RESOURCE MANAGEMENT PLAN

WAR IN THE PACIFIC NATIONAL HISTORICAL PARK

February 14, 1997

Prepared by
Pacific Islands System Support Office

Recommended: _____
Superintendent, War in the Pacific
National Park Historical Park

2-14-97
Date

Recommended: _____
Field Director, Pacific West Field Area

_____
Date

INTRODUCTION

Legislation

War in the Pacific National Historical Park was established August, 1978 (§6 of Public Law 95-348). The park's stated purpose is to " . . commemorate the bravery and sacrifice of those participating in the Pacific Theater of World WarII and to conserve and interpret outstanding natural, scenic, and historic values and objects on the island of Guam for the benefit and enjoyment of present and future generations." The law also requires that the park be administered " . . . in accordance . . with the provisions of law generally applicable to units of the National Park System. Most obvious of those applicable laws include:

- *National Park Act of August 25, 1916.* "The . . . service . . . thus established . . . shall . . . promote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . as provided by law, by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historical objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

- *National Trust Act of March 27, 1978.* (P.L. 96-250). "Congress declares that . . . the protection, management, and administration of . . . (the National Parks) . . . shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as . . . directly and specifically provided by Congress."

- *The Historic Sites Act of 1935.* Congress declared that ". . . it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people . . ."

Other relevant laws:

- *National Environmental Policy Act of 1969* (Public Law 91-190). The National Environmental Policy Act (NEPA requires an environmental

statement in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of human environment.

- *Clean Water Act of 1977* (Public Law 95-217). This act was formerly known as the Federal Water Pollution Control Act Amendments of 1972. The requirement is to evaluate discharge effects of dredged or fill materials into waters of the United States.

- *Coastal Zone Management Act of 1972* (Public Law 92-583). This act requires that the project must comply with the federal law as well as be consistent with the Coastal Management Program for the Territory of Guam (Guam E.O. 78-37: Compliance with the Guam Coastal Management Program policies).

- *Endangered Species Act of 1973* (Public Law 93-205).

- *Fish and Wildlife Coordination Act of 1958* (Public Law 85-624).

- *Marine Protection, Research, and Sanctuaries Act of 1972* (Public Law 92-523).

- *Executive Order on Floodplain Management (EO 11988).* This order requires that agencies avoid the base floodplain unless it is the only practicable alternative.

- *Executive Order on Protection of Wetland, (E) 11990).* This order requires the agency to analyze potential impacts to existing wetlands and associated values.

Location

War-in-the Pacific National Historical Park is composed of seven separated sites, all located in the west central portion of Guam. Guam is the southernmost and largest island of the Marianas Island chain. The Marianas are seventeen small islands forming a north-south volcanic arc some 400 miles long. The island chain is still forming and islands to the north are most recent. Guam is thirty miles long by four to eight and a half miles wide, and has an area with an area of 225 square miles. It is almost as large as the remaining Marianas islands together. It is the largest island in the north Pacific between the Philippines and Hawaii, and between Japan and New Guinea-- a vast expanse 5,000 miles long and over 2,000 miles wide.

Pre-war Times

Before World War II Asan village of 600-700 people was located on Asan Point . During the war the Japanese removed people from the village and they were subsequently returned to the Asan area by the U.S. Navy. However, the Navy settled the returning residents on the slopes of Nimitz Hill and kept the peninsula for military use. The community of Asan is now situated partly on the slopes of and partly at the base of Nimitz Hill, between the city of Agana and the village of Piti.

WW II Times

Japan began pre-invasion bombing Guam on December 8 and 9, 1941, and invaded and captured the island December 10. Japanese occupation lasted until the American forces invaded and re-captured the island between July 21 and August 10, 1944. Other than the Japanese occupation goal to make Guam as 'Japanese' as the other Marianas islands, atrocities were relatively rare until March 1944. The Japanese army returned March 4, 1944, in a desperate attempt to install defenses against the expected American invasion of the Marian islands. All the historic fortifications in the park date from the period March - July 1944. Guam men and boys were forced into labor groups to work with Korean laborers. They built a thousand or more installations (of which about 75 survive within the park, Figure 1).

Beginning July 21, 1944, the Americans launched two simultaneous landings at Agat and Asan.

Post-war Times

During early years post World War II Guam was predominantly a military economy as a base for air warfare during the Korean and Vietnam engagements. After Vietnam the U.S administration and oversight responsibility shifted from the Departments of Defense to Interior. Restrictions against visitors to the island relaxed and tourism and resort development became important to the economy. Interest in the Pacific War grew and several battle sites were added to the National Register of Historic Places.

Four sites are listed in the most recently published list of sites in the National Register of Historic Places (44 Fed. Reg. 7615, 6 Feb 79 and supplementary list, 6 Mar 79).

(1) The Asan Ridge Battle area, which is part of the War in the Pacific National Historical Park, was placed on the Guam Register of Historic Places 17 April 1975 and on the National Register on 18 July 1975.

(2) Matgue Valley to the west of the village was placed on the Guam Register 15 October 1974 and the National Register on 3 April 1975.

(3) The Memorial Beach Park, a small part of the 1944 invasion beach area, was placed on the National Register on 7 August 1974 and on the Guam Register on 7 August 1974 and on the Guam Register on 21 January 1975.

(4) The Asan Invasion Beach was placed on the Guam Register on 20 February 1975, and nominated to the National Register 10 March 1975.'

Geography and Site Description

The historical park is 934 acres of land and 1002 acres of water and is comprised of seven disjunct units as follows:

- The **Asan Beach Unit** has 109 land acres and 445 water acres and is the site of the northern landing beaches. The 3rd Marine Division came ashore here for the initial assault and was met by the Japanese 320th Independent Infantry Battalion. There are several Japanese defensive sites and structures at Asan and Adelup Points. Substantial amounts of American military equipment and munitions were dumped off the reef at Asan Point and are grown over with coral. The Asan Visitor Center is located mid-way along the beach in this unit.

- The **Asan Inland Unit**, of 522 land acres, lies across Marine Drive directly across from the Asan Beach Unit. This unit is a hillside of swordgrass and scattered jungle forest extending upward to the summit of Nimitz Hill. The American advance from Asan beaches met stiff resistance here, and the hillside has many historic sites-- foxholes, caves, pillboxes, and gun emplacements. Asan Overlook, with memorial to combatants is on Nimitz Hill in this unit.

- The **Fonte Plateau Unit**, of 38 acres, is the site of a former Japanese naval communications center. The caves here are currently undeveloped.

- The **Piti Guns Unit** is 24 acres of upland forest and has three large Japanese coastal guns.

- The **Agat Unit** of 38 land acres and 557 water acres is the site of the southern landing beaches. The 1st Provisional Marine Brigade and the 305th Regimental Combat Team came ashore here. They were met by the Japanese 38th Infantry. Bangi Point and Island contain caves, bunkers, latrine foundations and 10 pillboxes. Some American equipment still lies underwater at the edge of the reef.

- The **Mount Alifan Unit**, of 158 acres, is a hillside of swordgrass and scattered trees behind the village of Agat. Heavy fighting occurred here and the area remains covered with historic sites and debris.

- The **Mount Chachao/Mount Tenjo Unit** is 45 acres lying on the ridge between the two mountains. It has a foxholes and a WW II American gun emplacement

Geology

The Marianas Islands are summits of 16 submerged volcanic peaks which rise from a ridge along the Marianas Trench, the world's deepest. Although the southernmost of these, Guam, is geologically young (some sixty million years old) it has undergone several periods of subsidence and uplift, and its basal volcanic material is interbedded with, and often covered by, limestones of reef origin.

Major geologic rock units exposed within the park include the *Alutom formation* extending to very great depth and considered bedrock, the *Mariana limestone*, *Alifan limestone*, slope debris (colluvium), and alluvium. The slope debris and alluvium are relatively thin unconsolidated clays, silts, sands and gravels eroded from the higher slopes and deposited on the lower sloped bedrock as talus-alluvial fans. The *Alutom* volcanic series are well bedded, fine to coarse-grained tuffaceous sandstone, tuffaceous shale, tuff breccia and pyroclastic conglomerates. The *Mariana limestone* is limited to a few outcrops of massive, porous, fossiliferous rock in the northeasternmost portion of the Asan unit and in cliffs immediately upslope from the Asan spring. In the central parts of the Asan unit, slope debris contains scattered very large boulders of very dense, hard limestone typical of the *Alifan limestone*. The boulders form large outcrops which were first thought to be residual from previous mapping, but which have since been found to be transported downslope from the residual outcrops of *Alifan limestone* that caps Nimitz Hill. The boulders apparently were transported by gravity sliding primarily in the form of earth-flow type

landslides.

Climate

Guam's climate is tropical-- almost uniformly warm and humid throughout the year. Afternoon temperatures are about 81° F. (30° C), and nighttime temperatures fall to the low 20's C. Guam has an annual rainfall of 81 inches and humidity of 81 percent. Though temperature and humidity vary only slightly throughout the year, rainfall and wind conditions vary and they define Guam's seasons.

There are two distinct seasons: a dry season from January through May, and a wet season from July to November. December and June are transitional months; they may fall in either the wet or dry season. Easterly trades are dominant throughout the year, especially from November to June. Tradewind speeds are generally between 4 and 12 miles per hour and rarely exceed 24 miles per hour.

A breakdown of the trade winds commonly occurs during the rainy season, and on some days the weather may be dominated by westerly-moving storm systems that bring heavy showers or steady, sometimes torrential rains. Occasionally there are typhoons, and these bring not only extremely heavy rains, but also violent winds that may result in a surge of water onto low-lying coastal areas. Since 1908, typhoons have passed close enough to Guam to produce high winds and heavy rains in every month, but they occur most frequently during the latter half of the year. The chance of having one or more typhoons pass within this distance in any particular year is about once in 3 years. The chance of having a typhoon move directly across Guam, however, is only about once in 8 years.

Soils

All Guam's soils are lateritic, having evolved under high temperatures and heavy rainfall. Those of the bottomlands (Gaan, Agat and Asan lowlands) in nearly level areas of valley bottoms and coastal plains (the *Inarajan-Inajaran Variant* soils) are deep and somewhat poorly drained. They are clay throughout. During rainy periods they are subject to flooding, but the water table recedes during dry periods.

Soils of the volcanic uplands (*Akina-Agfayan* soils) are very shallow to very deep, well drained, moderately steep to extremely steep soils.

They are on strongly dissected mountains and plateaus. These are found on most of park-- Asan to Nimitz Hill and lower slopes of Alifan.

Soils on the limestone uplands (*Pulantat* soils) are shallow, well drained, gently sloping to steep soils. They occur on dissected plateaus and hills from Bundshu Ridge to Nimitz Hill.

Tsunami and Flood Zones

There are no areas within the park that are mapped as flood zone by the Corps of Engineers.

Storm Zones

The entire park is hit or grazed by typhoons every few years. Both the Asan Beach and Agat Units are subject to frequent wave damage from passing typhoons and tropical storms.

Alien Species Invasions

The terrestrial habitats of War in the Pacific NHP have been devastated by alien biotic introductions more than any other park in the system. Of course, the entire park area was devastated by U.S. bombardment during the re-invasion -- without a single square yard of real estate unaffected. Following the bombardment in Guam's wet climate erosion in these devastated lands washed tons of silt onto the fringing coral reefs and threatened their very existence. The Navy responded to curb the erosion by aerial broadcasting seeds of tangentangen as a quick expedient ground cover. It has been effective. A half century later tangentangen endures as the dominant shrubland community in the park.

The invasion of the brown tree snake, and resulting demise of the entire native forest avifauna, is described later under present resource status.

Land Ownership

Currently 805.92 acres of the park are in federal ownership (601.26

NPS and 204.66 Navy); 874.07 are owned by GovGuam; 237.96 are private; and 7.95 acreas are in unknown ownership. The private lands are in 53 tracts.

MANAGEMENT OBJECTIVES (related to resource management)

Administer the park in accordance P.L. 95-348 (which established the park) and provisions of law generally applicable to units of the National Park System including Acts approved August 25, 1916 and August 21, 1935.

To the greatest extent possible, interpretative activities will be conducted in the English, Chomorro, and Japanese languages.

Develop an appropriate interpretive program which will foster an understanding of the reasons for the Pacific War, the sequence and nature of its conduct, its effects upon the peoples involved, its basic themes and broad patterns, the manner of its resolution, and the course of its aftermath.

Cultural resources

Stabilize and preserve the sites and features related to the American re-invasion of Guam. Develop interpretive programs related to the Pacific encounters of World War II.

