

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 species¹, (4) marine communities, and (5) marine special-status species.

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 shown on Figure 3.4-1 and Figure 3.4-2 and listed in Table 3.4-1. Following the table, the six most prevalent plant communities on Tinian are described, with definitions of all plant communities provided in Appendix G.

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.



Figure 3.4-1 Plant Communities on Tinian (North)



Figure 3.4-2 Plant Communities on Tinian (South)

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

<i>Plant Community</i>	<i>Acres</i>	<i>% of Total Land Cover on Tinian</i>	<i>Acres within the Military Lease Area</i>	<i>% of Total Land Cover within the Military Lease Area</i>
<i>Leucaena</i> 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
<i>Casuarina</i> 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
<i>Bambusa</i> 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 tanga-tanga (*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, tanga-tanga 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.

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.

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

<i>Common Name/ Scientific Name</i>	<i>Federal Status</i>	<i>CNMI Status</i>	<i>Habitat</i>	<i>Occurrence</i>
Birds				
Mariana common moorhen/ <i>Gallinula chloropus guami</i>	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/ <i>Megapodius laperouse</i> 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/ <i>Pteropus mariannus mariannus</i>	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/ <i>Chelonia mydas</i> ^{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/ <i>Eretmochelys imbricata</i> ^{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/ <i>Perochirus ateles</i>	-	E/T	Forested areas.	Reported at Mount Lasso and Carolinas Plateau in 2008.
Invertebrates				
Humped tree snail/ <i>Partula gibba</i> 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/ <i>Cycas micronesica</i> ²	T ²	-	Forest and savanna ecosystems.	<i>C. micronesica</i> 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.

<i>Common Name/ Scientific Name</i>	<i>Federal Status</i>	<i>CNMI Status</i>	<i>Habitat</i>	<i>Occurrence</i>
Ufa-halomtano/ <i>Heritiera longipetiolata</i>	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/ <i>Dendrobium guamense</i>	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.



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

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).

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 Final 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.

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

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

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 marine species and habitats that could be affected by training and construction activities. Marine communities that may occur in the marine environment surrounding Tinian include aquatic vegetation and marine invertebrates, fish, Essential Fish Habitat, sea turtles, and marine mammals. Marine mammals, sea turtles, marine invertebrates (e.g. corals and giant clams) and certain fish species are discussed under Marine Special Status Species (see Section 3.4.5). This section describes existing environmental conditions for marine communities that could occur within and adjacent to the Proposed Action area and may be 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 vegetation, and algae. Mangroves are not present on Tinian; instead, coastal strand vegetation—comprised of flowering plants, vines, and salt-tolerant grasses—is prevalent along portions of the coasts and beaches (Plentovich 2020). Common coastal strand plant species include 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 are widespread in nearshore waters around Tinian and are commonly associated with reef habitats, where they provide structure and food resources supporting diverse fish and invertebrate assemblages (DON 2015). Macroalgae, microalgae, coralline/red algae and turf algae all occur throughout the CNMI region. Regional inventories report 109 species of red algae, 31 species of brown algae and 71 species of green algae within CNMI waters; although island-specific algae surveys for Tinian are limited, algae are expected to be common throughout suitable nearshore habitat in the Proposed Action area (DON 2023b).

Tinian is surrounded by a shore-attached fringing reef system that covers approximately 9 square miles and includes some of the oldest and most developed reefs in the CNMI (National Oceanic and Atmospheric Administration 2018). Seven defined reef flats have been identified around Tinian: Unai Chulu, Unai Babui, Unai Dankulo, Unai Masalok, Unai Barcinas, Unai Leprosarium, and Taga Beach (DON 2015).

Macroinvertebrates are ecologically important components of CNMI reef ecosystems; however, portions of the reef structure surrounding Tinian may provide relatively limited habitat for some invertebrate groups compared to other areas in the archipelago (National Oceanic and Atmospheric Administration 2018). Recent regional assessments indicate overall declines in some invertebrate populations across the Mariana Islands, including areas around Tinian, and identify potential relationships among heat stress, human density, and habitat loss with these observed declining trends. Surveys conducted during the three years of Mariana Archipelago Reef Assessment and Monitoring Program reported relatively low abundance of giant clams, sea cucumbers, and sea urchins around Tinian compared to the other surveyed locations within the Mariana Archipelago (Waddell and Clarke 2008; Couch et al. 2023).

