, State, Zip Code: Hagatna, GUAM 96932

PUG18-1

Comments: #1 Conflict resolution services of all types are available ON GUAM. this 28 year old NGO is dedicated exclusively to alternative dispute resolution (mediation, facilitation, conflict coaching) and violence prevention (restorative justice, caseload management training workshops) and university courses. We welcome inquiries. 475-1977 <inafa_maolek@yahoo.com> www.inafamaolek.org

#2 Please publish (PDN & Marianas Variety) where EIS Executive Summary is available in written form for interested public to take up

#3 Representatives here should have had business calling cards. Please provide us a complete list of reps and their titles + contact info.

Visit **www.MarianasRangeComplexEIS.com** for project information.

*Provide your mailing address to receive future notices about the Mariana Islands Range Complex EIS/OEIS.

Mariana Islands Range Complex EIS/OEIS
Nora Macariola-See, Project Manager, Code EV21
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

Re: Comments on the Mariana Islands Range Complex EIS/OEIS submitted during the public comment period

<marianas.tap.eis@navy.mil>
Subject: Marianas Islands Range Complex EIS/OEIS

Dear Ms. Macariola-See:

I have been a resident of the Commonwealth of the Northern Mariana Islands since December of 1980, and have written often on the subject of the need for environmental protection and preservation of the CNMI's ecosystems - both marine and terrestial - in my column "On My Mind," on line at <http://net.saipan.com/personal/omm/>.

However, given that I have been in Honolulu under radiation and chemo treatment for lung cancer since early January, that I was unaware of the existence of the draft Marianas Islands Range Complex EIS/OEIS until March 2, and that the MIRC EIS/OEIS is a massive 1444 pages long, I have, regrettably, not been able to give the EIS/OEIS much more than a cursory read.

PUM1-1

Nor do I know whether hearings have been held in the Commonwealth of the Mariana Islands regarding the MIRC EIS/OEIS, or whether notice of availability of the document for comment was given in the local media - one can only hope so!

While I've been given to understand that a great deal of detailed, useful information has been provided in the EIS/OEIS, particularly in Section 3 (with some notable exceptions in the seabird category, for example), nonetheless I believe the document could - and should - have been made far more accessible to those who might have wanted to comment.

PUM1-2

For starters, there is no index. There is no way to go directly to any given section. The content of the document is available only serially. In so large a document, this can get more than a little laborious. One must go through 47 pages of Executive Summary before finding the table of contents. I do not know what military protocol is in this regard, but that is absurd. A table of contents belongs at the start of the document! The table of contents does not indicate the break in volumes - the table of contents for volume 2 - which DOES come at the beginning of that volume, lists all of the contents of volume 1

all over again. Why? Nor does the table of contents provide page numbers - only section numbers - a real disadvantage in a computer document, since a full screen page per se often does not show a section number. The list of abbreviations is to be found neither at the end of the volume, nor at the beginning, but buried on page 65. May one ask why?

Much of what appears in the Executive Summary actually belongs in the report proper. I would suggest, for example, that the sections on why training is necessary and related sections belong in the document proper as "background" but have no place in an executive summary of a document that purports to address environmental impacts. The heart of the executive summary is actually Table ES-3, the summary of environmental impacts.

PUM1-3

As it is, even then the Executive Summary does not begin to serve its presumed purpose, for it provides only the broadest of generalities, often in murky language such as this, found in Section 3.6 Marine Communities, on page 22: for territorial waters *"Under the No Action Alternative there would be no long-term impacts to marine communities. Releases of munitions constituents from explosives, ordnance, and small arms rounds used during training exercises would have no short term impacts."* The first sentence claims that there will be no long-term impact, but the implication is there that there could be short term impacts. Yet the second sentence claims that there will be no short term impacts, from explosives, etc., implying that there might be long-term impacts. For non-territorial waters, it notes that the impact would be similar to that in territorial waters and there would be *"No significant harm to marine communities."*

PUM1-4

Just what, one may ask, constitutes "significant" harm? Moreover, this euphemism - there being no "significant" harm - is used throughout the document, with no definition or discussion as to what might constitute "significant" harm.

PUM1-5

Another frequently used word raises similar questions, as in *"Under the No Action Alternative, Alternative 1, or Alternative 2, terrestrial archaeological sites are not substantially affected by current training activities."* (Vol 1, p. 28) Again, there is no definition or discussion of just exactly what "substantially" means.

More samples of murky language:

PUM1-6

"The Proposed Action does not involve the redeployment of USMC, USAF personnel or assets, carrier berthing capability, or deployment of strategic missile defense assets to the Marianas." (Introduction, p. 5) And what are we to make of the omission of mention of the U.S. Navy, the U.S. Army, the U.S. Coast Guard?

"This EIS/OEIS focuses on the achievement of service readiness activities while the Guam and CNMI Marine Relocation EIS/OEIS focuses on the relocation of forces to the

PUM1-7

Marianas with its associated infrastructure and military construction, Nuclear Aircraft Carrier (CVN) Berthing, and Army Ballistic Missile Defense System." (Introduction, p. 5) Aha! There are other impact statement one must also consult to get a full picture! What is the status of this other document? Has it already been published in draft form for comment? On page 15, it is noted that the two documents overlap, and are being closely coordinated, but still no mention of how one can access the other EIS/OEIS.

PUM1-8

"The Services will need to repair and upgrade the existing MOUT facilities to support training requirements of special warfare units stationed at or deployed to the MIRC." (Vol 1, p.16). Elsewhere this EIS/OEIS states that no construction will occur, and therefore there will be no additional consumption of energy. Can one really upgrade MOUT facilities without undertaking some construction?

PUM1-9

"In addition to the discussion/analysis of the Preferred Alternative, the EIS/OEIS includes descriptions and analyses of the No Action Alternative and Alternative 2. The Navy will not make its decision of which alternative it will implement until the ROD is signed at the conclusion of the NEPA process." (Vol 1, p. 17) If "Alternative 1" is the preferred alternative, as it appears to be, what is the point of going further and discussing an even more intensive "Alternative 2"? This simply does not make sense.

PUM1-10

'The Navy is consulting with USFWS to avoid/reduce adverse effects associated with increased training under Alternative 1, as per Section 7(a)(2) of the ESA. No changes to vegetation that would alter vegetation community types will result from training activities; other wildlife resources will not be affected....'(vol 1, p. 28) What is meant here by "altering vegetation community types"? The vegetation community affected WOULD be altered, but not the TYPE of vegetation community in general?

PUM1-11

'Under the No Action Alternative, Alternative 1, or Alternative 2 there would be no long-term harm to public health and safety in the global commons. Implementation of safety procedures would reduce impacts to public health and safety in the global commons.' (vol 1, p. 30) This would seem to mean that there WILL be short-term harm in the global commons - whatever that term is supposed to mean. Particularly since the second sentence states that safety procedures would **reduce** impact to public health and safety.

PUM1-12

"Geographic boundaries for analyses of cumulative impacts in this EIS/OEIS vary for different resources and environmental media. ....The training area venues within the MIRC Study Area (Figures ES-1 through ES-12) are the appropriate geographical area for assessing cumulative impacts. For all other ocean resources, the ocean ecosystem of the marine waters off Mariana Islands is the appropriate geographic area for analysis of cumulative impacts." (vol 1, p. 31) I have no idea what this means given that this section first says the training area venues are the appropriate geographical area for assessing

cumulative impacts, but then says "for all other ocean resources," something else is the appropriate geographical area.....WHAT other ocean resources?

PUM1-13

The statement that *"Although the required electricity demands of increased intensity of land-use would be met by the existing electrical generation infrastructure at the MIRC, the alternatives would result in a net cumulative negative impact on the energy supply"* (vol 2, p. 31) is naive at best. The existing electrical generation infrastructure in the CNMI is unstable and unreliable. ANY additional load would create considerable problems.

This fact also weakens the following statement that *"No additional power generation capacity other than the potential use of generators would be required for any of the training activities."* Indeed! Use of [additional] generators is not a potential need, but a very real one!

PUM1-14

Not only is wording misleading, confusing, unclear, murky, but some statements are just not true. For example, it is the government of the CNMI, not Guam, that is negotiating in regard to the pozzolan ash on Pagan; the Marianas Trench Marine National Monument is not a Guam project; it is a CNMI project (chart, vol 2, p 60-61).

PUM1-15

The statements that *"Impacts to demographics are assessed in terms of their direct effects on the local economy and related effects on population and expenditure within the study area. Demographic impacts would be considered significant if the Proposed Action or alternatives resulted in a substantial shift in population trends, spending and earning patterns, or community resources (notably housing and education)"* and *"The assessment of the impacts upon population trends, regional spending, regional earning, housing trends, regional employment, and education with implementation of Alternative 2 are the same as those described in Section 3.15.3.2; there would be no impacts to demographics if Alternative 2 were implemented"* (vol 1, p. 818) ignore the fact that the presence of additional members of the Armed Forces for training activities, etc., would be spending time and money in the CNMI, and WOULD have an effect on the economy.

Indeed, they would seem to run contrary to the statement *"Analysis of past defense spending history in the United States (to include Hawaii) shows that each dollar of defense spending could generate 75 cents of gross domestic product (GDP), which is the final value of the economy's total annual output. The 75 cent contribution (or multiplier) to GDP is the sum of direct, indirect, and induced effects of defense spending (Pula 2008)*" found in.vol 1. p 826.

PUM1-16

Major assumptions are made that can hardly be supported. For example, *"Recreational diving activities within the ocean areas take place primarily at known diving sites. The*

locations of popular diving sites are well-documented, dive boats are typically well-marked, and diverdown flags would be visible from the ships conducting the proposed training, so possible interactions between training activities within the offshore areas and scuba diving would be minimized. The Navy would also notify the public of hazardous training activities through Notices to Airmen (NOTAM) and Notices to Mariners (NOTMAR)." (vol 1, p. 863) But what if things don't go as planned??? Not all dives are made at known sites; not all dive boats are well-marked; not all diverdown flags are equally visible. Such contingencies must also be considered.

PUM1-17

Unfortunately, there is not time for me to give the entire document a close read. Suffice to say I believe the document does a real disservice to any but the most dedicated of individuals among the general population - not only do its massive 1440 + pages make it difficult to wade through it all, but in addition, it is wordy, repetitive, redundant, and deceptive. To argue that this document proves that the public had an opportunity to comment on the draft EIS/OEIS is nonsense. The document deters and discourages comment. There is also considerable arrogance and condescension in the tone of the arguments made that what is good for the the military, particularly the U.S. Navy, is good for the inhabitants of the affected areas.

That is not to deny that there are sections that are informative, useful, accurate. There are. But they are lost in the babel that surrounds them.

Sincerely,

Ruth L. Tighe
P.O. Box 5684
Saipan,MP 96950

phone: 670-322-3639
e-mail: ruth.tighe@pticom.com

nb:: I would like to receive a CD copy of the final EIS/OEIS.

PUM2

Leslie	gottwald	27 years of ocean voyages to the islands north of Saipan	jogott_18@yahoo.com	2/2/2009	Saipan Island-CNMI	HI	96950

PUM2-1

I have observed the profound amount of isolated marine life and rare land life forms in the islands of Medinilla, Anatahan, Sariguan, Guguan, Alamagan, Pagan, Asuncion and Uracas with amazement and awe, for 27 years, and have sailed their about a hundred times, as well as having lived their for weeks at a time.

I have observed military activities their with keen interest. Now they plan to expand operations. Thats interesting.

Can such a pristine environment be maintained when military operations are being conducted? Certainly not, but I do appreciate the fact that our military wants to minimize the damage, and I thank tham for that praiseworthy attitude.

The only endangered species in those islands are humans. The sharks like white meat, and so do the 600 pound wild boar and 1600 pound bulls, so be carefull up their.Strong Typhoons and active volcanoes can send you back to God.

Contact me if you need an experienced guide. Anytime. Good luck and godspeed. Captain Kimo

16	David	Castro	Sablan	Saipan Resident / Part-time fisherman	P. O. Box 500466		2/23/2009	Saipan	MP 96950	The 10nm fishing restriction is justifiablly appropriate for safety reasons. My concern is the permanency of the restrictive clause that would preclude local fishermen to reach the best Emperor (Mafute) fishing ground located immediately north of FDM. A window of opportunity may be accorded the fishermen during the 3 months summer period beginning April to the end of June. This is simply because summer has the best water conditions to travel to FDM. There may be some argument against it due to spawning season and I would leave that to the Marine Biologist. The 2nd item that I would like to recommend is a navigational marker to give warning to fishermen as they approach the 10nm toward FDM. A device that gives night light warning. Some local fishermen do not have the financial luxury to buy navigational aide to detect distance to the island. With all the advance technological capabilities and economic might, such device on the water is not only feasible but provides necessary safety for the fishermen. Thank you very much.

PUM3

PUM3-1

PUM4

17	Fred	Cabrera	Camacho	concerned citizen	fred_booku@yahoo.com	p.o.box 5440chrb	2/24/2009	Saipan	MP 96950	It seems rather odd that the U.S. President is protecting part of the marianas considered to be pristine, the Marianas Monument, yet right in the middle of it, a military target island. Are we looking at another Bikini atoll. Enlarging the target zone from 3 miles to 7 or 10 miles just means that less of the Marinas is "pristine".

PUM4-1

PUM5

18	Phillip	T	Mendiola-Long	Tinian Chamber of Commerce	PO Box 800		2/25/2009	Tinian	MP 96952	The MIRC does not address access rights to the residents of Tinian during exercise activities. What is the plan for public access to tourist, historical, hunting, fishing and recreational sites in the Northern part of Tinian? Since lack of access to the environment is a major impact to a community, I believe the MIRC MUST address the impacts of any restrictions to access of the Northern part of Tinian.

PUM5-1

From: Marilyn Swift [mailto:sharc@pticom.com] Posted At: Tuesday, March 31, 2009 16:17 Posted To: MARTAPEIS
Conversation: Marianas Islands Range Complex EIS OEIS
Subject: Marianas Islands Range Complex EIS OEIS

Mariana Islands Range Complex EIS/OEIS
Nora Macariola-See, Project Manager, Code EV21 Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

Dear Project Manager Nora Macariola-See,

PUM6-1

Having obtained a copy of this EIS rather lately, I can only offer very general comments. I am concerned that overall, the conclusions of no adverse effect - particularly for seabirds and migratory shorebirds – have been based on relatively sparse data and in absence of detailed population studies. Without these types of baseline data, it is impossible to determine whether or not the proposed actions would have a significant effect on these seabird and migratory populations. It is very likely however, that the types of military activities listed in the EIS would add stresses on these bird populations. There are many stressors on the world's ocean life noted in various studies (see following). Without proper stewardship, it is likely the health of the oceans will reach a tipping point which vastly decreases the life and productiveity of the ocean's world wide.

There are numerous studies of the decline in bird populations and reports of non-military stressors on ocean life. A newly released report presents a comprehensive review of the state of U.S. birds; see www.StateoftheBirds.org.

Mass Extinctions accompanied by the rise of "slime" (pollutant based) are predicted for oceans http://www.sciencedaily.com/releases/2008/08/080813144405.htm.

A Wall Street Journal article http://online.wsj.com/article/SB123793936249132307.html questions who owns the responsibility for the widening gyre of floating plastic in the Pacific. This raises the question of how military ships will dispose of plastic waste while at sea.

Chilean authorities report mass deaths of nearly 1500 penguins at Caleta Queule, more than 1240 miles north of Antarctica http://thescotsman.scotsman.com/world/Experts-investigate-mass-penguin-deaths.5119975.jp.

Worldwide, there are reported examples of seabird population decline. Scotland reports that Kittiwakes, Arctic terns and Arctic skuas had a terrible breeding season which could see them wiped out in the UK (http://news.bbc.co.uk/2/hi/uk_news/scotland/north_east/7698125.stm). A little closer to home, the wedge-tailed shearwater colony on Managaha Island off Saipan also reported formidable results from a dismal breeding season.

PUM6-2

Also of special concern for the military use of the Mariana islands is how rigorous are the protocols for precluding introduction of the Brown Tree Snake to the northern Mariana Islands. Accidental introduction would be deleterious. Ancillary concerns for the project are the deleterious effects

of introduced mice which can bring seabirds to extinction, see http://www.sciencedaily.com/releases/2008/12/081228192127.htm for a cautionary note.

PUM6-3

These provide a few examples of my concerns about the effects of the proposed undertakings on ocean life and in particular to seabirds and migratory birds. Admittedly, the origin of some problems are not militarily based, but I am concerned that without proper stewardship, increased stressors could be a tipping point from which various species can not recover.

PUM6-4

I have known several young men from Saipan who have proudly joined the U.S. military service, and I am acutely aware of how important it is to make them battle ready. I fully support the military efforts in this regard. In my view however, the military should undertake and support increased and more detailed studies both of the wildlife and other resources in the target areas. Additionally, the effects of the activities on the wildlife and other resources - including the possible introduction of the brown tree snake, rats, or other predators to the Northern Mariana Islands - should be thoroughly considered. Plans for mitigation should be in place prior to any natural resource modifications within the Mariana Islands Range Complex.

I see a real opportunity for the US military to set an example for the Mariana Islanders and neighboring Asian countries of their concern for the problems facing the Pacific ocean area. For this reason, I encourage the Navy to consider sponsoring or partnering with other agencies to be part of the solution of these problems. It would make me so proud!!

Thank you for your attention to my comments and concerns,

Marilyn Swift
P.O.Box 7592
Saipan, MP 96950

PUB-1

15 March 2009

Dr. Justine B. de Cruz
5 Osgood Ave.
New Britain, CT 06053

Mariana Islands Range Complex EIS/OEIS
Nora Macariola-See, Project Manager, Code EV21
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96869-3134

Re: Comments on the Mariana Islands Range Complex EIS/OEIS submitted during the public comment period

Dear Ms. Macariola-See:

PUB1-1

As the former head of the Commonwealth of the Mariana Island's Wildlife Section, Division of Fish and Wildlife, Department of Lands and Natural Resources, I would like to submit the following comments for your consideration in preparing the final EIS/OEIS for the Mariana Islands Range Complex. In general I would like to compliment the EIS preparers for the detailed discussion and explanations of the impacts of the proposed actions on the marine environment, marine mammals, and sea turtles (specifically Sections 3.6-3.9). The meticulous preparation of those sections of the document, along with supporting information, is admirable. However, the thoroughness of those sections highlights the paucity and inaccuracy of information used to outline the impact of the proposed actions on seabirds in Section 3.10. I hope that a thorough revision of that section and a more substantial examination of the Cumulative Impacts (as well as a correction of errors in that chapter) are included in the Final EIS/OEIS.

Specific comments by section follow:

PUB1-2

3.2.4 Unavoidable Significant Impacts (of hazardous wastes) states that ranges will be cleaned up when they are no longer useful. Given that the removal of expended materials from ranges no longer in use in the Commonwealth of the Northern Marianas (CNMI) has not been undertaken in the past (for example, the mortar range no longer used on Tinian), it would be appropriate for the EIS to include details of clean-up activities and the extent to which hazardous materials will be removed from such inactive ranges.

PUB1-3

3.7.3.1.10 Integration of Biological and Regulatory Frameworks (for estimating the acoustic effects of training activities) states that secondary effects, such as the likelihood of an injury to an animal increasing the risk of predation, are not taken into consideration in the analysis. While it may be difficult to quantify these effects for modeling purposes,

they are important to the well being of the species none-the-less. One would expect that either the authors might apply the kind of well reasoned approach to the problem that they did in the analysis of primary acoustical effects or that such secondary but important effects would be taken into consideration in the Biological Opinion and during Section 7 consultations.

PUB1-4

In section 3.8 Sea Turtles, the analysis frequently enumerates potential effects of the proposed activities (summarized in Tables 3.8-4 and 3.8-5) and that Section 7 consultations with the appropriate federal agencies have been initiated. Such consultations would not be initiated if some level of sea turtle harassment or mortality were not an issue (see effects listed in the two tables). Additionally, the analysis of the effects of Alternative 2 is nearly non-existent, particularly section 3.8.4 (Unavoidable Significant Environmental Impacts). Therefore, it seems that the EIS conclusion of "no significant harm to sea turtles" prior to receiving the results of the consultations is premature. Perhaps conclusions similar to those stated so concretely in section 3.8.5.2 and Table 3.8-6 (e.g., no significant impact to sea turtles) should read instead "impact determination pending the results of consultation".

PUB1-5

Section 3.9 Fish and Essential Fish Habitat clearly outlines mortal effects of some of the proposed activities on fish (summarized in Table 3.9-1). It is difficult to concur with the conclusion that "in accordance with NEPA, explosive ordnance and underwater detonations will have no significant impact on fish, fish populations, or EFH" after reading in section 3.9.3.2.4 that "effects of underwater explosives on fish have been fairly well documented…empirical studies suggest that underwater explosions are lethal to most fish species in the immediate vicinity of the explosion regardless of size, shape, or internal anatomy." Although a clearer explanation of how this conclusion was reached given the negative results of most studies would be helpful, an approach more consistent with the available data seems more appropriate. It would be a relief to read a simple statement of the level of mortality expected from some of the exercises and suggested measures that might be taken to mitigate unavoidable impacts, rather than many paragraphs that amount to an evasion of responsibility for those impacts.

PUB1-6

Section 3.10 Seabirds and Shorebirds, as noted previously, is woefully inaccurate. The MIRC Study Area contains some of the largest concentrations of seabirds in the western Pacific. The majority of those birds are not found on Guam, Rota, and Tinian and so their distributions within the Study Area are not included in Table 3.10-2; even those species documented for Saipan are not included in the table. Section 3.10 delimits the discussion of seabirds and shorebirds to the confines of the Study Area, but birds north of FDM in the CNMI are not noted at all. I would suggest an expansion of the literature review in order to up-date the breeding, range, and distributional data on all of the species listed in Table 3.10-2. A good place to begin the revision would be to reference the table attached to the 26 March 2008 letter from the Department of the Navy to the U.S. Fish and Wildlife Service (5090.1G03 Ser EV22/237) in Appendix C. Also, the species accounts (3.10.2.2) are in dire need of revision and editing (particularly those on tropicbirds, shearwaters, noddies, terns and moorhens, with the section on sooty terns being particularly poorly structured), I suggest contacting CNMI-DFW for their data on

breeding and distribution within the northern Marianas. Any discussion of Wedge-tailed shearwaters should include the colony in Saipan's harbor on the island of Mañagaha, as extensive information is available from several years of monitoring by CNMI-DFW.

PUB1-7

Section 3.10-25, 26 discusses the probability of vessels striking birds in flight at sea, correctly noting that most such incidents will occur at night. The bright lights of ships at sea are known to attract and sometimes to disorient the family of birds that include petrels and shearwaters. When these birds are struck at night, the number of strikes can be massive and the level of mortality quite high. Again, members of this family are known to dive past 80m in depth. The discussion of the probability of collisions with members of the procellarid family should reference material on both massive night-time collisions and under-water interactions. Under-water impacts of exploding ordnance (discussion, for example, in 3.10-30) should also reference the deep dives of these species and possible impacts on the birds while they are underwater.

PUB1-8

Section 3.10-31 discusses the effects of High Explosive Ordnance on seabirds, stating, "While the effects of explosions in the MIRC Study Area on seabirds cannot be quantified, lethal injury to some individuals of some bird species could occur based on the total number of explosions that would take place per year under the No Action Alternative." This would also be true of the effects under Alternatives 1 and 2, however, the effects would be more intense as the number of missions increases under these alternatives. High explosive ordnance, including bombs, missiles, and naval gunshells, are listed as among the types of ordnance used during training missions involving FDM. It is difficult to reconcile the above with the statement on page 3.10-32 concerning the effect of the proposed actions on FDM seabirds. I do not believe there is data to support the contention that "...a small number of birds would be affected and that population level effects would not be expected." According to this same EIS, the effect of exploding ordnance on seabirds cannot be quantified, so lethal injury to individual birds could easily be extensive as opposed to small. In addition, there is no documentation of the effects of bombing missions on seabird population levels. Seabird numbers on FDM are known to fluctuate over time, which could be associated with seabird prey abundance in the surrounding waters. Or the fluctuations could be associated with migration among seabird colonies in response to the rich feeding grounds just off-shore of FDM attracting seabirds from nearby breeding colonies (e.g. Rota and the northern Mariana Islands). Or the fluctuations could be a response to the frequency of training missions or to the intensity of explosions during exercises. In the absence of data we do not know whether exercises conducted on FDM impact only the populations on that island, or have impacts on seabird populations throughout the archipelago. We do not know what levels of mortality from bombing can be sustained beyond which the populations can not recover. In sum, the assumption that exploding missiles have a negligible effect on either individuals or on populations is not supported by the data available.

PUB1-9

Section 3.10-34 is erroneous in stating that Wedge-tailed shearwaters are restricted to Saipan. Table 3.10-2 correctly lists them as being present near Tinian and has having been observed over FDM. Although data are scarce, they are likely to breed on several of the northern islands of the chain as well. This species ranges hundreds of kilometers while foraging from their colony on Mañagaha in Saipan's harbor during the breeding

season (April through December). This shearwater is quite likely to foraging often in the waters of FDM. Given the propensity for shearwaters to ingest plastic debris while feeding, the likelihood of this species ingesting expended plastic materials resulting from the proposed actions is not negligible. The Wedged-tailed shearwater colony on Mañagaha is the largest known breeding colony in U.S. controlled waters of the western Pacific. Any lethal or sub-lethal effects of plastic ingestion could greatly impact the survival or the genetic diversity of the Mariana population. Therefore, the impact of plastic ingestion would not be as slight as described in the EIS.

PUB1-10

Section 3.10.3.2 Alternative 1, Aircraft Overflights, states that number of fixed wing flights over FDM will increase nearly 318% (from 704 to 2,942 per year) while helicopter activity over FDM would increase by nearly 57% (from 717 to 1,123 per year). Both types of flights will elicit increases in seabird startle and stress responses. The substantially increased time spent away from nests for breeding birds will likely increase egg and chick mortality (from exposure and predation) and can be expected to impact seabird numbers on FDM via reproductive failure. The EIS should discuss the potential impacts of the expected increase in behavioral and physiological responses of seabirds on FDM more thoroughly to substantiate their conclusion of no significant impacts.

PUB1-11

Section 3.10.3.2 Alternative 1, Amphibious Landings, mentions impacts on seabirds but does not discuss shorebirds at all. The EIS should discuss the impacts of Over-the-Beach Training on shorebird species most likely to be affected (including the Pacific Reef Heron listed in Appendix C).

PUB1-12

In section 3.10-36, the statement, “Additionally, the seabird species that is morphologically challenged with the inability to regurgitate (wedge-tailed shearwater) is not known to occur on FDM or in waters off FDM” is at best misleading. Firstly, the Wedge-tailed shearwater feeds its chick exclusively by regurgitating partially digested food. During these feeds, plastics ingested by the adult are often passed to the chick. The chick retains the plastic, which accumulates in the gut for the four months it spends in the nest. If large amounts of plastic are consumed by either adult or chicks, lethal and sub-lethal impacts can result. Secondly, this species has been documented during periodic surveys as visiting, if not breeding, on FDM (see Table 3.10-2) and presumably is feeding there. If ingestion of expended material is lethal or sub-lethal to either adults or chicks, it clearly holds the potential to significantly alter the population structure of the colony of Wedge-tailed shearwaters on Mañagaha Island (see discussion above).

PUB1-13

The discussion of the impacts of Alternative 2 in Section 3.10.3.3 is restricted to the statement that “Seabirds would be affected by the increases in exposure to the various stressors considered for analysis….” I suggest that further discussion of the impacts is necessary here. Also, the statement that “…mitigation measures reduce the likelihood of impacts out of the realm of significance” does not do justice to the topic. As with other sections of the EIS, the increases in proposed activities in non-territorial waters are not mentioned except to say that they would not cause significant harm to the focal organisms. This equates to no information and to no discussion of the topic, which is unacceptable in an EIS.

PUB1-14

Why, in Section 3.11.1.2, is the Terrestrial Species and Habitats Study Area limited to the southern portion of the MIRC? Every other section of the document considers the entire MIRC Study Area (see Figures Es-1, Figure 1-1 and others); the Terrestrial Species and habitats section is an anomaly. The northern islands of the Marianas archipelago are rich in terrestrial species (including fruit bats, lizards and birds) some of which are threatened or endangered (e.g., the Micronesian megapode). The study area for terrestrial species should be expanded in this EIS so that it treats potential impacts on the northern Mariana Islands as well.

PUB1-15

Section 3.11.2.1.4 Saipan, Saipan Land-based Training Areas lists the Saipan Upland Mitigation Bank as a maneuver area. This tract of land is set aside as mitigation for the incidental take of the endangered Nightingale reed-warbler. A description of the habitats in this tract is available from CNMI-DFW and should be included in this section. There is no description of the kind of activities that might be conducted within the mitigation bank, and these should also be enumerated in the EIS so that the public might comment on them. It does seem ironic that an area set aside for conservation of an endangered species is slated to be used for military maneuvers. Perhaps the use of this area as an exercise site should be reconsidered as it does not seem to be consistent with other uses authorized in the agreement that established the mitigation bank.

PUB1-16

As noted above, Section 3.11.2.2 and Table 3.11-4 should be amended to include the northern distributions of species of concern, particularly fruitbats, lizards, butterflies and snails. The listing of the Nightingale reed-warbler in Table 3.11-4 suggests that it exists only in wetland or marsh areas, which is not true on Saipan (hence the *upland* mitigation bank) nor for the population on Alamagan. The Mariana fruit bat forages in habitats other than those listed in the table, especially in the coconut forests of the northern part of the archipelago. Generally, the table needs to be expanded and updated with more extensive information, much of which is available at CNMI-DFW.

PUB1-17

Section 3.11.2.2.4- Section 3.11.2.2.12 contains accounts of federally endangered species that generally lack information on the distribution or recent population figures for the northern islands of the Marianas archipelago. Much recent information (from the last 10-yr period) is available either from USFWS or from CNMI-DFW. For example, the status of the Mariana crow should be updated with information from the intensive studies conducted on Rota over the last 10 years….the last information listed in the EIS for Rota is from 1999 and the species has been in serious decline since then. Status of the Mariana common moorhen should be up-dated with monitoring information from Rota and Saipan. The write-up on the Micronesian kingfisher would benefit from including information on the extensive conservation efforts that the Association of Zoos and Aquariums has made to keep this species from extinction. The EIS should report the recent return to Guam of captive bred Micronesian kingfishers, information available from Guam-DAWR and in the local newspaper. With regard to Micronesian megapodes, there is barely any reference to their status on the northern Mariana Islands where the bird is most numerous. And the large colony of Mariana fruit bats on Rota has also escaped mention. The occurrence of Mariana fruit bats on Saipan, where they have been observed using the Saipan Upland Mitigation Bank (SUMB), is a fact that should be

included in the document as it is important when considering the SUMB for military exercises. Unfortunately, it is difficult to check the literature reviewed in the preparation of this section as citations are entirely missing from the List of References in Vol. 2 of the EIS.

PUB1-18

Section 3.11.2.4.1, a discussion of candidate species (for listing under the ESA) fails to mention the Sheath-tailed bat (*Emballonura semicaudata*) with its main population concentration near Tinian on Aguiguan, or the Mariana wandering butterfly (*Vagrans egestina*) known from Rota. No information is given on how the increase in proposed activities may affect these fragile populations. Because the species are part of the Section 7 consultation, per Appendix C, between the Department of the Navy and the USFWS, they should be included in the EIS.

PUB1-19

Section 3.11.3.2.1 refers to stressors to terrestrial species and habitats from the activity proposed under Alternative 1. It states that "…Nightingale reed warblers….are not expected to be affected by the increase in training activities, as training will not occur in areas occupied by the[se] species." However, the Saipan Upland Mitigation Bank, designed to protect and conserve the reed-warbler, is slated for use as a land-based exercise area (Fig. 3.11-7). A correction to the EIS is necessary here.

PUB1-20

Section 3.11.3.2.2 (and 5.3.2.1) lists conservation measures proposed by the Navy to mitigate the adverse impacts of the proposed increased activities under Alternative 1. Many of the measures are laudable or necessary, especially with regard to interdiction of the spread of the Brown treesnake. With regard to the proposed conservation measure titled "Life History Studies of Micronesian Megapodes", it should be recognized that conducting such a study with the Tinian population is probably not feasible. Section 3.11.2.2.9 suggests that 234 surveys over 19 years have only produced 13 detections of what may be the same megapode or an individual visiting from nearby Aguiguan. A study of life history characteristics requires a reasonable sample size (> 20) of individuals that are easily observed. At best, the Tinian population is too small to support a rigorous study, but clearly it should continue to be monitored. The population of megapodes on Saipan, located mostly within the SUMB, also is too small to be a candidate for observation. One suggestion would be to (1) continue monitoring the population on Tinian (surveys), and (2) conduct the life history studies on Sarigan and another island of relatively easy access where the proposed increase in military activities may have an impact, such as Aguiguan or Pagan.

PUB1-21

With regard to Section 3.11.3.3, to say that a discussion of the impacts of Alternative 2 on terrestrial species and habitats is scant would be euphemistic. Even with the dearth of information provided it is easy to see that if the conservation measures for Alternatives 1 and 2 are the same, and if the goals outlined in the Draft Brown Treesnake Control Plan during Alternative 2 activities would not be met (as is stated), then the risk of the spread of the snake is increased. Because the spread of the snake to currently snake-free islands is the number one threat to island biota, it can not be stated that "the increased exposure to stressors will have no significant impact on terrestrial natural resources under Alternative 2 relative to that of Alternative 1." The risk of spreading the Brown

treesnake during terrestrial maneuvers where equipment and vehicles are moved from Guam to other islands is already high. To increase this past the effectiveness of control measures is unacceptable. The EIS should outline the additional conservation measures the Navy would undertake to achieve 100% interdiction of the snake during Alternative 2 operations as well as the additional measures it will undertake to reduce other adverse impacts.

PUB1-22

Table 3.11-7, summarizes effects of the proposed activities on ESA listed species. The entry for the Nightingale reed-warbler needs to be amended from "no effect" to "may affect" reflecting the potential impacts of land-based activities on Saipan within the SUMB. The potential for land-based movements to harass or take reed-warblers should be added to the appropriate entry in Table 3.11-8.

PUB1-23

Chapter 5, Mitigation Measures, appears not to include any measures to conserve habitat for marine mammals and sea turtles. Is this an oversight?

PUB1-24

Section 5.2 discusses in detail both the general and exercise-specific measures taken to avoid or lessen impacts on marine mammals and sea turtles. Many of these measures appear to rely on having several Navy trained personnel on the bridge as watch standers and lookouts to scan for the presence of marine mammals and turtles prior to initiating exercises. Many other methods for detecting and avoiding marine mammals and sea turtles were considered and rejected (Section 5.2.4). Given that the Navy's reliance on lookouts is a key part of the mitigation plan, two questions come to mind: (1) because marine mammals and sea turtles spend very little time at the ocean's surface (< 10% of their daily activity budget), how are lookouts expected to detect them underwater?, and (2) given the recent grounding of a Navy vessel on a stationary reef in a well mapped zone in front of Pearl Harbor, how successful are watch standers expected to be at detecting small, mobile, uncharted objects that may be at great distances from the ship and just below the surface? It may be that the Navy's mitigation plan is feasible from a logistics and security standpoint, but it may not be effective in avoiding ship strikes and other impacts on marine organisms.

PUB1-25

Section 5.2.3.3 A MIRC Stranding Response Plan should be mandatory and fiscally supported, given the wealth of marine mammals in the Marianas Trench Marine National Monument and the increased use of sonar associated with the proposed activities.

PUB1-26

Chapter 6, the Cumulative Impacts Analysis, does not address in any form the problem of Brown treesnakes and the possibility of their introduction to exercise sites outside of Guam. The impacts (past, present and future) of such an introduction should surely be part of this discussion.

PUB1-27

Section 6.1.2.1, Other Projects and Activities Analyzed for Cumulative Impacts, includes Table 6-1, which contains a number of inaccuracies. For example, the table lists Pagan Mining as a Gov-Guam project, which is not correct. Pagan is part of the CNMI and it is the Commonwealth's government that is negotiating the mining permit with JG Sablan. Again, the sub-heading on page 6-3 should be changed from "Other Guam Projects" to

"Other Guam and CNMI Projects" if the Marianas Trench Marine National Monument and the 5-yr review of endangered species projects remain under this heading. Notably missing from Table 6-1 are reasonably foreseeable future actions relevant to the proposed action on Rota, Saipan and Sarigan. Projects on Rota (such as the Rota Avian Behavioral Ecology Program), Saipan (for example the TMAPS project that maintains netting stations close to or in the SUMB where land-based exercises are planned under Alternatives 1 and 2), and Sarigan (in particular the Marianas Avian Conservation program that is translocating birds threatened by the Brown treesnake from Saipan to Sarigan) should be included in the table along with a number of projects planned by the Commonwealth and by each island's municipal government.

PUB1-28

Section 6.2.3.1 and 6.2.3.2 discuss the cumulative impacts of the past, present, and future actions on fish and the marine environment. Both sections jump to conclusions that appear unsubstantiated by the short discussions included in the EIS. More explanation of how the conclusions were reached (as is given in 6.2.3.4 for marine mammals) is necessary.

PUB1-29

Section 6.2.3.6 Anthropogenic Stressors gives information on the impacts of bycatch, entanglement, and directed catch but fails to summarize the cumulative impact of these factors (past, present and future) on fisheries interactions.

PUB1-30

Section 6.2.4.1, the cumulative impacts on geology, soils and bathymetry environments maintains that soil erosion resulting from the proposed actions in conjunction with past and future actions is not heavily exacerbated. It would be advisable, then, for the EIS to discuss how the intensive exercises involving explosive ordnance on FDM do not increase erosion significantly and what "Best Management Practices for soil disturbing activities" are being implemented on that island.

PUB1-31

Note: at least once in the document Saipan's lagoon is referred to as the Saigon lagoon.

Lastly, I would like to be included among the individuals on the distribution list who receive copies of future Environmental Impact Statements and Environmental Assessments for projects that involve Guam and the Commonwealth of the Northern Mariana Islands.

Thank you for your attention.

Sincerely,

Dr. Justine de Cruz
5 Osgood Ave.
New Britain, CT 06053

From: jean public [mailto:jeanpublic@yahoo.com]
Posted At: Monday, March 23, 2009 9:52
Posted To: MARTAPEIS
Conversation: PUBLIC COMMENT ON FEDERAL REGISTER
Subject: PUBLIC COMMENT ON FEDERAL REGISTER

PUB2-1

I object to this plan. i also believe the navy lies to the public about the damage they cause. i believe they cause whales and other marine life all over this world to die fro mhemorrhage caused by high sonar levels. i think this plan of more destructive bombing of the world for alleged "training" is absolutely stupid and does nothign to make america safer. it is a stupid management plan.
b sachau 15 elm st florham park nj07932

HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

University of Guam
Mangilao, Guam

February 19, 2009

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HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS

ENVIRONMENTAL IMPACT STATEMENT

Hearing on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement was taken on Thursday, February 19, 2009, at the Anthony Leon Guerrero Multi-Purpose Room 129, University of Guam, Mangilao, Guam before George B. Castro, pursuant to Notice. That at said time and place there transpired the following:

APPEARANCES

Steve Ruder	Hearing Moderator
Ed Lynch	Project Manager, U.S. Navy's Pacific Fleet
Andrew Henderson	Commander, United States Naval Forces Marianas

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the public hearing, I may be able to offer additional time for you to speak.

Third, if you have prepared a written statement, you may turn it in at the comment table or you may read it out loud if you can do so within the 3-minute time frame.

Fourth, please honor any request that I make for you to stop speaking when you reach the 3-minute time limit. What I'll do to make it easy is, I'll hold up a card when you have 30 seconds left to speak to assist you in knowing that your allotted time is almost up so that you can comfortably conclude your remarks. When time is up, I will hold a red card.

So, we're now ready to begin and I'd like to call the first speaker, Mr. Jesse Limtiaco, to the podium.

PUBLIC COMMENT BY

MR. JESSE LIMTIACO

PM1

For the record, my name is Jesse Limtiaco, and I don't represent any organization, I'm just coming here as a resident and -- I guess I -- yeah, I just want to know what, how do you say this, just a

reference thing to me, I guess, to come here and speak to you guys today.

PM1-1 I would just like to comment on the Environmental Impact Statement and how a normal citizen that maybe cannot understand the full scope of this, how would you -- I mean, did you take that into consideration for people who would not, I mean better understand this as clearly as possible, you know. Someone who hasn't done like reading comprehension, to those normal people that may not understand the full scope and can't -- higher, you know, just basically any normal citizen of Guam, some older person that may not understand the terms, terminology, of this. Did you guys consider that also, and stuff like that, so.

PM1-2 And one other thing is, basically, I hope in Environmental Impacts Statement, it will show -- after all this is done and in the couple of years, I would like to see the projected amount of land mass that would, that I grew up for the 20, 25 years I've been on Guam, if it would change into like some concrete jungle or something, so -- you know. And then everything would just be left behind

like Tiyan or if they decide to pick up and leave and -- I mean, how would you address those issues with helping the Government of Guam if they fail and how would you help them not make it look like a Tiyan or any other abandoned base like Andy South or something like that, so. You know, that's -- that's pretty much it though.

MR. RUDER: Thank you. The next speaker is, Ms. Hope Cristobal.

PM2

PUBLIC COMMENT BY

MS. HOPE CRISTOBAL

My name is Hope Cristobal, and I represent myself. I haven't read the Draft EIS, I've just been able to get some brief exposure on it this evening.

On the basis of previous studies, this is my comment. The full impact statement should cover the physical and mental health effects on the human population as a result of physical, social, political and economic effects of your project.

On the physical effects, I want to list some possible anticipated and likely direct

effects.

PM2-1 Physical effects, and I would like to see these addressed in your EIS. The increased levels often exposure to military toxins in the sea and the air from your exercises, which should include volatile organic compounds, jet fuel, metals, etcetera; the increased radioactive exposures of -- if certain weapon systems are used in training; increased level of noise pollution from the exercises and the jets, military jets; reduced local food supply quality and quantity as a result of air and water pollution.

PM2-2 And on the human, physical and mental health effects, I would like to see addressed the increase levels of cancer, including leukemia, liver, kidney, lung, bladder, and cervical cancers; increased numbers of children that are born with low birth weight and certain birth defects; increased levels of fear of becoming a target of foreign military attack; increased levels of fear of becoming a victim of the crime, both military and civilian, I suppose; increased levels of alienation and sense of powerlessness in some parts of our

population as military colonization increases.

Under social, political and economic effects, I would like to see, as an example, address the intensified defense dependency that it makes our local economy more vulnerable than a diversified economy; increase in numbers of retired military personnel, like Ed Lynch for example, remaining on Guam with depressive impact on wages and local business.

And under political effects, I would like to see further addressed the impediment of a democratically approved process of mutual consent by the people of Guam of any major decision affecting our people. PM2-3

And more accepting culture attitudes towards war and militarism, culture militarization, including erosion of democratic process and faith as military increasingly determines most aspects of our island's fate and our people's fate. PM2-4

And I also have some other social effects that I would like to submit in writing. Thank you.

MR. RUDER: Thank you, ma'am. The next speaker, Victoria Leon Guerrero.

PM3

PUBLIC COMMENT BY

MS. VICTORIA LEON GUERRERO

Hafa adai, my name is Victoria Leon Guerrero and I'm also representing myself.

One of the things that you mentioned was the successful track record of Environmental Stewardship. Unfortunately, our

PM3-1

community here on Guahan and in all the Marianas islands have not experienced the successful track record.

To very common in public knowledge, there are several unclean military contaminated sites throughout the island. I myself grew up in Toto, where as a child my brother discovered

PM3-2

a bomb in our backyard. So, we've grown up with a very horrible exposure to contamination from military activities, and specifically, your training activities in our islands.

And to this day, we've never really had an open discussion with the military about

PM3-3

exactly what types of toxins are exposed to our environment.

When a nuclear sub recently was found leaking, at first, we were told it was only leaking for two weeks and then it came out that

PM3-4

it was leaking for two years.

So, this Environmental Impact Statement should include all toxins that have already occurred in all of our islands, and should include a thorough examination of the levels of cancer and other types of diseases that are higher on our islands than anywhere else in the world.

PM3-5

Before anything proceeds further, the issue of self determination and our political status should also be looked at, because the continued presence of the military and any increase in military activities or range affects our political future. And so it should also look at that.

PM3-6

In the impact study as well, I notice you mention the sound effects on mammals, but what type of research was done as to the sound effects of jets flying low over our homes? How does this affect the survivors of war who live on the island? How does this affect our other economic means, such as tourism? What effect does it have on Japanese people who may have experienced the bombings that happened in Japan during World War II?

PM3-7

So, there are many different concerns that I didn't notice in my quick glance of your huge documents. I suggest that this company, I believe it's a company that's not part of the military, that's doing the study, actually speaks with people and finds out what levels these sounds and these things have on their emotional stability and our health. Because our community health is not at its best, and in large part, it's due to your presence here. Thank you.

PM3-8

MR. RUDER: Thank you, ma'am. Are there other folks that have comments?

MS. AUYONG: Hi.

MR. RUDER: Thank you.

PUBLIC COMMENT BY

MARIE ADA AUYONG

PM4

Thank you. My name is Marie Ada Auyong, and I'm representing myself.

I actually just had three things that I would like to say in response to the presentation.

Please explain the process by which the public can find out what kinds of weapons are

PM4-1

tested in the range complex, if that's all something that we are able to find out.

Please explain any requirements by U.S. Federal and Territorial Laws to report adverse PM4-2 effects or potential adverse effects of weapons testing.

And the third is, this might actually be beyond the scope of the Environmental Impact PM4-3 Study, and I understand if that's the case, but I think the public will also appreciate any explanations for legal discrepancies between U.S. Federal and Territorial Laws that might occur between those two legal codes and in regards to reporting adverse effects. Thank you.

MR. RUDER: Thank you, ma'am. Are there others? (pauses) If there are no others, we could take a short break, 10-minute break, and if there are others that would like to provide oral comment, we can do so after the short break. Thank you.

(Break was taken from 7:51 p.m. to 8:06 p.m.)

MR. RUDER: Okay. Let me go ahead and formally reconvene the session and ask again if

HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Southern High School Cafeteria
Santa Rita, Guam

February 20, 2009

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HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS

ENVIRONMENTAL IMPACT STATEMENT

Hearing on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement was taken on Friday, February 20, 2009, at the Southern High School Cafeteria, #1 Jose Perez Leon Guerrero Drive, Santa Rita, Guam before George B. Castro, pursuant to Notice. That at said time and place there transpired the following:

APPEARANCES

Steve Ruder	Hearing Moderator
Ed Lynch	Project Manager, U.S. Navy's Pacific Fleet
Andrew Henderson	Commander, United States Naval Forces Marianas

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three minutes to speak. And depending upon the number of speakers and the time remaining for the public hearing, we may be able to offer additional time for you to speak.

And, third, if you have prepared a written statement, you may turn it in at the comment table or you may read it out loud if you can do so within the 3-minute time frame.

And, fourth, please honor any request that I make for you to stop speaking when you reach the three-minute time limit. What I'll do is just to help out is, I'll hold up the yellow card, indicating that there's 30 seconds left on the time so that you may comfortably conclude your statements. And then when time's up, I'll hold up the red card.

So now we're ready to begin, and if you have comments that you would like to make, please feel free to fill out a comment request card.

And the first speaker is Ms. Trini Torres. Thank you.

PUBLIC COMMENT BY

PM5

MS. TRINI TORRES

I am Trini Torres. I'm from the Taotaomona Native Rights. I'm a Chamorro woman. I'm also a biologist, microbiologist and also a critical and cultural analyst, specialty.

First of all, I'm kind of -- it looks like, when you're presenting this, I thought that you wrote this and presented to us as an Environmental Impact Statement.

But you're going back and forth and PM5-1 elling us that this is what you're going to do, which is opposite. You're not in line with what your representation is supposed to be.

PM5-2 You're giving us this thing to read and that this is what your study is all about. But yet you're telling us that you're going to do this and this is what you recommend and this is what you're going to continue doing.

I don't quite agree with how you're going about doing these things. You're telling us this is what you're going to do. And you still want our input.

Yeah, I'm listening to you. I've been going through this and I insist on getting those thick reports, the draft report, and also

the final report.

But something is wrong here. You're telling us this is what you're going to do anyway.

First of all, you have a No Plan Action, okay, the alternatives. You have No Action. No Action means, no action. But you're saying you're going to go continue doing what you're doing anyway. And that means also you're upgrading. No matter what you do, you're still going to upgrade whatever you're doing. Because nature takes its course, that you're going to upgrade whatever you're doing, especially in the military.

And then you have Alternative 1. And it says you're going increase your training activities, right? Yes.

And then Alternative 2, you're going to include everything else plus more of everything.

And then I was expecting to see some solution. So, will you please include that in your report? That you need to come up with solutions, how to improve things.

And it does have so many environmental

impacts on everything, you know, categories, including our culture, our people. What if we say to you that, well, we don't want the military here? Because it is killing us. It is impacting on our culture, our way of life as a people. You're leading us to extinction.

PM5-3 So, please I need, I strongly recommend that you have, besides those three categories, No Action, Alternative 1, Alternative 2, that you have a reversal type alternative to be included in this impact statement, environmental impact statement.

And you have to deal with the people too. Because we're animals too, right? You PM5-4 only deal with the whales and the turtles. Deal with the Chamorro people too. *Pot fabot*, please.

MR. RUDER: Thank you, ma'am. Are there others that would like to provide comment?

PUBLIC COMMENT BY

PM-6 **MR. IAN CATLIN**

My name is Ian Catlin. I just have a couple of questions.

PM6-1 How are you going to do the third party analysis or evaluation of the program? Nothing was stated there for third party interest.

So, you say you're going to go through this process of making sure that everything is safe, but who's checking you? No one?

There was an issue on the West Coast of the permanent sonar causing deafness in the PM6-2 whales. And I'm glad that you approached that. But making it portable, that means you can make more whales deaf in various places. It has nothing to do with the impact of the sound.

And there's still no justification for your continued presence here. You want more, but you're not telling us more. You're saying PM6-3 I want more of this, I'm going to take more of that, but you're not giving us more as a people.

And, more, not just in terms of finances, monetary. I'm talking about more in terms of respect as people.

There was no explanation of how our PM6-4 fishermen, we are watermen, are going to traverse the waters if this is all going to be a war zone, a practice zone.

We move freely here. This is our area. This is our water. We are caretakers of this property, of this land, and of this ocean. So, you have to excuse our emotional nature in this situation, just because in our culture it is deemed as an upfront. We've never come to you and tell you we're going to be doing this to you, without having any kind of repercussions.

PM6-5

And then with the justification for continued presence, given the global climate of all world powers diminishing their military presence, why are we increasing our military presence here? And excuse the word "we", I meant you.

MR. RUDER: Thank you. Why don't we take a 10-minute break and then we could re-adjourn if there are other comments that would like to be made. Thank you.

(Break was taken from 7:52 p.m. to 8:01 p.m.)

MR. LYNCH: Is there anyone else who would like to provide us some oral testimony?

GENERAL PUBLIC: (none say that they do)

MR. LYNCH: There being no further oral

HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Multi-Purpose Center
Susupe, Saipan

February 23, 2009

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HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Hearing on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement was taken on Monday, February 23, 2009, at the Multi-Purpose Center, on Beach Road (next to the Kiyu Library) in Susupe, Saipan. before George B. Castro, pursuant to Notice. That at said time and place there transpired the following:

APPEARANCES

Steve Ruder	Hearing Moderator
Ed Lynch	Project Manager, U.S. Navy's Pacific Fleet
Andrew Henderson	Commander, United States Naval Forces Marianas

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MR. BENAVENTE: If you don't mind.

MR. RUDER: That's fine. Representative Ray Tebuteb, also from the Legislature. Sir.

PUBLIC COMMENT BY

CNMI REPRESENTATIVE RAY A. TEBUTEB

PM7

Thank you, Mr. Ruder. Commander, I just going to say, Drew, Commander Henderson, Retired Ed Lynch, and panel members. I have a very short comment, since we had our wonderful conversation with Commander French at the legislature.

Thank you for the opportunity to engage our general public to submit comments with respect to the Marianas Range Complex, Mariana Islands Range Complex EIS.

PM7-1 In view of the constant change in our global defense technology and the need for our U.S. Military to continue their training and testing requirement, I assert my support at such.

Like most of our community members in this region, I also have family members and a daughter personally serving in the Armed

Forces. However, I would like to ask the Department of Defense, through this initiative, to engage with other relevant department, U.S. department and agencies, to consider two things.

PM7-2 One is to consider our fisherman who avail the Farallon de Medinilla area as a prime fishing ground. There is a need to strike in balance, most especially within the exceptional seasons bound with positive catches from January to June. Further clarification can be most specific with our U.S. and CMNI Division of Fish and Wildlife. As you all may know, the area specific, is one of the most subtle fishing grounds to our small time commercial fishermen.

PM7-3 The second one is submerged lands. Although our CMNI U.S. Representative Congressman Ray Sablan has submitted House Resolution 934 for U.S. Congress to grant CMNI the three miles on jurisdiction, I am one who has reservation as such. Other similar attempts since 1995 have failed.

Although the U.S. Federal Supreme clause under the U.S. Constitution Article 6,

Clause 3, over ownership of submerged landing prevail, I ask that the consideration is also given to Article 8, Section 801, with respect to potentiality of having been granted to CMNI. Given the U.S. -- or the United States and other nations, who did not sign the U.N. or United Nation Convention on the laws of the sea, I ask that the 1993 and 1988 Presidential Proclamation 5030 and 5928, respectively, be compromised (sic) -- be not compromised.

With this, I am used to say, if the CMNI owns the water around FDM and Tinian, as stipulated in the lease agreement, are we then now the lesser of U.S. citizenship, citizen incognito. If this public forum, a 10-mile radius around FDM, where does our CNMI approval of the range rest?

PM7-4

In all these, I strongly believe that the security of our nation be the utmost priority, no less, no more. The terms jurisdiction, ownership, control are all, in my opinion, semantics. It ought to be a shared responsibility, benefiting all.

The Mariana Islands Range Complex is a need we all must embrace. Thank you.

PM8

PUBLIC COMMENT BY

CNMI REPRESENTATIVE DIEGO T. BENAVENTE

Thank you, Hafa Adai. Good evening. My name is Diego Tenorio Benavente. I'm the House of the Representative and Chairman of the House Committee on Federal and Foreign Relations.

I'm here to testify on the proposed action and alternative regarding the ongoing and proposed military training activities within the Mariana Islands Range Complex.

In particular, I'm here to testify and express my concern on behalf of my constituents as the Chairman of the Federal and Foreign Relations Committee. In addition, to testify in my official capacity -- in addition to testifying in my official capacity, I also appear before you tonight as a life long fisherman of these waters, one who has previously owned and operated a local fish market for over 17 years.

Before I proceed any further, I would like to begin by acknowledging the hard work and the time the U.S. Department of Navy has

put into developing the MRC, the Environmental Impact Statement, as it is essential that we continue to work together to protect our valuable and never depleting natural resources.

Without getting into great detail, it is my understanding that the MIRC Environmental Impact Statement proposes three alternatives. A *No Action* plan, which essentially keeps the status quo and Alternatives 1 and 2. The latter of two alternatives, both decrease access to the water surrounding FDM, with Alternative 1 being the preferred choice.

PM8-1

I am here to state my opposition against Alternative 1. Simply put, the proposed restricted access to the water surrounding Farallon de Medinilla will have devastating consequences on the Commonwealth, consequences that the Draft EIS may not have taken into consideration.

In addition, it is my view that the increased restrictions are inconsistent with the covenant negotiations. These wars just within the outer limits of most boats in the Commonwealth represent perhaps the most fertile fishing grounds readily accessible to local

fishermen, whether they be commercial or subsistence. In fact, when I was the Lieutenant Governor, I made a request to suspend military training exercise on FDM to allow unlimited access for fishermen during the summer, recognizing the important value of these waters.

It is not uncommon to hear a true story, true fishing story, where two fishermen on an overnight trip to FDM would have brought home between 500 and 1000 pounds of white snapper, otherwise known as *mafute'*. Such a catch means a great deal in this difficult economic times when the Commonwealth is suffering from one of the most widely felt international recessions in history.

As I testify today, the Commonwealth is witnessing deterioration of its two most significant economic resources; the old, at debt garment industry, and the steadily declining tourism industry. This restricted access to FDM takes away an opportunity to mitigate this economic hardship. It would take away potential income for those who are forced to rely more on fishing to put food on the

table, buy cloths for their kids and pay their utility bill.

I could see I'm not going to finish this within the next few seconds, so if I may maybe come back at some point. May I go ahead and finish it? Thank you.

Currently restricted access is temporary, out to three miles and upon 72 hours notice. Now, under Alternative 1, there will be a permanent restriction out to 10 miles. And this restriction may be extended out to 30 miles. I fear that may include Marpi Reef, taking away yet another extremely valuable fishing ground.

PM8-2

These restrictions in my humble opinion are inconsistent with negotiations which lead to the signing of the covenant. By way of background, Section 802 of the section by section analysis of the covenant, provides that the amount of land to be made available to the United States reflects extensive negotiations and review by both United States and Marianas Political Status Commission, for two years, to assure that the United States requested and receive only the minimal amount of land which

it needed for defense purposes.

The amount of land to be made available under the covenant is far less than the amount initially requested by the United States. This accommodation of the interest on both sides reflect goodwill and understanding.

The covenant contemplated with respect to Farallon de Medinilla, and I quote, 206 acres encompassing the entire island and the waters immediately adjacent thereto. In contrast, Alternative 1 now calls for a minimum of 10 miles restricted access.

Let me be clear, this is not an argument based on principles of land ownership. I respectfully acknowledge and accept the court's ruling regarding ownership of these waters.

Instead, I appeal to your sense of fundamental fairness, consistent with the [quote] goodwill and understanding that prevail during negotiations of the covenant. A fairness that would favor access, not restriction; a fairness that would encourage fishing as a means to support one's self and one's family, as opposed to all but ensuring

federal dependency; a fairness that reflects that if greater restricted area is absolutely necessary, that we find a less drastic alternative that is beneficial to all concerned. I say this recognizing the patriotic importance of defense training and the role that FDM places in National security, just as the covenant also recognize. And I quote, "That the Northern Marianas will," like other members of the American political family, "contribute some of its resources for the common good, as well as receive assistance, which it needs."

In conclusion, I thank you for the opportunity to provide this testimony as this matter -- as this is a matter I hold dearly, one that is of great importance to the citizens of the Commonwealth. Thank you.

MR. RUDER: Next speaker, Richard Seman.

PUBLIC COMMENT BY

PM9

MR. RICHARD SEMAN

Good evening. My name is Richard Seman. I represent myself. I'm not in the

legislature. I was former Director of Fish and Wildlife and I dealt with former Commander Lynch in the past. Nice to see you back.

PM9-1 However, my point is just to make some comment, and it's very brief basically. You know the fact that FDM in itself has been a controversy and -- but, nonetheless, necessary for the defense of our nation. And that's understood. I'm just kind of surprised that what is controversial will now become even more controversial. So, I kind of find that's surprising that, you know, we'll be pushing them a little further in this particular undergoing.

And we all know what happened in Puerto Rico and, you know, our people are not -- and we won't -- I'm not saying we're not like them, but hopefully nothing like that had happens out here. And that's the kind of controversy that, you know, I'm worried about that may lead to something like that. That none of us want. Not at this time in the world, anyways.

PM9-2 Second part, just for the record, in planning ahead, we need a clear standing on this whole MRC between fishing and training.

So, we really need to, as much as you explain how important training is, you guys have to do your best to dig as much as you can and bring forth just how important fishing too, so that we know that you are looking at the interest of our people as well, and that fishing is not -- it's not just something that want to think on the side, but it is part of the most important stuff that you're giving will, as well.

And the last part here is the cooperation. We need the defense to be very cooperative. I've dealt in the past where we do not agree on certain statistical findings. Some of the end results, some of the post-training assessment, you know, we don't agree on some of the data, the statistics that comes out. And that shouldn't happen. Because ultimately one day, the training, the type of training that FDM is necessary for, may no longer be need. And when that need is no longer there, you vacate island but, you know, we'll be left behind to deal with it.

PM9-4

And good data, good statistic, can help us in understanding what we're dealing with in the future.

And, lastly, whatever it's worth, our people are not very vocal as in some other places. You guys are more experienced than we are in this particular type of issue, but when it comes to fishing, it is not just something PM9-3 that you go out there to catch. It's a way of life. It's our life. And when you try to do something to get into that type of livelihood, you know, that reaction is always personal at first. And then sometimes by taking it personal, sometime you don't really listen to the little facts that you guys present, the importance of those thing that you're presenting. So, that's why when you approach us with the importance of fishing and fish, we can probably have a better hearing. Thank you.

MR. RUDER: Thank you. Thanks everybody for your help on making my job easier. Is there anybody else that would like to provide oral comment at this time? Sir, could you help us by filling out a comment card? Thank you.

PUBLIC COMMENT BY

PM10 **MR. DAVID SABLAN**

My name is David Sablan. I'm just a part-time fisherman. I'm suppose to be writing on the website so I can write in more of my proposals or response.

But tonight I just want to mention a few things about that technology that has being mentioned thus far. With all the sonar system, navigation systems that you have, some of the local fishermen don't have the financial luxury of all the GPS or navigation system.

PM10-1

And so, when you mentioned that feedback sonar system, I hope that whatever the result is, whether it's three miles or 10 miles, that you'd be able to provide some kind of a buoy, some kind of a warning system, that when a fisherman now cross that marker, that that fisherman knows -- it should be a standard knowledge, common knowledge, that that marker is within the danger zone and so that fisherman should be able to return, go back to where he's coming from.

As I said earlier, that not all of us have the financial luxury to buy all those navigation system. That will be a tremendous help. So, whatever the result is, that would

really help some of the fisherman. And I'll be really looking forward to hearing from you on the web sites. Thank you.

MR. RUDER: Why don't we go ahead and take a 10-minute break. You'll be able to enjoy some of the food and meet with the experts in reviewing your -- and if anybody would care to provide additional comment, we could reconvene in 10 minutes. Thank you.

(Break was taken from 8:00 p.m. to 8:32 p.m.)

MR. RUDER: Excuse me, ladies and gentleman, why don't we go ahead and reconvene the hearing.

And before I forget and before we get started, it was pointed out to me that there's plenty of food and so please help yourself either now or on the way out to take some home for your families or for breakfast tomorrow morning.

So, we call the session back in. And our next speaker is Mr. Sam McPhetres from Northern Marianas College.

PUBLIC COMMENT BY

PM11

MR. SAM McPHETRES

Thank you very much. It's a pleasure to have a chance to address you, and I appreciate all the work that you've done preparing this program tonight.

I am here not as Marianas College but as a historian of the covenant. I was here at the time the covenant was negotiated and was very close to the negotiations and have certain feeling for it.

And I want to just simply caution everyone to make sure that you know what the covenant means and implies, particularly the military provisions in there. Because I could

PM11-1

feel that there's some sort of skating around some of the stuff that could cause problems between people of Marianas and the military.

So, I just wish to make this comment, then I can sleep well tonight. Thank you.

MR. RUDER: Is there anybody else that would like to provide other comments orally?

GENERAL PUBLIC: (none say that they do)

MR. RUDER: If not, we'll go ahead and close the public comment portion of the program

HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Tinian Elementary School Cafeteria
San Jose Village, Tinian

February 24, 2009

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HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS

ENVIRONMENTAL IMPACT STATEMENT

Hearing on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement was taken on Tuesday, February 24, 2009, at the hour of 7:06 p.m., at the Tinian Elementary School Cafeteria in San Jose Village, Tinian, before George B. Castro, pursuant to Notice. That at said time and place there transpired the following:

APPEARANCES

Steve Ruder	Hearing Moderator
Ed Lynch	Project Manager, U.S. Navy's Pacific Fleet
Andrew Henderson	Commander, United States Naval Forces Marianas

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number of speakers, and it looks like right now we had one, so there would be plenty time to circle back around for others that would like to provide comments. And we could also take a short break and you can exchange with the experts that are here and we can reconvene if you'd like.

Third, if you have a written statement, you may turn it in at the comment table or you may read it out loud as another way to communicate your thoughts and ideas.

And fourth, I've got some cards here that just helps us to stay on track with time, but it looks like right now we've just got one person at the onset that's going to provide comment. But what I do is, I've got to stopwatch and if we start to get a lot of folks that are interested, I'll just hold up some cards to help us keep things going on.

So, that said, our first person that would like to provide comment is Stephen Smith.

PUBLIC COMMENT BY

MR. STEPHEN SMITH

PM12

Actually, it's just a brief comment.

PM12-1

You mentioned that the new realities out here with the new threat, I guess you can call it the new threats we have out here or whatever they are, but you never mention what they are. I'd like to see that, and see that more explicitly made or explained. That's really all I have to say about.

(End Public Comment)

MR. RUDER: Thank you. Is there anybody else at this time that would like to provide public comment?

GENERAL PUBLIC (none say that they do)

MR. RUDER: If not, why don't we take a 5-minute break and then we could reconvene and if anybody would care to provide comment at that time, they can go ahead do so. Thanks.

(Break was taken from 7:47 p.m. to 8:04 p.m.)

MR. LYNCH: Do we have anyone who would like to give oral testimony at this time?

GENERAL PUBLIC (none say that they do)

MR. LYNCH: Going once? Going twice? There being no further oral testimony, I will close the oral testimony portion of the hearing. Thank you. Please hang around,

HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Sinapolo Elementary School Cafeteria
Sinapolo, Rota

February 26, 2009

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HEARING ON THE MARIANA ISLANDS RANGE COMPLEX DRAFT ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

Hearing on the Mariana Islands Range Complex Draft Environmental Impact Statement/Overseas Environmental Impact Statement was taken on Thursday, February 26, 2009, at the Sinapolo Elementary School Cafeteria, Sinapolo, Rota, before an Officer of Depo Resources, pursuant to Notice. That at said time and place there transpired the following:

APPEARANCES

Steve Ruder	Hearing Moderator
Ed Lynch	Project Manager, U.S. Navy's Pacific Fleet
Andrew Henderson	Commander, United States Naval Forces Marianas

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pause) Okay. Is there anybody else that would like to provide oral comment this evening? Yes, sir. Please go ahead and state your name.

PUBLIC COMMENT BY

PM13

MR. RICHARD E. TAISACAN

DIRECTOR, DEPARTMENT OF LABOR

Commander, good evening, and members of this panel. My name is Richard Taisacan, I'm the Director of the Department of Labor here in Rota. And I must say that when I saw you folks this morning, I had goose bumps. Reminds of the time when I was in active duty.

I just hope that you will bring your presence here to the CNMI a lot more often, and I'll tell you, we will support every endeavor that you have in the CNMI with respect to the Range Complex.

As a former soldier, I know what it's like to train, I know how important it is to train to prepare for whatever comes ahead of us. And having spent 20 years in the Army, I'll tell you, there's nothing better than training.

But the wonderful thing about here is

that, as far as your presentation is concerned, you mentioned that the military will do everything it can to preserve our wildlife, both on land and at sea. You know and that's very impressive to hear that.

I was hoping that the Navy would come out with a sonar that can hurt fish together, so that we here in CNMI can use to fish, but unfortunately, I guess technology later on will change.

Quite frankly, we support your operation. Just let us know if you're going to be having a war, so officially you can come in. We will support all your endeavors, your presence. I hope that as a result of these training, the military will continue to improve their system, improve the defense, so that we will continue to be free, to live in a free world.

PM13-1

And, again, we will support, I know we are in support of your operation. And -- so, thank you for being here and we hope that we'll see your presence. And when the soldiers are done with their training, I hope that you park your battle ship off of our coast, you know

what I mean, on land, so they can enjoy themselves. And, again, thank you for being here.

PUBLIC COMMENT BY

PM14

MR. THOMAS MENDIOLA

My name is Thomas Mendiola. I am from here. I am a coconut tree farmer.

First, I want to let you know that we appreciate very much your presence and at the same time to know that we are under the umbrella of your protection.

But I would like to share something else that might be very silent of everyone, particularly with the military. Being a farmer, I noticed that there are wildlife that might not be noticed by a big institution like the military.

PM14-1

I can take someone like myself inside the jungle and spending so many years together with this -- what do you call? If wrote this down correctly, the wildlife cultural resources. Maybe that's correct. I call them *fanihi*, which is fruit bat, I called them *umang*, which is the small traps in the reef,

the *atul*, and this is a different kind of fish.

However, I identify with your explanation, sir, about the sonar and this very high sophisticated scientific explanation. I have no words for it, I'm sorry about that. But it shows that the Navy is doing their part in trying to find out as much as possible what are here that we should protect or preserve our wildlife and natural resources, cultural resources.

And this, I believe, because of your explanation, I become rather satisfied that more research will be done. And somewhere, along the line, we will be able to meet this so-called cultural knowledge of our environment and the scientific knowledge of -- I was very surprised about your scientific explanation, and hope that we can bring this knowledge together and we can work things out to protect and preserve our cultural resources.

That is what I want to make sure that we come to understand that tonight and thank you very much. I appreciate your presence. Thank you.

MR. RUDER: Anybody else care to

provide comment at this time? Maybe what we can do is, take a -- sir?

PUBLIC COMMENT BY

PM15

MR. JOAQUIN MANGLONA

Good evening. I am Joaquin Manglona. I'm a farmer and also a businessman on the island of Rota. Welcome to the island, gentlemen.

My comment tonight is pretty much in support of your studies and the statement you're trying to put out in this process.

PM15-1

When you say that Rota would pretty much experience the status quo, pretty much a continuation of the activities you're doing now, it's nice. But we hope to have more activities, at least on my part. Because of the impact of the activity on the economy, it would be nice for the island, especially with the economic condition at this time. But if there is restriction for that, I can understand.

But, you know what we need is more activities, people coming in and sharing their resources with the islands.

So, that's pretty much my statement tonight to this board on what you're doing.

PM15-2

And also I want to say that your concern with the environment is pretty much the same as my concern; to protect the species that we have in our small island. We only have 32.9 square miles of land. And pretty much all the wildlife here are fragile. It can be destroyed and eliminated with the technology that we have. So, we're concern about the protection of the species. As I hear your presentation, that's also your concern, and that's nice.

So, you don't expect harm to the wildlife, that's nice to hear too. Because we want our eco-system, our bio-diversity intact, so that the younger generation can still enjoy our wildlife. Thank you again and welcome to Rota.

MR. RUDER: Why don't we go ahead and take a five minute break and then we could reconvene if anybody else would like to provide comment at that time. Thank you.

(Break was taken from 8:10 p.m. to 8:23 p.m.)

MR. LYNCH: All right. There being no

11.4.2 Comment Responses

Table 11-10 contains both comments and responses to the comments.

Table 11-10 Responses to Comments

Number	Resource	EIS Sect	Comment Summary	Response
FED1-1	Seabirds & Shorebirds	3.10	The EIS should address bird aircraft strike hazards.	Bird aircraft strike hazards are addressed for AAFB in Section 3.10.3.1. Range users implement standard operations procedures that have been designed to minimize bird aircraft strikes on other airfields. Air Force Instruction (AFI) 91-202 requires Andersen AFB to implement a Bird Aircraft Strike Hazard (BASH) Plan. The Andersen AFB BASH plan provides guidance for reducing the incidents of bird strikes in and around areas where flying training is being conducted. The plan is reviewed annually and updated as needed.
FED1-2	Terrestrial	3.11 Ch 5 Ch 6	The Mariana Islands Range Complex EIS/OEIS must include an invasive species risk assessment and management plan to prevent the spread of invasive species into and out of the Mariana Islands with troop, vessel and cargo movement. The EIS must include detailed discussion which fully describes the need for management and risks associated with each separate invasive species, as well as comprehensive, detailed plans for prevention, containment and control.	As part of the Section 7 ESA Consultation between the Navy and the USFWS Pacific Islands Field Office, the Navy developed conservation measures specifically targeted at brown treesnake control and interdiction. The regional biosecurity plan is still in development, and the Navy is a contributing agency to the Brown Treesnake Technical Working Group. The brown treesnake control and interdiction efforts described in the conservation measures within this EIS/OEIS are concerned with avoiding, offsetting, or minimizing potential introductions of invasive species associated with increased training. The Joint Region INRMP addresses other brown treesnake and invasive species control needs, and the biosecurity plan will cover all aspects of Navy activity within the MIRC. Specific measures within the MIRC EIS/OEIS include: (1) The inclusion of a group of conservation measures under the heading "*Conservation Measures for Predators, Pests, and Plants: Invasive Species Management Associated with MIRC Training Activities*". (2) Inclusion of a measure entitled: Brown Treesnake Interdiction and Control and DoD participation in the Brown Treesnake Control Plan. (3) Self-Inspection Training for Personnel and Awareness: Avoidance Invasive Species Introductions. (4) DoD participation in the Regional Biosecurity Plan (5) Cooperative development of regional training SOPs and Exercise Planning For specific descriptions of these measures, please see Section 3.11 and Chapter 5 (Mitigation).
FED1-3	Terrestrial	3.11	Integrated Invasive Species Management Plans must include BTS and Other Taxa in the EIS. Comprehensive integrated invasive species	See response to FED1-2.

