3.11 Cultural Resources

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3.11 CULTURAL RESOURCES

CULTURAL RESOURCES SYNOPSIS

The United States Department of the Navy considered all potential stressors, and the following were analyzed for impacts on cultural resources.

- Acoustic (underwater explosives)
- Physical disturbance (ground disturbance, use of towed in-water devices, deposition of military expended materials, and use of seafloor devices)

Preferred Alternative (Alternative 1)

- Acoustic and Physical Disturbance: Acoustic and physical stressors would not adversely affect submerged historic resources within United States territorial waters and National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands in accordance with Section 106 of the National Historic Preservation Act because measures were previously implemented to protect these resources and will continue to be implemented according to the conservation measures and procedures identified and described in the 2009 Mariana Islands Range Complex Programmatic Agreement. In accordance with Section 402 of the National Historic Preservation Act, no World Heritage Sites would be affected.
- The Programmatic Agreement identifies 13 No Training areas (eight on Guam and five on Tinian) and 35 Limited Training areas (20 on Guam and 15 on Tinian). Limited Training 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 Historic Preservation Office. In addition to establishing No Training and Limited Training areas, stipulations for additional cultural resources investigations in unsurveyed areas, archaeological monitoring and conditions documentation of military use of ingress and egress paths and training areas, and preparation of field reports were also implemented.

3.11.1 INTRODUCTION

Cultural resources are found throughout the Mariana Islands Training and Testing (MITT) Study Area (Study Area). The approach for the assessment of cultural resources includes defining the resource; presenting the regulatory requirements for the identification, evaluation, and treatment within established jurisdictional parameters; establishing the specific resources subtypes in the Study Area; identifying the data used to define the current conditions; and providing the method for impact analysis (see Section 3.0, Introduction).

Cultural resources are defined as any district, landscape, site, structure, or object, as well as other physical evidence of human activity, that are considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources include archaeological resources, historical architectural resources, and traditional cultural properties related to pre-contact (prior to European contact) and post-contact or historic periods.

Archaeological resources include pre-contact and post-contact locations or sites where human actions resulted in detectable changes. Archaeological resources can have a surface component, a subsurface component, or both. Archaeological resources also include human remains, which may be considered sacred. Post-contact archaeological resources are those resources dating from after European contact. They may include subsurface features such as wells, cisterns, or privies. Other historical archaeological resources include artifact concentrations and building remnants (e.g., foundations). Submerged cultural resources include historic shipwrecks and other submerged historic materials, such as sunken airplanes and pre-contact cultural remains. Architectural resources are elements of the built environment. These resources include existing buildings; dams; bridges; and other structures of historic, engineering, or artistic significance. Factors in determining a resource's significance are its age, integrity, design, and association with important events or persons. Traditional cultural resources are resources associated with beliefs and cultural practices of a living culture, subculture, or community. These beliefs and practices must be rooted in the group's history and must be important in maintaining the cultural identity of the group. Pre-contact archaeological sites and artifacts, historic and contemporary locations of traditional events, sacred places, landscapes, and resource collection areas, including fishing, hunting or gathering areas, may be traditional cultural resources.

Cultural resources are officially known as historic properties when they meet the specific criteria of the National Historic Preservation Act and its associated regulations. The cultural resources discussed in this section are historic properties unless otherwise noted (e.g., sovereign resources).

3.11.1.1 Identification, Evaluation, and Treatment of Cultural Resources

Procedures for the identification, evaluation, and treatment of cultural resources within United States (U.S.) territorial waters (within 12 nautical miles [nm]) are contained in a series of federal laws and regulations. Cultural resources are protected by a variety of laws and their implementing regulations: the National Historic Preservation Act of 1966 as amended in 2006; the Archeological and Historic Preservation Act of 1974; the Archaeological Resources Protection Act of 1979; the American Indian Religious Freedom Act of 1978; the Native American Graves Protection and Repatriation Act of 1990; the Submerged Lands Act of 1953; the Abandoned Shipwreck Act of 1987; and the Sunken Military Craft Act of 2004. The Advisory Council on Historic Preservation further guides treatment of archaeological and architectural resources through the regulations, *Protection of Historic Properties* (36 Code of Federal Regulations [C.F.R.] 800). Historic properties, as defined by the National Historic Preservation Act, represent the subset of cultural resources listed in or eligible for inclusion in the National Register of Historic Places.

National Historic Landmarks are cultural resources of national historical importance and are automatically listed in the National Register of Historic Places. Under the implementing regulations for Section 106 of the National Historic Preservation Act (36 C.F.R. Part 800.10) and in accordance with 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, 24 April 1998) (Section 110 Guidelines), special consideration to minimize harm to National Historic Landmarks is required, special emphasis on the public interest in the National Historic Landmarks and the proposed undertaking should be considered, and both the Advisory Council on Historic Preservation and the Secretary of the Interior are consulted if any adverse effects are likely to occur to such resources.

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on historic properties which are defined as cultural resources listed in or eligible for inclusion in the National Register of Historic Places. The regulations implementing Section 106 (36 C.F.R.

Part 800) specify a consultation process to assist in satisfying this requirement. Consultation with the appropriate State Historic Preservation Offices, the Advisory Council on Historic Preservation, individuals and organizations with a demonstrated interest in the undertaking, and state and federal agencies as required by Section 106 of the National Historic Preservation Act will be accomplished as part of the National Environmental Policy Act (NEPA) process for this Environmental Impact Statement (EIS)/Overseas EIS (OEIS) for the portion of the Proposed Action within U.S. territorial waters (within 12 nm).

Additional regulations and guidelines for submerged historic resources include 10 U.S. Code (U.S.C.) 113, Title XIV for the Sunken Military Craft Act; the Abandoned Shipwreck Guidelines prepared by the National Park Service (National Park Service 2007); and the Guidelines for Archaeological Research Permit Applications on Ship and Aircraft Wrecks under the Jurisdiction of the U.S. Department of the Navy (Navy) (36 C.F.R. 4, Part 767) overseen by the Naval History and Heritage Command. The Sunken Military Craft Act does not apply to actions taken by, or at the direction of, the United States. In accordance with the Abandoned Shipwreck Act, abandoned shipwrecks in state waters are considered the property of the U.S. Government (Barnette 2010). Warships or other vessels used for military purposes at the time of their sinking retain sovereign immunity (e.g., Japanese freighters). According to the principle of sovereign immunity, foreign warships sunk in U.S. territorial waters are protected by the U.S. Government, which acts as custodian of the sites in the best interest of the sovereign nation (Neyland 2001). In addition, the federal archaeological program, developed by the National Park Service by Presidential Order, includes a collection of historical and archaeological resource protection laws to which federal managers adhere.

The addendum to the National Historic Preservation Act (54 U.S.C. §307101(e): International Federal activities affecting historic properties) requires an assessment by federal agencies of project effects to resources located outside U.S. territorial waters that are identified on the World Heritage List. The Rock Island Southern Lagoon in Palau, inscribed on the World Heritage List in 2012, is located within the Study Area. The Rock Island Southern Lagoon consists of numerous large and small forested limestone islands, scattered within a marine lagoon protected by a barrier reef. The marine site covers 100,200 hectares and is characterized by coral reefs and a diversity of other marine habitats, as well as 445 coralline limestone islands. The Rock Island Southern Lagoon represents an extremely high habitat complexity, including the highest concentration of marine lakes in the world, which continue to yield discoveries of new species. The terrestrial environment also supports numerous endemic and endangered species. Although presently uninhabited, the islands were once home to Palauan settlements, and Palauans continue to use the area and its resources for cultural and recreational purposes. The islands contain a significant set of cultural remains relating to an occupation that lasted approximately 5,000 years and ended in abandonment (United Nations Educational, Scientific, and Cultural Organization 2012). Even though the Rock Island Southern Lagoon World Heritage Site occurs within the Study Area, it is within the territorial waters of Palau, and no proposed activities would occur in this area.

No specific procedures for the identification and protection of cultural resources within the open ocean have been defined by the international community (Zander and Varmer 1996). No treaty offering comprehensive protection of submerged cultural resources has been developed and implemented; however, a few international conventions prepared by the United Nations Educational, Scientific, and Cultural Organization are applicable to submerged cultural resources including the 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage, the 1982 Convention on the Law of the Sea, and the 2001 Convention on the Protection of the

Underwater Cultural Heritage. Only the 1970 and 1972 conventions have been fully ratified by the United States.

3.11.1.2 Methods

3.11.1.2.1 Approach

The approach for establishing current conditions is based on different regulatory parameters defined by geographical location. Within 12 nm of the U.S. coastline (defined as U.S. territorial waters), the National Historic Preservation Act and NEPA are the guiding mandates.

Under the NEPA, an EIS/OEIS must consider the adverse and beneficial effects of a proposed federal action on historical and cultural resources (40 C.F.R. §1508.8). Under the implementing regulations of Section 106 of the National Historic Preservation Act, federal agencies must take into account the effects that an action would have on cultural resources listed in or eligible for inclusion in the National Register of Historic Places. As mentioned previously, the term "historic properties" is synonymous with National Register of Historic Places-eligible or -listed archaeological, architectural, or traditional resources. Cultural resources not formally evaluated may also be considered potentially eligible (i.e., a Consensus Determination in consultation with the State Historic Preservation Office) and, as such, are afforded the same regulatory consideration as those resources listed in the National Register of Historic Places. Evaluations and determinations of historic properties within the Study Area is the responsibility of the federal agency in consultation with the Historic Preservation Offices.

