3.3.3.2 Public Health

There are two medical facilities on Tinian including the Tinian Healthcare Center and the Isla Community Health Clinic. The Tinian Healthcare Center, part of the Commonwealth Healthcare Corporation, is the island's primary health care facility and is located in San Jose Village. The facility was built in 1987 and has five holding beds and provides emergency services, an outpatient clinic, laboratory, x-ray, radiology, pharmacy, dentistry, and public health operations (Commonwealth Healthcare Corporation 2022).

In 2023 alone, the Tinian Healthcare Center and the Isla Community Health Clinic encountered 4,419 and 1,777 patients, respectively (Commonwealth Healthcare Corporation, 2023). Information provided by the Tinian Mayor's Office indicates that as of September 2023, there was one Physician's Assistant at the Tinian Healthcare Center and one Nurse Practitioner at the Isla Community Health Clinic (Tinian Mayor's Office, Personal Communication, 2023).

3.4 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife, both of which include terrestrial and marine species. Habitat can be defined as the conditions present in an area that support plants and wildlife.

Biological resources are divided into five categories: (1) terrestrial vegetation, (2) terrestrial wildlife, (3) terrestrial special-status species[1], (4) marine communities, and (5) marine special-status species (including marine protected areas).

3.4.1 Terrestrial Vegetation

Terrestrial vegetation is defined as plant species or groups of plants (plant communities) that occur and interact with each other, animal populations, and the physical environment. Plants that are of cultural or societal importance on Tinian are also described in this section. The vegetation present in an area provides habitat that supports different wildlife species. The plant communities on Tinian and within the Military Lease Area are described according to plant associations and the dominant species.

The 12 plant communities that occur on Tinian are listed in Table 3.4-1 and are shown on Figure 3.4-1 and Figure 3.4-2. The six most prevalent plant communities on Tinian are described below. Definitions of all plant communities in Table 3.4-1 are provided in Appendix G.

Table 3.4-1 Plant Communities on Tinian and Within the Military Lease Area

Plant Community	*Acres*	*% of Total Land Cover on Tinian*	*Acres within the Military Lease Area*	*% of Total Land Cover within the Military Lease Area*
Leucaena Forest	8,283.20	33.1	5,750.40	37.6
Secondary Limestone Forest	6,206.86	24.8	4,098.10	26.7
Other Scrub/Grassland[1]	5,176.60	20.7	3,229.50	21.1
Developed	1,683.00	6.7	407.90	2.7
Limestone Native Forest	1,032.59	4.1	268.30	1.8

[1] When species are mentioned for the first time, they are listed using their common name followed by their scientific name in parentheses; only the common name is used afterwards. If there is no common name, only the scientific name is used. Appendix G identifies the Chamorro names for species, where applicable.

Plant Community	*Acres*	*% of Total Land Cover on Tinian*	*Acres within the Military Lease Area*	*% of Total Land Cover within the Military Lease Area*
Casuarina Forest	779.08	3.1	528.20	3.5
Scrub/Shrub[2]	718.33	2.9	451.10	3.0
Limestone Coastal Scrub	614.22	2.5	339.20	2.2
Barren	353.31	1.4	123.00	0.8
Coconut Forest	106.84	0.4	50.80	0.3
Wetland[3]	30.62	0.1	34.00	0.2
Bambusa Forest[4]	15.56	0.1	11.80	0.1
Total	**25,000.21**	**100.0**	**15,292.40**	**100.0**

Legend: % = percent.

Notes: [1] Common non-native species include several considered invasive (that is, species that cause significant ecological harm when introduced to a new environment) such as: lantana (*Lantana camara*), paper rose (*Operculina campanulat*), climbing hempweed (*Mikania scandens*), mission grass (*Pennisetum polystachion*), giant sensitive plant (*Mimosa diplotricha*), and the African tulip tree (*Spathodea campanulate*).

[2] Characterized by the predominance of low-stature woody vegetation that can occur as a mixture of native and non-native species.

[3] The term "wetland" refers to the plant community and is not meant to infer a jurisdictional determination as defined under the Clean Water Act.

[4] Non-native bamboo (*Bambusa vulgaris*).

Source: NAVFAC Pacific 2019.

Coconut Forest. This plant community is almost exclusively dominated by coconut palm (*Cocos nucifera*). Stands of this forest type can support a relatively diverse understory of mixed native and non-native shrubs, herbs, and/or ferns, or have minimal understory. Some of these stands may be remnants of previous coconut plantations while others may be the result of natural dispersion. Approximately one-third of the island's coconut forests are located in five stands within the Military Lease Area.

***Leucaena* Forest.** This plant community is dominated by tangan-tangan (*Leucaena leucocephala*) and typically occurs on limestone substrate where it can occur in pure stands (Amidon et al. 2017). In areas adjacent to native forests, tangan-tangan can be invasive, mixing with native woody species. *Leucaena* forests dominate much of the level and moderately sloping lowland habitat areas on Tinian, especially in the northern portions of the island within the Military Lease Area. While not considered a native plant community on Tinian, *Leucaena* forest does provide habitat for some native bird species, including species protected under the Migratory Bird Treaty Act.

Limestone Coastal Scrub. This plant community, also simply referred to as coastal scrub, is found primarily on limestone terraces and cliff edges (Amidon et al. 2017). Species include *Ficus* spp., bantigue (*Pemphis acidula*), and great woolly Malayan lilac (*Callicarpa candicans*).

Secondary Limestone Forest. This plant community consists of limestone forest habitat that has been significantly disturbed by clearing, invasive plants, and non-native animals (Amidon et al. 2017). Secondary limestone forest is often referred to as degraded forest and exhibits a mixture of non-native trees, shrubs, and dense herbaceous plants. This community provides habitat for federally listed and CNMI-listed plant species and native birds, including those protected under the Migratory Bird Treaty Act.

Figure 3.4-1 Plant Communities on Tinian (North)

Figure 3.4-2 Plant Communities on Tinian (South)

Limestone Native Forest. This plant community consists of relatively undisturbed forest that occurs on shallow limestone soils dominated by native tree and shrub species (Amidon et al. 2017). Forest clearings from ungulates (i.e., mammals with hooves) and other disturbances are absent or very limited. The term "limestone native forest" also describes areas that may have been cleared and have regrown with native tree and shrub species.

The total area of limestone native forest has been significantly reduced on Tinian due to past human activities and land uses, including widespread cultivation of non-native species (e.g., sugar cane), ground disturbance during World War II, introduction of non-native plants and animals, and grazing by non-native ungulates. Limestone native forest is important because it retains the functional ecological components that provide habitat for most of Tinian's native species, including federally listed and CNMI-listed species, and migratory birds. The few areas of limestone native forest remaining on Tinian within the Military Lease Area occur along cliff lines near Mount Lasso, along cliff lines to the west and south of Unai Chiget, along the coast of Lamanibot Bay (known locally as Dump Coke), and above and to the south-southeast of Unai Masalok (Figure 3.4-1).

