



ASAN AND AGAT UNITS MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT

PART 3 of 4 – Chapter 3 and 4

WAR IN THE PACIFIC NATIONAL HISTORICAL PARK



January 2024

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AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3





Beach at Apaca Point in the Agat Unit, Photo: NPS

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter combines discussion of the affected environment and environmental consequences and is arranged by impact topic. It was prepared under the guidance of the NPS NEPA Handbook (2015) and 2022 NEPA regulations issued by the Council on Environmental Quality (CEQ 2022b).

The affected environment describes the physical, biological, cultural, and social environments of the planning area that could be affected from implementing the alternatives described in chapter 2. Effects (or impacts) mean changes to the environment that are reasonably foreseeable and include the following:

- Direct, which are caused by the action and occur at the same time and place,
- Indirect, which are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable, or
- Cumulative, which are caused by the action's incremental effects when added to the effects of other past, present, and reasonably foreseeable actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions.

Direct and indirect effects are discussed for each alternative and impact topic. Cumulative effects are discussed at the end of each impact topic.

Impacts are also described in terms of duration, whether short-term or long-term:

- A short-term impact is temporary, generally lasting for the duration of the project activities or construction period associated with project activities.
- A long-term impact is typically an effect that would last several years or more beyond the date the project is fully implemented.

IMPACT TOPICS ANALYZED IN DETAIL

The NPS followed the criteria in the 2015 NEPA Handbook to identify environmental issues and impact topics to analyze in detail in this chapter. The list of impact topics was developed based on internal NPS scoping, agency consultation, and public meetings and communications. Impact topics dismissed from detailed analysis are described in appendix C.

The following impact topics have been retained for analysis:

- Floodplains
- Threatened and Endangered Species
- Invasive Species Management
- Cultural Landscapes
- Ethnographic Resources
- Historic Structures
- Archeological Resources
- Visitor Use and Experience

Floodplains

The Asan Beach and Agat Units regularly experience coastal flooding due to storm surge, which is projected to increase with sea level rise: see the Climate Change Scenario Planning section of chapter 1. The units also experience overland flooding from storms with intense rainfall. Most recently, these coastal park units received significant coastal and overland flooding from Typhoon Mawar in May 2023.

Floodplain Management, Executive Order 11988 issued in May 1977, directs all federal agencies to avoid to the extent possible both long- and short-term adverse effects associated with occupancy, modification, and development in floodplains. Floodplains are defined in this order as “the lowland

and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a 1% or greater chance of flooding in any given year.” Areas subject to a 1% or greater chance of flooding annually are also known as 100-year flood zones.

NPS proposed actions that may adversely affect floodplains must also comply with Director’s Order #77-2: Floodplain Management, which requires the preparation of a Floodplain Statement of Findings if the action falls within the defined regulatory floodplain. Appendix E: Floodplain Statement of Findings describes the general nature of floodplain processes within the planning area and their associated site-specific flood risk.

DATA SOURCES ANALYZED

Three data sources inform the affected environment and analysis of environmental consequences. The first is the sea level rise and storm surge model developed by the US Geological Survey (USGS) Coastal and Marine Hazards and Resources Program (USGS 2023a). This model provides seven different sea level rise scenarios modeled with a one-year, 20-year, and 100-year storm. This is the first government-approved storm wave and surge flood modeling undertaken for Guam, Saipan, American Samoa, and Hawai’i and represents the most updated and site-specific projections for coastal flooding within the park. Appendix E illustrates several of the storm surge scenarios proposed under this model.

The second data source is provided by the Federal Emergency Management Agency (FEMA) in the form of Flood Insurance Rate Maps (FIRM) developed in 2007 that identify special flood hazard areas. These hazard areas include riverine and pluvial (from rainfall) flooding in addition to coastal flooding. Because the FEMA coastal data is not as current as the USGS model, the planning team has based the analysis on the USGS data for coastal areas and the FEMA data for overland and riverine flooding.

The third data source is the tsunami evacuation zone for Guam, modeled in 2009 by the National Oceanic and Atmospheric Administration (NOAA) Pacific Marine Environmental Lab. NOAA modeled five bays vulnerable to tsunami damage, including Apra Harbor, Tumon Bay, Pago Bay, Agana Bay, and Inarajan Bay. This was done by developing digital elevation models for the bays and testing them against historical data and preliminary worst-case inundation scenarios. Appendix E provides additional descriptions of these data sources.

AFFECTED ENVIRONMENT

Coastal Flooding

Based on the USGS coastal flooding model, the planning area already experiences vulnerability to flooding from the annual storm at current sea levels. Under these current conditions at Asan Beach Unit, the Punta Assan (Asan Point) area is flooded up to the base of Assan Ridge. Flooding also occurs along the coastline and at the mouth of the Saddok Assan (Asan River).

At Agat, Rizal and Apaca Points experience very minor flooding at current sea levels with a one-year storm. Ga’an Point receives significantly more flooding, particularly in the area west of the current restroom and at the mouth of the existing drainage. At current sea levels, the 20-year and 100-year storms substantively increase flooding within the coastal units, with the most significant impacts to Ga’an Point.

Inundation of the planning area from storm surge is expected to increase over time with sea level rise and storm systems of growing intensity, as illustrated by the model’s projections. As described in chapter 2, the park has identified two sea level rise scenarios to inform the two phases outlined in the proposed action. The first scenario and phase correspond to a 0.8-foot (25-centimeter) rise in sea level, and the second scenario corresponds to a 4.9-foot (150-centimeter) rise in sea level. As the maps in appendix E demonstrate, areas that will experience the greatest impacts from coastal flooding across all scenarios are:

Asan Beach Unit

- Punta Assan and the low-lying areas to the east of Assan Ridge
- The mouth of the Saddok Assan and eastern edges of the grassy open space
- For 100-year storms, the entire unit is impacted except for the high ground at Assan Ridge.

Agat Unit: Apaca and Rizal Points

- Areas near the Apaca Point parking and picnic areas
- The lower-lying area between Apaca and Rizal Points
- Wetlands north of the mouth of the Saddok Ñāmu (Namo River)
- For 100-year storms at the 4.9-foot (150-centimeter) sea level, most of the site is impacted except for the higher ground at Rizal Point.

Agat Unit: Ga'an Point

- The majority of the site is flooded at the projected 20-year storm at current sea level, except for the water treatment plant to the south that is within the boundary and on Government of Guam land.
- For 100-year storms, the NPS-owned and -managed site is projected to be fully flooded.

The three coastal sites of Asan Beach, Apaca and Rizal Points, and Ga'an Point are also included in Guam's tsunami evacuation zone, as noted above.

Riverine and Pluvial Flooding

FEMA FIRM maps for Guam include areas prone to riverine and pluvial flooding. In addition to coastal flood hazard zones, the FEMA maps illustrate a 500-year floodplain (area with a 0.2% chance of flooding annually) within the Asan Beach and Asan Inland Units in the vicinity of the Saddok Assan, as well as along the Saddok Matgue (Matgue River) primarily in the Asan Inland Unit. The Saddok Assan is additionally identified as a regulatory floodway within the coastal flood hazard zone. The FEMA FIRM maps do not indicate any

other pluvial or riverine flooding zones within the four units.

Most overland flooding zones mapped by FEMA are included within the projected flooding zones from the USGS coastal model, with the exception of the Saddok Matgue 500-year floodplain. Although coastal, riverine, and pluvial flooding are described separately, this is due to the limitations of current models. In reality, coastal and overland flooding will interact in a storm situation to exacerbate the effects of each. Rising groundwater will also likely occur due to sea level rise and would further increase flooding. Anecdotal, park staff have observed pluvial flooding from strong storm systems occur in lower areas of the park that are also projected to flood in the coastal storm surge model. These include the vulnerable parking areas and area surrounding the restroom at Asan Beach Unit, the river drainage near the restroom at Ga'an Point, and the parking and picnic areas at Apaca Point. Under all scenarios, inundation of park resources and facilities in the units adjacent to the ocean is expected to increase over time. Appendix E: Floodplain Statement of Findings includes additional descriptions of floodplain characteristics and flood risk.

ENVIRONMENTAL CONSEQUENCES

Impacts from Alternative A: No-Action Alternative

Under the no-action alternative, coastal flooding would continue to affect the Asan Beach and Agat Units. Limited development, such as walkways, parking areas, and restrooms, would remain within the floodplain and continue to impede natural floodplain processes to a minor degree. The park would continue vegetation management activities to maintain the health of existing shoreline vegetation, resulting in minor beneficial impacts to floodplain processes. Under all sea level rise and storm surge scenarios, flooding within the units adjacent to the ocean is expected to increase over time.

Impacts from Alternative B: Preferred Alternative

As in alternative A, the park's coastal units would continue to be vulnerable to coastal and overland flooding. The preferred alternative would promote the removal or relocation of facilities and related structures within floodplains (such as restrooms, parking lots, and picnic tables) and would substantially increase native vegetation along shorelines, at the mouths of rivers, and in wetland areas to protect against storm surge and better absorb overland flooding.

The removal of visitor facilities from areas prone to inundation and erosion would have long-term beneficial impacts on floodplains by restoring coastal floodplain functions. Facilities that are relocated and reconstructed would utilize materials and construction techniques that impede floodplain processes as little as possible. These include using pervious materials, such as crushed coral for pathways, and installing structures such as raised portable restrooms or interpretive kiosks to allow water to flow through or underneath with minimal damage.

Conclusion

Floodplain processes would continue largely unimpeded under both alternatives A and B. However, when compared with alternative A, the actions proposed in alternative B would further restore natural floodplain processes by removing infrastructure along the shoreline and restoring coastal vegetation. This would result in long-term beneficial impacts to floodplains.

Cumulative Impacts

There are no past or present NPS projects within the planning area or on adjacent lands that would result in cumulative impacts when analyzed with the preferred alternative. The US Army Corps of Engineers (USACE) has recently funded a project to protect the Hågat Mayor's Office from the threat of sea level rise. The proposed action is not yet known, but USACE is considering two alternatives: a rock revetment and a seawall. Both proposed project alternatives could impact floodplain processes within the Agat Unit of

the planning area. Since compliance has not yet been undertaken, the impacts on park resources, including floodplain processes, are unknown at this time.

In addition, the Guam Department of Public Works has proposed two future projects for Assan: (1) a replacement of the Asan Bridge along Marine Corps Drive (Route 1) and (2) pavement hardening of Marine Corps Drive through the village. Both projects are expected to occur primarily within the footprint of the existing road prism and immediate vicinity. The impacts from alternative B would not add appreciably to these cumulative effects, given that the proposed action doesn't result in adverse effects to floodplains, and both of these improvement projects would be expected to follow all applicable laws and site-specific mitigation regarding flooding and associated flood risk.

Threatened and Endangered Species

AFFECTED ENVIRONMENT

The forest, freshwater, and marine resources within park boundaries rank War in the Pacific National Historical Park as the most biologically diverse park in the national park system. The planning area therefore includes an exceptional variety of species found in terrestrial, aquatic, and marine ecosystems. As an island, Guam has historically provided habitat for a rich array of unique and endemic species. However, the isolation of Guam's ecosystems has also made them more vulnerable to species extinction. Since World War II, the island's fragile ecological communities have suffered devastating impacts from invasive species, development and urbanization, military activities, hunting, and climate change.

Wildlife species diversity is negatively affected by the proliferation of invasive, introduced predators. For example, almost all native bird species that were present four decades ago in the park are now locally extinct or extinct in the wild because of the invasive brown tree snake (*Boiga irregularis*), which preys on eggs, chicks, and small adults. A total of 29

species of birds have been recorded within the park. Two of these, the yāyaguak (Mariana gray swiftlet or *Aerodramus vanikorensis bartschi*) and pulåttat (Mariana common moorhen or *Gallinula chloropus guami*), are native terrestrial species; two are migratory raptors that visit occasionally; six are invasive terrestrial species; three are native freshwater or wetland species; eight are shore birds; and eight are seabirds (Donaldson et al. 2017).

Additionally, four native terrestrial bird species were extirpated from the park: the ko'ko' (Guam rail or *Hypotaenidia owstoni*), the sihek (Micronesian kingfisher or *Halcyon cinnamomina cinnamomina*), the sālì (Micronesian starling or *Aplonis opaca*), and the āga (Mariana crow or *Corvus kubaryi*). Of these, only the sālì may still be found in the wild on Guam. Another ten species of native terrestrial, aquatic, and sea birds may have resided within the park historically but have been extirpated from Guam or are extinct in the wild. An additional 48 species have been reported as visitors to Guam but have not been recorded within the park (Donaldson et al. 2017).

In contrast, no aquatic plants, invertebrates, fish, or amphibians found in freshwater habitats are known to be threatened or endangered in the park. However, the freshwater eels *Anguilla bicolor* and *A. marmorata* are species of concern due to climate change and effects of overfishing. The park also protects over 175 native plant species, many of which can be found in the planning area (Donaldson et al. 2017). Of these, three species are endangered and two are listed as threatened. In addition, the endangered Guam tree snail (*Partula radiolata*) is found within the Asan Beach and Asan Inland Units, and two additional endangered tree snails have the potential to occur within the planning area.

In terms of the marine ecosystem, the coral reefs at the Asan Beach and Agat Units are distinct from one another, resulting in much greater biodiversity than what would be found in a single reef system. This is due to the difference in reef character between the Asan Beach Unit (exposed) and the Agat Unit

(comparatively sheltered), which effects the structure and assemblage of the coral species and the type of fish inhabiting the reefs (Donaldson et al. 2017).

Future trends for threatened and endangered species are dependent on the ability of the park and partnering agencies and organizations to manage and minimize nonnative species proliferation, and other concerns such as poaching and habitat degradation. Additionally, climate change is expected to play a considerable role through correlated changes in precipitation and storm intensity that will affect the habitat and means of survival for many of the special species discussed in this plan. Direct intervention by the park and partnering agencies and organizations is expected to continue for the foreseeable future to prevent extinction of species within the planning area. The park is optimistic that future efforts to combat threats to listed species, such as brown tree snake removal, will assist in the direct repopulation and proliferation of many of the threatened and endangered species discussed in this section.

The park obtained a list of threatened and endangered species that could occur within the planning area from the US Fish and Wildlife Service (USFWS) on August 14, 2023, via the USFWS Information for Planning and Consultation project collection tool. Due to the size of the island, the NPS conservatively estimated the boundaries of the project to include all of Guam, given priorities in the plan to increase biodiversity and enhance partnerships to increase habitat for protected species on the island to the extent feasible. The NPS further relied on information in the draft natural resources condition assessment (Donaldson et al. 2017) and the 2020 and 2023 *Federal Register* notices for proposed designation of critical habitat for Indo-Pacific corals and the haggan betde (green sea turtle or *Chelonia mydas*).

Table 3.1: Threatened and Endangered Species That May Occur in the Planning Area

CHAMORU NAME	ENGLISH NAME	SCIENTIFIC NAME	STATUS	CRITICAL HABITAT PRESENT IN PLANNING AREA
Mammals				
Fanihi	Mariana Fruit Bat	<i>Pteropus mariannus mariannus</i>	Threatened	Designated Critical Habitat but not in Planning Area
Birds				
Pulåttat	Mariana Common Moorhen	<i>Gallinula chloropus guami</i>	Endangered	No
Yåyaguak	Mariana Gray Swiftlet	<i>Aerodramus vanikorensis bartschi</i>	Endangered	No
Reptiles				
Haggan or Haggan Betde	Green Sea Turtle	<i>Chelonia mydas</i>	Endangered	Yes: Proposed Critical Habitat
Haggan Karai	Hawksbill Turtle	<i>Eretmochelys imbricata brissa</i>	Endangered	No
Gastropods				
Akaleha'	Guam Tree Snail	<i>Partula radiolata</i>	Endangered	No
Akaleha'	Humped Tree Snail	<i>Partula gibba</i>	Endangered	No
Akaleha'	Fragile Tree Snail	<i>Samoana fragilis</i>	Endangered	No
Insects				
Ababbang	Mariana Eight-spot Butterfly	<i>Hypolimnys octocula marianensis</i>	Endangered	No
Flowering Plants				
Aplokating-palaoan	-	<i>Psychotria malaspinae</i>	Endangered	No
Pau Dedu	-	<i>Hedyotis megalantha</i>	Endangered	No

CHAMORU NAME	ENGLISH NAME	SCIENTIFIC NAME	STATUS	CRITICAL HABITAT PRESENT IN PLANNING AREA
-	-	<i>Tinospora homsepala</i>	Endangered	No
-	-	<i>Tuberolabium guamense</i>	Threatened	No
Conifers and Cycads				
Fadang	Cycad	<i>Cycas micronesica</i>	Threatened	No
Sharks				
Ulon Matiyu na Halu'u	Scalloped Hammerhead Shark	<i>Sphyrna lewini</i>	Threatened	No
Coral				
Kuraling	Coral	<i>Acropora globiceps</i>	Threatened	Yes: Proposed Critical Habitat
Kuraling	Coral	<i>Acropora retusa</i>	Threatened	Yes: Proposed Critical Habitat
Kuraling	Coral	<i>Seriatopora aculeata</i>	Threatened	Yes: Proposed Critical Habitat

Based on these sources of information, the park has identified that the species and proposed critical habitats listed in table 3.1 have the potential to occur within the planning area. The following discussion provides a brief overview of the habitat requirements and current threats facing each of those species.