Historic properties are defined in the National Historic Preservation Act (54 U.S.C. §300308) as any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register, including artifacts, records, and material remains related to such a property or resource. Properties are evaluated for nomination to the National Register of Historic Places and for evaluating eligibility of resources using the following criteria (36 C.F.R. §60.4[a]–[d]):

- Criterion A – Be associated with events that have made a significant contribution to the broad patterns of American history
- Criterion B – Be associated with the lives of persons significant in the American past
- Criterion C – Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
- Criterion D – Yield, or may be likely to yield, information important in prehistory or history

A historic property also must possess several of the seven aspects of integrity (location, design, setting, materials, workmanship, feeling, and association) to convey its significance and qualify it for the National Register of Historic Places. To retain integrity, a property will always possess several, and usually most, of these aspects.

The following are defined as cultural resources within U.S. territorial waters:

- Resources listed in or eligible for listing in the National Register of Historic Places (Section 106 of the National Historic Preservation Act)
- Resources entitled to sovereign immunity (e.g., Japanese transport ships or *marus*)

3.11.1.2.2 Data Sources

Cultural resources information was obtained from Naval Facilities Engineering Command Pacific/Marianas cultural resources personnel; the National Register of Historic Places (National Register Information System); Guam Register of Historic Places; and the Commonwealth of the Northern Mariana Islands (CNMI) listings for National Register of Historic Places-listed or -eligible resources on Rota, Saipan, and Tinian. Primary summary information on cultural resources was derived from a variety of management plans, archaeological and architectural survey reports, archaeological testing reports, cultural landscape studies, and traditional cultural properties reports.

The online National Register Information System was reviewed to identify National Register of Historic Places-listed resources, historic districts, and National Historic Landmarks. Appropriate information from the Historic Preservation Offices was obtained and online databases reviewed for information on the location of submerged resources, type, and eligibility for listing in National Register of Historic Places.

3.11.1.2.3 Cultural Context

The chronology, or historical sequence for the Mariana Islands, is detailed in the Integrated Cultural Resource Management Plan for Guam (U.S. Department of the Navy 2005b) and Tinian (U.S. Department of the Navy 2003), as well as in the cultural resources synthesis for Guam (U.S. Department of the Navy 2005a) and *The Archaeology of Micronesia* (Rainbird 2004).

The pre-Latte Period (1500 B.C.–A.D. 1000) consists of the Early, Middle, and Late Unai phases and the Huyong phase. The Early Unai phase (1500–900 B.C.) is characterized by the highly decorated Lapita pottery which represents the earliest evidence of occupation in the Mariana Islands (Rainbird 2004). The Early Unai phase sites are located on the sandy beaches along the coastlines on Tinian and Saipan. The Middle Unai phase (900–400 B.C.) is characterized by a simpler bold-line decoration on the ceramics. Middle Unai phase sites are located at several sandy and rocky beaches, coastal rock shelters, and a few inland caves in the islands of Guam, Rota, Tinian, and Saipan. The Late Unai phase (400 B.C.–A.D. 400) is characterized by large thick-walled shallow pan-like ceramic vessels. Late Unai sites occur throughout coastal and inland areas of Guam, Rota, Tinian, and Saipan and include both surface and subsurface scatters of artifacts and midden in diverse settings. The Huyong phase (A.D. 400–1000) exhibits a continuation of large flat-bottomed pans which declines in frequency as pots with rounded bases and slightly incurved rims become more common. Surface and subsurface scatters of pottery and midden have been reported in both coastal and inland settings of Guam, Rota, Tinian, and Saipan.

The *Latte* Period (A.D. 1000–1668) is characterized by *latte* which are quarried and shaped columns and capstones that once supported house structures. Nearly all of these columns and capstones were made from quarried limestone, but some (especially in the farthest northern islands) include basalt elements. *Latte* sets include paired rows of upright slab-like columns, arranged in rectangles. *Lusong* (grinding mortars in basalt or limestone) and *lummok* (stone pounders) are common during this time indicating an increased reliance of pounded food processing. Rice agriculture most likely occurred during this period as evidenced by the presence of rice impressions in ceramic pottery. The latter part of the *Latte* Period coincides with the early Spanish period. The early Spanish period refers to an extended period of Spanish contact with minimized direct impact on native Chamorro culture. This period begins with Magellan's arrival in the region in 1521, and it ends with the arrival of Spanish missionaries and soldiers intent on making radical changes and a long-term Spanish colony in 1668.

In the Spanish Period (A.D. 1668–1898), the nature of contact between Chamorro and Spanish populations changed radically after the arrival of Father Diego Luis de Sanvitores and his party. The

missionaries quickly began converting the Chamorro people to the Christian religion, also bringing many other social changes. The Spanish efforts that began in 1668 quickly led to conflict and violence, and the following few decades involved rapid and devastating impacts on the Chamorro people. Under Spanish influence, maize was introduced, and it soon became the staple food crop. Maize processing implements (*manos* and *metates*) replaced older food-pounders and mortars. Cattle, carabao (water buffalo), pigs, goats, and deer were also introduced and created new economic opportunities. In the early 1800s, the Manila galleons stopped their annual circuit across the Pacific, as the Spanish colonies in the Americas gained independence from Spain. The Philippines assumed Spanish administrative control of the Mariana Islands in 1817. Whaling ships were common at Guam between 1823 and 1853. During this time, approximately 30 ships provisioned at Guam each year. Between 1815 and 1820, canoe-loads of Carolinian Islander refugees requested permission from the Spanish governor to resettle in the Mariana Islands. In exchange for services rendered to the government, many of these refugees were allowed to settle in Saipan. In the 1880s, more Carolinian Islanders immigrated to the Mariana Islands. Carolinian communities were established throughout the islands.

The Pre-War Naval Administration (A.D. 1898–1941) on Guam and the Japanese Colonial/Pre-War Period for the Northern Mariana Islands reflects early U.S., German, and then Japanese control of the northern Marianas. In June 1898, during the Spanish-American War, the U.S. cruiser *Charleston* arrived at Apra Harbor to take control of Guam from Spain. Spain ceded Guam to the United States in 1899, and the Navy was given responsibility for the administration of Guam. Under U.S. rule before 1941, Guam served as a fueling station for ships between the United States and Asia, the site of the trans-Pacific cable station, the base of a strategic Naval radio station, and a landing place for the Pan American trans-Pacific air clippers flying between San Francisco and Hong Kong.

As part of an agreement at the end of the Spanish-American War, Spain decided to dispose of all remaining colonies in the Pacific and sold the Mariana Islands north of Guam along with the Caroline Islands to Germany. The end of the Spanish-American War resulted in the political separation of the Mariana Islands and the islands' inhabitants that still continues today. These colonial and political decisions, except for the CNMI covenant, were not made by the inhabitants of the islands. The Germans were interested in developing an agricultural cash crop economy in the Northern Marianas, based on copra production. Vast coconut plantations were started, but two typhoons in 1905 devastated the young coconut trees. In October 1914, a Japanese naval squadron seized control of Saipan and other German possessions in Micronesia. Saipan was placed under military jurisdiction, and German nationals were expelled. In 1921, the League of Nations awarded the Mariana Islands, except Guam, officially to Japan.

The Japanese Mandated Islands included more than the Northern Mariana Islands. A separate treaty included the non-fortification provision (these islands would not be fortified for military use) which applied to both Japanese and U.S. occupations on Guam. In 1922, the Nan'yō Kōhatsu Kabushiki Kaisha/Nankō (NKK, the South Seas Development Company) was established in Saipan to develop large-scale sugarcane production. Extensive plantations and settlements were developed in Saipan, Tinian, Rota, and Aguijan, vastly transforming the landscapes of these islands. Smaller-scale Japanese land use occurred at the various smaller islands in the Northern Marianas.

The World War II (A.D. 1941–1945) period covers Japanese occupation and U.S. liberation of the Mariana Islands. On 8 December 1941, Japanese planes attacked Guam, a few hours after the attack at Pearl Harbor on the O'ahu Island of Hawai'i. The Navy administration in Guam had not engaged in any substantial military build-up, despite being surrounded by Japanese-controlled islands of the Japanese

Mandate. After just 2 days, Japanese forces landed at Guam, and the Navy commander surrendered just 2 hours later. Throughout 1942 and 1943, Japanese Navy forces occupied Guam and brutalized the native population. Beginning in March 1944, with the increased threat of a U.S. military invasion, Japanese reinforcements landed at Guam. The Japanese Army assumed control of Guam and began to fortify the likely invasion landing beaches. The local population was forced to provide labor and eventually forced into internment camps. During just a few years, large-scale Japanese defensive constructions had greatly transformed sections of Guam and Saipan, and less extensive transformations occurred in Rota and Tinian. Camouflaged bunkers, carved tunnels, and various gun emplacements were numerous. The United States began its attack on Japanese-controlled Saipan on 15 June 1944, with air strikes that destroyed 150 Japanese planes. The U.S. Liberation of Guam commenced on 21 July 1944. From Saipan, U.S. forces began a bombardment of Tinian ending with a landing invasion on 24 July. Guam, Saipan, and Tinian then served as the staging base for B-29 bombers (Twentieth Air Force) on missions to the Japanese mainland, including the atomic bombing of Hiroshima and Nagasaki that effectively ended World War II.