Natural Resources

Manage native terrestrial ecosystems generally in accord with those conditions just prior to the American re-invasion of Guam. In many instances vegetation will be used which appears similar in life-form to the 1944 vegetation, i.e., grass instead of rice paddies.

Preserve and manage important geographical and historical features within the park in order to provide a setting with sufficient historical integrity to adequately interpret the battle for Guam as an example of the island-by-island fighting in the Pacific war battles.

Preserve and interpret important natural features such as native plant communities and stream and marine bed environments for public use and enjoyment.

PRESENT CULTURAL RESOURCE STATUS

Cultural Resource Baseline Information

The Park contracted with the Micronesian Area Research Center to inventory archival sources for the park. These and similar studies by MARC are published as a series of MARC Working Papers and include a listing of documents covering the American period of Guam (Spanish American War to the time of the Organic Act of Guam in 1950). The archival sources include written reports, daily correspondence, special events and activities of the Naval Government of Guam and other agencies with known Guam interests such as Pan American Airways. Documentation of World War II in Guam area is extensive. These studies not only located written materials but reviewed large amounts of photographs. These archives listings are in McGrath, 1979, and Johnston, 1979, American Era Historic Sites Research (covering the Naval Period on Guam 1898-1950; and Fiegel, 1980, Calendars of Documents in the Washington National Records Center, reels 26 and 24; and Leader, 1980, Calendars of Documents in the Washington National Records Center, reel 25.

In 1991 the Park contracted with the Wiss, Elstner Associates, Inc., (Wiss) to study the World War II concrete ruins and present a series of stabilization alternatives. One of their options suggested demolishing the existing roof slabs of some gun emplacements and constructing new concrete-rebar roofs. The park preferred the options which saved the original fabric of these structures. Western Region architects favored the demolition/replacement option, and in the impasse the funds were pulled for the entire ruin stabilization. That's a pity. This project needs to be resurrected and funded.

Table 1. Stabilize 12 WW II Gun Emplacements and Pillboxes

Feature	Site No.	Option Choice	1991 Cost
Asan Beach Unit			
Pillbox	61	B	3,200
Gun Emplacement	62	C	12,000
Stone & Concrete Wall	63	A	600
Gun Emplacement	64	C + F	10,600

Gaan Point			
Gun Emplacement	23	C	5,500
Pillbox	24	B	4,500
Apaca Point			
Pillbox	1	B	1,800
Pillbox	5	B	2,800
Total			41,000

Cultural resources of the park

The entire area of the park's Asan Units is within the actual invasion beachhead line and is on the National Register of Historic Places. During the historic period, July 1944, this area included the small community of Asan tied to subsistence fishing and agriculture. The flat lowlands were rice paddies. The beach today is substantially the same. Strand vegetation then was typical of Pacific islands-- Pandanus, coconuts, beach-morning glory, and grasses. Slopes leading to the uplands were largely swordgrass on the ridges with scattered clumps of Pandanus and coconut. Sheltered areas and stream bottoms had dense forest. Tangentangen, though present, was not the dominant vegetation. In Figure 1 notice the ridges defining the rice paddies in the flats behind the frontage roadway. Though badly bombarded, coconut and perhaps Pandanus are evident in the strand. Swordgrass and coconut are obvious in the rear foreground. This, as well as Figures 2 and 3, are excellent representations of vegetative patterns and the extent of buildings and roads at Asan during the historic period.

Figure 4, Third Marines Landing Plan & Scheme of Maneuver, has the best representation presently available to us of building, road, and rice paddy locations at Asan during the historic period. The intent of park management is to approximate the appearance of Asan as it appeared during this period. Mowed grass is to be substituted for the rice paddies. Generally, structures should not be allowed to intrude upon beach areas which had no buildings in 1944.

Table 1 is a synthesis of vegetation characteristics during different historic periods and defines a vegetation management objective to retain the aspect of the landscape during the historic period (July, 1944).

There are no known prehistoric archeologic sites or features within the park. The heavy bombardment as part of the U.S. invasion, destructive battle, and extensive rehabilitation following the war likely obliterated any sites which

may have occurred. A comprehensive survey of the coastal areas of Guam was conducted by Dr. Fred Reinman in 1965. He reported no sites within the Park.

Current Ethnographic Situation

The native people of Guam and the Marianas were Chamorro. Probably their origin was Micronesian but references supporting this are vague. Guam people came under Western influence early. Spanish ships routinely stopped at Guam by the early 1500's for re-supply. Magellan himself may have landed at Umatac in 1521. In 1565 Guam was claimed by Spain and thereafter Spanish influence became dominant in the folkways of Guam people, permeating language, religion, beliefs and legal customs. Guam remained under Spanish control and influence until 1898 when, as a result of the Spanish-American War, the U.S. assumed jurisdiction. During this century Guamanians adapted more and more American culture in dress, speech, modes of assembly, mannerisms, eating and playing. Now Guamanians are a mixture of Spanish, American, Chamorro, Filipino, Japanese and Chinese. No pure-blooded Chamorros remain. Recent American folkways and ideas are strong in Guam.

Major Issues

- Defining and managing "National Historic Landscapes."
- Brown Tree Snake
- Reef and ocean management (with mixed ownerships).
- The dumped munitions at Asan Point reef.

Cultural Context/Themes

Cultural groups include--

Fiesta type recreational gatherings including historical and political events.

Individual recreationists-- joggers, fishermen, beachcomers, divers, snorklers.

Japanese tourists

History buffs.

Veterans of WWII at Guam including Chomorro survivors.

Military and dependents, local mostly Chomorro, Japanese tourists, mainland 'expatriots,' new immigrants,

PRESENT NATURAL RESOURCE STATUS

During preliminary park studies in the mid-70s field checks of the terrestrial biota listed the following native forest birds in the proposed historical park:

Guam Rail	Asan, Piti, Mt Tenjo, Agat, and Mt Alifan units
White-browed Rail	known from forest near park units
White-throated Ground Dove	Asan, and Mt Alifan units
Mariana Fruit Dove	Asan, Agat, and Mt Alifan units
Island Swiftlet	Asan and Mt Alifan units
Micronesian Kingfisher	Asan, Agat, and Mt Alifan units
Mariana Crow	Asan, Agat, and Mt Alifan units
Nightingale Reed Warbler	known from forest near park units
Guam Flycatcher	known from forest near park units
Rufous Fantail	Asan, Agat, and Mt Alifan units
Micronesian Starling	Asan, Piti, Mt Tenjo, Agat, and Mt Alifan units
Cardinal Honeyeater	Asan, Piti, Mt Tenjo, Agat, and Mt Alifan units
Bridled White-eye	Asan, Agat, and Mt Alifan units

By the late-1980s all the species listed above except occasional vagrant Swiftlets were gone from the park. Only now have we realized that the park's entire native forest avifauna is completely decimated. Silently they were destroyed by a gigantic population explosion of the non-native brown tree snake introduced from New Guinea. The island's endemic birds had evolved in a snake free environment and were totally naive of predatory tree snakes. We only now realize the alien snake completely decimated the Park's and Guam's entire native forest bird fauna. As Tom Fritts describes, the Guam bird . .

> " . . extinctions are primarily due to a single factor . . . the introduction of an exotic snake, the brown tree snake . . The birds of Guam evolved in the absence of snake predators. Since the birds of Guam had no experience with such a predator, they apparently lacked protective behaviors against the brown tree snake, and were easy prey for these efficient, nocturnal predators. Once the invasion had taken hold, the snakes spread across the island, the number of snakes began to grow exponentially, and the bird populations began to decline."

Perhaps in only a decade and a half two bird species recorded from in and near the Park became extinct. The Guam Rail, for which we restored habitat, is extinct except for a few specimens in zoos. The Mariana Fruit Dove, Nightingale Reed Warbler, Rufous Fantail, Cardinal Honeyeater and Bridled White-eye are entirely gone from Guam and the Park. Micronesian Starlings are gone from the Park though some may survive elsewhere on Guam. Guam populations of White-

throated Ground Dove, Micronesian Kingfisher, and Mariana Crow are nearly extinct; they are no longer in the Park. Maybe a few Island Swiftlets occasionally come to the park as vagrants.

Of War in the Pacific National Historical Park's native forest birds only one species, the Swiftlet, may still remain. The rest, 12 species, are gone. Most are gone from Guam. Two are extinct. No other National Park has suffered such a massive loss of its biodiversity. It seems astounding that we failed to know it was occurring until quite long after the loss was total.

The brown tree snake numbers, at the height of its invasion were immense. In prime habitats snake numbers were estimated to be 12,000 snakes per square mile- - perhaps the greatest density of snakes anywhere in the world. Now, of course with a massive decline in prey, snake numbers are much less. Still, resilient populations of alien mice, rats, lizards and geckos support a sizable snake population, particularly in villages.

Natural Resource Baseline Information

Marine Resources

S. S. Amesbury, 1978, has good base line information of reef fishes at Guam, including the park.

Freshwater resources

There are only a few very small freshwater streams, and no lakes or ponds, within the park.

Terrestrial Resources

At this writing the park does not have any current base line information. Vegetation has never been mapped for the park; the snake has drastically modified all terrestrial vertebrate populations; the park has not had any sort of marine inventory. In sum, there is not current, valid baseline information on the park's terrestrial biota.

From both the Asan and Agat Beaches terrestrial vegetation grades from shoreline beach vegetation, strand, inland flood plain to the hillsides of predominantly savannah (sword grass) grass occasionally interrupted by isolated patches of tangen-tangen and ironwood trees. Valleys and stream beds are lined with forest , tangen-tangen, domestic fruit trees, and shrubs.

Appendix B is a speculative plant list for the historical park. Plant studies and vegetative mapping specific to the park have not been done. Table 2. contains a generalized plant summary by habitat for various times in the last three-quarters of a century. In general, the goal of vegetation management is to maintain the park vegetation in broad appearance to the landscape aspect which prevailed at the time of the U.S. invasion and recapture of Guam--the historic period for which the park was established. In that regard, two historic landscapes (the Asan Beachhead and the Agat Beachhead) should be defined. Both *Asan Invasion Beach* and *Agat Invasion Beach* are already listed on the National Register. This RMP identifies them as Cultural Landscapes of the Historic Site category, associated with the U.S. invasion at these beachheads in July and August of 1944. Portions of these landscapes lying within boundaries of War-in-the-Pacific National Historical Park should be nominated to the National Register as historic landscapes. The park proposes to add Asan and Agat Beachheads to the Cultural Landscape Inventory (CLI) and seek funding to prepare Cultural Landscape Reports (CLR) of the two beachheads.

Table 2. Plant Communities of the War in the Pacific National Historical Park Units.

Site	Pre-WW II	Japanese Occupation	Post- Liberation	Present
Asan Units				
Strand	Strand	Strand	Basically destroyed	strand
Beach	Halophytic-Xerophytic Limestone Forest	Halophytic-Xerophytic Limestone Forest	Basically destroyed	Tangentangen; some Limestone Forest
Coastal Plain	Some houses. Cleared Land	Some houses. Rice Paddies	Basically destroyed	Mowed grass, Weeds. Tangentangen
River Valleys	Ravine Forest/ Limestone Forest	Ravine Forest/ Limestone Forest. Fortifications	Heavily damaged	Tangentangen; some Limestone Forest
Fonte Plateau Slopes	Limestone Forest. Savanna	Limestone Forest. Savanna	Damaged	Tangentangen; some Limestone Forest; Savanna
Piti Unit				
Slopes	Limestone/ Ravine Forest	Limestone/ Ravine Forest; Mahogany; fortification	Basically destroyed	Mahogany; Ravine Forest
Mt Tenjo/Chachao Unit				
Slopes	Savannah; some Limestone/ Ravine Forest	Savanna; fortification; Limestone/ Ravine Forest	Damaged	Savanna; some Limestone/ Ravine Forest
Agat Unit				
Beach	Strand; some houses	Strand; houses; fortifications	basically destroyed	Strand; mowed grass, fortifications
Coastal Islands	Halophytic-Xerophytic Limestone Forest	Halophytic-Xerophytic Limestone Forest	Heavily damaged	Halophytic-Xerophytic Limestone Forest
Slopes	Savanna; Ravine Forest	Savanna; fortification; Ravine Forest	Basically destroyed	Eroded Savanna; Ravine Forest

The Asan Beachhead

The Asan Beachhead stretched from the outer reef to the summit of Nimitz Hill. Figure 1, Beach Sketch Northern Sector from the U.S. Marines battle plan graphically shows the extent of this proposed historic landscape.