Mammals

Pteropus mariannus mariannus Fanihi (Mariana Fruit Bat)

The fanihi inhabits mangroves, limestone forests, and coastal areas in northern Guam. Roosting fanihi are typically located near or on cliff lines or at other locations protected from strong winds and human disturbances. At night, they forage widely on nectar, fruit, and leaves of various native plant species, primarily in limestone forest. Fanihi is an important traditional food in CHamoru culture. The primary threats to this species include habitat loss and overhunting. Historically, fanihi were found in habitats within the park's boundaries but have since been extirpated from the planning area. It is not known if this species currently forages within the park (Donaldson et al. 2017).

Birds

Most native bird species on Guam are locally extinct or extinct in the wild due to decimation by the brown tree snake. Feral cats, feral dogs, and rats also prey upon bird species and are considered a threat. Of the federally listed bird species on the island, two are known to occur within the planning area.

Gallinula chloropus guami Pulåttat (Mariana Common Moorhen)

The pulåttat is a member of a species found worldwide; the Mariana subspecies is endemic to the Mariana Islands. The pulåttat is a nonmigratory freshwater wetland dweller and may be found along the Saddok Assan in Asan Inland Unit and the Saddok Ñåmu, near Apaca Point in the Agat Unit (Donaldson et al. 2017). It typically inhabits tropical freshwater lakes, marshes, swamps, and wet rice paddies and prefers open water fringed by emergent aquatic plants. The pulåttat requires permanent wetland habitats, and threats include habitat loss and degradation

of wetlands, predation, military activities, poaching, and climate change (USFWS 2020a).

Aerodramus vanikorensis bartschi Yâyaguak (Mariana Gray Swiftlet)

The yâyaguak is one of the few remaining birds found in Guam's forests. The yâyaguak is a terrestrial species endemic to Guam and several other islands in the Mariana archipelago. This species has been reported to forage over a wide variety of habitats including grasslands, limestone forest, ravine forest, and coconut groves. The yâyaguak roosts exclusively in caves. However, the species has declined on Guam due to the brown tree snake, habitat loss, nest loss due to nonnative insects, and climate change (USFWS 2020b). The yâyaguak has been recorded within the park and may occur incidentally within the Mt. Alifan Unit, because it is known to nest in a cave in the nearby Naval Magazine (Donaldson et al. 2017).

Reptiles

Chelonia mydas Haggan or Haggan Betde (Green Sea Turtle)

The haggan betde is found in coastal waters, primarily in tropical and subtropical areas, including around Guam (USFWS 2023a). It spends almost its entire life in the ocean but uses beaches for egg laying. There are 11 distinct population segments worldwide, which vary in species status and threats: the Marianas are part of the Central West Pacific distinct population segment (DPS), which is considered endangered. The park's draft natural resources condition assessment indicates that sea turtle nesting has not been reported at either of the two coastal units to date (Donaldson et al. 2017). However, aerial surveys of Guam's inshore coastal habitats, conducted by Guam's Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR), have identified sea turtles in the waters offshore of the two units, with higher densities at Agat than at Asan Beach Unit (Ibid.). Threats to the Central West Pacific DPS include habitat loss (including destruction, barriers to nesting habitat, and alterations due to both human activities and climate change), hunting and egg gathering,

predation, fisheries bycatch, vessel strikes, and ingestion of or entanglement with marine debris.

Proposed Critical Habitat for Haggan Betde

The proposed critical habitat for the Central West Pacific DPS of the haggan betde extends around the entire island of Guam, including offshore of the Asan Beach and Agat Units (NOAA 2023d). The proposed critical habitat covers the area from the mean high-water line to 66 feet (20 meters) in depth and includes the following essential physical and biological features needed to support turtle reproduction, foraging, and nesting:

- Sufficiently dark and unobstructed nearshore waters adjacent to nesting beaches to allow for transit, mating, and internesting of reproductive individuals, and the transit of posthatchlings; and
- Underwater refugia and food resources (i.e., seagrasses, macroalgae, and/or invertebrates) of sufficient condition, distribution, diversity, abundance, and density to support survival, development, growth, and/or reproduction.

Eretmochelys imbricata brissa Haggan Karai (Hawksbill Sea Turtle)

The haggan karai inhabits shallow coastal waters throughout tropical and subtropical regions, including the Mariana Islands. Populations in the Pacific Ocean are declining, and only five to ten females are estimated to nest in the Marianas. As noted above, nesting in the park has not been reported for sea turtles, however turtles have been observed offshore of the Asan Beach and Agat Units, with higher densities at Agat (Donaldson et al. 2017). Threats to the haggan karai include habitat loss, hunting and egg gathering, fisheries bycatch, predation, vessel strikes, and ingestion of or entanglement with marine debris.

Gastropods: Akaleha' (Tree Snails)

One endangered akaleha' species has been observed within the planning area. The Guam tree snail (*Partula radiolata*) has been documented in the Asan Beach and

Asan Inland Units, as well as the Piti Guns Unit (Donaldson et al. 2017). Two other endangered akaleha', the humped tree snail (*Partula gibba*) and the fragile tree snail (*Samoana fragilis*), have the potential to occur within or near the planning area.

Threats to akaleha' include loss of habitat due to development and urbanization, grazing by nonnative ungulates, military activities, destruction from wildfire and typhoons, habitat modification by invasive plants, and predation by nonnative invertebrates such as the manokwari flatworm (*Platydemus manokwari*), little fire ants (*Wasmannia auropuncta*), and three species of rats (*Rattus exulans*, *R. norvegicus*, and *R. tanezumi*) (USFWS 2022).

Partula radiolata Guam Tree Snail

The Guam tree snail is an endemic species to the island of Guam and is not found on other islands in the Mariana archipelago. This akaleha' inhabits moist native and nonnative forests. It is typically found on the undersides of leaves, branches of trees, shrubs, and vines during the daytime. During wet, rainy days it is also observed on the ground, feeding on decaying plant materials or fungal growth.

Partula gibba Humped Tree Snail

The humped tree snail is endemic to the forests of Guam, as well as multiple other islands in the Marianas. It inhabits the same subcanopy areas as the Guam tree snail, in cool, humid forest habitats.

Samoana fragilis Fragile Tree Snail

The fragile tree snail is endemic to the forests of Guam and Rota. Like the other akaleha', it inhabits the subcanopy in areas of dense forest and may be found on both native and nonnative plants.

Insects

Hypolimnast octocula marianensis Ababbang (Mariana Eight-Spot Butterfly)

Guam's forests were historically home to two ababbang in the Nymphalidae family: the Mariana eight-spot butterfly and Mariana wandering butterfly. These two ababbang, now listed as endangered species, have not been observed within the planning area. While the Mariana eight-spot butterfly may have the potential to occur within the four units, the Mariana wandering butterfly is believed to be extirpated on Guam (USFWS 2020c).

The historical range of the Mariana eight-spot butterfly on Guam corresponded to areas of limestone forest with karst terrain and an abundance of the ababbang's two host plants, *Procris pedunculata* (no common name) and tapun ayuyu (*Elatostema calcareum*) (USFWS 2021). Habitat destruction due to human development and agriculture, as well as invasive plant encroachment and damage by feral ungulates have greatly decreased this range, however eight-spot butterflies have been observed in the rugged high-quality limestone forest near the Mt. Alifan Unit, on neighboring Navy lands (USFWS 2021). A cooperative program with the USFWS began in 2017 to re-establish the ababbang's rare native host plants within the park, in an effort to support its recovery.

Flowering Plants and Cycads

The planning area includes a wide variety of native vegetation communities, ranging from shoreline strand vegetation to savanna/grassland ecosystems to wetlands and limestone forest. Seven species of plants are listed as endangered on Guam, and three of these species may be found within the park: aplokating-palaoan (*Psychotria malaspinae*), pau dedu (*Hedyotis megalantha*), and *Tinospora homosepala* (Donaldson et al. 2017). Another seven species are listed as threatened, and two of these may occur within the park: *Tuberolabium guamense* and *Cycas micronesica* (Ibid.). Threats to listed plants on Guam include loss and degradation of habitat due to development, impacts from invasive plants and animals, typhoon damage, and climate change

impacts such as increased storm intensity and changes in precipitation.

Psychotria malaspinae Aplokating-palaoan

Aplokating-palaoan is a small tree or shrub in the coffee family and endemic to Guam. Historically, this species was found scattered in forested habitats on the island, and it is found today within the Asan Inland and Mt. Alifan Units (Donaldson et al. 2017).

Hedyotis megalantha Pau Dedu

Pau dedu is an herbaceous perennial in the coffee family and is endemic to savannas on Guam. It is found frequently in patches with the native fern mana (*Dicranopteris linearis*) and low-growing shrubs and sedges and appears to be absent from areas that have been converted to dense grass by wildfire. Areas within the Asan Inland and Mt. Alifan Units may provide suitable habitat for this species, although vegetation surveys to date have only identified it as "likely present" within the park (Donaldson et al. 2017).

Tinospora homosepala

The vine *Tinospora homosepala* was historically found in forests on Guam and, although present in the Asan Beach Unit, is considered rare on Guam (Ibid.). Only male plants have been observed in recent years on Guam, making sexual propagation of the species unlikely. The park is conducting an ongoing project to remove invasive plants from known *Tinospora* vines in order to protect them.

Tuberolabium guamense

Tuberolabium guamense is an epiphyte in the orchid family endemic to forests in the Marianas. Although the park's draft natural resources condition assessment indicates that it may be found within the park, its location within the planning area is unknown. The species grows on the branches of native canopy trees, particularly *Hernandia layrinthica*, *Premna obtusifolia*, and *Elaeocarpus joga* (Ibid.).

Cycas micronesica
Fadang (Cycad)

Fadang occurs in forest and coastal habitat on Guam, as well as on Rota, Palau, and Yap (USFWS 2023a). It is a native species of Guam and used to be a common understory plant in limestone forests. Today, it is found in the Agat Unit at Bangngi' Point and in the Mt. Alifan Unit (Donaldson et al. 2017). Since the introduction of the nonnative insect cycad aulacaspis scale (*Aulacaspis yasumataui*) 10 years ago, fadang is experiencing mortality rates of over 90% across all life stages. It may be extirpated from Guam unless an effective control is found for the cycad aulacaspis scale.

Sharks

Sphyrna lewini

Ulon Matiyu na Halu'u (Scalloped Hammerhead Shark)

Ulon matiyu na halu'u is considered a circumglobal species, living in warm temperate and tropical seas. The shark is partly migratory, traveling along continental margins and between oceanic islands (NOAA 2020b). The Indo-West Pacific DPS of the shark is known to use Apra Harbor as a nursery area. The harbor is located between the park's two coastal units, and the shark is likely present in park-managed waters (Donaldson et al. 2017, 71). Guam's Department of Agriculture, Division of Aquatic and Wildlife Resources has undertaken aerial surveys of the island's inshore coastal habitats over the past 50 years that identified mean densities for sharks as relatively low in the habitats at the Asan Beach and Agat Units (Donaldson et al. 2017). Threats to the shark include degraded water quality in nursery and juvenile habitats, pollution, global fishery practices including the shark fin trade, and global climate change impacts to ocean temperatures, currents, and food sources (NOAA 2023a).

Indo-Pacific Corals

Acropora globiceps, *Acropora retusa*,
and *Seriatopora aculeata*
Kuraling (Coral)

Proposed critical habitat for Indo-Pacific corals was identified by a *Federal Register*

notice in November 2020 (NOAA 2020a). Of the seven kuraling included in the proposed critical habitat designation, three are found in the waters around Guam: *Acropora globiceps*, *A. retusa*, and *Seriatopora aculeata*. The endangered kuraling *Acropora globiceps* has been observed on reefs in NPS-managed waters. The other two kuraling have not been documented to-date in reef surveys in the park (Donaldson et al. 2017). Threats to listed kuraling include ocean warming, land-based sources of pollution, ocean acidification, coral disease, fishing, predation, sea level rise, and collection and trade (NOAA 2023b).

Proposed Critical Habitat for Kuraling

Proposed critical habitat for these three kuraling extends from 0 to 131 feet (40 meters) in depth offshore of the park's Asan Beach and Agat Units (NOAA 2020a). To support the normal function of all life stages of kuraling, suitable habitat for reproduction, recruitment, growth, and maturation is needed (Ibid.). This includes sites with natural, consolidated hard substrate or dead coral skeleton free of algae and sediment. Suitable habitat, as described in the *Federal Register* notice, also includes:

- Substrate with presence of crevices and holes that provide cryptic habitat, the presence of microbial biofilms, or presence of crustose coralline algae;
- Reefscape (all the visible features of an area of reef) with no more than a thin veneer of sediment and low occupancy by fleshy and turf macroalgae;
- Marine water with levels of temperature, aragonite saturation, nutrients, and water clarity that have been observed to support any demographic function; and
- Marine water with levels of anthropogenically introduced (from humans) chemical contaminants that do not preclude or inhibit any demographic function (Ibid., 76267).

ENVIRONMENTAL CONSEQUENCES

Impacts from Alternative A: No-Action Alternative

Under the no-action alternative, listed species would continue to be threatened by predation, climate change impacts, and habitat loss, all of which remain an island-wide challenge on Guam. The park would continue to manage threatened and endangered species and their habitat within the units, based on available funding and staff. The park would also continue to work with partner agencies, such as the USFWS and other local organizations to protect, preserve, and restore the habitat and the listed species described above.

Impacts from Alternative B: Preferred Alternative

Mammals

Pteropus mariannus mariannus | Fanihi (Mariana Fruit Bat)

Construction activity has the potential to startle or alarm roosting, foraging, and transiting Mariana fruit bats. Under the preferred alternative, limited construction to remove or relocate facilities along the shoreline or develop new trails has the potential to result in short-term adverse impacts to wildlife such as the fanihi. However, the preferred alternative includes mitigation measures and best management practices (or BMPs) that would be applied as projects from the plan are implemented in the future: see appendix D. These include requiring pre-construction biomonitoring surveys for fruit bats and roost sites, requiring that work would not occur within 492 feet (150 meters) of a bat or roost site, and requiring that ongoing work would pause if a bat enters the work area.

Artificial lighting also has the potential to disrupt fanihi roosting, foraging, and transiting. Under the preferred alternative, the park would implement low-level, solar-powered lighting along the primary pedestrian loop at Asan Beach to accommodate safe public use in the early morning and evening. However, lighting would be fully shielded and warm-toned to minimize light pollution and impacts to bats. The park would consult with the USFWS and NOAA about proposed

lighting design and locations in advance of implementing projects tiering from the plan that may include lighting. To further reduce the potential for adverse effects, the preferred alternative also includes BMPs such as contractor education and training to promote awareness of bats, limiting work to daylight hours, and additional measures to shield artificial light.

Birds

Gallinula chloropus guami | Pulåttat (Mariana Common Moorhen) and *Aerodramus vanikorensis bartschi* | Yâyaguak (Mariana Gray Swiftlet)

There are no specific actions in the preferred alternative that are likely to adversely affect these endangered bird species. The plan does not identify actions within the immediate vicinity of locations where the birds are known to occur (namely along the Saddok Assan and Saddok Nāmu and near the Naval Magazine). Furthermore, as described in the list of best management practices in appendix D, surveys for listed species by qualified biologists would occur before implementing any projects identified in the plan that might include ground disturbance or other construction impacts. Buffers surrounding listed species would be imposed to prohibit physical damage to identified populations or habitat, and natural features with obvious high value to wildlife would be preserved.

Under the preferred alternative, the park would continue its efforts to remove the brown tree snake and other destructive invasive species from Assan Ridge and restore a healthy limestone forest ecosystem. This would have long-term beneficial impacts to protected avian species. If the park is able to successfully reintroduce birds to the Assan Ridge area, additional management efforts would focus on establishing a bird sanctuary along the ridge. The park would promote plants and insects along the ridge that are especially beneficial to birds. The preferred alternative also proposes enhancing wetland habitat in the Asan Beach and Agat Units, which would have long-term beneficial impacts on the habitat type required by the pulåttat.