Wetland. These plant communities are areas of grasses, sedges, herbs, or woody species typically found in standing water or soils that are saturated for most of the year. Wetlands include marshes, swamps, bogs, and similar areas. See Section 3.14 Surface Waters and Wetlands for discussion of the jurisdictional status of these wetlands. There are two main types of wetland communities on Tinian:

- *Wetland Herbaceous,* dominated by herbaceous plants and, in most cases, dominated by only a few plant species. The most common herbaceous species found in this community is tall reed (*Phragmites karka*), which often forms a dense monoculture.
- *Wetland Shrub/Herb,* found in areas subject to permanent or periodic inundation or prolonged soil saturation. Wetland shrub/herb communities tend to be dominated by shrubs or a mixture of shrubs and herbs. They are located in low areas along coasts and streams, in depressions or in poorly drained volcanic soils, and in areas of fresh or brackish water.

Wetlands on Tinian provide habitat for the federally endangered Mariana common moorhen (*Gallinula chloropus guami*) and migratory birds. Wetland habitat occurs in three areas within the Military Lease Area: Lake Hagoi, Mahalang Complex, and Bateha. See Section 3.14 Surface Waters and Wetlands for discussion of the jurisdictional status of these wetlands. Lake Hagoi (Figure 3.4-1) is the only permanent wetland vegetative community within the Military Lease Area (NAVFAC Pacific 2013). The wetland consists of a band of tall reed and large patches of bulrush (*Schoenoplectus litoralis*) around the perimeter, and patches of giant swamp fern (*Acrostichum aureum*) and knotgrass (*Paspalum distichum*), all of which are native to Tinian (Raulerson 2006).

The Mahalang ephemeral wetland complex consists of at least 24 individual sites located on a plateau within the northern portion of the Military Lease Area, south of Lake Hagoi. These sites are located within a matrix of grasslands (herbaceous-scrub), *Leucaena*, and mixed secondary forest. A few sites contain water during the wet season, but all are dry during the dry season. The two largest sites are approximately 1.2 acres each (AECOS, Inc. and Wil Chee Planning, Inc. 2009). The majority of the sites are likely bomb craters from World War II. Invasive species including mission grass and various species of non-native weedy vines dominate the interior of the

craters. Other sites in the complex consist of shallow depressions with various weedy vines and herbs.

The Bateha ephemeral wetland site consists of two shallow depressions that contain water during the wet season. Each area is approximately 1 to 2 acres. The larger western site at Bateha is dominated by the non-native giant sensitive plant and contains the non-native shrub candle bush (*Senna alata*) along with other weedy species. Mission grass occurs along the perimeter. The eastern site is a deeper depression surrounded by ridges dominated by an overstory of non-native Formosan koa (*Acacia confusa*) and mission grass. Candle bush is dispersed throughout the northern and southern portions of the site.

Culturally Important Plants. Multiple plant species occurring throughout Tinian have served as important sources of food or medicine to the people of Tinian, both historically and currently. These culturally important plants on Tinian include wild yams (*Dioscorea villosa*), breadfruit (*Artocarpus altilis*), Donni Sali (*Capsicum chinense*), and medicinal plants including puntan talisai (*Terminalia catappa*), galak (*Asplenium nidus*), niyok (*Cocos nucifera*), and ahgao (*Premna obtusifolia*) and are fairly evenly distributed throughout the Military Lease Area.

3.4.2 Terrestrial Wildlife

The term wildlife is used to describe animals that are not assigned special status protection by law, and include birds, mammals, reptiles, amphibians, and invertebrates. Non-protected, native wildlife species on Tinian include five birds, seven reptiles, and an undefined number of invertebrates (DON 2023; Joint Region Marianas 2023). Special status species are described in Section 3.4.3.

Birds. The non-protected native bird species on Tinian include: the Micronesian myzomela (*Myzomela rubratra*), rufous fantail (*Rhipidura rufifrons uraniae*), bridled white-eye (*Zosterops conspicillatus saypani*), Micronesian starling (*Aplonis opaca guami*), and Tinian monarch (*Monarcha takatsukasae*) (U.S. Fish and Wildlife Service 2013).

The most abundant native bird species on Tinian are bridled white-eye, rufous fantail, and the Tinian monarch (Camp et al. 2009b, Camp et al. 2012; NAVFAC Pacific 2014; Spaulding et al. 2022). Analyses of population trends from 1982 to 2013 indicate increases in population densities for the Micronesian starling and rufous fantail and decreases in population densities for the Micronesian myzomela. Population densities have remained stable for the bridled white-eye and Tinian monarch (NAVFAC Pacific 2014; Spaulding et al. 2022). The five naturalized, non-native birds occurring on Tinian include red jungle fowl (*Gallus gallus*), rock dove (*Columba livia*), island collared dove (*Streptopelia bitorquata*), Eurasian tree sparrow (*Passer montanus*), and orange-cheeked waxbill (*Estrilda melpoda*). All five of these species are common and widespread on Tinian (DON 2023).

The Tinian monarch was previously listed as an endangered species in 1970 (35 FR 8491). In 1999, the U.S. and the CNMI dedicated approximately 970 acres of land for wildlife conservation for the Tinian monarch. In accordance with the conservation agreement, and as stated in the U.S. Fish and Wildlife Service Biological Opinion 1-2-98-F-07 issued to Federal Aviation Administration and Commonwealth Ports Authority for the expansion of West Tinian Airport. The military retained the right to use the Natural Resources Conservation Area for low impact, non-habitat-destructive military training. However, in 2004, the U.S. Fish and Wildlife Service

removed the Tinian monarch from the Federal List of Endangered and Threatened Wildlife (69 FR 56367). At the time, the U.S. Fish and Wildlife Service found that the Tinian monarch has continued to thrive despite historical and ongoing impacts to its habitat on Tinian (83 FR 65133).

Mammals. Non-native mammals include the black rat (*Rattus rattus diardii*), Polynesian rat (*Rattus exulans*), Norway rat (*Rattus norvegicus*), house mouse (*Mus musculus*), Asian house shrew (*Suncus murinus*), domestic cat (*Felis catus*), domestic dog (*Canis lupus familiaris*), goat (*Capra hircus*), cattle, pigs (*Sus scrofa*) and Philippine deer (*Rusa marianna*). Non-native rodents (rats, mice, and shrews) can have a profoundly negative effect on island populations of native birds, reptiles, and invertebrates (Doherty et al. 2016; Spatz et al. 2017). The dietary intake of rats also includes native plants, seeds, and fruit, leading high rodent densities to be correlated with negative changes in forest composition (Weiwei et al. 2009). High densities of black rats on Tinian, which are present in all plant communities in the Military Lease Area, pose a threat to flora and fauna, including Tinian's bird species (Wiewel et al. 2009; DON 2023, Leo and Wiewel 2013).

Feral domestic cats and dogs are common on Tinian and have been observed hunting in native forests at night (DON 2013a). Goats have been transported from Aguiguan to Tinian, and a coastal survey in October 2008 confirmed at least 20 goats at Puntan Kastiyu, south of the Military Lease Area (Kessler 2009). No goats have been observed in the Military Lease Area. Cattle and pigs occur on Tinian as domesticated livestock found penned or pastured on leased lands.