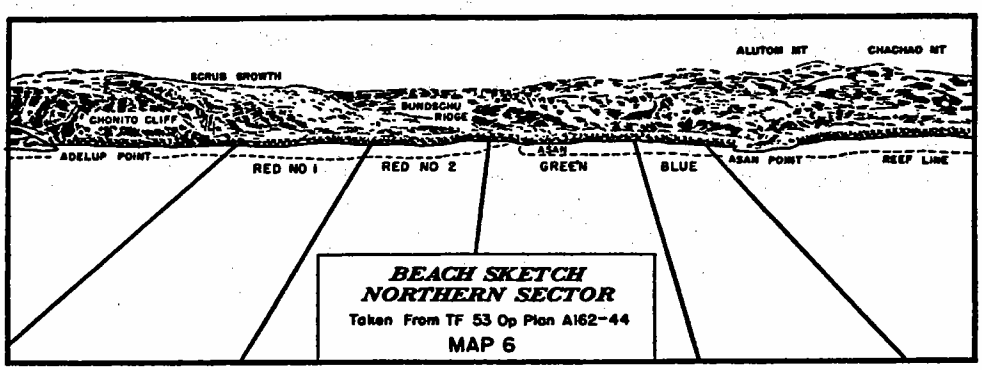

Figure 1. Asan Beachhead from the U.S. Marines battle plan. June 1944.

The flat lands just inland of the Asan Beach appear to be rice paddies in July of 1944. This landscape can be managed as mowed grassland as a surrogate vegetation to appear in aspect similar to rice lands during the historic period. The beach strand appears similar in aspect to the coconut and shrubbery that exists today. In the immediate foreground of Figure 2 are bunchgrasses and coconut trees.

On the 27 of July, 1944 marines advanced through bunch grasslands (Figure 3). This landscape extending from Nimitz Hill toward Alutom Mountain appears today much as it did then. In is grassland on the ridges and exposed flanks-- mostly swordgrass, and some ravine forest in the lower elevation ravines. Today tangentangen is invading this grassland and savannah. Management should be aimed at maintaining the grassland of swordgrass and scattered ironwood. In the past, this grassland-savannah has been maintained by periodic fires. With our present fire management capabilities it is not suggested that deliberate fire be used to maintain this landscape-- but in fighting fires it is certainly preferable to make and hold suppression fire-lines at the crest of Nimitz Hill and let the lower slopes burn, from the viewpoint of landscape management.

Figure 2. Asan invasion beach, July 27, 1944. National Archives photograph 88113.

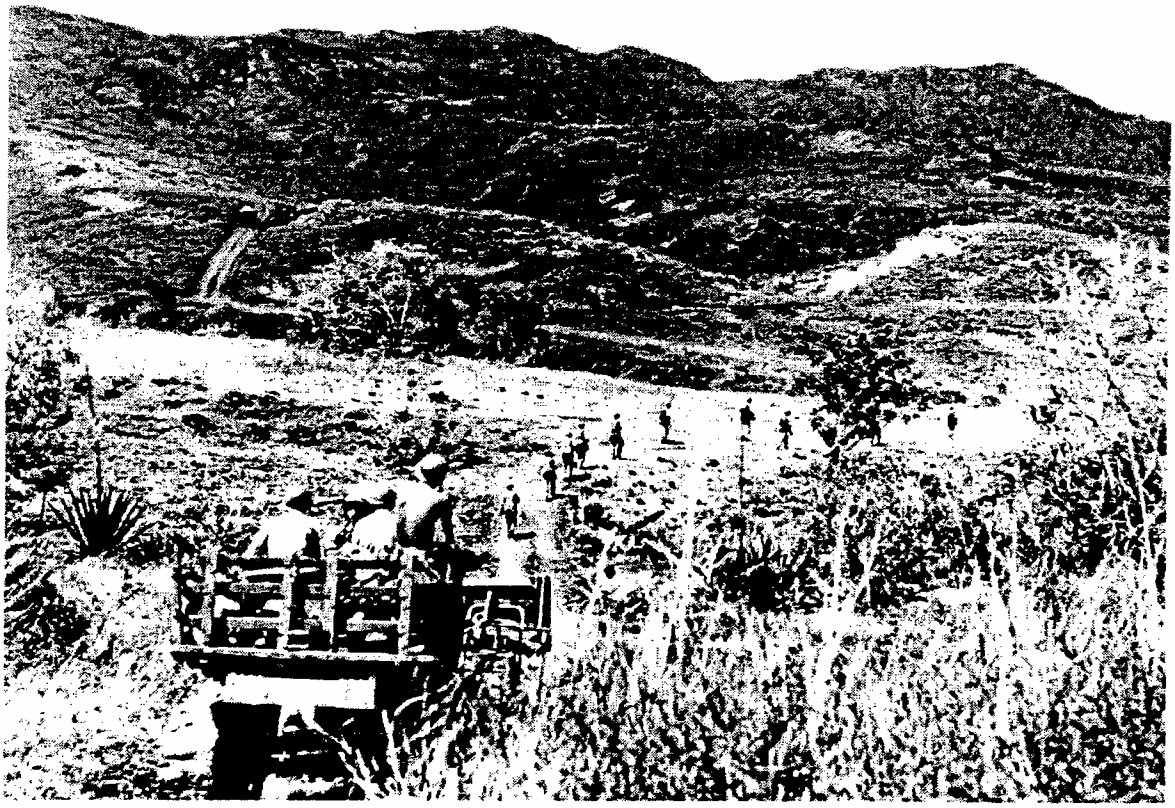

Figure 3. Marines advance toward Alutom Mountain. National Archives photo 238975.

The Agat Beachhead

The Agat Beachhead extended from the outer fringing reef to the summit of Maanot Ridge and Alifan Mountain. Figure 4, the beach sketch from the U.S. battle plans shows the extent of this proposed historic landscape. Substantial areas between Highway 2 and the sea, as well as upper slopes of Alifan Mountain are in the park and should be considered the cultural landscapes.

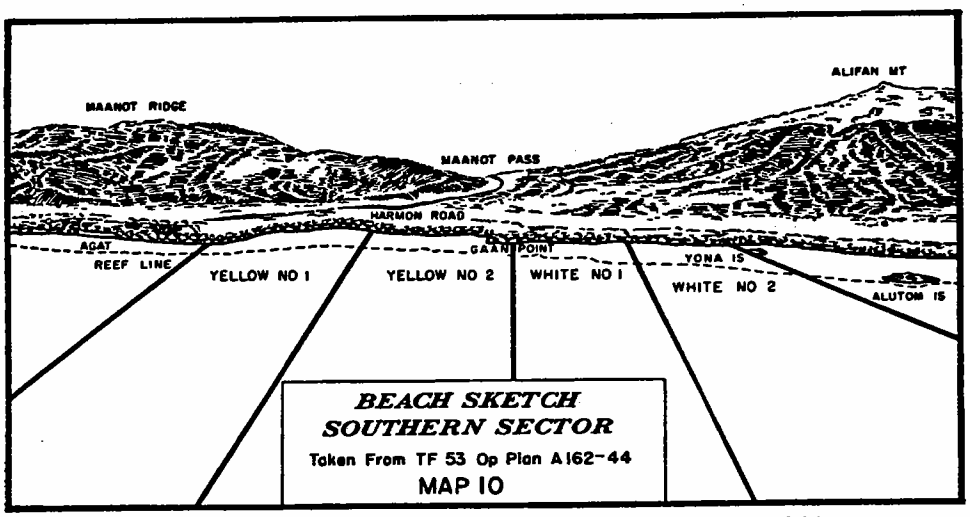

Figure 4. Agat Beachhead from the U.S. Marines battle plan. June 1944.

Figure 5 shows vegetation along the strand zone of White Beach in August of 1944. Vegetation is coconut and ironwood.

Figure 5. White Beach at Agat Beachhead August 22, 1944. National Archives photo 243803.

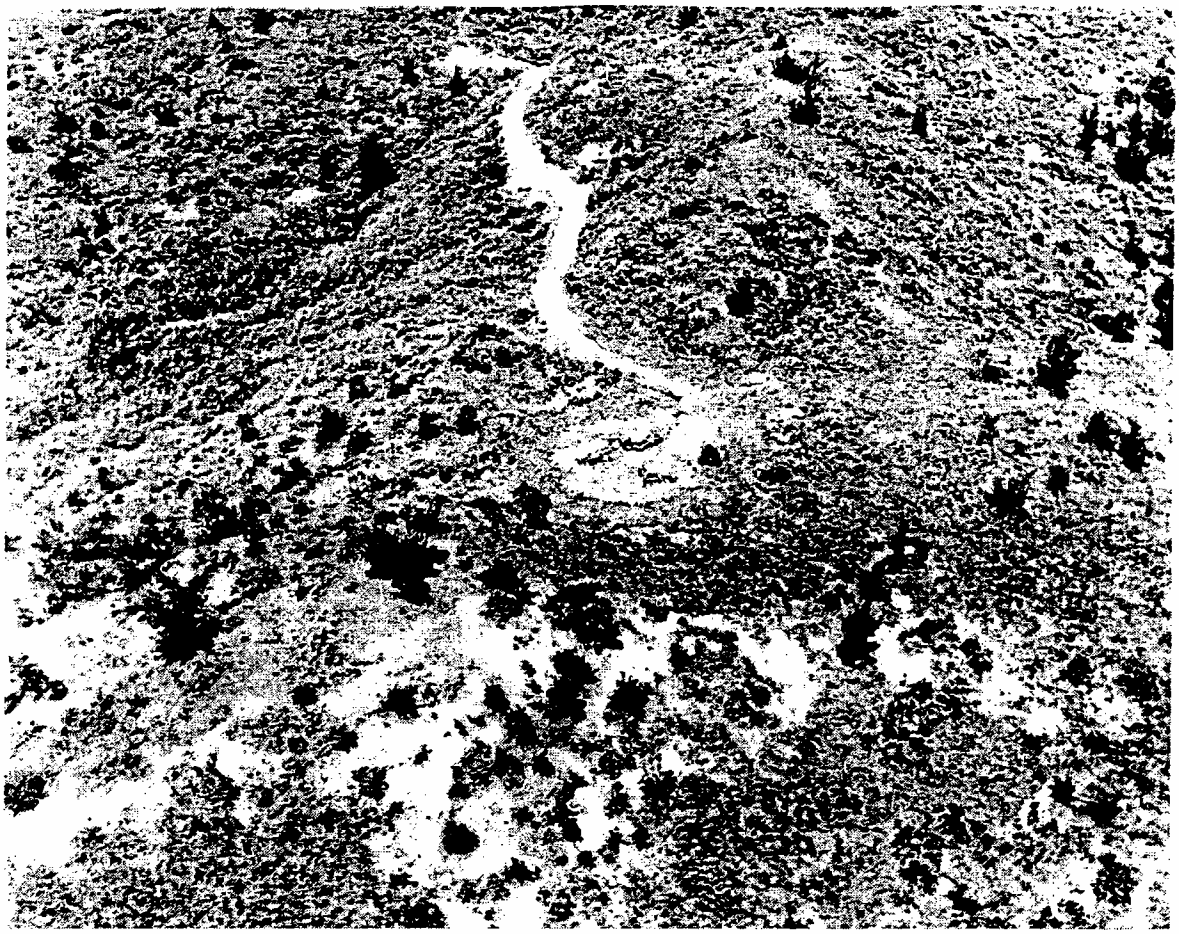

Figure 6. Aerial view of terrain behind Agat Town. August 7, 1944. National Archives photo 242195.

Figure 6 is an aerial view of Alifan Mountain slopes taken from a plane at 1000' elevation. Swordgrass is the dominant vegetation on this savannah hillside. The trees appear to be mostly ironwood. Alifan Mountain slopes appear like this today, but this vegetation is maintained by occasional grass fires.

Major Issues

a Inventory existing agricultural subsistence use with the people engaged in this farming. Contract aerial photo coverage in 1994 or '95 as baseline evidence of subsistence use.

b Inventory

R-MAP ANALYSES

R-MAP (Resource Management Assessment Program), and its cultural component CR-MAP, is a process designed to identify a park's base funding needs to reasonably protect and preserve its natural and cultural resources. It is particularly valuable for a new park such as this since it develops a rationale for staffing based upon parks of comparable resource complexity. The following table contains the first inventory for those R-MAP/CR-MAP for which we have enough knowledge to make entries.