3.4.4.2 Fish

Fish communities around Tinian are associated with reef and nearshore habitats. A 2011 rudimentary survey of the fish population in the Tinian Marine Reserve recorded nine commonly observed reef fish families, including surgeonfishes (*Acanthuridae*), butterfly fishes (*Chaetodontidae*), groupers and seabasses (*Serranidae*), damselfishes (*Pomacentridae*), wrasses (*Labridae*), triggerfishes (*Ballistidae*), emperors or ray-finned fishes (*Lethrinidae*), and snappers *Lutjanids* (Plass-Johnson 2011).

More recent site-specific surveys of the fish population in the study areas were conducted under the Mariana Archipelago Reef Assessment and Monitoring Program in 2023. These efforts integrated multiple data streams and applied a spatial downscaling approach to evaluate ecological patterns of resilience at management-relevant scales (Gajdzik et al. 2023). Species richness, with a range of 24 to 37 species per 100 square meters, was broadly similar to values reported from earlier survey efforts in 2003. Damselfishes—many observed as juveniles—were among the most abundant taxa, with princess damsel (*Pomacentrus vaiuli*), jewel damsel (*Plectroglyphidodon lacrymatus*), and midget chromis (*Chromis acares*) particularly common. Wrasses and surgeonfishes were also frequently observed.

Across survey years, total fish biomass at the Rapid Ecological Assessment sites around Tinian was moderately low, with a mean of 3.85 kilograms per 100 square meters across the three survey years for Mariana Archipelago Reef Assessment and Monitoring Program. Island-scale comparisons indicate Tinian exhibited among the lowest biomass values in the available Mariana Islands dataset (DON 2023b; 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, and Essential Fish Habitat, as regulated under the Magnuson-Stevens Fishery Conservation and Management Act. Marine mammals and sea turtles, as well as select invertebrate and fish taxa of conservation concern (e.g., corals and giant clams), are discussed in the following sections.

3.4.5.1 Marine Mammals

Several species of marine mammals are known to occur or potentially occur in the waters around Tinian. Multiple scientific field surveys documented the presence of whales and dolphins, including photo-documentation sightings of short-finned pilot whales (*Globicephala macrorhynchus*), and sperm whale (*Physeter macrocephalus*), spinner dolphin (*Stenella longirostris*), 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. In addition to the whales and dolphins listed above, some marine mammals not listed under the Endangered Species Act include the common minke whale (*Balaenoptera acutorostrata*), short-finned pilot whale (*Globicephala macrorhynchus*), false killer whale (*Pseudorca crassidens*), melon-headed whale (*Peponocephala electra*), bottlenose dolphin (*Tursiops truncatus*), pantropical spotted dolphin (*Stenella attenuata*), Blainville's beaked whale (*Mesoplodon densirostris*), and Cuvier's beaked whale (*Ziphius cavirostris*) (DON 2023b).

“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 ESA-listed and CNMI-listed species that could occur in the marine environment surrounding Tinian. This table compiles species that could occur based on habitat suitability and available records from Tinian and the surrounding region. It does not indicate confirmed or likely presence for all species; species may be included even if they have not been documented in the Proposed Action area. Inclusion of a species in this table should not be interpreted as evidence of regular or expected presence within the project area.

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Table 3.4-4 Federally Listed and CNMI-listed Marine Species that May Occur Around Tinian

<i>Common Name</i>	<i>Habitat</i>	<i>Presence around Tinian</i>	<i>ESA Status</i>	<i>CNMI Status</i>
Invertebrates				
Smooth Giant Clam/ <i>Tridacna derasa</i>	Offshore coral reefs, preferring clear, oceanic waters in depths of 4-25 meters (Neo et al. 2017)	Has historical occurrence in the CNMI; due to reintroduction efforts, the USMC considers the species to be potentially present in the area (Rippe et al. 2024)	Proposed Endangered	Species of Greatest Conservation Need
True Giant Clam/ <i>Tridacna gigas</i>	Reefs, sand, rock, dead corals rubble, seagrass beds, macroalgae; inhabit depths of 2-20 meters (NMFS 2024a)	Has historical occurrence in the CNMI; due to reintroduction efforts, the USMC considers the species to be potentially present in the area (Rippe et al. 2024)	Proposed Endangered	Species of Greatest Conservation Need
Giant Horse’s Hoof Clam/ <i>Hippopus hippopus</i>	Seagrass habitats, sand flats, and atoll lagoonal reefs; occur in depths of 10 meters or less (Neo et al. 2017)	Expected to be extremely rare or absent around Tinian and the CNMI (Rippe et al. 2024)	Proposed Threatened	Species of Greatest Conservation Need
Triton’s trumpet shell/ <i>Charonia tritonis</i>	Temperate and tropical waters worldwide in coral rich habitats	Documented along the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017); presence possible but would be considered rare	None	Species of Greatest Conservation Need
Common spider conch/ <i>Lambis lambis</i>	Indo-West Pacific; reef flats and shallow water coral-rubble bottoms	Documented along the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017); presence possible but would be considered rare	None	Species of Greatest Conservation Need
Silver-mouthed turban snail/ <i>Turbo argyrostomus</i>	Tropical Indo-Pacific on hard substrate and coral reefs	Could occur in suitable reef habitats or along Tinian’s eastern coast; documented as “common” around the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need
Tapestry turban/ <i>Turbo spp.</i>	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; documented around the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need