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			management plans which detail logistical requirements including personnel, locations, equipment, infrastructure, control methods and strategies, must be developed, approved and be ready for implementation prior to cargo and personnel movements into or out of the Marianas to any location. Commitments and plans must be included in the final EIS for disclosure of environmental effects. In addition, the invasive species management plans should identify pathways of risk for arriving invasives.	
FED1-4	Terrestrial	3.11	Early Detection and Rapid Response Plans Must be Included in the EIS.	See response to FED1-2.
FED1-5	Terrestrial	3.11	Brown Treesnake Control Plans Must be Developed.	See response to FED1-2.
FED1-6	Terrestrial	3.11	The effects of invasive vertebrate species on T&E species are broad and will require substantial cat, rodent, deer, pig and other management efforts. The EIS must include plans for controlling invasive species.	See response to FED1-2.
FED1-7	Terrestrial	3.11	Bird Aircraft Strike Hazards are a critical issue that will be a growing concern and should be acknowledged and prepared for independent of invasive species issues.	See response to FED1-1.
FED2-1	GIS	ES	The EIS maps do not include relevant jurisdictional boundaries. Boundaries of War in the Pacific NHP, the Piti Bombhole and Sasa Bay Marine Protected Areas (MPA) as well as other managed areas adjacent to proposed actions should be included in the Final EIS. This information is necessary to assess potential impacts of proposed actions.	EIS maps were updated to include relevant jurisdictional boundaries. Figures were revised to map Federal and Territorial protected areas.
FED2-2	Proposed Action	ES Ch 2	It is unclear in the impact summary tables (those used throughout document) whether the No Action alternative shows the number and extent of actions that are currently taking place and/or historically took place and/or this number simply represents the number/extent of a given activity that has been previously permitted and is projected for the future. It is critical to make this distinction. Tables should show the number/extent of each action that actually occurred in each year in one column and number/extent of each action that is currently permitted for in a second column.	Sections were revised to clarify number and extent of actions. The No Action Alternative is current training within the MIRC. Alternative 1 and Alternative 2 are current training as well as increased training supported by modernization and upgrades/modifications to existing capabilities, training associated with ISR/Strike, and multi-national and/or joint exercises. Each Alternative builds on the previous Alternative, so that Alternative 2 would capture all the activities proposed, including those current training activities under the No Action Alternative.
FED2-3	Recreation	3.12	Agat Bay tourism, diving, and noise impact analysis should be	For information related to training activities, the public may contact the

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		3.16 3.17	analyzed. Concerned about public notification of training activities. Tourism, specifically recreational diving, may be impacted from the increase in training in Agat Bay.	Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981. The No Action Alternative, Alternative 1, and Alternative 2 do not have a significant impact on recreational activities as they are now executed due to the Navy's policy of avoidance of marine and terrestrial animals.
FED2-4	Cultural	3.13	We recommend that the DoD make clear that it has, or will be, consulting the Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (63 Federal Register, April 24, 1998). Does the new MIRC training program, as it relates to the North Field NHL, take into account not just the potential adverse effects to the NHL from training but also the impacts the training will have on the public interest, specifically public access to the NHL?	Section 3.13.3.2 and 3.13.3.3 discusses the Programmatic Agreement under negotiation. The services have taken into account access issues to the NHL. Since current training level and project training levels will still leave the NHL accessible to the general public during most of the year, access issues are of no concern for the MIRC. The Navy has been closely working with the NPS (Dave Louter) and all of the comments in the NPS have been addressed already in the new PA. Yes, we have acknowledged in the new PA that an NHL is present in the Area of Potential Effect and mention the NHL in its full name in the EIS (but then it is abbreviated to Tinian NHL): 'WHEREAS, the DoD REP has determined that the military training program may have an effect upon the Tinian Landing Beaches, Ushi Point Field, and North Field, Tinian Island National Historic Landmark (Tinian NHL) and other historic properties determined eligible for inclusion in the National Register of Historic Places (NRHP) on Guam and Tinian, and has consulted with the ACHP, the Guam HPO, the CNMI HPO, and the National Park Service (NPS) pursuant to 36 CFR §800.3, implementing Section 106.
FED2-5	Cultural	3.13	It would be helpful to have a more clearly stated description of the North Field NHL to enable readers to recognize that it is a distinct historic property.	Text added as appropriate.
FED2-6	Cultural	3.13 Figure 3.13-6	Figure 3.13-6 gives the impression that the northern boundary of the NHL could either extend to the northern tip of the island or extend across the northern edge of the runways. It is the latter, according to the NHL nomination.	Figure revised.
FED2-7	Cultural	3.13 3.13.2.7	In this section {3.13.2.7}, using the formal name of the NHL might improve clarity as well. The official name is the Tinian Landing Beaches, Ushi Point Field, and North Field, TInian Island, National Historic Landmark.	Text revised as appropriate.

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FED2-8	Cultural	3.13	The NPS is also one of the Cultural Resources Partners participating in the negotiation of a new PA and should be listed.	Text revised as appropriate.
FED2-9	Cultural Cumulative Impacts	3.13	It seems that the first sentence of this section overstates the case when it claims in such absolute terms that none of the alternatives, including the preferred, would result in "significant cumulative impacts on cultural resources." It would be more accurate to state that the DoD does not *anticipate* that there will be significant cumulative impacts.	Text revised as appropriate.
FED3-1	All Resources	All	Ensure all concerns identified in the USFWS response to the NOI are addressed in the Final DEIS.	The NOI Comments have been added and are coded as FED7.
FED3-2	All Resources	All	Provide additional specific information in the following areas in the EIS: 1) description of the action and analysis of alternatives; 2) new activities; 3) the overlay units of the Guam National Wildlife Refuge; 4) threatened and endangered species; 5) coastal and marine environment; 6) migratory birds; 7) brown tree snakes and other invasive species; 8) contaminants; 9) global climate change; and, 10) cumulative impacts.	Comment noted, responses provided in subsequent comments in FED3-2 through FED3-55.
FED3-3	Proposed Action	Ch 2	Many proposed actions will employ apparently new and untested equipment, weaponry and/or technology whose potential environmental effects are poorly understood. As such, few details are provided on potential impacts of employing such actions. The DEIS does not provide sufficient detail on proposed construction of facilities and live fire ranges, base expansion and alteration projects, and military training activities on land and in near shore waters.	As a part of this EIS, the potential impacts of the proposed actions have been thoroughly reviewed and where gaps in science/environmental impacts exist, those gaps have been noted. The Proposed Action includes minor repairs and upgrades to facilities and capabilities but does not include any military construction/land acquisition or base expansion. Details on the military training activities can be found in Chapter 2 and Appendix D.
FED3-4	Appendix D	App D	Supply additional detailed information for each proposed activity or appropriate references to descriptions of these activities in other supporting documents identified at relevant locations within the text.	Detailed information regarding proposed activities are provided in Appendix D.
FED3-5	Proposed Action	Ch 2	Analysis of impacts for both Alternatives should consider differences in frequency and intensity as they relate to impacts to listed species and	The analysis of the impacts of each of the alternatives was independently conducted to ensure that impacts upon species and resources were thoroughly examined. Differences between frequency and intensity were

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	All Resources	Ch 3	trust resources.	part of the analysis.
FED3-6	Proposed Action	Ch 2	The DEIS proposes several new activities that may not have been analyzed previously. New proposed activities are not described in sufficient detail to determine their potential environmental impact. Site-specific natural resource information has not been provided for these activities, nor has any discussion of activity-specific alternatives been included.	Descriptions for the activities are provided in Chapter 2 and Appendix D. These sections contain site specific information and Chapter 3 and its subparts contain site-specific natural resource information. The Ferguson-Hill drop zone was previously analyzed in a categorical exclusion (TRUE Training, Helicopter Landings and Take-offs, and Parachute landings at NCTS, Guam, 2005). The amphibious landings were analyzed in the 1999 EIS. The Navy will coordinate with applicable resource agencies for any major improvement to existing facilities, addition of facilities, or beach clearing activities. The Navy recognizes that beaches are constantly changing due to natural erosion and wave action. Prior to an exercise occurring on a beach, the beach will be surveyed for site topography suitability.
FED3-7	Mitigation Measures	Ch 5	EIS should identify best management practices and/or standard operating procedures for new proposed activities and compensation that will be implemented to avoid and minimize unavoidable resource impacts from these activities.	Chapter 5 of the EIS contains discussion on the suite of mitigation measures/BMPs that will be followed as part of the proposed action. The descriptions for the activities are provided in Appendix D. The Ferguson-Hill drop zone was previously analyzed in a categorical exclusion. The amphibious landings were analyzed in the 1999 EIS. Federal resource trustees have been consulted under applicable federal statues including the ESA and all applicable permits/permissions have been obtained. Effects of the proposed actions on federally listed, candidate and Federal trust resource species are addressed in the EIS and in the Section 7 ESA consultations with the applicable resource agencies.
FED3-8	Land Use	3.12	Further detailed information should be provided on activities proposed to occur within these overlay units and that analysis of potential impacts to resources within these units be conducted.	The INRMP provides detailed information and management guidelines for the NWR; additional information regarding the overlay units was added to Sections 3.11 and 3.12.
FED3-9	Marine Communities	3.6	Several proposed activities *(e.g.,* amphibious landings, PUTR etc.) that are expected to have direct and potentially adverse impacts do not appear to have been included in the analysis (see section 3.6.3). Terrestrial-based activities have been excluded from analysis of potential impacts to the marine environment. Recommend all proposed activities that will have impacts on marine and coastal resources be included.	Amphibious landing activities will be analyzed for potential impacts to the marine environment. The following information is provided: The PUTR is portable. There is no training requirement or physical limitation to the system preventing it from being used anywhere, including within 3nm of shore; clearly it can be used within 12nm territorial seas. From past discussions with Pacific Missile Range Facility who would assist in deployment of this capability in Guam, the PUTR would initially be used in some of the same locations that Torpedo exercises (TORPEX) are now

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				conducted. There is an area west of Guam that has been looked at that meets the best technical, geographical, and environmental/regulatory compromise and still meets the training requirements. This area is outside 3NM, because TORPEX's are held outside 3nm, but that does not mean that it would always be deployed outside 3nm. The suggested area meets the main operational requirements----lee of island, accessible to torpedo recovery boat and helicopter recovery services, outside of harbor entrance/exit traffic pattern, supporting bathymetry. There is no designated area on charts for any of these TORPEX areas; it is just a generalized area west of Guam away from normal traffic.
FED3-10	Seabirds & Shorebirds	3.10	The DEIS currently lacks analysis of the proposed action on migratory birds. We recommend the EIS include analysis of noise, percussive force, and fire in relation to migratory seabirds and shorebirds and clarify anticipated effects to migratory (and endangered) birds at Lake Hagoi and Fena Reservoir.	The stressor table (Table 3.10-1) has been updated under STW/Strike Warfare at FDM to include potential for wildland fires and percussive force. FDM is the only location that live ordnance is proposed for MIRC training; therefore, MIRC training only has potential to cause wildland fires at FDM. Fires at the Naval Munitions Site on Guam and other training areas originated offsite and were not sourced from Navy training activities. Live fire on small arms ranges that include simulated training devices (including pyrotechnics) has been actively used on Guam for over 10 years. The military range control system controls all activities that can produce wildfires on the range. The active fire control measures in place on all the ranges have resulted in no wildfires. Conservation measures have been added to Section 3.10.5. Specifically for Lake Hagoi, the wetland is designated as a "No Training Area" with on the ground training restrictions and restrictions on aerial training (e.g. flight restrictions). Fena reservoir also has training restrictions described in the added Section 3.10.5. Fire bucket training and insertion/extraction occurs only near the spillway. The shallower portions of the reservoir including areas with emergent screening vegetation do not have this kind of training. Except at designated landing and drop zones, the Navy prohibits flights over the Naval Munitions Site below 1,000 feet AGL for fixed wing and 500 feet AGL for helicopters. No maneuver and navigation training occurs in areas with known Mariana common moorhen nesting activity. In addition there will be no clearing of vegetation during training events. Fire bucket training, which occurs near the spillway at Fena Reservoir, continues to follow the BO, "95I0012 Fire Bucket Training" of February 16, 1995. These avoidance measures are designed to not interfere with Mariana common moorhen recovery efforts or interfere with migratory bird use of Fena Reservoir.

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FED3-11	Terrestrial	3.11 CH5	We recommend specific operating instructions for invasive species quarantine and control be developed and incorporated into the EIS. It is recommended that the EIS identify funding mechanisms and techniques for early detection and eradication of incipient invasive species associated with proposed activities. Similarly, the EIS should identify funding mechanisms to manage and eradicate harmful invasive species that would get established in new sites due to the proposed activities.	See response to FED1-2.
FED3-12	Hazardous Materials	3.2	No determination on level of contaminant impacts to the environment have been made, other than to determine that substance concentrations would not "affect human health since military personnel exposure is limited and public access to training areas is restricted." (Page 3.2-25). We recommend an ecological risk assessment be conducted *(i.e.,* addressing potential impacts to biological resources in addition to human health risk). The DEIS states that ranges will be cleaned up when no longer needed. We recommend that cleanup plans include provisions for habitat restoration after contaminant remediation has been completed in areas where viable habitat existed prior to contamination resulting from the proposed action.	Estimates of released hazardous materials and expended training materials from training activities have been made and included in the revised Section 3.2. Assessment of impacts is based on quantities produced. The Navy has developed the Range Sustainability Environmental Program Assessment (RSEPA) to ensure long-term sustainability of its land ranges. RSEPA is a phased approach and starts with an assessment of a range for risk of an off-range release, followed with a verification or confirmation of an off-range release, and finally, oversight to ensure sustainability of the range while proceeding with CERCLA for the off-range release. Comment noted re habitat restoration for ranges that are no longer needed. All ranges in the MIRC as identified in the DEIS are needed to support required training for the Services.
FED3-13	Air Quality	Ch 3	Global climate change is expected to have significant impacts on the Pacific Islands. The DEIS does not include a discussion of potential impacts that climate change may have on training activities or facilities. Similarly, the DEIS has not considered how near-term impacts of climate change may compound adverse impacts resulting from proposed training activities on fish and wildlife resources within the MIRC area. We recommend the EIS consider (1) how climate change may affect proposed training activities (e.g., alteration in training activity due to extended periods of drought), (2) how the influence of climate change may affect impacts of training activities (e.g., reduction in rainfall may increase wildfire occurrence on live-fire ranges), (3) how these changes in potential impacts may affect fish and wildlife resources, and (4) proposed measures to monitor the effects of climate change and to make near-term adaptive changes to training activities accordingly in order to minimize adverse impacts to fish and wildlife resources.	It is not currently feasible to quantify the direct and indirect effects of individual or multiple projects on global climate change; nor is it feasible to know how climate change may affect individual or multiple projects. The relationship between projects and climate change cannot be measured on any scale at this time. Global climate change discussion has been added to Air Quality (Section 3.4) and Cumulative Effects (Chapter 6) analysis.
FED3-	Cumulative	Ch 6	In our July 30, 2007, response to the Notice of Intent to Prepare an EIS for the MIRC, we recommended that the analysis of cumulative	The EIS/OEIS is a programmatic review of military training requirements within the geographical Study Area of the MIRC; it is not a site specific

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14	Impacts		impacts include the proposed relocation of U.S. military forces to Guam and the CNMI, other planned military projects (e.g., Northwest Field Beddown and Global Strike Task Force expansions at Andersen Air Force Base) and private developments (e.g., casino and homestead development on Tinian and inter-island ferry service). These activities combined with expanded training under the MIRC would add to impacts on Federal trust resources and should be included in the cumulative impacts analysis for the proposed project. The DEIS restricts the impact analysis to only activities in the proposed alternatives and does not provide a full cumulative effects analysis, other than noting that impacts of certain developments would (a) be additive, (b) be beneficial, and (c) affect terrestrial or marine resources (see Table 6-1). Noted additive impacts and stressors to Federal trust species and habitat should be addressed in aggregate, and we recommend that a cumulative impacts assessment incorporating such effects be included in the EIS.	analysis of actions on particular areas. As a programmatic document we look at the training that occurs at the multiple training venues including consideration of multiple training activities in the same location and the same activities in multiple locations. See tables 2-8 and 6-1. The Proposed Action does not involve major permanent relocations of U.S. Army, USN, USMC, USAF, or U.S. Coast Guard personnel or assets, This EIS/OEIS focuses on the achievement of service readiness activities while the analyses of the Guam and CNMI Marine Relocation EIS/OEIS focuses on the relocation of forces to the Marianas with its associated infrastructure and military construction requirements. Chapter 3 provides analysis of impacts for affected environmental resources for the proposed project and project alternatives. Cumulative impacts are addressed in Chapter 6. Mitigation measures are addressed in Chapter 5.
FED3-15	Chapter 4	Ch 4	Page ES-8, ES 3.3. Other Environmental Requirements Considered. The list of other environmental requirements should include the Fish and Wildlife Coordination Act (FWCA).	No impacts under the proposed action are expected to result in the control or modification of a natural stream or body of water. Hence, the FWCA does not apply to this project because the proposed action would not result in the control or modification of a natural stream or body of water.
FED3-16	Proposed Action	Ch 2 Ch 5	Page ES-11, ES 4.3.2. Alternative I (Preferred Alternative) - Increase Training, Modernization, and Upgrades; ISR/Strike. The paragraph indicates that (a) the force structure consists of a variety of aircraft, (b) aircraft events will increase by 45 percent over the 2006 level and (c) the increase will require improved range infrastructure to accommodate increased training tempo, newer aircraft, and weapons system. The USFWS completed a Biological Opinion for the ISR/Strike project on October 3, 2006, which evaluated a specific set of anticipated aircraft operations, construction activities, and conservation measures between 2007 and 2017. For the years 2009 through 2016, use of only 46 total aircraft was evaluated. There was not an evaluation of impacts for 48 fighters, 12 tankers, 6 bombers, and 4 unmanned aircraft as stated in the DEIS. Further, our evaluation included a maximum of 70 aircraft. From your summary it is unclear if proposed increase in training temp, newer aircraft, and improved infrastructure are the same actions evaluated within the Biological Opinion and if the proposed timeline for implementation is still valid. We recommend this paragraph and any subsequent discussions within the EIS regarding ISR/Strike be clarified. Please indicate which actions were previously evaluated, which actions are new, and how proposed	Applicable paragraph in ES 4.3.2 and Section 2.4 were revised to reflect the correct number of aircraft (46) evaluated in the October 3, 2006 Biological Opinion for the ISR/Strike for the years 2009 through 2016. Conservation measures include past conservation measures developed as part of past Section 7 ESA consultations (e.g. ISR/Strike). Specific measures that have been completed are referenced in the conservation measure discussion in Section 3.11 and Chapter 5 (e.g. completion of AAFB-wide vegetation mapping (e2m 2008), completion of noise monitoring study (SWCA 2008). To better understand the habitat components and conservation management needs for ESA listed species in northern Guam habitats and ESA listed species' recovery efforts, the Air Force also completed in 2008 quantitative vegetation sampling throughout Andersen AFB (e2m 2008).

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			modifications will need to result in either expedited implementation of the conservation measures or development of additional conservation measures to minimize impacts from modifications to the ISR/Strike project.	
FED3-17	Proposed Action	Ch 2	Increased restriction to permanently close more area (up to 30 nautical miles) around FDM to public access is mentioned but not analyzed in the DEIS.	Summary of training activities done in and around FDM are found in Table 2-8 and Appendix D. Under the No Action Alternative, public access to FDM is strictly prohibited and there are no commercial or recreational activities on or near the island. During training exercises, aircraft and marine vessels are restricted within a 3-nm (5-km) radius. Notices-to-Mariners (NOTMARs) and Notices-to-Airmen (NOTAMs) are issued at least 72 hours in advance of potentially hazardous FDM range events and may advise restrictions beyond 3-nm (5-km) from FDM for certain training events. These temporary advisory restrictions are used to maintain the safety of the military and the public during training sessions by providing public notice of potentially hazardous training activity and temporary Danger Zones and Restricted Areas. FDM and the nearshore waters are leased to the United States for military purposes specifically for use as a live fire naval gunfire and air warfare air strike training range. As such, FDM and its nearshore area have always been an off-limits area to all personnel both civilian and military due to unexploded ordnance concerns. The lease agreement between CNMI and the United States, states in pertinent part, at Article 12 of the lease: "c. Farallon de Medinilla: Public access to Farallon de Medinilla Island and the waters of the Commonwealth immediately adjacent thereto shall be permanently restricted for safety reasons." This restriction will continue and FDM and nearshore areas, including the fringing reef remain a restricted area, which prohibits the entry of all personnel, civilian and military from the island without specific permission from Commander, Joint Region Marianas. Under implementation of either Alternative 1 or Alternative 2, a 10-nm surface Danger Zone would be established to restrict all private and commercial vessels from entering the area during the conduct of hazardous training activity. The proposed Danger Zone would designate a surface safety zone of 10-nm radius surrounding FDM. The creation of the proposed Danger Zone does not affect the continued implementation of restricted access as indicated in the lease agreement; and, therefore no trespassing is permitted on the island or nearshore waters and reef at any time. Public access to FDM will remain strictly prohibited and there are no commercial or recreational activities on or near the island. NOTMARs and

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				NOTAMs will continue to be issued at least 72 hours in advance of potentially hazardous FDM range events and may advise restrictions for certain training events. Scheduled training will be communicated to the stakeholders (e.g., local mayors, resources agencies, fishermen) using a telephone tree and e-mail (developed by Joint Region Marianas with stakeholders' input) to send, facsimiles to mayors and fishermen, and notices on the NOAA and local cable channels, and emergency management offices. This safety zone provides an additional measure of safety for the public during hazardous training activities involving the island. The surface Danger Zone is proposed as a surface safety exclusion area to be established in accordance with 33 CFR § 334.1. The U.S. Army Corps of Engineers (USACE) may promulgate regulations restricting commercial, public, and private vessels from entering the restricted safety zone to minimize danger from the hazardous activity in the area.
FED3-18	Mitigation Measures	Ch 5	We recommend including a summary of measures that will be implemented to avoid unnecessary impacts and minimize unavoidable impacts, and compensatory mitigation that will be needed to replace any unavoidable loss of resources, particularly Federal trust resources.	The summary of mitigation measures has been revised in Chapter 5.
FED3-19	Terrestrial	3.10	The stressors presented here are direct impacts only (e.g., noise, trampling nests, direct strikes on wildlife). Indirect impacts caused by these activities, specifically results of disturbances caused by foot and vehicle traffic and exploding ordnances, should also be included in the analysis. These activities create ground and canopy disturbances, which are conducive to establishment of invasive species.	The EIS analysis was revised to included indirect impacts. Indirect impacts are considered more thoroughly in Section 3.10, Section 3.11 and 3.6. For instance, indirect effects of wildland fire resulting from ordnance use at FDM are discussed, as well as indirect effects associated with invasive species introductions. To minimize indirect effects on terrestrial resources, the USFS has developed a fire management plan (USFS 2008) on Navy lands on Guam, which are more susceptible to wildand fires originating offsite than USAF lands. Further, the Navy has included several conservation measures specifically designed to offset or minimize the potential impact of additional extra-Marianas invasive species introductions, and intra-Marianas invasive species transport. DoD Instruction 5090.7, for example, has specific procedures for self-inspection of DoD personnel.
FED3-20	Proposed Action	ES	This section is comprised primarily of Table ES-3. We recommend this table be updated based on resolution of specific comments that will result from further inter-agency discussions.	The table has been updated.
FED3-21	Terrestrial	3.10	The proposed action includes many conservation and mitigation measures to reduce potential habitat loss and most actions will not result in permanent loss of habitat. However, many actions may result	The comment that habitat degradation and temporary habitat loss may result is noted and the EIS describes many SOPS/mitigations the military will follow to prevent the degradation/loss. As an example, live ordnance

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			in increased habitat degradation (e.g., trampling and compaction, erosion, clearing of pathways/trails etc.), temporary habitat loss (e.g., fires from explosive ordnance), and spread of invasive species. Introduction of non-native invasive species (plants, insects, ungulates, etc.) by MIRC activities has potential to alter habitats and could also result in habitat degradation and loss. These minor losses and degradation that could occur with implementation of the MIRC, coupled with current status of the habitats, continued loss of forest (by construction activities, both DOD and non-DOD, ungulate browse, etc.) on many islands, and the risk for non-native species introductions could result in a large cumulative loss of habitat throughout Guam and the CNMI. We recommend that this be clarified in the EIS particularly in light of plans for future expansion of military activities in the area.	that could ignite is only used at FDM; SOPs are in place that minimize fire potential (e.g., clearance of target areas). Chapter 6, Cumulative Impacts provides an extensive discussion of the assessment of cumulative impacts (or cumulative effects) which was made using an ecosystem management approach and follows the objectives of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Identifiable present effects of past actions are analyzed, to the extent they may be additive to impacts of the Proposed Action. In general, the Navy need not list or analyze the effect of individual past actions; cumulative impacts analysis appropriately focuses on aggregate effects of past actions. Reasonably foreseeable future actions that may have impacts additive to the effects of the Proposed Action also are to be analyzed. Various types of reasonably foreseeable future actions that are relevant to the Proposed Action have the potential to affect the resources identified in Chapter 3. Table 6-1 is an overview of these actions that emphasizes components of the activities that are relevant to the effects analysis in Chapter 3. Additionally, projects in the planning phase were considered, including reasonably foreseeable (rather than speculative) actions that have the potential to interact with the proposed Navy action. Geographic distribution, intensity, duration, and the historical effects of similar activities are considered when determining whether a particular activity may contribute cumulatively and significantly to the effect identified in Chapter 3.
FED3-22	GIS	All	The figures in these sections should include boundaries of all recognized Federal and Territorial protected areas.	EIS maps were updated to include relevant jurisdictional boundaries. Figures were revised to map Federal and Territorial protected areas (see Figure 3.12-1).
FED3-23	GIS	All	We recommend that location of training activities on non-DoD lands on Saipan and Rota be delineated in Figures 2-8 and 2-11. These delineations may then be used to evaluate any potential impacts to listed species or their critical habitats on these islands.	Marpi Point has been added to Figure 2-8 in the EIS. Training on Rota cannot be delineated on a map as training is on a case-by-case basis and the location will vary. Critical habitat areas are avoided on Rota. Training activities in Saipan and Rota were addressed in the Section 7 ESA consultations.
FED3-24	Hazardous Materials	3.2	We recommend that any clean up action planned under RCRA, CERCLA, or any other Act, on any DoD installations within Guam or the CNMI be coordinated with the USFWS as early as possible, ideally six months prior to soliciting bids for contractors, to ensure that impacts to trust resources and their habitats are avoided, minimized, or offset. Commitment to early coordination, as described above, should be included within the final EIS Chapter 5 on Mitigation Measures.	The Navy has developed the Range Sustainability Environmental Program Assessment (RSEPA) to ensure long-term sustainability of its land ranges. RSEPA is a phased approach and starts with an assessment of a range for risk of an off-range release, followed with a verification or confirmation of an off-range release, and finally, oversight to ensure sustainability of the range while proceeding with CERCLA for the off-range release. The comment is noted regarding cleanup action for ranges that are no longer needed. All ranges in the MIRC as identified in the DEIS are

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			We also request that you provide us with the National Priorities List of sites on Andersen Air Force Base and other areas in the CNMI so that we can provide you with early guidance regarding avoidance, minimization, and compensatory mitigation.	needed to support required training for the Services. When and if ranges are no longer needed, the DoD will coordinate with the appropriate Federal and State agencies for cleanup actions. Information relating to NPL sites at Andersen AFB and the CNMI are available from the USEPA.
FED3-25	Air Quality	3.4	Neither this section nor any other section within the DEIS includes a discussion regarding training-related and arson-related wildfires on DoD lands associated with MIRC.	Arson-related wildfires were not addressed in the EIS. The Marianas Training Handbook provides for measures to preclude the occurrence of wildfires. In addition, live ordnance that could ignite will only be used on FDM and handled in accordance with Standard Operating Procedures in the Marianas Training Handbook. Impacts to habitat from wildfires are addressed in Section 3.11 (Terrestrial Resources). Integrated Natural Resources Management Plans (INRMP) have been developed and coordinated with the USFWS and include provisions for wildfire management. Live fire on small arms ranges that include simulated training devices (including pyrotechnics) have been actively used on Guam for over 10 years. The military range control system controls all activities that can produce wildfires on the range. The active fire control measures in place on all the ranges have resulted in no wildfires.
FED3-26	Airborne Noise	3.5	We recommend that for Seabirds and Shorebirds, Terrestrial Species and Habitats, and Sea Turtles, more detailed discussions of anticipated noise impacts be included in the EIS. Analysis should address noise from overflights (fixed wing and rotary) and use of munitions and ordnance. Please include a comparative analysis of monitoring data collecting before, during, and/or after previous training exercises within the MIRC in relation to type of noise and noise level produced. Ideally, this comparative analysis would be at the species level; however, species groups (seabirds, shorebirds, passerines, bats, turtles) would be acceptable. This type of analysis is needed to support the discussion regarding behavioral response and habituation to noise by trust resources within MIRC. If these data are not available, we recommend development of a conservation and mitigation measure to conduct a short-term study at multiple locations within the MIRC action area to provide conclusive data regarding impacts of noise from training.	A noise study was completed in 2008 to fill data gaps associated with wildlife response to aircraft noise at Andersen AFB and to facilitate to the adaptive management strategies in development at the base (SWCA 2008). For the Mariana crow: although no visible nests were observed, anecdotal observations of the last two remaining crows on Andersen AFB (both males) were made during aircraft overflights. On three occasions fighter aircraft passed close to the crows. On all occasions, fighter jets departed from either the north or south runway of Andersen Main and flew around the south side of the MSA. Although both crows were alert and aware of the noise, neither departed the nest site. No direct overflights or noise level data were recorded during these occasions (SWCA 2008, page 27). As for Mariana fruit bats, The study monitored various behaviors of individual bats during periods of no aircraft noise and periods of take-offs and landings, and flushing behaviors associated with the Pati Point Mariana fruit bat colony as a whole. No flushing of the entire Mariana fruit bat colony was observed during any aircraft overflight event (SWCA 2008, page 21). Flushing episodes associated with overflights were infrequent at less than 5 percent (on 228 occasions) but increased to 6 percent for overflights above 100 decibels (dB) (in the SWCA [2008] study, noise was measured in dB, or decibels referenced to the carrier). In all flushing events, noise levels remained above 75 dB for between 31 and 87

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				seconds. The majority of flush events involved less than three individuals at one time (SWCA 2008, page 21). On one occasion, 14 fruit bats simultaneously flew from their colony roost sites and circled the main colony and surrounding cliff line. Noise from the aircraft peaked at 121.1 dB and lasted almost 35 seconds (above 75 dBA), causing between 38 and 50 percent of the fruit bats to flush. Flushed individuals were in flight for a relatively short period, generally resettling between 7 and 10 minutes after first flight.
FED3-27	Airborne Noise	3.5	Table 3.5-2 is restricted to Public Sensitive Receptors and does not necessarily include habitats for trust resources. We recommend that EIS sections on Seabirds and Shorebirds, Terrestrial Species and Habitats, and Sea Turtles contain more detailed discussions of anticipated noise, including a table for likelihood and frequency of the operation to exceed 65 decibels DNL for each area that supports habitat for listed species for each operation. We recommend noise model maps depicting different noise contours be developed following Figure 3.5-3 and Figure 3.5-4 on pages 3.5-11 and 3.5-13, respectively.	No quantitative noise studies are available for seabirds and shorebirds, sea turtles, and terrestrial species other than the Mariana Fruit bat and crow in northern Guam as described in FED3-26 response.
FED3-28	Marine Communities	3.6	The text on Mangroves (Page 3.6-16) includes a description of the Puerto Rico Dump that implies the dump is still active. We recommend that it be made clear in the EIS that the dump has been capped and that waste is no longer being deposited into it.	Language revised to clarify the dump is capped and no longer receives waste.
FED3-29	Marine Communities	3.6	The discussion of artificial reefs is misleading because it implies that all materials that are not ships or Fish Aggregating Devices (FADs) were intentionally deposited into the marine environment to "enhance" resources or opportunities for recreation and fishing. It is our opinion that including artificial habitats in the affected environment section is misleading and not necessary. Therefore, we recommend that Section 3.6.2.5 on artificial habitats be removed from the EIS.	This information was provided as background information.
FED3-30	Marine Communities	3.6	The analysis of vessel movements in marine environment is incomplete	Discussion of amphibious landings added. Vessel movements are discussed in Section 3.14.
FED3-31	Marine Communities	3.6	We recommend all activities be included in the impact analysis (see specific and general comments above) prior to reaching any conclusions regarding significance of impacts anticipated from the proposed action.	An Essential Fish Habitat Assessment (see Appendix J) was prepared, which concludes that based on the limited extent, duration, and magnitude of potential impacts from MIRC training and testing, there are no anticipated adverse impact to ecosystem structure and function or critical ecosystem services relative to EFH or managed species. From an

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				ecosystem-based management perspective, range training activities are not anticipated to adversely contribute to cumulative impacts on present or future uses of the area because it doesn't include small crafts, LCACs, or AAVs.
FED3-32	Marine Communities	3.6	The DEIS does not discuss beach repairs or improvements, both of which have potential to adversely affect sea turtles by permanently altering habitat. The Navy has implemented and plans to continue applying "no wildlife disturbance" and "no training" areas for several beaches on Guam and Tinian; however, the DEIS does not include details on criteria that would be used to determine how such "off-limits" areas would be delineated and thresholds that would be used to trigger their implementation over time. The Navy surveys for coral cover, turbidity, fish assemblage, sedimentation rates, and site topography at Unai Chulu and Unai Babui and Unai Lamlam (as a control) to evaluate potential impacts from training; however, no comparative data are collected to evaluate sea turtle nesting rates or nesting success at beaches used for training versus a control site. We recommend proposed beach repairs and improvements be described in the EIS, along with clarification of whether beach re-nourishment will be needed (see also comments above related to repairs and improvements to existing facilities and beaches). Please include brief discussion demonstrating how "no wildlife disturbance" and "no training" areas are determined and modified from monthly monitoring data (i.e., what are the thresholds for making a determination?). Please add additional conservation/mitigation measure that evaluates potential impacts from training on the rate of sea turtle nesting (versus false crawls) and success of nesting (hatch rates) at beaches used for training and at a control site. Nesting beaches should be inspected on a daily basis beginning at 90 days prior to an amphibious landing or other training activity on beaches known to support nesting sea turtles to further avoid disturbance to active nests. Night training should be avoided around expected dates for nest hatches.	The EIS has been revised to discuss the beach training activities that are conducted in accordance with the guidance published in the Mariana Training Handbook (COMNAVMARIANAS Instruction 3500.4) and the mitigations described in Chapter 5 (Mitigation Measures). There is a requirement to use both Unai Chulu and Unai Dankulo to support training requirements for LCAC amphibious assaults. Their different sizes, terrain, and maritime characteristics provide varied amphibious beach capabilities to support LCAC landing and offload capability. Unai Chulu: Potentially supports small scale single craft LCAC wave tactical landings, as part of an amphibious raid or assault; limited by single LCAC landing in the assault wave, timed with high tide, with follow-on waves of administrative movements. Chulu may require minimal improvement for safe LCAC landing (some deepening, possibly some tree removal, and some leveling). Unai Chulu is accessible over a large range of tide and seas. Unai Dankulo: Potentially supports small scale multiple craft LCAC wave tactical landings, as part of an amphibious raid or assault; capable of two or three craft LCAC landing waves in the assault wave, timed with the high tide, with follow-on administrative movements. Dankulo may require some minimal improvement for safe LCAC landing (some deepening, possibly some tree removal, and some leveling). Dankulo beach is sufficiently deep and wide and has sufficient room for offload of assault wave serial onto the beach prior to assault movement off the beach. The coral wall in front of Dankulo suggests less availability due to prevailing seas and current. Prior to beach landings by amphibious vehicles, known sea turtle nesting beaches are surveyed by Navy biologists for the presence of sea turtle nests no more than six hours prior to a landing exercise. Areas free of nests are flagged, and vehicles are directed to remain within these areas. LCAC landings on Tinian are scheduled for high-tide. LCACs stay on-cushion until clear of the water and within a designated Craft Landing Zone (CLZ). Within the CLZ, LCAC come off-cushion with the LCAC oriented to permit expeditious vehicle and cargo offload onto a cleared offload and vehicle traffic area. Although LCAC and expeditionary vehicle traffic typically do not leave ruts, some compaction of sand in vehicle tracks is possible. If restoration of beach topography is required it is conducted

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				using non-mechanized methods. On Tinian, pre- and post exercise surveys for sea turtles are conducted after each LCAC and AAV landing exercise, along with semiannual surveys at Unai Chulu and Unai Babui. Surveys also are conducted semiannually at Unai Lamlam to serve as a control site for baseline sea turtle activity where no landings occur. Semiannual surveys measure percent coral cover, turbidity, fish assemblage, sedimentation rates, and site topography.
FED3-33	Sea Turtles	3.8	The DEIS says that Unai Chulu will "require beach repairs prior to use" and that Unai Babui will be "capable of supporting AA V landings with improvements." Repairs and improvements are not described and assessment of potential impacts of these modifications cannot be made. We recommend a complete description of these modifications be included and their potential impacts on Federal trust resources be analyzed in the EIS.	See response to FED3-32.
FED3-34	Sea Turtles	3.8	More current information on the marine environment fronting Unai Dankulo, Unai Chulu, and Unai Babui is available. In cooperation with numerous Federal and commonwealth partners, the USFWS completed surveys of coral reefs fronting these Tinian Beaches. This report is available from Naval Facilities Engineering Command Pacific (Ms. Vanessa Pepi). We recommend results of this work be reviewed and incorporated into description of the affected environment as appropriate.	Information has been reviewed and incorporated into the EIS.
FED3-35	Sea Turtles	3.8	A wide reef flat, one of the widest on Tinian, fronts Unai Dankulo. It is significantly wider than reef flats at Unai Chulu and Unai Babui. The description of the reef flat at Unai Dankulo contained in the DEIS is somewhat misleading, and we recommend the description be reworded to clearly state that this reef flat is significantly wider than reef flats at Unai Chulu and Unai Babui.	Description of the reef flat has been clarified.
FED3-36	Seabirds & Shorebirds	3.10	The section does not include a detailed noise/percussive force analysis for overflights and weapons use. The chapter also does not describe potential impacts from habitat loss due to fire, particularly for birds on FDM. Additionally, Table 3.10-2 Seabirds and shorebirds within the MIRC study area does not include species on Saipan that may be using areas near the commercial port, Garapan, or the Marpi area. There are missing data within this table and chapter. The chapter also discusses the ingestion of expended materials. To address these concerns, we recommend a list of clarifications,	- FDM is the only location within the MIRC where training specific activities could cause wildland fires (through explosive ordnance use). Mitigations are provided in Chapter 5 to address wildland fires. - The Navy implements training standard operating procedures and mitigation measures at Hagoi on Tinian and Fena Reservoir (on Guam) to avoid, minimize, or offset potential impacts of training activities. Conservation measures have been added to Section 3.10.5. Specifically for Lake Hagoi, the wetland is designated as a "No Training Area" with on the ground training restrictions and restrictions on aerial training (e.g. flight restrictions). Although seabirds are not generally associated with Hagoi, this training measure avoids impacts to shorebirds/waterbirds that may utilize

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			inclusions and removals.	the emergent wetland. - Fena reservoir also has training restrictions described in the added Section 3.10.5. Fire bucket training and insertion/extraction occurs only near the spillway. The shallower portions of the reservoir including areas with emergent screening vegetation do not have this kind of training. Except at designated landing and drop zones, the Navy prohibits flights over the Naval Munitions Site below 1,000 feet AGL for fixed wing aircraft and 500 feet AGL for helicopters. No maneuver and navigation training occurs in areas with known Mariana common moorhen nesting activity. In addition there will be no clearing of vegetation during training events. Fire bucket training, which occurs near the spillway at Fena Reservoir, continues to follow the BO, "95I0012 Fire Bucket Training" of February 16, 1995. These avoidance measures are designed to not interfere with Mariana common moorhen recovery efforts or interfere with migratory bird use of Fena Reservoir. - Newell's shearwater has been added to the ESA discussion under Section 3.10.4. - A copy of the MISTCS cruise report was provided to USFWS Pacific Islands Field Office by NAVFACPAC personnel. A figure has been added to Section 3.10 (Figure 3.10-1) that shows the track lines of the survey, and on the side of the figure is a list of species sited per leg. Although this is not exact location data, the distribution of different bird species is shown on the figure along with the calendar dates of each leg. Further, Table 3.10-3 lists each species observed on the survey, which includes 814 individual observations of 40 species in nine families of seabirds (and shorebirds observed at sea). - Guam rail and other Rallidae have been removed from the table. - The Navy at this time will not add an additional watchstander to mitigate impacts to seabirds. Part of Navy watchstander procedures require the watchstander to report concentrations of seabirds to the officer of the deck who will take appropriate action. - Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding

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				chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
FED3-37	Terrestrial	3.11	This chapter includes information regarding the ESA and listed, candidate, and delisted species and critical habitat. We recommend information be incorporated into the EIS. We recommend revision of Table 3.11-4 (Threatened and Endangered Species within the MIRC Study Area) to indicate on which islands each species occur; include listed seabirds and sea turtles as well or reference the relevant chapters. We recommend inclusion of a map and a status update related to the out-planted *Serianthes nelsonii* trees. We recommend revising the species account for the nightingale reed-warbler to reflect new survey data, use of tangantangan habitat by the species, extirpation of the species on Guam and Pagan, and threats to the species from urban development. We recommend updating the Mariana swiftlet species account to include population estimates from other islands, including Saipan. We recommend inclusion of a discussion of the Guam National Wildlife Refuge Overlay and essential habitat for the Mariana crow, Guam Micronesian kingfisher, and Mariana fruit bat. We recommend the Navy provide your quarterly survey data for Mariana common moorhen at Fena Reservoir on Guam and Lake Hagoi on Tinian to the Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii, including a description of the buffer zone, in terms of area protected, overflights, Surface Danger Zones, etc. for Hagoi. If the buffer zone is inadequate, Mariana common moorhen may be adversely affected by training. We recommend most recent survey data collected for the Joint Guam Program Office project for butterflies and treesnails be included in the EIS along with information that ungulates and rats are likely threats to treesnails in the Mariana Islands as they are in Hawaii. We recommend you outplant host plants for the Mariana eight-spot butterfly within ungulate exclosures that will be built on Andersen AFB. We recommend inclusion of a conservation and mitigation measure to improve moorhen habitat at Fena Reservoir, Agana Marsh, and Naval	- The discussion of various stressors has been updated with language vetted through the Section 7 ESA consultation process, which includes fire, percussive force, and noise. - No clearing of habitat is associated with MIRC training; however, there are conservation measures that are linked to training activities designed to minimize or avoid habitat degradation. These measures are included in the updated conservation measure discussion in Section 3.11 and Chapter 5 mitigation, which include adherence to DoD Instruction 5090.7 (self-inspection provisions), establishing no training areas, fire management on Navy lands, standard procedures for fire prevention (use cigarette traps). - Maps and tables have been updated. - Marpi Maneuver Area has been identified since the publication of the DEIS, and there is no training in habitat areas and non-developed areas of Rota. - Discussion has been updated with language developed during the Section 7 ESA consultation. Basking does not occur within the CNMI or Guam due to exposure to poaching. - See Andersen AFB INRMP update for outplanting updates. - For specific conservation measures, please see the conservation measure discussion in Section 3.11 and Chapter 5.

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			Station Marsh on Guam, and at Lake Hagoi on Tinian to increase the abundance of moorhen in these areas.	
FED3-38	Terrestrial	3.11	We suggest that Table 3.11-1 indicate which activities pose risk of invasive species introduction.	See responses to FED1-2 and FED3-19.
FED3-39	Terrestrial	3.11	Ground and canopy disturbance caused by explosive ordnance and munitions can create conditions conducive to establishment of invasive plants and subsequent alteration of native forest. We recommend the EIS address this impact and describe measures to prevent it.	See responses to FED1-2 and FED3-19.
FED3-40	Terrestrial	3.11	Ground disturbance caused by land-based training can assist in creating conditions conducive to establishment of invasive plants and subsequent alteration of native forest. We recommend the EIS address this impact and describe measures to prevent it. In particular, efforts to prevent dispersal of invasive species need to be discussed.	See responses to FED1-2 and FED3-19.
FED3-41	Terrestrial	3.11	Increased training activities near areas where endangered *Serianthes nelsonii* is extant, or could potentially grow, are of particular concern from an invasive species perspective. We recommend the EIS describe efforts associated with training activities that will be taken to prevent introduction of invasive plants that could compete with S. *nelsonii* seedlings. Similarly, we recommend the EIS describe efforts to prevent creation of additional trails associated with training that could facilitate additional ungulate access.	No training associated with the MIRC will occur close to the last mature *S. nelsonii* (Ritidian Point, upper plateau), and no training occurs within the karst limestone primary forests of the Tarague Basin. The Section 7 ESA consultation, consistent with the ISR/Strike Section 7 ESA consultation and the Northwest Field Beddown Section 7 ESA consultation, training did not affect *S. nelsonii*. Management for this tree species is addressed within the Andersen AFB INRMP update, and will be addressed in the Joint Region INRMP.
FED3-42	Terrestrial	3.11	We appreciate the Conservation Measures discussed in this section. We recommend the EIS also include Conservation Measures to minimize introduction of plant, invertebrate and microbial invasive species through disturbance and transport during training exercises. Section 6.2.4 (pages 6 - 23-24) provides a preliminary summary of efforts that could be implemented to reduce invasive plant introductions.	See response to FED1-2.
FED3-43	Terrestrial	3.11	We recommend the EIS be more specific about Brown Treesnake Conservation Measures. Further detail related to implementation of measures should be discussed in the MIRC Biological Opinion.	The brown treesnake measures were updated during the Section 7 ESA consultation between the Navy and the USFWS. Please see response to FED1-2.
FED3-44	Terrestrial	3.11	We appreciate the Navy proposing to support rapid response efforts related to brown tree snake sightings associated with MIRC activities within the CNMI and Hawaii. We recommend the Navy provide additional information on type and level of support for rapid response	Rapid response measures were agreed to as part of the Section 7 ESA consultation between the Navy and the USFWS Pacific Islands Field Office. The following text was added to the FEIS: "The Navy will support rapid response actions to brown treesnake sighting within the CNMI and

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			(e.g., numbers and type of personnel, amount of funding etc.).	locations outside of the MIRC, specifically Hawaii by developing procedures and protocols that will support rapid action for a brown treesnake sighting. For example, Navy personnel (civilian and uniform) could be trained to augment response teams on Guam and Hawaii or by retaining an agreement with local pest control contractors." Other brown treesnake measures were updated during the Section 7 ESA consultation between the Navy and the USFWS. Please see response to FED1-2.
FED3-45	Terrestrial	3.11	We appreciate that the Navy proposes to fund an additional project within the BTS Control Plan. We recommend the Navy provide additional information on type and level of support proposed.	The conservation measures included in Section 3.11 and Chapter 5 were updated as per the Section 7 ESA consultation between the Navy and the USFWS Pacific Islands Field Office.
FED3-46	Terrestrial	3.11	We appreciate that the Navy proposes to provide BTS awareness training for all personnel involved in training activities. We recommend the Navy provide addition information on specific type(s) of training.	See the response to FED1-2.
FED3-47	Terrestrial	3.11	We appreciate that the Navy is considering rat eradication on FDM as a potential conservation measure. The description of this measure suggests that rat eradication "is possible" but does not state if the Navy is committed to implementing this conservation measure. We recommend the Navy clearly state its intention for this activity.	The conservation measures were updated during the Section 7 ESA consultation between the Navy and USFWS Pacific Islands Field Office. For rat eradication, the Navy will fund this activity on FDM. Specific technical information will be included in the Joint Region INRMP with the Navy's Sikes Act partners.
FED3-48	Terrestrial	3.11	Training near Mariana swiftlet caves and wetland areas has potential to impact listed species. Therefore, we recommend the EIS describe size, location and adequacy of "already identified buffers" around these sites. We recommend that this additional information be provided in the text or shown in Figure 3.11-12.	As requested by USFWS Pacific Islands Field Office, locations of swiftlet caves on Guam are not shown.
FED3-49	Terrestrial	3.11	Alternative 2 - All Stressors. The increased use of explosive ordinance and ground-based training activities described in the EIS poses increased risks of invasive species introductions and establishment. We recommend analysis of Alternative 2 address these issues.	The conservation measures were updated during the Section 7 ESA consultation between the Navy and USFWS Pacific Islands Field Office.
FED3-50	Terrestrial	3.11	The training activities described in this table increase likelihood of habitat disturbance and invasive species movement and establishment. We recommend the table reflect this issue.	This table has been updated.
FED3-51	Terrestrial	3.11	We appreciate that the Navy is currently supporting eradication of ungulates on the island of Anatahan. We recommend the EIS include completion of ungulate eradication on Anatahan as a conservation action.	Ungulate management activities on Anatahan were not included as a measure for this consultation because the mitigative actions were associated with potential impacts of the proposed training activities. However, future Anatahan ungulate management may be conducted as part of other Navy efforts not associated with MIRC training.

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FED3-52	Mitigation Measures	Ch 5	We appreciate that the Navy has implemented and continues to propose conservation and mitigation measures throughout the DEIS. We commend the Navy for adding new conservation measures to protect terrestrial species and their habitats. Throughout this letter we have suggested additional conservation and mitigation measures to further reduce impacts to trust resources. We recommend you incorporate our conservation and mitigation measures suggested within this letter into appropriate chapters and chapter 5 to further limit impacts to Federal trust resources. We recommend the brown tree snake conservation measures include interdiction for all training activities.	Additional conservation measures have been incorporated into the EIS/OEIS, through the Section 7 ESA consultation process. Section 3.11 and Chapter 5 of the EIS/OEIS has complete descriptions of these measures to offset potential adverse effects of the Action Alternatives.
FED3-53	Mitigation Measures	Ch 5	Measures Proposed to Reduce, Avoid, or Minimize Adverse Effects Associated with the Proposed Increase in Training Activities. Please refer to comments regarding Conservation Measures in Section 3.11.3.2.2	The conservation measures were updated during the Section 7 ESA consultation between the Navy and USFWS Pacific Islands Field Office.
FED3-54	Seabirds & Shorebirds	Ch 7	This chapter did not include references for the Seabird and Shorebird chapter, nor the Terrestrial Species and Habitats chapter. We recommend you include these references in your final EIS. We further recommend that you provide us with an electronic copy of all references cited, particularly gray literature, survey reports, and personal communications within Seabird and Shorebird, Terrestrial Species and Habitats, and Sea Turtles chapters. Your cooperation for future documents will also enable us to expedite portions of our review, commentary, and regulatory follow up (i.e., section 7 consultations).	References have been included in Chapter 7. See response to FED3-45.
FED3-55	Cumulative Impacts	Ch 6	We recommend the EIS consider (1) how climate change may affect proposed training activities (e.g., alteration in training activity due to extended period of drought), (2) how the influence of climate change may affect impacts of training activities (e.g., reduction in rainfall may increase wildfire occurrence on live-fire ranges), (3) how these changes in potential impacts may affect fish and wildlife resources, and (4) proposed measures to monitor the effects of climate change and to make near-term adaptive changes to training activities accordingly in order to minimize adverse impacts to fish and wildlife resources.	It is not currently feasible to quantify the direct and indirect effects of global climate change on training facilities. Likewise, currently it is not possible to quantify how climate change may affect impacts of training activities. This is especially true given the limited planning horizon of this EIS and the long-term nature of any global warming affects. Greenhouse gas emissions discussions have been added to Section 3.4 (Air Quality) and Chapter 6 (Cumulative Effects).
FED3-56	Cumulative Impacts	Ch 6	The DEIS restricts the impact analysis to only activities in the proposed alternatives and does not provide a full cumulative effects analysis, other than noting that impacts of certain developments within geographic areas would (a) be additive, (b) be beneficial, and (c) affect terrestrial or marine resources (see Table 6-1). Noted additive impacts and stressors to Federal trust species and habitat should be addressed in aggregate, and we recommend that a cumulative impacts	Table 6-1 provides an aggregate analysis of each resource area.

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			assessment incorporating such effects be included in the EIS.	
FED4-1	Proposed Action Land Use	All Ch 2 3.12	The DEIS does not provide any information on the impact of a permanent 10 nm closure around FDM, and based on our understanding of the importance of FDM to current and future CNMI fishery participants, the Council does not support a permanent 10 nm closure around FDM. The FEIS should provide the impact of such a closure, and if such a closure was implemented, the U.S. Navy should mitigate the current and future impact to CNMI fishermen by funding Fish Aggregation Devices around Saipan or other areas to make up for the loss of fishing area that a 10 nm permanent closure around FDM would produce.	The proposed Surface Danger Zone is required due to operational needs that will be communicated to the public through additional methods listed below. FDM constitutes the most important bombing range in the Western Pacific. As new air-to-surface weapons technologies enter military service, they must be exercised and military personnel must train to use them. These new technologies require ever greater airspace to accommodate air-to-surface employment parameters. The greater airspace in turn requires larger surface footprints under the airspace to ensure safety on the ground and sea surface. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex.
FED4-2	Regional Economy Recreation	3.16 3.17	The FEIS should include accurate information on the number of part-commercial fishermen in CNMI and Guam and analyze the impacts of the alternatives on those fishermen.	The FEIS provides the only data available on the number of fisherman. There is no data available to quantify the differences in the impacts of the alternatives on fisherman. Given that the proposed training activities in the No Action Alternative, Alternative 1 and Alternative 2 involved established range and training activities, it is unlikely that recreational or subsistence fishing would be impacted. Given the size of the training area and the limited number of registered commercial fishing vessels, it is unlikely that the commercial fishing industry (either registered or non-registered) would be impacted as it is unlikely that implementation of the No Action Alternative, Alternative 1, or Alternative 2 would change or result in an impact to commercial fishing.
FED4-3	Fish	3.9	Section 3.9 of the DEIS identifies the direct and indirect impacts of the alternatives on fish and Essential Fish Habitat (EFH). The analysis generally concludes that the alternatives will only have short-term or localized impacts and no long-term significant impacts on fish or EFH. Similar conclusions are made about sea turtles, sea birds, and marine mammals in subsequent sections of the document. When appropriate, the cumulative impacts analysis in the FEIS should provide quantitative assessment and comprehensive discussion of cumulative impacts of MIRC activities over the course of the next 5-10 years or longer.	See response to FED3-31. Chapter 6, Cumulative Impacts provides an extensive discussion of the assessment of cumulative impacts (or cumulative effects) which was made using an ecosystem management approach and follows the objectives of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Identifiable present effects of past actions are analyzed, to the extent they may be additive to impacts of the Proposed Action. In general, the Navy need not list or analyze the effect of individual past actions; cumulative impacts analysis appropriately focuses on aggregate effects of past actions. Reasonably foreseeable future actions that may have impacts additive to the effects of the Proposed Action also are to be analyzed. Various types of reasonably foreseeable future actions that are relevant to the Proposed

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				Action have the potential to affect the resources identified in Chapter 3. Table 6-1 is an overview of these actions that emphasizes components of the activities that are relevant to the effects analysis in Chapter 3. Additionally, projects in the planning phase were considered, including reasonably foreseeable (rather than speculative) actions that have the potential to interact with the proposed Navy action. Geographic distribution, intensity, duration, and the historical effects of similar activities are considered when determining whether a particular activity may contribute cumulatively and significantly to the effect identified in Chapter 3.
FED4-4	Regional Economy Recreation	3.16 3.17	The DEIS does not address inshore and offshore seasonal fishing patterns and how carrying out training activities may impact such seasonal fishing.	The FEIS has been revised to include available data.
FED4-5	Proposed Action Land Use	Ch 2 3.12	The DEIS must address the impact the proposed 10 nm closure around FDM would have on CNMI's supply of fresh fish. The council does not support a permanent 10 nm closure around FDM as it would significantly reduce community access to a culturally important resource as well as reduce the supply of locally-caught fresh fish.	See response to FED4-1.
FED4-6	Community Involvement	Ch 5	The DEIS does not address the issue of community consultation and potential for community participation in the management of the MIRC. The combined effect of the recently established Marine National Monuments in the CNMI and the proposed expanded scope of the MIRC results in a significant percentage of land and ocean under control by the federal government. The U.S. Navy should consider establishing a community advisory committee that would advise the Navy on community issues associated with the ongoing operation of the MIRC.	Chapter 5 has further been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex.
FED5-1	Proposed Action	Ch 2	The MMC recommends that the Navy revise its DEIS by providing a comprehensive description of past activity levels in the Mariana Islands Range Complex so that the reader can judge whether the activity types and levels proposed under the no-action alternative are, indeed, consistent with past practices.	Levels of current activities were determined by a number of means including the use of 1999 EIS; draft Range Complex Management Plan for the Marianas, and the Valiant Shield EAs/OEAs, interviews of range operators, and logistics data in order to best establish historic training levels. These data are reflected in tables in Chapter 2 and further description in appendix D.
FED5-2	Proposed Action	Ch 2	The MMC recommends that the Navy revise its DEIS by incorporating a set of explicit and clear metrics that the Navy, the public, and decision-makers can use to make informed judgments about various levels of readiness based on their benefits and costs.	Section 1.2.1 of the EIS discusses the requirements set forth in Title 10 U.S.C., Section 5062 that direct the Chief of Naval Operations to train all naval forces for combat. The operations described in Chapter 2 are essential to meet these requirements.
FED5-3	Proposed	Ch 2	The MMC recommends that the Navy revise its DEIS to include an alternative involving a reduction in activity types and levels to ensure	The statement of the purpose and need for the agency action appropriately defines the range of alternatives to be addressed in an EIS. In identifying

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	Action		that decision-makers are fully informed and presented with a full range of alternatives.	the purpose and need for a major federal action, the agency must consider the goals of Congress, such as those expressed in the agency's statutory authorization to act. With regard to the MIRC, the purpose and need for the agency action is clearly defined in the DEIS. Alternatives to be evaluated should be those that reasonably satisfy the specific purpose and need for the agency action. The DEIS appropriately limits its analysis to reasonable alternatives that meet the purpose and need of the action.
FED5-4	Proposed Action	Ch 2	The MMC recommends that the Navy revise its DEIS by limiting its scope to those proposed activities that can be described in sufficient detail to provide a reliable basis for assessing benefits and costs.	The Navy utilized best available science to conduct the analysis contained in the DEIS. The activities presented in the EIS provide enough details to assess environmental effects. Refer to Appendix D for additional activity information.
FED5-5	Proposed Action	Ch 2	The MMC recommends that the Navy subject its reviews of marine mammal density, distribution, behavior, and habitat use to scientific peer review.	The marine mammal density estimates were developed by contractors and researchers external to the Navy. The surveys were conducted using the same protocols as those developed by the NMFS-Southwest Fisheries Science Center. All of the observers involved in this survey had previously been contracted for NMFS-SWFSC surveys. Three abstracts were prepared and accepted for the 2007 17th Bienniel Conference of the Biology of Marine Mammals. A publication detailing the methods and results is currently being prepared for submission to a peer review journal. The Navy Marine Resource Assessment (MRA) for the MIRC is available to the public at: http://www.marianasrangecomplexeis.com/OtherResources.aspx
FED5-6	Mitigation Measures	Ch 5	The MMC recommends that the Navy develops and implements a plan to evaluate the effectiveness of monitoring and mitigation measures before beginning, or in conjunction with, operations under the final environment impact statement and anticipated issuance by the National Marine Fisheries Service of an incidental harassment authorization.	Chapter 5 of the EIS has been revised to include a Range Monitoring Plan, reporting requirements, and adaptive management. Range specific monitoring plans will also be included in the Final Rule and posted via the NOAA web site. Some components of the monitoring and mitigation plan are being implemented and the Navy is continuing to develop other components of the monitoring and mitigation plans in cooperation with NMFS. Monitoring and mitigation will be used both as: 1) a planning tool to focus Navy monitoring priorities (pursuant to ESA/MMPA requirements) across Navy Range Complexes and Exercises; and 2) an adaptive management tool, through the consolidation and analysis of the Navy's monitoring and watchstander (lookout) data, as well as new information from other Navy programs (e.g., research and development), and newly published non-Navy information.
FED6-1	Proposed Action	Ch 2 Ch 3	We have concerns regarding potential impacts to coral reef ecosystems, water quality and the threatened green sea turtle. The impact assessment approach does not fully assess all impacts and the	The EIS/OEIS is a programmatic review of military training requirements within the geographical Study Area of the MIRC; it is not a site specific analysis of actions on particular areas.

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	All Resources		DEIS frequently concludes that project impacts will not be significant without substantiating these conclusions. The impact assessment approach focused on identifying impacts from individual activities that occur at multiple training locations; however, the impact assessment did not fully consider stressors resulting from multiple training activities occurring at the same location. The DEIS does not sufficiently distinguish among the impacts of the alternatives, nor does it consider the cumulative impacts to resources from the training and other action that will occur as part of the planned expansion of U.S. military facilities and relocation of U.S. military personnel to Guam and CNMI A geography-based or training site-specific approach would improve the impact assessment, and could reveal significant impacts to resources at some potential training location.	As a programmatic document we look at the training that occurs at the multiple training venues including consideration of multiple training activities in the same location and the same activities in multiple locations. See tables 2-8 and 6-1. Chapter 3 provides analysis of impacts for affected environmental resources for the proposed project and project alternatives. Cumulative impacts are addressed in Chapter 6. Mitigation measures are addressed in Chapter 5.
FED6-2	Mitigation Measures	Ch 5	We also recommend an alternative be evaluated with additional mitigation measures. For example, we suggest a mitigated alternative that avoids, to the greatest extent possible, training activities in the Marianas Trench Marine National Monument, an area recognized for its biological and scientific importance.	The Armed Forces and the USCG are not subject to prohibitions required by the Presidential Proclamation establishing the Monument. The Armed Forces shall ensure that its vessels and aircraft act in a manner consistent with the Proclamation. Nothing in the Proclamation and implementing regulation limits or otherwise affects the Armed Forces' discretion to use Monument property for military mission purposes. The EIS process includes consultations and discussions with the FWS, NMFS, and others to establish mitigation measures that protect species. Such consultations and discussions resolve and seek to reduce any potential adverse effects. Chapter 5 of the EIS contains discussion of alternative mitigation measures considered but eliminated. Although that section does not include discussion of the Mariana's Trench Marine National Monument, Section 3.6.2.6 addresses the newly designated Mariana Trench Marine National Monument. It is specifically noted in that section that the events described under the Proposed Action can take place within the Monument. Additionally, the Presidential Proclamation affirmed that the prohibitions included in the Proclamation shall not apply to the activities and exercises of the Armed Forces. The extensive mitigation measures followed during activities and exercises of the Armed Forces within the Monument ensure that the activities are consistent so far as is reasonable and practicable with the Proclamation.
FED6-3	Proposed Action	Ch 2 Ch 3	EPA is concerned that the impacts from the proposed action are not properly disclosed in the DEIS; conclusions of insignificance are not substantiated; and the lack of knowledge regarding resource impacts is	The Navy utilized best available science to conduct the analysis contained in the DEIS. The activities presented in the EIS provide enough details to

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	All Resources		presented as indicative of no impact. These trends are evident throughout the document, and suggest that impacts may have been underestimated.	assess environmental effects.
FED6-4	Proposed Action	Ch 2	The comparison of alternatives does not meaningfully express the differences in impacts. Tables presented at the end of each impact section simply state that impacts of Alternative 1 and 2 would be "more", "slightly more", or "similar to" the no action alternative in some cases indicating that the impacts would be the same as the no action alternative, despite additional stressors acknowledged in the document. This falls short of the CEQ direction in 40 CFR 1502.14 that the analysis "should present the environmental impacts or the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public". Specific examples: <u>Soil impacts</u>. The DEIS well documents the substantial erosion that is occurring on FDM and acknowledges that bombing is contributing to this impact. It states that most of the existing training location have soil conditions that are degraded from ongoing military use (p. 3.1-23), and that many years of live fire training at the Tarague Beach small arms range has resulted in "severely degraded" geological resources (p.3.1-22). The DEIS concludes that surface soil changes would be minimal (p. ES-16) and that impacts to geological resources would not be significant (p. e.1-23) despite the impact assessment criteria that impacts would be significant if the action had the potential to increase erosion by training activities (p. 3.1-1). <u>Water quality impacts</u>. The DEIS acknowledges unavoidable effects on ocean and surface water quality, including the introduction of hazardous materials from munitions, the contamination of surface drainage areas from runoff, siltation and sediment plumes, and disruption of sediments with above-average loads of organic materials and toxic metals offshore of training locations (p.3.3-24), yet concludes that *no* short-term impacts or long-term impacts to water resources would occur (p. ES-17). <u>Sonar impacts on fish.</u> The DEIS acknowledges that data regarding sonar impacts on fish is "exceedingly limited" (p. 3.9-54), documents a study that showed a statistically significant post-exposure mortality of 20-30%, notes that the problem with the assessment is that there are so many differences in the studies, including species, precise sound source, and spectrum of the sound, that it *is hard to even speculate*	Analysis based on CEQ context and intensity definitions in 40 CFR 1508.27 did not indicate an increased significance of impact.…. (a) Context. The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. (b) Intensity. The severity of impact. The EIS considered and analyzes the best available scientific data. Monthly surveys at FDM have shown that increased erosion is the result of natural causes; storm and wave erosion. Operational changes on FDM, as described in Chapter 2, including reduction of live fire targeting area has reduced the potential for any erosion caused by military activities. Live fire impact area has been reduced from over 100 acres to less than 35 acres, a reduction of approximately two thirds. The discussion in Subchapter 3.1.3.2 for Alternatives 1 and 2 have been revised. With regards to geological resources at Tarague Beach Small Arms Range, information in the EIS indicates degradation due to human activity and does not indicate that it is due to its use as a small arms range. Lead is the only munitions constituent of concern deposited on land ranges (FDM and the EOD pit). These land ranges are monitored under the Navy's RSEPA program and the USEPA Munitions Rule. Only small quantities of munitions constituents are deposited in the ocean and dispersed over large areas. There has been no indication of any munitions contamination. The Navy is continuing to work with NMFS on sonar issues. Section 3.9 provides known data on sonar impacts on fish. Hearing capability data only exist for fewer than 100 of the 29,000 fish species. As such, it has been necessary to extrapolate data from species with known hearing ranges. The Navy continues to fund marine research and use the best available research as it becomes available.

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			(p.3l9-45) as to impacts, yet concluded that *no impacts* on fish are anticipated from sonar use (p.ES-23). Impacts from noise. The DEIS concludes that no sensitive receptors (residential land uses, schools, libraries, hospitals and churches) are likely to be exposed to sound by sound-generating training events (p.3.5-25) and that the impacts for the preferred Alternative 1 are the same as the no action alternative (p.3.5-25, ES-17). This conclusion appears to be unsubstantiated, given that implementation of Alternative 1 would result in ISR/Strike aircraft events out of Andersen Air Force Base increasing by 45% over the current level (p. ES-11). The DEIS identifies an expanded noise contour showing a larger amount of off-base are impacted above 65 DNL and a much larger area greater than 60 DNL. EPA recommends a DNL below 55 for outdoor noise levels. *Recommendation*: EPA recommends the impact analysis be training site-specific to facilitate more realistic and defensible impact conclusions. The Final EIS should attempt to discriminate among the impacts of the alternatives to a greater extent. For example, the FEIS could differentiate the degree to which erosion processes would be accelerated by each alternative, or the net deposition rate of training materials, etc. across the alternatives.	Sonar may cause some temporary behavioral impacts to some fish species due to their hearing sensitivity, but those impacts would be temporary and infrequent as a sonar ship operating mid-frequency sonar transits in an area (Section 3.9). Environmental impacts associated with ISR/Strike have been analyzed in the 2006 Establishment and Operation of an Intelligence, Surveillance and Reconnaissance Strike, Andersen Air Force Base, EIS (USAF 2006) and have identified that while a larger subset of the public would be exposed to DNLs higher than 65 dBA under Alternative A, these individuals would not experience hearing loss because they would not be exposed to DNL equal to or greater than 75 dBA for 40 years of exposure at 16 hours per day, the level at which hearing loss could occur (Section 4.1.1.1). Additionally, the ISR/Strike EIS reported that noise from aircraft overflights would affect Mariana fruit bat and Mariana crow recovery efforts, as well as current populations. The MIRC EIS reiterates this information (Section 3.5.3.3) and indicates that sound generating events do not expose a substantial number of human receptors to high noise levels. Very few sensitive receptors are likely to be exposed to sound from such military activities.
FED6-5	Mitigation Measures	Ch 5	Mitigation measures are not well defined in the DEIS. There are references to protective measures, but specific actions are rarely identified, and when they are, no discussion of the effectiveness of mitigation generally occurs. It is important that mitigation measures be discussed, especially if they are the basis for concluding that impacts will not be significant or not occur at all. Results of monitoring of training impacts would also be helpful to include in mitigation discussions. *Recommendation*: EPA recommends including in the FEIS a section in each resource chapter that identifies mitigation measures and discusses their effectiveness and likelihood of implementation. Monitoring efforts should be included. Information should also be provided regarding how destruction, loss, or injury from DoD activities will be monitored in the Marianas Trench Marine National Monument per the requirement in the Presidential Proclamation that requires coordination with the Department of Interior or Commerce, and mitigation/restoration (p. 3.6-20).	Ch 5 was updated with information that was developed under ESA consultation (marine and terrestrial) and the following information. Monitoring is part of the consultation process. Monitoring that is currently on-going is anticipated to continue; monitoring at FDM (monthly changing to quarterly), quarterly monitoring of beaches and forested areas at Tinian, frequent monitoring at Guam under the INRMPs and monitoring before and after training events. For National Monument clarification see response to FED6-2.
FED6-6	Marine	3.6	The DEIS evaluates impacts to marine communities, including coral communities and reefs (section 3.6); however the evaluation is	See response to FED3-32.

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	Communities		insufficient for the following reasons: - *Coral resources were not fully identified*. - *Impacts to coral reefs from amphibious vehicles, especially Landing Craft Air Cushion (LCAC) vehicles, were not discussed*. *Indirect impacts from sedimentation were not fully discussed.* - *Cumulative impacts from the dredging expected for the new CVN berth as part of the Guam military build-up were not considered.* *Recommendation*: EPA recommends improvements to the impact assessment for marine communities, including coral communities and reefs per the comments above. All indirect and cumulative impacts should be identified and assessed. Mitigation measures to avoid impacts should be discussed, and we recommend their inclusion in the proposed action. For scheduled events, we recommend the Navy avoid training activities that result in sediment disturbance during coral spawning periods. The DEIS states in the fish impacts chapter that "Navy mitigation measures include avoidance of areas of high productivity, discussed in Section 3.6, where some fish species tend to concentrate, further reducing the probability of habitat disturbance and injury or mortality" (p. 3.9-59). There is no mention of this mitigation in Section 3.6 or elsewhere in the DEIS; however, we strongly support this mitigation. Please clarify this mitigation measure. Avoid LCAC and amphibious training on Dankulo Beach. We recommend that the Navy amend the proposed action such that Unai Bankulo (Long Beach) is not utilized for amphibious landing activities, especially LCAC landings. The DEIS states that only Unai Chulu have been used for LCAC training (p. 3.11-27), but the preferred Alternative 1 proposes to increase amphibious landing activities and over the beach training by 6 annual training events and repeatedly notes that Unai Dankulo has the capability to support LCAC landings with craft landing zone and beach improvements (p.2-8). The DEIS states that Navy mitigation measures include avoidance of areas of high productivity (p. 3.9-59). The DEIS identifies the region surrounding Tinian as showing elevated primary production (p. 3.6-10). Finally, since Unai Dankulo is a known nesting location for the threatened green sea turtle (p. 3.8-25), and is one of the beaches most often utilized by the turtles (p. 3.8-16), avoiding use of this beach	Coral reef resources are identified and analyzed in the 3.6 Marine Communities, and in the Essential Fish Habitat Assessment Appendix J.