Table 2. Total Natural FTE Derivations from the Tables

Activity RMAP	Existing Alloc	Staff	Gap
Vegetation Management	1.03	0.00	1.03
Wildlife Management	2.09	0.00	2.09
Prescribed Fire Mgt	0.10	0.00	0.10
Water Quality Mgt	0.93	0.00	0.93
Air Quality Mgt	0.21	0.00	0.21
Geologic Management	0.21	0.00	0.21
Disturbed Area Rehab	0.62	0.00	0.62
Pest & Hazard Mgt	0.21	0.00	0.21
Environmental Planning	1.40	0.00	1.40
Collections Data Mgt	0.50	0.00	0.50
Science Oversight	0.30	0.00	0.50
Total	7.60	0.00	7.60

Table 3. Total Cultural FTE Derivations from the Tables

Activity CRMAP	Existing Alloc	Staff	Gap
Archeological Inv/Res/Mgt	0.77	0.00	0.77
Historic Structures	0.52	0.00	0.52
Ethnographic resource/research	0.13	0.00	0.13
Museum Collections Doc/Pres/Use	1.05	1.00	0.05
Cultural Resources Library	0.10	0.00	0.10
Cultural Studies/Reports	0.20	0.00	0.20
Historic Pres. Compliance	0.10	0.00	0.10
Total	2.87	1.00	1.87

Table 4. Related Workload Generated

Activity RMAP	Existing Alloc	Staff	Gap
GIS Data Management	0.70	0.00	0.70
Related Interpretation	0.80	0.00	0.80
Total	1.50	0.00	1.50

CURRENT FUNDING AND PERSONNEL

NPS Resources Personnel current year

Museum Specialist (History), GS-1016-9

NPS Resources Funding, natural and cultural, current year

Museum curation, $33,000/year

Natural and Cultural Resources Projects Programming Sheets

Program Sheet 1, Current Year Funded Cultural Resource Activities

Program Sheet 1, Current Year Funded Natural Resource Activities

Program Sheet 2, Unfunded Cultural Resource Activities

Program Sheet 2, Unfunded Natural Resource Activities

PROGRAMMING SHEET 1
CULTURAL
FUNDED ACTIVITIES
($ in thousands)

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
001.000 C	HISTORIC STRUCTURE STABILIZATION/ PRESERVATION	168	STRC	C12 C21	No funded data												
002.000 C	CHAMORRO ORAL HISTORY	207	ETHN	C04	No funded data												
003.000 C	JAPANESE ORAL HISTORY	116	ETHN	C04	No funded data												
004.000 C	AMERICAN ORAL HISTORY	115	ETHN	C04	No funded data												
005.000 C	INVENTORY, MONITOR & MANAGE ARCHEOLOGICAL RESOURCES	R108	SITE	C06 C03	No funded data												
006.000 C	PARK AERIAL PHOTOGRAPHY	110		C01	No funded data												
007.000 C	LOCATION OF SEALED JAPANESE EARTHEN TUNNELS/CAVES	153	SITE	C14	No funded data												
008.000 C	UNDERWATER CULTURAL RESOURCES SURVEY	133	COMB	C14 C10	No funded data												
009.000 C	PRESERVE 4 DOZEN WWII NAT'L REG HISTORIC RUINS	R013	STRC	C55	No funded data												

continued...

PROGRAMMING SHEET 1
CULTURAL
FUNDED ACTIVITIES
($ in thousands)

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
010.000 C	REHAB & MAINTAIN 2 WWII HISTORIC LANDSCAPES	R013??	SITE	C14	No funded data												
011.000 C	INSTALL AND OPERATE A PARK GIS INFORMATION SYSTEM	R107		C72 N24	No funded data												
012.000 C	PREPARE ASAN & GAAN CULTURAL LANDSCAPE REPORTS, CLR	188	COMB	C11 C72	No funded data												
013.000 C	STABILIZE 4 DOZEN WWII NAT REG RUINS	206	SITE	C72 C13	No funded data												
101.000 C	SUB-SURFACE ARCHAEOLOGICAL TESTING	151	SITE	C14	No funded data												
14 projects printed																	
					Grand Total $$			0.00		0.00		0.00		0.00		0.00	
					Grand Total FTE			0.00		0.00		0.00		0.00		0.00	

PROGRAMMING SHEET 1
NATURAL
FUNDED ACTIVITIES
($ in thousands)

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
001.000 N	PARK TOPOGRAPHIC BASE MAP	112		N20	No funded data												
002.000 N	IMPACT STUDY FOR REMOVAL OF REEF CONSTRUCTION	209	CULL	N08 N24	No funded data												
003.000 N	BOTANICAL RESOURCES SURVEY AND MAP	207		N20 N17	No funded data												
004.000 N	TANGANTANGAN CONTROL	184		N05	No funded data												
005.000 N	WILDFIRE STUDY	112		N07 N08	No funded data												
006.000 N	FAUNAL SURVEY	185		N17 N20	No funded data												
008.000 N	ENDANGERED BIRD STATUS SURVEY			N17 N20	No funded data												
009.000 N	ENDANGERED BAT STATUS SURVEY			N02 N20	No funded data												
010.000 N	RE-ESTABLISH HISTORIC SCENE			N24 N17	No funded data												

continued...

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
010.001 N	RE-ESTABLISH HISTORIC SCENE, BOUNDARY SURVEY BOUNDARY SURVEY	164		N20	No funded data												
010.002 N	RE-ESTABLISH HISTORIC SCENE FENCING OF NPS LANDS			N20 N24	No funded data												
010.003 N	RE-ESTABLISH HISTORIC SCENE, JUNK REMOVAL REMOVAL OF JUNK			N08 N24	No funded data												
010.004 N	RE-ESTABLISH HISTORIC SCENE, VEG STUDY HISTORIC VEGETATION STUDY			N17 N20	No funded data												
010.005 N	RE-ESTABLISH HISTORIC SCENE, CONTR TANGENTANGEN REMOVAL OF TANGANTANGAN			N05	No funded data												
					Project Total $$			0.00		0.00		0.00		0.00		0.00	
					Project Total FTE			0.00		0.00		0.00		0.00		0.00	
011.000 N	CONTROL OFF-ROAD VEHICLE DAMAGE	125	COMB	C18	No funded data												
012.000 N	REMOVE SEWAGE DISCHARGE	147		N11	No funded data												

PROGRAMMING SHEET 1
NATURAL
FUNDED ACTIVITIES
($ in thousands)

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
013.000 N	MISSION GRASS ECOLOGICAL STUDY	212		N05	No funded data												
014.000 N	ENDANGERED TREE FERN STATUS STUDY	213		N03	No funded data												
015.000 N	REEF DISTURBANCE STUDY	214		N06	No funded data												
017.000 N	ALIEN PIG STATUS	215		N01	No funded data												
018.000 N	MONITOR AND MANAGE OCEAN REEF HABITATS	R023	SITE	C72 N24	No funded data												
100.000 N	DEVELOP WATER RESOURCES MANAGEMENT PLAN	211		N11 N12	No funded data												
102.000 N	NATURAL HISTORY INTERPRETIVE TRAILS	114			No funded data												
103.000 N	BIOLOGICAL STUDY OF SMALL ISLANDS	186		N17 N20	No funded data												
104.000 N	ACQUISITION OF A PARK NATURAL HISTORY LIBRARY			N24	No funded data												
25 projects printed																	
					Grand Total $$			0.00		0.00		0.00		0.00		0.00	
					Grand Total FTE			0.00		0.00		0.00		0.00		0.00	

PROGRAMMING SHEET 2
CULTURAL
UNFUNDED ACTIVITIES
($ in thousands)

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
1 C	001.000	HISTORIC STRUCTURE STABILIZATION/PRESERVATION	168	STRC	C12 C21	RES	O	.00	.00	.00	.00	.00	.00	43.20	.00	43.20	0.00
2 C	009.000	PRESERVE 4 DOZEN WWII NAT'L REG HISTORIC RUINS	R013	STRC	C55	RES	R	.00	.00	218.00	3.00	218.00	3.00	218.00	3.00	654.00	9.00
3 C	012.000	PREPARE ASAN & GAAN CULTURAL LANDSCAPE REPORTS, CLR	188	COMB	C11 C72	RES	O	.00	.00	19.00	.00	.00	.00	.00	.00	19.00	0.00
4 C	013.000	STABILIZE 4 DOZEN WWII NAT REG RUINS	206	SITE	C72 C13	PRO	O	.00	.00	.00	.00	50.00	.00	50.00	.00	100.00	0.00
5 C	002.000	CHAMORRO ORAL HISTORY	207	ETHN	C04	RES	O	20.00	.00	.00	.00	.00	.00	.00	.00	20.00	0.00
7 C	003.000	JAPANESE ORAL HISTORY	116	ETHN	C04	RES	O	41.00	.00	.00	.00	.00	.00	.00	.00	41.00	0.00
8 C	010.000	REHAB & MAINTAIN 2 WWII HISTORIC LANDSCAPES	R013??	SITE	C14	RES	R	.00	.00	283.00	3.00	283.00	3.00	283.00	3.00	849.00	9.00
14 C	005.000	INVENTORY, MONITOR & MANAGE ARCHEOLOGICAL RESOURCES	R108	SITE	C06 C03	RES	O	5.00	.00	.00	.00	.00	.00	.00	.00	5.00	0.00
						RES	R	.00	.00	.00	.00	94.00	1.00	94.00	1.00	188.00	2.00
				Subtotal				5.00	.00	.00	.00	94.00	1.00	94.00	1.00	193.00	2.00
15 C	011.000	INSTALL AND OPERATE A PARK GIS INFORMATION SYSTEM	R107		C72 N24	RES	R	.00	.00	.00	.00	.00	.00	80.00	1.00	80.00	1.00
16 C	004.000	AMERICAN ORAL HISTORY	115	ETHN	C04	RES	O	20.00	.00	.00	.00	.00	.00	.00	.00	20.00	0.00

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PROGRAMMING SHEET 2
CULTURAL
UNFUNDED ACTIVITIES
($ in thousands)

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
17	006.000 C	PARK AERIAL PHOTOGRAPHY	110		C01	RES	O	50.00	.00	.00	.00	.00	.00	.00	.00	50.00	0.00
19	007.000 C	LOCATION OF SEALED JAPANESE EARTHEN TUNNELS/CAVES	153	SITE	C14	RES	O	50.00	.00	.00	.00	.00	.00	.00	.00	50.00	0.00
20	008.000 C	UNDERWATER CULTURAL RESOURCES SURVEY	133	COMB	C14 C10	RES	O	75.00	.00	.00	.00	.00	.00	.00	.00	75.00	0.00
26	101.000 C	SUB-SURFACE ARCHAEOLOGICAL TESTING	151	SITE	C14	RES	O	.00	.00	.00	.00	.00	.00	20.00	.00	20.00	0.00
	14 projects printed																
		Grand Total $$						261.00		520.00		645.00		788.20		2214.20	
		Grand Total FTE						0.00		6.00		7.00		8.00		21.00	

PROGRAMMING SHEET 2
NATURAL
UNFUNDED ACTIVITIES
($ in thousands)

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
5 N	003.000	BOTANICAL RESOURCES SURVEY AND MAP	207		N20 N17	RES	O	15.00	.00	.00	.00	.00	.00	.00	.00	15.00	0.00
9 N	103.000	BIOLOGICAL STUDY OF SMALL ISLANDS	186		N17 N20	RES	O	.00	.00	.00	.00	.00	.00	10.00	.00	10.00	0.00
10 N	002.000	IMPACT STUDY FOR REMOVAL OF REEF CONSTRUCTION	209	CULL	N08 N24	MIT	O	100.00	.00	.00	.00	.00	.00	.00	.00	100.00	0.00
11 N	001.000	PARK TOPOGRAPHIC BASE MAP	112		N20	RES	O	15.00	.00	.00	.00	.00	.00	.00	.00	15.00	0.00
12 N	005.000	WILDFIRE STUDY	112		N07 N08	RES	O	27.00	.00	27.00	.00	27.00	.00	.00	.00	81.00	0.00
13 N	018.000	MONITOR AND MANAGE OCEAN REEF HABITATS	R023	SITE	C72 N24	RES	R	.00	.00	.00	.00	.00	.00	189.00	2.00	189.00	2.00
18 N	012.000	REMOVE SEWAGE DISCHARGE	147		N11	RES	O	.00	.00	.00	.00	.00	.00	10.00	.00	10.00	0.00
21 N	100.000	DEVELOP WATER RESOURCES MANAGEMENT PLAN	211		N11 N12	MON	O	5.00	.00	.00	.00	.00	.00	.00	.00	5.00	0.00
22 N	013.000	MISSION GRASS ECOLOGICAL STUDY	212		N05	RES	O	.00	.00	.00	.00	.00	.00	10.00	.00	10.00	0.00
23 N	014.000	ENDANGERED TREE FERN STATUS STUDY	213		N03	RES	O	12.00	.00	12.00	.00	12.00	.00	.00	.00	36.00	0.00
24 N	015.000	REEF DISTURBANCE STUDY	214		N06	RES	O	12.00	.00	12.00	.00	12.00	.00	.00	.00	36.00	0.00
25 N	017.000	ALIEN PIG STATUS	215		N01	RES	O	2.00	.00	.00	.00	.00	.00	.00	.00	2.00	0.00