Reptiles and Amphibians. During surveys on Tinian in 2008, the U.S. Fish and Wildlife Service observed eight native terrestrial reptile species, including the mangrove monitor lizard (*Varanus indicus*), mourning gecko (*Lepidodactylus lugubris*), Micronesian gecko (*Perochirus ateles*), Indo-Pacific house gecko (*Hemidactylus granitic*), oceanic snake-eyed skink (*Cryptoblepharus poecilopleurus*), littoral skink (*Emoia atrocostata*), Pacific blue-tailed skink (*Emoia caeruleocauda*), and Brahminy blind snake (*Ramphotyphlops braminus*) (Rodda et al. 2009, Weijola et al. 2020). The mourning gecko was the most abundant lizard species in secondary limestone and limestone native forest habitats (Rodda et al. 2009).

Non-native reptiles include the oceanic gecko (*Gehyra oceanic*), mutilating gecko (*Gehyra mutilata*), curious skink (*Carlia fusca*), emerald skink (*Lamprolepis smaragdina*), and green anole (*Anolis carolinensis*). The marine toad (*Bufo marinus*) is the only amphibian that occurs on Tinian (Wiles et al. 1989; DON 2023).

Invertebrates. The coconut crab (*Birgus latro*), blue land crab (*Discoplax hirtipes*) and the brown land crab (*Cardisoma carnifex*) are regulated as native game species by the CNMI Department of Fish and Wildlife; a license is required for harvesting them during regulated hunting seasons (land crabs from April 1 to June 30; coconut crab from September 15 to November 15). Although the coconut crab occurs in limestone native forests, females regularly migrate to the ocean to spawn. Coconut crab densities on Tinian have been estimated at 2 crabs per acre in limestone native forest and 0.7 crab per acre in *Leucaena* forest (Vogt 2009). Land crabs are a common terrestrial burrowing crab found throughout the Indo-Pacific and are generally associated with wetland or coastal habitats on Tinian (DON 2023).

The mangrove crab (*Scylla serrata*), introduced as a potential food source, is the only non-native terrestrial crustacean on Tinian (Commander, U.S. Naval Forces Marianas 2004; NAVFAC Pacific and NAVFAC Marianas 2010; DON 2023).

Butterfly surveys were conducted on Tinian from June through October 2008 (Hawley and Castro 2009). Known host plants for several species were extensively monitored at four sites on the island, two of which are in the Military Lease Area. During these surveys, Hawley and Castro (2009) observed adults, caterpillars, and chrysalis of three non-protected species at a site in the Military Lease Area referred to as the Japanese Caves: blue moon butterfly (*Hypolimnas bolina*), guardian butterfly (*Hypolimnas anomala*), and the common evening brown (*Melanitis leda*).

The predatory New Guinea flatworm (*Platydemus manokwari*) was introduced to Tinian to help control the non-native giant African snail (*Achatina fulica*). The flatworm poses a serious threat to native tree snails, including the humped tree snail (Hopper and Smith 1992; NAVFAC Pacific 2014; U.S. Fish and Wildlife Service 2015).

Although the coconut rhinoceros beetle (*Oryctes rhinoceros*) is established on Guam and was discovered on Rota in October 2017, it has not yet been reported on Tinian (CNMI Department of Land and Natural Resources 2017). This invasive pest is a highly detrimental threat to coconut palms in the Marianas, and a monitoring program has been established on Tinian (CNMI Department of Land and Natural Resources 2017). Under this program, panel traps for the beetles were deployed on the North Field during training events between February 2020 and February 2023. Since then, panel traps have been deployed to approximately 40 locations throughout the Military Lease Area and are maintained as early detection tools.

3.4.3 Terrestrial Special Status Species

Special status species are those species listed as threatened or endangered under the Endangered Species Act (referred to as federally listed species), those designated by the CNMI Department of Lands and Natural Resources as threatened or endangered, and bird species protected under the Migratory Bird Treaty Act (referred to as migratory birds) that occur or have the potential to occur on Tinian.

3.4.3.1 Terrestrial Federally Listed and CNMI-listed Species

Table 3.4-2 describes the federally listed and CNMI-listed species known or having the potential to occur on Tinian. Figure 3.4-3 shows the locations of known occurrences of these species.

Birds. Two federally endangered bird species, the Mariana common moorhen and Micronesian megapode (*Megapodius laperouse*), occur within the Military Lease Area. The Mariana common moorhen relies on emergent vegetation of freshwater marshes, ponds, and placid rivers for breeding, foraging, and sheltering (U.S. Fish and Wildlife Service 1992; NAVFAC Pacific and NAVFAC Marianas 2010). Its preferred habitat includes freshwater lakes, marshes, and swamps. The U.S. Fish and Wildlife Service (1992) recovery plan for the Mariana common moorhen identifies Lake Hagoi within the northern portion of the Military Lease Area as primary habitat for the moorhen. Analysis of survey data collected between 1998 and 2014 suggest the moorhen population on Tinian has been stable to slightly increasing (Camp et al. 2014). The population estimate at Lake Hagoi in 2017 was less than 20 individuals (NAVFAC Marianas 2017). From 2018 to September 2024, up to 54 moorhens potentially occurred throughout the year at Lake Hagoi and at the seasonal Bateha and Mahalang ephemeral wetlands when water was present, based on point-count survey data (DON 2023, NAVFAC Pacific 2024). However, these data were based only on acoustic counts and reflect at least some degree of replication.

Surveys in the Military Lease Area have shown the Micronesian megapode occurs only occasionally at very low numbers. In the years that megapodes were detected (seen in 2001, 2004, 2005 and 2013; and one identified by sound in 2009), they were recorded in the Mount Lasso area, south of Lake Hagoi, and a small area of native forest adjacent to Cross Island Road in the southern portion of the Natural Resources Conservation Area (Figure 3.4-3) (Krueger and O'Daniel 1999; Witteman 2001; Vogt 2006; NAVFAC Pacific and NAVFAC Marianas 2010; DON 2012, 2014b, 2023). The infrequent sightings of the species on Tinian is likely the result of movement of these transient birds from Aguiguan or Saipan as no resident breeding population has been identified on Tinian (DON 2013a).

Table 3.4-2 Occurrence of Terrestrial Federally Listed and CNMI-listed Species on Tinian

Common Name/ Scientific Name	*Federal Status*	*CNMI Status*	*Habitat*	*Occurrence*
Birds				
Mariana common moorhen/*Gallinula chloropus guami*	E	E/T	Freshwater wetlands.	Monthly counts of moorhen at Lake Hagoi between 2002 and 2012 resulted in annual means of between 7 and 17 birds. Moorhen population estimates at Lake Hagoi between 2015 and 2017 averaged less than 20 birds. Similar numbers were estimated between 2018 through September 2024.
Micronesian megapode/ *Megapodius laperouse*[4]	E	E/T	Limestone forest and coconut forest.	Multiple reports of individual birds seen since the 1980s, but none detected by sight or sound since 2014.
Mammals				
Mariana fruit bat/ *Pteropus mariannus mariannus*	T	E/T	Limestone forest, coastal forest, and coconut forest.	Occasional sightings by residents; four surveys were conducted between 2000 and 2008, with five fruit bats observed in 2005. A colony consisting of up to approximately 100 individuals was discovered in the limestone native forest region north of Mount Lasso in 2023.
Reptiles				
Green turtle/ *Chelonia mydas*[1, 3]	E	E/T	Suitable beaches for basking and nesting.	Suitable nesting beaches occur at Unai Chulu, Unai Babui, Unai Lam Lam, Unai Chiget, Unai Dankulo, and Unai Masalok. Twenty-three nests were observed in the Military Lease Area in 2023 (at Unai Dankulo and Unai Masalok).
Hawksbill turtle/ *Eretmochelys imbricata*[3,4]	E	E/T	Suitable beaches for basking and nesting.	During monthly nesting surveys from 1999–present, one nest observed at Unai Dankulo in 2010.
Micronesian gecko/ *Perochirus ateles*	-	E/T	Forested areas.	Reported at Mount Lasso and Carolinas Plateau in 2008.
Invertebrates				