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			would also provide better protection for this species, more so than would the implementation of protective measures. Green sea turtle populations, including those within the MIRC, are in serious decline throughout the Pacific Ocean (p. 3.8-15). *Recommendation*: Confine amphibious landings to a minimum number of beaches previously used for these landings, and avoid training and beach improvements on Unai Dankulo (Long Beach).	
FED6-7	Hazardous Materials	3.2	*Recommendation*: the Navy should conduct the necessary monitoring to substantiate the assumptions being made regarding the lack of impacts from munitions releases into the ocean environment and from FDM as a source of munitions contaminants. In the FEIS, clarify the manner in which the proposed action will comply with the Clean Water Act and other laws or regulations adopted to protect or manage the water resource system. Identify the type (s) of permits that regulate the release of water pollutants associated with Navy training activities into the ocean.	Munitions constituents released to the environment are but a fraction of the original amount contained in ordnance following their use as a result of a high level of combustion efficiency. Therefore, resulting concentrations in marine waters would be extremely low. Estimates of concentrations for select munitions constituents are discussed in Section 3.3 (Water Quality). At the request of the CNMI Senate, the Agency for Toxic Substances and Disease Registry conducted an assessment of pelagic fish caught in the open Pacific. The Agency concluded that pelagic fish caught in the open water are not likely to contain high levels of explosive residues from the neighboring Farallon de Medinilla bombing range and will not pose a public hazard to people who eat them. Navy activities could result in environmental effects on water quality in ocean areas due to shipboard training, expenditure of ordnance, and training-related debris such as used targets. Navy ships are required to conduct activities at sea in a manner that minimizes or eliminates any adverse impacts on the marine environment. Environmental compliance policies and procedures applicable to shipboard training afloat and pollution prevention are defined in Navy instructions, DoD Instruction 5000.2-R, EO 12856, and EO 13101. These instructions reinforce the CWA's prohibition against discharge of harmful quantities of hazardous substances into or upon U.S. waters out to 200 nm (371 km), and mandate stringent hazardous waste discharge, storage, dumping, and pollution prevention requirements. Navy protective measures for shipboard management, storage, and discharge of Hazardous Materials, and other pollution protection measures are intended to protect water quality. The international treaty for regulating disposal of wastes in the open ocean generated by operation of vessels is the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). MARPOL 73/78 is implemented in the United States by the *Act to Prevent Pollution from Ships*, under the lead of the U.S. Coast Guard. MARPOL 73/78 includes regulations aimed at preventing and minimizing pollution

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				from ships, accidental or routine, and currently includes six annexes as follows: • Annex I—Regulation for the Prevention of Pollution by Oil • Annex II—Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk • Annex III—Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form • Annex IV—Prevention of Pollution by Sewage from Ships • Annex V—Prevention of Pollution by Garbage from Ships • Annex VI—Prevention of Air Pollution from Ships Annexes I and II are mandatory on parties to the treaty while Annexes III to VI are optional and not binding unless specifically accepted. The United States is not a party to Annex IV; however, the U.S. Congress mandated the Navy to comply with regulations set forth in Annex V. Annex V covers nonfood marine pollution solid waste. Although naval ships are exempt from MARPOL 73/78, the U.S. Congress required compliance by the U.S. Navy in the *Marine Plastic Pollution Research and Control Act of 1987* as modified by the *National Defense Authorization Act for Fiscal Year 1994*. Under Annex V, the nonfood solid waste materials that are controlled include the following: • Paper and cardboard • Metal • Glass (including crockery and similar materials) • Plastics The basic requirements of Annex V include the following: • Disposal of all plastics into the sea is prohibited. • Disposal of dunnage, lining and packing material that will float is prohibited within 25 nm of the nearest land. • Disposal of food waste and other garbage is prohibited within 12 nm of the nearest land, unless the waste is comminuted and able to pass through 25 mm screens, in which case, disposal is permitted beyond 3 nm from the nearest land.

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				• Disposal of all garbage (except food waste beyond 12 nm) is prohibited in the Baltic Sea and other Special Areas. The United States Environmental Protection Agency (USEPA) and National Oceanic and Atmospheric Administration (NOAA) are the federal agencies primarily responsible for water quality and ocean resources. Federal laws regulating water quality include the Clean Water Act (CWA) (33 USC 1251 *et seq.*) and the Safe Drinking Water Act (SDWA) (42 USC 300f *et seq.*). The CWA was enacted by Congress to restore and maintain the chemical, physical, and biological integrity of United States (U.S.) waters. The CWA requires each state to establish water quality standards for its surface waters based on designated uses. For impaired water bodies, the CWA directs each state to develop Total Maximum Daily Loads (TMDL), the amounts of pollutants that can be assimilated by a body of water without exceeding water quality standards. Based on the developed TMDLs, the state or USEPA can limit any discharge of pollutants to a level sufficient to ensure compliance with state water quality standards. As required under the CWA, the USEPA has established National Ambient Water Quality Criteria (NAWQC) (USEPA 1996). The criteria are maximum concentration levels for specific contaminants in discharges to surface waters necessary to protect ecological and human health. The criteria are not rules, and have no regulatory effect. However, they can be used to develop regulatory requirements, based on concentrations that will have an adverse effect on the qualities necessary to sustain beneficial uses of U.S. waters. Table 3.3-1 shows the NAWQC standards for saltwater. The CWA prohibits the discharge of oil or hazardous substances into the territorial waters of the U.S. (*i.e.*, up to 12 nm [19 km]) in quantities harmful to the public health or welfare, or to the environment. Oil and hazardous substance spills are addressed under the National Contingency Plan. USEPA has proposed Uniform National Discharge Standards for military vessels. Table 3.3-2 summarizes current Navy pollution control discharge restrictions in the coastal zone.
FED6-8	Hazardous Materials	3.2	*Recommendation*: the General Permit and EPA/Navy agreement required initial monitoring data. EPA recommends a summary of these data, as well as an estimate of PCBs that would be left in place under each project alternative, be included in the Final EIS for disclosure. EPA also recommends that specific text be provided detailing the environmental preparation the Navy undertakes to minimize the impacts that SINKEX may have on the marine environment. More specifically, there should be a discussion pertaining to how the Navy meets the conditions of the MPRSA General Permit (which includes	A summary of the 1999 Agreement Letter has been added to Section 3.2.2.3.3, including specific requirements. The sentence referring to the potential for floating non-hazardous expended materials in the section is not specific to SINKEX but to aerial and surface targets in general. Target hulls for SINKEX are prepared in accordance with the SINKEX general permit. The estimated amounts of PCBs remaining in a target hull are provided to the EPA under the requirements of vessel preparation. Potential sources

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			the requirements in the 1999 Navy/EPA agreement).	of PCBs from target vessels have been identified in the text. Information on vessel preparation has been added to the text.
FED6-9	Hazardous Material	3.2	We recommend the following changes to the document text: On p. 3.3-22, under the heading "e.2.2.3.3 Aerial and Surface Targets," there is text that states "The vessels used as targets are selected from a list of CNO approved vessels that have been cleaned in accordance with USEPA guidelines." This sentence should be re-written as follows: "The vessels used as targets are selected from a list of CNO approved vessels that have been cleaned ~~in accordance with USEPA guidelines~~ according to the requirements set forth under Section 102 of the Marine Protection, Research, and Sanctuaries Act (40 CFR § 229.2) and the August 1999 Navy/EPA Agreement that details vessel preparation requirements to address PCBs under the SINKEX permit."	Text revised to read as suggested.
FED6-10	Other Considerations	Ch 4	We recommend the following changes to the document text: On p.ES-8, the Marine Protection, Research and Sanctuaries Act (MPRSA) should be added to the list of applicable environmental requirements.	Text revised.
FED6-11	Alternative Development	Ch 2	*Recommendation:* EPA recommends an alternative with additional mitigation measures be developed in the Final EIS, and that an alternative with geographic and/or temporal exclusions be considered. We recommend the identification of geographic areas where training exclusions would be especially beneficial to environmental resources, such as the Marianas Trench Marine National Monument and discussion of how excluding such an area would affect training goals and the underlying purpose and need. Footnote to this suggestion: the Presidential Proclamation did not prohibit DoD activities in the Marianas Trench Marine National Monument, however, the value of its marine resources should prompt the Navy to avoid impacts to the greatest extent practicable.	The Navy considered a reasonable range of alternatives as discussed in the EIS, Section 2.2. All alternatives would employ mitigation measures described for the Proposed Action. Future training assumptions and their mitigation measures are subject to the constraints that are already developed in the No Action Alternative. When new activities or new requirements for current activities are identified, then new environmental analysis under NEPA would be conducted. Consultations and public review would be included as part of the analysis process. As noted, the U.S. Armed Forces and the USCG are not subject to prohibitions required by the Presidential Proclamation establishing the Monument. The Armed Forces will conduct training activities in the Monument and avoid impacts to the greatest extent practicable. See response to FED6-2.
FED6-12	Proposed Action	Ch 2	Impacts to Marine Mammals from Mid-frequency Active (MFA) Sonar EPA has concerns regarding increased impacts to marine mammals from MFA sonar over historic exposure levels. The DEIS estimates that the preferred Alternative 1 will increase the number of behaviorally harassed animals by 9,543 (from 67,872 to 77,415); increase the number of animals experiencing temporary hearing loss lasting several	The Navy's assessment of potential impacts on marine mammals reflects the use of the best available and applicable science determined in consultation with NMFS. Information concerning the scientific data used is provided in EIS/OEIS Section 3.7. EIS data were conservative and were developed without consideration of mitigation measures. As discussed in Southall et al (2007:413-414) and presented in Section 3.7.3 of the EIS/OEIS, the modeling and threshold levels developed for analysis of impacts to marine mammals universally erred on the side of precaution

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			minutes to several days by 149 (from 1,097 to 1,246); and double the animals experiencing permanent hearing loss (from 1 to 2) (pp. 3.7-181 – 3.7-182). The proposed action will also include low-frequency active sonar which unlike MFA sonar, can travel great distances. Impacts from LFA sonar were evaluated in the SURTASS LFA EIS. We are also concerned that the impact assessment methodology seemed to assume a uniform distribution of animals. The DEIS states that "Uniform animal distribution is overlaid onto the calculated sound fields to assess if animals are physically present at sufficient received sound levels to be considered "exposed" to the sound" (p. 3.7-62). In its descriptions of the distribution of various marine mammals in the MIRC, based on the Mariana Islands Sea Turtle and Cetacean Survey (2007), marine mammals appear to be concentrated in certain areas, mainly associated with the Marianas Trench or other bathymetric relief (Section 3.7.2). Additionally, the assessment methodology does not seem sufficiently conservative since it does not estimate indirect impacts/secondary effects, and counts a maximum of a single take within a 24 hour period regardless of additional harassment (p. 3.2-68). Recommendation: we recommend the Navy consider the scientific controversy, uncertain/unknown risks, and presence of threatened and endangered species in assessing significance of impacts from MFA sonar on marine resources. EPA recommends the Navy not exceed the historic exposure levels in the MIRC, and operate sonar at the lowest practicable level to achieve mandated training levels. We recommend the approach taken for the Hawaii Range Complex be utilized, where an additional alternative was created for the Final EIS that held sonar use at existing levels while increasing training activity. The DEIS should recognize the Marianas Trench as an area of greater biological significance and avoid this area to the greatest extent practicable.	with regard to the range at which an animal may have a probability of behavioral harassment (65 nm and 120 dB) or with regard to the accumulation of energy for harassment with no accounting for reactions of animals. At this time the models can only analyze impacts using uniform animal distribution although new models are under development. Variability in animal presence within relatively small ocean sub-areas, such as seamounts, ridges, fronts and trenches is often strongly correlated with daily, weekly, seasonal and even decadal changes in prey availability with prey availability being driven by changes in both local and basin-wide oceanographic conditions. While there is a trend toward marine mammals being detected in those areas, overall marine mammals are found at low densities throughout the MIRC. There is no evidence to suggest that short duration exposure to active sonar has caused any indirect effects, long term behavioral response or population effects to marine species. Animals exposed to sonar may only be exposed 2-3 times a minute for several minutes as the ship moves through an area. The exception being the Bahamas stranding incident and that area has a very different bathymetry compared to the MIRC (see Section 3.7.3.1.1). Chapter 5 of the EIS contains discussion of alternative mitigation measures considered but eliminated. Although that section does not include discussion of the Mariana's Trench Marine National Monument, Section 3.6.2.6 addresses the newly designated Mariana Trench Marine National Monument. It is specifically noted in that section that the events described under the Proposed Action can take place within the Monument. Additionally, the Presidential Proclamation affirmed that the prohibitions included in the Proclamation shall not apply to the activities and exercises of the Armed Forces. The mitigation measures followed during activities and exercises of the Armed Forces within the Monument ensure that the activities are consistent so far as is reasonable and practicable with the Proclamation.
FED6-13	Terrestrial	3.11	Biological Resources. EPA has concerns regarding the potential introduction of the BTS to Tinian or other locations in the Northern Mariana Islands. The DEIS states that, for Tinian and Saipan, sightings	The sightings on Saipan referred to in the comment and on page 3.11-63 were not known to relate to military activities.

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			in shipments and in the wild have increased through the 1990s and early 2000s, and a reliable sighting was reported from Saipan in April 2008 (p. 3.11-55). We encourage the Navy to work closely with the USFWS to ensure the BTS Interdiction Plans are adequate to mitigate this potential impact and are sufficiently funded. Additionally, we have concerns regarding impacts to wildlife and threatened and endangered species in the MIRC training areas. The Navy should work with USFWS and the NOAA to address impacts to these resources through Section 7 consultations and additional interagency coordination as necessary to gain concurrence from these agencies regarding project impact assessment and mitigation.	As part of the Section 7 ESA Consultations between the Navy and the USFWS Pacific Islands Field Office and the Navy and NMFS Office of Protected Resources, the Navy has included conservation measures specifically targeted at brown treesnake control and interdiction. The regional biosecurity plan is still in development, and the Navy is a contributing agency to the Brown Treesnake Technical Working Group. The brown treesnake control and interdiction efforts described in the conservation measures within this EIS/OEIS are concerned with avoiding, offsetting, or minimizing potential introductions of invasive species associated with increased training. The Joint Region INRMP will address other brown treesnake and invasive species control needs, and the biosecurity plan will cover all aspects of Navy activity within the MIRC. Specific measures within the MIRC EIS/OEIS include: (1) The inclusion of a group of conservation measures under the heading "*Conservation Measures for Predators, Pests, and Plants: Invasive Species Management Associated with MIRC Training Activities*". (2) Inclusion of a measure entitled: Brown Treesnake Interdiction and Control and DoD participation in the Brown Treesnake Control Plan. (3) Self-Inspection Training for Personnel and Awareness: Avoidance Invasive Species Introductions. (4) DoD participation in the Regional Biosecurity Plan (5) Cooperative development of regional training SOPs and Exercise Planning For specific descriptions of these measures, please see Section 3.11 and Chapter 5 (Mitigation).
FED6-14	Geology	3.1	It is not clear how impacts to Paleontological resources can be mitigated if they are unknown.	Revised text in 3.1 (2nd paragraph).
FED7-1	Proposed Action	Ch 2	Specific information is required to assess and disclose impacts including the nature, duration, and specific location of training activities and infrastructure improvements. Recommend that DoD begin coordination with USFWS to ensure concerns for threatened and	EIS Chapter 2 and Appendix D provide detail on the nature, duration, and specific location of training activities.

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			endangered species are addressed in EIS.	The EIS process includes consultations and discussions with the USFWS, NMFS, and others to establish mitigation measures that protect species. Such consultations and discussions resolve and seek to minimize any potential adverse effects.
FED7-2	Proposed Action USAF	Ch 2	The cooperative agreement between the USAF and the USFWS for the establishment and management of the Guam National Wildlife Refuge states that the USAF will provide for consultation with USFWS for actions that may impact habitat of endangered or threatened species even if those species are extirpated from the affected area, but are not extinct.	The EIS process includes consultations and discussions with the USFWS, NMFS, and others to establish mitigation measures that protect species. Such consultations and discussions resolve and seek to minimize any potential adverse effects. The Section 7 ESA consultation between the Navy and the USFWS Pacific Islands Field Office includes these species (e.g. Micronesian kingfisher, Guam rail).
FED7-3	All Resources	Ch 3	Potential impacts from the proposed activities on federally listed species, candidate species and other Federal trust resources may include: - Habitat destruction from expansion of installation, including live fire ranges, and from training exercises. - Disturbance of or collision with marine life during nearshore training exercises. - Disturbance by aircraft overflights and land-based training activities.' - Introduction of invasive alien species, especially BTS. - Increased vandalism, illegal hunting, and disturbance resulting from increased human access into previously inaccessible areas.	Potential impacts to Federal trust resources have been addressed in the Section 7 ESA consultation between the Navy and the USFWS Pacific Islands Field Office and in Chapter 3 of the EIS.
FED7-4	Cumulative Impacts	Ch 6	Cumulative Impacts. In addition to the proposed relocation of U.S. Marine Corps forces to Guam, other planned military projects and private developments should be included in the cumulative impacts analysis for the proposed project. Specific issues may include increased traffic among islands, increasing the probability of transporting invasive species to new locations, and continued habitat destruction due to concurrent development projects. We recommend that all possible cumulative effects associated with the proposed project be considered within the EIS/OEIS.	Cumulative impacts were addressed in all relevant NEPA documents. Chapter 6, Cumulative Impacts provides an extensive discussion of the assessment of cumulative impacts (or cumulative effects). Reasonably foreseeable future actions that may have impacts additive to the effects of the Proposed Action also were analyzed. Various types of reasonably foreseeable future actions that are relevant to the Proposed Action have the potential to affect the resources identified in Chapter 3. Table 6-1 is an overview of these actions that emphasizes components of the activities that are relevant to the effects analysis in Chapter 3. Additionally, projects in the planning phase were considered, including reasonably foreseeable (rather than speculative) actions that have the potential to interact with the proposed Navy action. Geographic distribution, intensity, duration, and the historical effects of similar activities are considered when determining whether a particular activity may

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				contribute cumulatively and significantly to the effect identified in Chapter 3.
FED7-5	Water Quality	3.3	Any action requiring the discharge of dredge and fill material into the water will require a CWA section 404 permit from the USCOE.	There are no new construction activities or water resource development of infrastructure improvement projects involving dredge or fill. Not applicable.
STG1-1	Ch 2 Ch 4	CZMA	CZMA Federal Consistency Determination No Federal consistency determination, analysis, or even the timeline to accomplish the requirement was addressed.	CZMA CCD for Guam was submitted to the Bureau of Statistics and Plans (BSP) on 18 March 2009. The CCD package is included in Appendix C.
STG1-2	Ch2	Proposed Action	Flight exercises should not be allowed over populated areas of Guam at any time.	Flight activities over Guam populated areas are controlled by the FAA.
STG1-3	Marine Communities Hazardous Materials	3.6 3.2	Coastal marine and terrestrial habitat will be affected by training exercises within the ocean surface and undersea areas, i.e. training explosions in Apra Harbor. The cumulative wastes and discharges from continued training explosions will generate pollutants and threaten estuarine and reefs.	COMNAVMARINST 3500.4 or the Marianas Training Handbook specifies training measures specifically designed to protect coral features potentially impacted by amphibious landing craft. Surveys will be conducted prior to any amphibious landings and based upon the findings of the surveys, coordination with resource agencies will be conducted, if applicable. These measures were added to the EIS, Section 3.6, (Marine Communities) and Chapter 5 (Mitigation).
STG1-4	Water Quality	3.3	What assurances are there that the designated Northern Aquifer will not be impacted?	It is unlikely that the Northern Aquifer will be impacted by training activities at Northwest Field. Training activities at Northwest Field consist of rapid runway repair conducted on an impervious surface (the runway).
STG1-5	Geology Land Use	3.1 3.12	Land disturbing activity increases the potential for erosion to occur resulting in loss of shorelines that leads to damage to coral reefs and disturbance of marine habitat.	The Navy concurs that land disturbing activities can increase erosion potential that may damage coral reefs and other marine communities. To minimize this potential impact, the Navy will implement protective measures when conducting training activities that will involve land disturbance. Chapter 5 of the EIS/OEIS was updated to include these protective measures. For instance, sedimentation load increase potential is reduced by not creating new bivouac areas in the Navy Munitions Site and limiting vehicle traffic to existing roads (no new roads will be created). In addition, provisions for wetlands and riparian habitat protection with stipulations on training within these areas are included in Integrated Natural Resources Management Plans for each installation.
STG1-6	Mitigation Measures Cumulative Impacts Hazardous	Ch 5 Ch 6 3.2	The cumulative impacts from firing range exercises will affect native forests and wetland areas. What measures are there to ensure that this activity does not pose unreasonable risks to the health, safety or welfare of the people of Guam?	Known distance firing ranges are controlled ranges with no native forests and are not located in wetland areas. They are contained within military bases where access by the public is limited. Range health and safety plans are enforced and periodically updated.

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	Materials			
STG1-7	Mitigation Measures Cumulative Impacts	Ch 5 Ch 6	Impacts from air traffic will have an effect on our community most especially on the elderly who will live in fear with the sounds of ammunition going off. This will affect their health to cause memories of war time and all the hardships endured by it, and cause them to live in fear from the constant loud sound of airplanes etc.	Both military and nonmilitary entities have been sharing the use of the ground, ocean, and airspace that encompasses the MIRC since World War II. Military, commercial, and general aviation activities have established an operational co-existence consistent with Federal, state, and local plans and policies and compatible with each interest's varying objectives. The No Action Alternative includes training and testing operations that are and have been routinely conducted in the area for decades. Ongoing, continuing training activities identified in this EIS/OEIS will continue to use the existing offshore areas and Warning Areas. Although the nature and intensity of use varies over time and by individual area, the continuing training activities represent precisely the kinds of training activities for which these areas were created (*i.e.*, those that present a hazard to other vessels). The No Action Alternative would not modify existing airspace use, and would not change the existing relationship of the Navy's SUA with Federal airways, uncharted visual flight routes, and airport-related air traffic training activities. Implementation of either Alternative 1 or Alternative 2 would not modify existing airspace use and military activities would continue to be scheduled or announced ahead of execution or take place in an area that is designated for the exclusive use of military activities.
STG1-8	Mitigation Measures	Ch 5	What assurances are there to protect native birds, marine animals and disturbance to native forest?	The Navy has engaged both NMFS Office of Protected Resources and the USFWS Pacific Islands Field Office in the Section 7 ESA consultation process. The NMFS jurisdiction covers sea turtles in nearshore and open ocean habitats, and the USFWS jurisdiction covers sea turtles on land and nesting habitats. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources are addressed in the consultations. The consultations and discussions resolve and seek to minimize any potential adverse effects. The Navy has designed new measures and enhanced prior measures for impact avoidance and minimization. Refer to Chapter 5 for a complete list of mitigative actions associated with all resource areas assessed within the FEIS/FOEIS, and Section 3.8 for specific measures for nesting sea turtles.
STG1-9	Proposed Action Alternative Development	Ch 2	The DEIS lacks a range of reasonable alternatives and does not provide an adequate explanation as to why other alternatives were eliminated.	Alternatives must meet the purpose and need for the proposed action. Discussion of alternatives are presented in Chapter 2.
STG1-	Water Quality	3.3	Commenter disagrees that the unavoidable impacts to water quality are temporary and would not result in adverse effects - specifically	Comment noted. It is likely that amphibious landing training activities may have temporary and localized impacts to marine communities. Amphibious

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10			relating to LCAC activity.	landings in nearshore areas can lead to a temporary and localized impact on coral species, and increased turbidity. Increases in turbidity could temporarily decrease the foraging efficiency of fishes. In sandy areas, given the dynamic nature of the habitat and the grain size of the material, turbidity is expected to be minimal and localized. Although corals are not common in the channels that are used for training, recovery to coral that is affected by amphibious landings would be dependent upon the frequency of additional disturbances and other natural factors. Protective measures (discussed in Section 3.6.4.1) are in place to insure that impacts to sensitive habitat are avoided. Amphibious landings would be infrequent; applicable surveys will be conducted before any beach improvements, amphibious landing activities, or over the beach insertions/extractions are conducted. Based upon the findings of the surveys, coordination with the resource agencies will be conducted, if applicable.
STG1-11	Airborne Noise Mitigation Measures	3.5 Ch 5	Commenter believes that the increase in aircraft events will impact residents; believes that additional analysis is warranted. Mitigation should be offered similar to what was given to residents affected by the International airport noise.	Analysis of noise impacts from aircraft at Andersen AFB are analyzed in the ISR/Strike EIS and are included in Section 3.5. Noise impacts were determined not to require mitigation measures to ensure public health and safety.
STG1-12	Airborne Noise Land Use	3.5 3.12	A referenced publication regarding aircraft noise was not cited in the DEIS and should be addressed: Parsons, E.C.M., S.J. Dolman. A.J. Wright, N.A. Rose, and W.C.G. Burs. 2008. Navy sonar and cetaceans: Just how much does the gun need to smoke before we act? Marine Pollution Bulletin 56: 1248-1257.	Comment noted. Airborne noise indicated the publication has to do with sonar and marine mammals. The reference is a review/policy paper that does not contain additional, new data and is not relevant to the marine mammal section.
STG1-13	Marine Mammals	3.7	Concerned about the impact of landing craft exercises on the dolphins that reside in Agat Bay. Contends unavoidable impacts.	The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures in consultation with NMFS under provisions of the MMPA. Beachmasters are shore based observers with binoculars whose sole purpose is to ensure safety of craft including avoidance of marine and terrestrial animals. Beachmasters will work with environmental monitors and the natural resource managers. In addition, Navy protective measures, specifically lookout measures for vessel movements, are contained in Section 3.7 and Chapter 5 (Mitigation).
STG1-14	Marine Mammals	3.7	Concerned about the impacts of UNDET activities on dolphins and other cetaceans.	See response to STG1-13.
STG1-15	Marine Mammals Sonar	3.7	Contend that there is a relationship between 2007 strandings in Guam and sonar training activities.	There is no evidence of a relationship between the 2007 strandings and sonar training activities.

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STG1-16	Sea Turtles	3.8	Believe that sea turtles would be affected by landing craft training activities in the MIRC.	The Navy agrees that landing craft training activities may potentially affect sea turtles within the MIRC. The Navy has consulted with NMFS and USFWS Pacific Islands Field Office under provisions of Section 7 of the ESA to avoid, minimize or offset potential impacts associated with MIRC training on sea turtle nesting activity and activity in near shore and open ocean marine environments. Refer to Chapter 5 for a complete list of mitigative actions associated with all resource areas assessed within the FEIS/FOEIS, and Section 3.8 for specific measures for nesting sea turtles.
STG1-17	Marine Communities	3.6	Concerned about the impacts of LCAC and AAV on coral reef habitat; specifically at Tipalao, Dadi, and areas within Apra Harbor.	See response to STG1-3.
STG1-18	Terrestrial	3.11	Concerned about the low-flying helicopters along the cliffline in Yigo to native wildlife; specifically the Marianas fruit bat. Asks why it was not described in the EIS and who should the community contact to address concerns.	Flights along the Yigo Cliffline are not considered part of MIRC training. Fruit bats do not currently utilize the Yigo cliffline area. See response to FED2-3.
STG1-19	Terrestrial Invasive Species	3.11	DEIS lacks a biosecurity plan to prevent introduction of invasive species and to prevent spread of species.	See response to FED1-2.
STG1-20	USAF Policy Proposed Action	Ch 2	Request AAFB activities of practice takeoffs/landings, instrument approaches, and base maintenance runup activities be limited to the hours of 8am to 5pm and that the community be notified.	See response to FED2-3. The primary sound sources of noise in the MIRC are aircraft and vehicle traffic and industry. Aircraft and general traffic and industrial noise sources in the Agana-Tamuning metropolitan area generate noise on Guam. Noise from power plants, aircraft, and vehicular traffic is limited. Aircraft from both Andersen Air Force Base (AAFB) and the Guam International Airport contribute to aircraft noise on Guam. The International Airport is operated by the Guam International Airport Authority (GIAA), a public corporation and autonomous agency of GovGuam., it handles nearly all of the commercial flights into and out of Guam and is the only civilian air transportation facility on Guam. Eight major airlines operate there, making it the hub of air transportation for Micronesia and the Western Pacific. AAFB handles Air Mobility Command Flights for military personnel and their dependents. AAFB is home the 36th Wing (host unit) as well as to the 734th Air Mobility Support Squadron, Navy Helicopter Squadron 25 (HC-25), and several other tenant organizations. The primary mission of AAFB is to maintain the manpower infrastructure to provide support for tactical and strategic peacetime, contingency, and wartime deployment and employment activities, strategic

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				airlifts, transient support, and staging activities. Commercial aircraft may occasionally fly through AAFB airspace, but only with permission from the AAFB control tower. In 2007, Wyle Laboratories prepared a set of data collection packages based on previous modeling of AAFB and performed a site visit to AAFB. As a result of the site visit and interviews, significant changes were made to the flight tracks, aircraft mix, and operations of the previous modeling (Table 4-1; Wyle 2008). Operation types include departures, straight-in (nonbreak) arrivals, overhead break arrivals, touch-and-go patterns, and ground controlled approach (GCA) patterns. Because much of AAFB flight activity is by deployed or transient aircraft, the fleet mix for the modeling scenario includes many aircraft types. The top users of the airfield are the MH-60S Knighthawks in HSC-25 (modeled as SH-60B aircraft in RNM), with 66 percent of the total military operations. Jet tankers (modeled as KC-135R) are the next most frequent users of the airfield, with approximately 10 percent of the total operations. F/A-18E/F and T-45 comprise eight percent of the total operations. The next most frequent users are transient F-15s, with approximately seven percent of the total operations. Based HSC-25 aircraft perform approximately 6 percent of their operations during the acoustical nighttime (10pm – 7am) period, and transient aircraft perform an average of 14 percent of their operations during the same period.
STG1-21	Regional Economy Recreation	3.16 3.17	DEIS does not adequately address the impacts to Guam's commercial fishing and tourism.	Under the EIS Alternatives 1 and 2, there is to be an increase in training activity and a larger restricted zone around FDM. Other marine areas will not be occupied as to interfere with fishing activities any more than they are today. Civilian recreational activities conducted in the MIRC Study Area include sport fishing/diving, sailing, and other tourist-related activities. These activities make a majority of the contribution to the overall economy of both CNMI and Guam. Military land training is conducted on land designated for that purpose. The number of additional live fire events is limited to no more than six events annually, the area where the events are proposed are south of the Galvez and Santa Rosa Banks. Additionally, the Galvez Bank is located outside of W-517 and Santa Rosa Bank is located on the fringe of W-517. Temporary clearance procedures for safety purposes do not adversely affect these economic activities because displacement is temporary. The Navy has performed military training events in this region in the past and has not precluded fishing or recreational use in the area, even during peak fishing seasons.

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				When safety clearance of an area is required, a NOTMAR is provided in advance, which allows boats to select an alternate destination without substantially affecting their activities. The majority of recreational fishing occurs within a few miles of shore due to swift currents and the size of the fishing vessels. Some commercial vessels do use offshore waters (>500 feet) and these activities are compatible with Navy training activities. Potential stressors of increased ship and aircraft training events and their associated training activities are confined to existing training areas. Potentially dangerous activities are communicated to all vessels and operators by use of NOTMARs, issued by the USCG, and NOTAMs, issued by the FAA. Operational activities are required to avoid recreational boaters in the range. Commercial fisheries in CNMI and Guam have remained relatively stable during current military training activities. The proposed increases in training are in existing training areas that include W-517, a deep open ocean area that is relatively free of surface vessel traffic (Table 2-2). The number of commercial fishing vessels has remained under 10 during the reporting period that is available. The number of additional live fire events is limited to no more than six events annually, the area where the events are proposed are south of the Galvez and Santa Rosa Banks. CNMI and Guam are established fishing communities with the majority of the population fishing for subsistence. Island and shallow water fishing provides the majority of the harvest due to the distance from port, use of small vessels (<25 ft) and strong currents. The proposed training activities involve established range and training activities and W-517 overlays deep open ocean approximately 50 miles south-southwest of Guam and provides a large contiguous area that is relatively free of surface vessel traffic (Table 2-2), therefore, it is unlikely that recreational or subsistence fishing would be impacted.
STG1-22	Regional Economy	3.16	Disagrees with "ripple effect" of defense spending verses recreational spending discussion in regional economy section.	The discussion has been revised to expand the information from the Guam Economic Development and Commerce Authority.
STG1-23	Recreation	3.17	The recreation section does not adequately address the range of potential impacts to recreational use on Guam	See response to STG1-21.
STG1-24	Navy Policy Proposed Action	Ch 2	Concern regarding the lack of proper notification to the community regarding training activities.	Prior to a training exercise, the Navy and USCG issue NOTMARs and NOTAMs to announce an exercise and to notify the public of potential hazards in the exercise area. In addition, scheduled training will be communicated to the stakeholders, mayors, resource agencies, fishermen using telephone tree and e-mail (developed by COMNAVMAR with stakeholders' input) to send, facsimiles to mayors and fishermen and

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				notices on the NOAA and local channels, and emergency management offices. See response to FED2-3 for training activities.
STG1-25	Policy Proposed Action	Ch 2	Requests information regarding a contact for when established training protocols are violated or accidents occur.	See responses to STG1-24 and FED2-3 for training activities.
STG1-26	Proposed Action Regional Economy	Ch 2 3.16	W-517 is not all open ocean; offshore banks (Galvez and Santa Rosa) restriction for training will impact fishing.	Prior to a training exercise, the Navy and USCG issue NOTMARs and NOTAMs to announce an exercise and to notify the public of potential hazards in the exercise area. See responses to STG1-24 and FED2-3 for training activities.
STG1-27	Public Involvement	Ch 2	How will the increased activities associated with the range reduce threats to human life and the environment?	Comment noted.. The EIS process includes consultations and discussions with the USFWS, NMFS, and others to establish mitigation measures that protect species. Such consultations and discussions resolve and seek to minimize any potential adverse impacts.
STG1-28	Airborne Noise Terrestrial Mitigation Measures	3.5 3.11 Ch 5	Need for assurance from military that whatever environmental damage is done will be repaired. When habitats are destroyed who will be responsible to repair and in what time frame?	See responses to STG1-3, STG1-5, and STG1-8.
STG1-29	Proposed Action	Ch 2	Ample public notice prior to training exercises.	The authors of the EIS met with Range Complex stakeholders to determine environmental impact issues and concerns both during the scoping process and at the public hearings. The public hearings afforded the public the opportunity to discuss their issues and concerns in open forum. See responses to STG1-24 and FED2-3 for training activities.
STG1-30	Proposed Action	Ch 2	Over time military's use of MIRC will disrupt the area's water supply and natural defenses.	Impacts to natural resources are presented in Chapter 3. See response to STG1-10 for water quality.
STG1-31	Natural Resources	Ch 3	the military needs to assure the people of Guam that whatever they might damage, be it the coral reefs, the ocean environment, the air, the land, that they will invest whatever it takes – money and personnel – to fix, replace or replenish. The burden on the island community is not just for those currently living here, but for those generations from now. I would like peace of mind to know that part of any legacy I leave behind for my family includes clear air, clean water and viable land.	Impacts to natural resources are presented in Chapter 3.
STG1-32	Public Involvement	Ch 3	I would appreciate ample public notice prior to any training exercises occurring in and around Guam.	The authors of the EIS met with Range Complex stakeholders to determine environmental impact issues and concerns both during the scoping process and at the public hearings. The public hearings afforded the

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				public the opportunity to discuss their issues and concerns in open forum. Prior to a training exercise, the Navy and USCG issue NOTMARs and NOTAMs to announce an exercise and to notify the public of potential hazards in the exercise area. In addition, scheduled training will be communicated to the stakeholders, mayors, resource agencies, fishermen using telephone tree and e-mail (developed by COMNAVMAR with stakeholders' input) to send, facsimiles to mayors and fishermen and notices on the NOAA and local channels, and emergency management offices. See response to FED2-3.
STG1-33	Natural Resources	Ch 3	Another concern is the damage that can occur to all habitats whether in the waters around Guam or on the land itself. Once coral is destroyed there is no way to mitigate that. When fish habitat are damaged or destroyed, how long will it take for mitigation and who shoulders that burden-the military or the island people? When wildlife habitats are disturbed, how does that get fixed-and again, whose burden does it become? When natural resources are damaged, depleted, destroyed the long-term impacts are exactly that-long term. Whatever potential damage military training might have on any living thing, there is a ripple effect, e.g., social impact, economic impact, health and welfare impact, and the list is long. At the end of the day, those left with the spoils are the ones who suffer the greatest impact.	The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office and the NMFS Office of Protected Resources. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources are addressed in the consultations. The NMFS jurisdiction covers marine resources, including sea turtles in nearshore and open ocean habitats and the USFWS jurisdiction covers terrestrial resources, including sea turtles on land and nesting habitats. Conservation/mitigation measures developed from these consultations to avoid and/or minimize any potential adverse effects are included in the EIS. In addition, the Navy requested a Letter of Authorization (LOA) from NMFS under MMPA for incidental harassment of marine mammals resulting from training activities proposed in the MIRC. As part of the LOA application, a monitoring plan was developed, with NMFS input, and will be implemented during training exercises involving sonar and explosives to determine the effectiveness of the mitigation measures. Adaptive management is an integral part of the monitoring plan. Refer to Chapter 5 for a complete list of mitigation measures to avoid and/or minimize these impacts associated with the resource areas assessed in the FEIS/FOEIS, and Section 3.8 for specific measures for nesting sea turtles.
STG2-1	Proposed Action	Ch 2	Mayors of Yigo and Agat, the two villages where much of the increased activity would occur, voiced strong opinions about inadequate notification to residents about training activities. This issue was repeatedly raised by residents of these villages and other, who have asked for a more reliable notification process for training events. The potential for harm to the public, military personnel and the environment is too great to ignore this need. A better notification system needs to be set up for the training events.	See response to STG1-32.

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STG2-2	Proposed Action	Ch 2	In addition to a more effective public outreach process, residents are concerned that there is no easy way to report problems or threats associated with the training exercises. Activities that are not discussed in the EIS itself – and are presumably counter to protocol as they are never mentioned in the 1,000 plus page document – have been reported with some frequency by residents near the training events. The public wishes to have the Navy set up a system that would allow such concerns to be reported and addressed in a timely fashion. I concur with the mayors and these concerned citizens that a system should be put in place to answer public calls and direct changes, where necessary, without the delay and confusion of calling Hawaii, or being transferred among commands to find resolution.	See response to STG1-32.
STG2-3	Terrestrial Invasive Species	3.11	Invasive Species. The draft EIS does not mention a biosecurity plan, which is critical to Guam, the Northern Marianas, and our neighbors in the region. Guam has already had catastrophic experiences with introduced species, such as the infamous brown tree snake and the recently introduced coconut rhinoceros beetle. Increases in activity will require new measures to ensure that the island does not receive new pests, and conversely, to ensure that our neighbors do not receive those pests that have already been established here on Guam.	See response to FED1-2.
STG2-4	Marine Communities Marine Mammals Regional Economy Mitigation Measures	3.6 3.7 3.16 Ch 5	Marine based training activities occur in a wide range of areas around Guam, including numerous important fishing areas. The draft EIS does not adequately address the impacts to local fishermen and boaters, and instead glosses over increased activities as having no significant impact. Many fishers are already restricted by weather conditions and other factors, so any additional closure of valuable fishing grounds could have potentially severe impacts on these users. Additionally, permanent harm from some of the military activities, which could kill fish, larvae and eggs, could result from the training, leading to reduced fishing success overall and having a broader impact than the periodic closures. The document does not provide any mitigation suggestions for the impacts of closures and other indirect effects on the fishing grounds. Alternatives that minimize these problems, or some sort of compensatory mitigation, should be considered.	The services train in a variety of marine bathymetric conditions. Recommendations from NMFS on the Navy's EFH assessments were considered and included as appropriate in both the resource section analysis and in Chapter 5. The analysis concluded that closures and other indirect effects are infrequent.
STG2-5	Marine Communities Marine Mammals	3.6 3.7 3.16	Many areas used by the military also are frequented by boaters, including fishermen, divers and other recreational users. There is no clear indication of how extensive these closures will be – do such events last for an hour, or a day, or a week? Again, the notification process will be critical, and every attempt should be made to reduce	See response to STG1-32. The Navy's present proposed action only includes one UNDET site in Agat Bay approximately 4 nm offshore, beyond normal operating areas for tourist dolphin-watching boats. The Navy, under provisions of the MMPA, consulted with NMFS for potential impacts to marine mammals in the open

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	Regional Economy Mitigation Measures	Ch 5	impacts to the existing community of users. The training activities themselves present additional challenges that may alter the landscape far beyond the closure period. The potential loss of marine life, whether through injury, morality or simply scaring them out of the area, presents significant problems, especially for tour operators who rely on a health population of marine animals to support their tours. The underwater detonations, for example, could lead to the relocation of Agat Bay's resident dolphin pod, disrupting the dolphin watch boats and other tours. In general, the draft EIS makes very little mention of the potential impacts associated with these activities and makes even less mention of mitigation options that may be viable. I request that these areas be revisited and more effort made to either find alternatives that will cause fewer impacts, or to provide environmental and compensatory mitigation to offset these issues.	ocean and near shore marine environments. The Navy has developed mitigation measures in cooperation with NMFS to minimize, avoid, or offset potential impacts associated with DEMO training activities in Agat Bay, including using trained monitoring personnel within the immediate zone of impact of the explosion. Spinner dolphin groups are easy to detect because of the size of the group and surface behaviors. Watchstander provisions described in Chapter 5 would also minimize impacts to dolphins subject to underwater noise by postponing detonations until after the marine animals have left the area.
STG2-6	Regional Economy	3.16	The MIRC undoubtedly supports Guam's economy due to the volume of defense spending during the exercise events, the preparation for such projects and other costs associated with maintaining operations on island. I strongly recommend that you revisit the economic impacts referenced in this document and prepare a more accurate review of the true costs of these exercises to existing tourism activities, fishing pursuits, and recreational users. Such impacts should be evaluated more thoroughly and more realistic and fair alternatives or mitigation should be discussed.	See response to STG1-21.
STG3-1	Sea Turtles	3.8 ES	The impacts to sea turtles are possible, how is the claim of no nest failures made? Would the increased activity impact sea turtle feeding, mating, etc?	The Navy conducts routine monitoring of sea turtle nesting beaches on Navy lands on Guam and Tinian. NAVFACMAR natural resource personnel have observed nest failures associated with poaching on Tinian, however, no nest failures have been attributed to MIRC training. See response to STG1-8.
STG3-2	Marine Communities	3.6	Underwater detonation would result in the injury or death of fish eggs or larvae.	Recommendations from NMFS on the Navy's EFH assessments were considered and included as appropriate in both the resource section analysis and in Chapter 5.
STG3-3	Proposed Action	Ch 2	The Description of Proposed Action and Alternative will need to include specific time of day (night/day hours) for training. Provide detail schedule of actions in Chapter 2.	Tables 2-7 and 2-8 and Appendix D provide information on the number of training events proposed annually under each alternative. The authors of the EIS met with Range Complex stakeholders to determine environmental impact issues and concerns both during the scoping process and at the public hearings. The public hearings afforded the

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				public the opportunity to discuss their issues and concerns in open forum. The Services considered development of an alternative with mitigations based on geographical or temporal restrictions due to a comment during public hearings that made the suggestion. Such an alternative could severely limit the flexibility required for meeting training requirements and is not consistent with the purpose and need of the Proposed Action. The services must train in the same manner as it will fight; therefore, specific times of day in which training will be conducted cannot be limited to a specific schedule. A significant amount of time can be required to develop the "tactical picture" or an understanding of the battle space such as area searched or unsearched, identifying false contacts, understanding the water conditions, etc. The Services have consistently adopted mitigation measures in consultation with USFWS, NMFS, and Range Complex stakeholders. Prior to a training exercise, the Navy and USCG issue NOTMARs and NOTAMs to announce an exercise and to notify the public of potential hazards in the exercise area. In addition, scheduled training will be communicated to the stakeholders, mayors, resource agencies, fishermen using telephone tree and e-mail (developed by COMNAVMAR with stakeholders' input) to send, facsimiles to mayors and fishermen and notices on the NOAA and local channels, and emergency management offices. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981.
STG3-4	Proposed Action	Ch 2 Pg 2-18 Tbl 2.3	Pati Point CATM/EOD Pit detail/description does not indicate time of day training will occur. Mariana fruit bat colony is located east of the training site. Bats have been observed flying above the training site at night to forage. Training at night may cause bats to alter their normal behavior/activities due to "new" stressor. Bats at the colony are habituated to activities at CATM/EOD range during the day. Night hours may have an impact on their normal behavior.	In 1998, the Andersen AFB completed Section 7 ESA consultation with the USFWS Pacific Islands Field Office for increased night training at the CATM range. The USFWS concluded that the lighting would not likely adversely affect the wildlife in the area, including Mariana fruit bats at the Pati Point colony. In 2006, the Air Force concluded formal consultation for the establishment of the ISR/Strike capability at Andersen AFB. Although this consultation did not include training events at the CATM Range, the consultation did specify monitoring of various stressors and adaptively manage activities to avoid, reduce, or offset potential impacts to the Mariana fruit bat colony at Pati Point.

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STG3-5	Mitigation Measures	Ch 5 Ch 2	The EIS/OEIS does not mention any monitoring or resources during training activities at the training sites. A monitoring plan on resources should be included in the EIS/OEIS. Monitoring is required to determine impacts to natural resources during training activities. EIS/OEIS will need to include monitoring efforts at all training sites.	The Navy has completed various natural resource technical studies on Guam to provide the most current status information for species occurring on military lands. As of the publication of the DEIS, these studies were not available and have been incorporated into the FEIS. Monitoring is accomplished through INRMP implementation by NAVFACMAR natural resource management specialists. Specific large training events have monitoring protocols included in exercise planning documents.
STG3-6	Proposed Action	Ch 2 Pg2-6; 2-18 Tbl 2-2	EIS/OEIS will need to provide detailed schedule of detonations at OAEDS, NAVY, and EOD, AAFB. Detonation activities will most likely affect breeding behavior and natural behavior of native species (moorhens, swiftlets, fruit bats) in Navy and (fruit bats, crows) AAFB property.	The Mariana common moorhen and the Mariana swiftlet will not be affected by detonations because they do not breed or forage in areas where these detonations occur. Detonations on AAFB property have been assessed for effects in prior consultations (e.g. Northwest Field Beddown informal consultation) between the Air Force and the USFWS Pacific Islands Field Office.
STG3-7	Recreation	3.17 Pg 2-6; 2-7; 2-18	Activities at Firing Range in Orote Point, NavMag, and Finegayan will pose a threat to recreational users near the area. Orote Point and Finegayan shooting range is situated where bullets are fired towards the ocean. The EIS/OEIS will need to address proficiency when notifying the public with training exercise, for the safety of local fishermen and tourist companies.	The Finegayan Small Arms Range has been designed to minimize any potential for stray projectiles from escaping the bermed control areas. The surface danger zone, designed for risk mitigation, lies over the Haputo Ecological Reserve Area and certain diving and fishing areas. The analysis of the impact to recreational uses based upon years of continuing use is minimal. The scheduling of the range has resulted in a minimum impact to the public over the life of the range. The range was built and approved for use over 30 years ago and has been reviewed for environmental effects including its effects on recreational uses in the EIS 1999 and again in this document. The continued use of the range based upon its projected throughput in the MIRC will not have appreciable effects on existing recreational uses. Plans for military expansion on Guam will necessarily evaluate the potential for effects on recreational uses but is beyond the scope of this document. If a determination was made to increase the size or throughput for the range recreational concerns will again be evaluated. The activities have been monitored since 1999 and no adverse affects from training have been noted. See responses to FED2-3 and STG1-24.
STG3-8	Terrestrial	3.11 Pg 2-7; 2-13	The EIS/OEIS will need to address the impacts to Mariana Common Moorhen and Island Swiftlet regarding the Sniper Range, OADR, and SLNA located in navy Magazine. Moorhen nesting and swiftlet foraging behavior may be impacted during activities in this site.	The Navy has addressed the effects of training on the Mariana swiftlet and Mariana common moorhen at the Naval Munitions Site through the Section 7 ESA consultation with the USFWS Pacific Islands Field Office. Conservation measures were specifically designed to avoid, minimize, or offset potential impacts to these two species. These measures include (1) continued brown treesnake trapping around known swiftlet caves, (2) establishing 100-m no training buffers around the caves, and (3) restricting training events at Fena Reservoir both geographically and seasonally. Refer to Section 3.11 and Chapter 5 (Mitigation).
STG3-9	Proposed	Ch 2	Field training exercises such as beach landing by small craft at Polaris	The locally designated Marine Preserve is located on federal property. The

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	Action Sasa Bay Marine Protected Area	Pg 2-12 Fig 2-4	Point Field would not be compatible with the Sasa Bay Marine Protected Area.	Navy, while not recognizing the designation of the Marine preserve over federal property, recognizes the importance of this resource. Amphibious craft, including LCAC and AAV, will not navigate in Sasa Bay, however Polaris Point Field will continue to be used for amphibious activities including a staging area and helicopter landing site for amphibious operations. Amphibious craft LCAC and AAV approach Polaris Point Field from the outer harbor outside of the Mangrove swamp and Sasa Bay.
STG3-10	Proposed Action	Ch 2	Amphibious Raid Special Purpose. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See response to STG3-9.
STG3-11	Marine Communities	3.6 3.16 Ch 5 3.1.2	The OEIS zone outer reef and banks of Guam, such as Santa Rosa Reef must be addressed in the OEIS and will be impacted by training. These banks need to be described and BMPs during training exercises and mitigation listed to protect the resources and the local fishing dependent on these sites.	As appropriate, mitigation measures are adopted to avoid shallow water areas and to protect the public safety. Training events within the MIRC avoid dropping explosive ordnance in shallow water. In addition, navigational activities avoid areas that are risks to safe navigation. To the extent practicable, the Navy tries to deconflict its activities with recreational and commercial fishermen.
STG3-12	Seabirds & Shorebirds	Pg 3.10-2; para 1 Sect 3.10.1.1	Armed Forces must confer and cooperate with the USFWS re: adverse effect on a population of a migratory bird species. Mitigation to provide a predator-free breeding site for the breeding seabirds and shorebirds found on Guam and CNMI to compensate birds that were harmed or killed during military readiness activities.	The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office for ESA listed species. Bird species protected under MBTA are addressed in Section 3.10. Further, the Navy has designed conservation measures in cooperation with the USFWS to avoid, minimize, or offset potential impacts to migratory birds protected under the MBTA consistent with the DoD exemption. The conservation measures included in the DEIS have been updated to include: (1) quarterly seabird monitoring at FDM to continue the trend data for various rookeries, (2) rat eradication methods on FDM, (3) Micronesian megapode life history studies on Tinian and Sarigan, (4) 5-year interval "on-island" megapode surveys on FDM, (5) establishment of no training areas around swiftlet caves within the Naval Munitions Storage activity, (6) continued limitation of fire bucket training to the Fena Reservoir spillway, (7) training restrictions within potential megapode habitats on Saipan, and (8) scheduling of training on Saipan to limit impacts to nightingale reed warblers (avoiding peak nesting seasons). To augment these conservation measures, the Navy and Air Force updates INRMPs in cooperation with GovGuam DAWR and USFWS Pacific Islands Field Office as specified by the Sikes Act Improvement Act (SAIA), which includes monitoring of seabirds and shorebirds on DoD owned and leased lands on Guam and the CNMI.
STG3-13	Seabirds & Shorebirds	Pg 3.10-24 Sect 3.10.3.2	Alternative 1 is the preferred Alternative for the EIS/OEIS. However, the effects described to seabirds are vague in the section. A more detail understanding will need to be addressed in the EIS/OEIS under	The text has been updated to include the ecological stressors of wildland fire potential and percussive noise associated with FDM ordnance use. Because no new activities are proposed under Alternative 1 that may

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			Alternative 1.	impact seabirds and shorebirds, the impacts of Alternative 1 on seabirds and shorebirds are similar to those under the No Action Alternative. Activities proposed for Alternative 1 will increase frequency and intensity (e.g. amount of ordnance used on FDM); however, no new areas are proposed that will subject seabirds and shorebirds to effects not considered under the No Action Alternative. For instance, the impact areas on FDM under Alternative 1 and 2 are limited to 20% of the island, as with the No Action Alternative.
STG3-14	Terrestrial	Ch 3.11	Potential impacts to terrestrial habitats is not fully discussed in the EIS/OEIS. Most of the "pristine" limestone forest is located in military lands where MIRC activities will take place. Preserving the forest will be beneficial for the recovery of Guam's Threatened and Endangered Species.	Chapter 3.11 and Chapter 5 of the EIS has been updated to include clarifications that training does not occur within intact limestone forests within Navy Main Base or within the Naval Munitions Site, For example, bivouac training, which occurs within the Naval Munitions Site, has restrictions specifically designed to avoid or minimize potential impacts to forest habitats such as (1) no additional clearance for bivouac areas so that existing areas or previously cleared areas are used, and (2) vehicles restricted to existing roads.
STG3-15	Terrestrial	3.11	Change local name for Mariana common moorhen from Sasangat/Sasangal to Palattat/Ghereel bweel.	The Chamorro name for the Mariana common moorhen has been changed to Palattat / Ghereel bweel.
STG3-16	Terrestrial	Pg 3.11-48; para 1 Sect 3.11.2.2.12	Population Status and Distribution: historical data have been described in the EIS/OEIS for terrestrial species and habitats. Current information is needed to make appropriate comments. In addition, fruit bats observed only once at FDM should not be a basis for determining no impact at the training site. Presence of fruit bat at FDM should not be ruled out in the decision-making.	The Navy has completed various natural resource technical studies on Guam to provide the most current status information for Mariana fruit bats and Mariana swiftlets occurring on Navy lands on Guam. In addition, the Navy has funded other natural resource technical studies completed by the USFWS Pacific Islands Field Office in support of the proposed military relocation action. As of the publication of the DEIS, these studies were not available, but have been incorporated into the FEIS.
STG3-17	Terrestrial	Pg 3.11-51 Sect 3.11.2.4.1	A survey for the rare partulids on Guam must be conducted to determine presence/absence at the Finegayan Small Arms Firing Range, and other MIRC training sites (Orote, NAVMAG, AAFB, etc).	The types of training events, as described in the EIS/OEIS "may affect" parulid snails that may inhabit forested areas of training lands. The Navy, in consultation with the USFWS Pacific Islands Field Office has designed training measures that avoids, minimizes, or offsets potential impacts to Partulid snails. For example, within the Naval Munitions Site, no new bivouac areas will be established for proposed training and vehicle access within habitat areas will be restricted to existing roads. No forest clearance is being proposed for the training proposed in this EIS/OEIS. The Navy is also implementing an ungulate management plan on Navy lands, which will reduce the potential for ungulate trampling and wallowing that impacts the forest substrate, reduce browse pressure in the lower canopy and encourage emergent tree recruitment which is essential to maintain mesic conditions necessary for Partulid life histories. The Navy believes that these training measures are sufficient to limit potential direct and indirect

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				effects of the proposed action where the possibility of take is unlikely.
STG3-18	Terrestrial	Sect 3.11	Periodic Weather Events: Trisiropis obtusangula is misspelled. Change to Tristiropsis obtusangula.	This spelling has been corrected for this tree species.
STG3-19	Terrestrial Mitigation Measures	Pg 3.11-3.2 Ch 5	There is no mention of conservation measures for Threatened and Endangered species (swiftlets, crows, fruit bats, partullids, etc.) that will be impacts on Guam MIRC sites.	In addition to conservation measures associated with brown treesnake control and interdiction, the Navy has updated the conservation measures included in the DEIS with five specific actions to avoid, minimize, or offset potential impacts to ESA listed species. These measures were developed in consultation with the USFWS Pacific Islands Field Office and include: (1) Continuance of existing conservation measures from prior USFWS consultations (including consultations concerning Andersen AFB), (2) Development of an ungulate management plan on Navy lands, (3) Establishment of no training buffers (100-meters) around the three known Mariana swiftlet caves within the Naval Munitions Site, (4) Wetland buffers around ecologically sensitive areas at Fena Reservoir associated with Mariana common moorhens, and (5) Fire management planning within the Naval Munitions Site.
STG3-20	Terrestrial Seabirds & Shorebirds Mitigation Measures	Sect 3.10 3.11 Ch 5	Conservation Measures. For the seabirds and shorebirds known to reside on Guam, the Navy should fund BTS control to allow for successful reproduction to occur. In addition, Andersen AFB should implement BTS (and other predator) control measures at Pati Point fruit bat colony. A Biosecurity Plan must be developed and approved by Guam DAWR, USDA-WS, CNMI-DFW and USFWS before implementation for interdiction.	See response to FED1-2.
STG3-21	Seabirds & Shorebirds Terrestrial Mitigation Measures	Sect 3.10 3.11 Ch 5	Quarterly seabird population monitoring at FDM: monthly monitoring should occur at FDM after the conclusion of MIRC activities until there is an indication that the population of seabirds are close to the numbers prior MIRC activities.	In consultation with the USFWS Pacific Islands Field Office, the Navy has concluded that quarterly seabird monitoring at FDM is sufficient to continue the trend data for various rookeries on the island. The monthly trend data, which dates back to 1999, has shown fluctuations which seem to be independent of training activities. The monthly surveys on FDM also indicate that the bird population is holding steady.
STG3-22	Water Quality	Pg 3.3-16 Sect 3.3-16	Cyanide is going to be released into marine environments from torpedo testing. No study to show the long-term effects of this? Why are no action alternative levels being used for these?	The information cited in the comment is under the analysis of the "No Action Alternative." Tables 3.3-12 and 3.3-13 present the amount of torpedoes used under Alternative 1 and Alternative 2, respectively. As discussed in the section, HCN is highly soluble in seawater resulting in a concentration less than the EPA acute and chronic national recommendation of 1 ug/liter in marine waters.
STG3-23	Water Quality	3.16	Lead weights being released not the substrate. This lead is still accessible to burrowing organisms, and thus still able to enter the food chain.	The lead weights are encased in a steel jacket, which makes contact with the lead by burrowing organisms unlikely.

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STG3-24	Water Quality	Pg 3.3-17	2.46 tons of material annually from sonobuoy deployments. No cumulative impacts?	Expended sonobuoys will accumulate in the ocean bottom over time. Sonobuoy hazardous constituents will be released to the ocean water, however, concentrations will be very low.
STG3-25	Water Quality	Pg 3.3-18	0.86 tons of residue from pyrotechnics. Why are no action alternative levels being used for these?	The information cited in the comment is under the analysis of the "No Action Alternative." Tables 3.3-12 and 3.3-13 present the amount of pyrotechnics (flares) used and the corresponding amount of residue generated under Alternative 1 and Alternative 2, respectively.
STG3-26	Water Quality	Pg 3.3-21	Piti mine neutralization site in 125 feet of water. In the MPA? If this is taking place in the Piti MPA, this is not compatible with the function of the MPA.	The Piti floating mine neutralization area is located approximately 1 nm northwest of the Piti Bomb Holes MPA.
STG3-27	Water Quality Mitigation Measures Transportation	Pg 3.3-21 Ch 5 3.14	100 pound and 500-pound NEW explosives use in W-517. Why the increase to 500 pounds. What will the effect be on marine mammals and reptiles? What guarantees are there these explosives will not be used near offshore banks that fall within 5-17? How will fishermen be notified when these detonations are going to occur?	The Proposed Action and Alternatives are focused, critical enhancements and increases in training that are necessary to maintain a state of military readiness commensurate with the national defense mission. The actions evaluated in the EIS/OEIS are needed to support current, emerging, and future training and RDT&E activities. These actions include: • Maintaining baseline training and RDT&E activities at mandated levels; • Increasing training activities and exercises from current levels; • Accommodating increased readiness activities associated with the force structure changes which include human resources, new platforms, additional weapons systems, including undersea tracking capabilities and training activities to support ISR/Strike; and • Implementing range complex investment strategies that sustain, upgrade, modernize, and transform the MIRC to accommodate increased use and more realistic training scenarios. The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office and the NMFS Office of Protected Resources. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources are addressed in the consultations. The NMFS jurisdiction covers marine resources, including sea turtles in nearshore and open ocean habitats and the USFWS jurisdiction covers terrestrial resources, including sea turtles on land and nesting habitats. Conservation/mitigation measures developed from these consultations to avoid and/or minimize any potential adverse effects are included in the EIS. In addition, the Navy requested a Letter of Authorization (LOA) from NMFS under MMPA for incidental harassment of marine mammals resulting from training activities proposed in the MIRC. As part of the LOA application, a monitoring plan was developed, with NMFS input, and will be implemented during training exercises involving sonar and explosives to determine the effectiveness of

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				the mitigation measures. Adaptive management is an integral part of the monitoring plan. Refer to Chapter 5 for a complete list of mitigation measures to avoid and/or minimize these impacts associated with the resource areas assessed in the FEIS/FOEIS, and Section 3.8 for specific measures for nesting sea turtles. NOTMARs and NOTAMs are used to alert the public to when training occurs in W-517. As appropriate, mitigation measures are adopted to avoid shallow water areas and to protect the public. Fish mortality associated with training activities within the MIRC are discussed in Section 3.9 (Fish and Essential Fish Habitat).
STG3-28	Regional Economy Marine Communities	3.16 3.6 3.7	Number of exercises in W-517, increased impact to fishermen who use southern banks. Risk of physical damage to marine resources.	See response to STG3-27.
STG3-29	Marine Communities Fish	3.6 3.9	Underwater explosions. The probability is that more than plankton will be affected. Current operations have led to fish mortalities, and increased levels of operation would probably lead to increased levels or mortality.	Fish mortality associated with training activities within the MIRC are discussed in Section 3.9 (Fish and Essential Fish Habitat). Further, the Navy has added a monitoring measure for fish mortalities associated with UNDETs in nearshore environments.
STG3-30	Marine Communities	Pg 3.6-5 Tbl 3.6-1	Accumulation in substrate. Accumulation of expended materials in substrate exposes benthic communities to unknown risks, and can still expose the food chain to accumulations of toxic materials.	The CNMI Senate requested the Agency for Toxic Substances and Disease Registry (ATSDR) on 19 February 2008 to conduct a public health assessment on FDM of toxic substances released by bombs and the "bioaccumulation of these toxins in consumable pelagic fish." The Agency, in its letter to the CNMI Senate on 24 September 2008 concluded that "pelagic fish caught in the open water are not likely to contain high levels of explosive residues from the neighboring Farallon de Medinilla bombing range and will not pose a public hazard to people who eat them." The conclusion is supported by the Agency's "Preliminary Assessment of Pelagic Fish Caught in the Open Pacific" (ATSDR 2008). The deposition of expended training materials on the ocean bottom is likely to have negligible impacts because expended materials are distributed widely across open ocean areas and the majority of items are inert and would have little impact. Benthic habitat could be disrupted locally, however, over the long-term, deposited materials could provide new, hard substrate for benthic communities to utilize. See Section 3.6. The quantities of hazardous substances (in expended training materials) in the soils, sands, and sediments of the MIRC training areas would gradually

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				accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposures is limited and public access to training areas is restricted. See Section 3.2 for details.
STG3-31	Marine Communities	Pg 3.6-6 Tbl 3.6-1	Collision with coral reef habitat. Amphibious craft, while potentially not colliding with reef directly, can cause sedimentation and pressure waves that do damage corals.	See response to STG1-3.
STG3-32	Marine Mammals Recreation Regional Economy	3.7 3.17 3.16	Underwater demolitions in Agat. Potential to injure marine mammals and disrupt dolphin-watching tourism. Even without direct injury, increased noise and activity could alter dolphin behavior, causing them to leave the area.	See responses to STG1-13 and STG2-5.
STG3-33	Marine Mammals	3.6 3.9	Release of chaff. Ingestion of chaff by marine organisms and birds is a concern. Concern for damage is more physical than chemical.	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
STG3-34	Marine Communities	Sect 3.6-17	FADs. What measures are being taken to eliminate interactions between FADs and Navy vessels?	FADs are noted on navigation charts. Watchstanders and lookouts on the bridge will ensure FADs and other obstacles are avoided. FADs are also visible on radar.
STG3-35	Marine Communities	Sect 3.6-26	Detonations over soft bottoms. Soft bottoms are habitat for a number of species of ecological as well as fishery resource importance.	Fish mortality associated with training activities within the MIRC are discussed in EIS, Section 3.9 (Fish and Essential Fish Habitat).The MIRC proposes only one location where detonations occur on the bottom. Further, the Navy has added a monitoring measure for fish mortalities associated with UNDETs in nearshore environments. The Summary of Effects and Impact Conclusion for Marine Mammals in Section 3.7 indicates that under Alternative 1 (Preferred Alternative) for underwater detonations and explosive ordnance there is a potential occurrences of Level B harassment events (sub-TTs and TTS) and modeling results for territorial and non-territorial waters indicate potentially 151 Level B harassments (109 from sub-TTS and 42 from TTS),which includes analyses for JDAMs and HELLFIRE use within the MIRC. No Level A exposures are anticipated.

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STG3-36	Marine Communities	Pg 3.6-30 Tbl 3.6-2	Underwater detonations and ordnance. Detonations do kill benthic organisms, including fish, on soft substrates. Additionally there is a risk for injury or death for mobile marine organisms, including marine mammals and reptiles.	See response to STG3-35.
STG3-37	Regional Economy Marine Mammals Recreation Terrestrial	3.7 3.II 3.16 3.17	All activities using underwater explosions. Number of exercises in W-517. Increased impacts to fishermen who use southern banks. Risk of physical damage to marine resources. Potential for level A harassment of marine mammals. Level B harassment of marine mammals may disrupt recreational and commercial activities. Potential for harm to marine reptiles.	NOTMARs and NOTAMs are used to alert the public to when training occurs in W-517. As appropriate, mitigation measures are adopted to avoid shallow water areas and to protect the public. See response to STG3-35.
STG3-38	Marine Mammals	3.7	Underwater demolition. Potential for level A harassment of marine mammals.	Though the potential exists, modeling did not show level A harassment. With mitigation measures, the potential for level A harassment is not anticipated. See response to STG3-35.
STG3-39	Marine Mammals	Pg 3.7-18	Dugongs. Dugongs have been recorded from Guam. UOGML Technical Report 17, from 1975.	In the 2007 Biological Opinion for Valiant Shield Training Exercises, the NMFS did not include the dugong in the species list that may be directly or indirectly affected by that proposed action. The Navy discusses species that are excluded from analysis (and reasons why) in Section 3.7.2.1.2 of the MIRC EIS/OEIS. In summary, the Navy's determination that the dugong is extralimital (highly unlikely to occur within the MIRC) is consistent with (1) NMFS Biological Opinions for past actions in the MIRC EIS/OEIS Study Area, (2) the Section 7 ESA consultation between the Navy and NMFS associated with the MIRC EIS/OEIS, and (3) the most recent dugong species distribution.
STG3-40	Marine Mammals	Pg 3.7-19	Marine mammal survey. Weather conditions were rough during this survey, resulting in conditions not favorable for marine mammal viewing. Counts probably underestimate true marine mammal abundance.	The Navy-funded vessel-based systematic marine mammal survey, the first for this area, was conducted for three months during the period when baleen whales would be present or migrating through the area. The protocols followed those developed by National Marine Fisheries Service (NMFS) and the observers were all NMFS trained and experienced in tropical species. The sei whale which was not expected to occur within the MIRC was seen nearly 20 times during the survey. The method used to calculate abundance and density estimates used a conservative approach and was reviewed by staff of NMFS and the Research Unit for Wildlife Population Assessment (RUWPA) from the Centre for Research into Ecological and Environmental Modelling (CREEM). This is currently the best scientific data available for abundance and density estimates for this area. Refer to Section 3.7.2.1.3.

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STG3-41	Marine Mammals	Pg 3.7-45	Cuvier's Beaked Whale. A Cuvier's beaked whale stranded alive in Piti in August 2007. This was two weeks after a major military exercise utilizing mid-range sonar was conducted in the area. In January, 2008, a beaked whale, species indeterminate due to advanced state of decomposition washed ashore in Piti.	There is no evidence of a relationship between the 2007 stranding and sonar training activities.
STG3-42	Marine Mammals	Pg 3.7-46	Dwarf Sperm Whale. A young Dwarf Sperm Whale was found floating in Cocos Lagoon in August 2002.	There is no evidence of a relationship between the dwarf sperm whale found in 2002 and sonar training activities.
STG3-43	Marine Mammals	Pg 3.7.2.3.5	Sperm whales have been photographed and videotaped giving birth in waters near Facpi Point Guam in June 2001 (Google Search: sperm whales Guam). Any detonations in this area can potentially disrupt birthing of this E.S.A. listed species. Sperm whales were also the most frequently cited cetacean in the waters around the Mariana islands in a recent marine mammal survey chartered by DoN. (DoN 2007). Based on the frequency of sightings, this E.S.A. listed species is the most likely to be impacted by detonations in waters off the coast of Guam.	There are no proposed UNDET activities near Facpi Point, Guam.
STG3-44	Marine Mammals	Pg 3.7-119	Sperm whales. The increased boat activity greatly increases the potential for boat strike of sperm whales. As this was the cetacean sighted most frequently in a recent survey of marine mammals, the likelihood of vessel strikes seems to be high for this E.S.A. listed species.	Navy lookouts undergo extensive training in order to qualify as a watchstander. This training includes on-the-job instruction under the supervision of an experienced watchstander, followed by completion of the Personal Qualification Standard program, certifying that they have demonstrated the necessary skills. In addition to these requirements, Fleet lookouts periodically undergo a 2-day refresher training course. The Navy includes marine species awareness as part of its training for its bridge lookout personnel on ships and submarines. This training addresses the lookout's role in environmental protection, laws governing the protection of marine species. Chapter 5 of the EIS has been revised to include a Range Monitoring Plan, reporting requirements, adaptive management, etc. Range specific monitoring plans will also be included in the Final Rule and posted via the NOAA web site. Some components of the monitoring and mitigation plan are being implemented and the Navy is continuing to develop other components of the monitoring and mitigation plans in cooperation with NMFS. Monitoring and mitigation will be used both as: 1) a planning tool to focus Navy monitoring priorities (pursuant to ESA/MMPA requirements) across Navy Range Complexes and Exercises; and 2) an adaptive management tool, through the consolidation and analysis of the Navy's monitoring and watchstander (lookout) data, as well as new information from other Navy programs (e.g., research and development), and newly published non-Navy information.