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PROGRAMMING SHEET 2
NATURAL
UNFUNDED ACTIVITIES
($ in thousands)

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	ACT TYP	T Y P	CURRENT YEAR 1997 $$	CURRENT YEAR 1997 FTE	OUTYEAR 1 1998 $$	OUTYEAR 1 1998 FTE	OUTYEAR 2 1999 $$	OUTYEAR 2 1999 FTE	OUTYEAR 3 2000 $$	OUTYEAR 3 2000 FTE	TOTAL $$	TOTAL FTE
27	010.000 N	RE-ESTABLISH HISTORIC SCENE			N24 N17	MIT	R	45.00	.00	75.00	.00	12.00	.00	.00	.00	132.00	0.00
						MIT	C	294.00	.00	189.00	.00	189.00	.00	.00	.00	672.00	0.00
				Subtotal				339.00	.00	264.00	.00	201.00	.00	.00	.00	804.00	0.00
28	010.001 N	RE-ESTABLISH HISTORIC SCENE, BOUNDARY SURVEY BOUNDARY SURVEY	164		N20	RES	O	.00	.00	.00	.00	.00	.00	70.00	.00	70.00	0.00
29	010.002 N	RE-ESTABLISH HISTORIC SCENE FENCING OF NPS LANDS			N20 N24	PRO	O	.00	.00	.00	.00	.00	.00	80.00	.00	80.00	0.00
				Project Total $$				339.00		264.00		201.00		150.00		954.00	
				Project Total FTE				0.00		0.00		0.00		0.00		0.00	
999	006.000 N	FAUNAL SURVEY	185		N17 N20	RES	O	15.00	.00	15.00	.00	15.00	.00	.00	.00	45.00	0.00
999	011.000 N	CONTROL OFF-ROAD VEHICLE DAMAGE	125	COMB	C18	PRO	R	200.00	.00	200.00	.00	200.00	.00	.00	.00	600.00	0.00
999	102.000 N	NATURAL HISTORY INTERPRETIVE TRAILS	114			INT	O	5.00	.00	.00	.00	.00	.00	.00	.00	5.00	0.00
999	104.000 N	ACQUISITION OF A PARK NATURAL HISTORY LIBRARY			N24	INT	O	.00	.00	.00	.00	.00	.00	5.00	.00	5.00	0.00
	19 projects printed																
				Grand Total $$				747.00		530.00		467.00		374.00		2118.00	
				Grand Total FTE				0.00		0.00		0.00		2.00		2.00	

Project Statement

WAPA-C-001.000
Last Update: 01/29/96 Priority: 1
Initial Proposal: 1993 Page Num: 0001

Title: STABILIZE 9 WWII CONCRETE DEFENSIVE STRUCTURES

Funding Status: Funded: 0.00 Unfunded: 310.00

Servicewide Issues: C12 (ICAP)
C21 (OVERVIEW)
Cultural Resource Type: STRC (Structure)
N-RMAP Program codes:
CR-MAP Program codes:
10-238 Package Number : 168

Problem Statement

Current Conditions:

The nine concrete defensive structures (numbers 61, 62, 63, and 64 at Asan Beach; 60 at Piti; 23 and 24 at Gaan Point; and 1 and 5 at Apaca) were constructed by Japanese occupation forces during the war, primarily in March through July, 1944. They are built of formed and unformed concrete, some of which is reinforced. Formwork was built from wood boards and in some cases coconut logs, as evidenced by the patterns in the concrete surface. Other locally available materials were used including coral for aggregate, seawater, and chain link fence in place of standard steel bars for some reinforcing. Lab studies revealed that old stockpiled cement was used in some structures resulting in lumps of cement in the concrete rather than the cement being dispersed. Many of the structures use natural rock formations as walls, roofs or for camouflage. The nature of the concrete and quality of construction varies between the structures. Defenses built immediately prior to the American assault were constructed hurriedly, with resultant lack of quality. Many structures were built by forced labor (brother of the former park superintendent, Reyes, working as a forced laborer was beheaded by Japanese). Most of the construction was done without heavy equipment, using only manual labor with wheelbarrows, and picks and shovels.

These historic structures are steadily deteriorating. The tropical environment, with high temperature, high humidity, high salt content in the air, etc., create severe conservation problems that cause damage to the resources.

Past Actions:

In 1989 temporary steel shoring was placed in ruins number 62, 64, and 23 to prevent the concrete roofs from collapsing. Vegetation has been cleared from some of the roofs, but little else has been done to preserve these features.

Wiss, Janney, Elstner Associates, Inc. (Engineers, Architects, Material Scientists) prepared a report recommending stabilization procedures for 12 significant concrete military structures (including these) in WAPA.

Description of Recommended Project or Activity

Phase II recommendations of the WJE Final Report concerning these nine concrete structures should be implemented as follows:

No.	Type	Recommendations	Cost '91
Asan Beach			
61	Pillbox	option B	$3,200
62	Gun Emplacement	option B	2,500
63	Concrete Wall	option B	1,800
64	Gun Emplacement	options A+B+E+F	6,000
Piti			
60	Gun Emplacement	options A+B	6,100
Gaan Point			
7	Latrine Foundation	option B	4,500
23	Gun Emplacement	options A+B	5,000
24	Pillbox	options A+B	5,100
Apaca Point			
1	Pillbox	option B	1,800
5	Pillbox	options A+B	3,200
	Total		39,300
		add 10% inflation (7 yrs)	3,900
		Total request	43,200

The Phase II options proposed here delay the Wiss options of supporting the weak concrete roofs of ruins 62,64, and 23 by supporting these roofs by suspended

Figure 7. Ruin #23 in 1979. Japanese strong point at Gaan Point. A large reinforced concrete pillbox complex.

Figure 8. Ruin #62 in 1979. Japanese pillbox of flimsy reinforced concrete, with 150mm gun base.

Figure 9. Ruin #64 in 1979. Japanese pillbox of reinforced concrete, Asan Beach.

Figure 10. Ruin #61 in 1979. Japanese pillbox of reinforced concrete, Asan Beach.

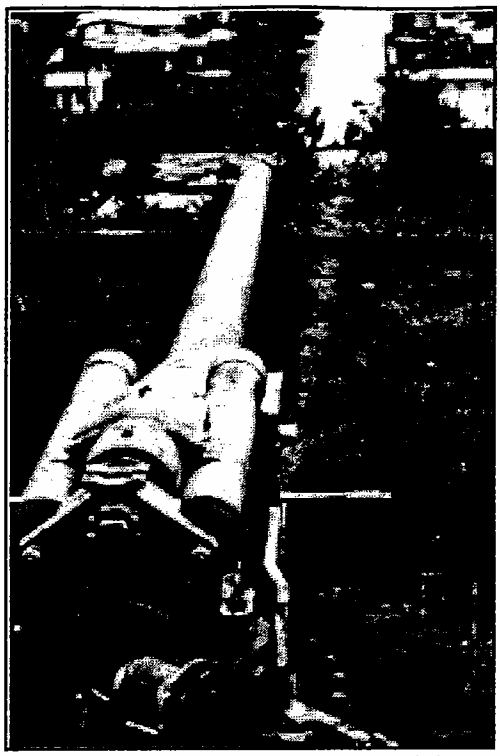

Figure 11. Site #60 in 1979. Vickers gun at concrete emplacement, Piti.

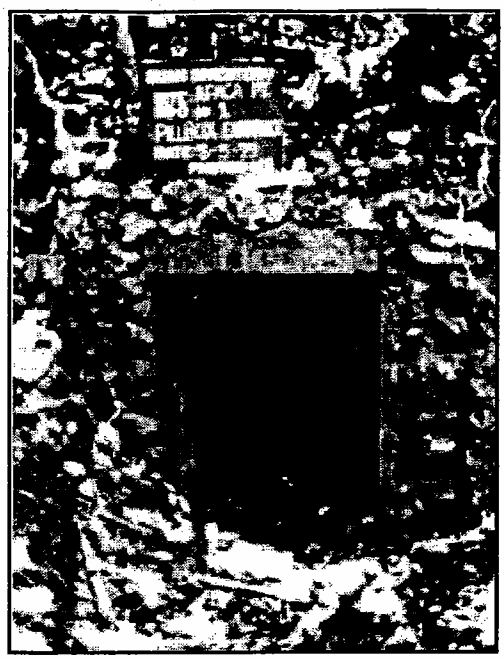

Figure 12. Ruin #1 in 1979. Japanese pillbox of reinforced concrete, Apaca Point.

Figure 13. Site #5 in 1979. Ruins of a Japanese bunker, Agat.

Figure 14. Ruin #63 in 1979. Japanese pillbox at Asan Inland Unit.

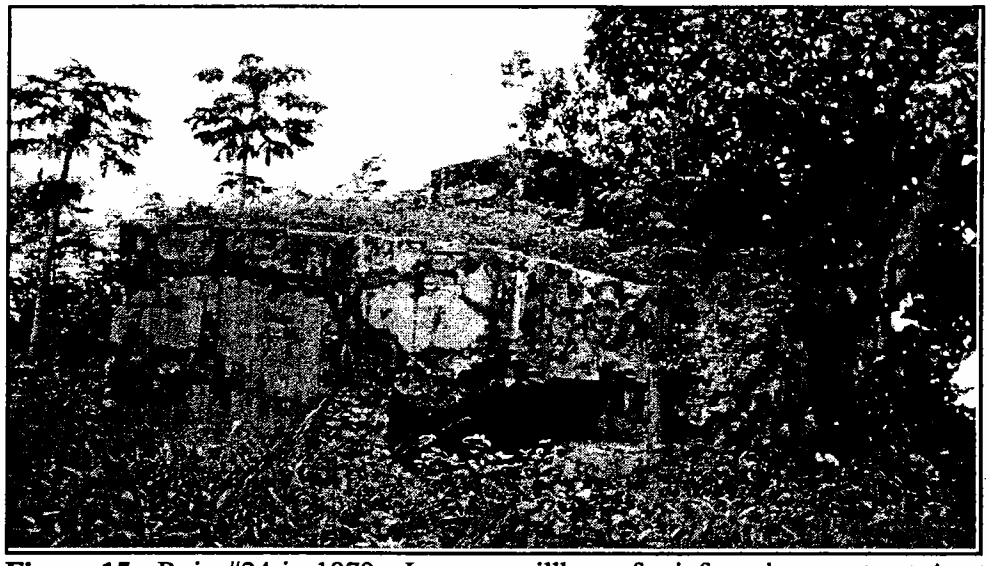

Figure 15. Ruin #24 in 1979. Japanese pillbox of reinforced concrete at Agat Beachhead.

structures from above, and delays (preferably rejects) the option of demolishing and replacing roofs of these three structures.

References:

Dr. Robert Hommon, Cultural Resources Specialist, PISO
Ed Wood, Superintendent, WAPA
Gary Barbano, Park Planner, PAAR
Bryan Harry, Director, PAAR

Wiss, Janney, Elstner Associates, Inc., March 8, 1991. Final Report: Stabilization of Concrete Military Structures, War in the Pacific National Historical Park, Guam.

BUDGET AND FTEs:

----------FUNDED----------

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

----------UNFUNDED----------

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	50.00	0.00
	PRO	One-time	260.00	0.00
		Subtotal:	310.00	0.00
		Total:	310.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Leave the structures to fall down and warn visitors to stay away from these areas. Nature and people will soon destroy these sites.

2. Remove Structures: Remove immediately all structures and features that are a safety hazard. Remove the others as they become safety hazards, thereby reducing the integrity of the historical sites.

Compliance codes: NHPA ((106) NAT. HIST. PRES.)