The U.S. Post-War (A.D. 1945–present) Period represents continued administration of the Mariana Islands by the United States. Guam was established as a U.S. flag territory and was governed separately under Navy administration. A civilian government was established in 1949, and Guam was made a U.S. territory in 1950. Still, the U.S. military presence has remained significant in Guam. Many of the World War II facilities continued to be used, and additional facilities were added in response to military needs associated with the Cold War, Korean War, and Vietnam War.

In 1947, a congressional resolution established the Trust Territory of the Pacific Islands and was signed into law by President Truman who then officially handed control over Micronesia to the Navy. The Northern Mariana Islands became part of the post-World War II United Nations' Trust Territory of the Pacific Islands. The United States became the administering authority under the terms of a trusteeship agreement (first under the Navy in 1947 and then under the Department of Interior in 1951). In 1976, Congress approved the mutually negotiated Covenant to Establish a CNMI in Political Union with the United States. The CNMI Government adopted its own constitution in 1977, and the constitutional government took office in January 1978.

3.11.1.3 Methods of Impact Analysis

Impact analysis for cultural resources is based on different parameters defined by geographical location. Within U.S. territorial waters, Section 106 of the National Historic Preservation Act and NEPA evaluation are the guiding mandates. In general, impacts are assessed by the importance of the resource; the sensitivity of the resource to proposed activities; and the duration of the effects on the environment (see Section 3.0, Introduction).

3.11.2 AFFECTED ENVIRONMENT

Several types of cultural resources are associated with the MITT Study Area: pre-contact (pre-A.D. 1521) archaeological sites, historic archaeological sites including submerged historic resources and man-made obstructions, historic architectural resources, and traditional cultural properties.

3.11.2.1 Guam

3.11.2.1.1 Cultural Resources Eligible for or Listed in the National Register of Historic Places

Over 540 cultural resources associated with Guam are considered eligible for or listed in the National Register of Historic Places including 8 individual resources listed in the National Historic of Historic Places, 6 listed in the Guam Register of Historic Places only but may most likely be considered eligible for the National Register of Historic Places as well, and 348 pre-contact sites, 36 multicomponent sites, 117 historic archaeological sites, 18 buildings, and 66 structures (Table 3.11-1).

Table 3.11-1: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Guam

Location	Resource	Description	Guam Register of Historic Places	National Register of Historic Places	Reference
Commercial Harbor	2 submerged historic resources	*SMS Cormoran*, German ship, World War I	Listed	Listed	Guam Register of Historic Places 2008; National Register Information System 2008a
		Tokai Maru, Japanese passenger-cargo freighter, World War II	Listed	Listed	Guam Register of Historic Places 2008; National Register Information System 2008
Naval Base Guam Polaris Point, Naval Base Guam Apra Harbor, Delta/Echo Fuel Piers, Sasa Valley Tank Farm, Tenjo Vista Tank Farm	3 historic sites	Cable Station Remains	Listed	Listed	Guam Register of Historic Places 2008; National Register Information System 2008a
		Japanese Midget Submarine	Listed	Likely eligible	Guam Register of Historic Places 2008; National Register Information System 2008a
		Sumay Cemetery	Listed	Likely eligible	Guam Register of Historic Places 2008

Table 3.11-1: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Guam (continued)

Location	Resource	Description	Guam Register of Historic Places	National Register of Historic Places	Reference
Naval Base Guam Polaris Point, Naval Base Guam Apra Harbor, Delta/Echo Fuel Piers, Sasa Valley Tank Farm, Tenjo Vista Tank Farm	Pre-contact rock shelter and petroglyphs, historic fort, steps, and well complex	Orote Historical Complex	Listed	Listed	Guam Register of Historic Places 2008; National Register Information System 2008a; Athens 2009
	16 pre-contact sites and 9 multicomponent sites	Middle and Late Unai occupations; Huyong occupations; *Latte* period sites; Late *Latte* period villages		Eligible	U.S. Department of the Navy 2005b; Athens 2009
	55 historic archaeological sites	Spanish period site Fort San Luis; Pre-War Naval Administration period Cable Station Superintendent's Building; Japanese trenches, foxholes, pillboxes, heavy caliber weapons, and Camp Bright		Eligible	U.S. Department of the Navy 2005b; Dixon et al. 2011

Table 3.11-1: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Guam (continued)

Location	Resource	Description	Guam Register of Historic Places	National Register of Historic Places	Reference
Naval Base Guam Polaris Point, Naval Base Guam Apra Harbor, Delta/Echo Fuel Piers, Sasa Valley Tank Farm, Tenjo Vista Tank Farm	13 buildings and 23 structures	Administration, shop, and office buildings, fallout shelter, sheds, floating dry docks, piers, breakwater, wharves, beach fortifications, Japanese bunkers, seaplane ramp, bridge, and reservoir		Eligible	U.S. Department of the Navy 2005b; Mason Architects, Inc. and Weitze Research 2010
Naval Base Guam Munitions Site	2 cave and rock shelter complexes	Middle Unai Phase, Pre-*Latte* and *Latte* Periods	Listed	Likely eligible	Guam Register of Historic Places 2008; National Register Information System 2008a
	Latte Period deposits; World War II massacre of Chamorro by the Japanese	Fena Massacre Site	Listed	Likely eligible	Guam Register of Historic Places 2008
	263 pre-contact sites; 27 multicomponent sites	Middle Unai, Late Unai, Huyong, and *Latte* Period sites		Eligible	U.S. Department of the Navy 2005b

Table 3.11-1: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Guam (continued)

Location	Resource	Description	Guam Register of Historic Places	National Register of Historic Places	Reference
Naval Base Guam Munitions Site	46 historic archaeological sites	Airplane crash location, a baseball field, water supply features, depressions, concrete blocks, Japanese fortifications, and artifact scatters		Eligible	U.S. Department of the Navy 2005b
	5 buildings; 39 structures	ARMCO buildings, abandoned magazines, storehouses, revetments, reservoirs, and bridges		Eligible	U.S. Department of the Navy 2005b
Naval Base Guam Telecommunications Site	2 pre-contact sites	Late Unai and *Latte* Period sites	Listed	Listed	Guam Register of Historic Places 2008; National Register Information System 2008a; U.S. Department of the Navy 2005a
	21 pre-contact sites	Middle Unai, Late Unai, Huyong, *Latte* Period sites		Eligible	U.S. Department of the Navy 2005a

Table 3.11-1: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Guam (continued)

Location	Resource	Description	Guam Register of Historic Places	National Register of Historic Places	Reference
Naval Base Guam Telecommunications Site	1 historic archaeological site	Cave used by Navy radioman to evade capture during World War II		Eligible	U.S. Department of the Navy 2005a
Naval Base Guam Barrigada	2 historic archaeological sites	Barrigada Battlefield and Well, and Officers Country		Eligible	U.S. Department of the Navy 2005b
Andersen Air Force Base	World War II airfield	Northwest Field		Listed	U.S. Air Force 2011
	Cold War era airfield	North Field		Eligible	National Park Service 2012
	Pati Point Complex	Chamorro village with caves, stone structures, possible *latte* stones, and dense midden deposits	Listed	Likely eligible	U.S. Air Force 2011
	Tarague Beach Historic District	139 archaeological localities including rock alignments, artifact scatters, rock shelters, rock mounds, bedrock mortars, and trails	Listed	Likely eligible	April 2006; U.S. Air Force 2011
	48 pre-contact sites	Including the Lafac site		Eligible	U.S. Air Force 2011; Athens 2009; Dixon and Walker 2011; Griffin et al. 2011

Table 3.11-1: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Guam (continued)

Location	Resource	Description	Guam Register of Historic Places	National Register of Historic Places	Reference
Andersen Air Force Base	14 historic archaeological sites	Spanish oven and well, a stone pier, a farmhouse, water catchment features, Japanese defensive sites, and traditional farms		Eligible	U.S. Air Force 2011; Dixon and Walker 2011
	3 historic structures	Two reservoirs and a well		Eligible	U.S. Air Force 2004

Notes: ARMCO = American Rolling Mill Company, U.S. = United States

A total of 13 possible traditional cultural properties have been identified on Guam installations, including 6 archaeological sites, another 6 nonarchaeological (natural features) sites, and 1 property bearing both archaeological and non-archaeological characteristics, all associated with the Chamorro. Three traditional cultural properties are listed in the National Register of Historic Places as archaeological sites: Haputo Beach, Latte Stone Park, and Sumay Cemetery (Griffin et al. 2010a).

3.11.2.1.2 Known Wrecks, Obstructions, or Occurrences (within the United States Territorial Waters)

Previous archival research and literature reviews conducted to identify submerged resources around Guam indicate at least 84 submerged historic resources, including 63 documented shipwrecks dating between 1520 and 1941 (Carrell et al. 1991). However, only the locations of about 60 known wrecks, obstructions, or occurrences (e.g., shipwrecks, aircraft, and military equipment) have been determined (Figure 3.11-1), including one World War II-era amphibious tractor in Agat Bay and 31 submerged wrecks, obstructions, or occurrences in the Guam Commercial Harbor (work and fishing boats; barges; tugs; landing craft utility vessels; a British passenger ship ("CS Scotia"); World War II Japanese freighters or transport ships ("Tokai Maru," "Kitsugawa Maru," and "Nichiyu Maru"); and three Japanese planes from World War II commonly referred to as Val, Jake, and Hufe) (Carrell et al. 1991; Lotz 1998). Additional offshore resources include amphibious tractor treads, American landing vehicles tracked, World War II debris and ordnance fields, a Japanese Zero (airplane), and the "Aratama Maru" (Carrell et al. 1991; Lotz 1998). Most obstructions are usually found to be modern debris.