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				According to the cetacean survey of the MIRC, baleen whales are only found in small numbers. Baleen whales are particularly susceptible to ship strikes (Nowacek et al. 2004; Panigadea et al. 2006; Douglas et al. 2008) However, major training exercises generally take place in the summer season when baleen whales have moved north to temperate/polar feeding areas. As a predator of fish and squid, sperm whales must hunt for their prey making them more cognizant of their environment than the baleen whales which feed on large patches of zooplankton species. Sperm whale acoustic abilities are also greater than those of baleen whales and would be able to detect vessels.
STG3-45	Sea Turtles	Pg 3.7-121	Parachutes. Sea turtles are well known for their propensity to ingest materials such as balloon and plastic bags that they mistake for food items. There is a risk that a parachute could result in a similar incident.	The Navy, as part of the Section 7 ESA consultation with NMFS has concluded that ingestion of expended training materials may affect ESA listed sea turtles (all sea turtles that may nest or occur in nearshore or open ocean areas of the MIRC are ESA listed). Due to the wide dispersal of expended training materials during training within the MIRC, and due to specific characteristics of parachutes, assemblies, and other material, the Navy believes that take resulting from expended training material is unlikely to occur. Parachutes, for example, are weighted with a 0.06-kg (2-ounce) steel material weight, which causes the parachute to sink from the surface within 15 minutes. This amount of time on the surface may potentially affect sea turtles at sea; however, due to the wide dispersal of sea turtles, the exposure to this potential foraging item is remote.
STG3-46	Marine Mammals	Pg 3.7-124	Marine mammal table. This table only examines the effects of sonar on the hearing of marine mammals. The potentially greater threat is the alteration in animal behavior. Sudden sonar noise can lead to uncontrolled ascents, causing a condition similar to the bends in whales, especially beaked whales.	There is no evidence to support the hypothesis that marine mammals make uncontrolled ascents in response to a surface noise which would cause decompression sickness (the bends or embolism). Marine mammals typically swim away and dive in response to a surface disturbance. Tyack et al. (2006) stated "the deep-diving behavior of beaked whales is unlikely, under current models of nitrogen diffusion, to heighten the risk of embolism.
STG3-47	Marine Mammals	Pg 3.7-129	Sperm whales. Only noise levels are looked regarding damage to whales. The risk of injury or death due to alteration in swimming behavior is potentially greater. Additionally sonar use could disrupt pupping behavior in sperm whales.	There is no evidence to suggest that short duration exposure to active sonar has caused any indirect effects, long term behavioral response or population effects to marine species. Animals exposed to sonar may only be exposed 2-3 times a minute for several minutes as the ship moves through an area. The exception being the Bahamas stranding incident and that area has a very different bathymetry compared to the MIRC (see Section 3.7.3.1.1). There is no evidence to support the hypothesis that marine mammals make uncontrolled ascents in response to a surface noise which would cause decompression sickness (the bends or embolism). Marine mammals typically swim away and dive in response to a surface

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				disturbance. Tyack et al. (2006) in a study of another deep diving species the Cuvier's beaked whale, stated "the deep-diving behavior of beaked whales is unlikely, under current models of nitrogen diffusion, to heighten the risk of embolism. See response to STG3-35.
STG3-48	Marine Mammals	Pg 3.7-132	Cuvier's beaked whale. Cuvier's beaked whales strandings have been strongly associated with mid range sonar use around the world. On Guam, in August, 2007, a Cuvier's beaked whale was stranded two weeks after major military exercises in the area that used mid range sonar.	There is no evidence of a relationship between the 2007 stranding and sonar training activities. This stranding occurred several weeks after VS07. In addition, there is no evidence to suggest that short duration exposure to active sonar has caused any indirect effects, long term behavioral response or population effects to marine species. Animals exposed to sonar may only be exposed 2-3 times a minute for several minutes as the ship moves through an area. The exception being the Bahamas stranding incident and that area has a very different bathymetry compared to the MIRC (see Section 3.7.3.1.1).
STG3-49	Marine Mammals	Pg 3.7-180	Take of beaked whales. In spite of the statement that the Navy does not anticipate that marine mammal strandings or mortality will result from conducting MIRC training activities within the Study Area, the Navy is requesting for the take of 10 beaked whales in the MIRC Study Area. This seems a contradiction, though take of beaked whales seems likely, with the relatively strong correlation between mid range sonar use and strandings of beaked whales around the world, including Guam.	The Navy does not anticipates that marine mammal strandings or mortality will result from the use of LFA, MFA or HFA sonar during Navy exercises within the MIRC. However, given the potential for naturally occurring marine mammal strandings in MIRC (e.g., natural mortality), it is conceivable that a stranding could co-occur with a Navy exercise even though the stranding is actually unrelated to and not caused by Navy activities. Accordingly, the Navy's LOA application will include requests for take, by mortality, of the most commonly stranded non ESA-listed species, which are the beaked whales.
STG3-50	Sea Turtles	Pg 3.8-5 Tbl 3.8-1	Inner harbor detonations. Sea turtles are frequently seen in inner Apra Harbor. Poor visibility in the inner Apra Harbor makes it likely that a turtle would be missed by observers, and take could result. Additionally, there is an increased risk of mortality due to ingestion of expanded materials.	In 1993, NMFS issued a BO in consultation with the Navy for MW training within Apra Harbor. The Navy was authorized to take up to 10 sea turtles per year through harassment. Of these authorized harassment takes, the NMFS authorized one injury or mortality per year of the sea turtle species that occur within Apra Harbor. As part of the BO, NMFS recommended several conservation measures to reduce the adverse effect. Since the 1993 BO, the Navy has expanded many conservation measures to reduce impacts to sea turtles associated with Navy activities within Apra Harbor. It should be noted that no injury or mortality of sea turtles have been observed by NAVFACPAC and NAVFACMAR natural resource specialists during UNDET training within Apra Harbor. UNDET activities associated with Agat Bay, as with Apra Harbor, are not expected to result in injuries or mortalities of sea turtles, but may result in short term behavioral responses. See response to STG3-35.

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STG3-51	Sea Turtles	Pg 3.8-8 Tbl 3.8-1	Amphibious craft. Sea turtles have nested in Apra Harbor, both historically and recently. The use of amphibious craft in Apra Harbor could impact sea turtle nesting sites.	The EIS has been revised to discuss the beach training activities that are conducted in accordance with the guidance published in the Mariana Training Handbook (COMNAVMARIANAS Instruction 3500.4) and the mitigations described in Chapter 5 (Mitigation Measures). Prior to beach landings by amphibious vehicles, known sea turtle nesting beaches are surveyed by Navy biologists for the presence of sea turtle nests no more than six hours prior to a landing exercise. Areas free of nests are flagged, and vehicles are directed to remain within these areas. LCACs stay on-cushion until clear of the water and within a designated Craft Landing Zone (CLZ). Within the CLZ, LCAC come off-cushion with the LCAC oriented to permit expeditious vehicle and cargo offload onto a cleared offload and vehicle traffic area. Although LCAC and expeditionary vehicle traffic typically do not leave ruts, some compaction of sand in vehicle tracks is possible. If restoration of beach topography is required it is conducted using non-mechanized methods.
STG3-52	Sea Turtles	Pg 3.9-10 Tbl 3.9-1	Detonations in inner Apra Harbor. The Navy currently conducts anti mine detonations in Apra Harbor. There has been a 100% mortality rate with these operations (every operation has led to the death of fish). Additionally, these detonations have taken place over soft muddy or sandy substrates. These substrates are habitat to a diverse fauna, and any detonation on this habitat will seriously impact these organisms.	The Navy acknowledges that UNDETs associated with anti-mine warfare will induce fish mortalities; however, the Navy minimizes the effects of these activities by (1) limiting the UNDET NEW to 10 pounds, (2) the Navy routinely invites regulatory personnel (GovGuam DAWR) personnel to observe UNDET activities at the Inner Apra Harbor UNDET site, and (3) conducting the UNDET activities at the same location. In other words, no new substrates are impacted because the same UNDET location within Inner Apra Harbor is utilized for each exercise. See response to STG3-35.
STG3-53	Mitigation Measures Terrestrial Marine Communities	3.6 3.11	No mitigation measures addressed for terrestrial and marine habitats, and terrestrial species (fruit bat, crow, moorhen, land snails, etc.) EIS/OEIS would need to address specific mitigation measures for species of concern and their habitats.	See response to STG3-51.
STG3-54	Mitigation Measures	5-1 thru 5-25 Ch 5	Chapter 5 mitigation measures – focuses more on Best Management Practices and Standard Operating Procedures. Mitigation is lacking for impacts resulting from MIRC activities.	See response to STG3-51.
STG3-55	Mitigation Measures	Pg 5-14 Sect 5.2.3.1	Conservation measure – adaptive management – mitigation will need to include impacts to terrestrial species and habitats. DEIS/OEIS documents mitigation on marine mammal habitats.	See response to STG3-51.
STG3-56	Mitigation Measures	Pg 5-14 Sect 5.2.3.1	Increased monitoring will need to occur for the probability of detecting the locally endangered Mariana fruit bat at the MIRC Study Area, especially at Firing Ranges.	All KD ranges have safety personnel assigned that monitor range activity and ensure compliance with safety and environmental regulations.

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STG3-57	Mitigation Measures Terrestrial	Pg 5-23 3.11	Nowhere in the DEIS/DOEIS mentions ungulates, or impacts caused by ungulates. It is unclear why the Navy proposes Ungulate Management Plan on Navy Lands? A description of the problem(s) caused by these animals need to be included.	The Navy recognizes ungulate management on DoD lands as an integral part to the recovery of ESA listed species and habitats. Section 3.11 describes the direct and indirect effects of ungulate pressure on Guam's native habitats, and these issues are also addressed in INRMP documents covering the Navy-owned lands and Andersen AFB.
STG3-58	Mitigation Measures Terrestrial	Pg 5-23 3.11	Navy will need to request for a revocable permit from the Department of Agriculture to remove ungulates in Navy lands.	The Navy has completed a draft environmental assessment for the ungulate management plan on Navy lands. This environmental assessment addresses permitting needs, specifically, depredation permits and compliance with applicable Guam game wildlife regulations.
STG3-59	Mitigation Measures Terrestrial	Pg 6-23 3.11	The Final EIS/OEIS will need to focus on minimizing the potential spread of "ALL" invasive species entering and exiting Guam and CNMI.	As part of the informal Section 7 ESA Consultations between the Navy and the USFWS Pacific Islands Field Office and the Navy and NMFS Office of Protected Resources, the Navy has included conservation measures specifically targeted at brown treesnake control and interdiction. The regional biosecurity plan is still in development, and the Navy is a contributing agency to the Brown Treesnake Technical Working Group. The brown treesnake control and interdiction efforts described in the conservation measures within this EIS/OEIS are concerned with avoiding, offsetting, or minimizing potential introductions of invasive species associated with increased training. The Joint Region INRMP will address other brown treesnake and invasive species control needs, and the biosecurity plan will cover all aspects of Navy activity within the MIRC. Specific measures within the MIRC EIS/OEIS include: (1) The inclusion of a group of conservation measures under the heading "*Conservation Measures for Predators, Pests, and Plants: Invasive Species Management Associated with MIRC Training Activities*". (2) Inclusion of a measure entitled: Brown Treesnake Interdiction and Control and DoD participation in the Brown Treesnake Control Plan. (3) Self-Inspection Training for Personnel and Awareness: Avoidance Invasive Species Introductions. (4) DoD participation in the Regional Biosecurity Plan (5) Cooperative development of regional training SOPs and Exercise Planning

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				For specific descriptions of these measures, please see Section 3.11 and Chapter 5 (Mitigation).
STG3-60	Cumulative Impacts Terrestrial	3.11 Ch 6	The Final EIS/OEIS will need to define, in detail, impacts associated with the implementation of the preferred Alternative on terrestrial ecosystem.	Refer to Section 3.11.3 for the environmental consequences on the terrestrial ecosystem. See response to STG3-51.
STG3-61	Mitigation Measures Terrestrial	Pg 6-23 Sect 6.2.4 3.11 Ch 5	Mitigation plans must be developed and implemented for terrestrial ecosystem to less than significant levels.	See response to STG3-51.
STG4-1	Cultural	3.13	In Section 3.13.2.2 Guam Offshore and Section 3.13.3.1 Guam Offshore, reference is made to Carrell et al 1991 as the only submerged archeological survey conducted on Guam. However, a recent submerged archaeological resources survey in support of the Joint Guam Build-up was conducted in Agat Bay and Tipalao Bay by Southeastern Archaeological Research, Inc. based in Gainesville, Florida. If a preliminary report from this survey can be acquired the results should be included, particularly if submerged resources were discovered in the course of the survey.	As much up to date information including the new AMTRAK location off of Agat have been incorporated into the training constraints maps. The JGPO underwater study report is still in preparation and any new information will be added to the maps as an amendment. However, initial feedback from the underwater field crew is that no submerged resources eligible for the National Register of Historic Places have been identified so far.
STG5-1	Airborne Noise	3.6	Noise pollution. Back in 1994 the Navy was conducting touch and go landings and take-offs at the Naval Air Station, Agana, now known as the Tiyan airfield. The jet aircraft were flying directly over the Tumon hotel row and the civilian hospital, Guam Memorial Hospital, as well as the Mental Health Facility. When video proof of this fact was presented to the Admiral, COMNAVMARIANAS, he learned that he had been lied to by the squadron commander who had presented, falsely, that his planes were avoiding these routes. Still, however, the Admiral responded to the complaint with an official written position that no laws or regulations were violated by the flights although they would; of course, continue to strive to avoid disturbing anyone. The noise was deafening, preventing the sick and newborn from sleeping. If such noise was legal and did not violate any regulations, then those regulations need to be changed. More recently, when the latest generation of aircraft, the stealth planes, came to this area, they broke the sound barrier over Saipan, breaking several windows. Again, the official position was that no regulations were broken.	See responses to FED2-3, STG1-20.

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			The MIRC EIS needs to rectify this situation.	
STG5-2	Proposed Action Alternative Development	Ch 2	My second comment regards the future firing ranges for the Marines coming to Guam. Although we were informed that the MIRC EIS pertains only to current and anticipated training excluding the Marine buildup, we should recognize the obvious. They are coming and they are coming in the near future. The Marines are looking at obtaining the use of additional land for live firing ranges in addition to the 26 percent of the island already owned by the military. This is very controversial in light of the land takings by the military after World War II. I have recently come into information that the three current firing ranges on island could be expanded to meet the needs envisioned for our Marines. The Terague Beach firing range, in particular, could be expanded to meet the MK19 hand grenade training requirements if the firing arcs are oriented properly. I strongly recommend that the MIRC EIS include this Schofield Barracks plan and consider its adoption for the anticipated needs of our Marines commencing about 2014.	Environmental impacts associated with the proposed construction and/or expansion of live fire ranges in Guam due to the relocation of the marines will be addressed in the Marine Relocation EIS. The Proposed Action and alternatives discussion in Chapter 2 cover the existing USMC training. Cumulative impacts from additional training are addressed in Chapter 6.
STG6-1	Irretrievable Allocation of Resources	Ch 4	Contracting. Our analysis shows that only 7% of the local businesses undertake contracts let by federal and military components. Part of the reason for this low participation rate is the inability to plan well in advance of procurements. The EIS does not help correct this problem nor are we able to verify its findings that there will be minor irretrievable allocation of resources as it does not specifically identify the improvements and modifications (and their costs) needed for the training ranges to satisfy the objectives established under the preferred alternative. The absence of this information increases the difficulty of understanding impacts on the community.	The DoD follows the Federal Acquisition Regulations (FAR) for contracts and procurements. Improvements and modifications to existing training facilities will be minor and will not consist of MILCON-type projects.
STG6-2	Proposed Action	Ch 2	As stated in the EIS/OEIS, training ranges already in place will continue to be used and no additional ranges will be established and that military construction projects are not planned. If existing ranges will continue to be used and MILCON projects are not planned, additional impacts would not be expected above and beyond the impacts already experienced. However, the EIS does mention improvements and upgrades to the ranges will be made and it is these improvements and upgrades that need to be specifically identified and assessed.	The Proposed Action includes minor repairs and upgrades to facilities and capabilities but does not include any military construction and land acquisition. Examples of minor repairs and upgrades may include replacing targets and repairing structures at MOUT facilities (e.g., replacing doors, windows).
STG6-3	Regional	3.16	In addition, the EIS should evaluate secondary impacts of the preferred alternative including the extent to which on-island spending is	Socioeconomic impacts of training events are evaluated using the best available data in the EIS in sections 3.12 (Land Use), 3.14

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	Economy Demographics	3.15	increased (or decreased) by military personnel as well as other impacts (e.g., crime and other social issues) upon completion of training. It is no secret that training events usually result in an increase in Guam's population soon after training ends. Socio-economic impacts of post-training events must be evaluated in the EIS.	(Transportation), 3.15 (Demographics), 3.16 (Regional Economy), 3.17 (Recreation), 3.18 (Environmental Justice and Protection of Children), and 3.19 (Public Health and Safety).
STG7-1	Marine Communities Sea Turtles	3.6 3.8 ES Table ES-3 Pg ES-16 Line 3.1	Besides impacts on sandy beaches that "would be similar to that from normal wave actions", the compaction of the sand by military craft and vehicles must be addressed.	Conservation measures have been identified to minimize damage to live coral, fish kill, sand compaction, and erosion, including LCAC staying on cushion until landing on the beach. Beach landings are infrequent and restricted to designated beaches on military land. These beaches are comprised of mixed sand and coral rubble which are resistant to compaction. LCACs are on full cushion for beach landings and designed not to compact the sand. AAVs are tracked vehicles, and by design distribute weight to minimize impacts to the beach. Environmental monitors are present during beach landings to ensure environmental compliance is adhered to. Following beach landing activities, beach topography would be restored to smooth out ruts left by military training vehicles on the beach.
STG7-2	Regional Economy Mitigation Measures	3.16 Ch 5 ES ES-26 Table ES-3	Table ES-3: Section 3.16, Any increase in training will result in the loss of subsistence and recreational fishing. What are DoDs plans to compensate this loss of fishing activities?	The EIS analyses very much considered the fishermen and their interests in the FDM waters. The proposed surface Danger Zone is required due to operational needs that will be communicated to the public through additional methods listed below. FDM constitutes the most important bombing range in the Western Pacific. As new air-to-surface weapons technologies enter military service, they must be exercised and military personnel must train to use them. These new technologies require ever greater airspace to accommodate air-to-surface employment parameters. The greater airspace in turn requires larger surface footprints under the airspace to ensure safety on the ground and sea surface. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex. See response to STG3-35.
STG7-3	Public Involvement	Ch 1 Table ES-1	The table does not show the date and location of public scoping. Specific attendees and public comments during the scoping should be referenced as an attachment or appendix.	The FEIS includes information as requested.
STG7-4	Marine	3.7	Under "Sonar Use", beyond the modeling, how will harm or mortality to	The Navy conducted Section 7 ESA consultations with NMFS and USFWS. Conservation measures developed from these consultations are

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	Mammals Mitigation Measures	Ch 5 Table ES-3 Pg ES-19 Line 3.7	marine mammals be monitored during actual training exercises?	included in the EIS. In addition, the Navy requested a Letter of Authorization (LOA) from NMFS under MMPA for incidental harassment of marine mammals resulting from training activities proposed in the MIRC. As part of the LOA application, a monitoring plan was developed, with NMFS input, and will be implemented during training exercises involving sonar and explosives to determine the effectiveness of the mitigation measures. Adaptive management is an integral part of the monitoring plan.
STG7-5	Sea Turtles	3.8 Table ES-3 Pg ES-21 Line 3.8 <12 nm	Have adequate assessments been made to support the claim that "No nest failures have occurred within the MIRC"? How is this claim justified?	The sentence should read “No nest failures have occurred within the MIRC associated with military training.”
STG7-6	Recreation	3.17	Underwater detonation injures and kills more than "fish eggs and larvae". Mine countermeasure training in Apra Harbor has regularly resulted in mortality of numbers of adult fishes. Increased training will increase numbers of fishes killed. An estimate should be provided of numbers of fishes to be killed by future increased activities, based on projections of past mortalities due to detonations during trainings. The projections should be compared to estimated populations of vulnerable species in the impact zone of this training.	As part of the MMPA/ESA consultation with NMFS, a monitoring program to include monitoring at UNDET sites at Apra Harbor and Agat Bay will include post activity monitoring for fish kills. Navy UNDET training is an essential perishable skill that must be kept current through continuous training. Training includes use of inert mine shapes and limited live underwater detonations. The infrequency of live training that occurs in Agat Bay and Apra Harbor is likely to have minimal impact on the resources. The activities are consistent with the proper use of Agat Bay and Apra Harbor and are consistent with the management of the natural resource. This training was fully reviewed and evaluated in the 1999 EIS. The Navy has continually invited Guam EPA and DAWR to observe each UNDET in Apra Harbor and Agat Bay. In the past ten years the agencies have not voiced concerns that the limited fish kills have had an appreciable negative effect on the resource. See response to STG3-35.
STG7-7	Exec Summary	ES	Foreign fishing boats passing through the MIRC or fishing within it (such as the Asian tuna long-liners in the FSM EEZ), do not stay within shipping lanes nor read the Notice to Mariners. How will impacts on these vessels be avoided?	See response to FED2-3.
STG7-8	Regional Economy Recreation Marine	3.16 3.17	There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals.	The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures in consultation with NMFS under provisions of the MMPA. Refer to Chapter 5 for specific mitigation measures. See response to FED2-3.

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	Mammals	3.7		
STG7-9	Hazardous Materials	3.2 Pg ES-27 ES-8	The Navy is justifying no impacts by indicating that the training area is large so there will not be one location accumulating the waste. Is DoD proposing the solution to pollution is dilution?	DoD's analysis indicates the amount of expended material is not significant. See Section 3.2. Section 3.2 Hazardous Materials provides detailed information regarding this comment. The quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. For land ranges, hazardous substances are deposited on the surface of the soil and confined within the perimeter of the range. Releases of munitions constituents from explosives, ordnance, and small arms rounds used during training exercises have no short-term impacts to the environment. No long-term degradation of marine, surface, or groundwater quality is anticipated under the Proposed Action or Alternatives. The proposed training activities in the MIRC would have unavoidable effects on ocean and surface water quality. Trace quantities of hazardous materials and hazardous constituents of training materials would be discharged into these waters, and training activities that re-suspend bottom sediments would reintroduce contaminants contained in these sediments to the water column. Contamination of surface drainage areas from runoff would continue. Contaminant accumulation in waters from leaks or spills of hazardous substances may occur. Siltation and formation of sediment plumes may form in water bodies where training activities occur. Training activities would continue to be conducted with implementation current protective measures described in Subchapter 3.3.2.1 and Chapter 5. While unavoidable, these temporary effects on water quality would not result in adverse effects.
STG7-10	Proposed Action Regional Economy Cumulative Impacts	Ch 2 3.16 Ch 6 Pg ES-27 ES-8 Cumulative	The cumulative impact of both military and civilian construction in the foreseeable future may require quarry materials to be imported from off island if the local quarries cannot meet demand. If these quarry shipments will arrive at the Guam Port where will these materials be staged assuming the ships carrying the material have to disembark right away due to the increase shipping and berthing activities at the port. It is likely that valuable space near and around the port will be scarce. Will these shipments be certified at point of origin prior to arriving? Currently Guam EPA inspects sand and quarry materials	The proposed action does not involve the construction of new facilities on Guam, therefore, quarry materials will not be imported under this proposed project.

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		Impact	coming into port and may be overwhelmed by increases in shipment.	
STG7-11	Marine Mammals Mitigation Measures	3.7 Ch 5 ES-28, Para ES 9.2	ES 9.2: 2nd paragraph, Will DoD provide a plan and schedule to accomplish this documentation?	The draft MIRC Marine Mammal Monitoring Plan was provided in the draft NMFS MMPA Proposed Rule issued in August 2009 . The monitoring plan provides at sea monitoring during major exercises, near shore monitoring for UNDETs, and monthly monitoring as part of the INRMPs for near shore resources.
STG7-12	Ch 4 Marine Communities	3.6 Ch 4	ES 9.3: Why isn't the loss of coral from groundings or sediment displacement listed in this section?	The EIS/OEIS analyzes training events, not military operations. Ship groundings at sea are outside the scope of military training analysis. Sediment displacement is discussed in Section 3.1 and 3.6.
STG7-13	Air Quality	3.4 ES-28,ES9.2	ES 9.5: Does this take into account all air emissions and is this listed in the GEPA air permit?	All air emissions from training activities were analyzed. There are no proposed stationary emission sources that require an air permit.
STG7-14	Regional Economy	3.16 ES-31	Please include the identification of Guam's fishing banks in this MIRC.	The best available data was used to assess the impact of the proposed action and alternatives upon commercial, recreational and subsistence fishing. See responses to FED2-3 and STG1-21.
STG7-15	Marine Mammals Regional Economy Recreation	3.7 3.16 3.17 Fig ES-2 P. ES-32	Mapped area of "Floating Mines Demolition Area". There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals.	See response to STG7-8.
STG7-16	Marine Mammals Regional Economy Recreation	3.7 3.16 3.17 Fig ES-5 P. ES-35	Mapped area of UNDET and Mine Neutralization Areas in Agat Bay. There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals.	See response to STG7-8.
STG7-17	Proposed Action Sasa Bay Marine Protected Area	Ch 2 Fig ES-5 P. ES-35	Field training exercises such as beach landing by small craft at the Polaris Point Field would be incompatible with the Marine Protected Area status of Sasa Bay.	See response to STG3-9.
STG7-	Alternative	1.2	The Strategic mission of MIRC is to provide training venues for the following warfare functional area: AW, AMW, SUW, ASW, MIW, STW,	Some training on simulators occurs, to the maximum extent practicable,

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18	Development		EC and NSW. Granted realistic training contributes to the operational readiness of any unit, but with the limited real estate on the island the consideration of employing simulators and synthetic training to provide early skills will be more suitable. The realistic training can be performed with many training exercise scheduled in the Pacific i.e. Cobra Gold, Foal Eagle, Balikatan, Tandem Thrust, and Cope Tiger to name a few.	however realistic training is required. Refer to Section 1.2.
STG7-19	Editing	1-7	Agat Bay is south of Main Base, not east of it.	Language updated.
STG7-20	Marine Mammals Regional Economy Recreation	3.7 3.16 3.17 Table 2-2 P. 2-4	Agat Bay. Underwater detonation must not be allowed here because it would have a significant impact on daily dolphin observation cruises for tourists and residents as well as probable harassment or harm to these marine mammals.	As part of the MMPA/ESA consultation with NMFS, a monitoring program to include monitoring at UNDET sites at Apra Harbor and Agat Bay will include post activity monitoring for fish kills. Navy UNDET training is an essential perishable skill that must be kept current through continuous training. Training includes use of inert mine shapes and limited live underwater detonations. The infrequency of live training that occurs in Agat Bay and Apra Harbor has minimal impact on the resources. The activities are consistent with the proper use of Agat Bay and Apra Harbor and are consistent with the management of the natural resource. This training was fully reviewed and evaluated in the 1999 EIS. The Navy has continually invited Guam EPA and DAWR to observe each UNDET in Apra Harbor and Agat Bay. In the past ten years the agencies have not voiced concerns that the limited fish kills have had an appreciable negative effect on the resource. See response to STG 3-35.
STG7-21	Marine Communities Fish	3.6 3.9 Table 2-2 P. 2-4	Tipalao Bay. This site would suffer less environmental damage from LCAC training than Dadi Beach, which was once proposed as a LCAC training site. Trial LCAC landing at Dadi showed damage to live coral and a fish kill. AAV landings at Tipalao would probably damage living corals and reef organisms and should be avoided there.	MIRC is a programmatic document and as such it is understood that changing natural conditions on the beach will require surveys and informal consultations as appropriate before beach landing operations could occur. Based on the LCAC landing trial at Dadi and Chulu, mitigation measures have been identified to mitigate damage to live coral, fish kill, sand compaction, and erosion, including LCAC staying on cushion until landing on the beach. The number of anticipated amphibious landings at Tipalao and Dadi are low and analyses show that the impacts are minimal and temporary.
STG7-22	Marine Mammals	3.7 Table 2-2	Piti Floating Mine Neutralization Area. There could be a probable harassment or harm to dolphins that frequent this area due to such training.	The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures in consultation with NMFS under provisions of the MMPA. Refer to Chapter 5 for specific

Number	Resource	EIS Sect	Comment Summary	Response
		P. 2-4		mitigation measures. See response to STG3-35.
STG7-23	Fish	3.9 Table 2-2 P. 2-4	Outer Apra Harbor. Underwater detonation training in Apra Harbor has regularly resulted in mortality of numbers of adult fishes. Increased training will increase numbers of fishes killed. An estimate should be provided of numbers of fishes to be killed by future increased activities, based on projections of past mortalities due to detonations during trainings. The projections should be compared to estimated populations of vulnerable species in the impact zone of this training.	See Response to STG7-20.
STG7-24	Proposed Action Sasa Bay Marine Protected Area	Ch 2 Table 2-2 P. 2-5	Polaris Point Field. Field training exercises such as beach landing by small craft at the Polaris Point Field would be incompatible with the Marine Protected Area status of Sasa Bay.	See response to STG3-9.
STG7-25	Proposed Action Regional Economy Recreation	Ch 2 3.16 3.17 Table 2-2 P. 2-7	Finegayan. Finegayan Small Arms Range has a danger zone extending over important fishing and diving areas. Therefore its use should be discontinued.	See response to STG3-7.
STG7-26	Marine Mammals Regional Economy Recreation	3.7 3.16 3.17	Agat Bay UNDET and Mine Neutralization Area. There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals.	See response to STG7-20.
STG7-27	Marine Mammals Regional Economy Recreation	3.7 3.16 3.17	Mapped area of "Floating Mines Demolition Area". There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals.	See response to STG7-20.
STG7-28	Fish	3.9 Fig. 2-4 P.	Outer Apra Harbor. Underwater detonation training in Apra Harbor has regularly resulted in mortality of numbers of adult fishes. Increased training will increase numbers of fishes killed. An estimate should be provided of numbers of fishes to be killed by future increased activities,	See response to STG7-20.

Number	Resource	EIS Sect	Comment Summary	Response
		2-12	based on projections of past mortalities due to detonations during trainings. The projections should be compared to estimated populations of vulnerable species in the impact zone of this training.	
STG7-29	Proposed Action Sasa Bay Marine Protected Area	Fig. 2-4 P. 2-12	Field training exercises such as beach landing by small craft at the Polaris Point Field would be incompatible with the Marine Protected Area status of Sasa Bay.	See response to STG3-9.
STG7-30	Proposed Action Regional Economy Recreation	Ch 2 3.16 3.17 Fig. 2-6 P.2-14	Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.	See response to STG3-7.
STG7-31	Hazardous Materials Water Quality	3.2 3.3 Table 2-3 P. 2-18	Northwest Field. What are impacts of "chemical attack/response" exercises? Would these and pyrotechnic firing be a risk to Guam's Sole Source designated Northern Aquifer, below this site?	There are no toxic chemicals used in chemical attack/response exercises. Further, all pyrotechnic firing and explosive devices are used on hard surfaces or on controlled ranges. Expended materials are removed after exercises to the extent possible, and all ranges are monitored for off-site release of constituents.
STG7-32	Hazardous Materials	3.2 Table 2-3 P. 2-18	Pati Point. Are inert shells and projectiles recovered and removed?	Expended materials are removed after exercises to the extent possible, and all ranges are monitored for off-site release of constituents.
STG7-33	Terrestrial	3.11 Table 2-3 P. 2-18	Pati Point. Aren't firing and EOD activities detrimental to endangered species, including the last remaining roost for fruitbats on Guam?	As stated in the DEIS, activities associated with EOD and use of the CATM range were assessed in prior consultations between the Air Force and the USFWS Pacific Islands Ecological Services Field Office.
STG7-34	Proposed Action Regional Economy Recreation	Ch 2 3.16 3.17	Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.	See response to STG3-7.
STG7-35	Terrestrial	3.11 Fig. 2-9 P. 2-19	Pati Point. Aren't firing and EOD activities detrimental to endangered species, including the last remaining roost for fruitbats on Guam? How are areas on shore and in the water to be cleaned of accumulated	As stated in the DEIS, activities associated with EOD and use of the CATM range were assessed in prior consultations between the Air Force and the USFWS Pacific Islands Ecological Services Field Office.

Number	Resource	EIS Sect	Comment Summary	Response
			projectile deposits?	
STG7-36	Proposed Action	Ch 2 P. 2-24 Line 2.2.1	No Action Alternative should reflect current level of activities. This current activity does not include LCAC and AAV landings at Tipalao or Dadi, outside of Apra Harbor. What is actual frequency of these activities historically? What damage has been identified from these activities? What mitigation is being proposed for current damage and increased damage under Alternative 1?	Historically, the conduct of any particular activity varies from year to year based on deployment schedules, funding, and world events e.g. the wars in Iraq and Afghanistan. The No Action alternative baseline represents the continuation of current baseline activity and is indicative of current activity, the current status quo. The use of the No Action Alternative current level of training activity as a baseline level is appropriate under CEQ's guidance. Table 2-8 indicates the No Action Alternative, and the Alternative 1 & 2 levels of proposed unit level training activity. LCAC and AAV landings have not occurred at Dadi and Tipalao recently however they have not categorically been excluded from occurring. It is recognized that LCAC and AAV landings at Dadi and Tipalao have the potential to impact natural resources. A single LCAC landing at Dadi was conducted approximately nine years ago and resulted in limited damage to one coral head. Prior to conducting LCAC or AAV landings at Dadi or Tipalao the Navy would conduct appropriate beach and surf zone surveys to determine current conditions and appropriate mitigation strategies.
STG7-37	Proposed Action Sasa Bay Marine Protected Area	Ch 2 P. 2-24 Line 2.2.1	No Action Alternative should reflect current level of activities. Does current activity include mine demolition in Agat Bay, outside of Apra Harbor? What is actual frequency of these activities historically? What damage has been identified from these activities? What mitigation is being proposed for current damage and increased damage under Alternative 1? Could recognition of the Sasa Bay Marine Preserve and support of its purpose be an appropriate mitigation action?	Historically, usage varies from year to year based on deployments, schedules, funding, and world events e.g. the wars in Iraq and Afghanistan. The No Action alternative baseline represents the continuation of current baseline activity and is indicative of recent requirements. Figure 2-4 indicates the current proposed areas for Floating Mine Neutralization and Underwater Detonation training. Appendix D describes these activities in further detail. No past damage from these activities is known to have impacted coral. A limited fish kill is expected. The results of over ten years of use of the Agat Bay UNDET site indicates minor effects on the fish population and no effect on coral or other species of concern. Recognition of the SASA Bay Marine preserve would not be considered appropriate compensatory mitigation for loss of coral or other natural resources even if there was evidence of damage to coral or protected resources which there is not. Compensatory mitigation for losses to the ecosystem should be based upon a replacement of ecological function analysis and should not be viewed as means to resolve political disputes. The issues involved with recognition of the Sasa Bay Marine Preserve are the result of historic land and real estate issues between the United States and the Territory of Guam and not the result of disagreements concerning protection of natural resources.
STG7-	Mitigation	Ch 5	Mitigation actions for some anticipated or actual damages to resources are missing in this DEIS, for some of the activities, such as the AAV	See response to STG7-1.

Number	Resource	EIS Sect	Comment Summary	Response
38	Measures	P. 2-25 Line 2.2.1	and LCAC landings.	
STG7-39	Proposed Action Alternative Development	Ch 2 P. 2-28 Line 2.2.2.3	Need to expand justification for eliminating this alternative. Show existing numbers of users and frequencies and times the ranges are actually in use to prove that additional use cannot be scheduled. Instead of 7 to 21 days per use, can't 7 to 14 be done or instead of 1 to 2 days, can't one day suffice, as in Table 2-8?	Table 2-8 describes unit training activity and where beneficial to description provides min-max days for an event. Unit requirements for the length and intensity of training range time may vary annually due to deployments, schedule limitations, funding, and world events e.g. responding to wars and natural disasters. Limiting units to the possibility of competing for fewer ranges and range time slots without regard to complexity and restrictions of unit schedules puts them at risk of not fulfilling their training requirements. Concentrating ranges negatively impacts risk to units accomplishing their training requirements and negatively impacts the quality of training when the same land and facilities are used over and over. In addition, heavily used ranges are more likely to rapidly accumulate maintenance requirements and land usage and resource impacts without sufficient recovery time.
STG7-40	Hazardous Materials Marine Mammals Sea Turtles Fish Seabirds & Shorebirds	3.2 3.7 3.8 3.9 3.10 P. 2-32 AW	Chaff/flare. What are risks and damages of chaff being ingested by seabirds and marine life?	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
STG7-41	Proposed Action	Ch 2 P. 2-33	SINKEX. Name the permit from US EPA and describe the permit process. Provide a list of the approved Guam SINKEX permits since 1999 in the MIRC.	A General Permit was issued by EPA under the Marine Protection, Research, and Sanctuaries Act (MPRSA) for SINKEX. An agreement letter between the Navy and the EPA was signed in 1999 detailing the requirements of the SINKEX General Permit. The SINKEX General Permit is codified in 40 CFR 229.2.
STG7-42	Proposed Action	Ch 2 P. 2-35	Direct Action. How many times has this exercise actually in the MIRC been done since 1999?	Historically, the conduct of any particular activity varies from year to year based on deployment schedules, funding, and world events e.g. the wars in Iraq and Afghanistan. The No Action alternative baseline represents the continuation of current baseline activity and is indicative of current activity, the current status quo. The use of the No Action Alternative current level of training activity as a baseline level is appropriate under CEQ's guidance. Table 2-8 indicates the No Action Alternative, and the Alternative 1 & 2 levels of proposed unit level training activity.

Number	Resource	EIS Sect	Comment Summary	Response
STG7-43	Proposed Action Regional Economy Recreation	Ch 2 3.16 3.17 P2-36	Marksmanship. Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.	See responses to STG3-7 and FED2-3.
STG7-44	Proposed Action	Ch 2 2-36	Expeditionary Raid. How many individual LCAC landings were done in 2003? How many each successive year?	See response to STG7-42.
STG7-45	Proposed Action Marine Mammals Regional Economy Recreation	Ch 2 3.7 3.9 3.16 3.17 2-37	Area of UNDET in Agat Bay. There would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals. Also fish kills would occur. How often has this exercise been done in Agat Bay since 1999? What notifications were given to regulatory agencies? What impacts had been monitored?	See responses to STG3-7 and FED2-3. Floating mine neutralization and underwater detonation exercises that involve explosive ordnance would require notification of the USCG for issuance as appropriate of a Notice to Mariners. No known impacts to residents, tourists, dolphins, turtles, small boat operators, or coral or bottom habitat have been associated with past conduct of underwater and floating mine neutralization training in the MIRC. Conduct of floating mine neutralization and underwater detonations are prescribed by COMNAVMAR instructions which require establishing a buffer zone around the area of training.
STG7-46	Proposed Action Mitigation Measures	Ch 2 Ch 5 2-37	Underwater Demolition. How many Floating Mine Neutralizations have been done at Agat and Piti since 1999? What kind of monitoring and notification was done?	Refer to responses to STG3-7, STG7-42, and STG7-45.
STG7-47	Proposed Action	Ch 2 Tables 2-7 & 2-8	Increases under Alternative 2 are extremely excessive, especially in regard to sonar use. Actions and impacts under this alternative should be decreased.	The sonar activity proposed is concurrent with the training proposed in Alternative 2. Alternative 1 is the Navy's preferred alternative.
STG7-48	Proposed Action Mitigation Measures	Ch 2 Ch 5 Table 2-8 P. 2-45	Mine Warfare. How many Mine Neutralizations and Detonations have been done at Agat and Piti since 1999? What kind of monitoring and notification was done? Smaller charges less than 10 lb. should be used as a maximum, to decrease fish kills while still providing trainees with real explosions, if needed.	See responses to STG3-7, STG7-20, and STG7-42.
STG7-49	Proposed Action	Ch 2 Table 2-8 P. 2-45	SINKEX. Name the permit from US EPA and describe the permit process. Provide a list of the approved Guam SINKEX permits since 1999 in the MIRC.	A General Permit was issued by EPA under the Marine Protection, Research, and Sanctuaries Act (MPRSA) for SINKEX. An agreement letter between the Navy and the EPA was signed in 1999 detailing the requirements of the SINKEX General Permit. The SINKEX General Permit is codified in 40 CFR 229.2.

Number	Resource	EIS Sect	Comment Summary	Response
STG7-50	Proposed Action	Ch 2 Table 2-8 P. 2-47	BOMBEX. How many bombs have actually been dropped at FDM annually since 1999?	See responses to FED2-3 and STG3-7. In 2000 there were a total of 1,118; in 2001 there were a total of 3,039, in 2002 there were a total of 2,326; in 2003 there were a total of 1,534; in 2004 there were a total of 2,328; in 2005 there were a total of 686; in 2006 there were a total of 768, in 2007 there were a total of 2,727; and in 2008 there were a total of 672.
STG7-51	Proposed Action Sasa Bay Marine Protected Area	Ch 2 Table 2-8 P. 2-48	Amphibious Raid Special Purpose. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See responses to FED2-3 and STG3-9.
STG7-52	Proposed Action Sasa Bay Marine Protected Area	Ch 2 Table 2-8 P. 2-52	NEO. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See responses to FED2-3 and STG3-9.
STG7-53	Proposed Action Sasa Bay Marine Protected Area	Ch 2 Table 2-8 P. 2-52	HADR. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See responses to FED2-3 and STG3-9.
STG7-54	Hazardous Materials	3.2	FDM No Action. How many bombs have actually been dropped at FDM annually since 1999?	See response to STG7-50.
STG7-55	Hazardous Materials	3.2	W-517. How many shells, canisters and missiles were actually released in W-517 annually since 1999?	Section 3.2 Hazardous Materials provides detailed information regarding this comment.
STG7-56	Proposed Action Marine Mammals Fish Regional Economy Recreation	Ch 2 3.7 3.9 3.16 3.17	Agat Bay and Apra UNDET. In Apra, smaller charges less than 10 lb. should be used as a maximum, to decrease fish kills while still providing trainees with real explosions, if needed. No UNDET should be done in Agat Bay because there would be a significant impact on daily dolphin observation cruises for tourists and residents by carrying out detonation exercises in the area designated in Agat Bay, as well as probable harassment or harm to these marine mammals. Also fish kills would occur.	See response to STG7-20.

Number	Resource	EIS Sect	Comment Summary	Response
STG7-57	Proposed Action	Ch 2 Table 2-9 P. 2-57	SINKEX. Name the permit from US EPA and describe the permit process. Provide a list of the approved Guam SINKEX permits since 1999 in the MIRC. Did this really occur annually?	A General Permit was issued by EPA under the Marine Protection, Research, and Sanctuaries Act (MPRSA) for SINKEX. An agreement letter between the Navy and the EPA was signed in 1999 detailing the requirements of the SINKEX General Permit. The SINKEX General Permit is codified in 40 CFR 229.2. There have been ten SINKEX events conducted in MIRC since 1999.
STG7-58	Consistency with other Federal, state and local regulations	Ch 4 3.1.1.1 P. 3.1-2	Don't the CWA, CAA, CZMA, CRCA and other Federal laws apply to impacts on geology here, as in erosion and deposit of non-recovered materials?	Erosion and non-recovered materials are discussed in Section 3.1 and 3.2. All applicable Federal and State laws have been reviewed and analyzed where applicable.
STG7-59	Consistency with other Federal, state and local regulations	Ch 4 3.1.1.2 P. 3.1-2	Don't the Guam water pollution control, solid waste, UIC, excavation, clearing and grading and other laws and regulations apply to impacts on geology here, as in erosion and deposit of non-recovered materials?	All applicable Federal and State laws have been reviewed and analyzed where applicable.
STG7-60	Proposed Action Sasa Bay Marine Protected Area	Ch 2 Table 3.1-1 P. 3.1-5 OTB	NSW, Polaris Point Field. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See response to STG3-9.
STG7-61	Mitigation Measures	Ch 5 Table 3.1-1 P. 3.1-5	Expeditionary Raids and Hydro Survey landings impacts require mitigation, especially at Tipalao.	Mitigation measures for amphibious operations have been added to the mitigation section. Refer to Chapter 5.
STG7-62	Geology	3.1 P. 3.1-7 Line 3.1.2	Was 1993 earthquake at level 8.1, as noted on P. 3.1-11, not 7.8?	Revised as suggested. Earthquake was originally reported at 8.1. Revised to 7.8 per USGS.
STG7-63	Proposed Action Marine Communities Regional Economy Recreation	Ch 2 3.6 3.16 3.17 Ch 5 P. 3.1-8	The OEIS zone includes outer reefs and banks of Guam, such as Santa Rosa Reef, which must be addressed in this OEIS and will be impacted by the MIRC Training. These banks need to be described and BMP during training exercises and mitigation listed to protect the resources and the local fishing dependent on these sites. They may also be critical to recruitment of stocks to the coastal reefs of Guam. Destructive anchoring should not be done at these coral reefs.	As appropriate, mitigation measures are adopted to avoid shallow water areas and to protect the public safety. Training events within the MIRC avoid dropping explosive ordnance in shallow water. In addition, navigational activities avoid areas that are risks to safe navigation. Anchoring evolutions are not conducted in W-517 for training. To the extent practicable, the Navy tries to deconflict its activities with recreational and commercial fishermen.

Number	Resource	EIS Sect	Comment Summary	Response
	Mitigation Measures	Line 3.1.2		
STG7-64	Geology	P. 3.1-11 Line 3.1.2	Ruby Volcano and Esmeralda Bank are not "east of Saipan"	Revised to read: Ruby Volcano and Esmeralda Bank are submarine volcanoes found west of Saipan and Tinian.
STG7-65	Geology	P. 3.1-11 Line 3.1.2.1	Was 1993 earthquake at level 8.1?	Revised as suggested. Earthquake was originally reported at 8.1. Revised to 7.8 per USGS. Revised to read: The most recent large-magnitude earthquake was recorded in 1993 and measured 7.8 on the Richter scale (USAF 2006). (Citation changed).
STG7-66	Geology Water Quality	3.3 P. 3.1-12 Para. 4	Guam Northern Aquifer is not the "only" drinking water aquifer, but is legally designated by US EPA as a "sole source aquifer".	Concur. Section was rewritten.
STG7-67	Geology	P. 3.1-12 Para. 6	Many corrections needed in this paragraph. The spur and grooves do not have grooves parallel to shore and are not on the reef flat or back reef and do not create pools in the back reef.	Section was rewritten.
STG7-68	Geology	P. 3.1-13 Para. 1	The unique barrier reef and deep lagoon condition at Apra and Luminao need to be described.	Comment noted. Information re Apra Harbor and Luminao reef have been added
STG7-69	Geology	P. 3.1-13 Para. 3	Is correct spelling : Mt. Jumullong Manglo?	Revised from “Mount Humuyong” to “Mount Jumullong Manglo.”
STG7-70	Geology	P. 3.1-14 Line 4	"formed from sediment eroded…"	Revised as suggested.
STG7-71	Geology	P. 3.1-17 Line 3.1.2.3	Change "cyclones" to "typhoons"	Revised as suggested.
STG7-72	Geology Mitigation Measures	Ch 5 P. 3.1-20 Line 3.1.2.6	The protective measures that would be used for landings on Guam would need to be developed, not just ones for Tinian.	Comment noted. Text revised to read: Ensure that protective measures are developed for amphibious landings on Guam and Tinian and other training activities at Unai Dankulo on Tinian.
STG7-73	Geology	P. 3.1-20 last	Collisions by submarines and deposits of training materials do affect geological resources. They cannot be disregarded.	The FEIS analyzes training events, not military operations. Collisions at sea are outside the scope of military training analysis and the EIS.
STG7-74	Geology Mitigation	Ch 5 P. 3.1-21	What mitigation is being done for this past degradation?	Training would be limited to the same areas where UNDETs have been historically conducted to prevent damage to the surrounding marine environment. Section 3.1 has been rewritten to reflect no historical

Number	Resource	EIS Sect	Comment Summary	Response
	Measures	Para. 2		geological degradation due to UNDETs. No degradation has been observed in the areas where UNDETs occur on the bottom.
STG7-75	Proposed Action	Ch 2 3.2 P. 3.1-21 Para. 5	This use of 10 lb. charges for neutralization should remain a maximum. Why increase it to 20 lb.?	There is a need to train with various sizes of charges based on the materials to be neutralized during real world situations. The proposed action has been changed to limit charges to 10 lb NEW. Explosive charges will remain at 10-lb NEW and this is reflected in the EIS.
STG7-76	Hazardous Materials Cumulative Impacts	Ch 6 3.2 P. 3.1-21 Para. 6	Because of cumulative impacts, sonobuoys should be recovered and not dumped.	Expended materials are removed after exercises to the extent possible, sonobuoys are not recoverable. In addition to the sonobuoy's metal case and expended power source, expendable materials include a parachute assembly, nylon cord, plastic casing, antenna float, metal clips, and electrical wires. Over time these materials will sink to the ocean floor. The outside metal case will slowly corrode and can become encrusted from seawater processes and marine organisms, thus further slowing the rate of corrosion. The total annual sonobuoy usage during training exercises for Alternative 2 (highest rate of usage) is 106 which equals 313 pounds of material which disperses over the training area (beyond 3 nautical miles from shore within W-517) to result in 0.0001 pounds of material per nautical mile square (see table 3.2-9). The resulting area loading is not expected to be significant.
STG7-77	Mitigation Measures Hazardous Materials	3.2 Ch 5 P. 3.1-21 Para. 8	Even buried lead and other contaminants from torpedoes would be exposed to burrowing benthic organisms and the food chain. Such impacts must be noted and mitigated.	This section discusses impacts to geological resources. Impacts to benthic organisms are presented in Section 3.6. Soft bottom benthic communities throughout the MIRC would be exposed to expended materials because use is widely dispersed and a majority of the materials rapidly sink to the sea floor. Expended materials would become encrusted by natural processes and incorporated into the sea floor with no significant accumulations in any particular area. Some of the materials are the same as those often used in artificial reef construction (e.g., concrete and metal) and would be colonized by benthic organisms that prefer hard substrate. This colonization could result in localized increases in species richness and abundance, but no significant changes in community structure or function would be anticipated based on the limited amount and dispersed nature of the materials.
STG7-78	Geology	P. 3.1-23 Para. 1	Beach landing activities create more negative geological effects than normal wave action because of their compacting sand.	See response to STG7-1.
STG7-79	Proposed Action	Ch 2	Use of new criteria of doubling weight of explosive charges is not necessary and not acceptable.	There is a need to train with various sizes of charges based on the materials to be neutralized during real world situations. The proposed

Number	Resource	EIS Sect	Comment Summary	Response
		P. 3.1-24 Para. 1		action has been changed to limit charges to 10 lb NEW. Explosive charges will remain at 10-lb NEW and this is reflected in the EIS.
STG7-80	Hazardous Materials	3.2 P. 3.1-24 Last Para.	Buildup of expended materials would be more than an aesthetic concern, especially after years of increased training as proposed. Additional clean-up practices must be planned for accumulated materials, especially plastics and metals.	Munitions constituents released to the environment are but a fraction of the original amount contained in ordnance following their use as a result of a high level of combustion efficiency. Therefore, resulting concentrations in marine waters would be extremely low. Estimates of concentrations for select munitions constituents are discussed in Section 3.3 (Water Quality). At the request of the CNMI Senate, the Agency for Toxic Substances and Disease Registry conducted an assessment of pelagic fish caught in the open Pacific. The Agency concluded that pelagic fish caught in the open water are not likely to contain high levels of explosive residues from the neighboring Farallon de Medinilla bombing range and will not pose a public hazard to people who eat them. Navy activities could result in environmental effects on water quality in ocean areas due to shipboard training, expenditure of ordnance, and training-related debris such as used targets. Navy ships are required to conduct activities at sea in a manner that minimizes or eliminates any adverse impacts on the marine environment. Environmental compliance policies and procedures applicable to shipboard training afloat and pollution prevention are defined in Navy instructions, DoD Instruction 5000.2-R, EO 12856, and EO 13101. These instructions reinforce the CWA's prohibition against discharge of harmful quantities of hazardous substances into or upon U.S. waters out to 200 nm (371 km), and mandate stringent hazardous waste discharge, storage, dumping, and pollution prevention requirements. Navy protective measures for shipboard management, storage, and discharge of Hazardous Materials, and other pollution protection measures are intended to protect water quality. The international treaty for regulating disposal of wastes in the open ocean generated by operation of vessels is the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). MARPOL 73/78 is implemented in the United States by the *Act to Prevent Pollution from Ships*, under the lead of the U.S. Coast Guard. MARPOL 73/78 includes regulations aimed at preventing and minimizing pollution from ships, accidental or routine, and currently includes six annexes as follows: • Annex I—Regulation for the Prevention of Pollution by Oil • Annex II—Regulations for the Control of Pollution by

Number	Resource	EIS Sect	Comment Summary	Response
				Noxious Liquid Substances in Bulk • Annex III—Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form • Annex IV—Prevention of Pollution by Sewage from Ships • Annex V—Prevention of Pollution by Garbage from Ships • Annex VI—Prevention of Air Pollution from Ships Annexes I and II are mandatory on parties to the treaty while Annexes III to VI are optional and not binding unless specifically accepted. The United States is not a party to Annex IV; however, the U.S. Congress mandated the Navy to comply with regulations set forth in Annex V. Annex V covers nonfood marine pollution solid waste. Although naval ships are exempt from MARPOL 73/78, the U.S. Congress required compliance by the U.S. Navy in the *Marine Plastic Pollution Research and Control Act of 1987* as modified by the *National Defense Authorization Act for Fiscal Year 1994*. Under Annex V, the nonfood solid waste materials that are controlled include the following: • Paper and cardboard • Metal • Glass (including crockery and similar materials) • Plastics The basic requirements of Annex V include the following: • Disposal of all plastics into the sea is prohibited. • Disposal of dunnage, lining and packing material that will float is prohibited within 25 nm of the nearest land. • Disposal of food waste and other garbage is prohibited within 12 nm of the nearest land, unless the waste is comminuted and able to pass through 25 mm screens, in which case, disposal is permitted beyond 3 nm from the nearest land. • Disposal of all garbage (except food waste beyond 12 nm) is prohibited in the Baltic Sea and other Special Areas. The United States Environmental Protection Agency (USEPA) and National Oceanic and Atmospheric Administration (NOAA) are the federal agencies primarily responsible for water quality and ocean resources.

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				Federal laws regulating water quality include the Clean Water Act (CWA) (33 USC 1251 *et seq.*) and the Safe Drinking Water Act (SDWA) (42 USC 300f *et seq.*). The CWA was enacted by Congress to restore and maintain the chemical, physical, and biological integrity of United States (U.S.) waters. The CWA requires each state to establish water quality standards for its surface waters based on designated uses. For impaired water bodies, the CWA directs each state to develop Total Maximum Daily Loads (TMDL), the amounts of pollutants that can be assimilated by a body of water without exceeding water quality standards. Based on the developed TMDLs, the state or USEPA can limit any discharge of pollutants to a level sufficient to ensure compliance with state water quality standards. As required under the CWA, the USEPA has established National Ambient Water Quality Criteria (NAWQC) (USEPA 1996). The criteria are maximum concentration levels for specific contaminants in discharges to surface waters necessary to protect ecological and human health. The criteria are not rules, and have no regulatory effect. However, they can be used to develop regulatory requirements, based on concentrations that will have an adverse effect on the qualities necessary to sustain beneficial uses of U.S. waters. Table 3.3-1 shows the NAWQC standards for saltwater. The CWA prohibits the discharge of oil or hazardous substances into the territorial waters of the U.S. (*i.e.*, up to 12 nm [19 km]) in quantities harmful to the public health or welfare, or to the environment. Oil and hazardous substance spills are addressed under the National Contingency Plan. USEPA has proposed Uniform National Discharge Standards for military vessels. Table 3.3-2 summarizes current Navy pollution control discharge restrictions in the coastal zone.
STG7-81	Geology	Table 3.1-2	No Action Alternative. Needs to note the additional compaction of sandy beaches.	See response to STG7-1.
STG7-82	Mitigation Measures	Ch 5 P. 3.2-1 Line last	Although some laws and regulations do not apply beyond 3 nm, the same effects of actions occur and similar environmental protection and BMP's should be applied during training there.	Comment noted. The application of mitigation measures is not limited to within 3 nm of shore.
STG7-83	Hazardous Materials	P. 3.2-1	U.S. Navy Annex V treaty covers nonfood marine pollution solid waste. The recent classification of the Marianas Trench Monument may add this to the "Special Areas" requirements for ocean waste disposal.	Comment noted. The Navy follows all discharge protocols to preclude inappropriate ocean waste disposal. Under the Presidential Proclamation establishing the Marianas Trench Marine National Monument, the prohibitions of the Proclamation shall not apply to the activities and exercises of the Armed Forces. However, the Navy will ensure by adoption of appropriate measures not impairing operations or operational capabilities, that its vessels and aircraft act in a

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				manner consistent, so far as is reasonable and practicable, with the Proclamation.
STG7-84	Hazardous Materials	P. 3.2-2 Line last	Add "biological and chemical agents"	Revised as suggested
STG7-85	Hazardous Materials Ch 4 other considerations	Ch 4 P. 3.2-3 and 3.2 -4	Add Federal and Territorial Pesticide Laws and Regulations.	Military training activities in the MIRC do not involve the use of pesticides. All applicable Federal and Territorial regulations are adhered to.
STG7-86	Hazardous Materials Water quality	P. 3.2-5 3.3	General approach to analysis training material including gun ammunition that are expended are not recovered. It should be noted that small firing ranges in the North are located in the Sole Source Aquifer for the island's drinking water and that a stricter recovery of lead base bullet should be implemented.	Refer to Section 3.2.2.1 – All expended brass and lead rounds are collected and hauled away during range clearance activities.
STG7-87	Airborne Noise	3.5-14 First Para.	Question basis of needing noise modeling at NW Field. DEIS does not account for projected aircraft activities.	Noise modeling is not required for NW field due to very limited training activities at NW field. Noise studies have been conducted for the impacts of the noise generated. See section 3.5. for the basis for noise modeling that have been developed. See responses to STG1-20 and STG1-26.
STG7-88	Proposed Action Sasa Bay Marine Protected Area	Table 3.2-1 P. 3.2-9	Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	Impacts from hazmat during LCAC and AAV landings are limited to potential leaks and spills of fuel and oil that are no different than those from privately owned watercraft. See response to STG3-9.
STG7-89	Mitigation Measures	Ch 5 Table 3.2-1 P. 3.2-10	Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms.	The number of anticipated amphibious landings at Tipalao and Dadi are low and analyses show that the impacts are minimal and temporary. Mitigation measures have been identified to mitigate damage to live coral, fish kill, sand compaction, and erosion, including LCAC staying on cushion until landing on the beach. Mitigation measures for potential damage to coral reef from LCAC and AAV landings are provided in Section 3.6 and Chapter 5.
STG7-90	Proposed Action Hazardous Materials	Ch 2 P. 3.2-12 Line 3.2.2.1	Will non-US participants in training in MIRC apply the same controls on hazardous materials and conform to US regulations, even on-board the foreign vessels?	The US Navy has no control over foreign participants with regards to hazardous material management on board their vessels. However, environmental protection protocols are discussed and agreed to during the exercise planning conferences prior to the joint exercises.
STG7-91	Proposed Action	Ch 2	Is it true that "No live fire or tracer rounds will be used on Tinian."?	Current and proposed training activities are conducted in accordance with the Marianas Training Plan, which states no live fire or tracer rounds will be

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	Hazardous Materials	P. 3.2-13 Line first		used on Tinian.
STG7-92	Proposed Action Hazardous Materials	Ch 2 P. 3.2-13 Line 7 & 8	The 10 lb. maximum noted here must be applied throughout the DEIS.	The 10-lb maximum described in this section is for current training activities. As a result of the public comment process, the proposed action to increase the explosive charge to up to 20-lb NEW has been changed to the previous 10-lb NEW maximum Explosive charges will remain at 10-lb NEW and this is reflected in the EIS.
STG7-93	Proposed Action Hazardous Materials	Ch 2 P. 3.2-13 Line 17	Will foreign ships, craft, aircraft and vehicles used in exercises conform to using hazardous chemical warning labels in English?	See response to STG7-90.
STG7-94	Hazardous Materials Water Quality Mitigation Measures	3.3 Ch 5 P. 3.2-14 Line first	Currents will not adequately disperse contaminants added to sediments within Apra Harbor. These will accumulate and create environmental problems. How will this problem be addressed?	We do not anticipate significant amounts of constituents being added to the sediments of Apra Harbor. The quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. For land ranges, hazardous substances are deposited on the surface of the soil and confined within the perimeter of the range.
STG7-95	Hazardous Materials Water Quality Mitigation Measures	3.3 Ch 5 P. 3.2-21 Para. 3	In parts of Apra Harbor, currents will not adequately disperse contaminants added to sediments. These will accumulate and create environmental problems. How will this problem be addressed?	See response to STG7-94.
STG7-96	Proposed Action Hazardous Materials Mitigation Measures	Ch 2 Ch 5 P. 3.2-22 Para. 4 Line 3.2.2.3.3	What records and reporting are kept for SINKEX? Are these available to the regulatory agencies?	An annual report is submitted to the Administrator of the Environmental Protection Agency that includes the name of each vessel used as a target vessel, its approximate tonnage, and the location and date of sinking (40 CFR 229.2).
STG7-97	Hazardous Materials	3.7 3.8	What are risks and impacts of chaff being ingested by seabirds and marine organisms?	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns

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	Marine Mammals Sea Turtles Fish Seabirds & Shorebirds	3.9 3.10		in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
STG7-98	Water Quality	3.3 Table ES3 Summary of Environmental Impact	Surface and Marine Waters may be indirectly impacted by muddied vehicles transversing highways to and from exercise sites; leaving mud on the roads that may eventually wash into surface or marine waters or be conveyed into storm water systems. The use of four wheel drive vehicles and other tractor vehicles may impact the landscape also causing erosion which may degrade the watershed in that location.	Military training vehicles will be confined to military training areas within DoD installations and are not expected to travel off-base during training.
STG7-99	Water Quality	P. 3.3-1 Above 3.3.1.1	Deposits on soils will affect ground water, as well as surface water resources.	Text revised. Deposition on soils could indirectly affect surface freshwater resources and groundwater.
STG7-100	Water Quality	Table 3.3-3	The 4th column mentioned contamination to drainage areas from runoff. Is there a plan in the document that shows the locations of the drainage systems that will be affected?	The reference to drainage areas pertains to potential impact to natural drainage areas in close proximity to the training areas listed. There are no engineered drainage systems associated with the training areas.
STG7-101	Water Quality	3.3	In general there are paragraphs that have conflicting statements on impact to water quality.	Comment noted. The section was reviewed and no conflicting statements were identified.
STG7-102	Water Quality Mitigation Measures	Ch 5 3.3.4	Unavoidable Significant Environmental Effects. The paragraph discussed the impact to water quality due to surface water contamination however, there was no plan or discussion on the protection or mitigation.	Current protective measures are provided in Section 3.3.2.1 and mitigation measures are presented in Chapter 5.
STG7-103	Water Quality	3.3.2	Affected Environment. The context of the paragraph is more on general statements (excerpts taken from different manuals or documents) rather than specifically discussing the impact of the new development.	The affected environment describes the characteristics of the general location of the training areas with respect to water resources that could potentially be impacted. Impacts are discussed under Section 3.3.3 – Environmental Consequences.
STG7-104	Water Quality	P. 3.3-5 First Para.	Guam EPA is not "responsible for providing sewage treatment". It permits and regulates sewage facilities. Guam Water Quality Standards are set to limit pollutants that would detract from designated uses of Guam waters, including the support of the health of aquatic and marine organisms. The Guam EPA web page listed is incorrect.	Text revised according to information on Guam EPA website: "… is responsible for administering a program that provides sewage treatment and related facilities for Guam." Web page citation has been corrected to: http://node.guamepa.net/programs/water/poll.html

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STG7-105	Proposed Action Sasa Bay Marine Protected Area	Table 3.3-3 P. 3.3-7	NSW and OTB. Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	Impacts from hazmat during LCAC and AAV landings are limited to potential leaks and spills of fuel and oil that are no different than those from privately owned watercraft. See response to STG3-9.
STG7-106	Water Quality Mitigation Measures	Ch 5 Table 3.3-3 P. 3.3-7	AMW. Because of effects, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms.	Mitigation measures for potential damage to coral reef from LCAC and AAV landings are provided in Section 3.6 and Chapter 5.
STG7-107	Water Quality	P. 3.3-9 Para. 3	Water associated with sediments in parts of Apra Harbor is contaminated.	Comment noted.
STG7-108	Water Quality	P. 3.3-9 Para. 4	"coastal regions contain surface water bodies ranging from pristine high quality to low quality."	Comment noted.
STG7-109	Water Quality	P. 3.3-10 to 3.3-14	This whole Groundwater section should be better organized and rewritten. Aquifers are not "uplifted" by volcanics but are perched above them. The Northern Aquifer is not well protected by natural filtration and surface contaminants can rapidly reach it. Recharge is supported by approximately 100 inches per year of rain. The "depth" of the lens does not depend on depth of limestone above it. Southern Guam rocks do not derive just from ash, but from lava flows. Thickness of the lens, its recharge dynamics and potential yields should be described.	Comment noted. Additional information has been provided in the section.
STG7-110	Water Quality	P. 3.3-13	"The military's remediation actions" (air stripping of TCE and PCE) for AAFB have been discontinued for many years.	The sentence refers to all remediation activities being conducted at Andersen AFB and does not mention the pump-and-treat system as being responsible for the reduction of contamination at Andersen AFB.
STG7-111	Water Quality Mitigation Measures	Ch 5 Table 3.3-4	How would release of "classified" hazardous materials be recorded and reported and how would this be mitigated and monitored?	The number of MK-48 ADCAP EXTORP torpedoes (classified information regarding hazardous materials content) used would be recorded. There is no requirement to report information on use. Since the impact to water quality from torpedo use is considered minimal, mitigation and monitoring are not proposed.
STG7-112	Water Quality	P. 3.3-17 Para. 4	Are fluorocarbon releases being assessed and reported? Doesn't the Montreal Protocol require this?	The amount of fluorocarbons from sonobuoys that is released to the water is minimal. The Montreal Protocol is based on releases of fluorocarbons to the atmosphere as an ozone-depleting substance.
STG7-113	Water Quality Marine Mammals	3.7 3.8 3.9	What are risks and damages of chaff being ingested by seabirds and marine life?	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No

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	Sea Turtles Fish Seabirds & Shorebirds	3.10		mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
STG7-114	Proposed Action Water Quality	Ch 2 Table 3.3-9	Are projectiles with depleted uranium being used on land or within 3 nm?	There are no known depleted uranium expenditures in the MIRC and none are proposed for use in the MIRC.
STG7-115	Proposed Action Water Quality	Ch 2	Are Piti Neutralization explosions done at 125 ft.? Are Agat Bay underwater detonations being done in spite of the threats to dolphins and impacts on the dolphin watching industry? Will charges of less than 10 lb. always be used and can these be made smaller?	Underwater detonations as described in the text are conducted as part of ongoing training. Training is postponed or cancelled when dolphins are observed in the area. The proposed action is to use charges of up to 10 lbs NEW. See response to STG3-35.
STG7-116	Proposed Action	Ch 2	How many missiles with explosive warheads have been fired annually and how many more will be used under Alternative 1?	Missiles with explosive warheads have not been used and none are proposed for use within 12 nm of shore.
STG7-117	Terrestrial	3.11	Besides altering shoreline topography, landing craft compact beaches and destroy in fauna and vegetation that controls erosion.	Comment noted. Text indicates "…disturbed areas would be restored to pre-existing conditions at the conclusion of the training exercise."
STG7-118	Water Quality	P. 3.3-23 Para. 7	All vessels, even foreign ones, training in the MIRC should prohibit discharges of solid waste in spite of the lesser restrictions shown in Table 3.3-2.	Restrictions presented in Table 3.3-2 indicate discharge of any kind is not allowed within 3 nm of shore (Guam territorial limits).
STG7-119	Water Quality	P. 3.3-26 Line 4	Increased training will have very serious impacts on public uses of coastal waters but Guam Water Quality Standards must support the existing and designated public uses of waters.	Comment noted.
STG7-120	Air Quality	Table 3.4-2	LCAC generate much sand and dust pollution on land.	Comment noted. Impact to air quality is temporary and localized to the affected training area. Exposure of public to dust is unlikely because LCAC landings are limited to controlled military areas and ranges.
STG7-121	Airborne Noise Land Use Cumulative Impacts	3.5 3.12 Ch 6	Has noise study taken into account existing fixed wing and helicopter sorties and anticipated aircraft stated for Red Horse, Special Force Exercises, and other cumulative airflight related exercises in the MIRC with existing and future land use activities outside these exercise areas?	Noise studies have been developed as part of the 1999 EIS. Those training activities have not changed since the 1999 document. The NW Field Beddown EA reviewed other relevant noise generating activities. See response to STG1-20.
STG7-122	Airborne Noise	P. 3.5-10 First Para.	Rewrite this paragraph. Increased aircraft activities (up 45%) at AAFB will have very noticeable noise impacts outside the base. Statistics quoted on annoyance levels outside of Guam do not apply to the relatively quiet environment of Guam. Instead of 12 to 22% the number would be expected to approach 100%. Land uses in the AAFB AICUZ area are increasing and are not restricted for noise	Paragraph rewritten based upon discussions with the USAF concerning aircraft loading and anticipated increased aircraft activities.

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			compatibility.	
STG7-123	Airborne Noise Mitigation Measures	Ch 5 P. 3.5-12 Last Para.	The relatively quiet environment of Guam will lead to numerous complaints from very disturbed residents about increased noises of helicopter overflights. These must be minimized beyond non-DOD properties, especially at night.	HSC night training flights are described in Section 3.5. Night training flights focus on use of night vision goggles (NVG) which require training over non-populated areas with minimal lighting. In addition, all flights including night flights are restricted to above 1,000 ft AGL.
STG7-124	Seabirds & Shorebirds	3.10 Ch 5	Helicopter noise impacts on the civilian population and on endangered birds must be avoided and highly mitigated. Mitigation should be described in the EIS.	The Navy has conducted Section 7 consultation with USFWS, which include conservation measures specifically designed to minimize, offset, and avoid impacts from noise. These include minimum altitudes (1,000 ft AGL) and flight path modifications.
STG7-125	Airborne Noise	P. 3.5-24 and Table 3.5-4	There will be substantial effects on human receptors from the proposed 45% increase in aircraft activities and this will be seriously exacerbated by the proposed transfer of Marines and its further increase of aircraft noises.	Text revised based on discussions with the USAF concerning aircraft loading and anticipated increased aircraft activities. Cumulative impacts are addressed in Ch 6 and in subsequent NEPA documents.
STG7-126	Marine Communities	3.6-4	Table 3.6-1: STOM-vessel movements, DoD should add the loss of coral from sediment displacement.	Based on analysis no loss of coral due to sediment displacement is anticipated.
STG7-127	Marine Communities	3.6-5	Table 3.6-1: ASW-vessel movements etc., The mortality to plankton may also result in the loss or reduction of fish populations. What does the Navy propose to ensure this does not occur?	Based on analysis of loss of plankton no loss or reduction of fish populations is anticipated.
STG7-128	Marine Communities Mitigation Measures	Ch 5 3.6-5	Table 3.6-1: ASW-vessel movements etc., will the Navy conduct monitoring of plankton and fish population levels?	Based on analysis of ASW-vessel movements no measurable loss or reduction of plankton or fish populations is anticipated.
STG7-129	Mitigation Measures Hazardous Materials	Ch 5 3.2 3.6-6	Table 3.6-1: STW-expended materials, will the Navy monitor the accumulation of expended materials?	Nonhazardous expended training materials will continue to be deposited on the training areas. On land ranges, nonhazardous expended training materials will continue to be collected for appropriate disposal or reuse options. Those expended on the water are not collected and will accumulate over time. Although unlikely because of the vast expanse of ocean area where expended training materials may be deposited, over time, they may become physical hazards to marine life or to navigation. Section 3.2 Hazardous Materials provides detailed information regarding this comment. The quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. For land ranges, hazardous substances are deposited on the surface of the soil and confined within the

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				perimeter of the range.
STG7-130	Marine Communities Mitigation Measures	Ch 5 3.6-7	Table 3.6-1: OTB and FIREX Land, will monitoring and notification of incidents be conducted by DoD?	Over The Beach (OTB) and Firing Exercises (FIREX) land activities will follow established safety and environmental protection standard operating procedures and notification requirements.
STG7-131	Marine Communities Mitigation Measures	Ch 5 3.6-8	Table 3.6-1: EOD-Explosive ordnance, etc., the sandy bottom areas are home to garden eels in the Agat Bay area. Does the Navy have a mitigation plan for this marine life?	No sea bottom UNDETs are planned for Agat Bay, only near-surface UNDETs, several kilometers offshore. Recommendations from NMFS on the Navy's EFH assessments were considered and included as appropriate in both the resource section analysis and in Chapter 5. See response to STG7-129.
STG7-132	Marine Communities Mitigation Measures	Ch 5 3.6-11	Table 3.6.2.2, Does DoD plan to conduct a long term survey of the secondary production communities?	There are no current DoD plans to conduct long term surveys of the secondary production communities. Recommendations from NMFS on the Navy's EFH assessments were considered and included as appropriate in both the resource section analysis and in Chapter 5. See response to STG7-129.
STG7-133	Proposed Action Sasa Bay Marine Protected Area	Table 3.6.1 P. 3.6-6	NSW. No amphibious landings, especially with LCAC and AAV, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See response to STG3-9.
STG7-134	Marine Communities Mitigation Measures	Ch 5 Table 3.6.1 P. 3.6-7	AMW. Because of effects to shallow coral reef, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms. If any such exercises have been done at Tipalao, what are the results of impact monitoring and damage assessment?	See response to STG7-1. The number of anticipated amphibious landings at Tipalao and Dadi are low and analyses show that the impacts are minimal and temporary. It is understood that changing natural conditions on the beach will require surveys and informal consultations with the USFWS will be conducted as appropriate before beach landing operations could occur.
STG7-135	Marine Communities Mitigation Measures	Ch 5 Table 3.6.1 P. 3.6-5	AW, SUW and ASW. These exercises must avoid the outer coral reefs and banks, such as Santa Rosa Reef, Galvez Banks, White Tuna Bank, etc. No anchoring or other actions that would damage the coral reef ecosystems should be allowed during training. These reefs support local fishing and may be a source of recruitment of corals and other organisms to the fringing and barrier reefs of Guam.	As appropriate, mitigation measures are adopted to avoid shallow water areas and to protect the public safety. Training events within the MIRC avoid dropping explosive ordnance in shallow water. In addition, navigational activities avoid areas that are risks to safe navigation. Anchoring evolutions are not conducted in W-517 for training. To the extent practicable, the Navy tries to deconflict its activities with recreational and commercial fishermen.
STG7-136	Marine Mammals Recreation	3.7 3.16 3.17	EOD UNDET at Agat Bay. Are Agat Bay underwater detonations being done in spite of the threats to dolphins and impacts on the dolphin watching industry? What are observed impacts and damage assessments? Have fish kills and marine mammal "taking" occurred?	See responses to STG3-35 and STG7-115.