Common Name/ Scientific Name	*Federal Status*	*CNMI Status*	*Habitat*	*Occurrence*
Humped tree snail/ *Partula gibba*[4]	E	-	Intact limestone forest.	Humped tree snail surveys have documented two discrete populations within limestone native forest along Lamanibot Bay (Dump Coke).
Plants				
Fadang/*Cycas micronesica*[2]	T[2]	-	Forest and savanna ecosystems.	C. micronesica is not known to historically occur on Tinian. In 2008, the DON planted 1,000 cycad seedlings in native forest near Mount Lasso. Cycads have also been planted at memorials, shrines, and World War II landmarks and individual cycads are found within the village of San Jose.
Ufa-halomtano/ *Heritiera longipetiolata*	E	-	Moist forest on limestone cliffs and in coastal sites with windy conditions.	Observed during 2018 and 2023 surveys within the Military Lease Area at Unai Masalok on the east coast and south of the Military Lease Area along the eastern/southeastern coast.
No common name/*Dendrobium guamense*	T	-	Grows on tree trunks and branches in native forest.	Observed during 2016, 2017, 2018 and 2023 surveys on and near Mount Lasso.

Legend: - = not listed; E = endangered; ESA = Endangered Species Act; T = threatened; E/T = the CNMI Administrative Code does not specify whether a species is threatened or endangered: all species are considered threatened *and* endangered.

Notes: [1] Central West Pacific Distinct Population Segment.
[2] Threatened, but no federal status on Tinian. Individuals established on Tinian by the DON via outplanting and residents via seeds from Rota are not included in the species' range in U.S. Fish and Wildlife Service determinations (2014, 2015). The species will not be consulted on under the Endangered Species Act.
[3] Land occurrence and nesting is under jurisdiction of U.S. Fish and Wildlife Service and aquatic occurrence is under jurisdiction of National Marine Fisheries Service. Marine occurrence of these Endangered Species Act-listed turtle species are described under Marine Special Status Species.
[4] Due to a lack of presence within the Proposed Action areas, this species will not be analyzed in the U.S. Fish and Wildlife Service Section 7 consultation under the Endangered Species Act.

Sources: Berger et al. 2005; Vogt 2008a, 2008b; Brooke 2009; Kessler and Amidon 2009; Marshall et al. 2009; DON 2011, 2012, 2013a, 2020, 2023; NAVFAC Pacific and NAVFAC Marianas 2010; Summers et al. 2018; U.S. Fish and Wildlife Service 2012a, 2014, 2015; Holland and Sischo 2013; Liske-Clark 2015; NAVFAC Pacific 2014, 2014, 2017, 2018, 2019; NAVFAC Marianas 2019, Joint Region Marianas 2023, Cardno Government Services – AECOM Pacific Joint Venture 2023.

Mammals. Tinian once readily supported colonies of Mariana fruit bats (*Pteropus mariannus mariannus*) but following native forest clearing during Spanish colonial times, sugarcane production under the Japanese administration and World War II, only 5 percent of their native forest habitat remained on the island, resulting in the virtual absence of Mariana fruit bats on Tinian. Today, there are approximately 8,140.9 acres of suitable foraging and roosting habitat (i.e., limestone native forest, secondary limestone forest, *Casuarina* Forest, and coconut forest) remaining for fruit bats on the island, 61 percent (4,957.2 acres) of which occurs in the Military Lease Area. Habitat loss and poaching are the primary reasons for the decline of Mariana fruit bats on Tinian.

During surveys for the then-proposed USAGM site in 1995, locals reported that fruit bats were known to roost in the southern portion of what would become the proposed Base Camp footprint (Voice of America 1995). A fruit bat colony consisting of up to approximately 100 individuals was discovered in the limestone native forest region north of Mount Lasso in 2023 (CNMI Department of Lands and Natural Resources 2024, Mildenstein 2024). Prior to this, no fruit bat colony was known to occur on Tinian. Habitat loss and poaching are the primary reasons for the near absence of Mariana fruit bats on Tinian (Wiles and Johnson 2004). Fruit bats may fly between islands in the southern Mariana Islands, including Aguiguan and Tinian (Mildenstein and Mills 2013; DON 2023).

Reptiles. Both the Central West Pacific distinct population segment of green turtle (*Chelonia mydas*) and the hawksbill turtle (*Eretmochelys imbricata*) have been documented nesting on Tinian beaches (Joint Region Marianas 2023).

Abundance and density of green turtle nesting is highest along Tinian's relatively uninhabited east coast (Kolinski 2001), as nesting green turtles require deep sand beaches with open ocean exposure and minimal disturbance (NAVFAC Pacific and NAVFAC Marianas 2010; DON 2012). Of the 13 distinct beaches or beach complexes on Tinian that could support nesting, 10 are within the Military Lease Area, 6 of which have continually been surveyed once a month since 1998: Unai Chulu, Unai Lam Lam, Unai Chiget, Unai Dankulo, Unai Masalok, and Unai Babui. After 21 years (1999 to 2019) of monthly beach surveys, approximately 55 percent of all green turtle activity on the six regularly surveyed Military Lease Area beaches was observed on the Unai Dankulo pocket beaches (DON 2020). In 2023, 17 nests occurred on Unai Dankulo and another 5 nests were documented on Unai Masalok (NAVFAC Marianas 2024). On July 19, 2023, the U.S. Fish and Wildlife Service issued a proposed rule for the designation of 6 acres of terrestrial critical habitat for the green turtle along the southwest coast of Tinian (88 FR 46376), none of which occurs within the Military Lease Area (Figure 3.4-3). Furthermore, section 4(a)(3)(B)(i) of the Endangered Species Act designates that areas owned or controlled by the DoD are exempt from critical habitat designation if an Integrated Natural Resources Management Plan is in place that provides a benefit to the species. Joint Region Marianas completed an Integrated Natural Resources Management Plan in 2019. Therefore, proposed critical habitat for the green turtle is not discussed further in this Revised Draft EIS.

Hawksbill turtles will nest on small pocket beaches and, because of their small body size and greater agility, hawksbill turtles can traverse fringing reefs that limit access to other sea turtle species (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1998). During monthly surveys from 1998 to 2017, only a single hawksbill turtle nest was documented at Unai Dankulo in 2010 (DON 2020). These monthly surveys are ongoing.

The Micronesian gecko (*Perochirus ateles*) is native to Micronesia and is the only CNMI-listed threatened/endangered terrestrial reptile in the Mariana archipelago. The species has never been abundant on Tinian and was believed extirpated on the island after 1946 (Rodda et al. 2009) until it was collected in southern Tinian in August 2003, was sighted in 2007 near Mount Lasso, and was collected again in limestone native forest on Mount Lasso in 2008, suggesting it may occur at very low densities (Rodda et al. 2009; NAVFAC Pacific and NAVFAC Marianas 2010). No further surveys have been conducted for the species on Tinian.