3.11.2.1.3 World Heritage Sites

The World Heritage List was reviewed, and no World Heritage sites are located in or around Guam.

3.11.2.1.4 Resources with Sovereign Immunity

As a result of World War I and, particularly, World War II, ships were bombed or torpedoed and sunk within 12 nm of Guam. The German ship, "SMS Cormoran" (PacificWreck.com 2011) and several Japanese freighters, the "Tokai Maru," "Kitsugawa Maru," "Nichiyu Maru," and the "Aratama Maru" retain sovereign immunity.

3.11.2.2 Commonwealth of the Northern Mariana Islands

3.11.2.2.1 Farallon de Medinilla

A preliminary archaeological field survey of Farallon de Medinilla (FDM) was conducted in 1996 (Welch 2010). No archaeological sites or isolated non-modern artifacts were observed. Only modern debris associated with the military use of the island was observed.

3.11.2.2.2 Tinian

3.11.2.2.2.1 Cultural Resources Eligible for or Listed in the National Register of Historic Places

Over 340 cultural resources associated with Tinian are considered eligible for or listed in the National Register of Historic Places including 1 National Historic Landmark, 1 individually listed resource (the Unai Dankulo Petroglyph site), 90 pre-contact sites, and 257 historic archaeological sites (Table 3.11-2).

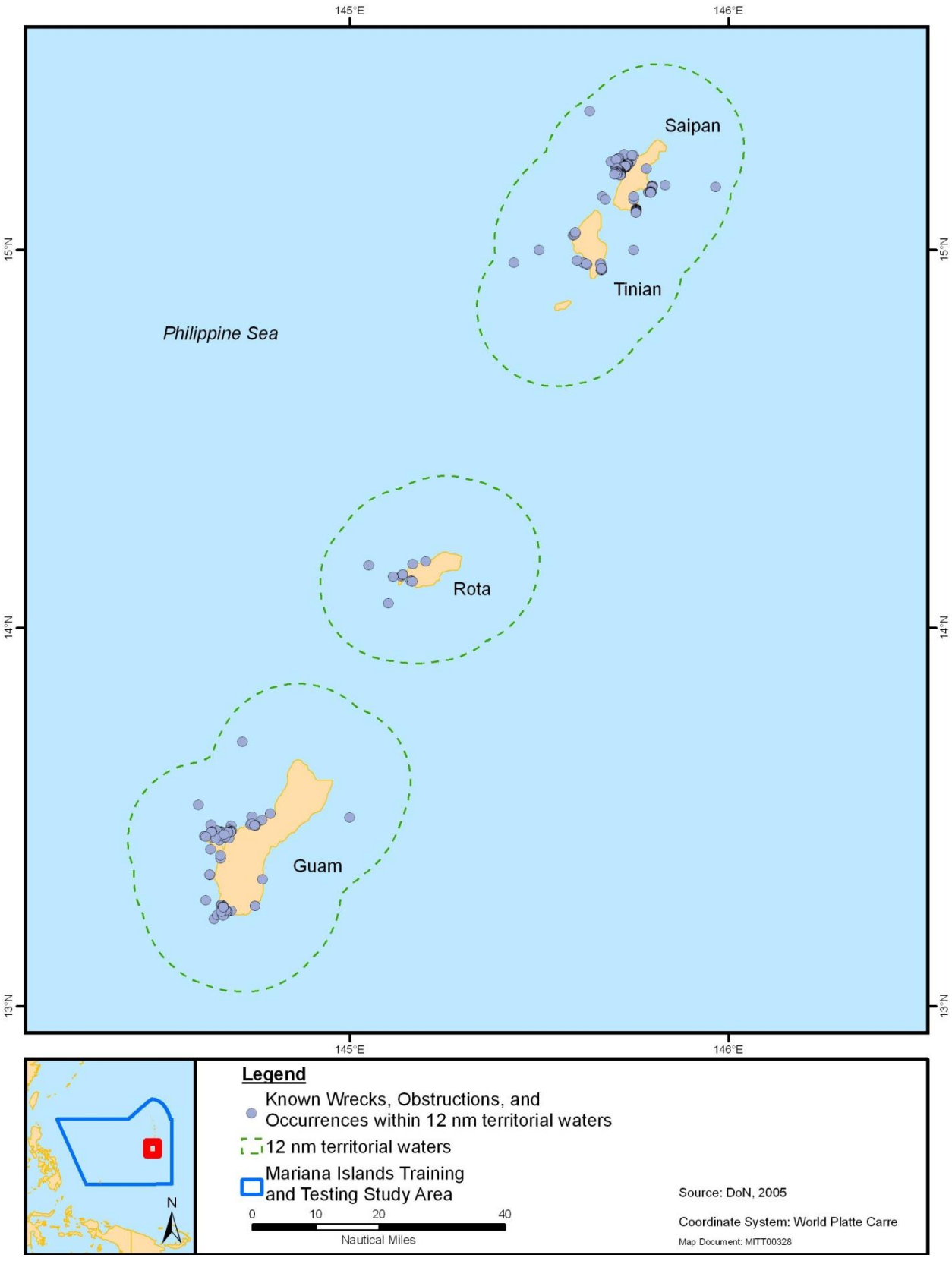

Figure 3.11-1: Known Wrecks, Obstructions, or Occurrences within the United States Territorial Waters

Table 3.11-2: Cultural Resources Eligible for and Listed in the National Register of Historic Places, and National Historic Landmarks, Tinian

Resource	Description	CNMI Register of Historic Places	National Register of Historic Places	National Historic Landmark/ Monument	Reference
Tinian Landing Beaches, Ushi Point Field, and North Field	Landing beaches White 1 and White 2 (Unai Babui and Unai Chulu) and landing craft and craft fragments; the Japanese pillbox at Beach White 2; the Japanese service apron, air administration building, air operations building, and two air raid shelters at former Ushi Point Field; and a complex of runways, aprons and parking areas at North Field	Listed	Listed	Listed	Commonwealth of the Northern Mariana Islands 2008; National Register Information System 2008b; U.S. Department of the Navy 2003; U.S. Department of the Navy 2010
Unai Dankulo Petroglyph Site	Unai Dankulo Petroglyph Site	Listed	Eligible		Commonwealth of the Northern Mariana Islands 2008; National Register Information System 2008b
90 pre-contact sites	Middle Unai, Late Unai, Huyong, *Latte* Period sites		Eligible		Rainbird 2004; U.S. Department of the Navy 2003
257 historic sites	Japanese civilian or colonial, post-war Chamorro, and U.S. occupations		Eligible		U.S. Department of the Navy 2003

Notes: CNMI = Commonwealth of the Northern Mariana Islands, U.S.= United States

A total of 13 possible traditional cultural properties have been identified on Tinian and all are archaeological sites; nine are associated with the Chamorro and four are associated with the Japanese (Griffin et al. 2010b).

3.11.2.2.2.2 Known Wrecks, Obstructions, or Occurrences (within the United States Territorial Waters)

Previous archival research and literature reviews conducted to identify submerged resources around Tinian indicate the possibility of numerous submerged historic resources (Carrell et al. 1991). However, only nine known wrecks, obstructions, or occurrences have been located during nearshore underwater surveys, including the “Mitakesan Maru” and the “Seizan Maru” (Figure 3.11-1). Most obstructions are usually found to be modern debris. No nearshore activities will be conducted around Tinian that will affect submerged resources.

3.11.2.2.2.3 World Heritage Sites

The World Heritage List was reviewed, and no World Heritage sites are located in or around Tinian.

3.11.2.2.2.4 Resources with Sovereign Immunity

As a result of World War II, ships were bombed or torpedoed and sunk within 12 nm of Tinian. Japanese freighters, the "Mitakesan Maru" and the "Seizan Maru," retain sovereign immunity.

3.11.2.2.3 Saipan

The Saipan Army Reserve Center was constructed in 2006 (Donato 2006). The building is not considered a historic architectural resource. Leased pier space on Saipan consists of approximately 100 acres (40.5 hectares) in the Wharf area. Even though this area is highly developed, intact cultural resources could occur. However, no ground-disturbing activities will occur within the leased pier space. The east side of north Saipan is used by the Army Reserves who conduct land navigation training on non-Department of Defense land.

3.11.2.2.3.1 Known Wrecks, Obstructions, or Occurrences (within the United States Territorial Waters)

Previous archival research and literature reviews conducted to identify submerged resources around Saipan indicate the possibility of numerous submerged historic resources (Carrell et al. 1991). However, only 36 known wrecks, obstructions, or occurrences have been located during nearshore underwater surveys, including the "Keiyo Maru," the "Taian Maru," a floating boat, a float plane, a harbor dredge, tanks, Japanese landing barges, American landing vehicles tracked, World War II debris fields, and railroad cars (Carrell et al. 1991; Lotz 1998) (Figure 3.11-1). Most obstructions are usually found to be modern debris. No nearshore activities will be conducted around Saipan.