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	Fish Marine Communities	3.9	Will charges of less than 10 lb. always be used and can these be made smaller?	
STG7-137	Marine Communities	Table 3.6.1 P. 3.6-8	Have amphibious landings been monitored for impacts at Reserve Craft Beach? Has damage to marine life been from this been assessed?	Amphibious landings are monitored for impacts. No damage has been observed at Reserve Craft Beach.
STG7-138	Marine Communities Proposed Action	Ch 2 P. 3.6-14 First Para.	Offshore coral reef banks used by Guam fishermen are within the MIRC, including Santa Rosa Reef, Galvez Banks, White Tuna Bank. They are very large relative to all Guam coral reefs. They need to be described and discussed in this EIS. No anchoring or other actions that would damage the coral reef ecosystems should be allowed during training. These reefs support local fishing and may be a source of recruitment of corals and other organisms to the fringing and barrier reefs of Guam and other islands.	See response to STG7-135.
STG7-139	Marine Communities	P. 3.6-16 Para. 2	Four seagrass species are listed from Guam but not Cymodocea. Need to add Halodule uninervis and Halophila sp. (cf., H. minor).	Section has been revised to include these species.
STG7-140	Proposed Action Sasa Bay Marine Protected Area	P. 3.6-16 Para. 4	The 88.7 acres of mangroves at "Apra Inner Harbor" are not at Inner Apra Harbor but are in the Marine Preserve of Sasa Bay and should be identified as such. This is the largest stand of mangroves on US soil in the entire Pacific and needs special recognition as such. The protection of this Marine Protected Area should be championed and supported by the US Federal Government, including the Department of Defense.	Marine Communities section has been revised to indicate that the 88.7 acres of mangroves are located in the Marine Preserve of Sasa Bay.
STG7-141	Marine Communities	P. 3.6-26 Para. 4	What studies have shown that "There is no deep water coral located in the area where SINKEX is typically conducted."?	Text has been revised to correct this statement.
STG7-142	Marine Communities Marine Mammals Sea Turtles Fish	3.7 3.8 3.9 P. 3.6-28 Para. 4	UNDET. Explosions underwater, as planned under all alternatives, could have significant impacts on marine communities. They already have been observed to kill fishes with every detonation and harm other organisms. If a school of popular food fish such as the large schools of atulai in Agat Bay swam through the impact zone during a detonation they all could be killed. Detonations could result in unintended "takes" of protected marine mammals and endangered turtles.	Conservation measures are in place to preclude training activities when and where marine mammals, sea turtles, and large fish schools are present. See responses to STG3-35 and STG7-20.
STG7-143	Marine Communities	Table 3.6-2	Amphibious landings over fringing reefs such as Tipalao would have long term effects in localized areas.	The number of anticipated amphibious landings at Tipalao and Dadi are low and analyses show that the impacts are minimal and temporary. Conservation measures have been identified to minimize damage to live coral, fish kill, sand compaction, and erosion, including LCAC staying on

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				cushion until landing on the beach.
STG7-144	Marine Mammals Mitigation Measures	Ch 5 3.7-1	Marine Mammals, The training activities would adversely affect the marine mammals in the area. Monitoring of incidents and beaching should be documented and used in re-evaluation of training activities.	Chapter 5 of the EIS has been revised to include a Range Monitoring Plan, reporting requirements, and adaptive management. Range specific monitoring plans will also be included in the MMPA Final Rule and posted via the NOAA web site. Some components of the monitoring and mitigation plan are being implemented and the Navy is continuing to develop other components of the monitoring and mitigation plans in cooperation with NMFS. Monitoring and mitigation will be used both as: 1) a planning tool to focus Navy monitoring priorities (pursuant to ESA/MMPA requirements) across Navy Range Complexes and Exercises; and 2) an adaptive management tool, through the consolidation and analysis of the Navy's monitoring and watchstander (lookout) data, as well as new information from other Navy programs (e.g., research and development), and newly published non-Navy information.
STG7-145	Marine Mammals Mitigation Measures	Ch 5 3.7	Although this chapter on Marine Mammals provides much new information, there are very serious gaps in the knowledge of the status of most species in the MIRC area and impacts on protected species from the various proposed training activities. Substitution of data from other ocean areas for projection of MIRC area resources cannot be accepted as conclusive. Measurements of impacts on MIRC species are full of unknowns. Further work and monitoring of impacts on marine mammals during ongoing exercises in the MIRC are required and modifications of activities need to be implemented based on such findings. Such modifications should not be delayed for five years until the next EIS but should be implemented expeditiously.	The Navy recognizes the limitations of the survey, but this is the best available data. The survey was conducted at a time of year outside of the typhoon season and when baleen whales would be migrating through the area. Although not integrated into the abundance estimates, acoustic methods were also conducted to supplement the data. See response to STG7-144.
STG7-146	Marine Mammals	P. 3.7-18	Dugong. This commentator and his SCUBA partner personally observed an adult dugong less than ten feet away while diving in Cocos Lagoon, Guam. This sighting by two scientists is documented in the University of Guam Marine Laboratory Technical Report No. 17, 1975, done for the US Army Corps of Engineers. This errant individual dugong is believed to have been killed and eaten by unknown poachers. But there is not a resident population of dugongs on Guam.	See response to STG3-39.
STG7-147	Marine Mammals	P. 3.7-19 Para. 4	Since visual sitings were recorded in the MISTCS during higher sea states (up to BSS 6), this may have decreased the numbers that would have been sighted in lower seas and skewed density estimates to lower values.	The Navy recognizes the limitations of the survey, but this is the best available data. The survey was conducted at a time of year outside of the typhoon season and when baleen whales would be migrating through the area. Although not integrated into the abundance estimates, acoustic methods were also conducted to supplement the data.

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STG7-148	Marine Mammals	P.3.7-34 Para. 6	Sp. :Chamorro Seamounts	Spelling has been corrected throughout the section.
	Proposed Action Marine Mammals	Ch 2 P. 3.7-38 Para. 4	Since Sperm Whales have exhibited reaction to active sonar, will use of the active sonar be stopped in the presence of these whales, even if the acoustic energy is low level and exposures are of short duration?	Active sonar transmissions will cease when any marine mammal is detected within 200 yards of the sonar dome. Mitigation measures for marine mammal exposures to sonar are discussed in detail in Section 5.1.
STG7-150	Marine Mammals Mitigation Measures	P. 3.7-61 Para. 3 Ch 5	The information on impacts of active sonar to marine mammals in the MIRC is not adequate to assure that protected species will be protected from harmful impacts during exercises. Therefore a precautionary approach must be taken and procedures modified constantly as new information becomes available to allow protection of these resources. Current procedures for mitigation should not remain in place for five years if they can be improved at any time.	See responses to STG7-4 and STG7-144.
STG7-151	Marine Mammals	P. 3.7-78 Para. 3	Movement of the animal after an explosion might be to another site of explosions, during a large exercise, rather than avoiding additive impacts by escaping other explosions.	Multiple underwater detonations generally take place in a single location (e.g. a target ship during a SINKEX) and it is likely that an animal would move away from that area during the first detonation. Mitigation measures would be in place to protect marine mammals during underwater detonations at any location.
STG7-152	Marine Mammals	P. 3.7-90	These controlled experiments lack relevance because the species are different from key MIRC species and they were not done for MFA sonar.	Both bottlenose dolphins and killer whales do occur in the MIRC. In each of the studies used in the Risk Function analysis, animals were exposed to either mid frequency sonar or other mid frequency sounds. Studies of these types are difficult to conduct and therefore have only included a few species or types of sound. Until more studies are conducted, those species will be surrogates for the other marine mammals found in the MIRC. As more data becomes available the models can be refined and improved.
STG7-153	Marine Mammals Mitigation Measures	Ch 5 P. 3.7-94	The risk function application is not based on conclusive data. Therefore a precautionary approach must be taken and procedures modified constantly as new information becomes available to allow protection of these resources. Current procedures for mitigation should not remain in place for five years if they can be improved at any time.	Concur. The development of the risk function by NMFS is detailed in Section 3.7.3.1.1 and reflects the recommendations of NMFS and the scientific review panel charged with revision of the analytical methodology. NMFS and the Navy continue to review and improve the acoustic exposure models as new data and techniques become available. As new data from outside sources or from Navy monitoring and research programs, including marine mammal densities and acoustics, become available they will be integrated into the models as appropriate. See response to STG7-144.
STG7-154	Marine Mammals	P. 3.7-104 Para. 5	The stranding of a beaked whale at Piti, Guam, documented by Guam DAWR just over a year ago, occurred coincidentally with a large Navy multi-ship exercise including an aircraft carrier. We believe this unusual stranding may have been associated with sonar use, contrary	There is no evidence of a relationship between the 2007 stranding and sonar training activities.

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			to this DEIS statement.	
STG7-155	Marine Mammals	P. 3.7-111 Para. 3	This DEIS blanket statement denying association of beaked whale stranding and MFA sonar seems contradicted by the stranding of a beaked whale at Piti, Guam, documented by Guam DAWR just over a year ago, which occurred coincidentally with a large Navy multi-ship exercise including an aircraft carrier. We believe this unusual stranding may have been associated with sonar use.	There is no evidence of a relationship between the 2007 stranding and sonar training activities.
STG7-156	Marine Mammals	P. 3.7-111 Para. 3	Navy findings here may need revision because of likely involvement of sonar from training exercises in the grounding and injury of a Cuvier beaked whale on Guam.	There is no evidence of a relationship between the 2007 stranding and sonar training activities.
STG7-157	Proposed Action Regional Economy Recreation Marine Mammals	Ch 2 3.16 3.17 P. 3.7-138 Para. 6	Isn't there a risk that detonations in Agat Bay will interfere with the daily dolphin watching cruises and perhaps because the dolphins to no longer be available for this established tourist industry? UNDET should not be allowed in Agat Bay.	The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures for UNDETs in consultation with NMFS under provisions of the MMPA.
STG7-158	Marine Mammals	P. 3.7-152 Para. 8	Navy findings here may need revision because of likely involvement of sonar from training exercises in the grounding and injury of a Cuvier beaked whale on Guam.	There is no evidence of a relationship between the 2007 stranding and sonar training activities.
STG7-159	Marine Mammals	P. 3.7-170 First Para.	Navy findings here may need revision because of likely involvement of sonar from training exercises in the grounding and injury of a Cuvier beaked whale on Guam.	There is no evidence of a relationship between the 2007 stranding and sonar training activities.
STG7-160	Sea Turtles	3.8-1 to 16	Sea Turtles, Who will survey and determine the causes of sea turtle injury and/or mortality, if any, due to the exercises done within the MIRC?	Qualified Navy biologists will conduct applicable surveys and assessments.
STG7-161	Sea Turtles Mitigation Measures	Ch 5 3.8-1 to 16	Sea Turtles, Who will determine what mitigation, will occur if there is mortality or injury?	The Navy will re-initiate Section 7 ESA consultation if provisions for incidental take are exceeded. The extent of additional mitigation will be discussed during the Section 7 ESA consultation.
STG7-162	Sea Turtles Mitigation Measures	Ch 5 3.8-1 to 16	Sea Turtles, Make sure that USFWS, NMFS, and local resource agency (DAWR) is involved in the process of assessing sea turtle injury and/or mortality.	Past Biological Opinions and the current Biological Opinion contains provisions for notifying USFWS Pacific Islands Field Office, GovGuam DAWR and CNMI DFW Section 7 ESA cooperators in the event of injury or mortality associated with MIRC training.
STG7-	Sea Turtles	Ch 5	When are the mentioned future surveys to be done for the MIRC? Will they provide data for improving protection of marine animals from	No new surveys similar to the MISTCS cruise are scheduled; however, an ancillary purpose of the MISTCS cruise was to provide baseline data for

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163	Mitigation Measures	P. 3.8-2 Sec. 3.8.1.2.3	exercises impacts before the next EIS is done for MIRC?	additional similar surveys.
STG7-164	Public Involvement	Ch 1 3.9-3 and 4	Why was Guam Fisherman's Coop Association not consulted? Its members will be greatly impacted by the proposed training.	As part of the NEPA process, scoping meetings and public hearings were conducted to get input from the public. Dates and venues of scoping meetings and public hearings were published in local newspapers. See Section 1.5 of the EIS/OEIS for details on the public involvement. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981.
STG7-165	Fish	3.9-5	DoD should provide the amount of contaminates released (at least semi-annually) in lieu of disregarding the amounts as negligible due to vastness of marine areas.	Estimates of expended materials are analyzed in Section 3.2. All regulated materials and discharges follow applicable Federal and State laws and reporting requirements.
STG7-166	Fish	3.9-7	Table 3.9.1 STOM, any major vessel(s) movement may cause stress in feeding, spawning, and or sleep patterns due to noise levels.	Table revised.
STG7-167	Fish	3.9-8	Table 3.9.1 Direct Fires Orote Pt, ATCAA 3A, activity may cause stress in feeding, spawning, and or sleep patterns due to noise levels.	Table revised.
STG7-168	Fish	3.9-9	Table 3.9.1 Vessel movements, major vessel(s) movement may cause stress in feeding, spawning, and or sleep patterns due to noise levels.	Table revised.
STG7-169	Fish	3.9-9	Table 3.9.1 ASW Underwater explosions, may cause EFH destruction or disturbance. Even shallow sandy bottoms are EFH.	Table revised.
STG7-170	Fish	3.9-11	Table 3.9.1 SUW Expended materials, DoD should monitor seafloor, numerous training events will build up debris on floor bottom.	Comment noted.
STG7-171	Fish	3.9-11	Table 3.9.1 STW Explosive ordnance, will DoD conduct surveys of fish mortality?	As part of the MMPA/ESA consultation with NMFS, a monitoring program to include monitoring at UNDET sites at Apra Harbor and Agat Bay will include post activity monitoring for fish kills.
STG7-	Transportation	3.14	Foreign fishing boats passing through the MIRC or fishing within it (such as the Asian tuna long-liners in the FSM EEZ), do not stay within	See response to FED2-3.

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172	Regional Economy	P. 3.16-10 Sec 3.16.3.2	shipping lanes nor read the Notice to Mariners. How will impacts on these vessels be avoided? If warned to stay out of naval exercise zones, they may stop using Guam shore facilities and Apra Harbor and negatively impact their suppliers of goods and services on Guam.	
STG7-173	Seabirds & Shorebirds Mitigation Measures	Ch 5 P. 3.10-26 Para. 6	Since sonar impacts on seabirds is unknown, will observers during exercises be recording and documenting any evidence of impacts on seabirds and will the results of such observations be used to modify exercise procedures to protect seabirds?	There are no watchstander measures specific to seabirds; however, the Navy as general practice avoids upwelling areas that bring prey fish closer to the surface and therefore more accessible to seabirds, as well as to recreational and commercial fishers. A figure has been added to Section 3.10 (Figure 3.10-4) that shows observations of seabird foraging concentrations around Saipan and Tinian associated with upwellings. These areas are not fixed locations; however, the figure has been added to demonstrate the Navy's awareness of the need to avoid these areas for seabirds as well as the fishing industry.
STG7-174	Mitigation Measures	Ch 5 P. 3.10-29 Para. 2	AMW. Because of effects to shallow coral reef, no amphibious landings, especially with LCAC and AAV, should be allowed over the reef at Tipalao Bay, unless mitigation is provided for damages to coral reef organisms. If any such exercises have been done at Tipalao, what are the results of impact monitoring and damage assessment?	The number of anticipated amphibious landings at Tipalao and Dadi are low and analyses show that the impacts are minimal and temporary. Conservation measures have been identified to minimize damage to live coral, fish kill, sand compaction, and erosion, including LCAC staying on cushion until landing on the beach. Previous training activity at Tipalao has not resulted in damage to coral.
STG7-175	Proposed Action	Ch 2 P. 3.10-30 Para. 2	Why say "small number of bombs and missiles", when 1800 inert training bombs=<2,000lbs each and 1,600 high explosive bombs 750/1,000 lbs/2,000 lbs are allowed?	This section discusses non-explosive (inert) ordnance and the probability of a seabird strike occurring over the whole of the MIRC study area over the period of a year. Within the MIRC study area, shell and bomb and missile expenditure typically occurs in R-7201 (FDM) and W-517, and the expenditure of small arms typically occurs on controlled land ranges or beyond 3nm of shore. Bomb, missile, and gunnery expenditures and the probability of bird strike within the MIRC Study Area are small when considered in context to the large amount of range area, the small physical cross section of an individual bomb, missile or shell, and the short time of flight for a bomb, missile or shell within the surface and near surface area occupied by birds. Anywhere within the MIRC Study Area, the probability of a physical bird strike from a bomb, missile or shell expenditure is extremely small and vanishingly small taken in context with existing mitigations and proposed numbers of ordnance expenditures.
STG7-176	Water Quality	3.3.3.1	"Expended materials entering the ocean could affect marine water quality". The use of different training materials in the ocean such as, pyrotechnics, chaff, sonobuoys, otto fuel II, torpedoes, ordnance, underwater explosives, and missiles all reflect that residues, chemicals leached, and spills will be released into the ocean but because of the large ocean volume the substance will be diluted so it will be ok. In other words dilution is the solution to pollution.	Comment noted. Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily

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				increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
STG7-177	Marine Mammals Sea Turtles Seabirds & Shorebirds	3.7 3.8 P. 3.10-3 3 Para. 3	The toxicity of the chaff should not be the concern, but what about the physical blocking of digestive tracts by the chaff? What evidence is there that this should not be a concern?	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
STG7-178	Mitigation Measures Terrestrial	3.11 Ch 5	ISR. The abandonment of the only remaining endangered fruitbat colony on Guam should not be an accepted risk. What will be done to prevent this?	Comment noted. As part of the Section 7 ESA consultations, conservation measures were developed to avoid and/or minimize potential adverse impacts. See Chapter 5 for mitigation/conservation measures.
STG7-179	Proposed Action Terrestrial Sasa Bay Marine Protected Area	P. 3.11-13 Para. 10	Polaris Pt. Field. No amphibious landings, especially with LCAC and AAV, but even smaller craft, should be allowed in the Sasa Bay Marine Preserve next to the Polaris Point Field.	See response to STG3-9.
STG7-180	Proposed Action Terrestrial	Ch 2 P. 3.11-14 Last Para.	What are past and projected impacts of exercise landings in the Haputo Ecological Reserve Area? Isn't such use contrary to an ERA established for compensatory mitigation?	Training within the Haputo Ecological Reserve Area is very limited and only used as a secondary training area with very minimal impacts on the resources in the designated marine preserve area. The activities are consistent with the management of the preserve. The training, previously reviewed and analyzed in the 1999 EIS consists of landing special forces trained SEALS on the beach in small raiding craft akin to a small rubber dingy and/or swimming ashore. These activities have similar impact on the area as the ongoing recreational uses of the preserves on Guam including the Tumon Bay Marine Preserve. The activities and the preserve have been monitored since 1999 and no adverse affects from training have been noted. The same mitigation measures described in Chapter 5 would apply to exercises that may occasionally occur at Haputo Beach.
STG7-181	Proposed Action Recreation Regional	Ch 2 3.16 3.17	Arms range. Danger zone for Finegayan Small Arms Range lies over prime diving and fishing areas for residents and tourists. Its use for training must be discontinued, as recognized by JGPO in plans for military expansion on Guam.	See response to STG3-7.

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	Economy			
STG7-182	Airborne Noise Land Use Mitigation Measures	3.5 Ch 5 P. 312-15	A RAICUZ Plan may be needed for AAFB because of the increased developments in zones outside the Base that are impacted by increasing flight exercises.	A RAICUZ is not required for AAFB because no live-fire range above small caliber KD exists on Guam. An AICUZ has been developed for the AAFB airfield operations.
STG7-183	Cultural	P. 3.13-41 Para. 2	Tipalao Cove listed as "offshore", but amphibious landings there would impact archeological sites on shore.	Onshore archaeological sites adjacent to Tipalao Cove and on Dadi Beach are already identified and discussed in subsection 3.13.2.4.
STG7-184	Cultural	Table 3.13-3 P. 3.13-44	Tipalao shore is believed to have archeological values which must be assessed before training activities cause damage.	Historic properties in the area have been assessed. Archaeological studies have shown that much of the area has been extensively disturbed and there are no surface sites. Subsurface deposits do occur, buried below a disturbed fill layer. Those areas have been delineated as no ground disturbance areas in the Programmatic Agreement, thus no historic properties will be affected by this Undertaking (Archaeological Surveys and Cultural Resources Studies on Guam and the Commonwealth of the Northern Mariana Islands in Support of the Joint Guam Build-Up Environmental Impact Statement, Volume I Guam, September 2009.)
STG7-185	Regional Economy	Table 3.16-1	Same effects in all items listed. Why have a table?	Table is included in this section for consistency.
STG7-186	Regional Economy	P. 3.16-10 Para. 5 & 8	Commercial and Recreational fishing importance of outer banks and reefs has not been addressed. Data should be shown and impacts of existing and expanded exercises discussed.	The EIS analyses very much considered the fishermen and their interests. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex. The EIS is based on best available data in regards to recreational and commercial fishing. There are no data available that show the impacts of existing and expanded exercises.
STG7-187	Regional Economy	Table 3.16-4	There are impacts on commercial and recreational fishing of outer banks and reefs. This has not been addressed. Data should be shown and impacts of existing and expanded exercises discussed.	See response for STG7-186.
STG7-188	Recreation	P. 3.17-13 First Para.	Sp. "natural preserve"	Revised to fix spelling.
STG7-	Proposed	Ch 2	While reviewing the MRIC it is perceived that the Military with the increase of training areas and the increase of frequency that they will	See response to STG1-21.

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189	Action		be dictating the how, what, where, and when we could use the ocean around our island. The area identified as w517 is a prime fishing grounds as a few banks are located in this area. With the addition of the floating mines demolition area and the Agat bay DZ will further affect the current use of area.	
STG7-190	Regional Economy Recreation	3.16 P. 3.17-13 Para. 5	Commercial and Recreational fishing importance of outer banks and reefs has not been addressed. Data should be shown and impacts of existing and expanded exercises discussed.	See responses to STG1-21 and STG7-86.
STG7-191	Other Considerations Marine Communities	Table 4-1	Must add Executive Order 13089 for protection of Coral Reefs	Added to Table 4-1.
STG7-192	Marine Mammals Mitigation Measures	5.2 3.7	Sea Turtles and Marine Mammals. If exercises are carried out in high waves, visual detection is decreased and risks increase for un-spotted animals. How is this mitigated?	See response to STG1-8. Every attempt would be made to conduct the exercise in sea states that are ideal for marine sea turtles and mammal sighting, Beaufort Sea State 3 or less. In the event of a 4 or above, survey efforts would be increased within the zones. This would be accomplished through the use of an additional aircraft, if available, and conducting tight search patterns.
STG7-193	Mitigation Measures	5.2.1.1	Must implement procedures and budget for multi-lingual program to train non-US participants before exercises, and have formal agreements to support mitigation measures, even beyond 12 miles.	During planning for training, exercise procedures including environmental risks and mitigation measures are fully briefed. The Officer in charge of the exercise is responsible for compliance. Non-U.S. participants involved in events within the territorial seas of the U.S. (12 nautical miles) are requested to comply with the measures to the extent that these measures do not conflict with Status of Forces agreements. Non-U.S. participants involved in events beyond the territorial seas (12 nautical miles) are encouraged to comply with the mitigation measures to the extent the measures will not impair training, operations, or operational capabilities. Any attempt to force compliance with US regulatory requirements would not be in compliance with international law.
STG7-194	Mitigation Measures Seabirds & Shorebirds	5.2.2.9.3	Post-exercise Surveys and reporting must include seabirds as well.	The Integrated Natural Resources Management Plans includes seabirds. Species surveys are conducted periodically in accordance with USFWS requirements. Refer to Ch 5.
STG7-	Mitigation	5.2.2.10	Who has granted permits for SINKEX? How many Sinkex exercises have been done since 1999? What post exercise impact assessments	See response to STG7-41. EPA agreement doesn't require a post-exercise environmental impact assessment. There have been ten SINKEX events

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195	Measures		have been made?	conducted in MIRC since 1999.
STG7-196	Cumulative Impacts	Table 6-1	Navy Base Facility Construction. Is this part of MIRC activities? If in Guam waters, require CWA 401 permits.	Comment noted. "The Navy Base Facility Construction" project is not part of the Proposed Action for this EIS/OEIS, however cumulative effects of other activities are analyzed in Ch 6.
STG7-197	Cumulative Impacts Sea Turtles	P. 6-11 First Para.	Fibropapillomatosis is a problem in Hawaiian Chelonia midas, but not such a problem in Mariana Islands.	Comment noted. Agree that it is not a problem in the Mariana Islands.
STG7-198	Cumulative Impacts	P. 6-18 Para. 5	Whale watching. This is very wrong! Cumulative impacts will definitely arise.	There is no whale watching tours on Guam. The dolphin watching and dive industry provide tours when whales are observed near shore. In areas of high military activity and marine mammals are observable on a seasonal or regular basis, whale watching and military activities coexist, as found in Hawaii.
STG7-199	Cumulative Impacts	P. 6-19 Para. 3&4	Should take a pre-cautionary approach when impacts are not clearly known and be prepared to modify exercises when negative impacts are observed.	Concur.
STG7-200	Cumulative Impacts	P. 6-25 Para. 5	Noise levels and noise impacts on residents and wildlife from increased flights at AAFB will be significant.	We have conducted Section 7 consultation with USFWS, which include conservation measures specifically designed to minimize, offset, and avoid impacts from noise. These include minimum above ground level (AGL) and flight path modifications. The Navy and Air Force have conducted Section 7 ESA consultations with the USFWS Pacific Islands Field Office for potential effects associated with aircraft noise on ESA listed species at Naval Munitions Site, Andersen AFB, and other DoD use areas. These measures are described in Section 3.11.4 and Chapter 5. For example, to better understand how aircraft noise may affect Mariana fruit bats and Mariana crows, the Air Force has completed in 2008 a noise monitoring study with quantitative noise measurements concurrent with behavioral observations (SWCA 2008). Further, flight restrictions are in effect over both Andersen AFB and the Naval Munitions Site to avoid, minimize, or offset potential impacts associated with noise on ESA listed species.
STG7-201			Different surface visibility occurs with different sea states (over BSS 4). The MIRC study was too rushed and included sightings at higher BSS, but did not factor in the difference of being able to sight in those conditions. Populations could have been underestimated.	The Navy recognizes the limitations of the survey, but this is the best available data. The survey was conducted at a time of year outside of the typhoon season and when baleen whales would be migrating through the area. Although not integrated into the abundance estimates, acoustic methods were also conducted to supplement the data.
STG7-202	Marine Mammals	G.7.1	Dugong. A current Guam EPA staff, former marine biologist, and his SCUBA partner personally observed an adult dugong less than ten feet	See response to STG3-39.

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			away while diving in Cocos Lagoon, Guam. This sighting by two scientists is documented in the University of Guam Marine Laboratory Technical Report No. 17, 1975, done for the US Army Corps of Engineers. This errant individual dugong is believed to have been killed and eaten by unknown poachers. But there is not a resident population of dugongs on Guam.	
STM1-1	Terrestrial Mitigation Measures	3.11 Ch 5	One of the major concerns for the DFW is the potential usage of the DoD leaseback/leased lands on the island of Tinian for a temporary or permanent training installment. The movement of vessels (aircraft and marine) and associated cargo from the island of Guam to Tinian would increase the risk of invasive species introductions, namely the brown treesnake (BTS), to Tinian if appropriate measures are not considered. It is understood that DoD has shipping/quarantine protocols in place that include language regarding the control and interdiction of BTS. It is also understood that a BTS Interdiction Plan is currently being developed to address this issue and we look forward to reviewing the document and providing comments as soon as possible.	As part of the informal Section 7 ESA Consultations between the Navy and the USFWS Pacific Islands Field Office and the Navy and NMFS Office of Protected Resources, the Navy has included conservation measures specifically targeted at brown treesnake control and interdiction. The regional biosecurity plan is still in development, and the Navy is a contributing agency to the Brown Treesnake Technical Working Group. The brown treesnake control and interdiction efforts described in the conservation measures within this EIS/OEIS are concerned with avoiding, offsetting, or minimizing potential introductions of invasive species associated with increased training. The Joint Region INRMP will address other brown treesnake and invasive species control needs, and the biosecurity plan will cover all aspects of Navy activity within the MIRC. Specific measures within the MIRC EIS/OEIS include: (1) The inclusion of a group of conservation measures under the heading "*Conservation Measures for Predators, Pests, and Plants: Invasive Species Management Associated with MIRC Training Activities*". (2) Inclusion of a measure entitled: Brown Treesnake Interdiction and Control and DoD participation in the Brown Treesnake Control Plan. (3) Self-Inspection Training for Personnel and Awareness: Avoidance Invasive Species Introductions. (4) DoD participation in the Regional Biosecurity Plan (5) Cooperative development of regional training SOPs and Exercise Planning For specific descriptions of these measures, please see Section 3.11 and Chapter 5 (Mitigation).

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STM1-2	Sea Turtles	Pg 3.8-14 Line 26 Technical	The DFW Sea Turtle Program has not been privy to data collected by the Navy on Tinian green turtle nesting beaches. It is asked that this information be shared with the DFW Sea Turtle Program so that we are able to make better informed decision regarding turtle conservation and management in the CNMI.	CNMI DFW has an opportunity to review and comment on all natural resource inventory data included in INRMPs. The last INRMP for DoD leased lands within the CNMI was completed in 2003. The Navy will complete an INRMP covering the entire region, the Joint Region INRMP during the next INRMP iteration cycle. The latest reports for Navy surveys on Tinian and FDM, which included turtle data, were provided to the CNMI DFW wildlife supervisor in April 09.
STM1-3	Sea Turtles	Pg 3.8-16 Line 16 Technical	The DFW Sea Turtle Program has a copy of the report by Kessler and Vogt (2002) on the attachment of satellite transmitters to green turtles on Tinian, however, this report simply covers the preliminary actions taken to attach the transmitters. However, the study results and the final destinations for the satellite tagged turtles was never expounded on or published for public consumption. Considering the fact that the Navy paid $20,000 for these satellite tags as stated in the preliminary report, certainly the Navy has the data regarding these animals to share with the DFW Sea Turtle Program. The DFW Sea Turtle Program would like to obtain this migration data and share it with turtle programs Pacific-wide, as this is critical information that has widespread implications not only in the CNMI but to the entire Pacific region for sea turtle management and conservation efforts.	The latest reports for Navy surveys on Tinian and FDM, which included turtle data, were provided to the CNMI DFW wildlife supervisor in April 09.
STM1-4	Sea Turtles Mitigation Measures	Pg 3.8-25 Line 22 Technical	The amphibious landings on Unai Chulu and Unai Dankulo (Long Beach) are a concern for the DFW Sea Turtle Program. Long Beach especially, as this beach was documented to support what appears to be one of the highest green turtle nesting density beaches in the CNMI by Susan Pultz (1999) as compared to other surveyed beaches, including those on Saipan. The DFW Sea Turtle Program believes therefore, that mitigative measures should be taken to significantly reduce the amount of take incurred on these critical nesting beaches. The beaches in question may well provide habitat to a remnant nesting green turtle population currently in danger of extirpation in the CNMI. Is it possible to restrict amphibious landings during the periods when turtle nesting and hatching does not occur? If the first nest was observed by Pultz on Jan 31 and the last nest on July 31 combined with a mean nest incubation time of 62 days, (last evidence of hatching would therefore occur around September 30th) this would leave October 1 through January 31 for amphibious landings to occur with minimum impact to nesting turtles. (However, the Pultz data are dated and more recent data would be helpful to make more	This section has been updated in the FEIS/FOEIS to include sea turtle activity at beaches within the MLA monitored by NAVFACMAR natural resource personnel. Since sea turtle nest locations are poached on Tinian and the FEIS/FOEIS is a public document, specificity for sea turtle activity is not included in the FEIS/FOEIS. This information was included in the consultation between the Navy and USFWS Pacific Islands Field Office. The consultation update included (1) a figure showing nesting activity (crawls, body pits, potential nests, hatchling tracks, and nests) observed at Dankulo, Chulu, Masalok, Lamlam, and Lepresarium (this beach is no longer within the MLA; therefore, part of the monitoring program), (2) a figure that includes turtle activity specific to Dankulo for Long Beach areas 1-13. During the monitoring program data available (1999 to 2007), Dankulo shows the most activity; however, the activity is not evenly distributed across the length of the beach. Segments Long Beach 8 and Long Beach 6 showed the most beach activities for sea turtles, and no beach activities were observed at Long Beach 10 and Long Beach 11. Long Beach 1, the beach segment where amphibious landings are proposed to occur showed one record of a sea turtle crawl between 1999 and 2007 (observed May 24, 2005). The Navy's conclusion was based on (1) the relative lack of turtle activity

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				over the monitoring period (1999 to 2007) for Long Beach 1 where amphibious activity occurs, and (2) Navy protective measures described in Section 3.8.4 and Chapter 5 of the FEIS/FOEIS.
STM1-5	Sea Turtles Mitigation Measures	Pg 3.8-1 & Pg 3.8-26 Line 6 Technical	Table 3.8-1 fails to include the potential activity effect that amphibious landings may create deep track ruts that may "entrap" hatchlings on their journey from the nest to the sea allowing them to become exhausted or taken by predators (Lutz, et al 1997). The MIRC also fails to mention how the LCAC or vehicle tracks will be "smoothed out". Will this involve heavy machinery or will they be raked out by hand? Will the beach profile or slope be changed by Naval activities, possibly affecting turtle nesting behavior? The Biology of Sea Turtles. (1997) Lutz, P., Musick, J.A., & Wyneken, J. CRC Press. Pp 432.	The table has been updated to include ruts as a potential entrapment for hatchlings. LCAC tracks are smoothed out with hand tools to the original topography (not with mechanical methods).
STM1-6	Sea Turtles	Pg 3.8-2 Line 3 Contextual	This statement makes reference to the fact that DFW Sea Turtle Program receives Federal assistance for our program through a Section 6 agreement with USFWS. However, this is a false statement as the DFW Sea Turtle Program unfortunately has not received funding through this avenue to better enable the Program to perform regular surveys on Tinian.	The information has been revised according to the comment.
STM1-7	Sea Turtles	Pg 3.8-1 Line 10 Technical	Tinian Harbor and the Marina Channel provide foraging habitat for juvenile and subadult green turtles as it is believed they feed on the algae laden rocks in that particular area. Up to eight turtles were observed at one time within the narrow confines of the Channel (Kessler & Vogt 2002). DFW Sea Turtle Program is concerned that since turtles have been documented as having strong site fidelity for many years, that the turtles that prefer Tinian Harbor and Marina Channel may be affected and possibly permanently displaced by disturbance from Naval activities.	Comment noted. The Navy's conclusion was based on the following: (1) continued use of Tinian Harbor and Mariana Channel by the Navy over the past few decades has not resulted in abandonment of these areas by sea turtles, and (2) the Navy maintains protective measures that avoid or minimizes impacts to sea turtles associated with Navy vessel movements in and out of Tinian Harbor. See response to STG1-8.
STM1-8	Proposed Action Sea Turtles Mitigation Measures	Ch 2 Ch 5 Pg 5-24 & Pg 3.8-26 Lines 28-30 & 16 Technical	Although there are beach access roads onto Unai Chulu and Unai Dankulu, this does not infer that driving is legal or encouraged on these beaches. CNMI Public Law No. 11-61, code 9 CMC Section 5807 (b) states "it is unlawful for any motor vehicle to enter or go upon any beach area or historic site or tourist site within the Commonwealth." Therefore ingress or egress by military or recreational vehicles onto Tinian beaches is strongly discouraged due to the occurrence of green turtle nesting. It states in 3.8-26 that there will be areas within Unai Chulu and Unai Dankulu that are designated as "No Wildlife Disturbance" and "No Training" areas where troop and vehicle movement is restricted to roads and trails, it is unclear if this includes beaches? Or if these areas restrict amphibious landings from occurring?	The EIS has been revised to discuss the beach training activities that are conducted in accordance with the guidance published in the Mariana Training Handbook (COMNAVMARIANAS Instruction 3500.4) and the mitigations described in Chapter 5 (Mitigation Measures). There is a requirement to use both Unai Chulu and Unai Dankulo to support training requirements for LCAC amphibious assaults. Their different sizes, terrain, and maritime characteristics provide varied amphibious beach capabilities to support LCAC landing and offload capability. Unai Chulu: Potentially supports small scale single craft LCAC wave tactical landings, as part of an amphibious raid or assault; limited by single LCAC landing in the assault wave, timed with high tide, with follow-on

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				waves of administrative movements. Chulu may require minimal improvement for safe LCAC landing (some deepening, possibly some tree removal, and some leveling). Unai Chulu is accessible over a large range of tide and seas. Unai Dankulo: Potentially supports small scale multiple craft LCAC wave tactical landings, as part of an amphibious raid or assault; capable of two or three craft LCAC landing waves in the assault wave, timed with the high tide, with follow-on administrative movements. Dankulo may require some minimal improvement for safe LCAC landing (some deepening, possibly some tree removal, and some leveling). Dankulo beach is sufficiently deep and wide and has sufficient room for offload of assault wave serial onto the beach prior to assault movement off the beach. The coral wall in front of Dankulo suggests less availability due to prevailing seas and current. Prior to beach landings by amphibious vehicles, known sea turtle nesting beaches are surveyed by Navy biologists for the presence of sea turtle nests no more than six hours prior to a landing exercise. Areas free of nests are flagged, and vehicles are directed to remain within these areas. LCAC landings on Tinian are scheduled for high-tide. LCACs stay on-cushion until clear of the water and within a designated Craft Landing Zone (CLZ). Within the CLZ, LCAC come off-cushion with the LCAC oriented to permit expeditious vehicle and cargo offload onto a cleared offload and vehicle traffic area. Although LCAC and expeditionary vehicle traffic typically do not leave ruts, some compaction of sand in vehicle tracks is possible. If restoration of beach topography is required it is conducted using non-mechanized methods. On Tinian, pre- and post exercise surveys for sea turtles are conducted after each LCAC and AAV landing exercise, along with semiannual surveys at Unai Chulu and Unai Babui. Surveys also are conducted semiannually at Unai Lamlam to serve as a control site for baseline sea turtle activity where no landings occur. Semiannual surveys measure percent coral cover, turbidity, fish assemblage, sedimentation rates, and site topography.
STM1-9	Mitigation Measures Sea Turtles	5-21:5-24 Technical	There is absolutely no mention of mitigation measures for sea turtles in this chapter. The DFW Sea Turtle Program requests that the entirety of Unai Dankulu (long beach) be considered a "No Wildlife Disturbance" and "No Training" buffer zone similar to those established for the swiftlet caves. We also suggest that funds be appropriated for periodic marine debris removal by divers to prevent the potential build-up of entanglement or ingestion hazards posed to turtles while in the water.	See responses to STM1-8 and STG1-8. The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office and the NMFS Office of Protected Resources. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources are addressed in the consultations. The NMFS jurisdiction covers marine resources, including sea turtles in nearshore and open ocean habitats and the USFWS jurisdiction covers terrestrial resources, including sea turtles on land and nesting habitats. Conservation/mitigation measures developed from these consultations to avoid and/or minimize any potential

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				adverse effects are included in the EIS. Refer to Chapter 5 for a complete list of mitigation measures associated with the resource areas assessed in the FEIS/FOEIS, and Section 3.8 and Section 5.2.5 for specific measures for nesting sea turtles. Accumulation of debris on Unai Dankulo does not result from training activities; however, the CNMI DFW, as a Sikes Act cooperating agency, is encouraged to work through the Joint Region INRMP process to suggest this stewardship project.
STM1-10	Sea Turtles	3.8-4 & 3.8-5 Technical	The DFW Sea Turtle Program hesitates to comment on behalf of hawksbill turtles until the "monthly data" that Navy personnel has been collecting thus far is revealed. Since hawksbill turtles are endangered in the Pacific, if nesting activity has been confirmed on Tinian it would prove essential information, as there has been no recent confirmed Hawksbill nests in the CNMI. It would thus be recommended that critical habitat designation immediately be pursued for the nesting beach in question.	See response to STG1-8. CNMI DFW has an opportunity to review and comment on all natural resource inventory data included in INRMPs. The last INRMP for DoD leased lands within the CNMI was completed in 2003. The Navy will complete an INRMP covering the entire region, the Joint Region INRMP during the next INRMP iteration cycle. The latest reports for Navy surveys on Tinian and FDM, which included turtle data, were provided to the CNMI DFW wildlife supervisor in April 09.
STM1-11	Editing	All All General	Please use page numbers instead of section numbers (i.e. 3.11-44). This would make it much easier for the reader to navigate this large document.	Comment noted. The page numbers reflect the section numbers to facilitate finding information on a specific topic or resource.
STM1-12	Proposed Action	Tbl 2-8 All Technical	Tinian: We are assuming that all activities that Tinian lands are mentioned in will take force at the full scale described in the EIS as there are no details per site provided. The table does indicate PRI - Primary and SEC - Secondary; however without further description these designations have no meaning. Based on this assumption we have calculated that there are over 700 days of activities on Tinian. Several of these activities would be overlapping and therefore encompass the whole Military area (EMU and MIB). It appears the military would like to have the options to conduct many of these training activities on Tinian; however they need to decide what are the maximum number of events of each activity that will occur so that it will be covered by the EIS. Since it is not possible to determine the environmental consequences or the cumulative effects of such vague activities we have to assume that all actives will occur in the upper two thirds military area. Given that there are bombing and land demolition activities proposed for 120 days this could impact much habitat for Micronesian megapodes, Tinian monarch.	Bombing and land demolitions are not proposed for Tinian in the MIRC EIS. The training proposed for Tinian would occur in conjunction with major exercises as proposed in Table 2-7 and discussed in Appendix D. Training on Tinian is proposed to occur in the Military Leased Area (MLA), and that within the MLA the current INRMP applies, and any exceptions to operation outside of the INRMP guidelines may require consultation. Tinian is not the primary site for all proposed major exercises; however if it were scheduled for every Alternative 1 major exercise event in a year (highly unlikely), the maximum number of days of Tinian involvement would be 175 days. See response to STG1-8.
STM1-	Appendix D	Tbl 2-8 &	Many of the definitions of the range activities in Appendix D that are referenced in Table 2-8 are vague and it is difficult to understand the	Appendix D has been updated.

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13		Appendix D Technical	full extent of the activities. We would like to see more definitions.	
STM1-14	Proposed Action	Tbl 2-9 & Tbl 3.11-1 All Technical	Table 2-9 does not mention Tinian, therefore we would assume there will be no ordinance used on Tinian. However, in Table 2.11-1 there are rows (for example 1st row on page 3.11-4) that say explosive ordnance for activities on Tinian MLA This has implications on impact analysis for the Tinian monarch and Micronesian megapode. Please be clear about whether ordnance use will occur on Tinian, and what the potential impacts are. In addition, on page 3.11-60 it says that land-based ordnance training would occur within the EMUA on Tinian.	Limited use of small arms fire into bullet traps is currently authorized for the Tinian MLA and proposed for continuation in the MIRC EIS. No training activity expenditure of explosive ordnance is proposed for Tinian. Explosive ordnance associated with MIRC training does not occur within critical or essential habitat areas on Tinian. Small explosive charges are used for MOUT type training. The Table has been updated to read (in reference to use of explosive ordnance and weapons firing): o Temporary behavioral disturbance from explosive ordnance and weapons firing (within controlled ranges and/or hardtop surfaces). Limited potential for direct strike of terrestrial species from weapons firing (bullets are fired into bullet traps). See response to STG1-8.
STM1-15	Proposed Action	Table 2-7 Table 2-8 Technical	The exercises listed for Tinian in Table 2-7 do not cross-reference in name and description to the range activities listed in Table 2-8.	Unit activities for a major exercise listed in Table 2-7 may include any of the unit activities permitted in the PRI or SEC training areas listed in Table 2-8.
STM1-16	Proposed Action	Section 2 Technical	The tables in general need to have better explanations or a key to the abbreviations and reference to where more detailed descriptions of the activities might be found. For example the abbreviations PRI and SEC in the location column in Table 2-8 are not easily deciphered.	"PRI' indicates the primary training area for a given activity. 'SEC' indicates secondary training areas that support the same activity.
STM1-17	Editing	MLA or LBA Technical	These two terms are used interchangeably throughout the document for lands on Tinian. Please choose one for the whole document.	These terms are not interchangeable. See glossary. The MLA refers to entire leased area. LBA is the smaller portion leased back to the CNMI government for agricultural and compatible uses with continuing military use. The EMUA is the exclusive military use area on the northern end of the island.
STM1-18	Proposed Action	3.10-13 Technical	This table includes a column for Rota. However, it is not clear to me what impacts from the proposed activities will occur in Rota. In the environmental consequences section there is no mention of Rota. If Rota seabirds are not going to be affected at all by the proposed actions then there is no reason to include Rota in the affected	Saipan has been included as part of the study area for Chapter 3.10 Seabirds. Activities on Rota and Saipan are very limited relative to Guam, Tinian, and FDM.

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			environment section of this chapter (like Saipan, which is not included).	
STM1-19	Seabirds & Shorebirds	3.10-28 Line 12 Technical	"dispersed nature of the over flights" how dispersed are these flights? What is the frequency? It is hard to decide if there are short or long term effects without this information.	The MIRC EIS study area is about 501,873 square nautical miles, which includes controlled airspace areas (aka Air Traffic Control Assigned Airspace [ATCAA]) which cover a total area of 63,000 square nautical miles. Frequency of flights over pelagic foraging habitats for seabirds is not possible to calculate, although ATCAAs are activated for short periods to cover the period of training activities. COMNAVMAR coordinates all ATCAA requests with the FAA and 36th Wing. Other ATCAAs may be configured and requested contingent on agreement with the FAA and coordination with COMNAVMAR and 36th Wing. The Navy's conclusion of aircraft overflights' potential impacts to seabirds is based on (1) the large size of ATCAA areas (63,000 nm), (2) the temporary nature of an aircraft disturbance (aircraft velocities compared to seabird flight characteristics), and (3) the large area available for pelagic foraging. All of these factors suggest that disturbance associated with aircraft overflights is short-term and temporary. Sound level exposure estimates for supersonic and subsonic flights at varying altitudes allowed within the ATCAAs are provided in Section 3.10.3.1 of the FEIS/FOEIS.
STM1-20	Proposed Action	3.10-29 Last para Technical	"These training events are often preceded by some other type of human activity in the general area." Are these other "human activities" analyzed somewhere else in this Chapter?	The "human activities" (e.g. vessel movements associated with a FIREX at FDM) are discussed under vessel noise. The paragraph in the FEIS/FOEIS has been revised to state: These training events are often preceded by some other activity, such as aircraft overflight approaches or vessel approaches (i.e. activities that may occur prior to a FIREX activity at FDM).
STM1-21	Proposed Action	3.10	How often are targets at FDM missed and the special use areas hit?	The database has no record of misses outside of the target area.
STM1-22	Seabirds & Shorebirds	3.10	Aircraft Over flights - This is a large increase (almost 3 times) in aircraft over flights on FDM. I think there needs to be more discussion on why behavioral reactions to these flights would be the same as under the No Action Alternative. Do you have any evidence for this claim? At some point a threshold might be reached on seabird tolerance of over flights.	The Navy's conclusion of aircraft overflights' potential to impact seabird populations at FDM is based on (1) aircraft overflights have varied over FDM under the No Action Alternative with increases associated with specific exercises, (2) populations of seabirds at FDM have fluctuated but have remained stable or increased despite activity. The Navy does not dispute that increased overflights will increase behavioral responses of seabirds; rather, the Navy, in consultation with USFWS Pacific Islands Field Office, has developed monitoring and conservation measures that are designed to offset the effects of increased overflights and to benefit seabird populations. These measures include: (1) maintaining training restrictions associated with FDM use, (2) only targeting of existing impact areas / no increase in impact areas which cover 34 acres or 20% of the island, (3) quarterly monitoring of seabird populations, (4) rat eradication

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				efforts on FDM. These measures are listed in Section 3.10.5 and in Chapter 5 of the FEIS/FOEIS. Under the Navy's obligations under the MBTA, the Navy would consult with USFWS Pacific Islands Field Office for population-level effects associated with the Navy's use of FDM evidenced by the quarterly monitoring program.
STM1-23	Seabirds & Shorebirds	TBL 3.10-39 TBL 3.10-3	At some point short-term behavioral responses may become long-term or permanent responses. These responses may not have population level effects, but repeated bombing may well have a permanent behavioral response from the seabirds. It is hard to believe that the increase by three fold of over flights let alone in bombing activity at FDM does not elicit a more permanent behavioral response or permanent population decline.	Refer to response to STM1-22.
STM1-24	Table of Contents Cumulative Impacts	Ch 6 TOC Technical	The Cumulative Analysis for terrestrial species is completely inadequate and incomplete. The Table of Contents for Cumulative Analysis the Onshore Biological Resources section does not include a subsection for Terrestrial Species. This needs to be added. The current discussion of cumulative impacts to terrestrial resources only mentions invasive species; this is inadequate for the Tinian monarch and Micronesian megapode. Cumulative impacts should include discussion of habitat loss on Tinian due to developments, population effects of frequent disturbances island-wide, habitat loss due to fire, and the potential introduction of the Brown Tree Snake. These impacts should be looked at to determine how they cumulatively affect Tinian monarch and Micronesian megopode populations.	The Section 7 ESA consultation considers cumulative impacts to the Tinian monarch, the Micronesian megapode, and other ESA listed and candidate species in an ESA context. Chapter 6 has been updated to consider cumulative effects to ESA listed species in a NEPA context. The Navy has concluded that the conservation measures proposed on Tinian (see Section 3.11.4 of the FEIS and Chapter 5 of the FEIS) and natural resource stewardship planning as part of the INRMP process are adequate to avoid, minimize, or offset the Navy's contribution to cumulative impacts to these species.
STM1-25	Proposed Action	Ch 2 Tbl 3.11-1 Technical	We need the frequency and duration of activities to determine whether behavioral disturbances from military activities are temporary or permanent. Without this information it is impossible to determine. Please provide an estimate of the amount of "potential for Inadvertent trampling of vegetation" to determine potential habitat loss. Please include the Tinian monarch in all analysis for impacts on Tinian. The Tinian monarch only occurs on Tinian and population numbers have been declining.	See Appendix D for additional details on frequency and duration of training activities. The training on Tinian is proposed to occur in the Military Lease Area (MLA), and that within the MLA the current INRMP applies to proposed training. Any exceptions to operation outside of the INRMP guidelines may require consultation. Table 2-7 indicates the frequency and duration of major exercise activity proposed for the MIRC and which of those events could involve Tinian. Analysis on the Tinian monarch is included in the EIS.
STM1-26	Seabirds & Shorebirds	Tbl 3.11-1	As mentioned above for Table 3.10-3, at some point temporary behavioral disturbance may become permanent. For example, if a bird is temporarily disturbed every day the response may be to permanently move out of the area. Repeated temporary disturbances may have a	These concerns were addressed through the Section 7 ESA consultation process between the Navy and the USFWS Pacific Islands Field Office, as well as Sikes Act procedures for INRMP monitoring. Tinian monarch was included in the Section 7 ESA consultation with the USFWS Pacific Islands

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			longer term response.	Field Office.
STM1-27	Terrestrial	3.11	Please discuss whether use of explosive ordnance on Tinian has the potential to start forest fires, and how that would impact native birds.	MIRC training does not use live ordnance within the MLA. The operations procedures used to employ expended ordnance on Tinian minimize the probability of fires. The small live fires conducted on Tinian are fired into bullet traps and there has been no incident of forest fires associated with training activities on Tinian.
STM1-28	Terrestrial	3.11-24 Marpi Maneuver Area Technical	Nightingale reed warblers have been known to nest in elephant grass when it reaches a height 10f 2m. There is potential, therefore, that nightingale reed warblers could be using this area. Please address this concern. Have surveys ever been conducted at this property? Activities in this area may also affect the endangered nightingale reed warbler on adjacent properties. Nightingale reed warblers are known in areas adjacent to Cow Town, so it is possible that activities may affect nightingale reed warblers on adjacent properties.	The conservation measures included in the DEIS were updated during the Section 7 ESA consultation between the Navy and the USFWS Pacific Islands Field Office and included in the FEIS. Refer to Section 3.11 and Chapter 5 (Mitigation). Specific measures for the nightingale reed warbler include the following measure: • Scheduling Training within Marpi Maneuver Area to Minimize Impacts to Nightingale Reed Warbler Nesting Activity Mosher and Fancy (2002) identified two peak breeding seasons on Saipan for the nightingale reed warbler—January through March and July through September. Although nightingale reed warblers are believed to nest year-round, training within the MIRC can minimize direct and indirect impacts associated with training within the Marpi tract to reduce impacts. Training within the Marpi tract is expected to be infrequent and limited to pedestrian land navigation training in open areas. Implementation of any training restrictions during peak breeding periods (April through June and October through December) may be implemented by the individual Commanding Officer conducting the training under guidance of the DOD representative.
STM1-29	Terrestrial	Tbl 3.11-4 Pg 3.11-32 Birds Technical	The Nightingale reed warbler also is found in tangantangan forests, and in tall grasslands. Tangantangan is an important habitat for the reed warbler on Saipan. Please update this information.	See response to STM1-28. Table 3.11-4 indicates habitat Areas in or near brackish water or marsh habitats, tangantagan forest, secondary forests, and various grasses including but not limited to elephant grass. Historical accounts of the nightingale reed-warbler include populations on Guam, Tinian, Aguiguan, Saipan, Alamagan, and Pagan. The nightingale reed-warbler is thought to now inhabit only two islands in the Marianas chain—Saipan and Aguiguan (USFWS 1998a), although nightingale reed-warblers have not been documented on Aguiguan since 1995 (Vogt 2008, personal communication). On Saipan, the nightingale reed-warbler is distributed island wide, and was estimated in 1997 to number 4,225 pairs (USFWS 1998a); however, the most recent data suggests that there are only 2,596 pairs (Camp *et al*. 2008). During surveys on Saipan in 2007, reed warbler density in occupied habitat was measured at 22 pairs per square kilometer (Camp 2008). This study on Saipan found nests in upland introduced tangantangan forest, a native mangrove wetland, and a native

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				reed wetland. On Alamagan, it inhabits open forest with brushy understory and wooded edges adjacent to open grassland. On Aguiguan, it inhabits formerly disturbed areas vegetated by groves of trees and thickets. On Guam and Pagan, it inhabited freshwater wetland and wetland edge vegetation almost exclusively.
STM1-30	Terrestrial	3.11-30 Line 3-10 Technical	Tangantangan needs to be added as a habitat type in the first section. Nightingale reed warblers are widely distributed on Saipan in many habitats. The second sentence seems to be taken from Mosher (2006) thesis - please take the "a" out- I.e. a native reed wetland. There may be more than one wetland used for nesting. These are just the habitats examined in one study, not all the potential habitats used for nesting. Nests have been found in swordgrass as well.	See responses to STM1-28 and STM1-29. The “a” has been removed from section 3.11.
STM1-31	Terrestrial	3.11	Threats to nightingale reed warblers also include development (i.e. resorts, homesteads etc).	The text has been updated as suggested.
STM1-32	Terrestrial	3.11	More recent data for crows on Rota should be included than 1999.	Comment noted. Please note that MIRC training does not occur in Rota habitat areas. Section has been updated to add Amar *et al.* (2004)—most recent published abundance estimate for Mariana crows on Rota.
STM1-33	Terrestrial	3.11	Threats to Micronesian megapodes also includes introduction of feral chickens.	Text has been updated as suggested.
STM1-34	Terrestrial	3.11-45 Pop status Technical	There is no information on the population of bats on Rota in this section. If activities occur on Rota this information should be included.	The species description for bats has been updated to include the most recent Rota population estimates.
STM1-35	Terrestrial	3.11	Development and feral animals are also threats.	The species descriptions have been updated as suggested.
STM1-36	Terrestrial	3.11	Development is also a significant threat to the Tinian monarch.	The species descriptions have been updated as suggested.
STM1-37	Terrestrial	3.11	Include feral chickens as they may compete with Micronesian megapodes.	The species descriptions have been updated as suggested.
STM1-38	Terrestrial	3.11-61	This section mentions that wildland fires ignited by military training activities have reduced the amount of suitable habitat for the 'elepaio, and indicate that this could also effect Tinian monarchs. Please include a more detailed analysis of this threat. How much Tinian monarch habitat could be destroyed? How many Tinian monarch pairs would this affect? What fire precautions and fire-fighting capabilities are present? Please include fire impacts in a separate paragraph than	Wildland fire resulting from training within the MIRC is only associated with FDM. The discussion for Tinian has been removed.

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			noise. Since the Tinian monarch only occurs on Tinian, any habitat loss from fire could be a serious threat that should be considered in the analysis to determine if the species should be re-listed. Fires could also impact habitat of Micronesian megapodes and Mariana fruit bats. Please include this as well.	
STM1-39	Terrestrial Mitigation Measures	Ch 5 3.11-61 Micronesian Megapode Technical	USFWS have permitted the Navy one take of a megapode nest per year. How is this monitored? Has take occurred in previous years?	The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office for potential impacts on ESA terrestrial species and habitats from the proposed activities in the MIRC. The consultations and discussions resolve and seek to minimize any potential adverse effects. The conservation measures developed during the Section 7 ESA consultations are included in the EIS. Please see Section 3.11 and Chapter 5 (Mitigation). For Micronesian megapodes, specific measures include (1) 5 year interval monitoring of megapodes at FDM, (2) life history studies at Saipan, (3) training restrictions within the Marpi tract, (4) rat eradication at FDM. The difficulty of monitoring incidental take on FDM is acknowledged within the USFWS BO; however, status of Micronesian megapodes on FDM is accomplished through periodic surveys of the vegetated upland plateau by NAVFACMAR biologists. These reports are cited in the document text and satisfy the NAVY's obligation for the monitoring of permitted incidental take as established in the BO.
STM1-40	Terrestrial Mitigation Measures	Ch 5 3.11-62 3.11.3.1.3 Technical	USFWS have permitted the Navy one take of a megapode nest per year. How is this monitored? Has take occurred in previous years?	See response to STM1-39.
STM1-41	Terrestrial	3.11-66 3.11.3.2.1	Please include Tinian monarchs in this analysis. If they are re-listed the military will want to have included a thorough analysis of impacts to the species. Mariana fruit bats are also not included.	See response to STM1-26. The Navy has completed various natural resource technical studies on Guam to provide the most current status information for Mariana fruit bats and Mariana swiftlets occurring on Navy lands on Guam. In addition, the Navy has funded other natural resource technical studies completed by the USFWS Pacific Islands Field Office in support of the proposed military relocation action. As of the publication of the DEIS, these studies were not available, but have been incorporated into the FEIS.
STM1-42	Terrestrial	3.11	Please include summary of potential impacts to Tinian monarchs.	Potential impacts to the Tinian monarchs have been included. These concerns were addressed through the Section 7 ESA consultation process between the Navy and the USFWS Pacific Islands Field Office, as well as Sikes Act procedures for INRMP monitoring. Tinian monarch was included

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				in the Section 7 ESA consultation with the USFWS Pacific Islands Field Office.
STM1-43	Terrestrial Mitigation Measures	5-23	There are no conservation measures listed for Tinian Monarch. Conservation measures for the Tinian Monarch should mitigate for potential impacts from habitat loss, increased risk of fire, potential for Brown Tree Snake introduction, and frequent harassment and disturbance. The Tinian Monarch occurs only on Tinian and the military leases about 2/3 of the island. Therefore military use of Tinian has a potential to seriously impact, either positively or negatively, the Tmlan Monarch population. The Tinian Monarch IS currently delisted; however, It's a locally protected species, and future population losses could potentially lead to re-listing. Preliminary results from the island-wide bird surveys in 2008 show that the Tinian Monarch population has declined by 27% since 1982 (USFWS 2008 study - under review). Therefore, we encourage the military to include conservation measures for the Tinian Monarch in their plans. Conservation measures should include 1) a conservation area, and 2) a life history study and captive rearing program, and 3) quarterly surveys to monitor impacts to Tinian monarchs from military actions	See response to STM1-42.
STM1-44	Terrestrial Mitigation Measures	5-23	We feel that the proposed Micronesian megapode life history study is not adequate to compensate for potential impacts to the very rare species. Additional mitigation could include 1) a native forest conservation area within the whole military use area (EMUA and LBA) and 2) feral chicken eradication within EMUA and LBA.	The USFWS considers the megapode as incidental on Tinian. Therefore, the life history study will be conducted on Saipan, along with rat eradication and interval monitoring on FDM.
STM1-45	Terrestrial Mitigation Measures	5-23	In the draft Marianas Fruit Bat Recovery Plan, for the southern islands bat numbers must be stable or increasing on 3 of the 5 islands for full recovery. While Tinian does not currently support fruit bats (due to poaching and other threats), potential habitat does exist. We proposed a native forest conservation area (same as Micronesian megapode) to preserve potential habitat for the Mariana fruit bat recovery. A military area restricted from poaching provides a good opportunity for Mariana fruit bat recovery.	Comment noted. As part of the Section 7 ESA consultations, conservation measures were developed to avoid and/or minimize potential adverse impacts. See Chapter 5 for mitigation/conservation measures.
STM1-46	Cumulative Impacts	Sect 6.1.1 Pg 6.1.1 Technical	There are three additional projects that are scheduled and have been permitted or are in the process of being permitted. The Tinian monarch is impacted by all these projects as is potentially the Micronesian megapode. The projects are as follows: 1. Matua Bay Development (located on SW shore south of Puntan Diapblo). The project is 136.5 ha, of which 115 ha are forest. The Environmental Assessment stated that 185 Tinian monarch pairs were detected on point count surveys conducted every 100m. If habitat and average territory is used there	See response to STM1-42.

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			will be 1,929 Tinian monarchs impacted by this development. This development was permitted by CNMI-CRMO in 2008. 2. FPA Pacific Corp Quarry, 4.9 ha and 23 Tinian monarchs detected and reported in the Environmental Assessment and permitted by CNMI-CRMO in 2008. 3. Resources Management Quarry, 5.84 ha, in the process of obtaining development permit. Additionally, of the listed future actions the current Tinian Landfill is 12ha and with 100 Tinian monarchs; the Tinian Wastewater Treatment plant is 4.94 ha and has 82 Tinian monarchs. Neither the Tinian Landfill or the Wastewater treatment facility were adequately surveyed for Micronesian megapode.	
STM1-47	Cumulative Impacts	Tbl 6-1 Tbl 6-2 Technical	The geographical boundary for the cumulative impacts analysis for terrestrial biological resources is not adequate. The cumulative impact analysis needs to include locations outside Navy controlled and managed areas for Tinian. The Tinian Monarch occurs only on Tinian and activities occurring on the southern third of the island cannot be ignored in the cumulative effects analysis. In Table 6-1 activities outside the Navy controlled areas are included. However, the cumulative effects from these projects combined with military activities are not analyzed. Please provide an analysis of the cumulative effects of the projects listed in Table 6-1. The island is one whole ecosystem and impacts in the two thirds of the area used by the Military could affect resources island-wide. Therefore, the cumulative effects of all the actions need to be recognized and addressed. The cumulative effects to the Tinian monarch could be especially devastating. The total forest area in the combined military area is 4623 ha which represents 65% of the total forested land on Tinian. The Tinian monarch population in the Military use area.	The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office and the NMFS Office of Protected Resources. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources are addressed in the consultations. Conservation/mitigation measures developed from these consultations to avoid and/or minimize any potential adverse effects are included in the EIS. Refer to Chapter 5 for a complete list of mitigation measures associated with the resource areas assessed in the FEIS/FOEIS, and Section 3.11 for specific measures for terrestrial biological resources.
STM1-48	Proposed Action	Ch 2 ES-1 4th para Technical	Does the proposed action include an increase in the frequency of training exercises? If so I would think that this would be an extensive change to the MIRC activities.	There is a an increase in frequency of training exercises in Alternative 1 and Alternative 2 over the No Action Alternative.
STM1-49	Proposed Action	Ch 2 ES-1 4th para Technical	Please provide a definition of military construction projects. Does this include improvements to existing infrastructure and facilities?	The Proposed Action includes minor repairs and upgrades to facilities and capabilities but does not include any military construction and land acquisition. Examples of minor repairs and upgrades may include replacing targets and repairing structures at MOUT facilities (e.g., replacing doors, windows).
STM1-	Proposed	Ch 2	Beyond a 30 nm radius or greater from FDM will include portions of Anatahan. Will the military be providing notice to residents of Anatahan	Based on EIS analysis, there will be no impacts on Anatahan.

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50	Action	ES-11	as well as evacuation support.	
STM1-51	Terrestrial	Tbl ES-3 Airborne Noise	There is a need to address whether airborne noise will affect terrestrial wildlife species.	Noise is considered as a direct and indirect threat to various terrestrial species. Impacts of airborne noise on terrestrial species were included in the Section 7 ESA consultation with USFWS Pacific Islands Field Office.
STM1-52	Seabirds & Shorebirds	Seabirds & Shorebirds	Please provide the supporting evidence regarding the limited effects to populations.	This conclusion was based on the results of the monthly bird surveys conducted by Navy biologists. Seabird populations, which fluctuate, have remained stable since monitoring began despite continued use of portions of FDM as a range.
STM1-53	Cultural	Tbl ES-3 Cultural Resources Technical	Please address limited access to cultural sites especially on the island of Tinian to tour operators and local residents during training exercises.	Section 3.13.3.2 and 3.13.3.3 discusses the Programmatic Agreement for training activities in the MIRC. The Services have taken into account access issues to the NHL. Since current training level and project training levels will still leave the NHL accessible to the general public during most of the year, access issues are not a concern for the MIRC. The Navy has worked closely with the NPS (Dave Louter) and all the comments by the NPS have been addressed in the new PA. Ongoing communications with the local chamber of commerce, government of Tinian, and local residents provides for access under negotiated terms during the limited times access is restricted.
STM1-54	Regional Economy Recreation	Tbl ES-3 Recreation Technical	Address limited access to recreational fishing and other water activities especially during training exercises on Tinian.	Under the EIS Alternatives 1 and 2, there is to be an increase in training activity and a larger restricted zone around FDM. Other marine areas will not be occupied as to interfere with fishing activities any more than they are today. See response to STG1-22.
STM1-55	Cultural	ES	Address how access to historical and cultural sites are not considered to be substantially affected under the no action and number one alternative.	See response to STM1-53.
STM1-56	Transportation	Tbl 2-5	Please include in map the 100 acres of Port Authority area that may be utilized.	The Port Authority area has been added to the Saipan map.
STM1-57	Proposed Action Land Use	Ch 2 Tbl 2-5	Currently there are no facilities on Angyuta Island. Will facilities be constructed to provide refueling and/or maintenance support, further more will areas need to be cleared to support these activities? It also mentions that leased space is used, is this existing leased space or Authority proposed lease space?	The Proposed Action includes minor repairs and upgrades to facilities and capabilities but does not include any military construction and land acquisition.
STM1-	Cumulative	Tbl 2-7	Address how climatic change and storm frequency may affect training	It is not currently feasible to quantify the direct and indirect effects of global

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58	Impacts	All	in the MIRC, please include frequency modifications and seasonal adjustments. Note that modifications may have severe impacts to potential fire and invasive species risks.	climate change on training facilities. Likewise, currently it is not possible to quantify how climate change may affect impacts of training activities. This is especially true given the limited planning horizon of this EIS and the long-term nature of any global warming effects. Global climate change has been added to Section 3.4 (Air Quality) and Chapter 6 (Cumulative Effects).
STM1-59	Terrestrial	Tbl 3.1-1 All	It is pertinent to address the potential advancement of invasive species introductions due to vehicular and troop movement.	This section analyzes potential impacts to geological resources. Potential impacts to biological resources are addressed in Section 3.11.
STM1-60	Geology	3.1.2 3.1-7 Technical	Anatahan was volcanically active in 2003 should be updated as this volcano was last active by USGS on Feb 3, 2008 with ash plumes extending for 60 miles. Pagan has also been reported to produce ashfall as recent as 2006 by the Hawaiian Volcano Observatory. It is requested that the most recent information be provided for this section.	Text revised based on information provided.
STM1-61	Terrestrial	3.5-9	Considerations should be made to include the sheath-tailed bat (emballonura semicaudata) and the marianas swiftlet (Aerodramus bartschi) as populations are present on proposed MIRC Training Islands and/or adjacent islands.	The Study Area for terrestrial species is the same for the action area defined in the Section 7 ESA consultation.
STM1-62	Transportation Airborne Noise Terrestrial	3.5-9	Indicate where the impact of helicopter activities will be addressed that may occur below large commercial jet aircraft altitudes (2200-2600 ft). include the effects to wildlife in relation to frequency of aircraft fly-overs and/or troop deployments, including refueling runs over Saipan.	Aircraft overflights (fixed wing and helicopters) are discussed in Section 3.11.3.1.1 of the FEIS/FOEIS.
STM1-63	Proposed Action	Ch 2 All All Technical	It is pertinent to indicate the level of training that has occurred under the no action alternative including but not limited to number of troops, vehicles, aircraft, days, land use, type of training, etc. over the last five years.	The No Action alternative is the continuation of the current baseline training range activity in the MIRC. Tables 2-7 through 2-10 and Appendix D and E describe the activities, systems, and personnel involved for all the alternatives. Tables 2-1 through 2-5 describe the training areas and their usage, and Figures 2-1 through 2-11 depict and describe the proposed training areas.
STM1-64	Geology	3.1.2.3 FDM para Technical	Provide a more elaborate discussion on the erosion processes of FDM and how the detonation or air-to-surface munitions has contributed to this process. Also include a resource on the vegetation regeneration process to justify the “typically reestablishes quickly” statement in para 2.	Section 3.1.2.3 was based upon all available evidence including pre and post storm evaluation of storm events, and pre and post activity evaluation using aerial photography and monthly surveys.
STM1-65	Geology	3.1.2.3 3rd para Technical	Include to what extent shore bombardments have weakened the exposed limestone and contributed to erosion.	Section 3.1.2.3 was based upon all available evidence including pre and post storm evaluation of storm events, and pre and post activity evaluation using aerial photography and monthly surveys.