Invertebrates. The humped tree snail was historically present on Tinian but was thought to be extirpated from the island until a June 2013 DON survey documented two discrete populations of the species within limestone native forest along Lamanibot Bay (known locally as Dump Coke). A total of 92 individuals were counted between the two sites, including adults, subadults, and juveniles (NAVFAC Pacific and NAVFAC Marianas 2010; NAVFAC Pacific 2014). Bleached humped tree snail shells were also observed on the ground in limestone native forests in the vicinity of Unai Chiget, south of Lake Hagoi, the Mount Lasso area, and Unai Masalok.

A 2019 survey conducted in the southern portion of Lamanibot Bay to locate these two humped tree snail populations post-Typhoon Yutu (NAVFAC Pacific 2019) found only old shells of humped tree snails at both locations. No living tree snails were observed (NAVFAC Pacific 2019); nor were any living humped tree snails observed during 2023 surveys for federally listed species, with only bleached, weathered shells discovered in the Mount Lasso region (Figure 3.4-3).

Plants. *Cycas micronesica* is not known to historically occur on Tinian. The cycads on Tinian are the result of a 2007 Joint Region Marianas project to collect cycad germplasm from geographically and genetically diverse plants on Guam and plant saplings on Tinian to ensure a broad genetic representation of Guam's cycads in a living seed bank (DON 2023). The collection has been and continues to be actively managed. In addition, approximately 50 cycads were planted by the Tinian Mayor's office in the early 2000s, at numerous memorials, shrines, and World War II landmarks (e.g., North Field historic landmark, Chulu roundabout) within the Military Lease Area, and at other locations in the south of Tinian (DON 2016). Tinian residents have also brought seeds from Rota and individual cycads are found within the village of San Jose. Because the individuals on Tinian were artificially planted outside of their natural range, they do not maintain a federal protection status in Tinian. No training events or construction would occur where these individuals have been planted on Tinian. Therefore, this species is not discussed further in this Revised EIS.

Heritiera longipetiolata is an endangered tree species reported from Guam, Saipan, and Tinian and is known outside the Marianas only in Pohnpei (U.S. Fish and Wildlife Service 2015, Raulerson 2006, Costion and Lorence 2012). Within the Military Lease Area, *H. longipetiolata* has been found in coastal forests near Unai Masalok on the east coast (NAVFAC Pacific 2017a), along the Lamanibot Bay (Dump Coke) escarpment (Hawaiian Agronomics International, Inc. 1985; DON 2016), and in limestone native forest between Puntan Barangka and Puntan Kastiyu (NAVFAC Pacific 2014; U.S. Fish and Wildlife Service 2015). During the 2023 surveys, known *H. longipetiolata* groves were revisited and mapped in the Unai Masalok region. One new grove was also discovered south of Unai Chiget. In total, 290 individuals (250 mature and 40 seedling/sapling) were mapped within 12 distinct groves in 2023 (Figure 3.4-3), all of which appeared to be vigorous and healthy.

Dendrobium guamense is a threatened orchid that grows on tree trunks and branches in forest habitats. During the 2023 survey efforts, 23 occurrences of *D. guamense* were recorded, totaling 208 individuals. These ranged from individual plants to localized populations of up to 34 individuals. The majority of these were found growing on dead and/ or downed trees and branches, all within the Mount Lasso region (Figure 3.4-3). Dead or downed trees were most likely the result of Typhoon Yutu in 2018.

Figure 3.4-3 Occurrences of Federally Listed and CNMI-listed Species on Tinian

3.4.3.2 Migratory Birds

Of 64 species of birds documented on Tinian, 55 are currently protected under the Migratory Bird Treaty Act (DON 2023). The 13 Migratory Bird Treaty Act-protected birds that are most likely to be exposed to project activities are listed in Table 3.4-3. A list of all 64 Migratory Bird Treaty Act-protected bird species is provided in Appendix G.

Table 3.4-3 Migratory Bird Treaty Act Bird Species Documented on Tinian Potentially Affected by the Proposed Action

Common Name	*Scientific Name*
black noddy	*Anous minutus*
brown booby	*Sula leucogaster*
brown noddy	*Anous stolidus*
Eastern cattle egret	*Bubulcus coromandus*
Mariana fruit dove	*Ptilinopus roseicapilla*
Mariana kingfisher	*Todiramphus albicilla*
Pacific golden plover	*Pluvialis fulva*
Pacific reef heron	*Egretta sacra*
Ruddy turnstone	*Arenaria interpres*
White tern	*Gygis alba*
White-tailed tropicbird	*Phaethon lepturus*
white-throated ground-dove	*Gallicolumba xanthonura*
yellow bittern	*Ixobrychus sinensis*

Sources: Reichel and Glass 1991; Stinson 1994; U.S. Fish and Wildlife Service 1992, 1998, 2013; Vogt and Williams 2004; Kessler 2009; DON 2013a, 2023; NAVFAC Marianas 2017a; NAVFAC Pacific 2017b; recent records retrieved from eBird (Sullivan et al. 2009); Taxonomy follows Gill and Donsker 2018.

The gray-tailed tattler (*Tringa brevipes*), wandering tattler (*Tringa incana*), Pacific reef heron (*Egretta sacra*), black noddy (*Anous minutus*), brown noddy (*Anous stolidus*), brown booby (*Sula leucogaster*), yellow bittern (*Ixobrychus sinensis*) and white tern (*Gygis alba*) commonly occur in and utilize the shoreline areas of the Military Lease Area (Kessler 2009; NAVFAC Pacific 2017b).

Three native species of Migratory Bird Treaty Act-protected land birds are known to occur on Tinian: Mariana kingfisher (*Todiramphus albicilla*), Mariana fruit dove (*Ptilinopus roseicapilla*), and white-throated ground-dove (*Gallicolumba xanthonura*) (Kessler 2009; NAVFAC Pacific 2017b).

The population of Mariana kingfishers has varied considerably since surveys began in 1982. In terms of abundance by habitat type, there were decreases from 2008 to 2013 in limestone native forest, secondary forest, and *Leucaena* forest habitats, with the greatest decrease in the latter at 83 percent (NAVFAC Pacific 2014). However, the trend for Mariana kingfisher abundance and density since 1982 is increasing (NAVFAC Pacific 2014; Spaulding et al. 2022).

The population of Mariana fruit doves has varied considerably since surveys began in 1982. There was a notable decrease from 2008 to 2013 in both herbaceous-scrub and *Leucaena* forest habitats and a slight increase in limestone native forest populations (NAVFAC Pacific 2014). The trend for Mariana fruit dove abundance since 1982 is increasing (NAVFAC Pacific 2014; Spaulding et

al. 2022). This conclusion is further supported by 1999 to 2015 breeding bird survey data from the CNMI Department of Fish and Wildlife (2015), which showed an increasing or stable fruit dove population on Tinian.

Abundance estimates for white-throated ground-doves have varied greatly, but the trend for both abundance and density of the species has increased since 1982 (NAVFAC Pacific 2014; Spaulding et al. 2022).