Reptiles

Chelonia mydas | Haggan or Haggan Betde (Green Sea Turtle) and
Eretmochelys imbricata brissa | Haggan Karai (Hawksbill Turtle)

The preferred alternative proposes that the park promote near-shore marine activities, such as snorkeling and tidepooling. These activities have the potential to affect sea turtles. However, these activities would occur through park interpretation and educational programs, and the park would continue its standard practice of providing Leave No Trace education and training in advance of any snorkeling or tidepooling programs. Through this training, visitors are informed about the sensitivity of the park's marine ecosystems, the importance of not disturbing sea turtles, and the need for reef-safe sunscreen. These educational programs would continue to raise awareness of the importance of protecting the park's marine environment. Information would also be provided by interpretive waysides and other materials describing reef- and turtle-friendly practices. The park could additionally restrict visitor access to portions of the beach, if necessary, in order to avoid disturbance to resting or nesting sea turtles.

The lighting proposed for the pedestrian loop at Asan Beach Unit has the potential to adversely affect sea turtles, however lighting would be installed at a low level and would be fully shielded and warm-toned to minimize light pollution and impacts to turtles. As noted above, the park would consult with the USFWS and NOAA about proposed lighting design and locations in advance of implementing projects tiering from the plan that may include lighting. To further reduce the potential for adverse effects, the preferred alternative also includes BMPs such as educating contractors and staff to promote awareness of turtles, ensuring a buffer between vessels and listed species, limiting vessel speeds, and additional measures to shield artificial light.

For the park's coastal units, the preferred alternative includes a managed retreat strategy that would remove some parking lots and paved walkways and replace them with native

strand and wetland vegetation. While these activities have the potential to temporarily increase erosion and turbidity in the water, erosion would be avoided or minimized through the mitigation measures outlined in appendix D. These actions would have long-term beneficial impacts on turtles by reducing vehicle and pedestrian infrastructure near the shoreline, which would reduce pedestrian and car traffic near turtle habitat and lessen runoff from impervious surfaces into nearshore waters. In the long term, the preferred alternative would result in an overall decrease in erosion and sedimentation impacts to marine ecosystems—a beneficial impact.

Proposed Critical Habitat for Haggan Betde

Actions within the preferred alternative would not result in destruction or adverse modification of haggan betde critical habitat and would not obstruct areas used for transit to or from nesting beaches, mating, or interesting areas. Activities that may interfere with access to nesting beaches, mating, or disturb internesting females include erecting structures offshore or nearshore, construction, dredging, artificial lighting, oil and gas activities, power generating activities, fishing, aquaculture, shipping, and military activities (NOAA 2023d, 46610). Other activities that contribute to degradation of the nearshore marine environment include general shoreline development, sedimentation caused by runoff and erosion, pollution, wastewater effluent, and invasive species (Ibid.).

Of the list of activities above, the preferred alternative includes only minimal construction, which is focused primarily on removing developed infrastructure from the shoreline and revegetating the shoreline with native strand plant communities. All construction activities would follow the mitigation measures outlined in appendix D, and impacts would be short-term and sited so as not to impact adjacent areas of proposed critical habitat. As noted above, the preferred alternative also calls for the installation of minimal pathway lighting for safety at the Asan Beach Unit, which would be designed and installed to minimize impacts on proposed critical habitat for turtles. The actions

included within the preferred alternative therefore fall within the category of effects that are temporary, small-scale, or occur outside of the migratory season, which are not expected to result in a destruction or adverse modification determination.

Gastropods

Partula radiolata | Akaleha' (Guam Tree Snail)

Partula gibba | Akaleha' (Humped Tree Snail)

Samoana fragilis | Akaleha' (Fragile Tree Snail)

The preferred alternative would not have any direct effects on endangered tree snails, and implementation-level projects tiering from the plan would include site-specific consultation with USFWS to avoid impacts to snails. Individual projects within the preferred alternative that may have the potential to affect tree snails include the proposed development of trails within the Asan Inland and Mt. Alifan Units, and the extension of an accessible pedestrian walkway along the base of Assan Ridge in the Asan Beach Unit. Tree snails may experience direct effects of physical disturbance, injury, or mortality from construction activities, and tree snail habitat may be impacted by vegetation clearing for construction activities.

Implementation of the BMPs in appendix D, which include pre-impact surveys and monitoring by a qualified biologist, would reduce the potential for direct impacts to snails. Any vegetation clearing for proposed trails would be minimized, and trail corridors would follow former roadway alignments and social trails to the greatest extent possible, further reducing potential impacts to snail habitat. Due to the limited area of potential trails, the minimal amount of vegetation removal that would be required is likely to be insignificant in comparison to the amount of suitable habitat within the rest of the planning area and adjacent lands (including limestone forest). In addition, the preferred alternative's emphasis on restoring native upland ecosystems and invasive species management would result in long-term beneficial impacts to tree snails and snail habitat.

Insects

Hypolimnys octocula marianensis | Ababbang (Mariana Eight-spot Butterfly)

Actions in the preferred alternative would result in long-term beneficial impacts to the ababbang because the park would focus resource restoration efforts on endemic and sensitive ecosystems. The impacts to ababbang from the plan would be indirect, as native habitat loss for the ababbang's two host plants, *Procris pedunculata* (no common name) and *Elatostema calcareum* (tapun ayuyu), has been a primary threat to the species. The park would directly target restoration of the two aforementioned host plants for the benefit of the ababbang. Furthermore, no facility development activities are proposed in the preferred alternative in karst limestone forest areas that may be suitable for butterfly habitat.

Flowering Plants and Cycads

Actions in the preferred alternative may result in short-term adverse effects to habitat for flowering plants and cycads; however, these would be reduced by following the mitigation measures and best management practices outlined in appendix D. To reduce the spread of invasive species and impacts to native plants, appendix D lists biosecurity measures that would be followed as individual projects in the preferred alternative are implemented. Before project implementation, the action area would be surveyed for listed plant species and native habitat. Alignment of proposed trails would follow existing roadway alignments and social trails as much as possible and would avoid areas with native plant communities. Formalized trails would reduce impacts from visitors trampling and hiking off-trail within the units, which do not currently provide trail facilities. Trail construction practices would follow the list of best management practices in appendix D to protect threatened and endangered species.

Under the preferred alternative, the park would focus vegetation restoration efforts on endemic and sensitive ecosystems, which would have long-term beneficial effects on listed plant species. Exclusion fencing proposed for the limestone forest areas of the Mt. Alifan Unit would additionally have

a long-term beneficial effect on listed plant species by prohibiting feral ungulate access to high-quality habitat.

Sharks

Sphyrna lewini | Ulon Matiyu na Halu'u (Scalloped Hammerhead Shark)

Actions in the preferred alternative are unlikely to have an adverse effect on sharks or shark habitat. While actions in alternative B have the potential to result in temporary opportunities for increased erosion and turbidity in near-shore areas, these potential impacts would be avoided or mitigated by following the BMPs outlined in appendix D. Similarly, BMPs to avoid waste, discharge, and pollutants in water and measures guiding work in near-shore areas would avoid or minimize any potential effects to sharks or shark habitat. In the long term, the preferred alternative would result in an overall decrease in erosion and sedimentation impacts to marine ecosystems due to increased vegetation along shorelines and upland areas—a beneficial impact.

Indo-Pacific Corals

Acropora globiceps, *Acropora retusa*, and *Seriatopora aculeata* | Kuraling (Coral)

Under the preferred alternative, the park would expand current efforts to select and outplant coral species that are more likely to be adaptable to ocean acidification and temperature increase, thereby supporting the health and resilience of existing corals and associated habitat for as long as it's feasible. This strategy would have long-term beneficial impacts on coral reefs and the multiple marine species that rely on them. Potential adverse effects from the coral restoration project may include short-term increased turbidity and exposure to disease, in addition to direct physical impacts from in-water construction (such as noise, vessel strike, physical contact, pollutant discharge, or entanglement). Additional site- and project-specific consultation would occur for the expansion of coral restoration efforts proposed by the unit management plan. Any adverse impacts associated with related in-water work would be minimized with BMPs and mitigation

measures outlined in appendix D, for implementation during site-specific design.

The preferred alternative's emphasis on enhancing shoreline vegetation and restoring native ecosystems throughout the four units would additionally have long-term beneficial impacts on coral species. While limited development or removal of facilities in the coastal units is proposed, this would result in only temporary opportunities for increased erosion that would be mitigated by the list of best management practices in appendix D. In the long term, as described above, the preferred alternative would result in an overall decrease in erosion and sedimentation impacts to marine ecosystems.

As noted above, the preferred alternative proposes that the park promote near-shore marine activities, such as snorkeling and tidepooling. These activities have the potential to affect corals. The park would follow the same mitigation measures for near-shore activities that are described in the sea turtle section above in order to avoid or minimize impacts to corals.

Proposed Critical Habitat for Indo-Pacific Corals (Kuraling) (*Acropora globiceps*, *Acropora retusa*, and *Seriatopora aculeata*)

Actions within the preferred alternative would not result in long-term destruction or adverse modification of proposed coral critical habitat. NOAA-identified activities that could have adverse effects to coral habitat include channel dredging and beach nourishment, in addition to stormwater runoff, wastewater and sewage outflow discharges, and point- and nonpoint-source contaminants (NOAA 2020a, 76282). Additionally, NOAA identifies that fishery management, aquaculture, and military activities may result in adverse effects to the coral habitat (Ibid.). The actions within the preferred alternative do not include the activities listed above. As noted above, potential adverse effects to coral habitat from the coral restoration project in the preferred alternative may include short-term increased turbidity and exposure to disease, in addition to direct physical impacts from in-water construction. Best management practices and mitigation measures have been identified

based on these potential impacts and are included in appendix D.

As described above, actions in the preferred alternative would result in a long-term decrease in erosion and sedimentation, and near-term opportunities for erosion due to minor construction activities would be temporary and mitigated by the best management practices described in appendix D. The actions included within the preferred alternative therefore fall within the category of effects that are temporary and small-scale, which are not expected to result in a destruction or adverse modification determination.

Conclusion

Alternatives A and B would have a range of localized, temporary adverse impacts on listed species that would be mitigated by the best management practices outlined in appendix D. Alternative B would additionally have a range of beneficial impacts on listed species, due to habitat restoration efforts and additional invasive species management.

Cumulative Impacts

The park has several reasonably foreseeable projects planned within the UMP area, including projects to support invasive species management, natural and cultural resources management, and maintenance. The park would continue current efforts to support threatened and endangered species by controlling invasive species and outplanting rare and endangered plants, including host plants for other endangered species such as the eight-spot butterfly and tree snails. These activities would have long-term beneficial effects on listed plants and animals when combined with the actions in the preferred alternative.

The park's planned coral nursery in Agat Bay would restore coral communities severely damaged by recent bleaching events, using proven methods of selection, cultivation, and outplanting of bleaching-resistant strains of keystone coral species. This would result in long-term beneficial impacts to coral and reef habitats, as well as to the rich diversity

of marine species, such as sea turtles, that rely on them. The park has identified best management practices to avoid or minimize impacts to listed species during implementation of the coral restoration project and has received concurrence from NOAA that the effects of the project are not likely to adversely affect threatened coral species, endangered sea turtles, and the threatened Indo-West Pacific scalloped hammerhead sharks.

A proposed parking lot project at Asan Bay Overlook would repaint two accessible parking areas, 16 standard parking stalls, and five bus parking stalls in the existing paved parking lot at the overlook. In addition, to improve nighttime safety and visibility, six solar-powered, battery-operated lights would be installed. The effects of this proposed project have not yet been identified; however, it is unlikely to result in adverse impacts to listed species because the work would be undertaken in an already disturbed, paved area. Lighting design would follow best management practices to minimize light pollution and impacts to species such as the Mariana fruit bat (as described in appendix D).

The park's ongoing and future work to maintain views and vistas within the cultural landscape, preserve historic structures, and stabilize gun emplacements is similarly unlikely to result in adverse effects to listed species. Vegetation management activities to protect historic structures and views would focus on removal of invasive plants, whose root systems are harming the park's World War II defensive structures and obscuring historic viewsheds. Vegetation removal activities would follow the best management practices outlined in appendix D to protect listed species, such as tree snails and threatened and endangered plants. Stabilizing gun emplacements at Ga'an Point is a small-scale project that would be conducted within a developed area of cultivated lawn and is not expected to result in adverse effects to listed species.



1. [Top left] Mariana fruit bat resting in tree. 2. [Top right] Guam tree snail resting on leaf. 3. [Middle] Guam tree snail relocation after Typhoon Mawar. 4. [Bottom] Visitor snorkels at coral reef within the boundaries of War in the Pacific NHP. Photos: NPS.



1. [Top left] Invasive coconut rhinoceros beetle (*Oryctes rhinoceros*) on coconut frond. Photo: NPS. 2. [Top right] Green anole (*Anolis carolinensis*) rests on ground. Photo: Grayson Smith, USFWS. 3. [Middle] Invasive brown tree snake (*Boiga irregularis*) coiled on tree branch. Photo: NPS. 4. [Bottom] Invasive feral pig in forest on Guam. Photo: NPS.

Although the NPS projects listed above have the potential to contribute cumulatively to adverse effects on listed species when combined with actions in the plan, the implementation of best management practices and mitigation measures mean that these actions would not jeopardize the continued existence of any listed species or result in the adverse modification of proposed critical habitat.

The most prominent future project being carried out by another agency is the proposed shoreline protection project by the US Army Corps of Engineers (USACE) at the Hågat Mayor's Office, adjacent to Ga'an Point. This project could impact coral and turtle species and proposed critical habitat; however, the effects of the project have not yet been identified. The park would continue efforts to support threatened and endangered species by creating coral nurseries and would work with USACE to include appropriate mitigation measures in the project to protect corals and sea turtles within the park boundaries. The preferred alternative would thus not lead to aggregated adverse effects when considered with this USACE project. The plan's beneficial impacts to coral reefs could in fact lessen some of the impacts from the proposed USACE seawall project.

In addition, the preferred alternative would not add appreciably to cumulative effects on listed species from the two future projects along Marine Corps Drive in Asan, planned by the Guam Department of Public Works. The Asan Bridge replacement and pavement hardening are expected to occur primarily within the footprint of the existing road prism and immediate area and would be expected to follow all applicable laws and site-specific mitigation to protect listed species.

Invasive Species Management

AFFECTED ENVIRONMENT

As described above, invasive species threaten terrestrial, aquatic, and marine resources in the park. The species discussed below have been identified as either invasive or introduced and have the potential to

contribute to the extirpation of native species or the instability of park ecosystems.

The passive introduction of invasive species, particularly predators such as the brown tree snake, has contributed to the decline and extirpation of many of Guam's native species, impacting the park and the planning area (GDAWR 2019). "Passive" introduction is defined as accidental introduction, for example species that arrived undetected on Guam via ships or airplane cargo. See the Threatened and Endangered Species section for more information about the brown tree snake's impact to native bird species. The Micronesian gecko (*Perochirus atelese*) and the rock or pelagic gecko (*Nactus pelagicus*) are additional species that have been impacted by the snake. The Micronesian gecko was last collected in 1978, and the rock or pelagic gecko has not been seen for many years and is presumed extinct on Guam (Donaldson et al. 2017). The snake remains a serious threat to Guam's remaining birds, geckos, and skinks.

The little fire ant (*Wasmannia auropunctata*) is another destructive invasive species that has been found at Assan Ridge in the Asan Beach Unit and in the Asan Inland Unit. Little fire ants build large colonies on the ground, in trees, and in other vegetation, and they produce painful stings and welts and may even kill native animals. The coconut rhinoceros beetle (*Oryctes rhinoceros*) is an invasive species that is causing severe damage to coconut palms in prominent areas of the park, such as Asan Beach and Ga'an Point. Amphibians established as invasive species within the park include the cane or marine toad (*Rhinella marina*) and eastern dwarf tree frog (*Litoria fallax*).

Several invasive reptiles have established populations within the planning area. The Indian monitor lizard (*Varanus indicus*) and the Brahminy blind snake (*Ramphotyphlops braminus*) are invasives believed to have been introduced in the precontact period, while the green anole (*Anolis carolinus*) and the island skink (*Carlia ailanpalai*, formerly *C. fusca*) have established themselves more recently in all units of the planning area.

Nine species of mammals have been recorded as invasive or otherwise introduced to Guam. These include a deer (*Cervus mariannus*), a feral pig (*Sus scrofa*), a feral cat (*Felis silvestris*), a feral dog (*Canis familiaris*), three species of rats (*Rattus exulans*, *R. norvegicus*, and *R. tanezumi*), a house mouse (*Mus musculus*), and a house shrew (*Suncus murinus*).