Explanation:

Project Statement

WAPA-C-009.000
Priority: 2
Page Num: 0017

Last Update: 01/17/96
Initial Proposal: 1996

Title: PRESERVE 4 DOZEN WWII NAT'L REG HISTORIC RUINS

Funding Status: Funded: 0.00 Unfunded: 654.00

Servicewide Issues: C55 (MAINTENANCE)
Cultural Resource Type: STRC (Structure)
N-RMAP Program codes :

10-237 Package Number: 013

Problem Statement

This new historical park has no existing historic structure preservation program or any funding for stabilizing and preserving some 75 earthen features such as WWII tunnels, foxholes, craters, etc., treating about 75 concrete pillboxes and structures for exfoliation and other deterioration. These are the primary historic features of the park and with their sites are the purpose for which the park was established. The tropical climate with high temperatures, humidity, salt air, typhoon conditions, and voracious insects endangers these national register historic structures. WWII historic sites and structures are inventoried in the illustrated database "Waparuin."

Description of Recommended Project or Activity

This package provides the base-funded professional direction and hands-on capability to stabilize and preserve the historic structures. In includes a Historic Architect, GS-12; a Williamsport trained Exhibit Preparation Specialist, GS-11; and a Maintenance Worker, WG-5/7. These specialists meet the Secretary's standards for preservation work on National Register Historic properties, and are in accord with the R-MAP analyses of WAPA.

BUDGET AND FTEs:

----------FUNDED----------

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

----------UNFUNDED----------

Activity	Fund Type	Budget ($1000s)	FTEs

Year 2:	RES	Recurring	218.00	3.00

Project Statement

WAPA-C-009.000
Priority: 2
Page Num: 0018

Last Update: 01/17/96
Initial Proposal: 1996

Year 3:	RES	Recurring	218.00	3.00
Year 4:	RES	Recurring	218.00	3.00
		Total:	654.00	9.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
EA (ENV. ASSESSMENT)

Explanation:

Pri	Site	Descr	Location	Action
1	49	2 pillboxes, trench	Alifan Mt	
2	18	craters, schrapnels	Alifan Mt	
3	19	cave shelter	Alifan Mt	
4	39	gun emplacements	Alifan Mt	
5	35	gun emplacements	Alifan Mt	
6	38	gun emplacement	Alifan Mt	
7	46	gun emplacements	Alifan Mt	
8	2	Japanese pillbox	Apaca Pt	
9	106	Asan Pt Cave	Asan	
10	107	Asan River Bridge	Asan	
11	20	gun emplacements	Alifan Mt	
12	47	tunnels, emplacements	Alifan Mt	
13	85	Japanese pillbox	Adelupe Inl	
14	21	foxholes and cave	Alifan Mt	
15	9	Japanese pillbox	Salinas Bch	
16	19	ammo dump, cave	Alifan Mt	
17	97	cave	Asan Inland	
18	50	cave and tunnel	Alifan Mt	

19	86	Matgue Riv. bridge	Asan Inland
20	26	pillbox	Bundschu Rg
21	27	foxhole and cave	Bundschu Rg
22	59	observation post	Bundschu Rg
23	94	3 caves	Asan Inland
24	88	cave	Nidual River
25	90	cave	Nidual River
26	67	gun emplacement	Asan Pt trail
27	89	cave	Nidual River
28	11	2 bomb craters	Alifan Mt
29	13	crater	Alifan Mt
30	14	crater	Alifan Mt
31	65	Takashina com. post	Fonte Plateau
32	103	collapsed tunnel	Apaca Pt
33	101	Japanese Mt gun	Nimitz Hill
34	51	crater	Alifan Mt
35	102	pillbox ruins	Asan Pt
36	44	gun emplacement site	Alifan Mt
37	91	camp site	Asan Inland
38	92	battle site	Asan Inland
39	93	battle site	Asan Inland
40	4	cave	Apaca Pt
41	43	battle site	near Torres Sch
42	15	foxhole and tunnels	Alifan Mt
43	12	shell site w/ shrapnel	Alifan Mt
44	22	gun emplacement	Alifan Mt
45	48	ammo case site	Alifan Mt
46	37	foxholes (17)	Alifan Mt
47	69	gun base	Asan Pt
48	95	water reservoir	Asan Inland
49	96	water tank ruins	Asan Inland

Project Statement WAPA-C-012.000

Last Update: 10/17/96 Priority: 3
Initial Proposal: 1998 Page Num: 0024

Title : PREPARE ASAN & GAAN CULTURAL LANDSCAPE REPORTS, CLR

Funding Status: Funded: 0.00 Unfunded: 19.00

Servicewide Issues : C11 (REPORT)
C72 (PROTECTION)
Cultural Resource Type: COMB (Combination)
N-RMAP Program codes :

10-238 Package Number : 188

Problem Statement

The battlefields at Asan Beach to Nimitz Hill and the beaches at Gaan to Mt Aliphan should qualify as Cultural Landscapes in the 'historic site' category. Minimum requirements for managing such landscapes is preparation of a Cultural Landscape Report including National Register documentation for these two landscapes.

Description of Recommended Project or Activity

Prepare as much preliminary data from park sources including material in 'Waparuin,' the Thompson report, and Snell materials as a basis for contract qualified professionals or DSC to complete a CLR, according to NPS-28 criteria, adequate for nomination to the National Register.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
			Total:	0.00

0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	19.00	

0.00

Total: 19.00

0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes :

Explanation:

Project Statement

WAPA-C-013.000

Last Update: 01/17/96
Initial Proposal: 1996

Priority: 4
Page Num: 0017

Title: STABILIZE 4 DOZEN WWII NAT'L REG HISTORIC RUINS

Funding Status: Funded: 0.00 Unfunded: 200.00

Servicewide Issues: C72 (PROTECTION)
C13 (EMERG STABL)
Cultural Resource Type: STRC (Structure)
N-RMAP Program codes :
10-238 Package Number: 206

Problem Statement

This new historical park has no existing historic structure preservation program or any funding for stabilizing and preserving some 75 earthen features such as WWII tunnels, foxholes, craters, etc., treating about 75 concrete pillboxes and structures for exfoliation and other deterioration. These are the primary historic features of the park and with their sites are the purpose for which the park was established. The tropical climate with high temperatures, humidity, salt air, typhoon conditions, and voracious insects endangers these national register historic structures. WWII historic sites and structures are inventoried in the illustrated database "Waparuin."

Description of Recommended Project or Activity

This package provides a quick emergency stabilization to each of the four dozen ruins to the extent that these sites can be helped from futher short run deterioration. Much of the work will be day-labor and/or small contract under direction of the park Chief of Maintenance and professional oversight of cultural resource specialists from Honolulu and San Francisco. All sites worked will be located with GPU and placed on the park GIS (by PISO).

BUDGET AND FTEs:

----------FUNDED----------

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

----------UNFUNDED----------

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	50.00	0.00
Year 2:	RES	One-time	50.00	0.00
Year 3:	RES	One-time	50.00	0.00
Year 4:	RES	One-time	50.00	0.00

Total:	200.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
EA (ENV. ASSESSMENT)

Explanation of Actions

Pri	Site	Descr	Location	Stabilization Actions
1	49	2 pillboxes, trench	Alifan Mt	stabilize concrete, rebar, soil; manage vegetation
2	18	craters, schrapnels	Alifan Mt	stabilize soil; manage vegetation
3	19	cave shelter	Alifan Mt	stabilize soil; manage vegetation
4	39	gun emplacements	Alifan Mt	stabilize soil; manage vegetation
5	35	gun emplacements	Alifan Mt	stabilize soil, metal; manage vegetation
6	38	gun emplacement	Alifan Mt	stabilize soil; manage vegetation
7	46	gun emplacements	Alifan Mt	stabilize soil; manage vegetation
8	2	Japanese pillbox	Apaca Pt	stabilize soil, concrete; manage vegetation
9	106	Asan Pt Cave	Asan	stabilize soil; manage vegetation
10	107	Asan River Bridge	Asan	stabilize soil; manage vegetation
11	20	gun emplacements	Alifan Mt	manage vegetation
12	47	tunnels, emplacements	Alifan Mt	stabilize soil; manage vegetation
13	85	Japanese pillbox	Adelupe Inl	locate; determine needs
14	21	foxholes and cave	Alifan Mt	stabilize soil; manage vegetation
15	9	Japanese pillbox	Salinas Bch	determine needs
16	19	ammo dump, cave	Alifan Mt	stabilize soil; manage vegetation
17	97	cave	Asan Inland	stabilize soil; manage vegetation
18	50	cave and tunnel	Alifan Mt	stabilize soil; manage vegetation
19	86	Matgue Riv. bridge	Asan Inland	stabilize concrete, rebar; manage vegetation; needs further analysis
20	26	pillbox	Bundschu Rg	locate; determine needs
21	27	foxhole and cave	Bundschu Rg	locate; determine needs
22	59	observation post	Bundschu Rg	locate; determine needs
23	94	3 caves	Asan Inland	stabilize soil; manage vegetation
24	88	cave	Nidual River	stabilize soil; manage vegetation
25	90	cave	Nidual River	stabilize soil; manage vegetation
26	67	gun emplacement	Asan Pt trail	stabilize soil; manage vegetation
27	89	cave	Nidual River	stabilize soil; manage vegetation
28	11	2 bomb craters	Alifan Mt	stabilize soil; manage vegetation
29	13	crater	Alifan Mt	stabilize soil; manage vegetation
30	14	crater	Alifan Mt	stabilize soil; manage vegetation
31	65	Takashina com. post	Fonte Plateau	determine needs
32	103	collapsed tunnel	Apaca Pt	determine needs

33	101	Japanese Mt gun	Nimitz Hill	locate; determine needs
34	51	crater	Alifan Mt	locate; determine needs
35	102	pillbox ruins	Asan Pt	locate; determine needs
36	44	gun emplacement site	Alifan Mt	determine needs
37	91	camp site	Asan Inland	locate; determine needs
38	92	battle site	Asan Inland	locate; determine needs
39	93	battle site	Asan Inland	locate; determine needs
40	4	cave	Apaca Pt	manage vegetation
41	43	battle site	near Torres Sh	determine needs
42	15	foxhole and tunnels	Alifan Mt	locate; determine needs
43	12	shell site w/ shrapnel	Alifan Mt	locate; determine needs
44	22	gun emplacement	Alifan Mt	locate; determine needs
45	48	ammo case site	Alifan Mt	locate; determine needs
46	37	foxholes (17)	Alifan Mt	stabilize soil; manage vegetation
47	69	gun base	Asan Pt	preserve from rust
48	95	water reservoir	Asan Inland	determine needs
49	96	water tank ruins	Asan Inland	determine needs

Title : CHAMORRO ORAL HISTORY

Funding Status: Funded: 0.00 Unfunded: 20.00

Servicewide Issues : C04 (DATA RECOV)
Cultural Resource Type: ETHN (Ethnographic Resources)
N-RMAP Program codes :

10-238 Package Number : 208

Problem Statement

The experiences of the Chamorros who lived through the two and a half years of Japanese miltary occupation and subsequent invasion by American forces have not been adequately recorded. In contrast to those of military personnel, these experiences are from a civilian point of view, thus providing a different perspective on the Pacific Theater of World War II. The majority of these individuals are now in their mid 60s, approaching the end of their average life span. Very little oral history has been done with individuals who may have lived within areas now covered by the park. Many of their experiences will also be related to other specific locations on Guam; thus, this project would facilitate the identification of additional historic sites on Guam as mandated by the park's authorizing legislation. Their memories are needed in order to help the park's interpretive program, the re-establishment of the historic scene, and location and identification of historic sites and/or structures.

A contract for Chamorro oral history was developed in 1979. [WITH WHOM?] Some oral history tapes are on file at the Micronesian Area Research Center. Park staff members have had many informal discussions with local residents, but few are documented by either tapes or transcriptions.

Description of Recommended Project or Activity

Develop a contract to carry out oral history research. In addition to the Micronesian Area Research Center at the University of Guam, contact universities with Anthropology or History Departments that have strong programs in Pacific Island cultures. This project would be ideal research for a graduate student (or students), and ideally the research team should include persons fluent in Chamorro.

References:

Dirk Ballendorf,Micronesian Area Research Center, University of Guam

Department of Anthropology, University of Guam
Historian, WRO
Guam Humanities Council
Chamorro Language Commission

Rose S. N. Manibusan, Park Ranger, WAPA

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	20.00	0.00
		Total:	20.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Many of the individuals who were adults during the years 1941-44 are now elderly, and as they die, the opportunity to obtain this important information on one of the park's main interpretive themes will be lost forever.