<i>Common Name</i>	<i>Habitat</i>	<i>Presence around Tinian</i>	<i>ESA Status</i>	<i>CNMI Status</i>
Rough turban/ <i>Turbo spp.</i>	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; documented as “common” around the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need
Longlegged spiny lobster/ <i>Panulirus spp.</i>	Rocky and coral reefs, usually depths less than 18 m	Documented around the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need
Pronghorn spiny lobster/ <i>Panulirus spp.</i>	Rocky and coral reefs, usually depths less than 18 m; tropical Indo-Pacific	Documented around the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need
Painted spiny lobster/ <i>Panulirus spp.</i>	Rocky and coral reefs, usually depths less than 18 m; tropical Indo-Pacific	Documented around the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need
Corals				
Staghorn corals/ <i>Acropora globiceps</i>	Near reefs within depths of 20 m from ocean surface in clear, non-turbid environments (Maynard et al. 2015; NMFS 2023)	Present along west shoreline near Lamanibot Bay, south end, east shoreline until Masalok Beach Road, and Unai Chulu (Maynard et al. 2015)	Threatened	Species of Greatest Conservation Need
Fishes				
Bump head or Napoleon wrasse/ <i>Cheilinus undulatus</i>	Steep outer reef slopes; warm waters of Pacific and Indian oceans	Documented along the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017); presence possible, but would be considered rare	None	Species of Greatest Conservation Need
Steephead parrotfish/ <i>Chlorurus microrhinos</i>	Inshore reefs, ocean reef fronts between 2 to 50 m depth; Indo-Pacific region (Liske-Clark 2015)	Have been observed around Tinian (Liske-Clark 2015); occurrence possible	None	Species of Greatest Conservation Need
Gray reef shark/ <i>Carcharhinus amblyrhynchos</i>	Offshore banks and reefs, 30-100 m depth	Documented along the leeward coast of Tinian in 2017 (NAVFAC Pacific 2017); presence possible but in low abundance	None	Species of Greatest Conservation Need
Oceanic white tip shark/ <i>Carcharhinus longimanus</i>	Open ocean; tropical and subtropical waters worldwide; depths down to at least 152 m (Young et al. 2017)	Presence possible, particularly while transiting through deeper waters just north of Tinian (NMFS 2024b)	Threatened	None

<i>Common Name</i>	<i>Habitat</i>	<i>Presence around Tinian</i>	<i>ESA Status</i>	<i>CNMI Status</i>
Scalloped hammerhead shark/ <i>Sphyrna lewini</i>	Warm temperate and tropical waters worldwide between 46°N and 36°S (Miller et al. 2014)	Presence considered possible in offshore pelagic/shelf-edge waters near Tinian, due to their highly mobile and migratory behavior (Budd et al. 2021)	Indo-West Pacific DPS –Threatened	None
Giant manta ray/ <i>Manta birostris</i>	Found in coastal waters near shorelines and offshore waters; often near productive areas, seamounts, and shelf edges; tropical, subtropical, and temperate waters (NMFS 2020)	Presence considered possible, particularly through deeper waters just north of Tinian, due to their migratory behavior (Hearn et al. 2014)	Threatened	None
Turtles				
Leatherback sea turtle/ <i>Dermochelys coriacea</i>	Found in temperate and tropical waters worldwide; up to 250 m depth (NMFS 2020)	Rare; pelagic/offshore; may transit through regional waters; occasional sightings/strandings possible due to their migratory behavior (NMFS 2020)	Endangered	None
Green sea turtle/ <i>Chelonia mydas</i>	Found in subtropical and tropical waters of the Atlantic, and Pacific, and Indian Oceans and in the Mediterranean Sea (NMFS 2020; Gaos et al. 2024)	Present in many areas around Tinian, including around Tinian Harbor and Babui Beach (Gaos et al. 2024)	Central West Pacific Ocean DPS – Endangered East Indian-West Pacific Ocean DPS – Threatened	CNMI Endangered
Hawksbill turtle/ <i>Eretmochelys imbricata</i>	Found in tropical and subtropical waters of all of the world’s major oceans (NMFS 2020); inlets, bays, coastal lagoons (King 2011)	Present in many areas around Tinian, including Tinian Harbor and Fleming Point (Gaos et al. 2024)	Endangered	CNMI Endangered
Loggerhead turtle/ <i>Caretta caretta</i>	Found worldwide in subtropical and temperate regions of Atlantic, Pacific, and Indian oceans; 0-20 m depth (NMFS 2020)	Could occur in pelagic waters far from shore; presence considered possible due to their migratory behavior (Navy 2018)	North Pacific Ocean DPS – Endangered	None