At least 403 species of plants are found within War in the Pacific National Historical Park, of which 175 are native species (43.4%), 222 are nonnative species that are considered invasive (55.1%), and six species are of unknown origin (1.5%) (Donaldson et al. 2017). Invasive plants such as tångantångan (*Leucaena leucocephala*) and the pink tecoma tree (*Tabebuia heterophylla*) pose a serious threat to native ecosystems by degrading terrestrial habitats and competing with endemic plants for resources.

Given the success of nonnative invasive species on Guam, aggressive management or intervention is required by the park into the foreseeable future. Invasive species management includes invasive species prevention and early detection and rapid response (EDRR), in addition to invasive species control. While control is a key component of a comprehensive management program, prevention and EDRR can be more cost-effective tools—especially on islands—to address incipient species and deal with problems before they become too costly or impossible to address.

The impact of invasive species is also exacerbated by several indirect factors. Native plants are impacted by direct competition from invasive plants but are also affected by invasive insects and mammals, wildfires and erosion, habitat destruction, and poaching. Climate change, further disrupts native species populations by altering precipitation patterns and leading to increasingly intense storms. These ecosystem disturbances can damage native plant communities and allow opportunities for nonnative invasive species to encroach and establish themselves within ecological networks.

ENVIRONMENTAL CONSEQUENCES

Impacts from Alternative A: No-Action Alternative

Under the no-action alternative, there would continue to be widespread impacts from the prevalence of invasive species within the park and the surrounding area. The park would continue to manage invasive species to the greatest extent possible based on available funding and staff. The NPS would continue to work with partner agencies, such as the USFWS, and other island and local partners to prevent, reduce, or eliminate invasive species within the planning area. Due to the sensitivity and isolation of Guam's ecosystems, the introduction of new invasive species would remain an ongoing threat.

Impacts from Alternative B: Preferred Alternative

The impacts from alternative B would be similar to alternative A, except that the preferred alternative would include additional efforts to restore native coastal and upland ecosystems. Revegetation efforts would enhance native plant communities while further controlling invasive species within the four park units. Exclusion fencing proposed for areas within the Mt. Alifan Unit would protect the limestone forest from damage by invasive ungulates. These actions would have long-term beneficial impacts on the management of invasive species and the restoration of native species.

Under alternative B, some disturbance of vegetation in the upland units would occur through the development of new trails. However, as noted above, trail alignments would follow existing roads or social trails to the greatest extent possible to minimize impacts on plant communities. All construction activities would follow the biosecurity measures and other BMPs in appendix D to prevent the introduction and avoid the spread of invasive species. Some of the areas where new trails would be built currently experience off-trail use. As a result, formalizing these trails would reduce off-trail impacts on vegetation. Enhanced communication would encourage visitors to stay on trail and minimize their role in

unintentionally introducing or spreading invasive species.

Conclusion

Alternative A would have a range of localized beneficial impacts on invasive species management, due to the park's ongoing efforts to control invasive species. Localized adverse impacts would occur in areas where the park is unable to undertake management activities. Under alternative B, the potential for short-term adverse impacts due to trail construction would be mitigated through implementation of biosecurity best management practices. The additional focus on revegetation, invasive species management, and protection of native plant communities in alternative B would result in long-term beneficial impacts when compared with alternative A.

Cumulative Effects

There would continue to be a range of adverse cumulative effects to invasive species management in the units, due to past actions that have resulted in the unintentional introduction or spread of invasive species. Neither alternative would contribute appreciably to these effects. Past and ongoing efforts at control and eradication have resulted in beneficial impacts, which would be enhanced by the actions proposed in the preferred alternative.

Cultural Resources

To meet NEPA requirements, this section describes the cultural and historic environments within the planning area that could be affected by implementing the alternatives. This section also addresses the National Park Service's responsibilities under the National Historic Preservation Act of 1966 (NHPA) Section 106, which requires the NPS to identify whether the actions in the preferred alternative (or undertaking) would result in an adverse effect to the historic properties of the park.

In accordance with 36 Code of Federal Regulations (CFR) Part 800.8 (c)I (Use of the NEPA process for Section 106 purposes), this draft plan and environmental assessment integrate compliance with

NEPA and Section 106 to allow a more comprehensive consideration of historic properties along with other environmental factors. It is important to note that the park also protects cultural resources that do not meet the definition of historic properties, as defined by 36 CFR § 800.16. To meet NEPA requirements, this analysis of potential effects includes all cultural resources within the planning area that may be affected by the plan's preferred alternative. While cultural resources are analyzed by category, there is significant overlap and interconnection between the types of resources analyzed. The assessment of effects to all historic properties under Section 106 can be found at the end of this section.

The following definitions are provided below to clarify and distinguish terms that are specific to the NEPA and Section 106 processes.

NEPA DEFINITIONS (40 CFR §1508.1)

Effects or impacts: changes to the human environment from the proposed action or alternatives. The NEPA analysis below uses "impacts" to help distinguish from "effects" as defined under Section 106.

SECTION 106 DEFINITIONS (36 CFR § 800)

Historic property: Any precontact or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior (National Park Service). This term includes artifacts, records, and material remains that are related to and located within such properties. Properties of traditional religious and cultural importance to Indigenous or other traditionally associated groups may be determined eligible for inclusion in the National Register.

Area of potential effects (APE): The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

No historic properties affected: There are no historic properties in the APE; or there are historic properties in the APE, but the undertaking would have no impact on them.

No adverse effect: The undertaking would affect the historic property, but the effect does not meet the criteria of adverse effect outlined in 36 CFR § 800.5(a)(1) and would not alter characteristics that make it eligible for listing in the National Register. The undertaking is modified, or conditions are imposed to avoid or minimize adverse effects.

Adverse effect: The undertaking would alter, directly or indirectly, the characteristics of the property that qualify it for inclusion in the National Register.

Due to the programmatic nature of the unit management plan and the progression of federal undertakings that would stem from the plan, the NPS cannot assess all specific effects of all future undertakings on historic properties. As implementation of this plan is carried out, the NPS would continue to conduct Section 106 compliance for undertakings and continue to consult with the Guam State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation, Indigenous CHamoru organizations, and other consulting parties as necessary on the effects of each undertaking on historic properties. An assessment of effects for the development of the management plan itself and its expected outcomes can be found at the end of the Cultural Resources section.

The entire park is listed in the National Register of Historic Places (1978) and is nationally significant under Criterion A for the role it played during America's involvement in World War II (WWII) in the Pacific and Criterion D for the archeological resources associated with the battle. The period of significance is 1941 to 1945, marking the beginning and ending of World War II in the Pacific. The area of potential effects for this unit management plan corresponds to the boundaries of each of the four units in the planning area. See figures F.1 and F.2. There are five properties within the area of potential effects for the UMP that are individually listed

in the National Register as historic sites: the Matgue River Valley Battle Area and Asan Ridge Battle Area in Asan Inland Unit (1975); the Asan Invasion Beach (1979) and Memorial Beach Park (1974) in Asan Beach Unit; and the Agat Invasion Beach in the Agat Unit (1975).

CULTURAL LANDSCAPES

Affected Environment

The area of potential effects for this project encompasses cultural landscapes with contributing features within the boundaries of the four units: Asan Beach, Asan Inland, Agat, and Mt. Alifan. Contributing features are those elements that contribute to the historic integrity of the cultural landscape. The description of contributing, undetermined, and non-contributing features has been adapted from the park's 2013 and 2003 cultural landscapes inventories (NPS 2013 and 2003) and the draft cultural landscape report for Asan Beach Unit and Agat Unit (NPS 2021a).

In addition to cultural landscape features commemorating the period of significance (1941 to 1945), several of the features and places described below hold ongoing cultural importance for CHamoru communities and other traditionally associated people. These features are described in more detail in the Ethnographic Resources section. Other areas and eras of significance within the park have not yet been established.

Many of the park's World War II defensive structures are also contributing features to the cultural landscape: see the Historic Structures section below for additional information and analysis. Likewise, archeological sites and features associated with the Battle of Guam are contributing features: these are discussed in the Archeological Resources section below.

The condition assessment conducted for the 2013 cultural landscapes inventory identified the cultural landscape condition within the four units as poor. This is due to the condition of the historic structures and vegetation that contribute to the significance of the historic property (specifically weathering and plant growth on structures and the loss

of historic viewsheds and impacts to the landscape's spatial organization and native plant communities). In many cases, the negative impacts and deterioration that harm the landscape are caused by activities within private or local government land that is adjacent to NPS-owned and -managed lands.

A climate change vulnerability assessment was also prepared as part of the draft cultural landscape report for the Asan Beach and Agat Units (NPS 2021a). The vulnerability assessment assigned a sensitivity rating to each contributing cultural landscape feature, reflecting the susceptibility of that feature or landscape characteristic to adverse effects from exposure to climate variables. The exposure of each landscape feature was assigned either a low, moderate, or high sensitivity rating, reflecting the type of feature and its ability to withstand exposure. Features with high sensitivity ratings are described in the relevant sections below to further describe resource condition trends.

Natural Systems and Features

The large-scale natural systems and features of Guam exerted a significant influence on the 1944 battle and are character-defining features of the cultural landscape of each unit. Character-defining features are those elements that convey the landscape setting and historic significance of the battle. Most important to the events of the battle were the natural features of the island, including the coral reef, limestone outcroppings, coastal cliffs, beaches, and a steep interior mountain range. The dense vegetation of Guam included coastal marshes, coconut groves, jungle-covered ravines, and savannas of dense sword grass, all of which influenced the movement of troops.

Natural systems and features with high sensitivity to climate change include the coral reefs and the vegetation within the cultural landscape, which are sensitive to changes in temperature and precipitation. The character of vegetation in the inland units is also highly susceptible to impacts from invasive species, particularly *tangantangan* (*Leucaena leucocephala*) and pink tecoma (*Tabebuia*

heterophylla) trees. Natural systems and features have a relatively low sensitivity when it comes to flooding from either coastal or overland flows (NPS 2021b, 54–55).

Asan Beach Unit

At Asan Beach Unit, the character-defining features include the prominent landforms of Punta Adilok (Adelup Point) and Punta Assan (Asan Point), which frame the east and west edges of the Asan invasion beach. These coral outcroppings were used by the Japanese to create camouflaged caves or concrete defensive structures built into the rock to suppress US forces moving across the reef flats to the beaches. The outcropping at Assan Ridge and Punta Assan retains the patches of limestone forest that hid Japanese defensive structures from aerial and ground reconnaissance. While the forest along Assan Ridge was heavily damaged during the battle, the native vegetation is slowly being restored and is a contributing feature. The coral reefs that still exist along the shoreline are character-defining features, as they influenced the battle by slowing the advance of the US military as they approached the heavily fortified coast.

The mouths of the Saddok Assan and Matgue are additional character-defining natural features of the battlefield cultural landscape. Running perpendicular to the beach, the rivers created natural cuts in the terrain that created a disadvantage for American troops because it prevented them from making physical contact with each other, influencing the initial invasion effort. The mouth of the Saddok Matgue, and the river's valley, was the site of a pivotal battle that represented a turning point in the larger Battle of Guam.

Topographic contributing features within the Asan Beach Unit also include features that were created by the US military during the immediate post-war period of construction on the island. The topographic cuts made to Punta Assan by the Seabees in 1944–45, to allow passage of Marine Corps Drive, are a contributing feature, as is the fill that was deposited on the reef flats east of Punta Assan in April 1945, much of which came

from constructing the highway. The fill was used to expand the area available to construct the military motor pool camp and barracks at Camp Asan (NPS 2013, 17).

Asan Inland Unit

The Asan Inland Unit still retains the naturally occurring dense vegetation and steep and rugged slopes that characterized the landscape during the battle. The vegetation in the unit includes mixed savanna-herbaceous woodland, palma brava, and tångantångan semi-natural scrubland. While the density of vegetation is similar to that which existed during the period of significance, the prevalence of nonnative invasive plants (such as tångantångan and pink tecoma) has increased substantially in recent decades.

Character-defining topographic and hydrological features in the Asan Inland Unit are the limestone cliffs and the Saddok Assan and Matgue, which exerted an important influence on the upland advance of the American troops during the battle. The Matgue River Valley, which is predominantly located in the Asan Inland Unit, was listed as a historic site in the National Register in 1975 for its military significance. In addition, the Asan Ridge Battle Area, comprising Assan Ridge, Bundschu Ridge, and Chorrito Cliff, was listed in the National Register the same year for the military significance of the ridges to the trajectory of the battle.

Agat Unit

As at the other units, the character-defining natural systems and features in the Agat Unit are those that influenced the events of the US landing. These include the coral reef; Apaca, Ga'an, and Bangngi' Points, as well as the caves at each point; and the mouth of the Saddok Ñamu south of Apaca Point. The remnant wetland at Apaca Point is also a contributing feature that illustrates the character of this low-lying, wet landscape both before the war and during the battle.

Mt. Alifan Unit

Character-defining natural systems and features at Mt. Alifan Unit include the distinctive ridgeline leading up to the

mountain, as well as the rugged, steep slopes that American troops ascended while under fire from the Japanese. The plant communities still present in the unit, including savanna and limestone forest, still evoke the dense vegetation that characterized the experience of the battle in 1944.

Spatial Organization

The historic spatial organization of the battlefield is evident when viewing each of the park units in an environmental setting and in relationship to the unfolding progression of the Battle of Guam. As the Japanese began to construct defenses, they used the ocean reef, beach cliffs, landforms along the shoreline, and interior mountains flanking Orote Peninsula and Apra Harbor in an effort to defend the island from a sea attack. This large-scale spatial organization encompassing the battlefield is largely intact today and helps to convey the events of the battle.

The 2013 cultural landscape condition assessment identified succession of vegetation communities as a primary threat to the integrity of the cultural landscape. Although the park is working to address the impacts of encroaching vegetation, large portions of the park, especially the upland units with little or no visitor access, have been released to succession. This has impacted the historically open spaces that were used for agriculture before the war and as a battle site during the war (NPS 2013).

Certain elements of the cultural landscape's spatial organization are also highly sensitive to impacts from climate change. These include the spatial organization of the defensive structures and caves at Punta Assan, Apaca and Rizal Points, and Ga'an Point, which are sensitive to damage from sea level rise, storm surge, and typhoon damage. In addition, the steeper slopes within the inland units are considered sensitive and at risk of erosion due to increased storm intensity (NPS 2021b, 56).



1. and 2. [Top left and right] Views of Asan Beach and Asan Inland Units from Asan Bay Overlook. Photos: NPS.
3. [Bottom] Aerial view of the present-day Asan Beach Unit. As noted in the original caption, "The picture shows the extensive alterations and developments that were made to this section of the northern landing beach since July 1944. The superhighway visible along the coast is Marine Drive," June 1945. Photo: NARA.



1. [Top] Troops of Company B, 305th Infantry, 77th Division of the US Army move up Mt. Alifan, August 1944. Photo: NARA.
2. [Bottom] View toward the peak of Mt. Alifan. Photo: NPS.

Asan Beach Unit

At Asan Beach Unit, the historic spatial organization is demonstrated by the existing coral reefs and defensive structures grouped at the beach points. The spatial organization of Asan Beach Unit is also characterized by dense shoreline, or native strand vegetation, fringing a large central open space. This open character is consistent with the appearance of the coastal plain before World War II, when the Asan Beach area was used for agriculture, including for growing rice. The park is grappling with ongoing impacts from the invasive coconut rhinoceros beetle (*Oryctes rhinoceros*), which has led to the death of coconut palms along the shoreline and has impacted the character of the existing strand vegetation.

Asan Inland Unit

The spatial organization of the battlefield can be discerned at Asan Inland Unit through the arrangement of the Japanese defensive structures along the slopes, overlooking the Asan invasion beach and Apra Harbor below. The cluster arrangement of the structures, and the network of underground tunnels and caves connecting them, are also character-defining features.

Agat Unit

Similar to Asan Beach, character-defining aspects of the spatial organization at Agat include the coral reefs and the defensive structures grouped at the rocky points, as well as the network of caves and tunnels connecting them. The open character of the landscape in the Agat Unit also reflects its historical use for agriculture before the war and the character of the site during the battle. As at Asan Beach, the coconut rhinoceros beetle has resulted in the loss of coconut palms along the shoreline at Ga'an Point, somewhat altering the spatial relationship between the open landscape and fringing strand vegetation.

Mt. Alifan Unit

Similar to Asan Inland, the spatial organization of the battlefield at Mt. Alifan is apparent through the arrangement of

defensive structures and foxholes constructed along the slopes and connected through tunnels and caves. This clustering of defensive structures allowed many Japanese positions to survive the extensive pre-invasion bombing by the United States.