3.4.4 Marine Communities

Marine biological resources include those marine species and habitats that could be affected by training and construction. Marine communities that may occur in the marine environment surrounding Tinian include aquatic vegetation and marine invertebrates, fish, sea turtles, and marine mammals. Marine mammals, sea turtles, and some fish species are discussed under Marine Special Status Species (see Section 3.4.5). This section describes existing environmental conditions for marine communities potentially affected by the Proposed Action described in Sections 2.2 and 2.3.

3.4.4.1 Aquatic Vegetation and Marine Invertebrates

Vegetation communities along the Tinian shoreline include seagrass beds, coastal strand, and algae. There are no mangroves present on the island; instead, a vegetation type referred to as coastal strand is prevalent and is made up of flowering plants, vines, and salt tolerant grasses and can be present along the coasts and beaches (Plentovich 2020). Common plant species found in coastal strand are love vine (*Cassytha filiformis*), velvet leaf (*Heliotropium foertherianum*), sea-hibiscus (*Hibiscus tiliaceus*), bunchgrass (*Lepturus repens*), beach pea (*Vigna marina*), rosewood *(Thespesia populnea*), and seashore rush grass (*Sporobolus virginicus*), among other species.

Algae is an important vegetation type present in the nearshore waters of Tinian. Algal areas tend to be near or on reef habitats and support a high diversity of fish and invertebrates (DON 2015). Macroalgae, microalgae, coralline/red algae and turf algae are all present in the nearshore waters. There are 109 species of red algae, 31 species of brown algae and 71 species of green algae present in the waters of CNMI. Although there are no known surveys of algae species for Tinian, they are assumed to be ubiquitous in the CNMI and therefore present in the study area (NAVFAC 2022).

Tinian is surrounded by a shore-attached fringing reef covering approximately 9 square miles. Tinian has some of the oldest and most developed reefs of CNMI (National Oceanic and Atmospheric Administration 2018). There are seven defined reef flats of Tinian: Unai Chulu, Unai Babui, Unai Dankulo, Unai Masalok, Unai Barcinas, Unai Leprosarium, and Taga Beach (DON 2015).

Though macroinvertebrates are ecologically important species within CNMI ecosystems, much of the reef structure surrounding Tinian is poor habitat for other species of invertebrates (National Oceanic and Atmospheric Administration 2018). Recent studies by Couch et al. in 2023 show an overall decline in the population of invertebrates around Tinian and the rest of the Mariana Islands. By analyzing factors such as heat stress, human density, and habitat loss, clear correlations can be seen between an increase in these factors and a decrease in benthic populations over time. Abundance of giant clams, sea cucumbers, and sea urchins from surveys conducted around Tinian during the three Mariana Archipelago Reef Assessment and Monitoring Program survey years was

also low relative to the rest of the Mariana Archipelago (Waddell and Clarke 2008; Couch et al. 2023).

3.4.4.2 Fish

In 2011, a rudimentary survey of the fish population in the Tinian Marine Reserve recorded nine common families consisting of *Acanthurids*, *Chaetodontids*, *Scarids*, *Serranids*, *Pomacentrids*, *Laridae*, *Ballistae*, *Lethrinids*, and *Lutjanids* (Plass-Johnson 2011).

The most recent site-specific surveys of the fish population in the study areas were conducted for the Mariana Archipelago Reef Assessment and Monitoring Program in 2023. Overall, this project combined different data streams, covered a wide spatiotemporal scale, and employed a spatial downscaling approach to unveil patterns of resilience at management-relevant scales which were otherwise masked or undetected when investigating trends at island or regional scale (Gajdzik et al. 2023). Species richness, with a range of 24 to 37 species per 100 square meters, was broadly similar to data recorded in 2003. Damselfishes, most of them juveniles, comprised the most abundant family with three species that were particularly common: princess damsel (*Pomacentrus vaiuli*), jewel damsel (*Plectroglyphidodon lacrymatus*), and midget chromis (*Chromis acares*). Wrasses and surgeonfishes were also common. Total fish biomass was moderately low at the Rapid Ecological Assessment sites surveyed at Tinian with a mean of 3.85 kilograms per 100 square meters across the three survey years for Mariana Archipelago Reef Assessment and Monitoring Program, and according to Gajdzik's research, fish biomass on Tinian was the lowest of all the previous years of data. Across all years combined, the lowest fish biomass was observed at Tinian (NAVFAC 2022; Gajdzik et al. 2023).

3.4.5 Marine Special Status Species

Marine special status species include marine mammals protected under the Marine Mammal Protection Act, Endangered Species Act-listed and CNMI-listed special status species, marine protected areas, and essential fish habitat, as regulated under the Magnuson-Stevens Fishery Conservation and Management Act.

3.4.5.1 Marine Mammals

Several species of marine mammals are known to occur or potentially occur in the waters around Tinian. Examples would be the photo-documentation sightings of short-finned pilot whales (*Globicephala macrorhyncus*) and false killer whales (*Pseudorca crassidens*) offshore of Tinian and humpback whales (*Megaptera novaeangliae*) offshore of Saipan.

All species of marine mammal are protected by the Marine Mammal Protection Act, and some are also listed and protected under the Endangered Species Act. Non-Endangered Species include common minke whale (*Balaenoptera acutorostrata*), short-finned pilot whale (*Globicephala macrorhynchus*), false killer whale (*Pseudorca crassidens*), melon-headed whale (*Peponocephala electra*), bottlenose dolphin (*Tursiops aduncus*), pantropical spotted dolphin (*Stenella attenuata*), spinner dolphin (*Stenella longirostris*), Blainville's beaked whale (*Mesoplodon densirostris*), and Cuvier's beaked whale (*Ziphius cavirostris*) (NAVFAC 2022).

"Species of Greatest Conservation Need" are those animal species or groups of particular importance to the people of the CNMI for biological, cultural, or economic reasons. All species first have to meet the following preliminary criteria before further consideration as a Species of Greatest Conservation Need:

- Animal species or groups only (any species that is Kingdom Animalia)
- Native species only
- "Manageable" species only (potential actions that could reasonably be expected to produce measurable population-level benefits for the species can be identified)
- Breeding species only

Table 3.4-4 provides a list of marine special status species that have been known to occur around Tinian. The species listed in this table include all federally listed and CNMI-listed species that could occur in the marine environment surrounding Tinian. This table represents the full range of possible occurrences based on habitat suitability and available documentation; however, it does not indicate confirmed or likely presence for all species. Inclusion of a species in this table should not be interpreted as evidence of regular or expected presence within the project area.