<i>Common Name</i>	<i>Habitat</i>	<i>Presence around Tinian</i>	<i>ESA Status</i>	<i>CNMI Status</i>
Olive ridley turtle/ <i>Lepidochelys olivacea</i>	Found primarily in the open ocean; tropical regions of Atlantic, Pacific, and Indian oceans; up to 150 m depth (NMFS 2024c)	Could occur in pelagic waters far offshore on the west side of Tinian in the soft-bottom habitats; however, occurrence would be considered rare (Navy 2020)	Threatened	None
Mammals				
Blue whale/ <i>Balaenoptera musculus</i>	All oceans, although they seem to avoid tropical waters; found in coastal waters, but seem to prefer offshore (NMFS 2020)	Could migrate through deepwater areas along the west side of the island during winter months (NMFS 2020)	Endangered	None
Fin whale/ <i>Balaenoptera physalus</i>	Found in many of the world's oceans; deep, open ocean (NMFS 2020)	Presence considered rare within the Proposed Action area (Fulling et al. 2011)	Endangered	None
Humpback whale/ <i>Megaptera novaeangliae</i>	Live along the coasts of all oceans (Reeves et al. 2002)	Could migrate through waters around Tinian; more expected near reproductive areas around Saipan (Hill et al. 2020a)	Endangered-Western North Pacific Ocean DPS	None
Sei whale/ <i>Balaenoptera borealis</i>	Subtropical, temperate, subpolar waters of Atlantic, Pacific, and Indian oceans (NMFS 2020)	Sightings have occurred south of Saipan; presence around Tinian considered possible due to their close proximity and migratory behavior (Norris et al. 2012)	Endangered	None
Sperm whale/ <i>Physeter macrocephalus</i>	All world's oceans; distribution dependent on food sources and conditions (NMFS 2020)	Presence within the Proposed Action Area considered likely due to encounters within the CNMI (Hill et al. 2017, 2018)	Endangered	None
Spinner dolphin/ <i>Stenella longirostris</i>	Nearshore waters around oceanic islands in tropical Atlantic, Indian, and Pacific oceans	Documented near Tinian in 2017 (NAVFAC Pacific 2017)	None	Species of Greatest Conservation Need

Legend: 46°N and 36°S = circles of latitude between the 46th parallel north and 36th parallel south; CNMI = Commonwealth of the Northern Mariana Islands; DPS = Distinct Population Segment; ESA = Endangered Species Act; m = meters; NAVFAC = Naval Facilities Engineering Systems Command; NMFS = National Marine Fisheries Service; USMC = United States Marine Corps

Source: Budd et al. 2021; Gaos et al. 2024; Fulling et al. 2011; King 2011; Hearn et al. 2014; Hill et al. 2018, 2017; Lisle-Clarke 2015; Maynard et al. 2015; Miller et al. 2014; Navy 2018, 2020; NMFS 2020, 2023, 2024a, 2024b, 2024c; Norris et al. 2012; Reeves et al. 2002; Rippe et al. 2024.

3.4.5.2 Sea Turtles

Green and hawksbill sea turtles, with respect to nesting and their terrestrial occurrence, are discussed in Section 3.4.3. This section focuses on their occurrence in the marine environment. Green sea turtles are the predominant sea turtle species in the Mariana Islands, accounting for 85 percent of turtles captured in-water in Guam (Martin et al. 2016) and 93 percent of turtles captured in-water in the CNMI (Summers et al. 2018). Long-term data from Guam corroborates this abundance; fifty years of aerial surveys suggest that the numbers of both green and hawksbill sea turtles have increased by an order of magnitude since the 1960's (Martin et al. 2016).