3.11.2.2.3.2 World Heritage Sites

The World Heritage List was reviewed, and no World Heritage sites are located in or around Saipan.

3.11.2.2.3.3 Resources with Sovereign Immunity

As a result of World War II, ships were bombed or torpedoed and sunk within 12 nm of Saipan. Two Japanese freighters, the "Keiyo Maru" and the "Taian Maru," retain sovereign immunity.

3.11.2.2.4 Rota

Leased pier space on Rota includes the use of Angyuta Island seaward of Song Song's West Harbor as a Forward Staging Base/overnight bivouac site. The island is adjacent to the commercial port facility that is used for boat refueling and maintenance. No historic properties were identified during a visual field inspection of Angyuta Island in February 2009.

3.11.2.2.4.1 Known Wrecks, Obstructions, or Occurrences (within the United States Territorial Waters)

Previous archival research and literature reviews conducted to identify submerged resources around Rota indicate the possibility of numerous submerged historic resources (Carrell et al. 1991). However, only seven known wrecks, obstructions, or occurrences have been located during nearshore underwater surveys (Figure 3.11-1), including the "Shotoku Maru," the "Shoun Maru," and Japanese submarine chasers 54 and 56 (Carrell et al. 1991; Lotz 1998). Most obstructions are usually found to be modern debris.

3.11.2.2.4.2 World Heritage Sites

The World Heritage List was reviewed, and no World Heritage sites are located in or around Rota.

3.11.2.2.4.3 Resources with Sovereign Immunity

As a result of World War II, ships were bombed or torpedoed and sunk within 12 nm of Rota. Japanese freighters, the "Shotoku Maru," the "Shoun Maru," and Japanese submarine chasers 54 and 56 retain sovereign immunity.

3.11.2.3 Mariana Islands Training and Testing Transit Corridor

The length and variable width of the MITT transit corridor is such a vast area that it precludes systematic survey for submerged historic resources. In addition, waters along the MITT transit corridor are deep, sometimes over 18,000 feet (ft.) (5,486 meters [m]); as a consequence, identification of submerged historic resources on the sea floor at these depths is prohibitive. However, in accordance with the addendum to the National Historic Preservation Act (54 U.S.C. §307101(e)) regarding international federal activities affecting historic properties, the World Heritage List was reviewed, and no cultural resources on the list were identified within the MITT transit corridor.

3.11.2.4 Current Requirements, Practices, and Protective Measures

3.11.2.4.1 Avoidance of Obstructions

The military routinely avoids locations of known obstructions which include submerged cultural resources such as historic shipwrecks. Known obstructions are avoided to prevent damage to sensitive equipment and vessels, and to ensure the accuracy of training and testing exercises.

3.11.2.4.2 Mariana Islands Range Complex Programmatic Agreement

A Programmatic Agreement was negotiated for all military training activities proposed under the Preferred Alternative for the Mariana Islands Range Complex (MIRC) based on consultations with the Guam State Historic Preservation Office, CNMI Historic Preservation Office, Advisory Council on Historic Preservation, and the National Park Service. The training constraints map identifies 13 No Training areas (eight on Guam and five on Tinian) and 35 Limited Training areas (20 on Guam and 15 on Tinian), refined from the previous Military Operations Area constraints map boundaries (U.S. Department of Defense 2009). Limited Training 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 Historic Preservation Office. In addition to establishing No Training and Limited Training areas, stipulations for additional cultural resources investigations in unsurveyed areas; archaeological monitoring and conditions documentation of military use of ingress and egress paths and training areas; and preparation of field reports were also implemented.

3.11.2.4.3 Guam and Commonwealth of the Northern Mariana Islands Military Relocation Programmatic Agreement

A Programmatic Agreement was executed on 14 March 2011 for all undertakings, such as establishing new training areas, base housing, and office areas; maintenance, rehabilitation, repair, construction and demolition of buildings, structures, and roads; and installing, repairing, and updating utilities and infrastructure on Guam and the CNMI, associated with the Joint Guam and CNMI Build Up project (U.S. Department of Defense 2011). The Programmatic Agreement provides stipulations for the identification and evaluation of historic properties through cultural resources field investigations; project review based on probability of occurrence and type of effects to cultural resources (i.e., No

Effect, Potential Effect, No Adverse Effect, and Adverse Effect); preparation and implementation of work plans and data recovery; and other mitigation measures including updating existing preservation plans, public interpretation of specific resources, preparation of general documents for public dissemination, preparation of a cultural landscape report, curation of archaeological collections and documentation; and access to traditional cultural properties for indigenous peoples and organizations.

3.11.3 ENVIRONMENTAL CONSEQUENCES

This section presents the analysis of potential impacts on cultural resources from implementation of the project alternatives, including the No Action Alternative, Alternative 1, and Alternative 2. As stated in Section 3.11.1.2.1 (Approach), NEPA and Section 106 of the National Historic Preservation Act are the guiding mandates and apply to U.S. territorial waters (within 12 nm). In accordance with an addendum to the National Historic Preservation Act, only potential impacts to World Heritage sites will be addressed in areas beyond 12 nm.

The stressors vary in intensity, frequency, duration, and location within the Study Area. Some activities, such as sinking exercises, would occur at locations greater than 50 nm from shore. The stressors applicable to cultural resources in the study area and analyzed below include the following:

- Acoustic (underwater explosives)
- Physical disturbance and strike (ground disturbance, use of towed in-water devices, deposition of military expended materials, and use of seafloor devices)

The specific analysis of the training and testing activities presented in this section considers the relevant components and associated data within the geographic location of the activity (see Tables 2.8-1 and 2.8-4) and the resource.

The use of sonar does not affect the structural elements of historic shipwrecks; therefore, no further analysis is required for cultural resources in this document. Archaeologists use multi-beam sonar and side-scan sonar as a regular practice in effectively exploring shipwrecks without disturbance. Based on the physics of underwater sound, the shipwreck would need to be very close (less than 22 ft. [7 m]) to the sonar sound source for the shipwreck to potentially experience any slight oscillations from the induced pressure waves. Any oscillations experienced at less than 22 ft. (7 m) would be negligible up to less than a few yards from the sonar source. This distance is smaller than the typical safe navigation and operating depth for most sonar sources and therefore is not expected to impact historic shipwrecks.

Given the limited extent of sonar maintenance and testing, pierside locations have been eliminated from detailed consideration in the analysis of impacts on cultural resources because of the extremely limited potential for active sonar to damage adjacent submerged historic resources.

Office of Naval Research testing activities proposed at the North Pacific Acoustic Laboratory involve the use of an acoustic tomography array, a distributed vertical line array, and moorings deployed in the deep-water environment of the northwestern Philippine Sea. These acoustic experiments use non-explosive acoustic sources; therefore, these activities do not generate shock (pressure) waves from underwater explosions or create cratering on the seafloor that could impact submerged historic resources. Although some acoustic experiments employ in-water devices, these types of activities are conducted in areas where the sea floor is deeper than the length of the tow lines, and vessel and in-water device strikes on submerged historic resources on the seafloor would not occur. No military expended materials are created from the acoustic experiments. Because the Navy routinely avoids

locations of known obstructions, which include submerged historic resources, it is unlikely that these resources were disturbed by the deployment of moorings associated with the existing use of the North Pacific Acoustic Laboratory. The acoustic experiments proposed by the Office of Naval Research at the North Pacific Acoustic Laboratory would not affect submerged historic resources or World Heritage Sites; therefore, no further analysis of cultural resources is required in this document for activities at this location.

3.11.3.1 Acoustic Stressors

Acoustic stressors that have the potential to impact cultural resources are shock (pressure) waves and vibrations from underwater explosions and cratering created by underwater explosions. A shock wave and oscillating bubble pulses resulting from any kind of underwater explosion, such as explosive torpedoes, missiles, bombs, projectiles, airguns, and mines could impact the exposed portions of submerged historic resources if such resources were located in the vicinity. Shock (pressure) waves generated from underwater explosions would be episodic rather than continuous and could create overall structural instability and eventual collapse of architectural features of submerged historic resources. The amount of damage would depend on factors such as size of the charge, distance from the historic shipwreck, water depth, and topography of the seafloor. No shock (pressure) waves, vibrations, or cratering from explosions will occur in nearshore waters surrounding Tinian, Saipan, or Rota. Therefore, no submerged historic resources will be affected by acoustic stressors in these areas.

3.11.3.1.1 Impacts from Explosives – Shock (Pressure) Waves from Underwater Explosions

Explosions associated with bombs, missiles, and projectiles occur at or immediately below the ocean surface (within 1 m [3.3 ft.]). In addition, some explosions associated with torpedoes and certain mine warfare activities may occur deeper in the water column. These types of explosions are within the water column and shock (pressure) waves would not reach submerged historic resources on the seafloor. Underwater detonations (UNDETs) of explosives from other mine warfare activities would occur near or on the seafloor. Shock (pressure) waves have the potential to damage architectural features of submerged historic resources if such resources are located in the vicinity.