Views and Vistas

Both the Japanese and United States militaries took advantage of the topography and vegetation that created natural view corridors during the battle. There were several views to and from the beaches, coastal plains, inland hills, and the inland mountain ridge that were critical in shaping the actual events of the conflict. These views included short-range views to and from the shoreline and long-range, distant views to and from the ridges. The views help to convey the significance of the site and contribute to the setting of the battle.

Encroachment of vegetation has impacted historic views over the years, especially in the upland units. Adjacent developments on lands not owned or managed by the NPS have also altered historic views (NPS 2013). In addition, certain viewsheds have a high level of sensitivity to climate change-driven drought and the increased risk of wildfire. These include the long-range views to and from the ridges and uplands of the Asan Inland and Mt. Alifan Units.

Asan Beach Unit

At the Asan Beach Unit, the character-defining views are the short-range views from the Punta Assan defensive structures to the sea, the short-range views from Punta Adilok defensive structures to the sea, long-range views from the beach to the Assan uplands, and long-range views from the beach to the ridgelines of Mt. Chachao and Mt. Tenjo across the open coastal plain.

Asan Inland Unit

The character-defining views that remain at Asan Inland Unit are the long-range views to Asan Beach Unit, Apra Harbor, and the sea.

Agat Unit

The character-defining views at Agat Unit include the short-range views from the Apaca Point defense structures to the coastline and the sea, short-range views from Ga'an Point to the sea, short-range views from Bangngi' Point to the sea and coastline, long-range views from the beach to the Mt. Alifan ridgeline, and long-range views from the beach to Orote Peninsula.

Mt. Alifan Unit

At Mt. Alifan, the primary character-defining view is the long-range view to Hâgat Beach below.

Circulation

The existing circulation systems in use within the park were developed after the war. Several roads and trails within the units were constructed prior to the war but were destroyed and rebuilt immediately after the Battle of Guam. The NPS has modified and added roads, parking areas, and trails to the Asan Beach, Asan Inland, and Agat Units. Due to the construction of and modification of circulation systems since the war, most of the circulation system does not contribute to the cultural landscape. A majority of the secondary circulation patterns associated with the war and pre-war settlement are either lost or heavily obscured by invasive vegetation (NPS 2013).

Asan Beach Unit

Unlike the rest of the circulation system at Asan Beach Unit, the path along Assan Ridge is considered a contributing feature. Atop the ridge is a wide path that was created through a cut across the ridge, leading out to the point. The path is roughly graded and hemmed in by dense limestone forest vegetation. Although it is undetermined whether the ridgeline path was present during the battle, the cut for the path is evident in historic photos of Punta Assan taken during 1945 construction activities (NPS 2013, 78).

Two unpaved paths leading from the entry road up to Assan Ridge are undetermined features: while the unpaved character of

the surface make it appear that these paths could have been used during the period of significance, there is no documentation to indicate that they were installed by the end of 1945 (NPS 2013, 80)

Asan Inland Unit

There are no circulation system features at Asan Inland that are considered contributing to the cultural landscape. The parking area and walkways at the Asan Bay Overlook and Memorial Wall were constructed by the National Park Service in the 1990s and are considered non-contributing features (NPS 2013, 79).

Agat Unit

Ga'an Point and Apaca Point provide parking areas and paved and unpaved walkways that are modern additions to the landscape. None of the circulation features in the units were present during the period of significance and are therefore considered non-contributing features (NPS 2013, 79).

Mt. Alifan Unit

There are no circulation systems currently in use in the Mt. Alifan Unit. Although historic road alignments or bull-cart trails may be present within the unit, connecting the villages of Hâgat and Sânta Rita, there is no documentation of the presence of these alignments during the period of significance.

Monuments and Flags

Asan Beach Unit

The Asan Beach Unit protects six monuments, five of which are located along the shoreline and one that is located near the upper parking lot adjacent to Marine Corps Drive. Established on site between 1961 and 1994, these monuments are considered non-contributing elements to the World War II cultural landscape. While they are non-contributing to the cultural landscape because they were installed after the period of significance, they are nonetheless important to many community members today.

Four of the monuments commemorate the 1944 US landing at Asan Beach and include

the Third Marine Division Association Monument, the United States Landing Memorial, and the United States Armed Forces Veteran-Chamorros Memorial (also known as the Liberators' Memorial), which is prominently located at Punta Assan. The War in the Pacific Park Plaque is sited near the parking lot at the park entrance. Two of the monuments are dedicated to the Filipino revolutionary leader Apolinario Mabini and were erected in 1961 and 1964 to memorialize his presence at Asan Beach as a political prisoner between 1901 and 1903. See the Ethnographic Resources section for additional information about the site's history before World War II.

The five monuments along the shoreline are highly exposed to damage from storm surge, and all the monuments are exposed to coastal weathering. This risk of damage is expected to increase with climate change-driven sea level rise. The Liberators' Memorial, constructed in 1994, is located in an area of the park that is already experiencing damage from coastal flooding and was heavily damaged by Typhoon Mawar in May 2023.

Asan Inland Unit

In Asan Inland Unit, the Asan Bay Overlook includes a memorial wall constructed in 1994 to commemorate the 50th anniversary of the battle. The memorial wall is also a non-contributing feature to the cultural landscape.

Agat Unit

Within the Agat Unit, at Ga'an Point, three flags stand to commemorate the war and provide a memorial to peace. The flagpoles displaying the flags of the US, Guam, and Japan were installed in 1980 and are non-contributing features to the cultural landscape. Like the monuments at Asan Beach, the flags at Ga'an Point are an important community feature. Adjacent to the flags are two World War II Japanese defense guns, which were relocated to Ga'an Point in the 1980s. The guns are not considered contributing features because they are no longer in their original locations. As at Asan Beach, the flags and guns are in an area that is critically vulnerable to sea level rise and storm surge.

Environmental Consequences

Impacts from Alternative A: No-Action Alternative

Under the no-action alternative, beneficial impacts would result from the park's ongoing cyclic maintenance activities to preserve historic structures and viewsheds and promote native plants through removal of invasive vegetation. The park would implement the treatment recommendations of the 2021 draft cultural landscape report, once finalized, which would also result in beneficial impacts to the cultural landscape.

Adverse impacts to the spatial organization of the cultural landscape would occur due to the continued presence of non-contributing parking areas and other circulation elements. These features were developed after the period of significance, detract from the integrity of the invasion beaches, and are frequently damaged by storms and coastal flooding. The non-contributing monuments, flags, and guns in the coastal units would also continue to be exposed to damage from coastal flooding and weathering and would remain at risk of total loss in a significant storm event.

Sea level rise and storm surge driven by climate change would continue to affect the historic structures, spatial organization, and views and vistas of the cultural landscape. Under alternative A, these impacts would continue without focused adaptive management efforts to monitor, document, and prioritize preservation activities based on risk of loss. This would result in additional long-term adverse impacts to these character-defining features.

Impacts from Alternative B: Preferred Alternative

Under alternative B, the removal of non-contributing circulation infrastructure (parking areas and access drives) would result in long-term beneficial impacts to the spatial organization of the cultural landscape. The siting of new trails or walkways would follow historic circulation routes where possible and would follow the recommendations for new development outlined in the draft

cultural landscape report, resulting in long-term beneficial impacts. The limited new facility developments under alternative B, including reconfigured parking areas, trails, new restrooms, picnic areas, and interpretive kiosks, would be designed and sited carefully, in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes to ensure that additions and modifications would not be incompatible, out of scale, or in great contrast to the character and aesthetic of the cultural landscape and National Register of Historic Places-listed battlefield.

Construction required for facility removal, relocation, and development proposed in alternative B would have a short-term adverse impact to the cultural landscape due to construction activities. These short-term impacts would be caused by the presence of construction equipment and activities, which could temporarily affect historic views and vistas and the spatial organization of the World War II battlefield. Implementation of construction-related best management practices (BMPs) would reduce the temporary impacts of construction activities (see Appendix D: Best Management Practices and Mitigation Measures).

The relocation of monuments, flags, and guns within the coastal units would also have a beneficial impact on the spatial organization and historic views and vistas of the cultural landscape, while protecting the monuments and flags from damage or total loss in the long term. The relocation would have beneficial impacts because these elements were installed in the units after the period of significance (1941–45) and are not considered contributing features to the cultural landscape.

Alternative B would result in long-term beneficial impacts to the cultural landscape through the development of trails in the inland units. Trails would follow historic wartime and pre-war roadway alignments, where possible, which would have beneficial effects on the cultural landscape by restoring historic circulation routes and key viewpoints that help convey the spatial organization and historic

views and vistas of the battlefield. Trail and viewpoint development would also include the removal of invasive species, which would have a beneficial impact on native vegetation, which is a contributing feature, as well as on views and vistas to the invasion beaches and upland terrain. Formalizing trail access and an NPS presence in these areas could additionally reduce impacts to native vegetation and cultural resources that are currently caused by social trails and off-road vehicle use. However, increased visitor access to these areas could also result in increased impacts to the cultural landscape and contributing features. The park would continue to provide Leave No Trace education and training through ranger-led tours, interpretive materials, and signage, emphasizing the importance of staying on the trail and avoiding impacts to resources.

Trail construction would have a short-term adverse impact on the cultural landscape that would be reduced by following the mitigation measures in appendix D. Impacts could include the presence of construction equipment and activities, which could temporarily affect historic views and vistas and the spatial organization of the battlefield. Trail development could also impact native vegetation communities, but adverse impacts would be mitigated by following the best management practices and mitigation measures in appendix D. The use of existing roadway alignments where possible would additionally reduce adverse effects to vegetation and cultural resources. As noted in appendix D, trail development would not occur in areas with high potential for cultural resources or sensitive native species, and trail location and design would be informed by the park's cultural landscape inventories to avoid adverse impacts.

The enhanced vegetation management activities under alternative B—including increased efforts to remove invasive species and replant native species that are more adaptable to climate change—would have a long-term beneficial impact on the cultural landscape's natural systems and features, historic views and vistas, and spatial organization by helping to return the battlefield vegetation to its historic character.

Increasing the use of native vegetation that is resilient to coastal flooding would also result in long-term beneficial impacts, by protecting the shoreline from storm surge and enhancing plant communities that historically existed at the beach sites, such as native strand vegetation and mangroves.

Climate change, especially sea level rise, storm surge, and an increase in storm intensity, is projected to result in long-term adverse impacts to the historic structures in the coastal units, the cultural landscape's spatial organization, and historic views and vistas. Under alternative B the park would implement a more rigorous monitoring, documentation, and stabilization program that would prioritize management activities for the defensive structures most at risk. This adaptive management approach would result in long-term beneficial impacts to historic structures because it would create a strategy to protect structures from sea level rise and storm surge and focus on preserving resources most likely to resist damage. Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER)/Historic American Landscapes Survey (HALS) documentation of structures, 3-D mapping and modeling, and alternate interpretation formats would convey the original spatial organization of the fortifications within the coastal battlefield, which would be beneficial to documentation, research, and interpretation.

Cumulative Impacts

Overall, past actions have influenced and affected the current condition of the cultural landscape within the project area. The primary circulation systems and visitor-serving facilities within the park were developed after the war and have changed the character of the battlefield landscapes, especially in the coastal units, resulting in adverse cumulative impacts. The rampant growth of vegetation in Guam's climate and the difficulty of adequately managing it with existing staff has also resulted in adverse cumulative impacts on the cultural landscape's spatial organization and historic views and vistas.

Both alternatives would implement the recommendations of the draft cultural landscape report for new development within the landscape, resulting in long-term beneficial impacts.

The Marine Corps Drive improvements proposed by the Guam Department of Public Works would not be expected to have an adverse impact on the park's cultural landscape, since the projects are expected to occur within the existing road prism.

The park's past, present, and foreseeable future projects to remove invasive species, increase native species diversity, and enhance the resilience of species (such as coral) to climate change would have a long-term beneficial impact on the cultural landscape. Combined with the beneficial impacts of these cumulative projects, the preferred alternative would enhance the natural systems and features, spatial organization, and views and vistas that define the character of the cultural landscape.

Ethnographic Resources

AFFECTED ENVIRONMENT

Ethnographic resources are the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. Some ethnographic resources might also be traditional cultural properties. A traditional cultural property is one that is eligible for inclusion in the National Register of Historic Places because of its association with the cultural practices or beliefs of a living community that are (1) rooted in that community's history, and (2) important in maintaining the continuing cultural identity of the community.

The description of ethnographic resources in the planning area is informed by the 2021 *Rapid Ethnographic Assessment Project for the Asan Beach Unit and Agat Unit Management Plan* (NPS 2021a). The rapid ethnographic assessment project (REAP) interviewed residents of Assan and Hågat who shared traditions, practices, and histories connected to the two villages from the 1930s to the

present day. The REAP process additionally included a review of historical documents and earlier ethnographic reports to identify resources of ethnographic importance and recommendations for management. While the REAP focused primarily on the two coastal units, it also identified recommendations for additional ethnographic research and resource management within the Asan Inland and Mt. Alifan Units.

In addition to information provided by the REAP, the description of the affected environment includes information received through civic engagement for the UMP and through the Section 106 consultation process, specifically consultation with Indigenous CHamoru organizations and other traditionally associated groups. See appendix G for a list of Section 106 consulting parties. The NPS recognizes that there may be additional ethnographic resources within the planning area that are unknown to the park and/or are of a sensitive nature and not appropriate as a topic of general public interest. The NPS will continue to work with the groups traditionally associated with the park to identify ethnographic resources in the planning area and assess any identified resources for eligibility for inclusion in the National Register.

Although not specifically addressed in the climate change vulnerability assessment for the cultural landscape (NPS 2021a), several ethnographic resources within the planning area are likely to have a high or moderate sensitivity rating to climate variables. These include plants and animals, both terrestrial and marine, that may be sensitive to changes in precipitation, coastal and overland flooding, ocean warming, and wildfire, among other impacts. The presence of invasive species, such as the brown tree snake, have also impacted the condition of ethnographic resources within the park. Traditional practices including fishing, hunting, and gathering that are tied to specific locations may be highly sensitive to climate variables and invasive species if activities are no longer possible in historically used locations. Additional climate-related impacts to the condition of ethnographic

resources may be identified through further research and consultation.

Asan Beach Unit

Ethnographic resources identified within the Asan Beach Unit include the Punta Assan area, Gâpang (also called Camel Rock), traditional fishing practices and the Sâgua Assan, and precontact burials and occupational deposits (NPS 2021a, 101). In addition to these specific sites and practices, traditional CHamoru place names were identified as an important ethnographic resource through Section 106 consultation.

Punta Assan (Asan Point)

The Punta Assan area, including the beach and open expanse of lawn now managed by the park, is important for its long history of use and community connections both before and after World War II. The point was named “Pte. Acahi-Fanihi” by the 1819 Freycinet expedition to the Marianas, indicating that it was historically a location for hunting fanihi. Freycinet also described Assan as a notable and highly productive agricultural area on the island (NPS 2021a, 101). The village of Assan was located on this site and included a number of small homes clustered along the coastal road.

During the Philippine-American War that followed the Spanish-American War, the United States established a camp near Punta Assan known as the “Presidio of Asan,” where the US government imprisoned nearly 60 Filipino generals, politicians, and others who had been deported from the Philippines for their refusal to swear allegiance to the United States. The Filipino revolutionary leader Apolinario Mabini was one of those held at the Presidio, and his presence at Assan between 1901 and 1903 was commemorated by two monuments installed along the beach in 1961 and 1964 (NPS 2013, 24).

After World War II, the landscape around Punta Assan changed even more dramatically with the development of the Asan Point Civil Service Community. Despite these changes, local villagers, especially children, continued accessing the area to hunt birds on Assan

Ridge or watch movies or other performances in the outdoor theater that was on site (NPS 2021a, 101).

Ga'pan Islet (Camel Rock)

Ga'pan Islet, also called Ga'pang Islet or Camel Rock, is a prominent small rocky islet that is located just to the northwest of Punta Assan. As noted by the rapid ethnographic assessment project, this islet is “the location of an important CHamoru legend related to inter-village warfare and the attempt by two boys to protect Asan from invasion by rival districts.” The area is additionally important ethnographically as a valued historical and contemporary location for collecting marine resources during low tides, in particular octopus and crabs (NPS 2021a, 102).

Fishing and Sāgua Assan

For the communities in and around Assan, fishing is an ongoing traditional practice that holds a great deal of cultural significance. The Sāgua Assan is a break in the reef near the mouth of the Saddok Assan. This area has been an important location for fishing for generations, because it is easily accessible and attracts a wide variety of fish. The REAP notes that fishing, in particular traditional net fishing, allows CHamoru communities the opportunity to continue the custom of pātte, or redistributing food that has been gathered through a collective effort (Tomonari-Tuggle 2021, 102).