Genetic research indicates that most green sea turtles foraging in the Mariana Islands originate from nesting beaches in the Republic of the Marshall Islands, with additional contributions from nesting areas in the Federated States of Micronesia and other locations (Michael Jensen, Personal Communication, March 15, 2021, as cited in Gaos et al. 2024). Hawksbill sea turtles in the region exhibit migratory connectivity among Micronesian islands; for example, Gaos et al. (2024) documented a hawksbill sea turtle that traveled from foraging grounds around Tinian to take up long-term residency, likely for foraging, in the Federated States of Micronesia.

Navy-funded in-water research conducted between 2013 and 2023 in the Mariana Islands tagged and tracked green and hawksbill sea turtles to characterize habitat use. Surveys around Tinian found that green and hawksbill sea turtles are most commonly associated with broad, relatively shallow substrates, such as seagrass flats or rocky and coral patch reefs, rather than steep cliffs or drop-offs. Green and hawksbill sea turtles were observed at most survey locations; however, green sea turtles were far more numerous, outnumbering hawksbills by an approximate ratio of 10:1 (Gaos et al. 2024).

3.4.5.3 Marine Invertebrates (Corals and Giant Clams)

In 2014, 15 Indo-Pacific corals were listed as threatened under the Endangered Species Act (79 FR 53852, September 10, 2014). The coral species, *A. globiceps*, has been documented within the waters around Tinian. Occurrence of this species around Tinian is primarily found in high-relief forereef habitats such as spur-and-groove and aggregate reef to 12 m of depth. The species is much less common or absent in other habitats like those dominated by rubble and pavement such as Tinian's reef flats, reef crests, and low-relief forereefs (National Marine Fisheries Service 2024d). In a 2017 survey, colonies of *A. globiceps* were noted in various locations, including Unai Babui, Puntan Diablo, Unai Chulu, Puntan Lamanibot, Atgidon, and Barcinas Bay (DON 2017).

On 25 July 2024, National Marine Fisheries Service proposed to classify five giant clam species as endangered under the Endangered Species Act, while five were proposed as threatened. No critical habitat has been proposed for the proposed giant clams that occur within U.S. jurisdiction, given that NMFS stated that critical habitat was not yet determinable. *H. porcellanus*, *T. mbalavuana*, *T. squamosina*, *T. derasa*, and *T. gigas* are proposed as endangered species based on their own extinction risk, while *H. hippopus* is proposed as a threatened species based on its own extinction risk. Of the six species proposed for ESA listing based on their own extinction risk, best available science indicates that *T. derasa*, *T. gigas*, and *H. hippopus* have been documented within the CNMI and are considered native. Their occurrence is consequently considered to be possible within the Proposed Action area. However, they are likely very rare in the CNMI or extirpated, likely due to overutilization (Wells 1997).

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. To reduce the complexity and the number of Essential Fish Habitat identifications required for individual species and life stages, the Western Pacific Regional Fishery Management Council designated Essential Fish Habitat for bottomfish and pelagic Management Unit Species based on the ecological relationships among species and their preferred habitat. 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). Table 3.4-5 presents the Essential Fish Habitat and Habitat Areas of Particular Concern designations provided by the Western Pacific Regional Fishery Management Council.

Table 3.4-5 Essential Fish Habitat and Habitat Areas of Particular Concern for Bottomfish and Pelagic Management Unit Systems

<i>Fishery Ecosystem Plan (Fishery)</i>	<i>Stock or Complex</i>	<i>Life Stage(s)</i>	<i>Essential Fish Habitat Designation</i>	<i>Habitat Area of Pacific Concern</i>
Mariana Archipelago (Bottomfish)	Shallow- and deep-water complexes	Egg / larval	Water column extending from the shoreline to the outer limit of the exclusive economic zone, down to a depth of 400 m	All slopes and escarpments between 40 m and 280 m
Mariana Archipelago (Bottomfish)	Shallow- and deep-water	Juvenile / adult	Water column and all bottom habitat extending from the shoreline to a depth of 400 m	All slopes and escarpments between 40 m and 280 m
Pacific Pelagic (All Pelagic Fisheries)	Tropical and temperate	Egg / larval	Water column extending from the shoreline to the outer limit of the exclusive economic zone, down to a depth of 200 m	Water column down to a depth of 1,000 m above all seamounts and banks with summits shallower than 2,000 m within the exclusive economic zone
Pacific Pelagic (All Pelagic Fisheries)	Tropical and temperate	Juvenile / adult	Water column down to a depth of 1,000 m	Water column down to a depth of 1,000 m above all seamounts and banks with summits shallower than 2,000 m within the exclusive economic zone

Legend: m = meters.

Source: Western Pacific Region Fisheries Management Council 2009a, 2009b.