3.11.3.1.1.1 No Action Alternative

Training Activities

Under the No Action Alternative, current training activities and the level of activity would remain the same and would continue within existing designated areas within the MITT Study Area. Current training activities would continue to be conducted in accordance with existing Section 106 compliance documents: the *Programmatic Agreement for the MIRC* (U.S. Department of Defense 2009) to protect National Register of Historic Places-listed or -eligible cultural resources.

In addition to the military training agreement documents, recorded cultural resources would continue to be managed in accordance with procedures identified in the *Updated Cultural Resources Management Plan for the Tinian Military Lease Area (MLA)* (U.S. Department of the Navy 2003), the *Regional Integrated Cultural Resources Management Plan for COMNAVREG Marianas Lands, Volume I: Guam* (U.S. Department of the Navy 2005b), and the *Integrated Cultural Resources Management Plan for Andersen Air Force Base, Guam, 2008 Update* (U.S. Air Force 2011).

Testing Activities

Under the No Action Alternative, no testing activities creating shock waves from underwater explosions with a potential to affect submerged historic resources would occur.

3.11.3.1.1.2 Alternative 1

Training Activities

Under Alternative 1, Limpet Mine Neutralization System/Shock Wave Generator activities and associated explosive rounds would increase from no activities under the No Action Alternative to 40 activities in the MITT Study Area. Training activities using explosives would not typically occur within approximately 3 nm from shore; however, explosives up to 20 pounds (lb.) net explosive weight (NEW) would occur at the Agat Bay Floating Mine Neutralization Site. At Piti Point Floating Mine Neutralization Site and Apra Harbor UNDET Site (located within Outer Apra Harbor), the maximum NEW would remain the same as with the No Action Alternative (a maximum allowable threshold of 10 lb. NEW). As with the No Action Alternative, 20 activities involving explosive detonations within Agat Bay and Apra Harbor are proposed under Alternative 1. For activities that occur in nearshore environments and further from shore, the military routinely avoids locations of known obstructions which include submerged historic resources. It is unlikely that these resources could be disturbed or destroyed from shock waves created by underwater explosions used during mine warfare activities or other training activities that use explosives. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no training activities would occur at that location.

Testing Activities

Under Alternative 1, torpedo testing activities and associated explosive munitions (use of up to eight explosive munitions) would increase from no activities under the No Action Alternative to two activities, and mine countermeasure mission package testing activities with use of up to 24 explosive munitions would increase from no activities in the No Action Alternative to 32 activities within the MITT Study Area. These activities would be conducted greater than 3 nm from shore. The military routinely avoids locations of known obstructions which include submerged historic resources. It is unlikely that these resources could be disturbed or destroyed from shock waves created by underwater explosions used during torpedo testing and mine countermeasure mission package testing activities. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.1.1.3 Alternative 2

Training Activities

Under Alternative 2, Limpet Mine Neutralization System/Shock Wave Generator activities and associated explosive rounds would increase from no activities under the No Action Alternative to 40 activities in the MITT Study Area, the same as Alternative 1. Training activities using explosives would not typically occur within approximately 3 nm from shore; however, explosives up to 20 lb. NEW would occur at the Agat Bay Floating Mine Neutralization Site. At Piti Point Floating Mine Neutralization Site and Apra Harbor UNDET Site (located within Outer Apra Harbor), the maximum NEW would remain the same as with the No Action Alternative (a maximum allowable threshold of 10 lb. NEW). Because the military routinely avoids locations of known obstructions which include submerged historic resources, it is unlikely that these resources could be disturbed or destroyed from shock waves created by underwater explosions during mine warfare activities.

Testing Activities

Under Alternative 2, torpedo testing activities and associated explosive munitions (use of up to eight explosive munitions) would increase from no activities in the No Action Alternative to two activities, and mine countermeasure mission package testing activities with use of up to 28 explosive munitions would increase from no activities in the No Action Alternative to 36 activities within the MITT Study Area. These activities would be conducted greater than 3 nm from shore. The military routinely avoids

locations of known obstructions which include submerged historic resources. It is unlikely that these resources could be disturbed or destroyed from shock waves created by underwater explosions used during torpedo testing and mine countermeasure mission package testing activities. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.1.2 Impacts from Explosives – Cratering

Underwater explosions near or on the sea floor could create sediment displacement in the form of cratering and could affect submerged historic resources at or near the explosive impact. Cratering of unconsolidated soft bottom habitats would result from charges set on or near the bottom. For a specific explosive charge size, crater depths and widths would vary depending on depth of the charge and sediment type. However, crater dimensions generally decrease as bottom depth increases. Cratering could disrupt the horizontal patterning and vertical stratigraphy of submerged historic resources, and could subsequently destroy those characteristics that would make them eligible for listing in the National Register of Historic Places. It is unlikely that these resources could be disturbed or destroyed from cratering created by underwater explosions during mine warfare activities because the military routinely avoids locations of known obstructions that include submerged historic resources.

3.11.3.1.2.1 No Action Alternative

Training Activities

Under the No Action Alternative, current mine warfare training activities and the level of activity would remain the same and would continue within existing designated areas within the MITT Study Area. Current training activities would continue to be conducted in accordance with existing Section 106 compliance documents: the *Programmatic Agreement for the MIRC* (U.S. Department of Defense 2009) to protect National Register of Historic Places-listed or -eligible cultural resources.

In addition to the military training agreement documents, recorded cultural resources would continue to be managed in accordance with procedures identified in the *Updated Cultural Resources Management Plan for the Tinian Military Lease Area (MLA)* (U.S. Department of the Navy 2003), the *Regional Integrated Cultural Resources Management Plan for COMNAVREG Marianas Lands, Volume I: Guam* (U.S. Department of the Navy 2005a), and the *Integrated Cultural Resources Management Plan for Andersen Air Force Base, Guam, 2008 Update* (U.S. Air Force 2011).

Testing Activities

Under the No Action Alternative, no testing activities creating cratering of the seafloor by deep underwater explosions with a potential to affect submerged historic resources would occur.

3.11.3.1.2.2 Alternative 1

Training Activities

Under Alternative 1, Mine Neutralization Remotely Operated Vehicle Sonar activities and associated explosive rounds with cratering created by deep underwater explosions would increase from no activities under the No Action Alternative to four activities in the MITT Study Area. Training activities using explosives would not typically occur within approximately 3 nm from shore; however, explosives up to 20 lb. NEW would occur at the Agat Bay Floating Mine Neutralization Site. At Piti Point Floating Mine Neutralization Site and Apra Harbor UNDET Site (located within Outer Apra Harbor), the maximum NEW would remain the same as with the No Action Alternative (a maximum allowable threshold of 10 lb. NEW). Because the military routinely avoids locations of known obstructions which include

submerged historic resources, it is unlikely that these resources could be disturbed or destroyed from cratering created by deep underwater explosions.

Testing Activities

Under Alternative 1, torpedo testing and Mine Countermeasure Mission Package testing activities that employ explosive munitions would increase from 0 activities under the No Action Alternative to 34 combined activities (with up to 32 explosive events) within the MITT Study Area. Torpedo testing activities would be conducted greater than 3 nm from shore, whereas the Mine Countermeasure Mission Package testing could occur anywhere within the MITT Study Area. The military routinely avoids locations of known obstructions, which include submerged historic resources. It is unlikely that these resources could be disturbed or destroyed from shock waves created by underwater explosions used during torpedo testing or Mine Countermeasure Mission Package testing activities. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.1.2.3 Alternative 2

Training Activities

Under Alternative 2, Mine Neutralization Remotely Operated Vehicle Sonar activities and associated explosive rounds with cratering created by deep underwater explosions would increase from no activities under the No Action Alternative to four activities, the same impact as Alternative 1. Training activities using explosives would not typically occur within approximately 3 nm from shore; however, explosives up to 20 lb. NEW would occur at the Agat Bay Floating Mine Neutralization Site. At Piti Point Floating Mine Neutralization Site and Apra Harbor UNDET Site (located within Outer Apra Harbor), the maximum NEW would remain the same as with the No Action Alternative (a maximum allowable threshold of 10 lb. NEW). Because the military routinely avoids locations of known obstructions which include submerged historic resources, it is unlikely that these resources could be disturbed or destroyed from cratering created by deep underwater explosions. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no training activities would occur at that location.

Testing Activities

Under Alternative 2, torpedo testing and Mine Countermeasure Mission Package testing activities that employ explosive munitions would increase from 0 activities under the No Action Alternative to 38 combined activities (with up to 36explosive events) within the MITT Study Area. Torpedo testing activities would be conducted greater than 3 nm from shore, whereas the Mine Countermeasure Mission Package testing could occur anywhere within the MITT Study Area. The military routinely avoids locations of known obstructions, which include submerged historic resources. It is unlikely that these resources could be disturbed or destroyed from shock waves created by underwater explosions used during torpedo testing or Mine Countermeasure Mission Package testing activities. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.1.3 Regulatory Conclusions of Acoustic Stressors

Acoustic stressors resulting from underwater explosions creating shock (pressure) waves or cratering of the seafloor during training or testing activities would not adversely affect submerged historic resources within U.S. territorial waters because the military routinely avoids known submerged obstructions. In accordance with Section 402 of National Historic Preservation Act, no World Heritage Sites would be affected.