Precontact Burials and Occupational Deposits

Very little information is available about precontact archeological resources at the Asan Beach Unit, since no specific archeological studies have been conducted within the unit. Precontact burial and occupational sites throughout the park were also heavily damaged or destroyed during the World War II battle. However, precontact human remains have been uncovered at certain sites in the Assan area by the limited archeological surveys that have occurred. The REAP cites two burials about 5 feet (1.5 meters) below the surface, in the vicinity of the former park visitor center parking lot in Assan, uncovered as part of a culvert replacement project

(Tomonari-Tuggle 2021, 102; Thomas and Price 1979, 7). In addition, in 1918 burials nearly 3 feet (1 meter) below the surface were discovered during construction activities at Punta Assan (NPS 2021a, 102; referencing Wells et al. 1995). Occupational deposits from the pre-latte and latte period have been found within the present-day village of Assan as well (NPS 2021a, 102).

Although little is known archeologically about the prehistory of the Asan Beach Unit, as a coastal area, Assan has a high likelihood of buried precontact deposits that may date to the latte and pre-latte periods (NPS 2021a, 13; NPS 2013, 98). Pre-latte period deposits are likely to be located farther inland than those of the latte period, since sea levels in the pre-latte era were approximately 6 feet (1.8 meters) higher than at present (Hung 2011). Desirable features for habitation sites include fertile soils for agriculture and productive reef-lagoon habitats for fishing (NPS 2003, 2; Hunter-Anderson 1989, 7; Thomas and Price 1979, 6). The site's central location within its watershed and proximity to rich marine resources suggest that it would have supported a thriving community (NPS 2021a, 13). Although it is likely that the destruction caused by the World War II battle eliminated surface deposits of pre-war cultural material (Thomas and Price 1979, 10), future archeological investigations at Asan Beach Unit could yield subsurface information from all precontact and historical periods (NPS 2013, 98).

Asan Inland Unit

Ethnographic resources identified within the Asan Inland Unit include subsistence gathering and the Spanish Road (or El Camino Real). While it is more unlikely that the interior upland units of the park would have archeological deposits associated with the latte or pre-latte periods (NPS 2013, 98), it is possible that archeological remains may exist, especially from the late latte or early historic periods (Thomas and Price 1979, 6, 13). Additional archeological surveys may identify precontact sites of ethnographic importance.

Subsistence Gathering

The area of Oppop, inland of Assan village and Kalākak, has long been used for subsistence cultivation and gathering, according to narrators interviewed for the 2021 REAP. Traditional activities included hunting for birds and fruit bats, collecting breadfruit, and tending a natural beehive (Tomonari-Tuggle 2021, 103). Farming also occurred in the area, through the lāncho system—shared familial lands where CHamorus would cultivate agricultural crops, raise livestock, or gather wild plants. The lāncho was located in the jungle, or along the beaches, and initially served as a means of resisting Spanish colonial rule, providing CHamoru families a refuge and place to continue their cultural practices and rituals (NPS 2021a, 103; Bevacqua 2023).

The Spanish Road (El Camino Real)

The Spanish Road (also called El Camino Real) roughly follows the alignment of Marine Corps Drive and Route 2 and was developed during the Spanish period to connect Hagåtña with villages to the southwest. Completed by the early 19th century (if not earlier), the 16-mile (26-kilometer) road alignment crosses through the Asan Inland Unit. Although most of the road has been destroyed by subsequent development, especially the construction of Marine Corps Drive, the alignment is still visible in a cut across Assan Ridge west of the Saddok Matgue and possibly along Chorrito Cliff on the east side of Assan (NPS 2021a). Assan residents interviewed for the REAP recalled personal and family stories of accessing the Asan Inland area via the old Spanish Road alignment, in the years before World War II (Tomonari-Tuggle 2021, vol. IIa, 128-29).

Agat Unit

Ethnographic resources identified within the Agat Unit include Fuña and the Pelagi Islets at Apaca Point, traditional fishing practices, and precontact burials and occupational deposits (NPS 2021a, 102).

Fuña at Apaca Point

The Agat Unit protects an important place in CHamoru origin myths. As noted by the REAP,

Fuña “is the location of the CHamoru tradition of a rock of creation, i.e., a rock that gave birth to humans.” The site is either on Apaca Point itself or is a small islet located just offshore of the point (Tomonari-Tuggle 2021, 102).

Pelagi Islets at Apaca Point

The Pelagi Islets are also connected to the mythic landscape of Hågat. “Mythic landscapes and seascapes” are defined in the REAP as the land and sea areas that are connected to traditional legends and stories on Guam. As reported by the REAP, their “origin is tied to a story about fishermen who were caught by the strong out-going tide and had to abandon their leaking canoe. The canoe became one of the islets, and jettisoned fishing equipment became another. Fishermen use the sound of slapping water against the canoe-shaped islet as an indicator of impending sea conditions” (Tomonari-Tuggle 2021, 103).

Traditional Fishing Practices

As at Asan Beach Unit, fishing is an important ongoing traditional cultural practice for the Hågat community.

Precontact Burials and Occupational Deposits

The coastal area around the Agat Unit has many of the same characteristics that made the Assan area a desirable habitation site during the pre-latte and latte periods. Archeological surveys along the coast and within the right-of-way of Highway 2, as well as in historical village site of Hågat, have uncovered precontact human remains and occupational deposits from the latte period (NPS 2021a, citing Moore et al. 1995; Hunter-Anderson 2002; and Craft 2013). Notably, the human remains were discovered in areas that had been almost completely destroyed during the 1944 battle and post-war redevelopment (NPS 2021a).

An archeological survey conducted in 1989 for a small boat harbor at Hågat, just south of the park boundary at Bangngi’ Point, found no surface evidence of cultural remains (NPS 2003, citing Hunter-Anderson 1989). However, auger tests performed by a survey in 1986 indicated that pre-latte subsurface

remains might be yielded at Hågat beach: the “coral and sand beach overlie a substantial older intact alluvial clay deposit with localized evidence of prehistoric/early historic cultural remains” (NPS 2003, 2). These remains may be a new site type, offering a model of precontact farming on Guam. The site may also reflect a major geological event on Guam, during precontact human occupation, which caused the massive erosion evident in the deep alluvium at the Hågat beach study site (Hunter-Anderson 1989, 27). Similar subsurface features are possible, if not probable, within the Agat Unit (NPS 2003, part 3a, 2).

Mt. Alifan Unit

While detailed ethnographic research has not been conducted for lands within the Mt. Alifan Unit, it is probable that Mt. Alifan has been a site of traditional subsistence hunting, gathering, and cultivation, similar to Asan Inland Unit (NPS 2021a, 103). Like Asan Inland, there is currently no archeological evidence of pre-latte or latte period activities within Mt. Alifan. However, archeological surveys in the unit may identify precontact sites of ethnographic importance.

ENVIRONMENTAL CONSEQUENCES

Impacts from Alternative A: No-Action Alternative

Under the no-action alternative, beneficial impacts to subsistence gathering and fishing would result from current management activities to control invasive species and restore native ecosystems, in particular from projects such as the brown tree snake removal initiative on Assan Ridge. Additionally, current management efforts to raise more heat-resilient coral would result in a beneficial impact to fishing as a traditional activity, by preserving reef resources and ecosystems supporting native fish.

Under alternative A, there would be fewer opportunities to interpret ethnographic resources through programming, wayside exhibits, CHamoru place names, and immersive experiences such as restored native wetlands. The ongoing lack of archeological

survey work within the park would continue to limit information about important precontact and ethnographic sites within the units. Climate change would continue to impact park sites and ethnographic resources, including precontact burials and occupational deposits.

Alternative A would have no impacts on mythic sites or other culturally significant features such as Ga’pan Islet, Fuña, the Pelagi Islets, or the Spanish Road.

Impacts from Alternative B: Preferred Alternative

Impacts to subsistence gathering and fishing under alternative B are similar to those described under alternative A. In addition, alternative B proposes enhanced strand vegetation along the shoreline and the restoration of mangroves at river mouths as a natural defense to sea level rise and storm surge, which would have long-term beneficial impacts to the native ecosystems that support these ethnographic resources.

Under alternative B, increased interpretation of the long-term history of the sites (both before and after World War II) and traditional uses of native plants and animals would result in long-term beneficial impacts to ethnographic resources. The cultural practitioners program proposed in alternative B would create an ongoing connection between the units and CHamoru residents with familial connections to the park lands, resulting in long-term beneficial effects. The ethnographic research included in alternative B would contribute new knowledge about the ethnographic importance of sites within the units, which would also have long-term beneficial impacts.

Climate change impacts such as sea level rise, erosion, flooding, and wildfire will result in adverse impacts to precontact burials and occupational deposits under any alternative. The archeological documentation proposed under alternative B, including an archeological strategy and archeological overview and assessment, would provide increased information about precontact habitation within the units, which would have a long-

term beneficial impact on these ethnographic resources. Alternative B would have no impacts on mythic sites or other culturally significant features such as Ga'pan Islet, Fuña, the Pelagi Islets, or the Spanish Road.

Cumulative Impacts

Oral histories and ethnographic studies conducted by the park in recent years, such as the 2021 REAP, have increased information about ethnographic resources in the park, resulting in cumulative beneficial impacts when combined with the actions in the preferred alternative. No other past, present, and reasonably foreseeable projects would have any spatial and temporal overlap with actions in alternative B that affect ethnographic resources.

Historic Structures

The description of historic structures below is adapted from the 2013 cultural landscapes inventory for the park. Several defense structures still exist within the park that were constructed by the Japanese during the war and are considered historically significant. Structures that lack individual physical integrity are considered ruins and are documented in the Archeological Resources section below. The commemorative monuments and markers concentrated at the Asan Beach and Agat Units are important for memorializing the events of World War II and other events that took place on site but do not rise to a level of historic importance on their own.

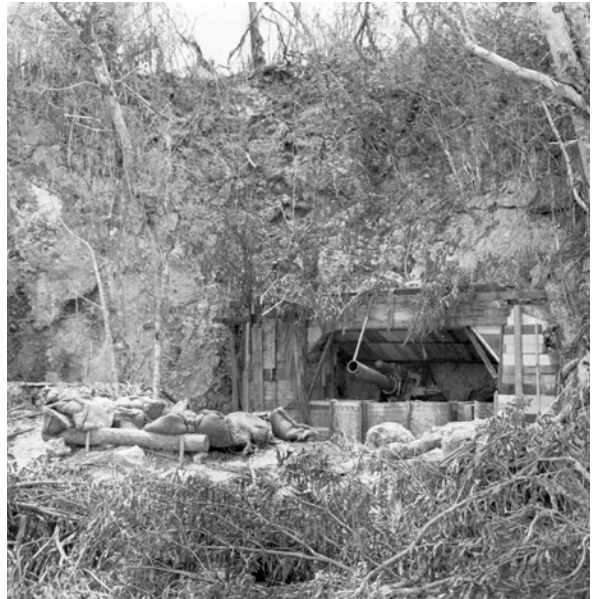
War-related structures remaining in the landscape include features and components of the Japanese defense system constructed in 1944. In general, there were three main types of fortifications constructed during the war: modified natural caves or man-made caves, reinforced concrete structures such as pillboxes, and constructed earthworks such as foxholes. All of these structures were hastily built in the months prior to the invasion, using forced labor and military conscripts. As noted above, defensive structures were built to take advantage of the natural outcroppings and landforms whenever possible for strategic reasons, but also because there were

critical shortages of basic building materials (Gailey 1988, 40).

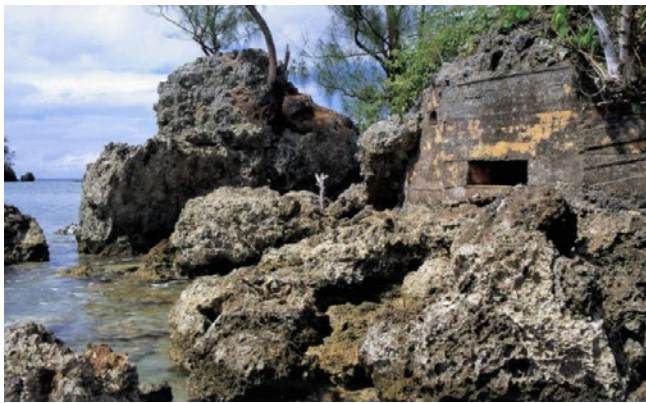
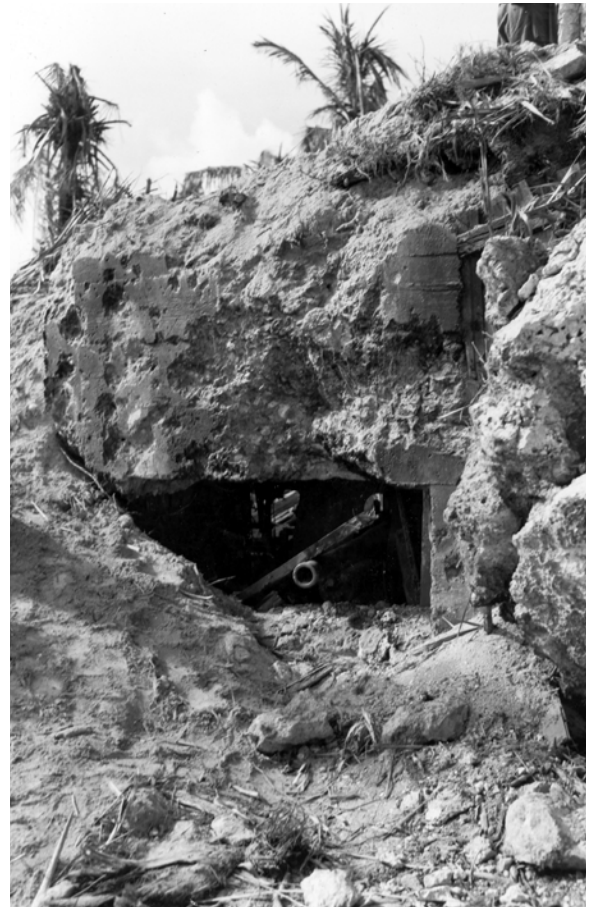
Arguably the most character-defining defense structures remaining on Guam are the concrete pillboxes with associated caves and tunnel systems. These systems allowed the Japanese to stage an attack from a pillbox and then retreat underground to follow a tunnel and emerge to attack from another location. Each park unit has evidence and remains of these defense systems: Asan Beach Unit protects gun emplacements and pillboxes, Agat Unit protects pillboxes and foundations from the war, and the inland units contain pillboxes, gun emplacements, caves, and discernable defensive lines. A list of historic structures by unit is included in appendix F.

The 2013 cultural landscape condition assessment identified the condition of the historic structures in the park as a primary threat to the integrity of the cultural landscape. Over the past couple of decades, efforts have been made to improve the condition of the historic structures and sites within the park. However, because the majority of historic structures were constructed quickly, often using substandard materials, they require a high level of preservation maintenance. Many of the historic Japanese defense structures built in 1944 are in a state of deterioration from various factors, including high humidity, high winds, heavy rains, frequent exposure to salt spray, coastal flooding, vegetation overgrowth, as well as displacement caused by invasive root systems, erosion, and impacts caused by visitor use. One of these issues, vegetation, results in slow yet steady deterioration that will cause the collapse of each structure if not abated. Vandalism of concrete features, including graffiti and fire pits, has also been a problem in the Asan Beach and Agat Units (NPS 2013).

The historic structures with the highest sensitivity to climate variables are the fortifications located on Assan, Apaca, and Rizal Points, along with their connecting tunnels and caves. These historic properties are at risk from coastal flooding due to the rapid deterioration of concrete by water intrusion (NPS 2021b, 55).



1. [Top left] Visitors reading about ethnographic resources at a trail dedication at Assan Ridge, Asan Beach Unit. This sign reads: "The Coconut Palm, called the 'Tree of Life', is traditionally used for food, drink, oil, building material, and animal feed." 2. [Top right] Japanese gun emplacement on Assan Ridge, Asan Beach Unit. 3. [Bottom left] Archeological resources impacted by coastal erosion. Photos: NPS. 4. [Bottom right] Japanese gun emplacement at Punta Assan (Asan Point), Asan Beach Unit, covering the beach south of the point, October 1944. Photo: NARA.



1. [Top left] Japanese bunkers at Ga'an Point in the Agat Unit. 2. [Middle left] Japanese bunker near the coastline at Apaca Point in the Agat Unit. 3. [Right] Japanese gun emplacement on Ga'an point in the Agat Unit, October 1944. 4. [Bottom] Visitors tour the World War II fortifications at Ga'an Point in the Agat Unit. Photos: NPS.