Table 3.4-4 Occurrence of Federally Listed and CNMI-listed Marine Species on and Around Tinian

Common Name	*Habitat*	*Presence around Tinian*	*ESA Status*	*CNMI Status*
Invertebrates				
Smooth Giant Clam/*Tridacna derasa*	Reefs or other coastal areas (ocean surface to less than 20 m)	Occasionally present near Puntan Diablo area	Proposed Endangered	Species of Greatest Conservation Need
Fluted Giant Clam/*Tridacna squamosa*	Reefs or other coastal areas (ocean surface to less than 20 m)	Occasionally present near Puntan Diablo area	Proposed Threatened	Species of Greatest Conservation Need
True Giant Clam/*Tridacna gigas*	Reefs or other coastal areas (ocean surface to less than 20 m)	Occasionally present near Puntan Diablo area	Proposed Endangered	Species of Greatest Conservation Need
Small Giant Clam/*Tridacna maxima*	Shallow waters of coral reefs and atoll lagoons	Occasionally present near Puntan Diablo area	Proposed Threatened	Species of Greatest Conservation Need
Giant Horse's Hoof Clam/*Hippopus hippopus*	Reefs or other coastal areas from ocean surface to depths of less than 20 m	Could be present along Tinian's shoreline or in areas where coral reefs are abundant	Proposed Threatened	Species of Greatest Conservation Need
Triton's trumpet shell/*Charonia tritonis*	Temperate and tropical waters worldwide in coral rich habitats	Could be present where coral reefs are abundant, in waters of about 75 m deep	None	Species of Greatest Conservation Need
Horned helmet/*Cassis cornuta*	Found on sand and coral rubble, often around reefs	Could occur near Unai Chulu	None	Species of Greatest Conservation Need
Common spider conch/*Lambis lambis*	Indo-West Pacific; reef flats and shallow water coral-rubble bottoms	Rare	None	Species of Greatest Conservation Need
Silver-mouthed turban snail/*Turbo argyrostomus*	Tropical Indo-Pacific on hard substrate and coral reefs	Could occur in suitable reef habitats or along Tinian's eastern coast	None	Species of Greatest Conservation Need
Tapestry turban/*Turbo spp.*	Tropical Indo-Pacific; intertidal and subtidal zones	Could occur along the west side of Tinian and southern tip, commonly observed in exposed areas of coral reefs	None	Species of Greatest Conservation Need
Rough turban/*Turbo spp.*	Tropical Indo-Pacific; exposed areas on coral reefs	Could occur along the west side of Tinian and southern tip, commonly observed in exposed areas of coral reefs	None	Species of Greatest Conservation Need
Branched murex/*Chicoreus ramosus*	Sandy and rubble bottoms near coral reefs; Indo-West Pacific	Could occur near Unai Chulu	None	Species of Greatest Conservation Need

Common Name	*Habitat*	*Presence around Tinian*	*ESA Status*	*CNMI Status*
Collector urchin/*Tripneustes gratilla*	Coral reefs and seagrass beds; warm shallow waters of the Indo-Pacific	Could occur near Unai Chiget and Unai Masalok	None	Species of Greatest Conservation Need
Longlegged spiny lobster/ *Panulirus spp.*	Rocky and coral reefs, usually depths less than 18 m	Could occur where coral reefs are prevalent and along Tinian's eastern coast	None	Species of Greatest Conservation Need
Pronghorn spiny lobster/*Panulirus spp.*	Rocky and coral reefs, usually depths less than 18 m; tropical Indo-Pacific	Could occur where coral reefs are prevalent and along the west and southern tip of Tinian and Unai Dankulo	None	Species of Greatest Conservation Need
Painted spiny lobster/*Panulirus spp.*	Rocky and coral reefs, usually depths less than 18 m; tropical Indo-Pacific	Could occur where coral reefs are prevalent and along the west and southern tip of Tinian and Unai Dankulo	None	Species of Greatest Conservation Need
Pectinate venus/*Gafrarium pectinatum*	Sand, mud, and seagrass beds; warm tropical and subtropical water	Could occur near Unai	None	Species of Greatest Conservation Need
Day octopus/*Octopus cyanea*	Coral reefs, rocky substrates, seagrass beds; Indo-Pacific	Has been observed at Unai Babui, Unai Chulu, Lamanibot Bay, and Puntan Diablo	None	Species of Greatest Conservation Need
Corals				
Staghorn corals/*Acropora globiceps*	Near reefs within depths of 20 m from ocean surface in clear, non-turbid environments	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Rd, and Unai Dankulo	Threatened	Species of Greatest Conservation Need
Staghorn corals/*Acropora retusa*	Near reefs within depths of 20 m from ocean surface in clear, non-turbid environments	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Rd, and Unai Dankulo	Threatened	Species of Greatest Conservation Need
Staghorn corals/*Acropora speciosa*	Near reefs within depths of 20 m from ocean surface in clear, non-turbid environments	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Rd, and Unai Dankulo	Threatened	Species of Greatest Conservation Need

Common Name	*Habitat*	*Presence around Tinian*	*ESA Status*	*CNMI Status*
Stony corals/*Fimbriaphyllia paradivisa*	Found in low light environments protected from wave action	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Rd, and Unai Dankulo	Threatened	Species of Greatest Conservation Need
Isopora crateriformis	On shallow forereefs or backreef areas with strong wave action	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Rd, and Unai Dankulo	Threatened	Species of Greatest Conservation Need
Pocillopora meandrina	Shallow reefs exposed to strong wave action	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Rd, and Unai Dankulo	None	Species of Greatest Conservation Need
Fishes				
Bump head or Napoleon wrasse/*Cheilinus undulatus*	Steep outer reef slopes; warm waters of Pacific and Indian oceans	Puntan Diablo and Port of Tinian	None	Species of Greatest Conservation Need
Steephead parrotfish/*Chlorurus microrhinos*	Inshore reefs, ocean reef fronts between 2 to 50 m depth; Indo-Pacific region	Present at Puntan Diablo and Port of Tinian; also present in the southeast near Marpo Point	None	Species of Greatest Conservation Need
Marbled parrotfish/ *Leptoscarus vaigiensis*	Coral reefs, seaweed and seagrass beds; Indo-Pacific region	Present at Puntan Diablo and Port of Tinian; also present in the southeast near Marpo Point	None	Species of Greatest Conservation Need
Gray reef shark/ *Carcharhinus amblyrhynchos*	Offshore banks and reefs, 30-100 m depth	Present around southeast Tinian near Marpo Point	None	Species of Greatest Conservation Need
Oceanic white tip shark/ *Carcharhinus longimanus*	Open ocean; tropical and sub-tropical waters worldwide	Present around southeast Tinian near Marpo Point	Threatened	None
Scalloped hammerhead shark/*Sphyrna lewini*	Warm temperate and tropical waters worldwide	Present around southeast Tinian near Marpo Point	Threatened	None
Giant manta ray/*Manta birostris*	Offshore; tropical, subtropical, and temperate waters	Present around Northeast and Northwest Tinian	Threatened	None
Turtles				

Common Name	*Habitat*	*Presence around Tinian*	*ESA Status*	*CNMI Status*
Leatherback sea turtle/ *Dermochelys oriacea*	Temperate and tropical waters worldwide	When observed, commonly found around Tinian Harbor and Kammer Beach	Endangered	None
Green sea turtle/*Chelonia mydas*	Subtropical and tropical waters of the Atlantic and Pacific oceans	When observed, commonly found around Tinian Harbor and Kammer Beach	Central West Pacific DPS – Endangered East Indian-West Pacific DPS – Threatened	CNMI Endangered
Hawksbill turtle/*Eretmochelys imbricata*	Tropical coral reefs of the Pacific, Indian, and Atlantic oceans	Sightings have occurred near Puntan Diablo area	Endangered	CNMI Endangered
Loggerhead turtle/*Caretta caretta*	Worldwide in subtropical and temperate regions of Atlantic, Pacific, and Indian oceans	Could occur in pelagic waters far from shore or near Tinian Harbor, as they often seek ship channels, bays, and lagoons	North Pacific Distinct Population Segment – Endangered	None
Olive ridley turtle/*Lepidochelys olivacea*	Open ocean; tropical regions of Atlantic, Pacific, and Indian oceans	Could occur on the west side of Tinian in the soft-bottom habitats; likely to be in pelagic waters rather than near coast	Threatened	None
Mammals				
Blue whale/*Balaenoptera musculus*	All oceans except Arctic; polar feeding grounds in summer and migration towards Equator during winter	Migrate along the west side of the island to travel away from strong winds and currents on the east side	Endangered	None
Fin whale/*Balaenoptera physalus*	Found in many of the world's oceans, except extreme polar regions; deep, open ocean	Migrate along the west side of the island to travel away from strong winds and currents on the east side	Endangered	None
Humpback whale/*Megaptera novaeangliae*	Live along the coasts of all oceans	Migrate along the west side of the island to travel away from strong winds and currents on the east side	Endangered	None