3.11.3.2 Physical Disturbance and Strike Stressors

Any physical disturbance of the ground surface such as construction or training activities with tracked vehicles, cratering and soil displacement from high explosive strikes, increased pedestrian access, and physical disturbance on the sea floor, such as targets or mines resting on the ocean floor, moored mines, bottom-mounted tripods and low-flying unmanned underwater vehicles could inadvertently damage or destroy submerged historic resources if such resources are located within the MITT Study Area. Expended materials, such as chaff, flares, projectiles, casings, target fragments, missile fragments, non-explosive practice munitions, munitions fragments, rocket fragments, ballast weights, sonobuoys, torpedo launcher accessories, and mine shapes can be deposited on the ocean bottom on or in the vicinity of submerged historic resources. Heavier expended materials have the potential to damage intact fragile shipwreck features if they land on this resource type with velocity. However, it is unlikely these resources could be disturbed or destroyed because the military routinely avoids locations of known obstructions that include submerged historic resources.

3.11.3.2.1 Impacts from Ground Disturbance

Physical disturbance to archaeological sites may occur through tracked vehicle use during training and testing activities, cratering and soil displacement from high explosive strikes, and disturbance or removal of archaeological materials from temporary or permanent increased access to sites by military personnel. In accordance with existing Section 106 compliance documents, all known sites are avoided and mitigation measures are in place to prevent and reduce disturbance. No ground-disturbing activities will occur within the leased pier space on Saipan.

3.11.3.2.1.1 No Action Alternative

Training Activities

Under the No Action Alternative, current training activities and the level of activity would remain the same and would continue within existing designated areas within the MITT Study Area on Guam and the Commonwealth of the Northern Mariana Islands. Current training activities would continue to be conducted in accordance with existing Section 106 compliance documents: the *Programmatic Agreement for the MIRC* (U.S. Department of Defense 2009) to protect National Register of Historic Places-listed or -eligible cultural resources.

In addition to the military training agreement documents, cultural resources would continue to be managed in accordance with procedures identified in the *Updated Cultural Resources Management Plan for the Tinian Military Lease Area (MLA)* (U.S. Department of the Navy 2003), the *Regional Integrated Cultural Resources Management Plan for COMNAVREG Marianas Lands, Volume I: Guam* (U.S. Department of the Navy 2005a), and the *Integrated Cultural Resources Management Plan for Andersen Air Force Base, Guam, 2008 Update* (U.S. Air Force 2011).

Testing Activities

Under the No Action Alternative, no testing activities creating ground disturbance with a potential to affect cultural resources have been identified.

3.11.3.2.1.2 Alternative 1

Training Activities

Under Alternative 1, the number of training activities and the number of high explosive rounds, such as bombing exercises, would increase from the No Action Alternative and create ground disturbance (see Table 3.0-22) for a summary of ordnance use on FDM for each alternative). These activities, however, are located on FDM which contains no cultural resources. The number of training activities associated

with Amphibious Raid-Special Purposed Marine Air Ground Task Force would increase on the Tinian Beaches; however, training activities would continue to follow established protocol for limited training areas and to avoid established off limit areas (no training permitted) (U.S. Department of Defense 2009); therefore, no National Register of Historic Places-eligible resources would be adversely affected.

Testing Activities

Under Alternative 1, no testing activities creating ground disturbance with a potential to affect cultural resources have been identified.

3.11.3.2.1.3 Alternative 2

Training Activities

Under Alternative 2, the number of training activities and the number of high explosive rounds, such as Strike Warfare, would increase from the No Action Alternative and Alternative 1 and create ground disturbance; however, these activities are located on FDM which contains no cultural resources. The number of training activities associated with Amphibious Raid-Special Purposed Marine Air Ground Task Force would increase on the Tinian Beaches; however, training activities would continue to follow established protocol for limited training areas and to avoid established off limit areas (no training permitted) (U.S. Department of Defense 2009); therefore, no National Register of Historic Places-eligible resources would be adversely affected.

Testing Activities

Under Alternative 2, no testing activities creating ground disturbance with a potential to affect cultural resources have been identified.

3.11.3.2.2 Impacts from Vessel and In-Water Device Strikes

In-water devices as discussed in this analysis are unmanned vehicles, such as remotely operated vehicles, unmanned surface vehicles and unmanned undersea vehicles, and towed devices. These devices are self-propelled and unmanned or towed through the water from a variety of platforms, including helicopters and surface ships. The use of towed systems would not affect submerged cultural resources because these types of activities are conducted in areas where the sea floor is deeper than the length of the tow lines. Prior to deploying a towed device, there is a standard operating procedure to search the intended path of the device for any floating debris (e.g., driftwood) or other potential surface obstructions, since they have the potential to cause damage to the device. The use of in-water devices would not impact submerged historic resources because these devices are designed and operated within the water column and they do not contact the seafloor.

3.11.3.2.2.1 No Action Alternative

Training Activities

Under the No Action Alternative, current training activities using in-water devices and the level of activity would remain the same and would continue within existing designated areas within the MITT Study Area. Current training activities would continue to be conducted in accordance with existing Section 106 compliance documents: the *Programmatic Agreement for the MIRC* (U.S. Department of Defense 2009) to protect National Register of Historic Places-listed or -eligible cultural resources.

In addition to the military training agreement documents, cultural resources would continue to be managed in accordance with procedures identified in the *Updated Cultural Resources Management Plan for the Tinian Military Lease Area (MLA)* (U.S. Department of the Navy 2003), the *Regional Integrated Cultural Resources Management Plan for COMNAVREG Marianas Lands, Volume I: Guam*

(U.S. Department of the Navy 2005a), and the *Integrated Cultural Resources Management Plan for Andersen Air Force Base, Guam, 2008 Update* (U.S. Air Force 2011).

Testing Activities

Under the No Action Alternative, no testing activities using in-water devices with a potential to affect cultural resources have been identified.

3.11.3.2.2.2 Alternative 1

Training Activities

Under Alternative 1, the number of training activities using in-water devices would increase from 174 activities under the No Action Alternative to 1,175 activities in the MITT Study Area. The use of in-water devices would not impact submerged historic resources because these devices are designed and operated within the water column and they do not contact the seafloor. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no training activities would occur at that location.

Testing Activities

Under Alternative 1, the number of testing activities using in-water devices would increase from one activity under the No Action Alternative to 66 activities in the MITT Study Area. The use of in-water devices would not impact submerged historic resources because these devices are operated within the water column and they do not contact the seafloor. The Rock Island Southern Lagoon World Heritage Site is within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.2.2.3 Alternative 2

Training Activities

Under Alternative 2, the number of training activities using in-water devices would increase from 174 activities under the No Action Alternative to 1,185 activities. Alternative 2 would increase training activities that use seafloor devices by 10 activities over Alternative 1. The use of in-water devices would not impact submerged historic resources because these devices are operated within the water column and they do not contact the seafloor. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no training activities would occur at that location.

Testing Activities

Under Alternative 2, the number of testing activities using in-water devices would increase from one activity under the No Action Alternative to 73 activities in the MITT Study Area. The increase proposed under Alternative 2 is seven more activities than proposed under Alternative 1. As with Alternative 1, the use of in-water devices would not impact submerged historic resources because these devices are operated within the water column and they do not contact the seafloor. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.2.3 Impacts from Military Expended Materials

Deposition of non-explosive practice munitions, sonobuoys, and military expended materials other than ordnance may affect submerged cultural resources through possible sudden impact of resources on the seafloor or the simple settling of military expended materials on top of submerged cultural resources. These potential impacts are combined in this discussion.

The locations of 112 known wrecks, obstructions, occurrences, or sites noted as "unknown" have been determined within U.S. territorial waters in the MITT Study Area. It is likely that the majority of these wrecks, obstructions, occurrences, or sites do not qualify as historic properties based on the results of previous underwater studies in the areas. Most anticipated expended munitions would be small objects and fragments that would slowly drift to the seafloor after striking the ocean surface. Larger and heavier objects such as non-explosive practice munitions could strike the ocean surface with velocity, but their trajectory would be slower as they move through the water.

If expended materials should sink in the vicinity of or on a submerged cultural resource, the expended materials would not affect the archaeological or historic characteristics of the submerged historic resource that contribute to its eligibility for the National Register of Historic Places or the World Heritage List. However, the likelihood of expended materials either impacting or landing on submerged historic resources is very low because the Navy routinely avoids known submerged obstructions.

3.11.3.2.3.1 No Action Alternative

Training Activities

Under the No Action Alternative, training activities would continue within existing designated areas in the MITT Study Area. Expended materials could be deposited on the seafloor on or in the vicinity of submerged historic resources. If they should sink in the vicinity of a cultural resource, the expended materials would not affect the archaeological or historic characteristics of the submerged historic resource. However, due to the size of the MITT Study Area and because the military routinely avoids known submerged obstructions, it is unlikely these materials would come into contact with a submerged historic resource.

Testing Activities

Under the No Action Alternative, no testing activities with the potential to expend military materials that could be deposited on the seafloor on or in the vicinity of submerged known historic resources have been identified.

3.11.3.2.3.2 Alternative 1

Training Activities

Under Alternative 1, the number of expended items from training activities would increase from the No Action Alternative. Expended materials could be deposited on the seafloor on or in the vicinity of submerged cultural resources if such resources occurred within the training areas and were not avoided. If they should sink in the vicinity of a cultural resource, the expended materials would not affect the archaeological or historic characteristics of the submerged historic resource. However, it is unlikely these materials would come into contact with a submerged historic resource since known resource locations are routinely avoided.