ENVIRONMENTAL CONSEQUENCES

Impacts from Alternative A: No-Action Alternative

As noted above, climate change impacts and deterioration caused by a number of factors has had an adverse effect on the condition of the park's historic structures. Under the no-action alternative, beneficial impacts would result from the park's ongoing cyclic maintenance activities to stabilize and preserve historic structures, as well as the upcoming project to stabilize many of the World War II concrete fortifications in the park. However, under alternative A, climate change effects would continue without focused adaptive management efforts to monitor, document, and prioritize preservation activities based on risk of loss. This would result in additional long-term adverse impacts to these character-defining features.

Impacts from Alternative B: Preferred Alternative

Under alternative B, the park would implement a more rigorous monitoring, documentation, and stabilization program that would prioritize management activities for the defensive structures most at risk of damage or loss due to climate change or other environmental stressors. This adaptive management approach would result in long-term beneficial impacts by strengthening the resistance of some historic structures and increasing their longevity. In the event that a structure becomes flooded and survives under water, the park would pivot maintenance activities and manage it as a submerged resource. For those structures that cannot be protected, HABS/HAER/HALS documentation of structures, 3-D mapping and modeling, and alternate interpretation formats would document their existence and convey the character and experience of the historic fortifications into the future. This documentation would have long-term beneficial effects to interpreting and documenting these resources once they become fully submerged, or in the case of complete loss due to storm damage or the impacts of climate change.

In addition, adaptive management strategies that address the potential impacts of visitor use on cultural resources would also result in long-term beneficial effects to historic structures. As described in Appendix A: Indicators, Thresholds, and Management Strategies, a monitoring protocol to document and report human-caused damage to cultural resources would result in proactive management strategies to reduce or mitigate damage to historic structures.

Cumulative Impacts

There would continue to be a range of adverse cumulative effects to historic structures in the units from past deferred maintenance, in particular the challenge of regularly removing encroaching vegetation. Neither alternative would contribute appreciably to these effects. Past and ongoing stabilization activities have resulted in beneficial impacts, which would be enhanced by the actions proposed in the preferred alternative.

Archeological Resources

The description of archeological resources below is adapted from the 2013 cultural landscapes inventory for the park. Archeological sites and features that contribute to the park's national significance include ruins and traces that are associated with the events of the Battle of Guam. Ethnographic information has also indicated the likely presence of pre-World War II archeological features and sites in the park, as noted in the Ethnographic Resources section above. However, the material remains of these sites have not been located. As future archeological work is conducted and new sites identified, their significance will be evaluated. Locations of ethnographic importance to the community will be a valuable resource to guide future archeological investigations.

World War II-era defense structures and associated ruins exist throughout the park's units. Defense structures in a ruinous state, while not functioning as they were initially intended, are nevertheless significant in understanding the 1944 battle. An initial reconnaissance survey was conducted in 1979, but no additional survey work or

analysis has been conducted other than site condition assessments and limited surveys of fire-affected areas. A systematic archeological survey of all park units is therefore needed.

There are several major types of contributing archeological resources within the Asan Beach, Asan Inland, Agat, and Mt. Alifan Units. Archeological features include defense structures, features that relate to the operation of the defense system that the Japanese constructed, as well as a number of features associated with the US invasion and efforts to secure the island from Japanese control. At the Asan Beach and Agat Units these features include caves, bunkers, tunnels, foxholes, and submerged resources. At the Asan Inland and Mt. Alifan Units, these features include caves, tunnels, foxholes, trenches, foundations, and isolated artifacts that all date to the war. These features have deteriorated rapidly both because they were hastily constructed during the war and as a result of Guam's harsh environment, which includes devastating typhoons, earthquakes, and high salinity due to the proximity of the ocean. A list of contributing archeological resources by unit is included in appendix F.

Impacts from Alternative A: No-Action Alternative

No archeological resources in the planning area that contribute to the National Register-listed battlefield would be affected by actions under alternative A. However, climate change would continue to adversely impact park sites and archeological resources, particularly through flooding and erosion, stronger typhoons, and increased wildfire risk. Under alternative A, these climate change effects would continue without focused adaptive management efforts to monitor, document, and prioritize preservation activities based on risk of loss. This would result in additional long-term adverse impacts to these character-defining features.

Impacts from Alternative B: Preferred Alternative

Under alternative B, the park would implement a more rigorous monitoring, documentation, and stabilization program that would prioritize

management activities for the archeological resources most at risk of damage or loss due to climate change or other environmental stressors. This adaptive management approach would result in long-term beneficial impacts by strengthening the resistance of some resources and increasing their longevity. In the event that an archeological resource becomes flooded and survives under water, the park would pivot maintenance activities and manage it as a submerged resource. For resources at risk of imminent loss, HABS/HAER/HALS documentation, 3-D mapping and modeling, and alternate interpretation formats would document their existence and convey the character and experience of the World War II archeological resources into the future. This documentation would have long-term beneficial effects to interpreting and documenting these resources once they become fully submerged, or in the case of complete loss due to storm damage or impacts from climate change. In addition, the baseline archeological documentation proposed under alternative B, including an archeological strategy and archeological overview and assessment, would provide increased information about archeological resources within the units, which would have a long-term beneficial impact.

The preferred alternative's proposal to formalize trail access in the inland units would reduce impacts to archeological resources that are currently caused by social trails and off-road vehicle use. However, increased visitor access to these areas could also result in increased impacts to archeological resources. The park would continue to provide Leave No Trace education and training through ranger-led tours, interpretive materials, and signage, emphasizing the importance of staying on the trail and avoiding impacts to resources.

Adaptive management strategies that address the potential impacts of visitor use on cultural resources would also result in long-term beneficial effects to archeological resources. As described in Appendix A: Indicators, Thresholds, and Management Strategies, a monitoring protocol to document and report human-caused damage to cultural resources would result in proactive management

strategies to reduce or mitigate damage to archeological features.

Under alternative B, some ground disturbance would be required for the development of limited facilities such as reconfigured parking areas, trails, new restrooms, picnic areas, and interpretive kiosks. Facilities would be sited to avoid known archeological resources, and the discovery potential for buried archeological resources would continue to involve the mitigation measures described in appendix D. As a result, there would be no adverse effect to archeological resources.

Cumulative Impacts

Overall, past actions have influenced and affected the current condition of archeological resources within the project area. Notably, the large-scale construction projects that occurred after World War II in locations such as the Asan Beach Unit created substantial ground disturbance before the units became national park sites and resulted in adverse cumulative impacts. There would continue to be a range of adverse cumulative effects to archeological resources due to the park's ongoing lack of documentation. The proposed action would not contribute appreciably to these adverse effects. Alternative B would add to the limited archeological data that does exist for the units, resulting in cumulative beneficial effects over time as increased information is gathered about archeological resources in the units.

Conclusion

Given the minimization and avoidance measures identified in this plan and in appendix D, and in view of law and NPS policy directives, neither continued management under alternative A nor the proposed actions under alternative B would result in significant impacts to cultural resources within the planning area.

Assessment of Effects Under Section 106

The NPS is required by Section 106 of the NHPA to take into account any effect an undertaking may have on historic properties within the APE. The undertaking being

assessed is the development and issuance of this plan, and the planning-level decisions made therein. The APE is the project planning area, which corresponds to the boundaries of the four units. There are five historic properties currently identified in the four units within the planning area/APE that are individually listed in the National Register; the entire park is also administratively listed on the National Register. The five properties and their character-defining features are listed in appendix F.

Based on the analysis in this section and on Section 106 consultation with the Guam State Historic Preservation Office and other interested parties, the proposed undertaking would result in *no adverse effect* on the historic properties within the APE. The decision to remove non-contributing landscape features, such as parking lots and roadways subject to sea level rise, would not have an adverse effect to the cultural landscapes of the Asan Beach, Asan Inland, Agat, and Mt. Alifan Units, as these features are not historic; for similar reasons, the relocation of non-contributing monuments, guns, and other landscape details would not have an adverse effect. The NPS would site new parking areas, other visitor support facilities, and any relocated non-contributing features in areas that do not have known archeological or ethnographic resources and that are not intrusive to the cultural landscape. The creation of trails for visitor use in the Asan Inland, Agat, and Mt. Alifan Units is not expected to have an adverse effect to the cultural landscape, archeological sites, or ethnographic resources as they would follow historic pathways or be designed to avoid sensitive sites. Staging sites for construction would be placed in locations that will not have an adverse effect on historic properties.

The decisions made in this plan would have *no adverse effect* on the character-defining features of the battlefield sites, including the topographical characteristics and natural systems that shaped the Battle of Guam, historic views and vistas, and the resulting spatial organization of Japanese defensive structures. The undertaking would not alter, directly or indirectly, any of the characteristics

of the historic properties that qualify them for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

While impacts from climate change will continue to result in adverse effects to the park's historic properties, the actions within the undertaking itself, including increased efforts to stabilize, preserve, and document historic properties, would not have an adverse effect. Additional documentation of historic structures and archeological resources would serve to mitigate adverse effects from climate change.

As implementation occurs for the individual actions within this plan, the NPS would continue to conduct Section 106 compliance for undertakings and continue to consult with the Guam SHPO, the Advisory Council on Historic Preservation, Indigenous CHamoru organizations, and other consulting parties as necessary. As more precise designs are developed during implementation, the NPS would evaluate other cultural resources within the area of potential effects for these actions for eligibility to the National Register and will make assessments of effects to historic properties.

Visitor Use and Experience

AFFECTED ENVIRONMENT

Visitors to War in the Pacific National Historical Park come for a variety of reasons and typically fall into two broad categories. One category includes tourists, many coming from off-island, who are visiting the park to commemorate the significance of the sites in World War II. The other category of visitor consists of local community members, who rely on the park as a valuable open space for multiple types of recreation.

This affected environment section analyzes all types of visitor use within the planning area, both from off-island tourists and local residents. The analysis therefore includes tourism (including international tourism) and

local recreational opportunities, as well as general visitor use of the planning area.

The nature of visitor use and experience in the park is not expected to change in the foreseeable future. In general, visitors are expected to continue to visit the park for its historical significance, for recreational use, and for uses associated with traditional practices, as discussed under the Ethnographic Resources section. Climate change impacts may have a detrimental impact on visitor use and experience, in particular the loss of areas for commemoration and recreation due to coastal inundation.

Tourism

Prior to the global COVID-19 pandemic, Guam experienced record visitation. In December of 2018, the island set a monthly visitation record with a total of approximately 146,104 arrivals (GVB 2018a). Guam also set record annual visitation in 2019, with approximately 1,666,665 visitors (GVB 2019). This was part of an overall trend of expanding tourism. From the years 2000 to 2017, tourism increased 16%, from 1,286,087 to 1,545,392 visitors annually (GVB 2017).

However, tourism on Guam has not recovered to pre-pandemic levels (IMF 2021, GVB 2023b). Uneven recovery is expected to continue, despite a general increase in worldwide travel demand expected for 2023 (UNWTO 2023). Recent trends on Guam suggest tourism is still down almost 46% from pre-pandemic levels: in April 2023 the island received approximately 55,354 visitors, whereas it received approximately 120,000 visitors in April 2019 (GVB 2023b).

A shift in visitation by country post-pandemic has occurred as well. Prior to the pandemic, the island was visited predominantly by Japanese tourists. In 2013, almost 70% of all tourists came from Japan (GVB 2013a). However, Japanese tourism on the island has decreased over the last decade. In 2017, 40% of the tourists came from Japan and another 44% were from South Korea. Less than 5% of visitors were from the US. By December 2022, approximately 65% of tourists were from South Korea, with only 11% from Japan.

During this month another 13% of visitors came from the US, and the remainder were from other countries (GVB 2023).

Visitor Use Statistics

Visitor Center

The park collects visitor use data on tourism, via traffic counters and at the visitor center. During 2017, the park received approximately 50,354 visitors at the visitor center (NPS 2017). While the park visitor center is not located within any of the planning units, staff have observed that people who visit the visitor center typically spend time in the various units of the park as well. During fiscal year 2022 (October 1, 2021 to September 30, 2022), the visitor center recorded a total of 6,326 visitors. Approximately half of these visitors were from the continental United States. The second-largest group recorded at the visitor center were local residents: approximately 1,070 visitors. The third-largest group were visitors from South Korea (579), followed by Japan (240). Park visitation trends from Asian countries are similar to the statistics available from the Guam Visitors Bureau (GVB) for the entire island of Guam, as discussed above (GVB 2023a).

Planning Area via Traffic Counts

As noted above, the park collects visitor data at various locations with traffic counters.¹ During the year 2017, the park received 384,868 total visitors within all units (NPS 2017). Within the planning area, for the year 2017 there were 763 visitors at Apaca Point; 41,528 visitors at Asan Bay Overlook; 240,344 visitors at Asan Beach; 50,704 visitors recorded at Ga'an Point; and zero² recorded at Rizal Point (NPS 2017). During the year

1 The use of this dataset to predict various visitor uses (e.g., type of use, length of visit, etc.) is limited. At Asan Beach Unit for example, the park has seen some vehicles use the entrance to turn around on Marine Corps Drive.

2 The last report for Rizal Point was taken in June of 2010. Since this area of the park is no longer accessible to visitors, the traffic count number reflects that it's no longer in use.

2022, the park recorded a total number of 380,578 visitors (NPS Stats 2023). Within the planning area, for the year 2022 there were 29,670 visitors at Apaca Point; 47,458 visitors recorded at the Asan Bay Overlook; 276,204 visitors at Asan Beach; and 19,710 at Ga'an Point (NPS 2022). While tourism on the island is down from pre-pandemic levels, the stability of the park visitor counts can be attributed to regular use of the park by locals, particularly the Asan Beach Unit.

Recreation

The land within the planning area provides a very important recreational amenity to residents of Guam, where open green spaces are comparatively limited (NPS 1983). Guam's tropical setting allows for year-round recreational opportunities, and the Asan Beach Unit in particular is heavily used for walking, jogging, beach activities, family picnics, and other outdoor gatherings (DPR, Government of Guam 2019). The beach and adjacent reefs further provide kite-boarding, fishing, and snorkeling opportunities. The Agat Unit offers similar activities, including picnicking, fishing, food gathering on the reef, boat launching with traditional vessels, snorkeling, and scuba diving (DPR 2019; NPS 1983). Currently there are no formal public access opportunities within the Asan Inland and Mt. Alifan Units, although the Asan Bay Overlook at the top of Asan Inland provides a Memorial Wall honoring those lost in the World War II Battle of Guam.

The planning area is surrounded by several communities. As of 2020, the Agat Census Designated Place (CDP) had a population of 3,292 people, the Asan CDP had a population of 860 people, the Piti CDP had a population of 596, and the Santa Rita CDP had a population of 973 people. Given the small size of Guam, it's reasonable to expect that visitors to the units come from other parts of the island as well. Guam's total population was 153,836 as of 2020 (United States Census Bureau 2020b).

ENVIRONMENTAL CONSEQUENCES

Impacts from Alternative A: No-Action Alternative

Under the no-action alternative, local residents and tourists would continue to visit the park for commemorative as well as recreational visitor experiences. Visitation rates would continue to fluctuate due to natural disasters, public health emergencies, or global economic conditions, as well as other unforeseen situations. The uncertainty of future conditions and external influences would require the park to react to these events as they impact the visitor experience. Projected sea level rise and storm surge would continue to reduce the areas and facilities available for visitor use within the coastal units. Accessibility of visitor facilities would be adversely impacted by flooding, erosion, and storm damage under alternative A. Loss or damage of the park's World War II historic structures could reduce visitation to the coastal units; however, the invasion beaches that had such a pivotal influence on the war's Pacific Theater would remain a fundamental resource of the park and a key attraction for visitors.

Impacts from Alternative B: Preferred Alternative

Several actions under alternative B would result in long-term beneficial impacts to visitor use and experience. While visitor use is likely to be affected by climate change and associated coastal flooding, the preferred alternative identifies measures to minimize these impacts on the visitor's experience of the park and provide access to safe recreational opportunities and facilities for as long as possible. Under this alternative, the NPS would carry out a managed retreat from existing visitor facilities that are at risk of damage, while continuing opportunities for visitor use and recreation by relocating facilities to alternative sites, reconfiguring facilities for greater resilience to coastal flooding, and employing durable and resilient construction techniques and materials. Although facilities or areas of the park may need to close temporarily during construction activities, which has the potential to adversely affect the visitor experience, any facility closures would be communicated early and

proactively by the park, and adverse effects would be short-term.