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STM1-66	Seabirds & Shorebirds	3.10	A level of effort should be considered in retrieving current data from annual bird surveys from regional and local environmental agencies.	The Navy completed a comprehensive and systematic review of relevant literature and survey data has been collected in order to complete this analysis for seabirds and shorebirds. Information for the presence, abundance and distribution of seabirds and shorebirds included (1) periodic surveys of FDM and Tinian conducted primarily by Navy natural resource personnel (DoN 2008a,c), (2) USFWS BO issued for various training actions on Tinian (USFWS 1984a, 1984b, 1990a, 1990b, 1999) and FDM (USFWS 1997a, 1997b, 1997c, 1998, 1999) (3) the Integrated Natural Resources Management Plan (INRMP) associated with Navy lands (and leased lands) in the CNMI (DoN 2003), (4) the USFWS Pacific Region Seabird Conservation Plan (2005a), (5) USFWS recovery plans for the endangered short-tailed albatross and the Hawaiian petrel (USFWS 1983, 2005b), (6) site specific seabird and shorebird inventories obtained from Lusk et al. (2000) for FDM and Pratt et al. (1987) for the Mariana Islands, (8) at sea observations of pelagic seabirds observed during the Navy's Mariana Island Cetacean and Sea Turtle Survey (MISTCS) cruise (DoN 2007), (9) seabird surveys summarized by Kessler (2009) during natural resource technical studies on Tinian and Aguiguan (USFWS 2009), and (10) checklists compiled by GovGuam DAWR (Wiles 1998) that includes seabird and shorebird species lists for Guam.
STM1-67	Seabirds & Shorebirds	3.10-21	Please cite reference for shear-waters to breed on Bird Island. Known populations are present to breed on Managaha and possibly Naftan Rock.	This information was sourced from the 1983 USFWS recovery plan covering Newell's shearwaters.
STM1-68	Proposed Action	Ch 2 All All	Consider describing (in a table) the past to current (1997-2009) MIRC Training values frequency and the current No Action Alterative values frequency such as troops, vehicles, days. This will aid the reader in establishing a baseline for the previous events and the range proposed under No Action.	Historically, usage varies from year to year based on deployment schedules, funding, and world events e.g. the wars in Iraq and Afghanistan. The No Action alternative baseline represents the continuation of current baseline activity and is indicative of current activity.
STM1-69	Seabirds & Shorebirds	3.10.2 All	Climate change may affect the foraging behaviors of Seabirds and Shorebirds by effecting ocean currents, etc. Please discuss how foraging will be monitored to avoid striking or disturbing these animals.	There are no specific watchstander provisions for seabirds, however watchstanders while monitoring for marine mammal and sea turtle activity may alert for seabird activity, as well. Further, as general practice, the Navy avoids upwelling sites to avoid impacts to recreational and commercial fishing. These areas are not fixed; however, an example of upwelling locations has been added to Section 3.10 (see Figure 3.10-3 in the FEIS/FOEIS.
STM1-70	Mitigation Measures	Ch 5	Discuss which BTS interdiction protocols will be adhered to, are these local protocols or operational instruction? It would be beneficial to include these protocols in an appendix.	The Navy has developed in consultation with the USFWS Pacific Islands Field Office specific conservation measures that are designed to avoid, minimize, or offset potential impacts associated with brown treesnakes. These measures have been updated since the publication of the DEIS,

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				and are included in Section 3.11 and Chapter 5.
STM1-71	Seabirds & Shorebirds	3.10.3.2 All	Please discuss the impact of fire caused from high explosive ordnances on Seabird and Shorebird nesting habitat.	Indirect impacts are considered more thoroughly in Section 3.10, Section 3.11 and 3.6. For instance, indirect effects of wildland fire resulting from ordnance use at FDM are discussed, as well as indirect effects associated with invasive species introductions. To minimize indirect effects on terrestrial resources, the USFS has developed a fire management plan (USFS 2008) on Navy lands on Guam, which are more susceptible to wildand fires originating offsite than USAF lands. Further, the Navy has included several conservation measures specifically designed to offset or minimize the potential impact of additional extra-Marianas invasive species introductions, and intra-Marianas invasive species transport. DoD Instruction 5090.7, for example, has specific procedures for self-inspection of DoD personnel.
STM1-72	Terrestrial	3.11.1.5.2	Consider dropping DLNR and replacing it with CNMI Gov as DFW is the only agency involved in permitting under DLNR. The other agencies DEQ and CRM fall under the Executive Office of the Gov of the CNMI.	Text revised as suggested.
STM1-73	Terrestrial	Tbl 3.11-1	Consider discussing, as an impact, how vehicular and troop movements may accelerate invasive species introductions by spreading them from their initial point of introduction.	Added text discussing possible acceleration of invasive species through vehicular and troop movements.
STM1-74	Terrestrial	Tbl 3.11-1	Consider including the potential increase in introducing invasive species to and from various training sites within the MIRC and how potential introductions will effect terrestrial species and habitats.	Added text discussing potential effects to terrestrial species and habitats from potential increase in invasive species introduction.
STM1-75	Terrestrial	Tbl 3.11-4 Birds	Please update Acrocephalus /uscinia to include tangantagan forest, secondary forests, and various grasses including but not limited to elephant grass.	Information has been updated.
STM1-76	Terrestrial	Tbl 3.11-4 All	Consider researching surveys and reports from CNMI DFW to update information in this table especially habitat types utilized by the species discussed.	Information has been updated.
STM1-77	Terrestrial	3.11.2.2.4	Please include the unintentional release of pets including avian species that may compete with NGRW for resources or may be vectors of avian diseases.	Information has been updated.
STM1-78	Terrestrial	3.11.2.2.5	Consider replacing "blamed" to "known" for reducing, this was indicated in the previous sentence.	Text revised as suggested.
STM1-79	Terrestrial	3.11.2.2.6	Consider updating Crow Population numbers with recent data.	Text revised as suggested.

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STM1-80	Terrestrial	3.11.2.2.6	Include rats, drongo harassment, monitor lizards as additional predators, as well as habitat modifications (agriculture, homesteads).	Information has been updated.
STM1-81	Terrestrial	3.11	Consider replacing "blamed" to "known" for declines…	Text revised as suggested.
STM1-82	Terrestrial	3.11.2.2.12	BTS would also be a threat to fruit bat on Saipan and any other island it may be introduced.	Information has been updated.
STM1-83	Terrestrial	3.11.2.4.1	Mariana wandering butterfly (Vagrans egistina) is also a candidate species under USFWS and should be included, especially since its home range includes…	The Mariana wandering butterfly was added to the species considered in the FEIS/FOEIS. Surveys for this species and the other candidate nymphalid butterfly (Mariana eight spot butterfly) were completed in 2008 by USFWS personnel (studies funded by MARFORPAC) in support of the military relocation NEPA efforts.
STM1-84	Terrestrial	3.11.2.5.2	Discuss the relationship between natural mortality and human-induced mortality especially how weather events may affect the operational integrity of quarantine programs and may increase the risk of introductions of invasive species. Discuss what types of protocols and safeguards will be in place when moving troops/supplies (including emergency supplies) to and from islands.	Refer to Chapter 5 for an updated description of brown treesnake control and interdiction measures.
STM1-85	Terrestrial	3.11.2.8	Change "one" to "two" brown tree snakes were discovered on nearby Rota on Nov 22, 1991.	Text revised as suggested.
STM1-86	Terrestrial	3.11.2.8 Exotic Predator	Replace the third sentence of paragraph two with the following quote from the same source. "Repeated BTS sightings on Saipan indicate that an incipient population is now present there." The original quote was taken from a section of the review panel report that was not relevant to the discussion.	Text revised as suggested.
STM1-87	Terrestrial	3.11.2.8 Exotic Predator	Consider reviewing SYSTEMATIC RODENT MONITORING A Study of the Introduced Small Mammals of the Mariana Islands Final Report to the USGS Brown Treesnake Project, Fort Collins Science Center, Fort Collins, CO submitted by Andrew S. Wiewel, Amy A. Yackel Adams, and Gordon H. Rodda to update the information.	This study will be considered as the conservation measures are incorporated into various implementation plans, such as the Joint Region INRMP and the Regional Biosecrutity Plan. GovGuam DAWR and CNMI DFW are Sikes Act cooperating agencies for the Joint Region INRMP and stakeholder agencies for the Regional Biosecurity Plan.
STM1-88	Terrestrial	3.11	Include the latest distribution ranges of the introduced rhino beetle on Guam. One may argue that this is an established pest on Guam.	The introduced rhino beetle information was updated in the FEIS.
STM1-89	Terrestrial Mitigation Measures	Ch 5 3.11	Explain the monitoring protocol that ensures only one nest is taken per year as permitted to the Navy by USFWS.	This text has been revised as per informal Section 7 ESA consultation process.
STM1-	Mitigation	Ch 5	Second bullet should include Hawaii and the Western Pacific.	Text revised as suggested.

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90	Measures Terrestrial	3.11		
STM1-91	Terrestrial	Tbl 3.11-8	Consider discussing, as an impact, how vehicular and troop movements may accelerate invasive species introductions by spreading them from their initial point of introduction.	Text revised as suggested.
STM1-92	Regional Economy	3.16.2	Update the garment industry to reflect the current situation. Also discuss the projected impacts on tourism due to Federalizing immigration in the CNMI.	Garment industry information has been updated. The projected impacts on tourism due to Federalizing immigration in the CNMI is not applicable to the Proposed Action or Alternatives for this EIS/OEIS.
STM1-93	Regional Economy	Tbl 3.16-2	Review the values for the totals 2 million or 22 million?	Commas were adjusted correctly.
STM1-94	Regional Economy	3.16.2.6.2	Please include crabbing activities, specifically coconut crabbing and how training activities under each alternative would impact access to coconut crab hunting grounds (Tinian).	There are no data regarding coconut crabbing on Tinian.
STM1-95	Terrestrial Cumulative Impacts	6.2.4 3.11	Consider dropping plant from the phrase "invasive plant species is high…"	Text revised as suggested.
STM2-1	Proposed Action	Ch 2	Regarding the major exercises planned under the EIS, the Office of the Mayor Saipan is concerned about the airborne noise that may exist from increased training activities associated with the 45 percent increased activities out of Anderson AFB on all the current training areas, which will include the Saipan International Airport where the military has joint-use rights. The increase strike force will consist of up to 48 fighter, 12 aerial refueling, six bomber, and four unmanned aircraft. According to the study, noise levels in excess of 90 decibels can occur. However, it also states that sustainable range management practices are in place that protect and conserve natural and cultural resources as well as preserve access to training areas for current and future training requirements.	Section 3.5 Airborne Noise provides detailed information regarding airborne noise in the Study Area. Airborne noise generated by the Proposed Action under the No Action Alternative, Alternative 1, or Alternative 2 would have no substantial environmental effects on human sensitive receptors because noise from training activities in the MIRC would be dispersed and intermittent, so it would not contribute to long-term noise levels, training areas on FDM are remote and isolated from the general public, so no sensitive receptors (non-participants) would be exposed to noise events occurring on FDM, no new public areas would be exposed to noise from training and testing activities, land-based ordnance detonations occur mostly in FDM, a designated restricted area; and the incremental increases in the numbers of range events would not considerably increase long-term average noise levels; hourly equivalent noise levels are and would remain relatively low.
STM2-2	Proposed Action	Ch 2	In addition, we are also concerned about continued public access to FDM where such access may be strictly prohibited with no commercial and/or recreational activities on or near the island. During training exercises, marine vessels are restricted to within a five-km radius and the public may be restricted from beyond five to 56 km radius or greater for certain training events. We are also concerned that as usage of FDM increases in the future, a permanent safety danger zone	The proposed surface Danger Zone is required due to operational needs that will be communicated to the public through additional methods listed below. FDM constitutes the most important bombing range in the Western Pacific. As new air-to-surface weapons technologies enter military service, they must be exercised and military personnel must train to use them. These new technologies require ever greater airspace to accommodate air-to-surface employment parameters. The greater airspace in turn

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			and restricted area will be established restricting all private and commercial vessels.	requires larger surface footprints under the airspace to ensure safety on the ground and sea surface. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex.
STM2-3	Marine Mammals	3.7	Another area of concern is marine mammals where the much potential exists for injury or mortality from vessel collisions with whales and dolphins. This has unfortunately been the case in and around such exercises in Hawaii where mammal behavioral responses have resulted in the past. Sonar use has also had effects such are mammal behavioral disturbances that result from increased harassment dangers to the spotted dolphin and sperm whale. Such exposures have proven in the past to result in mammal mortality. According to the EIS, critical habitat for such marine mammals has not been designated within the MIRC Study Area. Because these mammals are supposedly protected under the Endangered Species Act, it is important for the Navy to consult with the National Marine Fisheries Service regarding such disturbances to marine mammals and related behavior disturbances.	See response to STG1-33.
STM2-4	Marine Mammals	3.7	These mammals will also be exposed to impacts associated with sonar, underwater detonations, and explosive ordinance use that could seriously endanger them. In this connection, the Navy must work with the National Marine Fisheries Service to ensure proper compliance and safety for such mammals.	See response to STG1-33.
STM2-5	Sea Turtles	3.8	Amphibious landings also could result in danger to nesting female sea turtles. Protective measures need to be employed to avoid or reduce potential adverse effects to nesting near turtles and habitat. In addition, underwater detonations and explosive ordinance have potential danger to sea turtles and efforts must be made to protect them. In this connection, the Navy must continue to work with the National Marine Fisheries Service to avoid negative effects to sea turtles in the marine environment. The potential also exists for ingestion of flare caps, marine markers, and entanglement of sea turtles in parachutes and other military-related debris.	See response to STG3-51.
STM2-6	Seabirds & Shorebirds	3.10	Impacts to seabirds and shorebirds as a result of vessel movements, aircraft overflights, amphibious landings, weapons firing and other ordinance use including underwater detonations present potential for injury or death from collisions, primarily at night. Such activities present	Comment noted. Refer to mitigation measures included in Chapter 5 and Section 3.10.

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			increased danger to shorebirds and seabirds, especially at sites like FDM.	
STM2-7	Mitigation Measures	Ch 5	Regarding these and other problems, it is our hope that the Navy is committed to furthering understanding of these forms of wildlife and mammals, and make every effort to develop ways to lessen or eliminate the impacts of such training activities on animals.	Concur.
STM2-8	Mitigation Measures	Ch 5	In closing, the Office of the Mayor of Saipan looks forward to working closely with the military services to develop ways to mitigate the negative effects of military activities on fish, birds, mammals, and other wildlife in implementing the proposed action. Ways must be developed to minimize such impacts on the environment within the lands and waters of the Mariana Islands to lessen or eliminate the impacts of training activities on these animals.	Comment noted.
STM3-1	Proposed Action	Ch 2	The presence of the military service and training in our Western Pacific region is very important. The military will ensure our freedom and safety whether through land, air or at sea. We fully support the Mariana Islands Range Complex. The range complex is needed in order to advance and increase military trainings and capability within the Western Pacific region. Our environment and resources will surely be protected as the military training enhances in our region. Our infrastructures and economic development will advance toward revitalization and diversification through military presence and assistance. Hopefully the military personnel and dependents will make CNMI especially Rota island as their pleasant and relaxation destination.	Comment noted.
STM4-1	Regional Economy	3.16	To consider our fishermen who avail the FDM area as prime fishing grounds. There is a need to strike a balance most especially with the exceptional seasons bound with positive catches from January to June. Further clarifications can be most specific with our U.S. and CNMI Division of F&WL. As you all may know, the area specific is one of the most sought out fishing grounds to our small time commercial fishermen.	FDM, which is leased by the DoD from the CNMI, consists of the island land mass and the restricted airspace designated R-7201. The land mass (approximately 182 acres), is approximately 1.7 miles long and 0.3 miles wide. It contains a live-fire and inert bombing range and supports live-fire and inert engagements such as surface-to-ground and air-to-ground GUNEX, BOMBEX, MISSILEX, Fire Support, and precision Weapons (including laser seeking). R-7201 is the Restricted Area surrounding FDM (extending 3-nm radius from center of FDM, encompassing 28 nm^2, and altitude limits from surface to FL600). Public access to FDM is strictly prohibited and there are no commercial or recreational activities on or near the island. During training exercises, aircraft and marine vessels are restricted within a 3-nm (5-km) radius. Notice to Mariners (NOTMAR) and Notice to Airmen (NOTAM) are issued at least 72 hours in advance of potentially hazardous FDM range events and may advise restrictions beyond 3-nm (5- km) from FDM for certain

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				training events. These temporary advisory restrictions are used to maintain the safety of the military and the public during training sessions by providing public notice of potentially hazardous training activity and temporary danger zones and restriction areas. As usage of FDM increases under implementation of either Alternative 1 or Alternative 2, a 10-nm danger zone would be established to restrict all private and commercial vessels from entering the area during the conduct of hazardous training activity. Development of a 10-nm danger zone would be supplemented by temporary advisory notices as required. FDM and the near shore waters are leased to the United States for military purposes specifically for use as a live fire naval gunfire and air warfare air strike training range. As such FDM and its near shore area have always been an off-limits area to all personnel both civilian and military due to unexploded ordnance concerns. The lease agreement between CNMI and the United States, states in pertinent part, at Article 12 of the lease: "c. Farallon de Medinilla:. Public access to Farallon de Medinilla Island and the waters of the Commonwealth immediately adjacent thereto shall be permanently restricted for safety reasons." This restriction will continue and FDM and near shore areas including the fringing reef and other near shore formations remain a restricted area which prohibits the entry of all personnel, civilian and military from the island without specific permission from Commander US Naval Forces, Marianas. The creation of the proposed danger zone does not affect the continued implementation of restricted access as indicated in the lease agreement; and, therefore no trespassing is permitted on the island or near shore waters and reef at any time. The proposed danger zone would designate a surface safety zone of 10 nm radius surrounding FDM. Public access to FDM will remain strictly prohibited and there are no commercial or recreational activities on or near the island. Aircraft and marine vessels continue to be restricted in accordance with the lease agreement. Notice to Mariners (NOTMAR) and Notice to Airmen (NOTAM) will continue to be issued at least 72 hours in advance of potentially hazardous FDM range events and may advise restrictions for certain training events. These temporary advisory restrictions are used to maintain the safety of the military and the public during training sessions by providing public notice of potentially hazardous training activity and associated danger zones and restriction areas. As usage of FDM increases, a danger zone would be established to restrict all private and commercial vessels from entering the area during the conduct of hazardous training activity. Development of a 10-nm danger zone would continue to be supplemented by temporary advisory notices as required. Scheduled training will be communicated to the stakeholders

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				(e.g., local mayors, resource agencies, fishermen) using a telephone tree and e-mail (developed by COMNAVMAR with stakeholders' input) to send, facsimiles to mayors and fishermen, and notices on the NOAA and local cable channels, and emergency management offices. This safety zone provides an additional measure of safety for the public during hazardous training activities involving the island. The Surface Danger Zone is propose as a surface safety exclusion area to be established in accordance with 33 CFR § 334.1. The USACOE may promulgate regulations restricting commercial public and private vessels from entering the restricted safety zone to minimize danger from the hazardous activity in the area.
STM4-2	Proposed Action	Ch 2	Submerge Lands. Although our CNMI Representative Greg Sablan submitted HR 934 for US Congress to grant CNMI the 3 miles "jurisdiction", I am one who has reservation as such. Other similar attempts since 1995 have failed.	The EIS process does not intervene in Government to Government agreements and understandings. Disagreements over the interpretation of laws are outside the scope of this EIS.
STM5-1	Regional Economy	3.16	The people of Rota is in support of the U.S. military activities. However, we would like to see military activity to assist in positive economic impact through project that will help the community. In the 1960's and 1970's, the military cargo plane used to pick-up Farm produce for military consumption providing important income to the farmers, and at the same time saving the farmers from paying for freight. Perhaps the same arrangement can be brought back.	The EIS covers military training impacts. Analysis of the use of military aircraft in support of commercial activities is outside the scope of the EIS.
STM6-1	Mitigation Measures	Ch 5	My concern would be if the impact assessments done in 1999 thru the present would be available and the various findings or impacts are significant to warrant stricter adherence. And lastly is this type of information readily available?	The 1999 EIS was provided to the public libraries in Guam, Saipan, Tinian, and Rota. The MIRC EIS will be available on the project website and in public libraries. See Chapter 11 of the FEIS for a complete discussion of the public involvement process that was conducted.
STM7-1	Mitigation Measures Regional Economy	Ch 5 3.16	While the Environmental Impact Statement and the Overseas Environmental Impact Statement is in its draft stage, we generally support its action plan as described on tables ES 3.1 to 3.19 with respect to Mariana Islands Range Complex, (MIRC). However, I must challenge the Department of the Navy to implement its alternative action with integrity to commit itself to safeguarding our precious natural resources within the MIRC and to take responsibility should an environmental catastrophe occurs as a result of any MIRC operation and not to turn a blind eye. Lastly, I would like to venture to inquire if there any economic benefits Rota should receive out of the Mariana Islands Range Complex (MIRC). Currently, Saipan and Tinian appear to be enjoying the economic benefits out of the military preposition ships and port of calls.	Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities.
STM8-1	Proposed	Ch 2	The proposal to modify the training area around FDM is unclear and	Chapter 2 has been revised to clarify the proposed surface danger zone

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	Action		needs to be expanded.	for safety purposes around FDM. See response to STM4-1
STM8-2	Proposed Action	Ch 2	Concerns that the proposed FDM restrictions will impact commercial, and local fishermen negatively.	See response to STM8-1.
STM8-3	Hazardous Materials	3.2	Opposes the use of any chemical or nuclear devices and maintains the military must monitor use of Hazardous Materials.	In Section 3.2 and Chapter 5 detailed information is provided regarding the use and disposal of any hazardous materials and any associated mitigations and monitoring of such hazardous materials.
STM8-4	Public Notice	Ch 5	The military must notify the public of the schedule of training.	Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981.
STA1-1	Marine Mammals Cumulative Impacts	3.7 Ch 6	The Office of Hawaiian Affairs (OHA) does express concern over impacts to resources of this state that are also significant to our beneficiaries. OHA sees that occurrences of large numbers of level B harassment events and potential level A exposures are expected to marine mammals. We ask how these exercises differ from those taking place in the Hawai'I Range Complex and also point out that these animals do migrate and, therefore, may be exposed to cumulative effects.	The analysis presented within this EIS/OEIS (Section 3.7) indicates that non-ESA listed marine mammals could be exposed to impacts associated with sonar, underwater detonations, and explosive ordnance use under the No Action Alternative, Alternative 1 (Preferred Alternative), and Alternative 2 that could result in Level A or Level B harassment as defined by MMPA provisions that are applicable to the Navy. Exposure estimates are provided in Tables 3.7-9 though 3.7-20. Other nonacoustic stressors associated with the No Action Alternative, Alternative 1, or Alternative 2 are not expected to result in Level A or Level B harassment. Accordingly, the Navy is working with NMFS through the MMPA permitting process to ensure compliance with the MMPA. Overall, the conclusions in this analysis find that impacts to marine mammal species and stocks would be negligible for the following reasons: • Most acoustic harassments are within the noninjurious TTS or behavioral effects zones (Level B harassment). Two exposures to sound levels causing PTS/injury (Level A harassment) resulted from the summation of the modeling under Alternative 1 and Alternative 2 and consideration of PUTR placement scenarios; however, these exposures are not expected to occur. • Although the numbers presented in Tables 3.7-9 through Table 3.7-20 represent estimated harassment under the MMPA for the

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				No Action Alternative, Alternative 1, and Alternative 2, they are conservative estimates of harassment, primarily by behavioral disturbance. In addition, the model calculates harassment without taking into consideration standard mitigation measures, and is not indicative of a likelihood of either injury or harm. • Additionally, the mitigation measures described in Chapter 5 of this EIS/OEIS are designed to reduce sound exposure of marine mammals to levels below those that may cause "behavioral disruptions," and to achieve the least practicable adverse effect on marine mammal species or stocks. Consideration of negligible impact is required for NMFS to authorize incidental take of marine mammals under the MMPA. By definition, an activity has a "negligible impact" on a species or stock when it is determined that the total taking is not likely to reduce annual rates of adult survival or recruitment (*i.e*., offspring survival, birth rates). The analysis conducted by the Navy assumes that short-term noninjurious sound exposure levels predicted to cause non-TTS and TTS or temporary behavioral disruptions qualify as Level B harassment. As discussed, this will overestimate reactions qualifying as harassment under MMPA because there is no established scientific correlation between mid-frequency active sonar use and long-term abandonment or significant alteration of behavioral patterns in marine mammals. As part of the Navy's formal consultations with NMFS, the Navy has requested the take, by serious injury or mortality of ten beaked whales, although the Navy does not anticipate that marine mammal strandings or mortality will result from conducting MIRC training activities within the study area. In addition, the Navy requests take by Level A Harassment one sperm whale and one pantropical spotted dolphin, although injury will likely be avoided through the implementation of the Navy's proposed mitigation measures. The request is for mid- and high frequency active sonar (does not include low frequency active), underwater detonation and training events within the MIRC Study Area. The request is for a 5-year period commencing in May 2010.
STA1-2	Sea Turtles	3.8	Of additional concern is the harassment of sea turtles. The potential for applicant actions to cause nesting failures must be clarified and mitigated in this environmental review. We ask that the consultations with the Navy and the National Marine Fisheries Service regarding the negative effects to sea turtles be included in the EIS.	The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office and the NMFS Office of Protected Resources. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources were addressed in the consultations. The NMFS jurisdiction covers marine resources, including sea turtles in nearshore and open ocean habitats and the USFWS jurisdiction covers terrestrial resources, including sea turtles

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				on land and nesting habitats. Conservation/mitigation measures developed from these consultations to avoid and/or minimize any potential adverse effects are included in the EIS. In addition, the Navy requested a Letter of Authorization (LOA) from NMFS under MMPA for incidental harassment of marine mammals resulting from training activities proposed in the MIRC. As part of the LOA application, a monitoring plan was developed, with NMFS input, and will be implemented during training exercises involving sonar and explosives to determine the effectiveness of the mitigation measures. Adaptive management is an integral part of the monitoring plan. Refer to Chapter 5 for a complete list of mitigation measures associated with the resource areas assessed in the FEIS/FOEIS, and Section 3.8 for specific measures for nesting sea turtles.
ORG1-1	Marine Mammals	3.7	At the outset we must note that the potential effects on marine mammals are one of the primary concerns associated with this proposal. Unfortunately, the paucity of information provided has severely curtailed the public's ability to meaningfully evaluate and comment upon the environmental impacts and effects of the proposal. Simply stated, there is a dearth of scientific surveys or research to support the Navy's environmental analysis and take estimate in the MIRC. Only one dedicated cetacean survey has ever been conducted around the Commonwealth of the Northern Marianas Islands ("CNMI"). We recommend that, at a minimum, the Navy obtain additional data on cetacean distribution in the MIRC, re-analyze its impacts analysis and take estimates accordingly, and reissue its DEIS.	As detailed in Section 3.7, the Navy's Marianas MRA was the first comprehensive review of marine mammal species that may occur within the MIRC. The MRA presented information from small surveys, fisheries interactions, observations from commercial fisherman, strandings and whaling data. The MRA presented relative occurrence of marine mammals but did not have the information necessary to estimate the marine mammal densities needed for the exposure modeling. The Navy then funded a vessel-based systematic marine mammal survey. The first for this area, was conducted for three months during the period when baleen whales would be present or migrating through the area. The protocols followed those developed by National Marine Fisheries Service (NMFS) and the observers were all NMFS trained and experienced in tropical species. The sei whale which was not expected to occur within the MIRC was seen nearly 20 times during the survey. The method used to calculate abundance and density estimates used a conservative approach and was reviewed by staff of NMFS and the Research Unit for Wildlife Population Assessment (RUWPA) from the Centre for Research into Ecological and Environmental Modelling (CREEM). This is currently the best scientific data available for abundance and density estimates for this area. See section 3.7.2.1.3.
ORG1-2	Proposed Action	Chapter 2	We must also note that the Navy fails to adequately examine impacts from the proposed use of its Surveillance Towed-Array Sensor System (SURTASS) low-frequency active (LFA) sonar. While noting that LFA will be used in the MIRC, the Navy fails to disclose how often it will be used, what mitigation measures will be used, the adequacy of the protective measures currently in place, and whether it will avoid using LFA in areas of the ocean that are especially important habitat. The	"The Navy has analyzed possible effects from the use of SURTASS LFA sonar in the January 2001 SURTASS LFA Sonar Final EIS/OEIS and the April 2007 SURTASS LFA Sonar Supplemental EIS/OEIS. In using SURTASS LFA sonar in the MIRC, the Navy will adhere to the requirements set forth in the MMPA regulations authorizing the take of marine mammals incidental to Navy's SURTASS LFA sonar operations promulgated by NMFS at 50 CFR Part 216 Subpart Q and the associated

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			paucity of information on the Navy's proposed use of LFA makes meaningful comment difficult. Thus, we incorporate by reference our comments on the Navy's Draft Supplemental Environmental Impact Statement for SURTASS LFA and our comments on NMFS' Proposed Rule for the Navy's SURTASS LFA. A copy of each comment letter is attached.	annual Letters of Authorization, the terms and conditions of the annual ESA incidental take statements, and, so long as it remains in effect, the August 8, 2008, Stipulated Settlement Agreement between the Navy and the commenter. With regards to the commenter's re-submission of its comments on the Navy's SURTASS LFA Sonar Draft Supplemental EIS/OEIS, the Navy has re-considered its responses to those questions and incorporates them by reference as set forth in the SURTASS LFA Sonar Final Supplemental EIS/OEIS. The Navy has similarly reviewed and considered NMFS's responses to the commenter's questions on the Proposed Final Rule as set forth at 72 Fed. Reg. 46846-46882, concluding that NMFS's responses are consistent with the SURTASS LFA Sonar Final EIS/OEIS. Regarding those activities in the MIRC Study Area which are part of the proposed action, the Navy proposes to conduct up to 3 exercises during the 5-year period that may include both SURTASS LFA and MFA active sonar sources. The expected duration of this type of exercise, commonly referred to as a "combined exercise", is approximately 14 days. Based on an exercise of this length, an LFA sonar (note to all, we need to be precise an remember to include "sonar") system would be active (i.e., actually transmitting) for no more than approximately 25 hours." The Navy has incorporated by reference NRDC comments on the Draft Supplemental EIS for SURTASS LFA and NMFS Proposed Rule for the SURTASS LFA.
ORG1-3	Proposed Action	Chapter 2	We must also object to the Navy's piecemealing of expansion projects in Guam and CNMI. See, e.g., Joint Guam Program Office, Guam and CNMI Military Relocation EIS/ OEIS (relocating over 8,552 marines and 9,000 dependents to Guam by 2014); U.S. Air Force, Intelligence, Surveillance, and Reconnaissance/Strike EIS; and U.S. Navy, Kilo Wharf Extension EIS. The Navy is attempting to improperly segment the MIRC DEIS and the other proposed relocation and expansion projects. However, these projects are connected to one another both geographically and operationally. The National Environmental Policy Act, 42 U.S.C. 4321 et seq., prohibits the Navy from segmenting these types of connected actions in different analyses and requires consideration of the impacts of such connected actions together in one EIS that comprehensively considers environmental effects. 40 C.F.R. § 1508.25(a)(1) (ii), (iii); id. § 1502.4(a).	The training within the MIRC is not dependent upon the movement of the Marine, the ISR/Strike, or CVN pier. The training within the MIRC will not automatically trigger other actions which may require environmental impact statements. The training within the MIRC will proceed regardless of whether other actions (ISR/Strike/CVN/movement of additional forces) are taken previously or simultaneously and the actions are not dependent on each other for their justification. According to the CEQ regulations, training in the MIRC may logically be viewed in isolation, as it has independent utility as training is an on-going activity. In addition, Courts have upheld federal agencies' decisions to organize and plan their actions in a reasonable or rational manner. The MIRC EIS/OEIS analyzes the cumulative impacts of these independent actions.
ORG1-4	Marine Mammal	3.7	The National Environmental Policy Act requires the Navy to employ rigorous standards of environmental review, including a full explanation	Refer to Section 3.7 for a detailed discussion of the Navy's assessment of potential impacts on marine mammals. The Navy's assessment of

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			of potential impacts, a comprehensive analysis of all reasonable alternatives, a fair and objective accounting of cumulative impacts, and a thorough description of measures to mitigate harm. Unfortunately, the DEIS released by the Navy falls far short of these standards. The Navy's DEIS does not properly analyze the environmental impacts of the limited alternatives it has proposed. Its analysis also substantially understates the potential effects of sonar on marine wildlife. For instance, the Navy fails to acknowledge risks posed to a wide range of marine species and impacts to the Marianas Trench Marine National Monument from the increased activities, or from actions necessary to support the proposed increase in training.	potential impacts reflects the use of the best available and applicable science determined in consultation with NMFS. This includes analysis of the cumulative impacts, mid and high frequency active sonar, underwater detonations, and activities within the Marianas Trench National Marine Monument.
ORG1-5	Marine Mammal	3.7	Further, the Navy concludes that only one sperm whale and one Pantropical spotted dolphin would suffer serious injury or die during the many hours of proposed sonar and other training in its preferred alternative. The Navy reaches this conclusion by excluding relevant information adverse to its interests, using approaches and methods that are unacceptable to the scientific community and ignoring entire categories of impacts. As discussed in detail in Appendix C and the attached critique by Dr. David Bain, the Navy's assessment of acoustic impacts is highly problematic.	As discussed in Section 3.7.3 of the EIS/OEIS, Southall et al (2007:413-414) presented the modeling and threshold levels developed for analysis of impacts to marine mammals universally erred on the side of precaution with regard to the range at which an animal may have a probability of behavioral harassment (65 nm and 120 dB) or with regard to the accumulation of energy for harassment with no accounting for reactions of animals. The model estimates that one sperm whale and one spotted dolphin may be exposed annually to sound levels that could cause Level A Harassment (injury only) but would not cause serious injury or death. These estimates are presented without consideration of mitigation measures that would be in place to prevent Level A Harassment. The risk function methodology was developed by the Navy and NMFS scientists and was reviewed by a panel of six marine mammal biologists and bioacousticians (NMFS 2008 [Lecky letter]). Response to comments by Dr. Bain are provided as Appendix I in the EIS/OEIS.
ORG1-6	Marine Mammal	3.7	Moreover, the Navy's analysis entirely fails to account for cumulative impacts for the years of anticipated activity. The Navy merely recites a list of potential impacts without actually taking the next step of analyzing the effects of those impacts. The Navy's repeated platitude that any impacts are short-term in nature and thus would not combine to produce cumulative effects not only lacks scientific validity, but also grossly misapprehends the definition of cumulative impacts under NEPA. 40 C.F.R. § 1508.7.	Given the periodic and short term nature of training activities along with the large area where exercises will be conducted, the mobile nature of marine species, and sparseness of other activities in the area, it is not anticipated that there will be chronic, long term or cumulative effects to marine mammals. NMFS and the Navy continue to review and improve the acoustic exposure models as new data and techniques become available. As new data from outside sources or from Navy monitoring and research programs, including marine mammal densities behavior and acoustics, become available they will be integrated into the models as appropriate. The Navy and NMFS will continue development of monitoring plans and mitigation measures for short term and wide spread activities (time and

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				place) in MIRC using adaptive management techniques. Chapter 6 provides the cumulative impacts analysis. The past and present impacts and environmental conditions that represent the baseline and the consequences or potential future impacts from Navy proposed activities are found in Chapter 3.
ORG1-7	Marine Mammal	3.7	The failure to meaningfully assess these kinds of risks also necessarily infects the Navy's proposed mitigation measures and alternatives. The Navy fails to consider a variety of other options, alternatives, and common-sense mitigation measures – some employed by the Navy itself in previous training – that would reduce the impacts. What the Navy presents instead is an alternatives analysis and mitigation strategy so narrowly defined that it effectively disregards the environment.	The Navy continually strives to develop and improve models, monitoring, mitigation measures, and standard-operating procedures. The Navy must train in the same manner as it will fight. ASW can require a significant amount of time to develop the "tactical picture," or an understanding of the battle space such as area searched or unsearched, identifying false contacts, understanding the water conditions, etc. The Navy has consistently adopted mitigation measures in consultation with USFWS and NMFS that are effective at reducing risk without significant detrimental effects on training. The Navy has historically declined mitigation measures that are not effective at reducing risk to marine species, yet cause an undue burden on training. Alternative mitigation measures considered but eliminated, and the reasons for their elimination from further consideration was provided in Section 5.2.4 of the Draft EIS/OEIS. See Mitigation Measures in Chapter 5, the MMPA final rule, and the Biological Opinion.
ORG1-8	Marine Mammal	3.7	The Navy can, and must, adopt meaningful measures to reduce the harmful impacts of sonar, including spatial and temporal restrictions for its training exercises. As described in detail in Appendix A and Section IV below, these measures should, at a minimum, include protecting the following areas: • Coastal waters between the shoreline and the 200 meter depth contour • Waters to 2,000 meter isobath • The Marianas Trench Marine National Monument In sum, we urge the Navy to revise its impacts analysis consistent with federal law and to produce a mitigation plan – which includes protected areas – that truly maximizes environmental protection given the Navy's actual operational needs. We also urge the Navy to make available to the public the data and modeling on which its analysis is based. Legal Framework: The National Environmental Policy Act. In nearly every respect, the Navy's DEIS fails to meet the high	The US Navy in conjunction with NMFS and USFWS is best suited to determine what mitigation it can effectively use during its training and testing activities to mitigate harm to marine mammals while still being able to meet its operational needs to train for real-world conditions it may face. The Navy's mitigation scheme is more than just visual monitoring. Aerials and sonar power-down protocols are used as well. Chapter 5 presents the US Navy's protective measures, outlining steps that would be implemented to protect marine mammals and Federally listed species during training events. Navy does not expect 100% of the animals present in the vicinity of training events will be detected and the acoustic impact modeling quantification is not reduced as a result of mitigation effectiveness. During a recent major exercise in Hawaii (RIMPAC 2006), a mitigation measure that precluded ASW training in the littoral region (within 12 nm from shore or to the 200 meter isobath), had a significant impact on realism and training effectiveness. There is no scientific evidence that any set distance from the coast is more protective of marine mammals than any other distance. The Navy has also determined that limiting MFA sonar use to outside 12 nm from the coast prevented crew members from gaining critical experience in training in shallow and littoral waters where sound

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			standards of rigor and objectivity required under NEPA.	propagates differently than in deep water. The training activities within the MIRC are not expected to have any effect on those resources designated for special protection under the Mariana's Trench Marine National Monument designation. However, Chapter 5 of the EIS contains extensive discussion of alternative mitigation measures considered but eliminated. Although that section does not include discussion of the Mariana's Trench Marine National Monument, Section 3.6.2.6 addresses the newly designated Mariana Trench Marine National Monument. It is specifically noted in that section that the events described under the Proposed Action can take place within the Monument. Additionally, the Presidential Proclamation included that the prohibitions included in the Proclamation shall not apply to the activities and exercises of the Armed Forces. The extensive mitigation measures followed during activities and exercises of the Armed Forces within the Monument ensure that the activities are consistent so far as is reasonable and practicable with the Proclamation. The EIS process provides three scenarios for military activities in the Marianas Range Complex. These scenarios are described as the No Action Alternative, Alternative 1, and Alternative 2. The No Action Alternative describes activities as they currently exist and as they will be done in the future; essentially no change from the existing scenario. Alternative 1 and 2 describe other scenarios that are different from the No Action Alternative. Through the NEPA process, the decision maker, the DoD REP will determine which alternative will be implemented, taking into account the analysis in the EIS, which included the review of the written and oral comments provided during the public meetings. Section 1.5 details the steps in the National Environmental Policy Act and the Services' actions to ensure compliance.
ORG1-9	Marine Mammal	3.7	The Navy Fails to Properly Analyze Impacts on Marine Mammals. As set forth in further detail in Appendix A, there is a dearth of dedicated cetacean surveys in the area. Nonetheless, a general review of the region's marine mammals and habitat indicates that the Navy's impacts analysis underestimates actual impacts on species.	See response to STG1-33. As discussed in Southall et al (2007:413-414) and presented in 3.7 of the FEIS/OEIS, the modeling and threshold levels developed for analysis of impacts to marine mammals universally erred on the side of precaution with regard to the range at which an animal may have a probability of behavioral harassment (8-81 nm from source to be below 150 dB and further away to reach the 120 dB lower limit of behavioral harassment) or with regard to the accumulation of energy for harassment with no accounting for reactions of animals. There has been no presumption that exposures are reduced to zero by mitigation and in fact the Navy has consulted with NMFS for all exposures resulting from the modeling without any reduction as a result of mitigation or standard protective measures.

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				The few exposures resulting in injury (e.g. PTS) are very unlikely given the protective measures and range clearance procedures that have been in place for years. The Navy's Marianas MRA (DoN 2005) was the first comprehensive review of marine mammal species that may occur within the MIRC. The MRA presented information from small surveys, fisheries interactions, observations from commercial fisherman, strandings and whaling data. The MRA presented relative occurrence of marine mammals but did not have the information necessary to estimate marine mammal densities needed in the exposure modeling. The Navy then funded a vessel-based systematic marine mammal survey, the first for this area, was conducted for three months during the period when baleen whales would be present or migrating through the area. The protocols followed those developed by National Marine Fisheries Service (NMFS) and the observers were all NMFS trained and experienced in tropical species. The sei whale which was not expected to occur within the MIRC was seen nearly 20 times during the survey. The method used to calculate abundance and density estimates used a conservative approach and was reviewed by staff of NMFS and the Research Unit for Wildlife Population Assessment (RUWPA) from the Centre for Research into Ecological and Environmental Modeling (CREEM). This is currently the best scientific data available for abundance and density estimates for this area. See section 3.7.2.1.3.
ORG1-10	Marine Mammal	3.7	Impacts on Wildlife and the Marianas Trench Marine National Monument. Unfortunately, data on cetacean distribution for this region is extremely sparse, as only one dedicated cetacean survey has ever been conducted around the Marianas or CNMI. NEPA requires agencies to make every attempt to obtain and disclose data necessary to their analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. See 40 C.F.R. § 1502.22(a). Despite this paucity of information, the DEIS dismisses or improperly minimizes any significant risk to marine mammals, fish and wildlife in this area. At a minimum, the Navy must provide cetacean distribution information, as well as a detailed analysis of the impacts on marine species in the Marianas Trench Marine National Monument. Further, given the federally-protected status of the Monument and its	See responses to ORG1-8 and 1-9.

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			importance to wildlife, the Navy should prepare and evaluate an alternative that excludes the Marianas Trench Marine National Monument from training exercises.	
ORG1-11	Marine Mammal	3.7	Acoustic Impacts. In this case, the Navy's assessment of impacts is consistently undermined by its failure to meet these fundamental responsibilities of scientific integrity, methodology, investigation, and disclosure. As set forth in greater detail in Appendix C and the attached critique by Dr. Bain, the DEIS disregards a great deal of relevant information adverse to the Navy's interests, uses approaches and methods that would not be acceptable to the scientific community, and ignores whole categories of impacts. In short, it leaves the public with an analysis of harm—behavioral, auditory, and physiological—that is at odds with established scientific authority and practice. The Navy must revise its acoustic impacts analysis, including its thresholds and risk function, to comply with NEPA.	The development of the risk function by NMFS is detailed in Section 3.7.3.1.1 and reflects the recommendations of NMFS and the scientific review panel charged with revision of the analytical methodology. The marine mammal acoustical analysis is based on he use of the best available science (see Section 3.7) as it applies to mid-frequency and high-frequency sources used during training in MIRC. The thresholds used in this analysis were developed in cooperation with NMFS, who serves as the regulator for these resources. Responses to comments by Dr. Bain are provided as Appendix I in the EIS/OEIS.
ORG1-12	Marine Mammal	3.7	Impacts of SURTASS LFA Sonar. Despite acknowledging that LFA may cause "temporary behavioral disturbances" (DEIS at 3.7-8), the Navy fails to estimate the impact of such use as required by NEPA and as it does for its use of MFA and other acoustic sources. The Navy also fails to discuss appropriate mitigation for its use of LFA sonar. As noted by the Court in NRDC v. Gutierrez, to comply with the MMPA the Navy must not use sonar during training exercises in "areas of the ocean that are especially important habitat." NRDC v. Gutierrez, 2008 WL 360582 *32. Nonetheless, the Navy does not state that it will not use SURTASS LFA in the Marianas Trench Marine National Monument, which is encompassed by the MIRC.	See response to ORG1-2
ORG1-13	Marine Mammal	3.7	The Marianas Trench Mariana National Monument was created by President George W. Bush and covers "waters of the [Mariana] archipelago's northern islands [that] are among the most biologically diverse in the Western Pacific." 74 Fed. Reg. 1557. In accord with the MMPA, the Navy must not use LFA sonar during training exercises in such areas.	See responses to ORG1-2 and ORG1-8.
ORG1-14	Marine Mammal	3.7	Other Impacts on Marine Mammals The activities proposed for the MIRC may have impacts that are not limited to the effects of ocean noise. Unfortunately, the Navy's analysis of these other impacts is cursory and inadequate. First, the Navy fails to adequately assess the impact of stress on	Exposure to mid or high frequency active sonar is not a chronic occurrence. Sonar pings are intermittent, occurring several times a minute and given the large area of the MIRC it is extremely unlikely that individual animals are exposed chronically or even over multiple days. Studies of odontocetes chased during purse seining of tuna showed stress effects when pursued for long periods (30-40 minutes) but most of those animals recovered (Edwards 2007 International Journal of Comparative Psychology, 20: 217-227.). Animals exposed to sonar may only be

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			marine mammals, a serious problem for animals exposed even to moderate levels of sound for extended periods. Second, the Navy fails to consider the risk of ship collisions with large cetaceans, as exacerbated by the use of active acoustics. DEIS 3.7-116 to 120. Third, in the course of its training activities, the Navy would release a host of toxic chemicals, Hazardous Materials into the marine environment that could pose a threat to local wildlife over the life of the range. Finally, the Navy's analysis cannot be limited only to direct effects, i.e., effects that occur at the same time and place as the training exercises that would be authorized. 40 C.F.R. § 1508.8(a). It must also take into account the activity's indirect effects, which, though reasonably foreseeable (as the DEIS acknowledges), may occur later in time or are further removed. 40 C.F.R. § 1508.8(b). This requirement is particularly critical in the present case given the potential for sonar exercises to cause significant long-term impacts not clearly observable in the short or immediate term (a serious problem, as the National Research Council has observed).9 Thus, for example, the Navy must not only evaluate the potential for mother-calf separation but also the potential for indirect effects—on survivability—that might arise from that transient change. 40 C.F.R. § 1502.16(b).	exposed 2-3 times a minute for several minutes. Marine mammal populations are generally stable in Navy range areas. Studies of resident animals within the Hawaii Range Complex (e.g. spinner dolphins and beaked whales) show that individuals have continued to use the same area for up to 19 years. These individuals may have been exposed to Navy activities multiple times over that period and continue to inhabit that area. For further information see sections 3.7.3.1.1. According to the cetacean survey of the MIRC, baleen whales are only found in small numbers. Baleen whales are particularly susceptible to ship strikes (Nowacek et al. 2004; Panigadea et al. 2006; Douglas et al. 2008) However, major training exercises generally take place in the summer season when baleen whales have moved north to temperate/polar feeding areas. The Navy has not found any information to suggest that animals exposed to MFA/HFA sonar would be more susceptible to vessel collisions. The Nowacek et al., 2004 study was conducted on north Atlantic right whales and North Pacific right whales, which have not been observed in the MIRC for many years. Nowachek et al. 2004 used three types of continuous 2 minute signals for 18 minutes, only one of which was mid frequency type signal. MFAS signal is approximate 1 sec and repeated 2-3 times per minute. Naval activities represent a very small percentage of the overall ship traffic. While Navy ship movements may contribute to the ship strike threat, given the lookout and mitigation measures adopted by the Navy, the probability of ship strikes is greatly reduced. For further information see Section 3.7.3.2.1.2. Non-Acoustic Effects. There is no evidence to suggest that short duration exposure to active sonar has caused any indirect effects, long term behavioral response or population effects. The exception being the Bahamas stranding incident and that area has a very different bathymetry compared to the MIRC. Beaked whales and spinner dolphins in Hawaii show island specific residency in areas that have been exposed to Navy activities. For more information see Section 3.7.3.1. The analyses presented predict that the majority of the expended and hazardous materials would rapidly sink to the sea floor, become encrusted by natural processes, and be incorporated into the sea floor, with no significant accumulations in any particular area and no significant negative effects to water quality or marine species. Mitigation measures will be in place to protect marine mammals from the sound and pressure effects of underwater detonations and would also help to avoid their exposure to

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				hazardous materials associated with those activities. For further information see Sections 3.3.2 and 5.2.2. Douglas, A.B., J. Calambokidis, S. Raverty, S.J. Jeffries, D.M. Lambourn, and S.A. Norman. 2008. Incidence of ship strikes of large whales in Washington State. Journal of the Marine Biological Association of the United Kingdom. 1-12. Nowacek, D.P., M.P. Johnson, and P.L. Tyack. 2004. North Atlantic right whales (Eubalaena glacialis) ignore ships but respond to alerting stimuli. Proceedings of the Royal Society of London, part B. 271:227-231. Panigada, S., G. Pesante, M. Zanardelli, F. Capoulade, A. Gannier, M.T. Weinrich. 2006. Mediterranean fin whales at risk from fatal ship strikes. Marine Pollution SeeBulletin. 52:1287–1298.
ORG1-15	Marine Mammal Sea Turtles Seabirds Fish	3.11 3.8	Other Impacts on Wildlife As discussed above, the Navy's proposed training activities pose risks to marine life other than that associated with ocean noise, such as injury or death from collisions with ships, bioaccumulation of toxins, and stress. These same concerns that apply to marine mammals apply to sea turtles, birds and other biota as well. The Navy must adequately evaluate impacts and propose mitigation for each category of harm. 40 C.F.R. §§ 1502.14, 1502.16. The effects of mid-frequency active sonar on sea turtles are glossed over on the grounds that their best hearing range appears to occur below 1 kHz. DEIS at 3.8-13 to 14. But having their best acoustic sensitivity in this range does not mean that sea turtles are oblivious to noise at higher frequencies.	Section 3.7.3.2.1 addresses non-acoustic effects to marine mammals. The potential impacts of non-acoustic stressors have been analyzed and there are no anticipated significant impacts that would require additional mitigation (See section 3.7 for marine mammals and section 3.8 for sea turtles). The ongoing Behavioral Response Study (BRS) on the AUTEC range (DoN 2007; NMFS 2007) is studying the direct effects of mid-frequency active sonar on the diving behavior and movements of cetaceans and indirect effects including stress. The Navy's Office of Naval Research has also funded studies of stress effects from sonar on cetaceans (Romano et al. 2004). Romano, T.A.; M.J. Keogh, C. Kelly, P. Feng, L. Berk, C.E. Schlundt, D.A. Carder, and J.J. Finneran. 2004. Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure. Canadian Journal of Fisheries and Aquatic Science. 61:1124–1134. The cited reports were reviewed and the relevant information for fish was added to Section 3.9 of the EIS. Section 3.9.2.3.2 discusses the data on the range of frequencies that a fish can detect. To date there has not been any experimental determination of an association of such effects from military mid- and high-frequency active sonars. The summary of effects to seabirds in Section 3.10 is based on all known information on the subject. Tremblay et al. (2003) developed methods for measuring time budgets and diving behavior for common guillemots and in this study electronic time-depth recorders attached to the seabirds' bellies measured dives that resulted in average dive times of 38.7 seconds and

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				the average time interval between dives during observed foraging activity as 20.1 seconds. The probability of explosions or sonar occurring within close proximity of seabirds, and specifically diving seabirds, would be infrequent. Because of the extremely short period of time that sea birds spend under water, the fact that sea birds do not usually congregate in the offshore locations that sonar training occurs and the sonar activities occur as intermittent sonar training events. Sea birds would have limited exposure to sound stressors during sonar activities and therefore would not change the conclusion of the DEIS.
ORG1-16	Seabirds	3.10	Nor is the Navy's reasoning with regard to seabirds any more sound. Although the Navy acknowledges that "[i]nformation regarding the effects from sonar on seabirds is virtually unknown" (DEIS at 3.10-26), it then inexplicably concludes that, "[i]n general, birds are less susceptible to both TTS and PTS than are mammals." Id. Such reasoning does not bear up to any serious scrutiny. Seabirds occur in the MIRC, dive underwater (in some cases to depths of hundreds of feet), and are sensitive to same frequencies used by the Navy's acoustic sources. They must receive further analysis in the DEIS, both for the direct impacts they may suffer on exposure to the Navy's acoustic sources and for the impacts they may incur indirectly through depletion of prey species and hard bottom habitat. 40 C.F.R. § 1502.16(a), (b).	See response to ORG1-15.
ORG1-17	Fish	3.9	The Navy Fails to Analyze the Impacts on Fish and Fisheries The DEIS also fails to evaluate the impacts of anthropogenic sound on fish and fisheries. Though the architecture of their ears may differ, fish are equipped, like all vertebrates, with thousands of sensory hair cells that vibrate with sound; and a number of specialized organs like the abdominal sac, called a "swim bladder," that some species possess which can boost hearing. Fish use sound in many of the ways that marine mammals do: to communicate, defend territory, avoid predators, and, in some cases, locate prey. Although fish and wildlife agencies, as well as the studies detailed above, document impacts to fish from both noise and underwater explosions, the DEIS nonetheless concludes that there would be no significant impact on fish or essential fish habitat from its increased sonar training activities and explosive detonations. DEIS at 3.9-61, 65. Such a conclusion is at odds with the scientific literature. NEPA does not allow the Navy to ignore the valid scientific studies that have already been conducted simply because they are contrary to its	See response to ORG1-15.

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			interest. The Navy attempted to avoid further analysis by arguing that "data are limited and it would be very difficult to extrapolate to other species." DEIS 3.9-52. It then capriciously dismisses the potential for adverse impacts on fish. DEIS 3.9-61, 65. This lack of analysis does not meet the requirements of NEPA. The Navy must rigorously analyze the potential for behavioral, auditory, and physiological impacts on fish, including the potential for population-level effects, using models of fish distribution and population structure and conservatively estimating areas of impact from the available literature. 40 C.F.R. § 1502.22. It must also provide appropriate mitigation measures, such as avoidance of spawning grounds and of important habitat for fish species, especially hearing specialists.	
ORG1-18	Mitigation Measures	Chapter 5	The Proposed Mitigation Measurers Fail to Protect Marine Wildlife To comply with NEPA, an agency must discuss measures designed to mitigate its project's impact on the environment. This mitigation scheme disregards the best available science on the significant limits of visual monitoring. The Navy's reliance on visual observation as the mainstay of its mitigation plan is therefore profoundly misplaced. While we applaud the Navy for recognizing these conditions of concern, NEPA requires more. The Navy must impose concrete mitigation measures rather than rhetorical issues of concern. The Navy's ineffective mitigation measures are all the more remarkable given its adoption of more protective measures during previous training. In this light, the Navy's claims that it cannot implement more protective mitigation measures ring false. DEIS at 5-16 to 21. Although the Navy goes to some pain to describe "alternative mitigation measures considered but eliminated" —primarily for "training effectiveness" reasons—its previous adoption of the same measures belies its argument. Clearly the Navy has done more to mitigate the harmful effects of sonar in previous exercises than what it proposes for the MIRC. It can, and must, do more to mitigate the harm on marine wildlife.	Chapter 5, Mitigation Measures, has been updated to reflect the Navy's current mitigation measures and their use of the best available science balanced with the National Marine Fisheries Service (NMFS) approach and the requirements of the Navy to train. Visual observations –The Navy is better positioned, trained, and equipped to spot marine mammals and other sea life than most marine vessels. Navy lookouts undergo extensive training in order to qualify as a watchstander. This training includes on-the-job instruction under the supervision of an experienced watchstander, followed by completion of the Personal Qualification Standard program, certifying that they have demonstrated the necessary skills. In addition to these requirements, Fleet lookouts periodically undergo a 2-day refresher training course. The Navy includes marine species awareness as part of its training for its bridge lookout personnel on ships and submarines. This training addresses the lookout's role in environmental protection, laws governing the protection of marine species. As part of the Navy's on-going monitoring and mitigation measures adaptive management program, studies will be conducted that determine the effectiveness of the lookout/watchstander at other ranges. In addition to visual monitoring, passive acoustic systems are used by all platforms to monitor for marine mammal vocalizations, which are then reported to the appropriate watch station for dissemination to observers. Navy ships also monitor their surroundings using all appropriate sensors at night and with night vision goggles as appropriate for activities conducted at night.

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ORG1-19	Proposed Action	Chapter 2	Protection Zones. To mitigate sonar's harmful effects on marine wildlife, the Navy should adopt protection zones in which sonar activity will be banned. Based on our preliminary analysis of marine mammal densities and habitat in the MIRC, we call for the following exclusion areas for sonar: 1) Coastal exclusion to 200 meter depth contour – This area is important habitat for coastal cetaceans, including humpback whales, spinner dolphins and dugongs. To protect these sensitive species and near coastal habitat, a robust buffer zone should be applied beyond the 200 m contour, and exercises should be planned to eliminate or minimize ship movements towards shore when sonar systems are active. 2) Exclusion to 2000 meter isobath – This area represents important areas for beaked and sperm whale sightings, including a sperm whale calving event. 3) Marianas Trench Marine National Monument – As noted in Section II.A and Appendix A, waters here are among the most biologically diverse in the Western Pacific and include the greatest diversity of seamount and hydrothermal vent life yet discovered. The northern islands are ringed by coral ecosystems with very high numbers of apex predators, including large numbers of sharks. They also contain one of the most diverse collections of stony corals in the Western Pacific. The northern islands and shoals support some of the largest biomass of reef fishes in the Mariana Archipelago. These relatively pristine coral reef ecosystems are objects of scientific interest and essential to the long-term study of tropical marine ecosystems. Any Navy plan for the training range must include measures to eliminate or very substantially limit the number of exercises taking place in Monument waters.	During a recent major exercise in Hawaii (RIMPAC 2006), a mitigation measure that precluded ASW training in the littoral region (within 12 nm from shore or to the 200 meter isobath), had a significant impact on realism and training effectiveness. There is no scientific evidence that any set distance from the coast is more protective of marine mammals than any other distance. The Navy has also determined that limiting MFA sonar use to outside 12 nm from the coast prevented crew members from gaining critical experience in training in shallow and littoral waters where sound propagates differently than in deep water. See response to ORG 1-8.
ORG1-20	Mitigation Measures	Chapter 5	Other Mitigation Measures In addition to the specific protection zones set forth above, the Navy should adopt the following measures: 1) Seasonal avoidance of marine mammal feeding grounds, calving grounds, and migration corridors; 2) Avoidance of or extra protections in other federal and local marine protected areas, including the Piti Bomb Holes Marine Preserve, Tumon Bay Marine Preserve and Sasa Bay Marine Preserve. 3) Avoidance of bathymetry likely to be associated with high-value habitat for species of particular concern, including submarine canyons	The Navy, in conjunction with NMFS, has considered numerous mitigation measures during the development of this EIS/OEIS. The mitigation measures adopted were determined to be the most effective and scientifically supported measures. Mitigation measures are coordinated and agreed upon with NMFS and are constantly updated and reviewed through adaptive management (for further information see Section 5.2). Avoidance of the seasonal presence of migrating marine mammals fails to take into account the fact that the Navy's current mitigation measures apply to all detected marine mammals no matter the season. Advance planning to avoid the seasonal presence of migrating marine mammals is not possible given the start of any "season" is variable (dependent on

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			and large seamounts, or bathymetry whose use poses higher risk to marine species; 4) Avoidance of fronts and other major oceanographic features, such as the warm core rings and other areas with marked differentials in sea surface temperatures, which have the potential to attract offshore concentration of animals, including beaked whales; 5) Avoidance of areas with higher modeled takes or with high-value habitat for particular species; 6) Concentration of exercises to the maximum extent practicable in abyssal waters and in surveyed offshore habitat of low value to species; 7) Use of sonar and other active acoustic systems at the lowest practicable source level, with clear standards and reporting requirements for different testing and training scenarios; 8) Expansion of the marine species "danger zone" to a 4km shutdown, reflecting international best practice, or 2 km, reflecting the standard prescribed by the California Coastal Commission; 9) Suspension of relocation of exercises when beaked whales or significant aggregations of other species are detected by any means within the orbit circle of an aerial monitor or near the vicinity of an exercise; 10) Use of simulated geography (and other work-arounds) to reduce or eliminate chokepoint exercises in near-coastal environments, particularly within canyons and channels, and use of other important habitat; 11) Avoidance or reduction of training during months with historically significant surface ducting conditions, and use of power-downs during significant surface ducting conditions at other times; 12) Use of additional power-downs when significant surface ducting conditions coincide with other conditions that elevate risk, such as during exercises involving the use of multiple systems or in beaked whale habitat; 13) Planning of ship tracks to avoid embayments and provide escape routes for marine animals; 14) Suspension or postponement of chokepoint exercises during surface ducting conditions and scheduling of such exercises during	largely unknown environmental factors). Variability in animal presence within relatively small ocean sub-areas, such as seamounts, ridges, fronts and trenches is often strongly correlated with daily, weekly, seasonal and even decadal changes in prey availability with prey availability being driven by changes in both local and basin-wide oceanographic conditions. While there is a trend toward marine mammals being detected in those areas, overall marine mammals are found at low densities throughout the MIRC. It is critical that Navy be able to conduct ASW training in a variety of environment and bathymetric conditions, including in the vicinity of seamounts. The seamount allows a submarine to hide in an area that is shadowed by seamount because the active transmission cannot reach the sub via the bottom bounce path. Therefore, it is critical to operate MFA sonar in areas of high bathymetric variability. The effects of surface ducting were incorporated into the modeling given that average conditions (including the occasional presence of a surface duct) were taken into account. The Navy is proposing research and monitoring to obtain more information about the potential impacts resulting from navy operations. As part of the Navy's marine mammal monitoring program, additional information on species abundance and distribution will be collected. The MMPA Letter of Authorization is renewed each year and as more data become available they can be used to further refine density estimates for the area. The Navy has a large research program in place with $24 million in 2008. The research is also included in the monitoring plan being developed for the MIRC and will be similar to those for Hawaii and SOCAL. The Services continue to research new ways to provide realistic training through simulation, but there are limits to realism that simulation can provide, most notably in dynamic environments involving numerous forces, and where the training media is too complex to accurately model. Simulation cannot replicate the dynamics of the natural environment, especially the unanticipated. A good example of this is the behavior of sound in the ocean, as currents and sea temperature may change quickly under certain weather conditions, thereby invalidating standard assumptions. Simulators may assist in developing an understanding of basic skills and equipment operation, but cannot offer a complete picture of the detailed and instantaneous interaction within each command and among the many commands and warfare communities that actual training at sea provides. A simulator cannot replicate the dynamic maneuvering of various ships/units within any area of ocean.

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			daylight hours; 15) Use of dedicated aerial monitors during chokepoint exercises, major exercises, and near-coastal exercises; 16) Use of dedicated passive acoustic monitoring to detect vocalizing species, through established and portable range instrumentation and the use of hydrophone arrays off instrumented ranges; 17) Modification of sonobuoys for passive acoustic detection of vocalizing species; 18) Suspension or reduction of exercises outside daylight hours and during periods of low visibility; 19) Use of aerial surveys and ship-based surveys before, during, and after major exercises; 20) Use of all available range assets for marine mammal monitoring; 21) Use of third-party monitors for marine mammal detection; 22) Establishment of long-term research, to be conducted through an independent agent such as the National Fish and Wildlife Foundation, on the distribution, abundance, and population structuring of species in the MIRC, with the goal of supporting adaptive geographic avoidance of high-value habitat. Notably, additional high-value habitat is likely to be identified in the MIRC, and research should be undertaken to identify this critical habitat; 23) Application of mitigation prescribed by regulators, by the courts, by other navies or research centers, or by the U.S. Navy in the past or in other contexts; 24) Avoidance of fish spawning grounds and of important habitat for fish species potentially vulnerable to significant behavioral change, such as widescale displacement within the water column or changes in breeding behavior; 25) Evaluating before each major exercise whether reductions in sonar use are possible, given the readiness status of the strike groups involved; 26) Dedicated research and development of technology to reduce impacts of active acoustic sources on marine mammals; 27) Establishment of a plan and a timetable for maximizing synthetic training in order to reduce the use of active sonar training;	Aviation simulation has provided valuable training for aircrews in specific limited training situations. However, the numerous variables that affect the outcome of any given training flight cannot be simulated with a high degree of fidelity. Landing practice and in-flight refueling are two examples of flight training missions that aircraft simulators cannot effectively replicate. While classroom training and computer simulations are valuable methods for basic training they are no substitute for real-time, at-sea training which mimics the conditions the Services and their allies would encounter in actual operating environments. Therefore, the use of training ranges, unlike simulators, is vital. The training that occurs in these designated training areas allows for safe and effective multi-warfare training. There is a reporting section with report requirements in the MMPA Letter of Authorization (LOA) application and will be the same as in the HRC and SOCAL LOAs. See Chapter 5 for updated Navy funded research, mitigation, reporting and monitoring. The safe transit distance has been corrected to 2,000 yards. Refer to mitigation effectiveness discussion in Chapter 5. To implement its Congressional mandates, the Services needs to support and to conduct current and emerging training events in the MIRC and upgrade or modernize range complex capabilities to enhance and sustain military training. These objectives are required to provide combat capable forces ready to deploy worldwide in accordance with U.S.C. Title 10, Section 5062 for the Navy and additional sections for the other Services. The DoD REP determines both the level and mix of training to be conducted within the MIRC that best meet the needs of the Services.

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			28) Prescription of specific mitigation requirements for individual classes (or sub-classes) of testing and training activities, in order to maximize mitigation given varying sets of operational needs; and 29) Timely, regular reporting to NOAA, state coastal management authorities, and the public to describe and verify use of mitigation measures during testing and training activities. Consideration of these measures is minimally necessary to satisfy the requirements of NEPA, and we note that similar or additional measures may be required under the Marine Mammal Protection Act, Endangered Species Act, and other statutes.	
ORG1-21	Cumulative Impacts	Chapter 6	The Navy Fails to Properly Analyze Cumulative Impacts The Navy's cumulative impact analysis fails to meet these basic requirements. The Navy's analysis merely recites a list of "reasonably foreseeable future actions." DEIS 6-2 to 8. Nowhere in its cumulative impact analysis does the Navy consider—let alone reach the conclusion—that the sum of the various environmental impacts that are enumerated will be limited. DEIS at 6-1 to 26. Indeed, the Navy's analysis cannot provide such support because the Navy fails to explain what the sum of these impacts is expected to be. NEPA requires more than just a recital of possible impacts: it requires the Navy to actually analyze the overall impact of the accumulation of individual impacts. Grand Canyon Trust, 290 F.3d at 345. The DEIS fails to make this analysis. For instance, the Navy must consider the full effects of its sonar training. Instead, it simply assumes that all behavioral impacts are short-term in nature and cannot affect individuals or populations through repeated activity—even though the anticipated takes at its preferred alternative would affect the same populations. Nor does the Navy consider the potential for acute synergistic effects from sonar training. Although the DEIS discusses the potential for ship strike in the training area (DEIS 6-14 to 15), it does not consider the greater susceptibility to vessel strike of animals that have been temporarily harassed or disoriented by certain noise sources. The absence of analysis is particularly glaring in light of an incident in 2003 involving the Navy's use of mid-frequency active sonar, in which killer whales and other marine mammals were observed fleeing away from the sonar vessel at high speeds. Neither does the Navy consider the synergistic effects of noise with other stressors in producing or magnifying a stress-response. For these reasons alone, the Navy	Chapter 6, Cumulative Impacts provides an extensive discussion of the cumulative impacts in relation to the proposed alternatives. Section 6.2.3.6 states that given the periodic and short term nature of sonar exposure along with the vast area where exercises will be conducted, and sparseness of other activities in the area, it is unlikely that there will be long term or cumulative effects to marine mammals. An extensive discussion of sonar training can be found in Sections 3.7 Marine Mammals and 3.8 Sea Turtles. There is no evidence that under the bathymetric conditions found in the MIRC and with mitigation measures in place that marine mammals would be exposed to sonar sound levels that would cause disorientation and therefore make them more susceptible to ship strikes (see Section 3.7.3.2.1.2). Mitigation measures presented in Section 5.2 are designed to minimize ship strikes.

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			should have concluded that the cumulative and synergistic impacts from sonar training are significant and focused its efforts to analyze and develop mitigation measures to avoid those impacts.	
ORG1-22	Cumulative Impacts	Chapter 6	Cumulative Effects. The Navy also acknowledges that the MIRC is crowded with human and military activities, many of which introduce noise, chemical pollution, debris, and vessel traffic into the habitat of protected species. DEIS at 6-15 to 23. Yet it inexplicably fails to conclude what the cumulative effects will be for all those activities.	The revised Chapter 6, Section 6.2.3.6 provides additional detail and discussion of the cumulative impacts of the Anthropogenic Stressors in the Study Area.
ORG1-23	Cumulative Impacts	Chapter 6	Cumulative Effects. Given the scope of the proposed action, the deficiencies of the Navy's cumulative impacts assessment represents a critical failure of the DEIS. At a minimum, the Navy must evaluate the potential for cumulative impacts on populations that would occur in and near the MIRC, clearly define the extent of expected cumulative impacts, and assess the potential for synergistic adverse effects (such as from noise in combination with ship-strikes).	See response to ORG1-22.
ORG1-24	Proposed Action	Chapter 2	The Navy Fails to Properly Analyze Reasonable Alternatives Consideration of alternatives is required by (and must conform to the independent terms of) both sections 102(2)(C) and 102(2)(E) of NEPA. Here, the Navy's alternatives analysis misses the mark.	Alternative development is detailed in Section 2.2.1. The alternatives that are analyzed in the EIS/OEIS each builds upon the previous Alternative, so that Alternative 2 would capture all the activities proposed, including those current training activities under the No Action Alternative. As detailed in Chapter 2 and Table 2-7, the No Action Alternative includes one Joint Expeditionary Exercise and one Joint Multi-strike Group Exercise, as well as two Urban Warfare Exercises. The Proposed Action in Alternative 1 includes one Joint Expeditionary Exercise and one Joint Multi-strike Group Exercise, four MAGTF Exercises, two SPMAGTF Exercises, and five Urban Warfare Exercises. The Proposed Action in Alternative 2 includes all of the actions proposed in the No Action Alternative and Alternative 1 plus a Fleet Strike Group Exercise, an Integrated ASW Exercise, and a Ship Squadron Exercise.
ORG1-25	Proposed Action	Chapter 2	Failure to Identify Environmental Impact-Based Alternatives The Navy claims it assesses "the potential environmental effects" while executing its responsibilities under federal law, including NEPA. DEIS at 1-1. But the Navy's alternatives were not selected to "inform decision-makers and the public" of how the Navy could "avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. Instead, as discussed in the DEIS and below, the Navy chose alternatives based on factors unrelated to the proposed action's environmental impacts. Further, at no point in the DEIS does the Navy discuss how the	See response to ORG1-24. The statement of the purpose and need for the agency action appropriately defines the range of alternatives to be addressed in an EIS. In identifying the purpose and need for a major federal action, the agency must consider the goals of Congress, such as those expressed in the agency's statutory authorization to act. With regard to the MIRC, the purpose and need for the agency action is clearly defined in the DEIS. Alternatives to be evaluated should be those that reasonably satisfy the specific purpose and need for the agency action. The DEIS appropriately limits its analysis to reasonable alternatives that meet the purpose and need of the action.

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			alternatives pose different environmental choices for the public and decisionmakers. The DEIS fails entirely to comply with NEPA's regulations, requiring the Navy to "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among option by the decisionmaker and the public." 40 C.F.R. § 1502.14. The Navy fails to sharply define the environmental issues applicable to each alternative and include these differences in a comparison of alternatives. There is simply no comparison of the risks and benefits of each alternative site showing what is and is not known and what species and habitats would be most at risk from each alternative.	
ORG1-26	Proposed Action	Chapter 2	Identification of Alternative Sites The DEIS does not include any discussion of alternative sites, instead proposing a No Action alternative (maintaining the current level of activities), the preferred Alternative 1 (increasing training activities, range enhancements and upgrades), and Alternative 2 (increasing training activities, range enhancements and upgrades, as well as increasing major at-sea exercises and training). The Navy's analysis is devoid of geographic alternatives. The information the Navy does include indicates that factors of convenience and cost dominated the decision. Factors of mere convenience alone cannot dictate an agency's choice of alternatives to evaluate in an EIS. An agency must discuss all reasonable alternatives—those that will accomplish the purpose and need of the agency and are practical and feasible—not simply those it finds most convenient. 40 C.F.R. § 1502.14. "The primary purpose of the impact statement is to compel federal agencies to give serious weight to environmental factors in making discretionary choices." I-291 Why? Ass'n v. Burns, 372 F.Supp. 233, 247 (D. Conn. 1974). If an agency is permitted to consider and compare the environmental impacts of its proposed action with only equally convenient alternatives—and permitted to omit from such analysis any alternatives that are less convenient, no matter that they might result in significant environmental benefits—this purpose would be thwarted. Carefully siting the activities proposed to occur in the range to avoid concentrations of vulnerable and endangered species and high abundances of marine life is the most critical step the Navy can take in reducing the environmental impacts of this project. Because the Navy has failed to undertake an alternatives analysis that allows it to make an informed siting choice, however, the DEIS is	Section 2.2.2.1 provides an extensive discussion of the consideration of alternative locations for the training presently conducted in the MIRC. The MIRC is the only suitable and efficient training location within the territory of the United States in the WestPac for military services homeported, deployed to, or returning from regions in the WestPac and the Indian Ocean. The U.S. military's physical presence and training capabilities are critical in providing stability to the Pacific Region and the MIRC's strategic location provides the Pacific Joint Commander an area from which strategic engagement plans may include multinational training with allied nations.