Common Name	*Habitat*	*Presence around Tinian*	*ESA Status*	*CNMI Status*
Sei whale/*Balaenoptera borealis*	Subtropical, temperate, subpolar waters of Atlantic, Pacific, and Indian oceans	Migrate along the west side of the island to travel away from strong winds and currents on the east side	Endangered	None
Sperm whale/*Physeter macrocephalus*	All world's oceans; distribution dependent on food sources and conditions	Migrate along the west side of the island to travel away from strong winds and currents on the east side	Endangered	None
Dugong/*Dugong dugon*	Warm coastal waters of Indian and Pacific oceans	Unlikely to be present, but would be near coastal areas if present	Endangered	None
Spinner dolphin/*Stenella longirostris longirostris*	Nearshore waters around oceanic islands in tropical Atlantic, Indian, and Pacific oceans	Present around Tinian Harbor and Kammer Beach; present around Marpo Point	None	Species of Greatest Conservation Need

Legend: ESA = Endangered Species Act; CNMI = Commonwealth of the Northern Mariana Islands.
Source: Lisle-Clarke 2015.

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3.4.5.2 Sea Turtles

Green and hawksbill sea turtles, with respect to nesting and their terrestrial occurrence in general are discussed in Section 3.4.3. This section focuses on their occurrence in the marine environment. An estimated 351 individual green turtles were observed in 27 surveys from March 12-21, 2001. The study area covered roughly 59 percent of the total shore and outer reef perimeter of Tinian. The numerical results in this study also examined 95 percent of Aguijan's outer reef and shoreline perimeter (Kolinski et al. 2001).

A vast majority of the green sea turtles (92.8 percent) showed high foraging site fidelity and limited movements. Only 8 out of 107 tagged turtles whose tags transmitted data moved out of the home range and traveled between distinct areas on the same island, moved from one island to another, or departed the Mariana Islands. Both green and hawksbill turtles have been observed spending the majority of their time at depths of 25 meters or less. Despite this similarity, hawksbill turtles spent more time in deeper waters than green turtles and they also have longer dive durations (Kolinski et al. 2004).

3.4.5.3 Marine Protected Areas

Marine Protected Areas are specific regions of the ocean designated for the conservation and protection of marine ecosystems and biodiversity. "Protected lands and waters" are those legally designated by the federal or CNMI government primarily for conservation of natural resources. Conservation Areas, Marine Protected Areas, and National Monuments are examples of protected lands or waters. Generally, the natural habitats in protected lands and waters are prevented from being converted to developed areas and have associated regulations regarding hunting, fishing, and other uses of the area. These regulations vary among protected areas, as each has a distinct history and purpose for protection. This Marine Protected Area along the southeast coast of Tinian is distant from the Military Lease Area; the southern boundary of the Military Lease Area is 2 miles from the northern boundary of the Marine Protected Area.

3.4.5.4 Essential Fish Habitat

The primary federal law that makes up the regulatory framework for essential fish habitat is the Magnuson Stevens Fishery Conservation and Management Act or Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297). Essential Fish Habitat is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Western Pacific Regional Fisheries Management Council 2005). Essential Fish Habitat for managed fishery resources is designated in the Fishery Management Plans prepared by the local regional fisheries management council, the Western Pacific Regional Fisheries Management Council, which manages the fisheries resources for Tinian and CNMI. Habitat Areas of Particular Concern are subsets of essential fish habitat that exhibit one or more of the following traits: (1) rare, (2) stressed by development, (3) provide important ecological functions for federally managed species, or (4) are especially vulnerable to anthropogenic (human impact) degradation. Habitat areas of particular concern can cover a specific location such as a certain bank, ledge, or spawning ground, or they can cover habitat that is found in many locations (coral, nearshore nursery areas, or pupping grounds) (National Oceanic and Atmospheric Administration Fisheries 2025). See Table 3.4-5 for Essential Fish Habitat and Habitat Area around Tinian.

Table 3.4-5 Tinian Essential Fish Habitat and Habitat Area

Fishery Ecosystem Plan Management Units Species Group	*Essential Fish Habitat: Juveniles and Adults*	*Essential Fish Habitat: Eggs and Larvae*
Coral Reef Ecosystems	Water column and benthic substrate to a depth of 328 ft (100 m)	Water column and benthic substrate to a depth of 328 ft (100 m)
Bottomfish	Water column and bottom habitat down to 1,312 ft (400 m)	Water column and bottom habitat down to 1,312 ft (400 m)
Crustaceans	Bottom habitat from shoreline to a depth of 328 ft (100 m)	Water column down to 492 ft (150 m)
Pelagics	Water column down to 3,281 ft (400 m)	Water column down to 656 ft (200 m)

Legend: ft = feet; m = meters.
Note: All areas are bounded by the shoreline and the outer boundary of the exclusive economic zone, unless otherwise noted.
Source: Western Pacific Region Fisheries Management Council 2009a.

3.5 Cultural Resources

Cultural resources are the physical evidence of or places of past human activity. Several federal laws and regulations govern the identification and management of cultural resources. The term "cultural resource" applies broadly to a variety of resources subject to consideration under the National Historic Preservation Act and other similar laws. Included are historic properties, which are defined under the National Historic Preservation Act as a district, site, building, structure, or object that is eligible for or listed on the National Register of Historic Places. These also include National Historic Landmarks and traditional cultural places. Under NEPA, the consideration of cultural resources also includes other resources that are not eligible for the National Register of Historic Places, but are important to the community, such as shrines and memorials. In order to qualify for the National Register of Historic Places, a property must exhibit a quality of significance in American history, architecture, archaeology, engineering, and culture in addition to retaining integrity of location, design, setting, materials, workmanship, feeling, and association. Significance is based on the following associations:

1. Criterion A: Properties that are associated with events that have made a significant contribution to the broad pattern of our history; or
2. Criterion B: Properties that are associated with the lives of persons significant in the past; or
3. Criterion C: Properties that embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or
4. Criterion D: Properties that have yielded, or may be likely to yield, information important in prehistory or history.

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on historic properties before undertaking a project, and to afford the Advisory Council on Historic Preservation with a reasonable opportunity to comment. Federal regulation 36 C.F.R. Part 800, "Protection of Historic Properties," defines specific procedures for federal agencies to follow in complying with Section 106. Additionally, Section 110(f) of the