Adaptive management strategies that address the combined impacts of visitor use and climate change would additionally result in long-term beneficial effects to visitor use. As described in appendix A, a monitoring protocol to document and respond to facility closures would result in proactive messaging and information about weather impacts and redirection of use to areas of the park where facilities are still open.

Alternative B also includes elements not related to climate change that would improve the visitor experience. The preferred alternative would provide an increased NPS presence within the coastal units by establishing a small open-air interpretive shelter at Asan Beach Unit and an interpretive kiosk at Rizal Point in the Agat Unit. A mobile visitor center, rotating between the coastal sites, could serve as a contact station for members of the public to interact with a ranger, resulting in long-term beneficial impacts to visitor use and experience. As part of alternative B, the park would additionally promote marine activities within the coastal units and improve access for those with disability-related access constraints.

The plan also includes proposed trail corridors for future interpretive trails through the inland units to help convey the reef-to-ridge experience of the 1944 battle (see figures 2.3 and 2.8). These trails would have beneficial impacts on visitor use and experience within the planning area, given the increased opportunity for recreation and expanded access into the inland units.

Conclusion

The actions in alternative A would not appreciably impact visitor use and experience within the planning area. Alternative B, because of its focus on maintaining visitor access to park resources, would result in long-term beneficial impacts to visitor use and experience.

Cumulative Impacts

Past and ongoing coastal flooding impacts and associated facility closures have had temporary adverse effects on visitor experience and recreational opportunities within the planning area. These effects are expected to continue and to intensify given projected climate futures. Neither alternative is expected to add appreciably to these adverse effects. Alternative B would result in cumulative beneficial effects over time, as the park would employ strategies to ensure visitor use opportunities for as long as possible in vulnerable areas within the four units.

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CONSULTATION AND COORDINATION





Asan Beach Unit, looking west along the shoreline to the offshore Japanese pillbox. Photo: NPS.

CHAPTER 4: CONSULTATION AND COORDINATION

Civic engagement and consultation efforts were ongoing throughout the process of preparing this unit management plan and environmental assessment (UMP/EA). Public involvement included news releases, public meetings, newsletter distribution, website postings, radio announcements, and social media posts. This chapter summarizes these civic engagement efforts and consultation with other agencies.

CIVIC ENGAGEMENT

The National Park Service (NPS) conducted civic engagement in summer 2022 to seek public comments, concerns, and ideas related to the unit management plan. This report summarizes all public comments received during the civic engagement period, which occurred between August 4 and September 30, 2022.

As part of civic engagement, the park hosted in-person meetings detailed in table 4.1. During the same week of the public meetings, the park also set up informational tables both in the morning and evening at Asan Beach to solicit input on the UMP. Park staff also had an informational table, with an opportunity for the public to ask and provide comments, at the CHamoru Village Wednesday Night Market on August 31, 2022. The planning team shared information with about 90 individuals or small groups as part of these informal tabling efforts.

The project home page on the NPS's Planning, Environment & Public Comment (PEPC) website (<https://parkplanning.nps.gov/wapaump>) provided information about the UMP, a copy of the civic engagement newsletter that was distributed during meetings and other engagements with the public, [an interactive online StoryMap](#), and an opportunity to provide comments directly into PEPC.

Table 4.1: Public Meetings

DATE AND TIME	LOCATION	ATTENDANCE
Monday, August 29, 2022 6:00 – 8:00 pm	Assan Mayor's Office	16
Tuesday, August 30, 2022 5:00 – 7:00 pm	Hågat Community Center	2
Wednesday, August 31, 2022 2:00 – 3:30 pm	Guam Museum, Hågatña	15

Summary of Civic Engagement Comments

The following summary incorporates both the oral comments from the public meetings and the written comments received by the NPS through PEPC, the project e-mail mailbox, and hard copy comment forms. The park received 11 unique comment letters. All comments received were reviewed and considered to inform the preparation of the plan.

INTERPRETATION AND EDUCATION

The NPS received approximately the same number of comments on interpretation and education as on visitor use and facilities (see "Visitor Use and Facilities" section below). One of the main themes reflected in the public comments is a desire for the park to include broader historical perspectives in interpretation. Several commenters noted that the NPS should focus on the natural and cultural histories of the park sites and the familial and cultural connections that community members have held to these resources over time, in addition to the story already told about World War II.

Commenters suggested interpreting additional perspectives, including Indigenous traditional knowledge; changes to the cultural landscape over time; and the stories of CHamoru, Japanese, and Filipino people with connections to the sites. One commenter asked that the NPS consider telling the story of the ancient CHamorus living in Assan, Piti, Sumai, and Hågat, including their relationship to the natural environment (such as plants and animals), cultural practices, life during the Spanish period, and life during the later American period leading up to World War II. The NPS was encouraged to focus interpretation on the local histories of CHamoru people who lived on park lands, rather than presenting a more generalized history of CHamoru culture. In addition, a commenter expressed the importance of explaining differences in cultural values when telling these different stories about World War II and periods of colonization.

The NPS was also asked to tell the story of the refugee camp that was located at Asan Beach Unit during the Vietnam War. One commenter suggested a need for the unmarked graves in the Asan Inland Unit to be commemorated. Other commenters expressed the importance of placing past conflicts in the context of what they mean for the future and highlighting the importance of peace.

There was also public interest in providing more interactive experiences, especially for school-aged children, to teach them about the park sites. A few commenters suggested that the NPS include more opportunities for youth involvement at the park units. Another commenter requested more interpretive opportunities in general. The NPS was also encouraged to continue providing community opportunities at the park for visitors with disabilities. Several commenters requested additional rangers at the park units, to provide more engagement with the public through tours and natural and cultural resource exhibits.

VISITOR USE AND FACILITIES

Climate Change Impacts on Facilities

The NPS received several comments focused on the need to prepare the park for climate change and sea level rise. Respondents offered a variety of comments on this topic. Some participants supported the idea of a living shoreline and promoting native plants to help minimize the impact of storm surge. Many commenters identified the need for improved drainage to reduce flooding, especially in the coastal units including Asan Beach. Flooding from past storms at Asan Beach was an issue mentioned by several individuals. A few participants emphasized the importance of protecting existing coral reefs as much as possible. One commenter suggested that NPS build a sea wall to protect the coastal units. Another commenter suggested that risks posed to facilities could be minimized by using haligitype architecture for necessary structures in areas prone to flooding.

Visitor-Serving and Interpretive Facilities

A few commenters agreed with the NPS concepts to relocate the restrooms at Asan Beach and Ga'an Point to higher ground, as necessary, to address sea level rise and inundation. The NPS was asked to continue to provide restrooms in the more highly visited units, as they are considered an important community amenity.

Several commenters suggested that the NPS could improve maintenance at the park units, including more regular waste management and additional clean-up of lawns and picnic areas. A few commenters requested additional trash cans and recycling. Others emphasized the importance of continuing to provide benches, picnic facilities, and restrooms, even in the face of climate change impacts. Similarly, a commenter suggested the need for more benches and picnic tables at the Agat Unit. One commenter suggested that the NPS should provide camping opportunities at Asan Beach Unit.

A number of commenters suggested that the NPS should provide additional interpretive facilities, especially at the Asan Beach Unit.

One commenter would like to see the NPS build a small visitor center or visitor contact stations at Asan Beach. Another commenter had a similar request but did not specify the location within the park. Several other commenters supported the idea of providing a mobile visitor center or an open-air interpretive kiosk that could help to educate visitors about the park.

Flags and Monuments

Some members of the public requested that the NPS display the American flag more prominently on park grounds, specifically at the Asan Beach Unit, where a previous flag was recently removed. Another related comment suggested that the park could move the flags currently at Ga'an Point to higher ground on Rizal Point, if the flags are in danger of inundation from sea level rise.

A few people provided comments on the monuments along the shoreline at Asan Beach. One respondent noted the importance of protecting the monuments but did not express a preference for how they should be protected. Another commenter expressed concern regarding the lack of CHamoru monuments in the park. Another member of the public noted that the park's monuments should also commemorate the important role of the US Army in addition to the US Marines during the Battle of Guam.

Trails and Walkways

Trail use was an important topic for a number of commenters. Several respondents supported the NPS preliminary proposal for additional trail opportunities within the four park units. Those commenting on this subject expressed a need for additional safe walking and hiking opportunities on Guam, especially opportunities that offer a connection to nature and history. However, there was also some concern about how the new potential trail networks in the Asan Inland Unit of the park would impact those who live at adjacent residences.

One participant noted that it would be interesting to see what World War II resources could be experienced from trails in the Mt.

Alifan Unit, connecting to Hågat or Santa Rita. Another commenter supported the idea of adding a trail at Rizal Point and suggested providing lighting for safety. Another person suggested that the NPS increase the size of the existing walking trails at Ga'an Point and also provide lighting. One comment stressed the importance of accessible trails, particularly providing access to the beach and along the coastline for people using wheelchairs. The NPS was also encouraged to provide distance markers on the existing trails to help visitors understand how long it might take to reach key destinations. Several commenters requested that more lighting be installed at the units to enhance safety for those visiting the park and using walkways in the early morning and the evening.

Additional Comments on Facilities

A couple of commenters suggested that the NPS include a baseball field at Asan Beach Unit, to replace the baseball field that existed at Assan before it became a national park site. An additional two respondents asked whether food vendors could be permitted in the park units to attract additional visitors to the park, but one of these commenters wondered if there would be a negative impact to food vendors at other sites on the island.

Another commenter encouraged the park to achieve carbon neutrality, using available tools to achieve net zero emissions and pursuing carbon off-sets in the interim. The same commenter further suggested that NPS convert to renewable energy for all NPS energy use.

A few commenters urged the park to ensure that Congressional appropriations are available to fund the preliminary concepts described in the newsletter and also to provide for their long-term maintenance.

RESOURCE MANAGEMENT

Climate Change Impacts to Resources

Resource management includes both natural and cultural resources. The NPS received several comments on resource management, and many of these comments focused on

protecting the park's resources from the impacts of climate change. The climate change impacts discussed included sea level rise, changes in precipitation and storm intensity, loss of coral reefs, and the related adverse issues that would result, including flooding at the beach units and additional habitat loss.

Participants recommended that the NPS should integrate CHamoru traditional ecological knowledge into resource management to help mitigate the impacts of climate change. The NPS was also encouraged to return the Asan Beach Unit to its original pre-development condition to improve its resilience to climate change. The park was additionally asked to consider the character of the cultural landscape at Asan Beach at different periods in history and determine which period of time should be reflected in the experience of the landscape. This commenter noted that at one time Asan Beach was occupied by rice fields and homes.

One commenter supported the NPS preliminary proposal to replant coral reefs and suggested that the park include the local community in this process, including offering trainings on this topic. Another commenter emphasized that protecting biodiversity should continue to be a priority in NPS management.

Natural Resources

A few comments focused on natural resources and traditional uses. Some respondents suggested that the park also consider the importance of native animal species to ecosystem health and climate resilience and encouraged the NPS to address plant and animal symbiosis in the plan. A related comment suggested the park should have more monitoring of animal and plant life. One commenter expressed concern about natural resources, stating that the condition of flora and fauna within the park has deteriorated over time. Another related comment suggested the need to propagate and reintroduce native plant species throughout the four units included in the UMP.

One participant asked the NPS to plant more coconut trees along the shoreline at Asan Beach Unit to mitigate the loss of existing

coconut trees due to infestation from the coconut rhinoceros beetle.

One commenter requested that the park include traditional sustainable fishing at the beach units.

Cultural Resources

Those commenting on cultural resources emphasized the importance of preserving cultural resources including archeological resources, such as pottery and stone artifacts, and historic structures from World War II. Commenters expressed support for monitoring the sites to preserve their integrity. One respondent observed that it is extremely important and urgent for the NPS to preserve the tangible evidence of the World War II conflict, including historic fortifications along the shoreline that are threatened by rising sea levels and storm surge.

Submerged Resources

Some commenters expressed concern regarding underwater resources. Specifically, these respondents requested that the NPS provide a means to protect the submerged amtrac, or Landing Vehicle Tracked, at Asan Beach Unit and conduct necessary surveys of other underwater cultural resources. Another, similar comment expressed the need for the NPS to protect and preserve all underwater archeological resources. One commenter expressed concern about an underwater trail concept proposed during civic engagement, noting that it might have the potential to result in damage to underwater archeological resources. This commenter asked the NPS to consider whether a more formal interpretive program and well-defined underwater trails could reduce the risk of impact to submerged resources.

ENGAGEMENT WITH LOCAL COMMUNITIES AND LOCAL VILLAGE EXPERTS

Several commenters requested that local villages be given more input into the management of park resources and in telling the story of the park sites. Some respondents requested that the NPS

employ CHamoru elders with expertise in traditional knowledge and cultural practices to enhance interpretation and education for visitors. Suggested examples of additional interpretation include sharing traditional knowledge of habitats and ecosystems, using Indigenous place names, and demonstrating traditional practices such as fishing methods, use of medicinal plants, gathering of plants for food, and farming and ranching. Also, it was recommended that the NPS continue to reach out to the local villages and community centers at Hågat, Assan, Santa Rita, and Piti to keep people informed and to engage them in the planning process.

PUBLIC SAFETY

Several commenters expressed concern about public safety within the park units, especially at Asan Beach. Commenters expressed concern regarding both feral and off-leash dogs, crime, drug use, and a lack of law enforcement in the unit. A lack of lighting on the walking paths was a common concern as well. One commenter suggested that the NPS should install gates at the Asan Beach Unit to secure the area at night.

PRIVATE PROPERTY ISSUES

Some commenters were concerned about private property issues for residences located near the park, or for privately owned lands within the boundary of the Asan Inland Unit. Many of the comments submitted on this topic were about issues not related to the UMP, such as requests for private road upgrades and questions about permissible uses of private property.

AGENCY CONSULTATION AND COORDINATION

The following sections document the ongoing consultation and coordination efforts undertaken by the NPS during the preparation of this UMP/EA.

Section 106, National Historic Preservation Act

As described in chapter 3, the NPS is using the process and documentation required for the preparation of an environmental assessment to comply with Section 106 of the National Historic Preservation Act (36 CFR 800.8(c)I). To meet the requirements of Section 106 consultation, the NPS initiated early engagement with the Guam SHPO, the Advisory Council on Historic Preservation (ACHP), and other consulting parties. Historic preservation issues raised during the course of the planning process by the public and consulting parties were considered in the development of the alternatives and impact analysis. A meeting focused on identifying historic properties and integrating traditional knowledge into the UMP was held in April 2023 with the Guam SHPO, representatives of local agencies and organizations, and independent historians and cultural practitioners. See appendix G for a full list of consulting parties to date for the plan.

Electronic copies of this UMP/EA have been distributed to the Guam State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), and interested parties for review and comment related to compliance with Section 106. The NPS is proposing a finding of *no adverse effect* to historic properties from the decisions made in this plan.

CONSULTATION WITH THE GUAM STATE HISTORIC PRESERVATION OFFICE

In summer 2022, the NPS notified the Guam SHPO of the agency's intent to prepare the UMP/EA and invited participation by representatives of the SHPO. The SHPO initially responded and participated in a meeting focused on the plan in September 2022, and the park is currently still in consultation. During the public review period for this EA, the NPS will continue to consult with the SHPO to meet the remaining requirements of 36 CFR 800.

CONSULTATION WITH INDIGENOUS CHAMORU GROUPS

The park invited consultation with Indigenous Chamoru groups, neighboring villages and residents, historians, and cultural practitioners to inform the preferred alternative presented and analyzed in the plan. Consultation opportunities have been provided during civic engagement in summer 2022, during the April 2023 meeting focused on historic properties and traditional knowledge, and during the public review period for this plan and EA. Appendix G includes a list of Chamoru community leaders who participated as consulting parties.

Section 7, Endangered Species Act

Prior to civic engagement in 2022, the NPS notified the USFWS of the agency's intent to prepare the UMP/EA. In September 2023, the NPS initiated informal consultation with the US Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). During the public review period for this EA, additional consultation with the USFWS and NMFS will occur to affirm concurrence with the determinations of effect on listed or proposed species.

Coastal Zone Management Act

In summer 2022, the NPS notified the Guam Coastal Management Program of the agency's intent to prepare the UMP/EA. The park will be submitting a Federal Coastal Zone Consistency Determination to the Guam Coastal Management Program in advance of public review of the plan and EA.

Floodplain Management

NPS proposed actions that may adversely affect floodplains must comply with Executive Order 11988 and Director's Order #77-2: Floodplain Management, which requires the preparation of a Floodplain Statement of Findings if the action falls within the defined regulatory floodplain. The park's coastal units fall within the tsunami evacuation zone for Guam, which is considered a coastal high-hazard area (NPS 2002). See appendix E for the Floodplain Statement of Findings.