Testing Activities

Under Alternative 1, the number of expended items from testing activities would increase from the No Action Alternative. Expended materials could be deposited on the seafloor on or in the vicinity of submerged historic resources. If they should sink in the vicinity of this type of cultural resource, the expended materials would not affect the archaeological and historic characteristics of the submerged historic resource. However, it is unlikely these materials would come into contact with a submerged historic resource since known resource locations are routinely avoided.

3.11.3.2.3.3 Alternative 2

Training Activities

Under Alternative 2, the number of expended items from training activities would increase from the No Action Alternative and Alternative 1. Expended materials could be deposited on the seafloor on or in the vicinity of submerged historic resources. If they should sink in the vicinity of this type of cultural resource, the expended materials would not affect the archaeological or historic characteristics of the submerged historic resource. However, it is unlikely these materials would come into contact with a submerged historic resource since known resource locations are routinely avoided.

Testing Activities

Under Alternative 2, the number of expended items from testing activities would increase from the No Action Alternative and Alternative 1. Expended materials could be deposited on the seafloor on or in the vicinity of submerged historic resources. If they should sink in the vicinity of either this of cultural resource, the expended materials would not affect the archaeological and historic characteristics of the submerged historic resource. However, it is unlikely that these materials would come into contact with a submerged historic resource since known resource locations are routinely avoided.

3.11.3.2.4 Impacts from Seafloor Devices

Seafloor devices include moored mine shapes, anchors, and bottom-placed instruments. Seafloor devices are either stationary or move very slowly along the bottom. Stationary devices are specifically placed within the Study Area. Divers are used to set bottom and moored mine anchors (blocks of concrete weighing several hundred pounds) in water less than 150 ft. (45.7 m) deep and routinely avoid known obstructions, which include historic resources. Any physical disturbance on the continental shelf and seafloor could inadvertently damage or destroy submerged historic resources if such resources are located within the MITT Study Area and are not avoided. However, it is unlikely these resources could be disturbed by the use of seafloor devices because the military routinely avoids locations of known obstructions that include submerged historic resources.

3.11.3.2.4.1 No Action Alternative

Training Activities

Under the No Action Alternative, current mine warfare training activities using seafloor devices, such as moored mine shapes, would continue to be conducted within the MITT Study Area. Current training activities would continue to be conducted in accordance with existing Section 106 compliance documents: the *Programmatic Agreement for the MIRC* (U.S. Department of Defense 2009) to protect National Register of Historic Places-listed or -eligible cultural resources.

In addition to the military training agreement documents, recorded cultural resources would continue to be managed in accordance with procedures identified in the *Updated Cultural Resources Management Plan for the Tinian Military Lease Area (MLA)*, the *Regional Integrated Cultural Resources Management Plan for COMNAVREG Marianas Lands, Volume I: Guam* (U.S. Department of the Navy 2005a), and the *Integrated Cultural Resources Management Plan for Andersen Air Force Base, Guam, 2008 Update* (U.S. Air Force 2011).

Testing Activities

Under the No Action Alternative, current testing activities using seafloor devices, such as the North Pacific Acoustic Lab Philippine Sea 2018–19 Experiment, would continue and the level of activity would remain the same within the MITT Study Area.

3.11.3.2.4.2 Alternative 1

Training Activities

Under Alternative 1, mine warfare training activities using seafloor devices such as moored mine shapes would be conducted within the Mariana littorals and Inner and Outer Apra Harbor, representing an increase of 92 events over the No Action Alternative. Because the military routinely avoids locations of known obstructions which include submerged historic resources, it is unlikely that these resources could be disturbed by the use of seafloor devices. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no training activities would occur at that location.

Testing Activities

Under Alternative 1, the number of testing activities using seafloor devices, such as mine countermeasure mission package testing activities, would increase from one event under the No Action Alternative to 64 events under Alternative 1. Because the military routinely avoids locations of known obstructions which include submerged historic resources, it is unlikely that these resources could be disturbed by the use of seafloor devices. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.2.4.3 Alternative 2

Training Activities

Under Alternative 2, mine warfare training activities using seafloor devices such as moored mine shapes would be conducted within the Mariana littorals and Inner and Outer Apra Harbor, representing an increase of 92 events over the No Action Alternative and would be the same as Alternative 1. Because the military routinely avoids locations of known obstructions which include submerged historic resources, it is unlikely that these resources could be disturbed by the use of seafloor devices. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no training activities would occur at that location.

Testing Activities

Under Alternative 2, the number of testing activities using seafloor devices, such as mine countermeasure mission package testing activities, would increase from the No Action Alternative and Alternative 1 for a total of 68 events. Because the military routinely avoids locations of known obstructions which include submerged historic resources, it is unlikely that these resources could be disturbed by the use of seafloor devices. The Rock Island Southern Lagoon World Heritage Site is situated within the territorial waters of Palau, and no testing activities would occur at that location.

3.11.3.2.5 Regulatory Conclusions of Physical Disturbance and Strike Stressors

Physical stressors resulting from vessel strikes and use of in-water devices would not adversely affect submerged resources because these devices are operated within the water column and they do not contact the seafloor. The use of seafloor devices during training and testing activities under Alternative 1 and Alternative 2 would not adversely affect submerged historic resources because the military routinely avoids locations of known submerged obstructions and would continue to follow established protocol for limited training areas and to avoid established off limit areas (no training permitted) as defined in the 2009 Programmatic Agreement (U.S. Department of Defense 2009). Ground disturbance associated with existing training activities on Guam and the Commonwealth of the Northern Mariana Islands, and with increased amphibious training activities on Tinian would continue to follow established protocol for limited training areas and to avoid established off limit areas (no training permitted) as defined in the 2009 Programmatic Agreement (U.S. Department of Defense 2009); therefore, no National Register of Historic Places-eligible resources would be adversely affected. In accordance with Section 402 of National Historic Preservation Act, no World Heritage Sites would be affected.

3.11.4 Summary of Potential Impacts on Cultural Resources

3.11.4.1 Combined Impact of All Stressors

3.11.4.1.1 No Action Alternative

Training activities associated with acoustic and physical stressors would not impact cultural resources because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement (U.S. Department of Defense 2009).

3.11.4.1.2 Alternative 1

Changes in the number and type of training and testing activities from the No Action Alternative would occur under Alternative 1. Training and testing activities associated with acoustic and physical stressors would not impact cultural resources because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement (U.S. Department of Defense 2009).

3.11.4.1.3 Alternative 2

Changes in the number and type of training and testing activities would occur under Alternative 2. Training and testing activities associated with acoustic and physical stressors would not impact cultural resources because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement (U.S. Department of Defense 2009).

3.11.4.2 Regulatory Determinations

Table 3.11-3 summarizes the potential effects of the Proposed Action on cultural resources. The MIRC Programmatic Agreement is in effect and satisfies the requirement for consultation as long as the stipulations in that Programmatic Agreement are followed.

Table 3.11-3: Summary of Effects of Training and Testing Activities on Cultural Resources

Alternative and Stressor	Effects of Training and Testing Activities
No Action Alternative	
Acoustic Stressors	Acoustic stressors resulting from underwater explosions creating shock (pressure) waves and cratering of the sea floor would not adversely affect submerged historic resources within U.S. territorial waters because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.
Physical Disturbance and Strike Stressors	Physical disturbance and strike stressors including vessel strikes, use of towed in-water devices, use of seafloor devices, and ground disturbance during training and testing activities would not adversely affect submerged historic resources within U.S. territorial waters and National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.
Regulatory Determination	***No adverse effects would occur to submerged historic resources or National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.***
Alternative 1	
Acoustic Stressors	Acoustic stressors resulting from underwater explosions creating shock (pressure) waves and cratering of the seafloor would not adversely affect submerged historic resources within U.S. territorial waters because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.
Physical Disturbance and Strike Stressors	Physical disturbance and strike stressors including vessel strikes, use of towed in-water devices, use of seafloor devices, and ground disturbance during training and testing activities would not adversely affect submerged historic resources within U.S. territorial waters and National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.
Regulatory Determination	***Alternative 1 includes increases in the number of training and testing activities. Adverse effects would not occur to submerged historic resources within U.S. territorial waters and National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.***

Table 3.11-3: Summary of Effects of Training and Testing Activities on Cultural Resources (continued)

Alternative and Stressor	Effects of Training and Testing Activities
Alternative 2	
Acoustic Stressors	Acoustic stressors resulting from underwater explosions creating shock (pressure) waves and cratering of the seafloor would not adversely affect submerged historic resources within U.S. territorial waters because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.
Physical Disturbance and Strike Stressors	Physical disturbance and strike stressors including vessel strikes, towed in-water devices, use of seafloor devices, and ground disturbance during training and testing activities would not adversely affect submerged historic resources within U.S. territorial waters and National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.
Regulatory Determination	***Alternative 2 includes increases in the number of training and testing activities compared to the No Action Alternative. Adverse effects would not occur to submerged historic resources within U.S. territorial waters and National Register of Historic Places-eligible resources on Guam and the Commonwealth of the Northern Mariana Islands because measures have been previously implemented to protect these resources and would continue to be implemented according to the conservation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement.***

Notes: MIRC = Mariana Islands Range Complex, U.S. = United States

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