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			inadequate and must be revised.	
ORG1-27	Proposed Action	Chapter 2	Other Reasonable Alternatives The DEIS fails to consider any alternatives beyond increasing the level of training. Therefore, many reasonable alternatives are missing from the Navy's analysis that might fulfill that purpose while reducing harm to marine life and coastal resources. For example: (1) The DEIS fails entirely to consider seasonal restrictions on the use of the range. Instead, all of the action alternatives propose year-round use without regard to seasonal variations in marine mammal and fish abundance. This is true despite seasonal migrations of numerous marine mammals. Yet the DEIS fails even to consider the feasibility of avoiding seasonal habitat, or any other seasonal variation in marine life abundance (such as migration routes). Omitting even the mere consideration of any alternative that recognizes the need to protect endangered and sensitive marine life is unacceptable. (2) The DEIS fails to include a range of mitigation measures among its alternatives. Many such measures have been employed by the U.S. Navy in other contexts, as discussed in Section IV; and there are many others that should be considered. Such measures are reasonable means of reducing harm to marine life and other resources on the proposed range, and their omission from the alternatives analysis renders that analysis inadequate. (3) The Navy declines to consider a reduction in the level of proposed training in the MIRC. Yet the Navy's assumption that sonar exercises must occur at the level proposed may well be an artifact of the Navy's Tactical Training Theater Assessment and Planning Program (TAP) process, which, in requiring separate environmental analysis of existing ranges and operating areas, seems to assume a priori that exercises cannot be reapportioned. (4) The Navy's statement of purpose and need contains no language that would justify the limited set of alternatives that the Navy considers (or the alternative it ultimately prefers). In sum, the DEIS shortchanges or omits from its analysis reasonable alternatives that might achieve the Navy's core aim of testing and training while minimizing environmental harm. For these reasons, we urge the Navy to revise its DEIS to adequately inform the public of all reasonable alternatives that would reduce adverse impacts to whales, fish, and other resources. 40 C.F.R. § 1502.1.	See responses to ORG1-24 and ORG1-26 for discussions on alternatives. Avoidance of the seasonal presence of migrating marine mammals fails to take into account the fact that the Navy's current mitigation measures apply to all detected marine mammals no matter the season. Advance planning to avoid the seasonal presence of migrating marine mammals is not possible given the start of any "season" is variable (dependent on largely unknown environmental factors). Mitigation measures are coordinated and agreed upon with NMFS and are constantly updated and reviewed through adaptive management (for further information see Section 5.2). The Navy's current mitigation measures reflect the use of the best available science balanced with the NMFS approach and the requirements of the Navy to train.

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ORG1-28	Recreation	3.17	The Navy Fails to Analyze the Impacts on Wildlife Viewing Interests The DEIS does not adequately consider the MIRC's effects on wildlife viewing and other wildlife-dependent recreational interests. The DEIS makes no mention of the value lost from the harm to marine mammals that attract a number of our organizational members and members of the public to the potentially affected areas of the MIRC.	Text revised. See Section 3.17.3.1.
ORG1-29	Proposed Action	Chapter 2	Project Description and Meaningful Public Disclosure Disclosure of the specific activities contemplated by the Navy is essential if the NEPA process is to be a meaningful one. As several groups and individuals identified in their scoping comments, the overall level of detail about the Navy's actions revealed in this process is a far cry from previous EISs and is so general as to undermine the ability to provide meaningful comment.	Appendix D was developed and is provided to ensure a complete description of each of the activities discussed in the Alternatives.
ORG1-30	Proposed Action	Chapter 2	With regard to noise-producing activities, for example, the Navy must describe source levels, frequency ranges, duty cycles, and other technical parameters relevant to determining potential impacts on marine life. The DEIS provides some of this information, but it fails to disclose sufficient information about active sonobuoys, acoustic device countermeasures, training targets, or range sources that would be used during the exercises. DEIS Appendix D-28 to 31. And the DEIS gives no indication of platform speed, pulse length, repetition rate, beam widths, or operating depths—that is, most of the data that the Navy used in modeling acoustic impacts. The Navy—despite repeated requests—has not released or offered to release CASS/GRAB or any of the other modeling systems or functions it used to develop the biological risk function or calculate acoustic harassment and injury. See, e.g., DEIS at Appendix D. These models and requests for information must be made available to the public, including the independent scientific community, for public comment to be meaningful under NEPA and the Administrative Procedure Act. We encourage the Navy to contact us immediately to discuss how to make this critical information available.	Appendix F provides an extensive description of the modeling performed for MIRC noise sources. The model has been reviewed by acoustic experts and will be subject to independent peer review for conferences or journal submissions. Based on the information provided in the EIS/OEIS, others with the required technical expertise can use the existing information to calculate similar results. The CASS/GRAB program is export controlled and not available for public release, however, approximate results can be obtained using other mathematical models commonly available to those with the technical expertise to utilize those tools.
ORG1-31	Proposed Action	Chapter 2	Scope of Review We are also concerned about the Navy's understanding of its obligations under applicable law. The Navy indicates that its analysis of "extraterritorial" activities, those activities that would take place outside U.S. territorial waters, was prepared under the authority of Executive Order 12114 rather than under NEPA. See DEIS at ES-7. Not only is	The EIS/OEIS has received extensive legal review to ensure that current operations are in compliance with all required Federal, state, and local regulations/laws.

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			this position on the scope of review inconsistent with the order (see, e.g., Environmental Defense Fund v. Massey, 968 F.2d 528 (D.C. Cir. 1994) and NRDC v. Navy, No. CV-01-07781, 2002 WL 32095131 at *9-12 (C.D. Cal. Sept. 19, 2002)), but, insofar as it represents a broader policy, it provides further indication that current operations are likewise out of compliance. Most of the area used for sonar training is sited beyond the 12nm territorial boundary, within the U.S. Exclusive Economic Zone. If, as we expect, activities currently taking place there have not received their due analysis in a prior environmental impact statement, then the Navy is operating in ongoing violation of NEPA.	
ORG1-32	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (1) The Marine Mammal Protection Act ("MMPA"), 16 U.S.C. § 1361 et seq., which requires the Navy to obtain a permit or other authorization from NMFS or the U.S. Fish and Wildlife Service prior to any "take" of marine mammals. The Navy must apply for an incidental take permit under the MMPA, and NRDC will submit comments regarding the Navy's application to NMFS at the appropriate time.	The Navy applied for a LOA under the MMPA.
ORG1-33	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (2) The Endangered Species Act, 16 U.S.C. § 1531 et seq., which requires the Navy to enter into formal consultation with NMFS or the U.S. Fish and Wildlife Service, and receive a legally valid Incidental Take Permit, prior to its "take" of any endangered or threatened marine mammals or other species, including fish, sea turtles, and birds, or its "adverse modification" of critical habitat. See, e.g., 1536(a)(2); Romero-Barcelo v. Brown, 643 F.2d 835 (1st Cir. 1981), rev'd on other grounds, Weinberger v. Romero-Carcelo, 456 U.S. 304, 313 (1982). Given the scope and significance of the actions and effects it proposes, the Navy must engage in formal consultation with NMFS and the U.S. Fish and Wildlife over the numerous endangered and threatened species in the MIRC.	The Navy consulted with NMFS and USFWS regarding the Endangered Species Act requirements.
ORG1-34	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the	The Navy has made Coastal Consistency Determinations in accordance with CZMA. The Navy believes its activities in and around Guam are consistent with the enforceable policies of the Coastal Management

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			proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (3) The Coastal Zone Management Act, and in particular its federal consistency requirements, 16 U.S.C. § 1456(c)(1)(A), which mandate that activities that affect the natural resources of the coastal zone—whether they are located "within or outside the coastal zone"—be carried out "in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs.	Program to the "maximum extent practicable." Also, the Navy has made a Negative Determination as its actions will not have an effect on any coastal use or resource of the Northern Marianas Islands.
ORG1-35	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (4) The Magnuson-Stevens Fisheries Conservation and Management Act, 16 U.S.C. § 1801 et seq. ("MSA"), which requires federal agencies to "consult with the Secretary [of Commerce] with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken" that "may adversely affect any essential fish habitat" identified under that Act. 16 U.S.C. § 1855 (b)(2). In turn, the MSA defines essential fish habitat as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." 16 U.S.C. § 1802 (10). As discussed at length above, anti-submarine warfare exercises alone have the significant potential to adversely affect at least the waters, and possibly the substrate, on which fish in the MIRC depend. Under the MSA, a thorough consultation is required.	Given the limited extent, duration, and magnitude of potential impacts of Navy training, adverse effects on managed species and essential fist habitat are not expected. Thus no consultation with NMFS is necessary. See FEIS Section 3.9.4.1 and Appendix J.
ORG1-36	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (5) The Marine Protection, Research and Sanctuaries Act, 33 U.S.C. § 1401 et seq., which requires federal agencies to consult with the Secretary of Commerce if their actions are "likely to destroy, cause the loss of, or injure any sanctuary resource." 16 U.S.C. § 1434(d) (1). Since the Navy's exercises would cause injury and mortality of species, consultation is clearly required if sonar use takes place either within or in the vicinity of a sanctuary or otherwise affects its resources. Since sonar may impact sanctuary resources even when operated outside its bounds, the Navy should indicate how close it presently operates, or	The MPRSA is not applicable to this action.

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			foreseeably plans to operate, to any such sanctuary and consult with the Secretary of Commerce as required. In addition, the Sanctuaries Act is intended to "prevent or strictly limit the dumping into ocean waters of any material that would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities" (33 U.S.C. § 1401(b)), and prohibits all persons, including Federal agencies, from dumping materials into ocean waters, except as authorized by the Environmental Protection Agency. 33 U.S.C. §§ 1411, 1412(a). The Navy has not indicated its intent to seek a permit under the statute.	
ORG1-37	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (6) The Migratory Bird Treaty Act, 16 U.S.C. § 703 et seq. ("MBTA"), which makes it illegal for any person, including any agency of the Federal government, "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory birds except as permitted by regulation. 16 U.S.C. § 703. After the District Court for the D.C. Circuit held that naval training exercises that incidentally take migratory birds without a permit violate the MBTA, (see Center for Biological Diversity v. Pirie, 191 F. Supp. 2d 161 (D.D.C. 2002) (later vacated as moot)), Congress exempted some military readiness activities from the MBTA but also placed a duty on the Defense Department to minimize harms to seabirds. Under the new law, the Secretary of Defense, "shall, in consultation with the Secretary of the Interior, identify measures-- (1) to minimize and mitigate, to the extent practicable, any adverse impacts of authorized military readiness activities on affected species of migratory birds; and (2) to monitor the impacts of such military readiness activities on affected species of migratory birds." Pub.L. 107-314, § 315 (Dec. 2, 2002). As the Navy acknowledges, migratory birds occur within the MIRC. The Navy must therefore consult with the Secretary of the Interior regarding measures to minimize and monitor the effects of the proposed range on migratory birds, as required.	Section 3.10 details analysis of Seabirds and Migratory Birds in the MIRC Study Area.
ORG1-38	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: (7) Executive Order 13158, which sets forth protections for marine	The Military in carrying out the Proposed Action will follow the guidelines of EO 13158.

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			protected areas ("MPAs") nationwide. The Executive Order defines MPAs broadly to include "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." E.O. 13158 (May 26, 2000). It then requires that "[e]ach Federal agency whose actions affect the natural or cultural resources that are protected by an MPA shall identify such actions," and that, "[t]o the extent permitted by law and to the maximum extent practicable, each Federal agency, in taking such actions, shall avoid harm to the natural and cultural resources that are protected by an MPA." Id. The Navy must therefore consider and, to the maximum extent practicable, must avoid harm to the resources of all federally- and state-designated marine protected areas.	
ORG1-39	Proposed Action	Chapter 2	Compliance With Other Applicable Laws A number of other statutes and conventions are implicated by the proposed activities. Among those that must be disclosed and addressed during the NEPA process are the following: The proposed activities also implicate the Clean Air Act and Clean Water Act as well as other statutes protecting the public health. The Navy must comply with these and other laws.	Discussions of these statutes and resources are included in Section 3.1, Geology, Soils, and Bathymetry; Section 3.2, Hazardous Materials; Section 3.3. Water Quality; Section 3.4, Air Quality; Section 3.5, Airborne Noise; Section 3.6, Marine Communities; Section 3.7, Marine Mammals; Section 3.8, Sea Turtles; Section 3.9, Fish and Essential Fish Habitat; Section 3.10, Seabirds and Shorebirds; Section 3.11, Terrestrial Species and Habitats; Section 3.12, Land Use; Section 3.13, Cultural Resources; Section 3.14, Transportation; Section 3.15, Demographics; Section 3.16 Regional Economy; Section 3.17, Recreation; Section 3.18, Environmental Justice and Protection of Children; and Section 3.19, Public Health and Safety. Additionally Chapter 4 contains a detailed discussion of consistency with other Federal, state, and local plans, policies, and regulations.
ORG1-40	Proposed Action	Chapter 2	Conflicts with Federal, State and Local Land-Use Planning NEPA requires agencies to assess possible conflicts that their projects might have with the objectives of federal, regional, state, and local land-use plans, policies, and controls. 40 C.F.R. § 1502.16(c). The Navy's training and testing activities may affect resources in the coastal zone and within other state and local jurisdictions, in conflict with the purpose and intent of those areas. The consistency of Navy operations with these land use policies must receive more thorough consideration.	See response to ORG1-34.
ORG1-41	Proposed Action	Chapter 2	Conclusion For the reasons set forth above, we urge the Navy to satisfy its obligations under NEPA and other applicable laws. To that end, the Navy should revise its DEIS, improving its impacts and alternatives analysis and establishing temporal and geographic protection zones to	Comment noted.

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			mitigate the harmful impacts of its training.	
ORG2-1	Marine Mammals	3.7	Monitoring of endangered and threatened species: The areas of northern Guam are documented to have the largest nesting sites for sea turtles. The existing range complex extends over these known as well as unknown areas. The concern is the military activity during seasonal fish arrivals both the in-shore and off-shore species.	The Navy conducted Section 7 ESA Consultations with the USFWS Pacific Islands Field Office and the NMFS Office of Protected Resources. Potential impacts from the proposed activities in the MIRC on federally listed species, candidate species and other Federal trust resources are addressed in the consultations. The NMFS jurisdiction covers marine resources, including sea turtles in nearshore and open ocean habitats and the USFWS jurisdiction covers terrestrial resources, including sea turtles on land and nesting habitats. Conservation/mitigation measures developed from these consultations to avoid and/or minimize any potential adverse effects are included in the EIS. In addition, the Navy requested a Letter of Authorization (LOA) from NMFS under MMPA for incidental harassment of marine mammals resulting from training activities proposed in the MIRC. As part of the LOA application, a monitoring plan was developed, with NMFS input, and will be implemented during training exercises involving sonar and explosives to determine the effectiveness of the mitigation measures. Adaptive management is an integral part of the monitoring plan. Refer to Chapter 5 for a complete list of mitigation measures associated with the resource areas assessed in the FEIS/FOEIS, and Section 3.8 for specific measures for nesting sea turtles.
ORG2-2	Mitigation Measures	Chapter 5	Personnel Trained to handle the issues pertaining to the protected species: the personnel may be trained to handle protected species but there exist a greater need for personnel to be trained in impacts to the island's supply of fresh fish.	Comment noted.
ORG2-3	Mitigation Measures	Chapter 5	Minimizing or avoiding exercises around traditional fishing areas during fishing seasons: a. Areas surrounding the island up to 30 nautical miles around seamounts should be excluded from the designated Marine Range Complex which should include the western seamounts. The area on the eastern side of Guam past 30 nautical miles would minimize user conflicts. The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resources prior to any designation.	As general practice, the Navy avoids upwelling sites to avoid impacts to recreational and commercial fishing. These areas are not fixed; however, an example of upwelling locations have been added to Section 3.10 (see Figure 3.10-3 in the FEIS/FOEIS. The EIS analyses very much considered the fishermen and their interests. Better communication will mitigate impacts to fisherman. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex.
ORG2-4	Mitigation	Chapter 5	Minimizing or avoiding exercises around traditional fishing areas during	See response to ORG2-3. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's

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	Measures		fishing seasons: b. The seasonality of off-shore and inshore species coupled with environmental factors (water temperature and currents) make it difficult to ascertain the exact time and favorable location. One week the fish may be found up north this week south and another week around the island itself. The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resources prior to any designation.	request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981. Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services.
ORG2-5	Mitigation Measures	Chapter 5	Minimizing or avoiding exercises around traditional fishing areas during fishing seasons: c. A factor of equal importance but often over-looked is the recruitment of the fish's food fish otherwise known as bait fish. The military exercises may highly impact the migratory travels. The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resources prior to any designation.	See response to ORG2-3.
ORG2-6	Mitigation Measures	Chapter 5	Minimizing or avoiding exercises around traditional fishing areas during fishing seasons: d. The issue that the military exercises would be occurring in areas (sandy bottoms) where allegedly impacts are minimized does not address the upper layers of the habitat where the migratory fish travel. The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resources prior to any designation.	See response to ORG2-3.
ORG2-7	Mitigation Measures	Chapter 5	Minimizing or avoiding exercises around traditional fishing areas during fishing seasons: e. The belief that reef fish exist only in areas understood to be Essential Fish Habitat (EFH) is false. The reef fish larval distribution extends to the all parts of the ocean for 30 to 60	See response to ORG2-3.

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			days and then return (currents permitting) to occupy these EFH areas (reefs). The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resources prior to any designation.	
ORG2-8	Mitigation Measures	Chapter 5	Minimizing or avoiding exercises around traditional fishing areas during fishing seasons: f. A hundred million dollars was spent on protected species research but little if any funds where allocated to food fish impacts on the community. The concerns raised by this section remain unaddressed by the DEIS. There remains an obvious need to address the impacts to traditional uses of the resources prior to any designation.	See response to ORG2-3.
ORG2-9	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. the designated Range Complex encompassing ATCAA5, ATCAA2 and ATCAA 6 are all traditional and historically identified marine resource areas.	ATCAAs are airspace designations; not sea space; marine resources in these areas were surveyed.
ORG2-10	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. i. ATCAA5 encompasses the western seamounts where the marine resources are harvested on occasion as weather permits.	ATCAAs are airspace designations; not sea space; marine resources in these areas were surveyed.
ORG2-11	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. ii. ATCAA2 encompasses the southern seamounts which contributes nearly 80% of the bottom fish and 60% of the pelagic fish harvested.	ATCAAs are airspace designations; not sea space; marine resources in these areas were surveyed.
ORG2-12	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. iii. ATCAA6 encompasses the island of Guam where near-shore marine activities will be greatly affected. Marine Activities from Dolphin Watching, Charter Fishing, recreational SCUBA diving near shore harvesting and so forth will be further burdened by large military activities.	ATCAAs are airspace designations; not sea space; marine resources in these areas were surveyed.

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ORG2-13	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. iv. The current small scale military exercises have already impacted the marine community. There many reported incidents of military vessels either traveling through or situated on a seamount traditionally used by fishermen resulting in the fishing day curtailed or changed. These unconscionable incidents reflect the lack of community dialogue. A fisherman spends a day preparing his vessel, equipment, and gear. This coupled with a several hundred dollars of direct expenses, movement and planning is not a simple task. Upon arriving at the fishing area the unannounced military exercise sends the fisherman packing.	See response to ORG2-3.
ORG2-14	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. v. Religious commitments will be impacted. On an island where 80% are Roman Catholic and the practice of eating fish during lent is guarded ritual. The irony in a recent incident at Orote Point where a fisherman was told to leave the area after he was already bottom fishing due to a live fire exercise held on the plateau above. This fisherman was catching fish for his brother who is a priest and his family in an area that was safe due rough sea conditions.	Comment noted. See response to ORG2-3.
ORG2-15	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. vi. The area seaward of Orote Point is often closed without warning hampering all water related activities. During rough weather conditions users often rely on these safe and calmer areas to conduct their marine activities.	See response to ORG2-3.
ORG2-16	Marine Mammals	3.7	Surveying of training areas for the presence of marine resources utilized by the community: a. vii. The impact by the noise and disturbance caused by the surface and sub-surface vessels has not been studied. The movement of the small boats on a school of fish has an impact what more vessels many times larger.	Section 3.9.3.1.1 provides an analysis of the effect of human-generated sound on fish. Section 3.9.3.1.2 details the effects of impulsive sounds and explosive sources on fish. There have been very few studies on the effects that human-generated sound or impulsive sounds may have on fish. Section 3.9.3.1.3 states that it is a reasonable conclusion that sound on fish would result in few and more likely, no, impacts on the behavior of fish
ORG2-17	Mitigation Measures	Chapter 5	Military exercises should be halted during seasonal and poor weather conditions (Nov-Apr) near in-shore areas: i. Seasonal runs of Mahi and Wahoo occur during these	See response to ORG2-3. Avoidance of the seasonal presence of migrating marine mammals fails to take into account the fact that the Navy's current mitigation measures apply to all detected marine mammals no matter the season. Advance planning to avoid the seasonal presence of migrating marine mammals is not possible given the start of any "season"

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			months occurring near-shore.	is variable (dependent on largely unknown environmental factors). Variability in animal presence within relatively small ocean sub-areas, such as seamounts, ridges, fronts and trenches is often strongly correlated with daily, weekly, seasonal and even decadal changes in prey availability with prey availability being driven by changes in both local and basin-wide oceanographic conditions.
ORG2-18	Mitigation Measures	Chapter 5	Military exercises should be halted during seasonal and poor weather conditions (Nov-Apr) near in-shore areas: ii. The poor weather conditions only allow for users to fish near-shore to include bottom fishing.	See response to ORG2-17.
ORG2-19	Mitigation Measures	Chapter 5	Military exercises should be halted during seasonal and poor weather conditions (Nov-Apr) near in-shore areas: iii. Mitigation should be worked out with the fishing community to lessen the impacts.	See response to ORG2-17.
ORG2-20	Proposed Action	Chapter 5	Consultation on the proposed military range complex: i. There has been no consultation with the organization responsible for the management of the federal waters, namely the Western Pacific Regional Fishery Management Council except for a report on the proposed Complex.	The Navy conducted Section 7 ESA consultation with the USFWS Pacific Islands Filed Office and the NMFS Office of Protected Resources. The Navy also requested a Letter of Authorization (LOA) from NMFS under MMPA for incidental harassment of marine mammals resulting from the training activities proposed in the MIRC. In addition, as part of the NEPA process, scoping meetings and public hearings were conducted to get input from the public. Dates and venues of scoping meetings and public hearings were published in local newspapers. See Section 1.5 of the EIS/OEIS for details on the public involvement.
ORG2-21	Proposed Action	Chapter 2	Consultation on the proposed military range complex: ii. There has been no consultation with the only fishing organization on Guam, the Guam Fishermen's Cooperative Association on the proposed Complex.	See response to ORG2-20.
ORG2-22	Proposed Action	Chapter 2	Consultation on the proposed military range complex: iii. Public meetings were held at venues that did not reach out to the fishermen. The public meeting appears to provide a semblance of community in-put but lacks sincerity in truly gathering active participation.	Comment noted. Dates, times, and locations of public meetings were published at least 3 times prior to the meetings and in three different newspapers to ensure stakeholders are informed of the meetings.
ORG2-23	Proposed Action	Chapter 2	DEIS alternative: i. The alternatives should have included a no action alternative meaning no marine military activities to include past activities due to	The No Action Alternative describes activities as they currently exist and as they will be done in the future; essentially no change from the existing scenario.

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			the aforementioned impacts and concerns.	
ORG2-24	Proposed Action	Chapter 2	In closing, the impact of the military range complex is far reaching and would severely curtail the island community ability to consume fresh fish. The community would be greatly impacted both culturally and economically.	See responses to ORG2-3 and ORG2-4. Impacts on additional submerged cultural resources will not occur. Section 3.16, Regional Economy analysis concluded that existing and proposed training activities; to include an increase in training activities and modernization of existing ranges and training areas will not directly impact the leading industries in either CNMI or Guam. Commercial fisheries are unlikely to realize an impact and fishing gear potential to interact with training equipment is not projected to impact either commercial or recreational fishing. Tourism, recreational fishing and subsistence fishing is not likely to be impacted as training occurs in existing training areas.
ORG2-25	Proposed Action	Chapter 2	Again, we emphasize the main concerns: 1. No military activities around the island for 30 miles or as prescribed by the Western Pacific Regional Fishery Management Council 50 miles from the islands for vessels greater than 50 feet.	See responses to ORG2-3 and ORG2-4. Title 10 of the U.S.C. directs each of the U.S. Military Services (Services) to organize, train, and equip forces for combat. U.S. military forces must have access to the ranges, operating areas (OPAREAs), and airspace needed to develop and maintain skills for the conduct of military activities. Ranges, OPAREAs, and airspace must be sustained to support the training needed to ensure a high state of military readiness. It is critical that Navy be able to conduct ASW training in a variety of environment and bathymetric conditions, including in the vicinity of seamounts. The seamount allows a submarine to hide in an area that is shadowed by seamount because the active transmission cannot reach the sub via the bottom bounce path. Therefore, it is critical to operate MFA sonar in areas of high bathymetric variability.
ORG2-26	Proposed Action	Chapter 2	Again, we emphasize the main concerns: 2. No military activities around any of the seamounts for a radius of 15 miles.	See response to ORG2-25.
ORG2-27	Mitigation Measures	Chapter 5	Again, we emphasize the main concerns: 3. Mitigation for the use of the marine resource by establishing a Fish Aggregating Device Program to provide for alternative fishing areas during military activities.	See responses to ORG1-24 and ORG1-26 for discussions on alternatives. Avoidance of the seasonal presence of migrating marine mammals fails to take into account the fact that the Navy's current mitigation measures apply to all detected marine mammals no matter the season. Advance planning to avoid the seasonal presence of migrating marine mammals is not possible given the start of any "season" is variable (dependent on largely unknown environmental factors). Mitigation measures are coordinated and agreed upon with NMFS and are constantly updated and reviewed through adaptive management (for further information see Section 5.2). The Navy's current mitigation measures reflect the use of the best available science balanced with the NMFS approach and the requirements of the Navy to train.

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ORG2-28	Proposed Action	Chapter 2	Again, we emphasize the main concerns: 4. No use of explosives in the waters of the Marianas except for the established areas such as FDM in order not to disturb the migratory distribution of the coral reef fish larvae and travels of seasonal fish stocks.	See response to ORG2-17.
ORG2-29	Regional Economy	3.7	Again, we emphasize the main concerns: 5. No study was every funded to address the impact on the marine resources. We on Guam do not eat whales.	Section 3.16, Regional Economy analysis concluded that existing and proposed training activities; to include an increase in training activities and modernization of existing ranges and training areas will not directly impact the leading industries in either CNMI or Guam. Commercial fisheries are unlikely to realize an impact and fishing gear potential to interact with training equipment is not projected to impact either commercial or recreational fishing. Tourism, recreational fishing and subsistence fishing is not likely to be impacted as training occurs in existing training areas.
ORG2-30	Proposed Action	Chapter 2	The DEIS fails to address user conflicts, resource impacts, cultural impacts, economic impacts, social impacts, religious impacts, and many more. The fact that addresses protected species issues, terrestrial issues and cultural legacies is insufficient and proves the document to be highly flawed and incomplete. The fact that there seems to be top-down approach reflects this major flaw. There has been no continuous consultation or dialogue with the fishing community which would most impacted by any military marine activity in the proposed complex.	Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981. Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services.
ORG3-1	Proposed Action	Chapter 2	The EIS provides the perspective that the Study Area lands are "ideal" for training of U.S. forces however; they are not ideal from our perspective. These are the lands of the Chamoru people, my Chamoru people of the entire Marianas. These islands have been divided by the U.S. politically and administratively, but they are still the lands and seas of the Chamoru people, historically, and still presently.	Comment noted.
ORG3-2	Proposed Action	Chapter 2	The environment, both land and sea waters around the Mariana archipelago will be grossly, negatively, impacted by the continued use of the U.S. military and its maneuvers and training activities. Using the example of Puerto Rico the commenter states the U.S. military has had	Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. Chapter 5 has been revised to include mitigation

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			a poor record of leaving places they occupied clean. On Guam, the dump sites and continuous toxic contaminants seep into Guam waters such as that of Orote Point that has not been cleaned up. Their usual practice is to bury, cover up dumpsites, and then grow vegetation on top and then designate these places good only for parks, never to be used as residential or commercial lands.	measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. See response to FED1-2 for specific measures on invasive species, including brown treesnake. See response to STG3-51 for mitigation measures for sea turtles and turtle nesting.
ORG3-3	Proposed Action	Chapter 2	The Chamoru people and their cultural way of life and their island homeland – the Mariana Islands and its surroundings, will be devastatingly affected. The animals, land and water animals, the marine life – all plants and animals – big or minute sizes will be wiped out or destroyed tremendously to no degree of recovery. What is the ultimate objective? Is it military for might? Is it military might for destruction of human lives, of plants and animals, and of the environments of our planet Earth? NOT IN OUR MARIANAS!	Section 1.2.1 of the EIS discusses the requirements set forth in Title 10 of the U.S.C. directs each of the U.S. Military Services (Services) to organize, train, and equip forces for combat. To fulfill their statutory missions, each of the Services needs combat-capable forces ready to deploy worldwide. U.S. military forces must have access to the ranges, operating areas (OPAREAs), and airspace needed to develop and maintain skills for the conduct of military activities. The operations described in Chapter 2 are essential to meet these requirements. Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. See response to STA1-1. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981.
ORG4-1	Recreation Regional Economy	3.17 3.16	The MIRC does not address access rights to the residents of Tinian during exercise activities. What is the plan for public access to tourist, historical, hunting, fishing and recreational sites in the Northern part of Tinian? Since lack of access to the environment is a major impact to a community, I believe the MIRC MUST address the impacts of any	Ongoing communications with the local chamber of commerce, government of Tinian, and local residents provides for access under negotiated terms during the limited times access is restricted. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and

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			restrictions to access of the Northern part of Tinian.	the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981. Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services.
ORG4-2	Mitigation Measures	Chapter 5	There are comments in the MIRC that address possible introduction of invasive species such as the brown tree snake, however the MIRC continues on that it sees no significant impact. What, if any, are the mitigation plans for prevention of the introduction of the brown tree snake. What are the mitigation plans for possible disturbance to the turtle nesting? Can there be funding for a turtle hatchling conservation fund.	As part of the informal Section 7 ESA Consultations between the Navy and the USFWS Pacific Islands Field Office and the Navy and NMFS Office of Protected Resources, the Navy has included conservation measures specifically targeted at brown treesnake control and interdiction. The regional biosecurity plan is still in development, and the Navy is a contributing agency to the Brown Treesnake Technical Working Group. The brown treesnake control and interdiction efforts described in the conservation measures within this EIS/OEIS are concerned with avoiding, offsetting, or minimizing potential introductions of invasive species associated with increased training. The Joint Region INRMP will address other brown treesnake and invasive species control needs, and the biosecurity plan will cover all aspects of Navy activity within the MIRC. Specific measures within the MIRC EIS/OEIS include: (1) The inclusion of a group of conservation measures under the heading "*Conservation Measures for Predators, Pests, and Plants: Invasive Species Management Associated with MIRC Training Activities*". (2) Inclusion of a measure entitled: Brown Treesnake Interdiction and Control and DoD participation in the Brown Treesnake Control Plan. (3) Self-Inspection Training for Personnel and Awareness: Avoidance Invasive Species Introductions. (4) DoD participation in the Regional Biosecurity Plan (5) Cooperative development of regional training SOPs and

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				Exercise Planning For specific descriptions of these measures, please see Section 3.11 and Chapter 5 (Mitigation).
ORG4-3	Proposed Action	Chapter 2	After reviewing the 1,500 pages and seeing the multiple references to several studies, I have noticed that some of the references date back to 1998 and some to 1986. it would be appropriate for the MIRC to conduct new baseline studies with referred studies that reflect data that is not reliable which is what studies are that date back 10-20 years old.	A number of studies that were completed recently were conducted in support of the development of the EIS and are included as references. References that are older are used when their analysis is still valid and no other more recent references on a particular subject matter are available.
ORG5-1	Proposed Action	Chapter 2	Overall concern is the highly presumptive approach used in the assessment of ecological and environmental risk. When potential harm to specific species and natural systems is unknown, sound science and appropriate risk management dictate that a LACK of harm cannot be presumed. In cases where the degree of harm is unknown, the legitimate presumption AT BEST is "indeterminate" as the degree of potential harm. The DEIS is at risk for under-estimating risks to marine mammals and ecosystems, especially so when compounded in assessing cumulative risk.	The Navy continually strives to develop and improve models, monitoring, mitigation measures, and standard operating procedures. The Navy has consistently adopted mitigation measures that are effective at reducing risk without detrimental effects on training. The Navy has historically declined mitigation measures that are not effective at reducing risk to marine species, yet cause an undue burden on training. Alternative mitigation measures considered but eliminated, and the reasons for their elimination from further consideration was provided in Section 5.2.4 of the EIS/OEIS. See Mitigation Measures in Chapter 5.
ORG5-2	Hazardous Materials	3.2	Abandoned UXO pose a significant toxic and physical risk to human health and the environment.	Section 3.2 Hazardous Materials provides detailed information regarding the quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. Munitions constituents released to the environment are but a fraction of the original amount contained in ordnance following their use as a result of a high level of combustion efficiency. Therefore, resulting concentrations in marine waters would be extremely low. Estimates of concentrations for select munitions constituents are discussed in Section 3.3 (Water Quality).
ORG5-3	Mitigation Measures	Chapter 5	Environmental documentation for current and future military training activities must include a discussion of technologies that are economically feasible, environmental sound and technologically capable of remedying expected environmental insults.	Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. Mitigation measures are coordinated and agreed upon with NMFS and are constantly updated and reviewed through adaptive management (for further information see Section 5.2). The Navy's current mitigation measures reflect the use of the best available science balanced with the

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				NMFS approach and the requirements of the Navy to train.
PUG1-1	Mitigation Measures	3.2	The military needs to assure the people of Guam that whatever they might damage, be it the coral reefs, the ocean environment, the air, the land, that they will invest whatever it takes – money and personnel – to fix, replace or replenish. The burden on the island community is not just for those currently living here, but for those generations from now. I would like peace of mind to know that part of any legacy I leave behind for my family includes clean air, clean water and viable land.	See response to ORG5-3. Mitigation/conservation measures to avoid and/or minimize adverse impacts to the different resources analyzed in the EIS/OEIS are discussed in Chapter 5.
PUG2-1	Hazardous Material	Ch 2	I am concerned about the toxicity of the many chemicals entering the air and water due to the military activities. My house is very close to Naval Magazine where they explode bombs and even a little smoke causes severe lung irritation – my doctors think these bomb explosions may have contributed to my condition.	Section 3.2 Hazardous Materials provides detailed information regarding this comment. The quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. For land ranges, hazardous substances are deposited on the surface of the soil and confined within the perimeter of the range. The Navy monitors offsite releases of munitions constituents under the supervision of federal and local regulators to determine if offsite migration of constituents may occurs. The release of hazardous chemicals (if any) are not significant and the only use of explosives at NAVMAG is at the EOB bomb pit; which occurs infrequently.
PUG3-1	Alternative Development	Ch 2	I know we're in an era of challenges of world peace. I know that military need to practice and be better on what they do. Military need to know also that there are human beings here on island. They need the land and water to survive/live. Can they use another area that don't have much impact to the island's water environment & land?	Section 2.2.2.1 Alternative Range Complex Locations provides a detailed discussion of alternative locations for training that is presently conducted in the MIRC. Consideration of alternative locations for training was rejected from further analysis because it does not meet the criteria set forth for the purpose and need of the Proposed Action. The MIRC is the only capable and efficient training location within the territory of the United States in the WestPac for military services homeported, deployed to, or returning from regions in the WestPac and the Indian Ocean. The U.S. military's physical presence and training capabilities are critical in providing stability to the Pacific Region. The premier capability of the MIRC is the combination of large ocean and airspace to support undersea, surface, air, and space warfare training combined with land-based training for multiservice and multinational training.
PUG4-1	Public Notification	Ch 2	We should require the military to provide ample notification of any exercise (regardless of type of exercise) that impacts local activities (fisherman; recreational events). Notification should be via Public Media i.e. PDN, Notice to Mayor's Office & Marina's throughout Guam.	Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of

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				training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981.
PUG4-2	Study Area	Ch 2	How about any info regarding any potential exercise near Cetti Bay (Southern Guam)	The proposed action and alternatives analyzed in this EIS/OEIS do not involve Cetti Bay.
PUG5-1	Proposed Action Public Notification	Ch 2	The people of Guam love to eat fish enjoy the beaches and water activities. With the upcoming military activities, these will all be eliminated. What are the plans of the military to avoid all of these from happening? We need to preserve our aquatic & wildlife for us and our young generation to enjoy.	Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities.
PUG6-1	Hazardous Material Water Quality	3.2 3.3	Notification of exercises – Vice Mayor wasn't notified of activity. Request notification of exercise Called Resue Fish Advisory – PCB	See response to PUG4-1.
PUG7-1	Transportation Regional Economy Recreation	3.14 3.16 3.17	Comments: live fire will impact if not doing it now shorting keep people out of area not asked cost for not using the area Land: o contamination o use of H20 quality (marine/fuel) o noise Hazardous material Cultural Historic Resources Economic Impact on tourism Environmental justice	Comment noted; see chapter 3 for a detailed discussion of each of the resources analyzed in the EIS/OEIS and Chapter 5 for a discussion of Mitigation Measures.

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			o Minority community Toxic o clean up o year / year accumulation Ocean View High School o to Navy Mag Notification – recreational activity	
PUG8-1	Proposed Action	Ch 2 3.14	Comments: Air exercises must be away from residential area Concern on noise impact notification to the residents of exercise schedules is important	Section 3.5 Airborne Noise provides detailed information regarding airborne noise in the Study Area. Airborne noise generated by the Proposed Action under the No Action Alternative, Alternative 1, or Alternative 2 would have no substantial environmental effects on human sensitive receptors because noise from training activities in the MIRC would be dispersed and intermittent, so it would not contribute to long-term noise levels, training areas on FDM are remote and isolated from the general public, so no sensitive receptors (non-participants) would be exposed to noise events occurring on FDM, no new public areas would be exposed to noise from training and testing activities, land-based ordnance detonations occur mostly in FDM, a designated restricted area; and the incremental increases in the numbers of range events would not considerably increase long-term average noise levels; hourly equivalent noise levels are and would remain relatively low. See response to PUG 4-1.
PUG9-1	Hazardous Materials Mitigation Measures	3.2 Ch 5	With chaff release and shooting ranges, harmful chemicals are exposed more to the environment around Guam. What type of mitigation can be provided to stop this exposure to the harmful substances to the environment? Also with the detonation off shore that could affect dolphin habitats, what alternatives can be done to prevent this?	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts. Section 3.7 discusses the impacts upon marine mammals and Chapter 5 discusses mitigations that have been established to minimize or eliminate impacts upon marine mammals to include establishment of lookouts, buffer zones, recovery of deployed targets, and aerial surveillance.
PUG10-1	Public Involvement	Ch 1	A representative from the U.S. Navy should be available to provide feedback on the MIRC.	See PUG4-1.
PUG10-2			The military should provide the residents of Guam incentives, benefits, consideration, and protection in exchange for the use of the	The U.S. military's physical presence and training capabilities are critical in providing stability to the Pacific Region. In addition, federal expenditures, including military procurements, represent an important element of the

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			environment and its resources.	region's economy.
PUG10-3	Cultural Regional Economy	3.13 3.16	This military training & operations will have an impact not only on the environment and wildlife but also on the cultural preservation and economic status of Guam.	Section 3.13, Cultural Resources analyzed Cultural Resources and determined that terrestrial archaeological sites are not substantially affected by current training activities. Buildings and structures are not substantially affected by current training activities. Compliance with existing protective measures in accordance with the Navy MOA, Navy PA, and the Air Force MOA to avoid cultural resources substantially reduces effects from training activities. Impacts on additional submerged cultural resources will not occur. Section 3.16, Regional Economy analysis concluded that existing and proposed training activities; to include an increase in training activities and modernization of existing ranges and training areas will not directly impact the leading industries in either CNMI or Guam. Commercial fisheries are unlikely to realize an impact and fishing gear potential to interact with training equipment is not projected to impact either commercial or recreational fishing. Tourism, recreational fishing and subsistence fishing is not likely to be impacted as training occurs in existing training areas.
PUG11-1	All Resources	Ch 3	By the presentation of MIRC, it gives us a clear view about the military activities that is happening in the surrounding of Guam such as in land & water. I think the military should be more concern about Guam's land, environment, water, animal etc. They should also notify the resident of Guam. Trees & animals are affected by this. It will also damage the economy. We should give credits to MIRC for letting us know what's happening.	Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. The purpose of analysis of Environmental Justice (Section 3.18) is to provide an evaluation of the potential for disproportionate impacts to minorities, low-income populations, or children in the Study Area.
PUG12-1	Public Involvement	Ch 1	If the MIRC prevents fishermen & ships in certain areas due to activity more specifically the gun ranges in the North & in the South I know the island will be notified but what about those who aren't notified. How will you let the public know about the activities because not everyone reads the newspaper or watches the local channels?	Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981.
PUG12-2	Proposed Action	Ch 2	About the helicopter activity I believe that the military should utilize what time the local residents aren't usually home for example most people on the island have an 8 to 5 job or go to school from 8 am – 3	Section 3.14 (Transportation) details the proposed alternatives' impacts to traffic in the Study Area; including airspace traffic. Implementation of any of the proposed alternatives would not require modification of existing

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			pm.	airspace use and would not change the existing relationship of the Navy's Special Use Airspace with Federal airways, uncharted visual flight routes, or airport-related air traffic training activities.
PUG12-3	Public Involvement	Ch 1	In regard with notifying the public what was done for the public for them to be aware of what is happening.	As part of the public involvement during the NEPA process, scoping meetings and public hearings were conducted in Guam and CNMI to get the public input in the development of the EIS/OEIS. Notice of scoping meetings and public hearings, announcing the dates, times and locations of the meetings were published in the Federal Register and local newspapers. See Chapter 1 for details on the scoping meetings and public hearings and Chapter 11 for details on the comments received during the public hearings.
PUG13-1	Public Involvement	Ch 1	This Draft EIS was inaccessible by the general public of Guam. It was much too large and difficult to understand and the review period was too short. The public comment sessions glossed over the potential impacts paining a rosy picture and did not accurately portray the true impacts of the planned training activities on the environment, the resources, and more importantly, the people who live here. The DoD needs to do a better job of communicating the facts to the public and soliciting meaningful comments, rather than simply fulfilling the NEPA requirements. While the scoping sessions, and presentations are a step in the right direction, these forums still lack substance and targeted information – they still do not relate the information to the general populace in a meaningful way and the DoD needs to invest in new ways to engage the people of the Marianas.	Comment noted. See response to PUG12-3.
PUG13-2			The characterization of the W-517 area as being located as 50nm south of Guam is inaccurate and misleading as the upper reaches of this area are clearly located much closer – approximately 10-12 nm south of Guam and are located over Guam's two most heavily used fishing banks. Galvez and Santa Rosa Banks. This misleading statement needs to be corrected throughout the document. Also, for the sake of clarity, these offshore banks should be illustrated on the maps.	Galvez and Santa Rosa Banks were added to Figure 2-1 in Chapter 2, Figure 2-1.
PUG13-3			There are numerous statements throughout the document noting the impacts of previous and ongoing training, however, these statements also note that the impacts are not quantified and that the extent of the impacts is unknown (ex. Tarague Beach Small Arms Range p.174). The DoD needs to do a better job of monitoring the impacts of their training exercises to determine the true impacts – rather than the conjecture offered in this document. This information should then be	The mitigation measures (Chapter 5) have been revised with public and resource agencies.

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			used to refine their environmental management specific to the Mariana Islands Range to avoid impacts in the future.	
PUG13-4	Transportation Regional Economy Recreation	3.14 3.16 3.17	Table 2-2; W-517 The description "relatively free of vessel traffic" does not apply to the northern reaches of the W-517 area. This area is frequented by the local bottom fishing fleet. Most of the bottom fish catch for Guam comes from the Galvez and Santa Rosa Banks which are wholly contained by the W-517 area. It is not uncommon to see a number of vessels in this area when the weather permits the journey for smaller boats.	Text has been revised to remove the term "relatively free of vessel traffic". Figure 2-1 shows that both banks are outside W-517.
PUG13-5	Proposed Action Alternative Development	Ch 2	2.2.21 Alternative Range Complex Locations It appears that the relocation of range components was rejected out of hand as not meeting the criteria of the Proposed Action. However, DoD needs to carefully weigh the needs of residents in the face of increased training activity and exercises, particularly where there might be a high level of user conflict such as the southern fishing banks, certain sites in Apra Harbor, and Agat Bay, and consider slight adjustments to the range alignments. Particularly in the W-517 area, shifting the northern "handle" portion of this area away from the banks would decrease the chance of fatal interactions and impacts to this important resource and should have been considered in the analysis, particularly given the broad range of training expected to occur in the area. For example, the many artillery exercises to be conducted in the W-517 area would have serious detrimental effects if conducted over Galvez and Santa Rosa Banks, due to the shallow coral reef habitat found in these areas. Take the banks out of the W-517 area and shift it South to the 50 nm you state in the text or East if the close proximity to the island is necessary – this should be reassessed and addressed in the FDEIS/OEIS. (A western shift would not be recommended due to the pelagic fisheries in that area around the FADs – eastern access is more restricted and the waters are less hospitable for small craft most of the year).	Section 2.2.2.1 Alternative Range Complex Locations provides a detailed discussion of alternative locations for training that is presently conducted in the MIRC. Consideration of alternative locations for training was rejected from further analysis because it does not meet the criteria set forth for the purpose and need of the Proposed Action. The MIRC is the only capable and efficient training location within the territory of the United States in the WestPac for military services homeported, deployed to, or returning from regions in the WestPac and the Indian Ocean. The U.S. military's physical presence and training capabilities are critical in providing stability to the Pacific Region. The premier capability of the MIRC is the combination of large ocean and airspace to support undersea, surface, air, and space warfare training combined with land-based training for multiservice and multinational training. As shown in Figure 2-1, Galvez and Santa Rosa Banks are outside W-517. As appropriate, mitigation measures are adopted to avoid shallow water areas and to protect the public. See response FED2-3 regarding public notification on training activities.
PUG13-6	Proposed Action Alternative Development	Ch 2	2.2.2.3 Concentrating to fewer sites This paragraph does not adequately address the concern that was raised by the public. There is no evidence of a thorough assessment of this issue. If there was a full assessment conducted, please reference it and provide it for review. Given the small size of this island and the fact that these ranges may impact sensitive wildlife communities or fragile habitats, such as the Marianas fruitbat and	Section 2.2.2.3 discusses the reasons why concentrating training to fewer sites does not meet the purpose and need of the Proposed Action. An alternative that does not meet the criteria for the purpose and need is not a reasonable alternative therefore, is not carried out in the EIS analysis. See responses to STG1-33 and STG3-51.

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			remaining limestone forest or coral reefs, it would be better to consolidate ranges or move sites that might impair resources to less sensitive areas – particularly as there is the potential for some larger caliber weaponry and more frequent use of the ranges. In addition, it is clear from the discussion that the existing impacts both inside and outside the ranges are not fully quantified and it is better to take a precautionary approach with these limited natural resources.	
PUG13-7	Proposed Action Alternative Development	Ch 2	2.2.3 Proposed Action and Alternatives Considered This 5 yr review offers an excellent opportunity for the DoD to review the impacts that existing training has had on the environment in the MIRC and determine if that level is acceptable or if perhaps it should be reduced due to the impacts it is having. There should be an alternative related to reducing training – even if it is not preferred. Contrary to the many "no significant impacts" findings in this document, there appears to be numerous impacts from these activities that should be weighed against the benefits of training.	Comment noted. Alternatives analyzed in the EIS must meet the purpose and need of the proposed action. If reducing training will meet the purpose and need, then it is considered a reasonable alternative that needs to be analyzed in the EIS. In some cases, surveys and/or monitoring will be conducted before and after training activities to determine the effectiveness of mitigation/conservation measures. Adaptive management is an integral part of the monitoring plan.
PUG13-8	Geology	3.1	Section 3.1 Geology, Soils, and Bathymetry p. 175 The document states that LCACs may resuspend sediment similar to wave events. Recent experience suggests that they resuspend sediment at a rate greater than all but perhaps the most extreme wave events and do so even in areas that are normally not heavily disturbed by wave events (Jade Shoals February 2009). The Navy should consider funding monitoring to determine the extent of these impacts and then develop better mitigation practices to avoid these impacts or provide compensatory mitigation. While corals have some capacity to remove sediments, repeated impacts, particularly at increased frequencies can have deleterious impacts on survival and reproduction. The timing of these events can also be critical, particularly if the landing occur during the spawning periods as the sediment can impact the release of gametes from adults, the survival of larvae, and the timely setting o f coral recruits. This needs to be addressed in the mitigation and environmental management plans.	The EIS has been revised to discuss the beach training activities that are conducted in accordance with the guidance published in the Mariana Training Handbook (COMNAVMARIANAS Instruction 3500.4) and the mitigations described in Chapter 5 (Mitigation Measures). Applicable surveys will be conducted before any beach improvements for amphibious landing activities are implemented. Based upon the results of the surveys, coordination with resource agencies will be conducted as applicable.
PUG13-9	Proposed Action	Ch 2	3.1.3.2 Alternative 1 p.175 This section states that no construction would be required, although facilities would be improved. Unai Dankulu would require some serious "improvements" that would in some cases be defined as construction for use as a landing beach by LCACs. These improvements are not clearly defined, yet were listed as modification of the reef, trees, rocks, possibly the beach. Please clarify this statement or define what	No military construction is proposed under this EIS/OEIS. References to "construction" were intended to encompass only the regular maintenance and minor modification of facilities and lands required to ensure the existing training areas continue to be maintained in a safe and environmentally responsible manner. Applicable surveys will be conducted before any beach improvements for amphibious landing activities are implemented. Based upon the results of the surveys, coordination with

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			improvements you will make as these might have significant impacts to the area.	resource agencies will be conducted, as applicable.
PUG13-10	Geology Mitigation Measures	3.1 Ch 5	3.1.4 Unavoidable Adverse Environmental Effects What are these erosion control measures, structures, and procedures that "could" minimize increases in erosion and what assurance is there that they will be used? There are already a number of areas that are highly disturbed within DoD properties.	Refer to Section 3.1.2.6, Current Protective Measures.
PUG13-11	Proposed Action	Ch 2	3.1.4 Unavoidable Adverse Environmental Effects Table 3.1-2 Alternative 1 &2 – how much greater will intensity of impacts be and what level of management can be expected to prevent erosion?	Refer to Section 3.1.2.6, Current Protective Measures.
PUG13-12	Hazardous Materials Proposed Action	3.2 Ch 2	3.2.3.2 No Action Alternative p. 201 This section notes that while unlikely, expended training materials may become physical hazards to marine life or to navigation over time. This would be more likely if training exercised occurred often in the same area. This is something that is not addressed in the document – how far do the vessels travel to do their training? Do they truly use the full range of the MIRC or do they tend to focus on certain areas that are closer to the island or perhaps due to bottom topography, distance, lack of vessel traffic, etc? is there a higher probability for accumulations in certain places than in other places? Were actual vessel tracks, practice areas, etc. analyzed and used in the development of this document?	Chapter 2 provides a detailed explanation of the Services training area, figures that depict the training areas, and descriptions of the types of training proposed. As discussed in Section 3.2 (3.2.4 Unavoidable Significant Environmental Effects), the quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health. Section 3.6, Marine Communities also analyzed this issue and concluded that in both the less than 12 nm and greater than 12 nm environment there would be long-term, minor, and localized accumulation of expended materials in soft bottom benthic communities. No long-term changes in community structure or function would be expected or anticipated. The analysis of this issue in Section 3.7, Marine Mammals concluded that in both the less than 12 nm and the greater than 12 nm there was a low potential for ingestion of ordnance related materials and chaff and/or flare plastic end caps and pistons. The analysis for Fish and Essential Fish Habitat found in Section 3.9 concluded that long-term, minor, and localized accumulation of expended materials in benthic habitat was anticipated. Limited potential for ingestion is expected. No long-term population-level effects or reduction in the quality or quantity of essential fish habitat is anticipated or expected.
PUG13-13	Hazardous Materials	3.2	3.2.3.2 No Action Alternative Table 3.3-3 Contamination of surface drainage areas from runoff at various ranges	Section 3.3.3.1.2, Effects on Water Resources discusses that the training activities would not permanently alter surface flows and would have no

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	Water Quality	3.3	– will this runoff be contained and treated or be discharged into the marine waters or released onto the ground to seep into the aquifer? There are existing PCB accumulations in Apra due to past drainages on DoD property, please address this more clearly.	adverse effect on surface hydrology or floodplains within the drainage basin. Certain training activities result in minor topographic alterations of beaches, but disturbed areas would be restored to pre-existing conditions at the conclusion of the training exercise.
PUG13-14	Hazardous Materials Water Quality	3.2 3.3	3.2.3.2 No Action Alternative Mine Warfare/Landing Craft etc. may cause sediment resuspension in the harbor. There is much concern about toxins in the harbor sediment such as PCB and heavy metals released from previous DoD and shipyard operations (see Navy RAB documents). These exercises may cause additional exposure to these toxins, to humans and to other organisms, possibly reducing the fecundity of coral and other organisms. This EIS does not sufficiently address this exposure. What toxins are in the sediment at these areas and what are the exposures? What level of sediment suspension is expected – quantify it – there are sensors commercially available that can measure suspended solids in situ to determine the actual impacts of these activities. The data can then be used to strengthen environmental planning and facilitate improved stewardship by DoD.	Chapter 6 (Cumulative Impacts) discusses in Section 6.2.3.1 that potential cumulative impacts on marine plants and invertebrates in the MIRC Study Area include releases of chemicals into the ocean, introduction of debris into the water column and onto the seafloor, and mortality and injury of marine organisms near the detonation or impact point of ordnance or explosives. The presence of persistent organic compounds such as DDT (dichlorodiphyenyltrichloroethane) and PCBs (polychlorinated biphenyls) are of particular concern. In light of these concerns, Navy activities would have small or negligible potential impacts. There would be no long-term changes to species abundance or diversity, no loss or degradation of sensitive habitats, and no effects to threatened and endangered species. None of the potential impacts would affect the sustainability of resources, the regional ecosystem, or the human community.
PUG13-15	Water Quality Mitigation Measures	3.3 Ch 5	3.3.3 Environmental Consequences "Expended materials entering the ocean could affect marine water quality." The hazardous components of these expended materials can have serious deleterious effects on marine life particularly coral larvae and fish larvae. Guam's reefs have witnessed a tremendous drop in coral recruitment over the last twenty years. We have yet to pinpoint the cause, but pollution is a likely cause as larvae are particularly susceptible to pollutants. Are there any plans to minimize or avoid training during key coral spawning periods to prevent impacts to the long term viability of Guam's coral reef ecosystems?	Refer to Section 6.2.3.2 for a discussion of the cumulative impacts to the coral reef ecosystems.
PUG13-16	Proposed Action Hazardous Material Mitigation Measures	Ch 2 3.2 Ch 5	p. 220 Torpedo Expended Materials Where will torpedo training take place? How deep do torpedoes run? Will training take place over the Galvez and Santa Rosa Banks areas where corals may be impacted by the cyanide wake of the torpedo? How will the DoD ensure that important resources such as tuna and other fisheries resources are not impacted by these activities? What is the failure rate of the torpedoes being used?	Section 3.2.2.2.5 discusses the use of torpedoes and their composition. During training exercises, the torpedo is recovered at the end of a run; therefore, none of the potentially hazardous or harmful materials would be released to the marine environment. Because the guidance system of the torpedo is programmed for target and bottom avoidance, potentially hazardous or harmful materials are not released on impact with a target or the sea floor. Table 2-9 presents the summary of ordnance use by training area in the MIRC Study Area. Torpedo use is restricted to W-517 in areas that exceed 3 nm and 50 nm.
PUG13-17	Proposed Action	Ch 2	p. 221 Sonobuoys While the dispersal calculations given here are reassuring, it is	Table 2-10 presents a summary of sonar activity by exercise type in the MIRC Study Area and Section 3.2.2.2.4 discusses sonobuoys composition

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	Hazardous Material Marine Communities	3.2 3.6	unrealistic to assume that the buoys will be dropped in a large area. What is the normal range of operations for training the sonobuoys? How many are used at a time? In how large of an area? What is a realistic concentration of these materials during a normal training operation? Please provide realistic, meaningful analysis. Also, as with other weapons, this would have serious deleterious effects if used over banks, or other submerged reefs. More details about their use or a statement that they will not be used in areas populated by coral reef resources is necessary.	and disposition.
PUG13-18	Hazardous Material Marine Communities Marine Mammals Sea Turtles Public Health	3.2 3.6 3.7 3.8 3.19	p.221 Chaff What happens to chaff in the marine environment? An earlier section stated that it is neutrally buoyant, so it will not sink, but will merely float around. Is it not consumed by organisms? Has it been studied in tropical food chains? Could there be bioaccumulation of any of its components in the local food chain? Effects on human health?	Chaff is nonhazardous consisting of 60% silica (inert) and 40% alumina, with stearic acid (animal fat used as an anti-clumping agent). The thickness of chaff fibers is similar to that of human hair at about 25 microns in diameter. Analysis of potential chaff ingestion is included in the seabirds, fish, sea turtle, and marine mammal sections of the EIS/OEIS. No mitigations are required regarding chaff as the fine, neutrally buoyant chaff streamers act like particulates in water, temporarily increasing the turbidity of the ocean's surface, but quickly disperse. The Air Force has studied chaff and has determined that it has no adverse environmental impacts.
PUG13-19	Hazardous Material Marine Communities Marine Mammals Sea Turtles Public Health	3.2 3.6 3.7 3.8 3.19	p.224 Ordnance Recent observations through the Pacific have documented phase shifts due to accumulations of metals in coral reef environments after impacts to reefs (ex. Ship groundings). In some cases this is believed to be due to increased availability of iron and other metals in a metal limited environment. The accumulation of metals from expended ordnance could have similar effects on a micro scale affecting environments particularly as more and more builds up. The EIS needs to assess the potential impacts of phase shifts and likelihood of accumulation of materials within the range areas.	Section 3.3, Water Quality concludes that munitions constituents from training devices and training exercises would have little effect or result in short-term impacts for either less than 12 nm or greater than 12 nm training areas within the Study Area. No long-term degradation of marine, surface, or groundwater quality is anticipated or expected. As detailed in Section 3.3, Contaminants from many sources accumulate in bay and ocean bottom sediments over time. Ship movements and amphibious exercises, including some of the logistics training activities, stir up bottom sediments. This activity temporarily increases the concentration of suspended sediments and decreases water clarity in the vicinity of the training exercise. Detonating underwater explosives charges in shallow water also stirs up sediments, with a short-term increase in turbidity in the vicinity of the exercise. When military training activities disturb bottom sediments, re-suspending them in the water, the contaminants present in the sediments may re-enter the water. Sediments offshore of training locations have above-average loads of organic materials and of some toxic metals. Following completion of training activities, sediments will begin to aggregate and re-settle to the ocean bottom. In addition, training events with potential to stir bottom sediments are spaced over time, allowing sediments to re-settle. For these reasons, the suspension of bottom sediments from training activities would

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				not result in adverse effects on water quality.
PUG13-20	Proposed Action Water Quality	Ch 2 3.3	3.3.3.1.2 Effects on Water Resources p.226 Please describe more fully what is meant by "minor alteration" of beaches and explain how they will be restored to pre-existing conditions. How temporary will the alterations from landing craft be? What type of modification is expected? How will this affect water quality?	Section 3.11, Terrestrial Resources and Chapter 5, Mitigation Measures, have been revised to include the following discussion regarding the "minor alteration" of beaches. "Amphibious Landing Restrictions at Unai Chulu, Unai Babui, and Unai Dankulo – At Unai Chulu, the Navy recognizes that surge waves may be generated by slow moving LCACs could break off coral heads. To avoid or minimize the surge effect, amphibious landings occur at high tide, and LCACs remain fully on cushion when over shallow reef and slowing and turning when over land or deeper water. AAV landings at Unai Babui are restricted to an established approach lane and land at high tide one vehicle at a time." Section 3.3 , Water Quality discusses that training activities would not permanently alter surface flows, and would have no adverse effect on surface hydrology or floodplains within the drainage basin. Certain training activities result in minor topographic alterations of beaches, but disturbed areas would be restored to pre-existing conditions at the conclusion of the training exercise. Landing craft can cause temporary, minor alterations in bottom topography at the shoreline. Military training vehicles would be confined to military training areas within DoD installations and are not expected to travel off-base during training. Non-recovery of fired missiles would result in deposition of material on the ocean floor. Modification of beaches is not known at this time. However, applicable surveys will be conducted before any beach improvements for amphibious landing activities are implemented. Based upon the results of the surveys, coordination with resource agencies will be conducted, if applicable.
PUG13-21	Proposed Action Water Quality	Ch 2 3.3	P.228 last paragraph of no action/ p.220 last paragraph Alt. 1 What is the spacing of these exercises? Depending on the spacing, particularly with an increased number of exercises it may become a chronic impact to the coral reef habitat in the area, resulting in decreasing reef health. What are the specific measures that will be used to protect water quality?	Chapter 2 provides an extensive discussion of each of the alternatives and their associated types, intervals, and locations of training activities. Specific protective measures are provided in Chapter 5.
PUG13-22	Marine Communities	3.6	p.284 Table 3.6-1 Summary of Potential Stressors to Marine Communities Please quantify the level of disturbance, injury, and mortality to plankton, benthic community features, and possible collisions with coral communities in both territorial and non-territorial waters – also please clearly delineate where these impacts may occur. Due to the	Section 3.6, Marine Communities concludes that for both territorial and non-territorial waters localized disturbance, injury, and mortality to plankton is possible. No long-term population or community level effects are anticipated. There is potential exposure to aircraft noise, but no long-term population or community-level effects are anticipated or expected. Localized and short-term disturbance to soft bottom benthic communities is

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			fluid nature of the ocean, reefs in non-territorial waters may be the source of larvae for Guam and CNMI's nearshore reefs, damage to these areas may result in decreased coral recruitment to territorial reefs and may also impair fisheries resources if the direct impacts take place at sites used by fisheries stocks. Frequency, area, and intensity of damage are all relevant and should be included. Soft bottom habitat impacts should be included as well as hard bottom.	expected, but no long-term population or community level effects are anticipated. No significant impact or harm is anticipated to marine communities as a result of implementation of the No Action Alternative, Alternative 1, or Alternative 2.
PUG13-23	Marine Communities	3.6	p. 297 Artificial Reefs Further monitoring of the artificial reefs cited in this section clearly indicated that the projects did not enhance fish habitat or overall fish abundance or diversity and Guam's artificial reef program was ended. Further studies have indicated instead that these artificial surfaces provide a foothold for non-native possibly invasive species. See Guam DAWR annual reports from the 1980s and Gustav Paulay and Lisa Kirkendale's work on Marine Invasive Species for more information.	Comment noted.
PUG13-24	Marine Communities	3.6	p.307 Artificial Reefs The construction of artificial reefs is not a practice that is embraced in this region - it is a key pathway for the introduction of invasive species and does not result in substantial benefits to native reef species. This is not a good justification for leaving these expended materials and should be struck from the document. Also, not all of the areas are soft bottom - for instance Guam's most heavily used banks are located within the W517 training area and practices, expended projectiles on these and other submerged reef habitats can damage coral and other benthic structures.	Comment noted. Refer to Section 6.2.3.2 for a discussion of the cumulative impacts to the coral reef ecosystems.
PUG13-25	Marine Communities	3.6	p. 310 Table 3.6-2 Summary of Environmental Effects Amphibious Landings – Surge wave generated by slow moving craft could break off coral heads – this could be a long term affect for some slow growing coral species that are limited in range /distribution. Recommend consultation with local coral experts to ensure that areas of impact do not include any rare species that are likely to be severely impacted. According to Richard Randall there are some rare, slow growing species that have been found at only a few locations in the reef margins of Guam.	Section 3.11, Terrestrial Resources and Chapter 5, Mitigation Measures, have been revised to include the following discussion regarding the "minor alteration" of beaches. "Amphibious Landing Restrictions at Unai Chulu, Unai Babui, and Unai Dankulo – At Unai Chulu, the Navy recognizes that the surge waves generated by slow moving LCACs could break off coral heads. To avoid or minimize the surge effect, amphibious landings occur at high tide, and LCACs remain fully on cushion when over shallow reef and slowing and turning when over land or deeper water. AAV landings at Unai Babui are restricted to an established approach lane and land at high tide one vehicle at a time." Applicable surveys will be conducted before and after amphibious landing activities and before any beach improvements for amphibious landing activities are implemented. Based upon the results of the survey, coordination with applicable resource agencies will be conducted, if

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				applicable.
PUG13-26	Marine Communities	3.6	Overall comments on table – there is not enough analysis to make the blanket statements of no long-term population or community-level effects. The impacts are too poorly defined to make a definitive analysis given the possible impacts listed. This needs to be reassessed with additional information provided.	Comment noted. Discussions are included in Section 3.1, Geology, Soils, and Bathymetry; Section 3.2, Hazardous Materials; Section 3.3. Water Quality; Section 3.4, Air Quality; Section 3.5, Airborne Noise; Section 3.6, Marine Communities; Section 3.7, Marine Mammals; Section 3.8, Sea Turtles; Section 3.9, Fish and Essential Fish Habitat; Section 3.10, Seabirds and Shorebirds; Section 3.11, Terrestrial Species and Habitats; Section 3.12, Land Use; Section 3.13, Cultural Resources; Section 3.14, Transportation; Section 3.15, Demographics; Section 3.16 Regional Economy; Section 3.17, Recreation; Section 3.18, Environmental Justice and Protection of Children; and Section 3.19, Public Health and Safety. Chapter 4 contains a detailed discussion of consistency with other Federal, state, and local plans, policies, and regulations. Chapter 5 provides mitigation measures and Chapter 6 provides discussions of cumulative impacts.
PUG13-27	Marine Mammals	3.7	3.7 Marine Mammals The surveys for this assessment were conducted in subpar conditions in only one small window of time, they did not assess the nearshore environments, and they did not collect information from local mariners and other sources of information – for example it neglects the birth of a Sperm Whale documented just off of Apra Harbor. Additional effort should have been made to collect data on marine mammals to provide a more robust data set. The no significant impact determination given the assessment's findings of a high number of temporary impacts a PTS level impact for an endangered whale under Alternative 1 are troubling, particularly given the limited sampling effort for the marine mammal assessment. The sonar impacts are even more troubling given the number of marine mammals that have washed up on shore over the last year, particularly the two beaked whales, one that stranded within 2 weeks after a large joint force exercise that used MFA sonar. In addition, the assessment does not appear to fully address the impacts to resident spinner dolphins located in Agat Bay and other coastal locations that might be impacted by increased training. The EIS should include mitigation actions to assure their well being during landings, detonations, hydrographic surveys, etc. that will occur in the vicinity of their resting area in Agat off of Dadi Beach adjacent to Tipalao and the Agat Det areas.	See response to STG3-40 for marine mammal surveys. There is no evidence of a relationship between the beaked whale strandings and sonar training activities. The Navy requested an LOA from NMFS under MMPA for incidental harassment of marine mammals from training activities proposed in the MIRC Study Area. See response to STA1-1.

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PUG13-28	Fish	3.9	3.9 Fisheries and EFH The analysis presented in the summary table for this section is inadequate. The impacts that are listed have the potential to be adverse effects, but the document does not provide clear information about the frequency, intensity, and duration of the impacts to make a reasonable determination. The information provided in earlier sections would suggest that there is the potential for adverse effects to EFH and that this needs closer investigation and analysis. The description of EFH is lacking a full description of Coral Reef EFH. This should be added to the document as it is a key element of fisheries in this area and needs to be fully considered in the analysis.	See response to FED3-31. A cumulative ecosystems impact section has been added to Chapter 6 to address the potential cumulative impacts of Navy training exercises under each of the proposed alternatives.
PUG13-29	Fish	3.9	3.9.2.3 Sensitivity of Fish to Acoustic Energy I did not see any references to large schooling pelagic fish (tunas, mahi, wahoo) or to the smaller pelagic schooling fish that they follow. Given the economic benefit these fish provide to local residents, the impacts training might have on their migratory routes is a serious concern. Has the DoD funded any research to address this issue or do they plan to as part of the mitigation for these training activities?	An ecosystem-based assessment of EFH has been prepared (see Appendix J) and the findings have been summarized briefly in Section 3.9 (Fish). The Study Area covers a vast area encompassing more than 501,873 nm^2 (1,299,851 km^2). The wide dispersion in time and space of Navy training activities superimposed on the variable temporal and seasonal distributions of the fish species present minimizes the potential for interaction with local populations. As described in Section 3.9.1.2, for managed species and EFH an adverse effect is 1) more than minimal, 2) not temporary, 3) causes significant changes in ecological function, and 4) does not allow the environment to recover without measurable impact. Given the limited extent, duration, and magnitude of potential impacts of Navy training, adverse effects on managed species and EFH are not expected under Alternatives 1 or 2 (Table 3.9-3). From an ecosystem-based management perspective, range training activities would not adversely contribute to cumulative impacts on present or future uses of the area. Additional details regarding effects to EFH are provided in the EFH Assessment (see Appendix J). NMFS provided EFH recommendations; copies of NMFS correspondence and Navy's response correspondence are provided in Appendix C.
PUG13-30	Fish GIS	3.9	3.9.3.2.2 p. 597 Amphibious Landings The statements about Unai Culu and Unai Dankulo are misleading – while certain areas are predominantly turf, the reef margin and other areas that would have to be transited by the landing craft have very high coral densities, or what would be deemed as high coral densities compared to other reefs in the region. Landings at these sites would result in serious impacts to coral habitats that would be lasting in the areas used. The training descriptions provided in this document do not provide sufficient detail on how these impacts will be minimized or	Section 3.11, Terrestrial Resources and Chapter 5, Mitigation Measures, have been revised to include the following discussion regarding the "minor alteration" of beaches. "Amphibious Landing Restrictions at Unai Chulu, Unai Babui, and Unai Dankulo – At Unai Chulu, the Navy recognizes that surge waves may be generated by slow moving LCACs could break off coral heads. To avoid or minimize the surge effect, amphibious landings occur at high tide, and LCACs remain fully on cushion when over shallow reef and slowing and turning when over land or deeper water. AAV landings at Unai Babui are restricted to an established approach lane and

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			mitigated to justify these comments. Please provide a more detailed, accurate description of these areas and provide information about the paths to be used by the landing craft. Please provide documentation of your description of Tipalao as having less than one percent coral cover including locations of where that metric came from, as personal experience from that area suggests something more on the order of 10-30%. Also, please provide more information about impact zones, intensity levels, duration, impacts from hydrographic surveys and other planned operations in that area. Please provide documentation to support your statement that the impacts of amphibious landings, hydrographic surveys, and OTB training on fish, fish populations, and EFH would be temporary and localized. There is not enough in this document to substantiate this claim given the statements made in the tables about coral collisions, sediment suspension, number of trainings, etc. Recommend that you provide maps of each landing beach indicating data on coral densities and intended impact zones for landing. Also, include data on frequency and duration of expected events.	land at high tide one vehicle at a time." Description of Tipalao was updated to include additional information if available, in addition to percent coral cover. Applicable surveys will be conducted before and after amphibious landing activities and before any beach improvements for amphibious landing activities are implemented. Based upon the results of the surveys, coordination with resource agencies will be conducted, as applicable.
PUG13-31	Fish Recreation	3.9 3.17	3.9.3.2.4 Explosive Ordnance and Underwater Detonations The Piti, Agat, and Apra Detonation locations appear to be relatively close to shore and areas frequented not only by important fisheries resources including dolphins and sea turtles, but also recreational users. The Piti site is also near the territorial Piti Bomb Hole Marine Preserve. Has the DoD considered moving these sites to other locations further offshore that might have fewer resource conflicts? There are resident dolphin pods in Agat and Piti, high levels of recreational use near all three sites, and also relatively high levels of fish and turtles near all three sites, which raise the likelihood of impacts.	As indicated in Section 2.2.2.5, an alternative with mitigations based on geographical or temporal restrictions could severely limit the flexibility required for meeting training requirements and is not consistent with the purpose and need of the Proposed Action. The Navy must train in the same manner as it will fight. ASW can require a significant amount of time to develop the "tactical picture," or an understanding of the battle space such as area searched or unsearched, identifying false contacts, understanding the water conditions, etc. The Navy developed the Proposed Action and Alternatives in conjunction with the cooperating agencies for this FEIS; the NMFS, the USFWS, the FAA, the USMC, and the USAF. The Navy has consistently adopted mitigation measures in consultation with USFWS and NMFS that are effective at reducing risk without significant detrimental effects on training. The Navy has historically declined mitigation measures that are not effective at reducing risk to marine species, yet cause an undue burden on training. See responses to STA1-1 and STG1-13 for mitigation measures on the resident dolphins in Agat Bay and Piti. See response to STG1-24 and FED2-3 for communications with the public on training activities.