2. Conduct Historical Research With Existing Staff Members: As time permits, the two interpreters on the staff who speak Chamorro could conduct oral history interviews. At best, the staff may obtain four or five interviews a year, and lack of adequate personnel would prohibit transcription of the tapes. This alternative would further hamper an already limited interpretive operation.

Compliance codes :

Explanation:

Title : BOTANICAL RESOURCES SURVEY AND MAP

Funding Status: Funded: 0.00 Unfunded: 15.00

Servicewide Issues : N20 (BASELINE DATA)
N17 (BIODIVERSITY)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 207

Problem Statement

General data are available about park botanical resources, but specific distributions are not plotted on maps for use by park staff. A detailed vegetation map is needed for a number of reasons: (1) Delineation of areas of original (natural) vegetation communities so they may be preserved, (2) Delineation of exotic communities so they may be eradicated, (3) Identification of any rare or endangered species and their locations so they may be protected, (4) Location of suitable areas for natural history interpretation, and (5) Delineation of any critical habitat areas so they may be protected.

Primarily drawing on existing data supplemented by a small amount of field work, Lynn Raulerson of the University of Guam compiled a report on the terrestrial resources within the park (as part of a more comprehensive study). This report is of value but is not sufficiently specific to use as a management, development, or interpretive tool.

References:

Lynn Raulerson, 1979, 'Terrestrial and Freshwater Organisms' in "Limnology and Hydrology of the Guam Seashore Study Area and the War in the Pacific National Historical Park," University of Guam
Tony Aguon, Aquatics and Wildlife
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Andy Yuan, Fish and Wildlife, Honolulu

Description of Recommended Project or Activity

By means of a contract with a the University of Guam, a thorough botanical survey of the park should be undertaken to produce a large-scale vegetation map. [How large a scale?] An accompanying report should include (1) location, nature, and significance of

any critical habitat, rare and endangered species and/or communities, (2) distribution of exotics, and (3) areas of vegetation that have remained essentially unchanged since the begining of World War II. A cost-effective method of obtaining needed information would be for the University to allow students to earn class credit for conducting field studies. Field work could also be augmented by either aerial photography or remote sensing [see WAPA-C-006].

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	15.00	0.00
		Total:	15.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Wihout a survey, management decisions about resource protection, development, interpretation, re-establishment of the historic scene, and exotic plant control will be based on inadequate and perhaps inaccurate data. The resulting decisions may cause inadvertent damage to significant natural resources or failure to adequately protect some critical ones.

2. A staff biologist could be hired or an NPS biologist detailed to WAPA to conduct the botanical survey and compile the map. However, this would be a more expensive alternative than utilizing island personnel.

Compliance codes :

Explanation:

Title : JAPANESE ORAL HISTORY

Funding Status: Funded: 0.00 Unfunded: 41.00

Servicewide Issues : C04 (DATA RECOV)
Cultural Resource Type: ETHN (Ethnographic Resources)
N-RMAP Program codes :

10-238 Package Number : 116

Problem Statement

The park mandate is to interpret the Pacific Theater of World War II from all points of view, including that of the Japanese. Little information is known to WAPA about the Japanese side of the conflict, especially individual experiences and observations. The Japanese who were involved are a resource, not located in the park, but critical to its mandate.

To some extent, published materials in English on the Japanese side of the conflict have been collected. These are very limited in scope and nature, however, and are mainly broad overviews of official battle summaries. Almost nothing has been located which details individual experiences and memories; yet, this is a most important aspect of preserving information about the war and forming the basis of a good interpretive program.

Description of Recommended Project or Activity

Contact the National Trust for Japan and both Japanese and American universities (History, Anthropology, and/or Sociology Departments) for the development of an oral history research team. If rolls of participants are not readily available, the initial effort must be focused on locating Japanese individuals who served in Guam, either in the military or as civilians. This project presents an ideal research opportunity to a graduate student or students.

References:

Mitsu Watanabe, Japanese Council General
Nobuo Ichihara, Environmental Agency for Japan, Tokyo
Office of the Consulate General of Japan, Guam

Project Statement WAPA-C-003.000

Last Update: 10/17/96 Priority: 7
Initial Proposal: 1993 Page Num: 0007

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	41.00	0.00
		Total:	41.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: As the elderly Japanese WW II participants die, the opportunity to enhance park interpretation from the Japanese viewpoint will be irretrievably lost.

Compliance codes :

Explanation:

Project Statement WAPA-C-010.000

Last Update: 10/17/96 Priority: 8
Initial Proposal: 1998 Page Num: 0020

Title : REHAB & MAINTAIN 2 WWII HISTORIC LANDSCAPES

Funding Status: Funded: 0.00 Unfunded: 1132.00

Servicewide Issues : C14 (MAINTENANCE)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number : R013

Problem Statement

The two invasion beaches, Asan and Guam, from their shoreline beachheads to the skyline at Mt Alifan and Nimitz Hill are two historic landscapes and are the major battlefields for which the park was established. Without skilled historic and ecologic management these two battlefields' historic character will change to scrubland and/or tropical forest-- far different from the historic scene. This base program is to restore and maintain the landscapes to vegetation similar in general aspect: swordgrass mountainsides to remain as swordgrass; rice fields to be maintained as mowed grassland; coconut and strand vegetation maintained as such; forest and marsh maintained as native forest and marsh.

Description of Recommended Project or Activity

This package provides the base-funded professional direction and hands-on capability to restore and maintain Asan and Gaan historic landscapes. These include a Historic Landscape Architect, GS-12; an Ecologist, GS-12; and a Historian, GS-12. These specialists meet the Secretary's standards for preservation work on National Register Historic properties, and are in accord with the R-MAP analyses of WAPA.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	Recurring	283.00	3.00

Year 2:	RES	Recurring	283.00	3.00
Year 3:	RES	Recurring	283.00	3.00
Year 4:	RES	Recurring	283.00	3.00
		Total:	1132.00	12.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
NHPA ((106) NAT. HIST. PRES.)

Explanation:

Project Statement WAPA-N-103.000

Last Update: 10/18/96 Priority: 9
Initial Proposal: 1993 Page Num: 0079

Title : BIOLOGICAL STUDY OF SMALL ISLANDS

Funding Status: Funded: 0.00 Unfunded: 10.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 186

Problem Statement

Six small islands, each less than about one acre in size, lie within park boundaries, but nothing is known about their flora and fauna. One island appears to be barren, but the others have vegetative cover and possibly populations of small animals. In order to ensure proper management, it is important to know the nature and significance of the biotic communities on these islands. Access may need to be restricted in order to protect the biological populations, but such a decision must be based on appropriate knowledge of the ecosystems.

In the summer of 1980, Dr. F. R. Fosberg, Professor Emeritus of Tropical Botany at the Smithsonian Institution, taught a course on Island Plant Geography [at the University of Guam?]. One feature of the course was that each student would map a species (or several species) of plants on Guam or would survey a specific portion of Guam and map the species and vegetation of that area. Three of the students (whose reports will be published as a technical report [were?]) mapped small islands off Guam: Anae, Cocos, an an unnamed detrital island in Tumon Bay. Dr. Fosberg was quite interested in these reports and suggested that an interesting project might be to map every small island off Guam. These small islands, while influenced greatly by the biota of Guam (as a source of species for colonization or recolonization), might be less vulnerable to human impact and their biota might evolve in different ways from that of Guam itself. Information gained now could be valuable as baseline data for future studies.

As far as known the tree snake is not yet present on these islands.

Description of Recommended Project or Activity

The park should contract with the Biology Department at the University of Guam to inventory, describe, map the vegetation, and assess biological significance of the six offshore islands in the park. A final report for each island should include

suggestions for appropriate preservation and management. Student projects and reports as part of a classroom experience or as graduate theses could again be a cost-effective means of conducting the research.

References:

Tony Aguon, Aquatics and Wildlife
Lynn Raulerson, Professor of Biology, University of Guam
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	RES	One-time	10.00	0.00
		Total:	10.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If there is no action, the possible biological significance of these islands will go unnoticed, resulting in inadvertent damage or destruction through lack of proper management, and a valuable resource and research opportunity will be lost. Alternatively, a biologist or biogeographer could be hired as permanent staff or an NPS biologist could be temporarily detailed to the park to conduct the research.

Compliance codes :

Explanation:

Title : IMPACT STUDY FOR REMOVAL OF REEF CONSTRUCTION

Funding Status: Funded: 0.00 Unfunded: 100.00

Servicewide Issues : N08 (CULT LANDSCAPE)
N24 (OTHER (NATURAL))
Cultural Resource Type: CULL (Cultural Landscape)
N-RMAP Program codes :

10-238 Package Number : 209

Problem Statement

Three post-war, abandoned sewer outfalls and several boulder and rubble fills are located on park reefs. Two sewer outfalls and rubble from an old swimming site are in the Asan Beach Unit, and one sewer outfall and rubble support is in the Agat Unit. It is not known what damage has been done to the reef since their installation or how they have altered the marine environment. However, a basic description of the reef areas has been completed and published. These structures are intrusive on the historic scene and present a danger to park visitors who may attempt to walk on them. The best means of removal which results in the least environmental damage is unknown. [A fourth sewer outfall was removed by the Government of Guam in 1986 as part of a recreational development plan.]

References:

Eldredge, L. G., 1979, "Marine Biological Resources within the Guam Seashore Study Area and the War in the Pacific National Historical Park," University of Guam.
Rob Myers, University of Guam Marine Lab
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants

Description of Recommended Project or Activity

By means of a contract with the University of Guam and its Marine Laboratory, a detailed survey of the structures to be removed from the reefs and their immediate environs should be completed. A description of the marine resources to be affected is needed, together with an assessment of their relative significance and recommendations as to the most feasible means of removing the structures within acceptable levels of damage to the reef.

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	MIT	One-time	100.00	0.00
		Total:	100.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

A Corps of Engineers permit will be sought and, if granted, the structures will be removed on the basis of the best judgment of park staff about minimizing reef damage. The structures must be removed if the historic scene is to be restored and danger to the public safety is to be eliminated.

Compliance codes :

Explanation:

Title : PARK TOPOGRAPHIC BASE MAP

Funding Status: Funded: 0.00 Unfunded: 15.00

Servicewide Issues : N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 210

Problem Statement

A large-scale topographic map of the park is basic for proper resource management, location of features and resources, and for planning. Many of the projects called for in this Resource Management Plan require that features be plotted on a map. The only existing maps are USGS quads at small scale (1:62,500 with 20 foot contours) and photo-based blue-lined maps with very poor definition (1:400 scale with 10 foot contours). These maps are also several years old, do not reflect current developments and features, and have a number of inaccuracies. Although the blue-lined photo maps are fairly large scale, the nature of the topography, especially along the relatively flat coastal units, and the small size of park units demand a still larger scale in order to be satisfactory.

Description of Recommended Project or Activity

Contract with a commercial photogrammetric firm to conduct surveys, ground-truth, flights, compilation, and production of a topographic map showing currently-existing conditions at a scale of 1:200 with 2 foot contours and standard mapping accuracy. [It may be possible that this task could be accomplished in conjunction with the aerial photography requirement (C-6).]

References:

Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	15.00	0.00
		Total:	15.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If no current and detailed topographic map is available, the use of existing poor quality and small-scale maps will continue to hamper management decisions.

Compliance codes :

Explanation:

Project Statement WAPA-N-005.000

Last Update: 10/18/96 Priority: 12
Initial Proposal: 1993 Page Num: 0039

Title : WILDFIRE STUDY

Funding Status: Funded: 0.00 Unfunded: 81.00

Servicewide Issues : N07 (NAT FIRE REGM)
N08 (CULT LANDSCAPE)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 112

Problem Statement

Wildfires occur every year throughout Guam, including savanna grasslands in the park. Wildfires typically occur during the January through May dry season, and in any one year an average of 25 fires burns about one-fifth of the park's land area [approximately 81 ha (200 acres) of 405 ha (1000 land acres)]. Regrowth begins almost immediately and within several months a burned area is again covered with savanna grasses, tangentangen, etc. Erosion problems, however, are common in savanna areas and may be caused by or at least aggravated by large and frequent fires.

Although local residents set most of the fires, some are believed to occur naturally. Fires also burn into the park from adjacent private lands or U.S. Navy lands. Chamorros, who have occupied Guam for at least 3000 years, have traditionally used fire to enhance wildlife hunting by concentrating deer on new forage and to ease both access and visibility. Since burning is a cultural activity that has been practiced for many years, the historic scene includes savannas maintained by wildfires. As such, the suppression of all wildfires would have an adverse effect on the attempt to re-establish the historic scene.