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PUG13-32	Fish	3.9	3.9.3.2.6 Expended Materials Please see comments above about expended materials as pathways for invasive species introductions, the ineffectiveness of artificial reefs in Guam, and other concerns. Depending on the accumulation, size, and location of impact, expended materials may have significant impacts on EFH, however, the analysis presented in this document is insufficient for a final determination.	See response to FED3-31.
PUG13-33	Fish	3.9	Table 3.9-3 Summary of Environmental Effects The findings in this table are generally not supported by the data presented in this document. Based on knowledge of the subject area I would expect there to be at least some reduction in the quality or quantity of EFH due to the activities described in this document. This section needs further analysis and refinement. Also, the impacts to habitat need to be more clearly defined.	See response to FED3-31.
PUG14-1	Proposed Action Regional Economy	Ch 2 3.16	I do support your efforts to explore suitable areas on Guam to conduct weapons firing exercises. Keep in mind that the majority of people of Guam are behind the buildup. I encourage you to continue with the planning because this buildup is mutually beneficial to both the military and the civilian population in defense of U.S. interest and its territories. My family owns property near Andy South bordering the eastside shoreline of the island. The possibility of its use as a small arms firing range could be explored for range complex consideration. My family also owns property in the south a few miles from Inarajan Village. I figured it could be used for jungle warfare training operations. Hopefully, other private landowners have offered their lands for such purposes. Because I strongly believe in this buildup, I offer any assistance or input that will help push the process forward.	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.
PUG14-2			Since H. Clinton reaffirmed the Japan-U.S. pact to relocate 8000 Marines to Guam, it is imperative that planning stages accelerate to meet the 2014 goal. All military sectors in my opinion have greatly gathered input from the community. The Civilian Military Task Force under Governor Camacho has been very effective in cooperating with JGPO. The vast majority of Guam do support the move, and understand the strategic value of this island. We believe there are mitigation processes in place to respond to any environmental concern to our mutual satisfaction. Furthermore, I hope the military maximizes the full potential of weapon range possibilities on this island. And if necessary, obtain private or public lands at fair value in order to accomplish their training objectives. So keep up the	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.

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			good work; of course they will be bumps/opposition from vocal minority groups along the way, but that is expected.	
PUG15-1	Proposed Action Transportation	Ch 2 3.14	I need more specific information regarding the way in which air traffic in and out of West Tinian airport (PGWT) will be affected. This is in reference to 3.14.4.2 in the impact study. Also, the runway length at PGWT is 8600 feet, and is being designed for large jet airline traffic as well as the current commuter traffic that currently serves the island. The ferry service that connects Tinian with Saipan is not sufficient to handle the daily needs of both local and tourist traffic. The air service provided by Freedom Air is a necessity for passengers, cargo and mail. Serious disruption of this traffic will cause hardships to the community. Our flight pattern is pretty much determined by Federal Air Regulation, that is, we cannot deviate significantly without violating both regulations and safety. As we operate single-engine aircraft, we are required to stay in gliding distance of land at all times. This limits our routing most of all, and to maintain gliding distance, we must stay between 1300 and 1800 feet altitude. As we operate under Visual Flight Rules (VFR), we must stay below cloud layers, and that often limits us to an altitude below 2000 feet. This best describes the limits in which Freedom Air operates between Saipan and Tinian. The exact information I need to know is: 1. will plans for military exercises impact our routing so as to require us to cancel flights? 2. how often will these exercises occur? 3. for how long a period of the day will they negatively impact our operations? Please send me data on this.	As stated in Section 3.14, Transportation, the FAA has established SUA W-517, R-7201, and ATCAAs for military training activities. When military aircraft are conducting training activities that are not compatible with civilian activity, the military aircraft are confined to the SUA to prevent accidental contact. Hazardous air training activities are communicated to commercial airlines and general aviation by NOTAMs, published by the FAA. There are no additional impacts on the FAA's capabilities, no expected decrease in aviation safety, and no adverse effect on commercial or general aviation activities.
PUG15-2			In my previous comment, I forgot to add my email address: safety@freedomairguan.com, thank you.	Comment noted.
PUG16-1			Thank you for the awareness that you are trying to share to the people of Guam. I just hope marine preservation will be to the utmost.	Comment noted. Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services.
PUG17-	Public	Ch 1	Thank you for providing this forum for the exchange of information. I would like to see a more aggressive effort to provide correct facts	Comment noted. As part of the public involvement during the NEPA process, scoping meetings and public hearings were conducted in Guam

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1	Involvement		about DoD and related activities in order to put to rest the misinformation and negative effects of a rumor mill which pits factions of the community against each other. The military does have a continuing positive impact on the community. I support that. Yet silence in response to mudslinging causes doubt in those who may otherwise be supportive.	and CNMI to get the public input in the development of the EIS/OEIS. Notice of scoping meetings and public hearings, announcing the dates, times and locations of the meetings were published in the Federal Register and local newspapers. See Chapter 1 for details on the scoping meetings and public hearings and Chapter 11 for details on the comments received during the public hearings.
PUG18-1	Public Involvement	Ch 1	#1 conflict resolution services of all types are available on Guam. This 26 years old NGO is dedicated exclusively to alterative dispute resolution (mediation, facilitation, conflict coaching) and violence prevention (restorative justice, conflict management training workshops) and university courses. We welcome inquiries. 475-1977 cinata_maolek@yahoo.com www.infomaolek.org #2 please publish (PDN and Marianas Variety) where EIS executive summary is available in written form for interested public to pick up. #3 representatives here should have had business calling cards. Please provide me a complete list of reps and their titles and contact info.	See response to PUG12-3.
PUM1-1	Public Involvement	Ch 1	Commenter feels the document should have been made more accessible to those who might have wanted to comment.	See response to PUG12-3.
PUM1-2	Table of Contents	Ch 1	There should be an index. The TOC should be at the beginning of the document. The TOC should indicate the break in volumes. The TOC provided for volume 2 should only concern volume 2. The list of abbreviations should be at the end or beginning of the volume; not buried on page 65. The TOC does not provide page numbers; only section numbers.	Comment noted.
PUM1-3	All	All	The ES is too general and too murky.	Comment noted.
PUM1-4	Significance	Ch 1	The term “significant harm” should be defined.	“significant harm” was added to the glossary as: Significant harm— Use in NEPA requires consideration of both context and intensity (40 CFR 1508.27): Context - significance of an action must be analyzed in its current and proposed short-and long-term effects on the whole of a given resource (e.g.-affected region) Intensity – Refers to the severity of the effect. Harm - An act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

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PUM1-5	Significance	Ch 1	There is no definition or discussion of just exactly what "substantially" means.	"substantially" was added to the glossary as: Substantially—relating to, or having substance. Being of considerable importance.
PUM1-6	Proposed Action	Ch 2	*"The Proposed Action does not involve the redeployment of USMC, USAF personnel or assets, carrier berthing capability, or deployment of strategic missile defense assets to the Marianas."* (Introduction, p. 5) And what are we to make of the omission of mention of the U.S. Navy, the U.S. Army, the U.S. Coast Guard?	The Guam and CNMI Marine Relocation Draft EIS/OEIS was published on November 20, 2009. The notice of availability of the Draft EIS/OEIS was published in the Federal Register and local newspapers on November 20, 2009. Section was revised to clarify that the EIS does not involve the redeployment of U.S. Navy, U.S. Army, or U.S. Coast Guard personnel.
PUM1-7	Proposed Action Alternative Development Public Involvement	Ch 1 Ch 2	*"This EIS/OEIS focuses on the achievement of service readiness activities while the Guam and CNMI Marine Relocation EIS/OEIS focuses on the relocation of forces to the Marianas with its associated infrastructure and military construction, Nuclear Aircraft Carrier (CVN) Berthing, and Army Ballistic Missile Defense System."* (Introduction, p. 5) Aha! There are other impact statements one must also consult to get a full picture! What is the status of this other document? Has it already been published in draft form for comment? On page 15, it is noted that the two documents overlap, and are being closely coordinated, but still no mention of how one can access the other EIS/OEIS.	The Guam and CNMI Marine Relocation Draft EIS/OEIS was published on November 20, 2009. The comment period ends February 17, 2010.
PUM1-8	Proposed Action	Ch 2	*"The Services will need to repair and upgrade the existing MOUT facilities to support training requirements of special warfare units stationed at or deployed to the MIRC."* (Vol 1, p.16). Elsewhere this EIS/OEIS states that no construction will occur, and therefore there will be no additional consumption of energy. Can one really upgrade MOUT facilities without undertaking some construction?	The Proposed Action includes minor repairs and upgrades to facilities and capabilities but does not include any military construction and land acquisition. Examples of minor repairs and upgrades may include replacing targets and repairing structures at MOUT facilities (e.g., replacing doors, windows).
PUM1-9	Proposed Action	Ch 2	*"In addition to the discussion/analysis of the Preferred Alternative, the EIS/OEIS includes descriptions and analyses of the No Action Alternative and Alternative 2. The Navy will not make its decision of which alternative it will implement until the ROD is signed at the conclusion of the NEPA process."* (Vol 1, p. 17) If "Alternative 1" is the preferred alternative, as it appears to be, what is the point of going further and discussing an even more intensive "Alternative 2"? This simply does not make sense.	As stated, the decision will not be made until the ROD is signed at the conclusion of the NEPA process. Analysis of the No Action Alternative, Alternative 1, and Alternative 2 provides the decision maker with a range of viable alternatives from which to make a decision.
PUM1-10	Terrestrial	3.11	*'The Navy is consulting with USFWS to avoid/reduce adverse effects associated with increased training under Alternative 1, as per Section*	This section has been revised as follows: The Navy consulted with USFWS regarding its determination of effect for

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			7(a)(2) of the ESA. No changes to vegetation that would alter vegetation community types will result from training activities; other wildlife resources will not be affected....'(vol 1, p. 28) What is meant here by "altering vegetation community types"? The vegetation community affected WOULD be altered, but not the TYPE of vegetation community in general?	federally listed terrestrial species. The analyses presented above indicate that Alternative 1 (Preferred Alternative) and Alternative 2 may affect ESA-listed animal species in the MIRC Study Area. ESA-listed plant species are not expected to be affected. The Navy entered into formal ESA consultation in July 2009 with the USFWS Pacific Island Field Office for the implementation of Alternative 1 (Preferred Alternative). Table 3.11-6 is a summary table of effects for each species considered for analysis in the ESA consultation. Training activities will not result in the adverse modification of critical habitat designations on Guam or Rota.
PUM1-11	Public Health	3.19	*'Under the No Action Alternative, Alternative 1, or Alternative 2 there would be no longterm harm to public health and safety in the global commons. Implementation of safety procedures would reduce impacts to public health and safety in the global commons.'* (vol 1, p. 30) This would seem to mean that there WILL be short-term harm in the global commons - whatever that term is supposed to mean. Particularly since the second sentence states that safety procedures would reduce impact to public health and safety.	Table 3.19-2 in Section 3.19, Public Health and Safety concludes that Impacts to public health and safety reduced by access restrictions to nearshore training areas and prior notification (where appropriate) during training events. Implementation of applicable safety procedures further reduces potential impacts to public health and safety.
PUM1-12	Cumulative Impacts	Ch 6	*"Geographic boundaries for analyses of cumulative impacts in this EIS/OEIS vary for different resources and environmental media. ....The training area venues within the MIRC Study Area (Figures ES-1 through ES-12) are the appropriate geographical area for assessing cumulative impacts. For all other ocean resources, the ocean ecosystem of the marine waters off Mariana Islands is the appropriate geographic area for analysis of cumulative impacts."* (vol 1, p. 31) I have no idea what this means given that this section first says the training area venues are the appropriate geographical area for assessing cumulative impacts, but then says "for all other ocean resources," something else is the appropriate geographical area.....WHAT other ocean resources?	As indicated in Chapter 6, Section 6.1.1, Geographic boundaries for analyses of cumulative impacts in this EIS/OEIS vary for different resources and environmental media.
PUM1-13	Land Use	3.12	The statement that *"Although the required electricity demands of increased intensity of land-use would be met by the existing electrical generation infrastructure at the MIRC, the alternatives would result in a net cumulative negative impact on the energy supply"* (vol 2, p. 31) is naive at best. The existing electrical generation infrastructure in the CNMI is unstable and unreliable. ANY additional load would create considerable problems. This fact also weakens the following statement that *"No additional power generation capacity other than the potential use of generators would be required for any of the training activities."* Indeed! Use of [additional] generators is not a potential need, but a very real one!	Comment noted.

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PUM1-14	Cumulative Impacts	Ch 6	Not only is wording misleading, confusing, unclear, murky, but some statements are just not true. For example, it is the government of the CNMI, not Guam, that is negotiating in regard to the pozzolan ash on Pagan; the Marianas Trench Marine National Monument is not a Guam project; it is a CNMI project (chart, vol 2, p 60-61).	*Text revised.*
PUM1-15	Regional Economy	3.16	The statements that *"Impacts to demographics are assessed in terms of their direct effects on the local economy and related effects on population and expenditure within the study area. Demographic impacts would be considered significant if the Proposed Action or alternatives resulted in a substantial shift in population trends, spending and earning patterns, or community resources (notably housing and education)"* and *"The assessment of the impacts upon population trends, regional spending, regional earning, housing trends, regional employment, and education with implementation of Alternative 2 are the same as those described in Section 3.15.3.2; there would be no impacts to demographics if Alternative 2 were implemented"* (vol 1, p. 818) ignore the fact that the presence of additional members of the Armed Forces for training activities, etc., would be spending time and money in the CNMI, and WOULD have an effect on the economy. Indeed, they would seem to run contrary to the statement *"Analysis of past defense spending history in the United States (to include Hawaii) shows that each dollar of defense spending could generate 75 cents of gross domestic product (GDP), which is the final value of the economy's total annual output. The 75 cent contribution (or multiplier) to GDP is the sum of direct, indirect, and induced effects of defense spending (Pula 2008)*" found in.vol 1. p 826.	Comment noted.
PUM1-16	Recreation Mitigation Measures	3.17 Ch 5	Major assumptions are made that can hardly be supported. For example, *"Recreational diving activities within the ocean areas take place primarily at known diving sites. The locations of popular diving sites are well-documented, dive boats are typically wellmarked, and diverdown flags would be visible from the ships conducting the proposed training, so possible interactions between training activities within the offshore areas and scuba diving would be minimized. The Navy would also notify the public of hazardous training activities through Notices to Airmen (NOTAM) and Notices to Mariners (NOTMAR)."* (vol 1, p. 863) But what if things don't go as planned??? Not all dives are made at known sites; not all dive boats are well-marked; not all diverdown flags are equally visible. Such contingencies must also be considered.	Chapter 5, Mitigation Measures details the standard operating procedures in place that require clearance of training areas prior to commencement of exercises.
PUM1-	Public	Ch 1	Unfortunately, there is not time for me to give the entire document a	Comment noted.

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17	Involvement		close read. Suffice to say I believe the document does a real disservice to any but the most dedicated of individuals among the general population - not only do its massive 1440 + pages make it difficult to wade through it all, but in addition, it is wordy, repetitive, redundant, and deceptive. To argue that this document proves that the public had an opportunity to comment on the draft EIS/OEIS is nonsense. The document deters and discourages comment. There is also considerable arrogance and condescension in the tone of the arguments made that what is good for the military, particularly the U.S. Navy, is good for the inhabitants of the affected areas. That is not to deny that there are sections that are informative, useful, accurate. There are. But they are lost in the babel that surrounds them.	
PUM2-1			I have observed the profound amount of isolated marine lifeand rare land life forms in the islands of Medinilla, Anatahan, Sariguan, Guguan, Alamagan, Pagan, Asuncion and Uracas with Saipan amazement and awe, for 27 years, and have sailed their about a hundred times, as well as having lived their for weeks at a time. I have observed military activities their with keen interest. Now they plan to expand operations. That's interesting. _ Can such a pristine environment be maintained when military operations are being conducted? Certainly not, but I do appreciate the fact that our military wants to minimize the damage, and I thank them for that praiseworthy attitude. _ The only endangered species in those islands are humans. The sharks like white meat, and so do the 600 pound wild boar and 1600 pound bulls, so be careful up their. Strong Typhoons and active volcanoes can send you back to God._ Contact me if you need an experienced guide. Anytime. Good luck and Godspeed. Captain Kimo	Comment noted. Chapter 3 outlines the specifics of the Services' stewardship responsibilities for the rich variety of natural resources at land and sea, managing them for multiple use, sustained yield, biodiversity, and ecosystem services. See Chapter 5 for mitigation/conservation measures to avoid and/or minimize adverse impacts to the resources analyzed in the EIS/OEIS.
PUM3-1	Proposed Action Transportation Mitigation Measures	Ch 2 3.14 Ch 5	The 10nm fishing restriction is justifiably appropriate for safety reasons. My concern is the permanency of the restrictive clause that would preclude local fishermen to reach the best Emperor (Mafute) fishing ground located immediately north of FDM. A window of opportunity may be accorded the fishermen during the 3 months summer period beginning April to the end of June. This is simply because summer has the best water conditions to travel to FDM. There may be some argument against it due to spawning season	Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. For information related to training activities, the public may contact the Navy Operational Training and Readiness Department at 339-4710 and the Air Force 36th Wing Public Affairs Office at 366-4202 during office hours (0730 to 1630). After hours, the public may contact the Navy

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			and I would leave that to the Marine Biologist. The 2nd item that I would like to recommend is a navigational marker to give warning to fishermen as they approach the 10nm toward FDM. A device that gives night light warning. Some local fishermen do not have the financial luxury to buy navigational aide to detect distance to the island. With all the advance technological capabilities and economic might, such device on the water is not only feasible but provides necessary safety for the fishermen. Thank you very much.	Operational Training and Readiness Department at 339-8054 or the Command Duty Officer at 777-1809 and the Air Force 36th Wing Command Post at 366-2981. Navigational devices/markers must be approved by the U.S. Coast Guard (USCG), in coordination the U.S. Army Corps of Engineers (USACE) in development of the final Federal Rule making process. The USCG and USACE will determine the feasibility and practicality of markers near FDM. The type of marker and maintenance of the marker will determine the feasibility of this proposal in conjunction with an evaluation of the effectiveness of this proposal in regards to overall safety of navigation for the region. Any final rule concerning the surface danger zone around FDM will incorporate appropriate notification and advisory requirements.
PUM4-1	Proposed Action	Ch 2	It seems rather odd that the U.S. President is protecting part of the Marianas considered to be pristine, the Marianas Monument, yet right in the middle of it, a military target island. Are we looking at another Bikini atoll. Enlarging the target zone from 3 miles to 7 or 10 miles just means that less of the Marinas is "pristine".	Comment noted.
PUM5-1	Transportation Regional Economy Recreation	3.14 3.16 3.17	The MIRC does not address access rights to the residents of Tinian during exercise activities. What is the plan for public access to tourist, historical, hunting, fishing and recreational sites in the Northern part of Tinian? Since lack of access to the environment is a major impact to a community, I believe the MIRC MUST address the impacts of any restrictions to access of the Northern part of Tinian.	Impacts to transportation, recreational, and regional economy in the Study Area are addressed in Sections 3.14, 3.17, and 3.16 respectively.
PUM6-1	Seabirds & Shorebirds	3.10	Having obtained a copy of this EIS rather lately, I can only offer very general comments. I am concerned that overall, the conclusions of no adverse effect - particularly for seabirds and migratory shorebirds – have been based on relatively sparse data and in absence of detailed population studies. Without these types of baseline data, it is impossible to determine whether or not the proposed actions would have a significant effect on these seabird and migratory populations. It is very likely however, that the types of military activities listed in the EIS would add stresses on these bird populations. There are many stressors on the world's ocean life noted in various studies (see following). Without proper stewardship, it is likely the health of the oceans will reach a tipping point which vastly decreases the life and productivity of the ocean's world wide. There are numerous studies of the decline in bird populations and reports of non-military stressors on ocean life. A newly released report	See response to PUM2-1.

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			presents a comprehensive review of the state of U.S. birds; see www.StateoftheBirds.org. Mass Extinctions accompanied by the rise of "slime" (pollutant based) are predicted for oceans http://www.sciencedaily.com/releases/2008/08/080813144405.htm. A Wall Street Journal article http://online.wsj.com/article/SB123793936249132307.html questions who owns the responsibility for the widening gyre of floating plastic in the Pacific. This raises the question of how military ships will dispose of plastic waste while at sea. Chilean authorities report mass deaths of nearly 1500 penguins at Caleta Queule, more than 1240 miles north of Antarctica http://thescotsman.scotsman.com/world/Experts-investigate-mass- penguin-deaths.5119975.jp. Worldwide, there are reported examples of seabird population decline. Scotland reports that Kittiwakes, Arctic terns and Arctic skuas had a terrible breeding season which could see them wiped out in the UK (http://news.bbc.co.uk/2/hi/uk_news/scotland/north_east/7698125.stm). A little closer to home, the wedge-tailed shearwater colony on Managaha Island off Saipan also reported formidable results from a dismal breeding season.	
PUM6-2	Terrestrial	3.11	Also of special concern for the military use of the Mariana islands is how rigorous are the protocols for precluding introduction of the Brown Tree Snake to the northern Mariana Islands. Accidental introduction would be deleterious. Ancillary concerns for the project are the deleterious effects of introduced mice which can bring seabirds to extinction, see http://www.sciencedaily.com/releases/2008/12/081228192127.htm for a cautionary note.	See response to FED1-2.
PUM6-3	Seabirds & Shorebirds	3.10	These provide a few examples of my concerns about the effects of the proposed undertakings on ocean life and in particular to seabirds and migratory birds. Admittedly, the origin of some problems are not militarily based, but I am concerned that without proper stewardship, increased stressors could be a tipping point from which various species can not recover.	See responses to STA1-1 and PUM2-1.

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PUM6-4	Mitigation Measures	Ch 5	I have known several young men from Saipan who have proudly joined the U.S. military service, and I am acutely aware of how important it is to make them battle ready. I fully support the military efforts in this regard. In my view however, the military should undertake and support increased and more detailed studies both of the wildlife and other resources in the target areas. Additionally, the effects of the activities on the wildlife and other resources - including the possible introduction of the brown tree snake, rats, or other predators to the Northern Mariana Islands - should be thoroughly considered. Plans for mitigation should be in place prior to any natural resource modifications within the Mariana Islands Range Complex.	See responses to FED1-2 and STA1-1.
PUB1-1	Seabirds & Shorebirds Cumulative Impacts	3.10 Ch 6	As the former head of the Commonwealth of the Mariana Island's Wildlife Section, Division of Fish and Wildlife, Department of Lands and Natural Resources, I would like to submit the following comments for your consideration in preparing the final EIS/OEIS for the Mariana Islands Range Complex. In general I would like to compliment the EIS preparers for the detailed discussion and explanations of the impacts of the proposed actions on the marine environment, marine mammals, and sea turtles (specifically Sections 3.6-3.9). The meticulous preparation of those sections of the document, along with supporting information, is admirable. However, the thoroughness of those sections highlights the paucity and inaccuracy of information used to outline the impact of the proposed actions on seabirds in Section 3.10. I hope that a thorough revision of that section and a more substantial examination of the Cumulative Impacts (as well as a correction of errors in that chapter) are included in the Final EIS/OEIS.	Comment noted, Section 3.10 and Chapter 6 have been revised and updated.
PUB1-2	Mitigation Measures	Ch 5	3.2.4 Unavoidable Significant Impacts (of hazardous wastes) states that ranges will be cleaned up when they are no longer useful. Given that the removal of expended materials from ranges no longer in use in the Commonwealth of the Northern Marianas (CNMI) has not been undertaken in the past (for example, the mortar range no longer used on Tinian), it would be appropriate for the EIS to include details of clean-up activities and the extent to which hazardous materials will be removed from such inactive ranges.	This section has been revised and the statement that ranges will be cleaned up when are no longer useful has been removed.
PUB1-3	Marine Mammals	3.7	3.7.3.1.10 Integration of Biological and Regulatory Frameworks (for estimating the acoustic effects of training activities) states that secondary effects, such as the likelihood of an injury to an animal increasing the risk of predation, are not taken into consideration in the analysis. While it may be difficult to quantify these effects for modeling	There is no evidence to suggest that short duration exposure to active sonar has caused any indirect effects, long term behavioral response or population effects. The exception being the Bahamas stranding incident and that area has a very different bathymetry compared to the MIRC. Beaked whales and spinner dolphins in Hawaii show island specific

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			purposes, they are important to the well being of the species none-the-less. One would expect that either the authors might apply the kind of well reasoned approach to the problem that they did in the analysis of primary acoustical effects or that such secondary but important effects would be taken into consideration in the Biological Opinion and during Section 7 consultations.	residency in areas that have been exposed to Navy activities. For more information see Section 3.7.3.1. The Navy has not found any information to suggest that animals exposed to MFA/HFA sonar would be more susceptible to vessel collisions. The Nowacek et al., 2004 study was conducted on north Atlantic right whales and North Pacific right whales, which have not been observed in the MIRC for many years. Nowachek et al. 2004 used three types of continuous 2 minute signals for 18 minutes, only one of which was mid frequency type signal. MFAS signal is approximate 1 sec and repeated 2-3 times per minute. Exposure to mid or high frequency active sonar is not a chronic occurrence and therefore, is unlikely to cause long term stress effects. Sonar pings are intermittent, occurring several times a minute and given the large area of the MIRC it is extremely unlikely that individual animals are exposed chronically or even over multiple days. See response to STA1-1.
PUB1-4	Sea Turtles	3.8	In section 3.8 Sea Turtles, the analysis frequently enumerates potential effects of the proposed activities (summarized in Tables 3.8-4 and 3.8-5) and that Section 7 consultations with the appropriate federal agencies have been initiated. Such consultations would not be initiated if some level of sea turtle harassment or mortality were not an issue (see effects listed in the two tables). Additionally, the analysis of the effects of Alternative 2 is nearly non-existent, particularly section 3.8.4 (Unavoidable Significant Environmental Impacts). Therefore, it seems that the EIS conclusion of "no significant harm to sea turtles" prior to receiving the results of the consultations is premature. Perhaps conclusions similar to those stated so concretely in section 3.8.5.2 and Table 3.8-6 (e.g., no significant impact to sea turtles) should read instead "impact determination pending the results of consultation".	Comment noted.
PUB1-5	Fish	3.9	Section 3.9 Fish and Essential Fish Habitat clearly outlines mortal effects of some of the proposed activities on fish (summarized in Table 3.9-1). It is difficult to concur with the conclusion that "in accordance with NEPA, explosive ordnance and underwater detonations will have no significant impact on fish, fish populations, or EFH" after reading in section 3.9.3.2.4 that "effects of underwater explosives on fish have been fairly well documented…empirical studies suggest that underwater explosions are lethal to most fish species in the immediate vicinity of the explosion regardless of size, shape, or internal anatomy." Although a clearer explanation of how this conclusion was reached	Fish kill data provided by Guam Environmental Protection Agency (GEPA) observations from four deepwater demolition training exercises indicated that a total of 3, 4, 765, and 103 fishes were killed, respectively. As exercises occur no more than once per month, the numbers recorded equated to a maximum of about 4 fish per day – well below the number caught daily by fisherman. The majority of the fish were less than 12 inches (30 cm) long, and mortality of fishes and other marine life following exercises was relatively low since the activities are conducted in areas where marine fauna are not abundant.

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			given the negative results of most studies would be helpful, an approach more consistent with the available data seems more appropriate. It would be a relief to read a simple statement of the level of mortality expected from some of the exercises and suggested measures that might be taken to mitigate unavoidable impacts, rather than many paragraphs that amount to an evasion of responsibility for those impacts.	See response to FED3-31 for essential fish habitat assessment.
PUB1-6	Seabirds & Shorebirds	3.10	Section 3.10 Seabirds and Shorebirds, as noted previously, is woefully inaccurate. The MIRC Study Area contains some of the largest concentrations of seabirds in the western Pacific. The majority of those birds are not found on Guam, Rota, and Tinian and so their distributions within the Study Area are not included in Table 3.10-2; even those species documented for Saipan are not included in the table. Section 3.10 delimits the discussion of seabirds and shorebirds to the confines of the Study Area, but birds north of FDM in the CNMI are not noted at all. I would suggest an expansion of the literature review in order to up-date the breeding, range, and distributional data on all of the species listed in Table 3.10-2. A good place to begin the revision would be to reference the table attached to the 26 March 2008 letter from the Department of the Navy to the U.S. Fish and Wildlife Service (5090.1G03 Ser EV22/237) in Appendix C. Also, the species accounts (3.10.2.2) are in dire need of revision and editing (particularly those on tropicbirds, shearwaters, noddies, terns and moorhens, with the section on sooty terns being particularly poorly structured), I suggest contacting CNMI-DFW for their data on breeding and distribution within the northern Marianas. Any discussion of Wedge-tailed shearwaters should include the colony in Saipan's harbor on the island of Mañagaha, as extensive information is available from several years of monitoring by CNMI-DFW.	Species list: Information sources included the following for land training areas within the MIRC: (1) periodic surveys of FDM and Tinian conducted primarily by Navy natural resource personnel, (2) USFWS Biological Opinions issued on various training actions on Tinian and FDM, (3) Integrated Natural Resource Management Plans (INRMPs) for Navy lands on Guam, Andersen AFB, and Navy-leased lands within the CNMI, (4) the USFWS Pacific Region Seabird Conservation Plan, (5) USFWS recovery plans for three ESA listed seabird species (short-tailed albatross, Hawaiian petrel, Newell's shearwater), (6) site specific inventories at FDM and other locations within the CNMI, (7) checklists compiled by GovGuam DAWR, (8) Pratt *et al.*(1987) for seabirds and shorebird checklists for the Pacific. In addition to these sources, seabirds in pelagic zones were supplemented by at-sea observations during the MISTCS cruise in 2007 and seabird surveys in nearshore environments by Kessler (2009). This last reference was not available at the time of the DEIS publication. Study Area: Land-based training only occurs on Guam, Tinian and FDM, with limited training on Rota (not in habitat areas) and on Saipan (with an emphasis on the Marpi Maneuver Area). Islands north of FDM are not included in the study area because MIRC training does not occur there. In order to address this comment, the FEIS was updated by the following actions: (1) Table 3.10-2 was updated to include species thought to occur on Saipan, (2) a table of species observed on each survey leg of the MISTCS cruise, and (3) a figure showing the at-sea bird survey effort legs. The Navy recognizes that bird species lists are continually updated, and accomplishes this through the INRMP five-year update process, as required by the Sikes Act Improvement Act.
PUB1-7	Seabirds & Shorebirds	3.10	Section 3.10-25, 26 discusses the probability of vessels striking birds in flight at sea, correctly noting that most such incidents will occur at night. The bright lights of ships at sea are known to attract and sometimes to disorient the family of birds that include petrels and shearwaters. When these birds are struck at night, the number of strikes can be massive and the level of mortality quite high. Again, members of this family are known to dive past 80m in depth. The	The Navy employs a number of measures that would reduce the likelihood of seabird-vessel and seabird-explosive interactions. Please see Section 3.10 for specific measures for seabirds, although Chapter 5 contains an annotated comprehensive list of measures for all resource areas. For instance, Navy ships as a general practice avoid upwelllings that attract seabird prey species in order to reduce impacts to recreational and commercial fishing. In recent seabird surveys (2008) conducted by

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			discussion of the probability of collisions with members of the procellarid family should reference material on both massive night-time collisions and under-water interactions. Under-water impacts of exploding ordnance (discussion, for example, in 3.10-30) should also reference the deep dives of these species and possible impacts on the birds while they are underwater.	USFWS personnel, three upwelling areas were identified with associated seabirds (report cited as Kessler 2009). Although these upwellings can vary in location, a map was added to the FEIS to show these locations.
PUB1-8	Seabirds & Shorebirds	3.10	Section 3.10-31 discusses the effects of High Explosive Ordnance on seabirds, stating, "While the effects of explosions in the MIRC Study Area on seabirds cannot be quantified, lethal injury to some individuals of some bird species could occur based on the total number of explosions that would take place per year under the No Action Alternative." This would also be true of the effects under Alternatives 1 and 2, however, the effects would be more intense as the number of missions increases under these alternatives. High explosive ordnance, including bombs, missiles, and naval gunshells, are listed as among the types of ordnance used during training missions involving FDM. It is difficult to reconcile the above with the statement on page 3.10-32 concerning the effect of the proposed actions on FDM seabirds. I do not believe there is data to support the contention that "...a small number of birds would be affected and that population level effects would not be expected." According to this same EIS, the effect of exploding ordnance on seabirds cannot be quantified, so lethal injury to individual birds could easily be extensive as opposed to small. In addition, there is no documentation of the effects of bombing missions on seabird population levels. Seabird numbers on FDM are known to fluctuate over time, which could be associated with seabird prey abundance in the surrounding waters. Or the fluctuations could be associated with migration among seabird colonies in response to the rich feeding grounds just off-shore of FDM attracting seabirds from nearby breeding colonies (e.g. Rota and the northern Mariana Islands). Or the fluctuations could be a response to the frequency of training missions or to the intensity of explosions during exercises. In the absence of data we do not know whether exercises conducted on FDM impact only the populations on that island, or have impacts on seabird populations throughout the archipelago. We do not know what levels of mortality from bombing can be sustained beyond which the populations can not recover. In sum, the assumption that exploding missiles have a negligible effect on either individuals or on populations is not supported by the data available.	As defined in Section 3.10.1, the criteria for significance is based on the NDAA rule authorizing the take of migratory birds by military readiness training if simultaneous measures for migratory birds are implemented. The requirement to consult with USFWS is triggered if population-level effects are expected. The Navy consulted with the USFWS Pacific Islands Field Office for impacts to species (seabirds, shorebirds). Please see Section 3.10 for specific measures for seabirds, although Chapter 5 contains an annotated comprehensive list of measures for all resource areas. For instance, Navy ships as a general practice avoid upwelllings that attract seabird prey species in order to reduce impacts to recreational and commercial fishing.
PUB1-9	Seabirds & Shorebirds	3.10	Section 3.10-34 is erroneous in stating that Wedge-tailed shearwaters are restricted to Saipan. Table 3.10-2 correctly lists them as being present near Tinian and has having been observed over FDM.	Wedge-tailed shearwaters discussion revised as follows: Most species of this family observed within the MIRC Study Area are considered visitors (DoN 2007; Pratt *et al.* 1987). Shearwaters and petrels do not breed on

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			Although data are scarce, they are likely to breed on several of the northern islands of the chain as well. This species ranges hundreds of kilometers while foraging from their colony on Mañagha in Saipan's harbor during the breeding season (April through December). This shearwater is quite likely to foraging often in the waters of FDM. Given the propensity for shearwaters to ingest plastic debris while feeding, the likelihood of this species ingesting expended plastic materials resulting from the proposed actions is not negligible. The Wedged-tailed shearwater colony on Mañagha is the largest known breeding colony in U.S. controlled waters of the western Pacific. Any lethal or sub-lethal effects of plastic ingestion could greatly impact the survival or the genetic diversity of the Mariana population. Therefore, the impact of plastic ingestion would not be as slight as described in the EIS.	DoD owned or leased lands within the MIRC, although wedge-tailed shearwaters are known to breed on Bird Island (an islet off Saipan's eastern coast). Shearwaters and petrels primarily utilize offshore and coastal waters for foraging and are typically concentrated along upwelling boundaries and other water mass convergence areas (USFWS 1983). The Hawaiian petrel, observed during the 2007 MISTCS cruise survey (DoN 2007), is protected under the ESA, and is described in more detail in the ESA-listed species discussion within this subsection. The Navy does not expend military training material on or around Saipan; therefore, based on the relatively small amount spread over a wide area, impacts to shearwaters associated with expended training material are expected to be quite small relative to the amount of plastics and other ingestible material released from other non-military sources.
PUB1-10	Seabirds & Shorebirds	3.10	Section 3.10.3.2 Alternative 1, Aircraft Overflights, states that number of fixed wing flights over FDM will increase nearly 318% (from 704 to 2,942 per year) while helicopter activity over FDM would increase by nearly 57% (from 717 to 1,123 per year). Both types of flights will elicit increases in seabird startle and stress responses. The substantially increased time spent away from nests for breeding birds will likely increase egg and chick mortality (from exposure and predation) and can be expected to impact seabird numbers on FDM via reproductive failure. The EIS should discuss the potential impacts of the expected increase in behavioral and physiological responses of seabirds on FDM more thoroughly to substantiate their conclusion of no significant impacts.	The Services' conclusion was reached based on the following: (1) No new impact areas will be used at FDM, therefore, the total area of impact area [which is greater than the actual strike zone] will remain at 34 acres, or approximately 20 percent of the total island area, (2) past use of the island as a range has occurred over a long period of time coinciding with stable enumeration of seabirds using the island (there are fluctuations), (3) continued implementation of conservation measures (firing restrictions, (4) anecdotal evidence suggests that FDM as a closed military lease area (not open to the public) has benefited seabird populations by protecting them from poaching, (5) additional conservation measures which include a rat eradication project used on proven techniques on similar islands in the Pacific, and (6) continued monitoring on a quarterly basis of seabird populations. The Navy's definition of significance is described within the regulatory framework discussion and would be consistent with the DoD's MBTA exemption.
PUB1-11	Seabirds & Shorebirds	3.10	Section 3.10.3.2 Alternative 1, Amphibious Landings, mentions impacts on seabirds but does not discuss shorebirds at all. The EIS should discuss the impacts of Over-the-Beach Training on shorebird species most likely to be affected (including the Pacific Reef Heron listed in Appendix C).	Pacific reef herons nest year-round, nesting habitat including isolated patches of forests, small islets, or in palustrine or estuarine marshes and swamps. Amphibious landing beaches used for training do not impact these habitat types, therefore, amphibious landings will not impact nesting habitat for this waterbird. Applicable surveys and monitoring will be conducted prior to and after amphibious landing activities. In addition, the Navy has designed conservation measures during the Section 7 ESA consultation with the USFWS Pacific Islands Field Office that will benefit waterbirds utilizing wetlands within Navy leased lands within the CNMI. For example, the Navy maintains training restrictions at Hagoi and other wetlands within the Tinian MLA and helicopter and fixed wing flight altitude restrictions over wetlands. These measures are described in Chapter 5

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				(mitigation) and within Section 3.10.
PUB1-12	Seabirds & Shorebirds	3.10	In section 3.10-36, the statement, "Additionally, the seabird species that is morphologically challenged with the inability to regurgitate (wedge-tailed shearwater) is not known to occur on FDM or in waters off FDM" is at best misleading. Firstly, the Wedge-tailed shearwater feeds its chick exclusively by regurgitating partially digested food. During these feeds, plastics ingested by the adult are often passed to the chick. The chick retains the plastic, which accumulates in the gut for the four months it spends in the nest. If large amounts of plastic are consumed by either adult or chicks, lethal and sub-lethal impacts can result. Secondly, this species have been documented during periodic surveys as visiting, if not breeding, on FDM (see Table 3.10-2) and presumably is feeding there. If ingestion of expended material is lethal or sub-lethal to either adults or chicks, it clearly holds the potential to significantly alter the population structure of the colony of Wedge-tailed shearwaters on Mañagaha Island (see discussion above).	The Navy does not expend military training material on or around Saipan; therefore, based on the relatively small amount spread over a wide area, impacts to shearwaters associated with expended training material are expected to be quite small relative to the amount of plastics and other ingestible material released from other non-military sources.
PUB1-13	Seabirds & Shorebirds	3.10	The discussion of the impacts of Alternative 2 in Section 3.10.3.3 is restricted to the statement that "Seabirds would be affected by the increases in exposure to the various stressors considered for analysis…." I suggest that further discussion of the impacts is necessary here. Also, the statement that "…mitigation measures reduce the likelihood of impacts out of the realm of significance" does not do justice to the topic. As with other sections of the EIS, the increases in proposed activities in non-territorial waters are not mentioned except to say that they would not cause significant harm to the focal organisms. This equates to no information and to no discussion of the topic, which is unacceptable in an EIS.	The Navy's determination process of these regulatory conclusions is described under the regulatory framework discussion and the analysis follows in subsequent subsections.
PUB1-14	Terrestrial	3.11	Why, in Section 3.11.1.2, is the Terrestrial Species and Habitats Study Area limited to the southern portion of the MIRC? Every other section of the document considers the entire MIRC Study Area (see Figures Es-1, Figure 1-1 and others); the Terrestrial Species and habitats section is an anomaly. The northern islands of the Marianas archipelago are rich in terrestrial species (including fruit bats, lizards and birds) some of which are threatened or endangered (e.g., the Micronesian megapode). The study area for terrestrial species should be expanded in this EIS so that it treats potential impacts on the northern Mariana Islands as well.	As stated in Chapter 1, the land areas of the MIRC include DoD training areas and facilities located on FDM, Tinian, and Guam, and non-DoD training venues on Rota.
PUB1-15	Terrestrial	3.11	Section 3.11.2.1.4 Saipan, Saipan Land-based Training Areas lists the Saipan Upland Mitigation Bank as a maneuver area. This tract of land is set aside as mitigation for the incidental take of the endangered	No training is proposed to occur within areas designated for conservation use, including the Saipan Upland Mitigation Bank. Training does occur within the Marpi Maneuver Area, defined on maps within Section 3.11.

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			Nightingale reed-warbler. A description of the habitats in this tract is available from CNMI-DFW and should be included in this section. There is no description of the kind of activities that might be conducted within the mitigation bank, and these should also be enumerated in the EIS so that the public might comment on them. It does seem ironic that an area set aside for conservation of an endangered species is slated to be used for military maneuvers. Perhaps the use of this area as an exercise site should be reconsidered as it does not seem to be consistent with other uses authorized in the agreement that established the mitigation bank.	The figure showing the mitigation bank is clarified with text on the figure as "no training."
PUB1-16	Terrestrial	3.11	As noted above, Section 3.11.2.2 and Table 3.11-4 should be amended to include the northern distributions of species of concern, particularly fruitbats, lizards, butterflies and snails. The listing of the Nightingale reed-warbler in Table 3.11-4 suggests that it exists only in wetland or marsh areas, which is not true on Saipan (hence the *upland* mitigation bank) nor for the population on Alamagan. The Mariana fruit bat forages in habitats other than those listed in the table, especially in the coconut forests of the northern part of the archipelago. Generally, the table needs to be expanded and updated with more extensive information, much of which is available at CNMI-DFW.	The species descriptions have been updated with language used in the Section 7 ESA consultation process between the Navy and the USFWS Pacific Islands Field Office. See response to comment PUB1-15 (there is no existing or proposed training within the Saipan Upland Mitigation Bank).
PUB1-17	Terrestrial	3.11	Section 3.11.2.2.4- Section 3.11.2.2.12 contains accounts of federally endangered species that generally lack information on the distribution or recent population figures for the northern islands of the Marianas archipelago. Much recent information (from the last 10-yr period) is available either from USFWS or from CNMI-DFW. For example, the status of the Mariana crow should be updated with information from the intensive studies conducted on Rota over the last 10 years….the last information listed in the EIS for Rota is from 1999 and the species have been in serious decline since then. Status of the Mariana common moorhen should be up-dated with monitoring information from Rota and Saipan. The write-up on the Micronesian kingfisher would benefit from including information on the extensive conservation efforts that the Association of Zoos and Aquariums has made to keep this species from extinction. The EIS should report the recent return to Guam of captive bred Micronesian kingfishers, information available from Guam-DAWR and in the local newspaper. With regard to Micronesian megapodes, there is barely any reference to their status on the northern Mariana Islands where the bird is most numerous. And the large colony of Mariana fruit bats on Rota has also escaped mention. The occurrence of Mariana fruit bats on Saipan, where they have been observed using the Saipan Upland Mitigation Bank (SUMB), is a fact that should be included in the document as it is important when	See the response to PUB1-16.

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			considering the SUMB for military exercises. Unfortunately, it is difficult to check the literature reviewed in the preparation of this section as citations are entirely missing from the List of References in Vol. 2 of the EIS.	
PUB1-18	Terrestrial	3.11	Section 3.11.2.4.1, a discussion of candidate species (for listing under the ESA) fails to mention the Sheath-tailed bat (*Emballonura semicaudata*) with its main population concentration near Tinian on Aguiguan, or the Mariana wandering butterfly (*Vagrans egestina*) known from Rota. No information is given on how the increase in proposed activities may affect these fragile populations. Because the species are part of the Section 7 consultation, per Appendix C, between the Department of the Navy and the USFWS, they should be included in the EIS.	The study area defined for terrestrial biological resources includes DoD leased lands within the CNMI, which does not include Aguiguan. The Mariana wandering butterfly was added to Section 3.11 species considered in the analysis for potential intersects with Tinian land training.
PUB1-19	Terrestrial	3.11	Section 3.11.3.2.1 refers to stressors to terrestrial species and habitats from the activity proposed under Alternative 1. It states that "…Nightingale reed warblers….are not expected to be affected by the increase in training activities, as training will not occur in areas occupied by the[se] species." However, the Saipan Upland Mitigation Bank, designed to protect and conserve the reed-warbler, is slated for use as a land-based exercise area (Fig. 3.11-7). A correction to the EIS is necessary here.	See response to PUB1-15.
PUB1-20	Terrestrial	3.11	Section 3.11.3.2.2 (and 5.3.2.1) lists conservation measures proposed by the Navy to mitigate the adverse impacts of the proposed increased activities under Alternative 1. Many of the measures are laudable or necessary, especially with regard to interdiction of the spread of the Brown treesnake. With regard to the proposed conservation measure titled "Life History Studies of Micronesian Megapodes", it should be recognized that conducting such a study with the Tinian population is probably not feasible. Section 3.11.2.2.9 suggests that 234 surveys over 19 years have only produced 13 detections of what may be the same megapode or an individual visiting from nearby Aguiguan. A study of life history characteristics requires a reasonable sample size (> 20) of individuals that are easily observed. At best, the Tinian population is too small to support a rigorous study, but clearly it should continue to be monitored. The population of megapodes on Saipan, located mostly within the SUMB, also is too small to be a candidate for observation. One suggestion would be to (1) continue monitoring the population on Tinian (surveys), and (2) conduct the life history studies on Sarigan and another island of relatively easy access where the proposed increase in military activities may have an impact, such as	Comment noted. The Services coordinated the details of the megapode study with the USFWS Pacific Islands Field Office as part of the Section 7 ESA consultation.

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			Aguiguan or Pagan.	
PUB1-21	Terrestrial	3.11	With regard to Section 3.11.3.3, to say that a discussion of the impacts of Alternative 2 on terrestrial species and habitats is scant would be euphemistic. Even with the dearth of information provided it is easy to see that if the conservation measures for Alternatives 1 and 2 are the same, and if the goals outlined in the Draft Brown Treesnake Control Plan during Alternative 2 activities would not be met (as is stated), then the risk of the spread of the snake is increased. Because the spread of the snake to currently snake-free islands is the number one threat to island biota, it can not be stated that "the increased exposure to stressors will have no significant impact on terrestrial natural resources under Alternative 2 relative to that of Alternative 1." The risk of spreading the Brown treesnake during terrestrial maneuvers where equipment and vehicles are moved from Guam to other islands is already high. To increase this past the effectiveness of control measures is unacceptable. The EIS should outline the additional conservation measures the Navy would undertake to achieve 100% interdiction of the snake during Alternative 2 operations as well as the additional measures it will undertake to reduce other adverse impacts.	See response to FED1-2.
PUB1-22	Terrestrial	3.11	Table 3.11-7, summarizes effects of the proposed activities on ESA listed species. The entry for the Nightingale reed-warbler needs to be amended from "no effect" to "may affect" reflecting the potential impacts of land-based activities on Saipan within the SUMB. The potential for land-based movements to harass or take reed-warblers should be added to the appropriate entry in Table 3.11-8.	The conclusions listed in the table are based off ESA effects determinations as defined in the USFWS and NMFS 1998 handbook for conducting Section 7 ESA consultations. Table 3.11-7 has been revised and updated. Based on the Navy's consultation with the USFWS Pacific Islands Field Office, the Navy has concluded that the proposed activities will not adversely affect Nightingale reed warblers on Saipan.
PUB1-23	Mitigation Measures	Ch 5	Chapter 5, Mitigation Measures, appears not to include any measures to conserve habitat for marine mammals and sea turtles. Is this an oversight?	Chapter 5 has been updated based upon public input and consultations.
PUB1-24	Mitigation Measures	Ch 5	Section 5.2 discusses in detail both the general and exercise-specific measures taken to avoid or lessen impacts on marine mammals and sea turtles. Many of these measures appear to rely on having several Navy trained personnel on the bridge as watch standers and lookouts to scan for the presence of marine mammals and turtles prior to initiating exercises. Many other methods for detecting and avoiding marine mammals and sea turtles were considered and rejected (Section 5.2.4). Given that the Navy's reliance on lookouts is a key part of the mitigation plan, two questions come to mind: (1) because marine	See response to PUG13-29.

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			mammals and sea turtles spend very little time at the ocean's surface (< 10% of their daily activity budget), how are lookouts expected to detect them underwater?, and (2) given the recent grounding of a Navy vessel on a stationary reef in a well mapped zone in front of Pearl Harbor, how successful are watch standers expected to be at detecting small, mobile, uncharted objects that may be at great distances from the ship and just below the surface? It may be that the Navy's mitigation plan is feasible from a logistics and security standpoint, but it may not be effective in avoiding ship strikes and other impacts on marine organisms.	
PUB1-25	Mitigation Measures	Ch 5	Section 5.2.3.3 A MIRC Stranding Response Plan should be mandatory and fiscally supported, given the wealth of marine mammals in the Marianas Trench Marine National Monument and the increased use of sonar associated with the proposed activities.	See response to PUG13-29.
PUB1-26	Cumulative Impacts	Ch 6	Chapter 6, the Cumulative Impacts Analysis, does not address in any form the problem of Brown treesnakes and the possibility of their introduction to exercise sites outside of Guam. The impacts (past, present and future) of such an introduction should surely be part of this discussion.	Mitigations have been revised in Chapter 5 to reduce the possibility of the introduction of brown treesnakes to exercise sites outside of Guam. The procedures listed in the Marianas Training Handbook describe the past and present actions to reduce the possibility of the introduction of brown treesnakes to exercise sites outside of Guam. The future procedures will be based on the overall Joint Region Biosecurity Plan. This information has been added to Chapter 6. See response to FED1-2.
PUB1-27	Cumulative Impacts	Ch 6	Section 6.1.2.1, Other Projects and Activities Analyzed for Cumulative Impacts, includes Table 6-1, which contains a number of inaccuracies. For example, the table lists Pagan Mining as a Gov-Guam project, which is not correct. Pagan is part of the CNMI and it is the Commonwealth's government that is negotiating the mining permit with JG Sablan. Again, the sub-heading on page 6-3 should be changed from "Other Guam Projects" to "Other Guam and CNMI Projects" if the Marianas Trench Marine National Monument and the 5-yr review of endangered species projects remain under this heading. Notably missing from Table 6-1 are reasonably foreseeable future actions relevant to the proposed action on Rota, Saipan and Sarigan. Projects on Rota (such as the Rota Avian Behavioral Ecology Program), Saipan (for example the TMAPS project that maintains netting stations close to or in the SUMB where land-based exercises are planned under Alternatives 1 and 2), and Sarigan (in particular the Marianas Avian Conservation program that is translocating birds threatened by the Brown treesnake from Saipan to Sarigan) should be included in the table along with a number of projects planned by the Commonwealth and by each island's municipal government.	Chapter 6 has been revised and updated based upon project updates and public input.

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PUB1-28	Cumulative Impacts	Ch 6	Section 6.2.3.1 and 6.2.3.2 discuss the cumulative impacts of the past, present, and future actions on fish and the marine environment. Both sections jump to conclusions that appear unsubstantiated by the short discussions included in the EIS. More explanation of how the conclusions were reached (as is given in 6.2.3.4 for marine mammals) is necessary.	Chapter 6 has been revised based upon public input and consultation.
PUB1-29	Cumulative Impacts	Ch 6	Section 6.2.3.6 Anthropogenic Stressors gives information on the impacts of bycatch, entanglement, and directed catch but fails to summarize the cumulative impact of these factors (past, present and future) on fisheries interactions.	Chapter 6 has been revised based upon public input and consultation.
PUB1-30	Cumulative Impacts	Ch 6	Section 6.2.4.1, the cumulative impacts on geology, soils and bathymetry environments maintains that soil erosion resulting from the proposed actions in conjunction with past and future actions is not heavily exacerbated. It would be advisable, then, for the EIS to discuss how the intensive exercises involving explosive ordnance on FDM do not increase erosion significantly and what "Best Management Practices for soil disturbing activities" are being implemented on that island.	Chapter 6 has been revised based upon public input and consultation.
PUB1-31	Editing		Note: at least once in the document Saipan's lagoon is referred to as the Saigon lagoon.	Comment noted and revised.
PUB2-1	Marine Mammals	3.7	I object to this plan. i also believe the navy lies to the public about the damage they cause. i believe they cause whales and other marine life all over this world to die from hemorrhage caused by high sonar levels. i think this plan of more destructive bombing of the world for alleged "training" is absolutely stupid and does nothing to make America safer. it is a stupid management plan.	Comment noted.
PM1-1	General Comment		Did the Navy consider the public's level of comprehension when developing the EIS?	The Navy is aware of the public's unfamiliarity with military terminology and nomenclature. The Navy made a concerted effort to write the EIS so that it is clearly understood. In addition, during the Public Hearing process the Navy provided resource specialist staff to answer EIS questions from the public and to inform the public of EIS issues to enhance public understanding.
PM1-2	General Comment		It would be useful to forecast the state and size of military lands and infrastructure at a point in the future when the military expansion is complete and what the island would look like once the military has vacated its holdings. I would not want Guam to resemble what has happened on Tiyan and Andy South.	The Proposed Action includes minor repairs and upgrades to facilities and capabilities but does not include any military construction and land acquisition. Disposition of military holdings at a future date will include public input.
PM2-1	Human Physical		Physical health effects from military toxins (e.g., volatile organic	Section 3.2 Hazardous Materials provides detailed information regarding

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	Health Effects		compounds, jet fuel, metals, radioactive exposures, etc.) should be addressed, to include the effects of noise pollution from jet aircraft and reduced local food supply quality and quantity as a result of air and water pollution.	this comment. The quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. For land ranges, hazardous substances are deposited on the surface of the soil and confined within the perimeter of the range. Section 3.5 Airborne Noise provides detailed information regarding airborne noise in the Study Area. Airborne noise generated by the Proposed Action under the No Action Alternative, Alternative 1, or Alternative 2 would have no substantial environmental effects on human sensitive receptors because noise from training activities in the MIRC would be dispersed and intermittent, so it would not contribute to long-term noise levels, training areas on FDM are remote and isolated from the general public, so no sensitive receptors (non-participants) would be exposed to noise events occurring on FDM, no new public areas would be exposed to noise from training and testing activities, land-based ordnance detonations occur mostly in FDM, a designated restricted area; and the incremental increases in the numbers of range events would not considerably increase long-term average noise levels; hourly equivalent noise levels are and would remain relatively low.
PM2-2	Human Physical and Mental Health Effects		Increased levels of cancer (e.g., leukemia, liver, kidney, lung, bladder, and cervical cancers), low birth weights and birth defects, increased anxieties of potential foreign military attack and crime, and increased levels of alienation caused by military colonization should be addressed in regards to the military project.	Section 3.2 Hazardous Materials provides detailed information regarding hazardous substances. The quantities of hazardous substances in expended training materials in the soils, sands, and sediments of the MIRC training areas would gradually accumulate over time. However, the concentrations of these substances are not expected to reach a concentration that could affect human health since military personnel exposure is limited and public access to training areas is restricted. For land ranges, hazardous substances are deposited on the surface of the soil and confined within the perimeter of the range. Analysis of environmental justice issues are found in Section 3.18, Environmental Justice. The purpose of analysis of Environmental Justice is to provide an evaluation of the potential for disproportionate impacts to minorities, low-income populations, or children in the Study Area.
PM2-3	Political Effects		The impediment of a democratically approved process of mutual consent by the people of Guam of any major decision affecting our people should be addressed.	See response to PM2-1 regarding hazardous materials.
PM2-4	Cultural		There appear to be more accepting cultural attitudes towards war and militarism, culture militarization, including erosion of democratic	Military services are directed by Title 10 of the U.S. code to organize, train, and equip forces for combat. The military's role in Guam is defined by the

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	Attitudes		process and faith as the military increasingly determines most aspects of our island's fate and our peoples' fate.	U.S. Government and national security imperatives to support these requirements.
PM3-1	General Comment		The Navy speaks of successful track record of Environmental Stewardship. Our community on Guahan and all the Marianas Islands have not experienced the successful track record.	The military commands on Guam are committed to environmental stewardship. As environmental issues surface, the military resolves the issues through consultations and discussions with public, governmental, and regulatory stakeholders.
PM3-2	Military Contaminated Sites		It is public knowledge that there are several unclean military contaminated sites throughout the island. We've grown up with a very horrible exposure to contamination from military activities, especially training activities.	See response to PM2-1 regarding hazardous . The Navy has developed the Range Sustainability Environmental Program Assessment (RSEPA) to ensure long-term sustainability of its land ranges. RSEPA is a phased approach and starts with an assessment of a range for risk of an off-range release, and finally, oversight to ensure sustainability of the range while proceeding with CERCLA for the off-range release.
PM3-3	Military Toxins		We've never really had an open discussion with the military about exactly what types of toxins are exposed to our environment.	Section 3.2 Hazardous Materials provides detailed information regarding hazardous substances.
PM3-4	Nuclear Submarine Leak		When a nuclear sub recently was found leaking, at first, we were told it was only leaking for two weeks and then it came out that it was leaking for two years.	The Navy is committed to announcing environmental issues that affect the public. When inaccurate information is disseminated, the Navy corrects it as soon as possible.
PM3-5	Military Toxins		The EIS should include all toxins that have already occurred in all our islands. It should include a thorough examination of the levels of cancer and other types of diseases that are higher on our islands than anywhere else in the world.	See response to PM3-2.
PM3-6	Self Determination and Political Status		Self determination and our political status should be reviewed. The continued presence of the military and any increase in military activities and range affects our political future.	The military is based in Guam as part of the national security strategy of the United States. Matters of self determination and political status are matters for the U.S. Government and the Government of Guam and are not in the scope of this EIS.
PM3-7	Sound Effects on Mammals		What type of research was done as to the sound effects of jets flying low over our homes? How does this affect war survivors? How does this affect our other economic means, such as tourism? What affect does jet noise have on Japanese visitors who may have experienced bombings that happened in Japan during WWII?	Section 3.5 Airborne Noise provides detailed information regarding airborne noise in the Study Area. Airborne noise generated by the Proposed Action under the No Action Alternative, Alternative 1, or Alternative 2 would have no substantial environmental effects on human sensitive receptors because noise from training activities in the MIRC would be dispersed and intermittent, so it would not contribute to long-term noise levels, training areas on FDM are remote and isolated from the general public, so no sensitive receptors (non-participants) would be exposed to noise events occurring on FDM, no new public areas would be exposed to noise from training and testing activities, land-based ordnance detonations occur mostly in FDM, a designated restricted area; and the incremental increases in the numbers of range events would not considerably increase long-term average noise levels; hourly equivalent

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				noise levels are and would remain relatively low.
PM3-8	Public Liaison		The company writing the EIS should actually speak with people to find out the effects of jet noise and toxins on their lives. Our community health is not at its best, and in large part, it's due to the military presence here.	The authors of the EIS met with Range Complex stakeholders to determine environmental impact issues and concerns both during the scoping process and at the public hearings. The public hearings afforded the public the opportunity to discuss their issues and concerns in open forum. See response to PM2-1.
PM4-1	Weapons Testing		Please explain the process by which the public can find out what kinds of weapons are tested in the range complex.	Table 2-8 and Appendix D in the EIS provides detailed information regarding locations and types of ordnance expended in the range complex.
PM4-2	Weapons Testing Adverse Effects		Please explain any requirements by U.S. Federal and Territorial Laws to report adverse effects or potential adverse effects of weapons testing.	Any new RDT&E activities are reviewed within the scope of the existing environmental analysis and documentation. If there are any questions regarding impacts, the Services will initiate informal consultation. Any training not contained in existing documentation would require new or updated analysis.
PM4-3	Legal Discrepancies		The public will appreciate any explanations for legal discrepancies between U.S. Federal and Territorial Laws that might occur between these two legal codes. How do the discrepancies influence the reporting of adverse effects of weapons testing?	It is outside the scope of this EIS to analyze the discrepancies between U.S. Federal and Territorial Laws.
PM5-1	EIS Process		You wrote and presented to us an Environmental Impact Statement. You're telling us what you are going to do and you still want our input. The process seems broken. You describe No Action and the Alternatives. No Action means no action, yet you are telling us what you are going to do with No Action. The Alternatives just add on to the No Action and to the Alternatives. I was expecting to see some solution how to improve things.	The EIS process provides three scenarios for military activities in the Marianas Range Complex. These scenarios are described as the No Action Alternative, Alternative 1, and Alternative 2. The No Action Alternative describes activities as they currently exist and as they will be done in the future; essentially no change from the existing scenario. Alternative 1 and 2 describe other scenarios that are different from the No Action Alternative. Through the NEPA process, the decision maker, the DoD REP will determine which alternative will be implemented, taking into account the analysis in the EIS, which included the review of the written and oral comments provided during the public meetings.
PM5-2	Environmental Impacts		There seem to be impacts on everything including our culture, our people. What if we say we don't want the military here? Because it is killing us as it is impacting on our culture, our way of life as a people. You're leading us to extinction.	Guam hosts U.S. military forces as part of the national security strategy of the United States. The military respects the local culture and is committed to honoring and preserving cultural activities, lifestyles, and history. Should the Government of Guam and the U.S. Government mutually agree that military forces are not required to be based on Guam, the Governments will decide on the disposition of the military forces and their continued presence on Guam.
PM5-3	Reverse Alternative		I strongly recommend you have a fourth alternative as a reversal type alternative to be included in the EIS. [Presumably the reversal alternative would tell the military to leave Guam per the previous	The alternatives considered in the EIS were required to meeting the Purpose and Need of the Proposed Action. Analysis of other alternatives was discussed in Section 2.2.1 and 2.2.2.

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			comment PM5-2.]	
PM5-4	General Comment		You have to deal with the people. You only deal with the whales and turtles. Deal with the Chamorro people, too.	The EIS process and public hearings attempt to engage the public to identify and discuss public concerns and issues related to military activities in the Marianas Range Complex. The Chamorro people are welcome to participate in the public hearings and discussions.
PM6-1	Third Party Review		How are you going to do the third party analysis or evaluation of the program? You're going to make sure that everything is safe, but who's checking you? No one?	There are any number of Federal, State, and local stakeholders that evaluate the EIS process and documentation. The EIS is designed to identify and assess the environmental impacts of training activities. Regulatory stakeholders, such as the USFWS and the EPA, oversee the EIS assessments and engage in consultations with the military to ensure that environmental mitigation and protective measures are appropriate and adequate.
PM6-2	Noise in the Water		There was an issue on the West Coast of the permanent sonar causing deafness in the whales. But making it portable, that means you can make more whales deaf in various places. It has nothing to do with the impact of the sound.	The Navy's assessment of potential impacts on marine mammals reflects the use of the best available and applicable science determined in consultation with NMFS. Mitigation measures used in this EIS/OEIS were developed in conjunction with the National Marine Fisheries Service (NMFS), the Federal regulatory authority for actions potentially affecting marine mammals in the MIRC. These measures are identical to those proposed in the Navy's Application for a Letter of Authorization from NMFS pursuant to the Marine Mammal Protection Act, and, to the extent they relate to species listed as threatened or endangered under the ESA, in the Navy's Biological Assessment submitted to NMFS pursuant to Section 7 of the ESA. These measures are based on the best available science, and are appropriate for purposes of this EIS/OEIS.
PM6-3	General Statement		There's still no justification for your continued presence here. You want more, but you're not telling us more. You're saying I want more of this, I'm going to take more of that, but you're not giving us more as a people, not just monetary, but more in terms of respect as people.	The EIS articulates the requirement for training in the Marianas Range Complex. Under the EIS alternatives, there is no request for additional construction and land acquisition.
PM6-4	Watermen		There was no explanation of how our fishermen are going to traverse the waters if this is all going to be a war zone, a practice zone. We move freely here. This is our area. This is our water. We are caretakers of this property, of this land and of this ocean . So, you have to excuse our emotional nature in this situation, just because in our culture it is deemed as an upfront. We've never come to you and tell you we're going to be doing this to you, without having any kind of repercussions.	The EIS analyses very much considered the fishermen and their interests. Better communication will mitigate impacts to fisherman. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex. See responses to FED3-2 and FED4-1.
PM6-5	General Comment		Given the global climate of all world powers diminishing their military presence, why is the U.S. increasing its military presence here.	The U.S. Government recognizes that regional powers are changing the geo-political landscape. As some regional powers become more militant and influential, the U.S Government must respond to protect its national

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				security interests in the region. There may be countries that are diminishing their military presence in other regions, but the Western Pacific is not one of those regions.
PM7-1	General Comment		In view of the constant change in our global defense technology and the need for our U.S. military to continue their training and testing requirement, I assert my support at such.	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.
PM7-2	FDM Fishing		U.S. departments and agencies should consider our fishermen who avail the FDM area as a prime fishing ground.	Public access to FDM is strictly prohibited and there are no commercial or recreational activities on or near the island; aircraft and marine vessels are restricted from entering a 3-nm radius of FDM. NOTAMs and/or NOTMARs are issued at least 72 hours in advance of potentially hazardous activity occurring during a training exercise. NOTAMs and NOTMARs may also advise restrictions beyond a 3-nm radius as needed for certain training events. These increased advisory restrictions are used in an effort to ensure better protection to the military and the public during some training sessions. For these specific exercises, additional public notice will be provided. The EIS analyses very much considered the fishermen and their interests in the FDM waters. The proposed Surface Danger Zone is required due to operational needs that will be communicated to the public through additional methods listed below. FDM constitutes the most important bombing range in the Western Pacific. As new air-to-surface weapons technologies enter military service, they must be exercised and military personnel must train to use them. These new technologies require ever greater airspace to accommodate air-to-surface employment parameters. The greater airspace in turn requires larger surface footprints under the airspace to ensure safety on the ground and sea surface. Chapter 5 has been revised to include mitigation measures that have been developed in response to the public's request for better communication protocols. Proposed avenues for improving communications include NOAA weather channel, television, telephone and FAX announcements of training activities. Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex.
PM7-3	Submerged Lands		I am not in agreement with House Resolution 934 that grants the CNMI a three mile jurisdiction. The U.S. Constitution, Article 6, Clause 3, prevails. I ask there be consideration of Article 10, Section 8 with respect to the potential of having it be granted to the CNMI. Also I ask that the 1993 and 1988 Presidential Proclamations 5030 and 5928, respectively, not be compromised. If the CNMI owns the water around FDM and Tinian, as stipulated in the lease agreement, are we then now the lesser of U.S. citizenship, citizen incognito? In this public	The EIS process does not intervene in Government to Government agreements and understandings. Disagreements over the interpretation of laws is outside the scope of this EIS. See response to PM7-2.

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			forum, a 10-mile radius around FDM, where does our CNMI approval of the range rest?	
PM7-4	General Comment		I strongly believe that the security of our nation be the utmost priority, no less, no more. The terms jurisdiction, ownership, control are all, in my opinion, semantics. It ought to be a shared responsibility, benefiting all. The Mariana Islands Range Complex is a need we all must embrace.	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.
PM8-1	FDM Waters		I state my opposition against Alternative 1 (preferred choice). Alternative 1 places a permanent restriction out to 10 miles from FDM, with a provision to extend the restriction out to 30 miles under certain conditions. Such restrictions may include Marpi Reef, another valuable fishing ground. The FDM waters are at the outer limits of most fishing boats and represent perhaps the most fertile fishing grounds readily accessible to local fishermen, commercial or subsistence. Additional restricted access to waters surrounding FDM will have devastating consequences to local fishing that the Draft EIS may not have taken into consideration.	See response to STG7-2.
PM8-2	Covenant Negotiation		It is my view that increased restrictions to FDM waters are inconsistent with Covenant negotiations. Section 802 provides that the amount of land made available to the U.S. was a result of extensive negotiations and review (two years) by both the U.S. and the Marianas Political Status Commission to assure that the U.S. requested and received only the minimal amount of land which it needed for defense purposes. The amount of land made available to the U.S. through the Covenant negotiations is far less than that requested by the U.S. This accommodation reflected both sides' interests. I accept the court's ruling regarding ownership of FDM waters. I appeal for fundamental fairness consistent with the goodwill and understanding that prevailed during Covenant negotiations; a fairness that would encourage access, not restriction; a fairness that would encourage fishing to support families and not drive fishermen into Federal dependency; a fairness that reflects that if a greater restricted area is absolutely necessary, that we find a less drastic alternative that is beneficial to all concerned.	The EIS process does not intervene in Government to Government agreements and understandings. Disagreements over the interpretation of laws are outside the scope of this EIS. See responses to STM4-1 and PM7-2.
PM9-1	FDM Restrictions		FDM matters are a persistent controversy. I'm surprised that the Navy would want to intensify the controversy by further restrictions to FDM waters. I would not want the matter to elevate to a level that resembles what happened in Puerto Rico.	See responses to STM4-1 and PM7-2.
PM9-2	Fishing and Training		As much as the Navy has explained the importance of training, the Navy should equally consider the importance of fishing. That way the Navy will be viewed positively as protecting the interests of the people.	Section 3.16 analyzed the impacts of the proposed action on fisherman in the range complex. Through the NEPA process the DoD REP solicited input from the public and used that input in analyzing and producing the

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			Fishing to us is not a side issue; it is simply one of the most important issues to be considered alongside training.	EIS/OEIS. See responses to STM4-1 and PM7-2.
PM9-3	Cooperation		We need the Navy to be very cooperative. Shared statistics and data must be commonly understood and accepted by the Navy and the public. In the past, I have not agreed with certain statistical findings. That shouldn't happen. Ultimately, when FDM is no longer needed, it will revert to the public and we'll be left behind to deal with it. Good data and statistics will help us to understand what we will face in the future.	See response to PM9-2.
PM9-4	Fishing		The Navy is more experienced than our local public in your areas of expertise. But when it comes to fishing, the Navy seems prepared to affect our way of life. Fishing is our life. When the Navy seeks to affect our livelihood, the public will react, sometimes by taking it personally. The public may not comprehend the small details the Navy presents because the public skips over them in reaction to the bigger issue. That's why the Navy should approach the public with an understanding of the importance of fishing. The Navy will have a better public hearing doing so.	See response to PM9-2.
PM9-4	Cooperation		We need the Navy to be very cooperative. Shared statistics and data must be commonly understood and accepted by the Navy and the public. In the past, I have not agreed with certain statistical findings. That shouldn't happen. Ultimately, when FDM is no longer needed, it will revert to the public and we'll be left behind to deal with it. Good data and statistics will help us to understand what we will face in the future.	The military commands are willing to share statistics and data with the public to ensure a common data knowledge base and mutual understanding. Through the NEPA process the DoD REP solicited input from the public and used that input in analyzing and producing the EIS/OEIS.
PM10-1	FDM Warning System		Some of the local fishermen do not have the financial luxury to purchase GPS and other navigational systems. My request is that the Navy put in place some sort of warning system that would notify the fishermen when they have strayed into restricted waters around FDM.	See response to PM7-2.
PM11-1	Covenant		The Navy should thoroughly understand what the Covenant means and implies. There appears to be some sort of skating around some of the stuff that could cause problems between the people of the Marianas and the military.	The EIS process does not intervene in Government to Government agreements and understandings. Disagreements over the interpretation of laws is outside the scope of this EIS.
PM12-1	Realities and Threats		The Navy mentions that new realities and new threats affect training requirements. The Navy, however, does not state what the threats are. I would like the Navy to state what the new threats are and explain their influence on military activities in the Marianas.	The military forces in the Western Pacific train for real world contingencies. Some contingency war plans are speculative and some are based on existing and emerging threats. Contingency planning is by its nature very threat oriented and must be protected for operational security reasons. Contingency plans are maintained as highly classified products. Detailed descriptions of threats, therefore, cannot be done in a public forum without

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				breaching security and exposing war plan details. Unclassified information of a geo-political nature containing military threat particulars can be found in any number of studies and publications.
PM13-1	General Comment		I am in total support of your military activities. We will support every endeavor that you have in the CNMI with respect to the Range Complex. Your efforts to protect wildlife are appreciated. My hope is that through your training the military will continue to improve its people and systems so that we will continue to live in freedom.	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.
PM14-1	Natural Resources		As a farmer, I notice natural resources perhaps more than the U.S. military. Your explanation of SONAR and it's affects on wildlife was helpful to me to understand that the military is concerned about natural resources and is doing its part to protect and preserve our natural resources. Because of the explanation, I have become rather satisfied that more research will be done. In that regard, I'm hopeful that we together can use your environmental knowledge to protect and preserve our cultural resources.	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.
PM15-1	General Comment		I understand Rota will remain as the status quo. It would be beneficial economically if the military could increase its activity on the island.	The U.S Government acknowledges and appreciates the continuing support of the CNMI public and Government to our military forces and families in the Mariana Islands.
PM15-2	Environment		It was good to hear that the military is concerned about and seeks to protect the environment on Rota. We have a fragile eco-system with considerable bio-diversity. We wish to protect our environment so our younger generation can still enjoy our wildlife.	The U.S. Government and the Military Services have strong environmental programs designed to protect eco-systems within the military's areas of responsibility.