It may be that fire is a component of a healthy savanna ecosystem, or it may be that fires cause serious damage. The most serious resource impact of wildfire burning is on the vegetative composition of savanna grasslands. The native swordgrass, although able to withstand periodic burning, is being encroached upon by the exotic mission grass under a regime of frequent fires. If wildfires are not controlled, it is suspected that the savanna will be converted to the exotic species. Wildfires also burn into the ravine forest community which contains the endangered tree fern. The fern is very susceptible to fire and can be eliminated by repeated burning. Within the limestone forest, repeated wildfires appear to have the effect of controlling the exotic tangantangan. Initially, new seeds expand the extent of the species, but subsequent fires eventually kill it.

There is the possibility of using planned and managed fires as an

aid to archaeological and ordnance surface surveys. Even in areas previously surveyed, after a fire it is usual to find sites and features that were previously masked by vegetation. In particular, small features and war-related artifacts hidden by tall swordgrass turn up. The temporary removal of the vegetation provides the opportunity to more accurately locate, describe, map, and evaluate historic sites. Most important, burned areas can be carefully surveyed for unexploded ornance which constitutes a threat to public safety; it can then be removed for disposal.

The National Park Service has negotiated a memorandum of understanding with the Government of Guam for fire protection. Wildfires are not suppressed unless a residence or utility is threatened. Records of all fires that occur in the park are kept by grids established by the Department of Forestry. The NPS monitors the presence of fire on its lands.

Description of Recommended Project or Activity

A study is needed to ascertain impacts, if any, upon the natural history of those areas subject to burning. The study should also include both the spatial and temporal extent of traditional Chamorro burning practices to determine the effects that their long-term occupance had on the "native" vegetational communities of the historic scene. A service biologist familiar with fire research should be detailed to the park to conduct or assist in contracting out the studies. Specific objectives would include fire hazard reduction, historic scene maintenance, tangantangan control, and erosion control. Fire may be a useful tool in the restriction or elimination of some exotic species. A prescribed burning program may also reduce severe impacts caused by intense wildfires. The expertise to conduct prescribed fire experiments exists within Western Region staff, and it is proposed that members of the staff conduct the work. However, neither wildfire nor intentional fire can be used as a management tool unless fire's effects have been thoroughly evaluated through research. A study report and recommendations to management regarding fire control procedures and the appropriateness of using fires as a survey tool are needed. Particular attention should be given to the threat that fire poses to the endangered tree fern.

References:

Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Lynn Raulerson, Professor of Biology, University of Guam
Tom Gavin, Resource Management Specialist, WRO
Jan van Wagtendonk, Research Scientist, Yosemite National Park

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	12.00	0.00
	RES	One-time	15.00	0.00
		Subtotal:	27.00	0.00
Year 2:	RES	One-time	12.00	0.00
	RES	One-time	15.00	0.00
		Subtotal:	27.00	0.00
Year 3:	RES	One-time	12.00	0.00
	RES	One-time	15.00	0.00
		Subtotal:	27.00	0.00
		Total:	81.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Fires will undoubtedly continue to occur and ad hoc decisions will be made by park staff on whether to control them or let them burn out. No information will be available about fire impacts on the natural communities or on erosion patterns. Augmented cultural and ordnance surveys will not occur except on a random basis in reaction to the occurrence of natural or unauthorized fires.

2. Monitor Wildfire Impacts: A monitoring program would include establishing transects on wildfires immediately after burning to determine short- and long-term responses. All fires would be mapped, with particular attention paid to areas of mission grass and tree ferns. Such a monitoring program could be conducted simultaneously with the recommended fire research.
[Specific effects of fire on mission grass and tree ferns are address in project statements N-13 and N-14, respectively.]

Compliance codes :

Explanation:

Project Statement WAPA-N-018.000

Last Update: 10/18/96 Priority: 13
Initial Proposal: 1998 Page Num: 0073

Title : MONITOR AND MANAGE OCEAN REEF HABITATS

Funding Status: Funded: 0.00 Unfunded: 378.00

Servicewide Issues : C72 (PROTECTION)
N24 (OTHER (NATURAL))
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes : N00 (Resource and Visitor Use Management)
N04 (Open Water Boat Patrol)

10-238 Package Number : R023

Problem Statement

Coral reef borders all the shoreline areas of the park, and more than half of the park's 1,925 acres are ocean waters. The reefs are exceptionally fine, but have problems with sewage effluent from both sewage plant overflow and cesspool contaminated groundwater. Additionally, Asan Point was used as a war material dumping place at the end of World War II. Large quantities of unexploded ordinance was dumped off the reef edge and remains there still at depts of twenty feet or greater. Coral growth covers this ruin, and there is no technological knowledge of how to clear this high hazard site. The reef needs both inventory and monitoring to assess and remedy damage from the sewage effluent, the ordinance dump, and heavy use by fishermen and divers. The reef is the finest native habitat within the park.

Description of Recommended Project or Activity

This package provides for base-funded professional biologists to inventory and monitor ocean habitats-- particularly the coral reefs. Based upon their monitoring of changes to the reef biology they will develop strategies for dealing with threats to the reef habitats. The specialists are an Oceanographer, GS-12, and a Marine Biologist, GS-12. These specialists and proposal are in accord with the R-MAP analysis of WAPA.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

Project Statement WAPA-N-018.000

Last Update: 10/18/96 Priority: 13

Initial Proposal: 1998 Page Num: 0074

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 3:	RES	Recurring	189.00	2.00
Year 4:	RES	Recurring	189.00	2.00
		Total:	378.00	4.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes :

Explanation:

Title : INVENTORY, MONITOR & MANAGE ARCHEOLOGICAL RESOURCES

Funding Status: Funded: 0.00 Unfunded: 193.00

Servicewide Issues : C06 (SITE MONIT)
C03 (SITE DOC)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number : R108

Problem Statement

Little archeological knowledge of this historical park currently exists, nor is any systematic attempt made to acquire this knowledge. A basic archaeological surface survey was completed in 1979 for approximately 90% of the park land areas. From the data, the Pacific Area Historian compiled a park List of Classified Structures (LCS). Approximately 83.6 ha (100 acres) in the xxxxxx unit remains to be surveyed. These 100 acres, however, are quite rugged and overgrown with thick tropical vegetation, making survey difficult, slow, and expensive. Although the park-wide archaeological land survey appears to have succeeded in locating most significant fetures and sites, experience has shown that smaller features, artifacts, and ordnance become exposed when thick savanna grasses are burned off. However, regrowth occurs and recovers the area within two months or less. Newly burned areas within these park areas used to be inspected by park staff, but due to staff reductions and insufficient time, even this rudimentary survey technique is no longer possible.

Description of Recommended Project or Activity

This package provides for a base-funded Archeologist, GS-12, to design and lead a strategy which, over time, will achieve a completed archeological inventory of the park-- concentrating first on the most threatened and the more relevant WWII sites. From this inventory will be developed a continuing monitoring strategy. This specialist meets the Secretary's standards for preservation work on National Register Historic properties, and is in accord with the R-MAP analyses of WAPA.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	5.00	0.00
Year 3:	RES	Recurring	94.00	1.00
Year 4:	RES	Recurring	94.00	1.00
		Total:	193.00	2.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: The location, nature, significance, and preservation needs of any historical resources within the unsurveyed land areas will continue to be unknown. While the ruggedness and inaccessibility of these areas may protect any potential historic resources from human activities, the weather and vegetation will continue to cause deterioration of possible historic sites.

2. Hire a park archaeologist as a permanent member of the WAPA staff.

3. Have the Pacific Area Archaeologist travel to Guam to do the required survey.

4. Make standing arrangements to send a locally-based archaeology team into unsurveyed areas of the park soon after a burn.

Compliance codes :

Explanation:

Project Statement WAPA-C-011.000

Last Update: 10/17/96 Priority: 15
Initial Proposal: 1998 Page Num: 0022

Title : INSTALL AND OPERATE A PARK GIS INFORMATION SYSTEM

Funding Status: Funded: 0.00 Unfunded: 160.00

Servicewide Issues : C72 (PROTECTION)
N24 (OTHER (NATURAL))
Cultural Resource Type:
N-RMAP Program codes : N00 (Resource and Visitor Use Management)

10-238 Package Number : R107

Problem Statement

None of the park's critical components (facilities, biota, historic resources) are documented and located on maps. Their location and condition knowledge is kept mostly in peoples' heads; thus it is impermanent and cannot be used to monitor trends in facility or resource conditions. The park needs to have this knowledge GPU located and GIS mapped as a fundemental basis to care for and interpret park resources.

Description of Recommended Project or Activity

This package provides for a base funded Cartographer, GS-11, to carry out necessary Global Positioning Location of park resources, their digitized loading into a park GIS system, and the maintenance of the system for use by the park staff. The specialist and project are in accord with the R-MAP analyses of WAPA.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 3:	RES	Recurring	80.00	1.00
Year 4:	RES	Recurring	80.00	1.00
		Total:	160.00	2.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes :

Explanation:

Title : AMERICAN ORAL HISTORY

Funding Status: Funded: 0.00 Unfunded: 20.00

Servicewide Issues : C04 (DATA RECOV)
Cultural Resource Type: ETHN (Ethnographic Resources)
N-RMAP Program codes :

10-238 Package Number : 115

Problem Statement

Many American participants in the Pacific Theater of World War II who are now elderly have memories of experiences and observations which should be documented. Although a wealth of information exists on the course of the conflict, the nature of the battles, military strategy, and the memories of the major military leaders, very little organized information exists at WAPA about the personal experiences of individual American soldiers and civilians who were caught up in the war. This human aspect of the war is a much-needed element in the interpretative effort.

Past Actions:

A very informal program exists at WAPA. American veterans are occasionally given a questionnaire to be completed, and occasionally veterans will talk with the interpretive rangers about their experiences. These casual conversations are not recorded or documented.

Description of Recommended Project or Activity

Contact several universities in the U.S. to carry out oral history research with American WW II veterans who served in the Pacific Theater, particularly on Guam. This project would be appropriate for graduate student research in History, Sociology, or Anthropology and would require the researcher to identify, contact, interview, and record and transcribe experiences of both civilian and military Americans involved in the war.

References:

Historian, WASO
Historian, WRO

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	20.00	0.00
		Total:	20.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: As American participants die, the opportunity for the interpretation of their personal experiences will be lost.

2. Conduct Oral History Research With Existing Staff Members: As time permits, the staff interpreters could conduct oral history interviews with returning veterans on an ad hoc basis. Because of inadequate staffing, it is unlikely that such oral interviews could be transcribed. Although such occasional interviews would be valuable, they would constitute a biased sample in that only those veterans who chose to return to Guam would have a chance of being interviewed. Experiences of veterans NOT returning to Guam would not be represented.

Compliance codes :

Explanation:

Project Statement

WAPA-C-006.000
Priority: 17
Page Num: 0012

Last Update: 10/17/96
Initial Proposal: 1993

Title : PARK AERIAL PHOTOGRAPHY

Funding Status: Funded: 0.00 Unfunded: 50.00

Servicewide Issues : C01 (OVERVIEW)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 110

Problem Statement

Current Condition:

No large-scale aerial photography suitable for identifying both cultural and natural resources is available.

Past Actions:

The Navy has provided some aerial photographs of the Asan Inland Unit, and WAPA has also purchased a few of the Agat Unit from a private firm.

Description of Recommended Project or Activity

Contract with a private firm on Guam for large-scale stereoscopic coverage of aerial photographs, and purchase a mirror stereoscope for their interpretation. Although dense tropical vegetation limits the use of traditional air photos in locating additional historical sites, a set of large-scale stereopairs will provide an excellent base tool for a wide range of management, operational, and interpretive operations.

References:

Roger Kelly, Regional Archaeologist, WRO
Tom Mulhern, Chief, Cultural Resources Specialist, WRO
Rose S. N. Manibusan, Park Ranger, WAPA

BUDGET AND FTEs:

FUNDED				
Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	50.00	0.00
		Total:	50.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Without a complete set of current aerial photographs, park management will not have an adequate base map from which to work.

2. High-altitude (but also high-resolution), multi-spectral photographs (remote sensing) may be obtainable from NASA or other agencies such as Jet Propulsion Lab (JPL in Pasadena, California). Such images would be a valuable resource tool at WAPA because different radiation wavelengths from ground features would be visible in spite of the dense vegetation; thus, they could be used for location of hidden historic sites. Different vegetation communities would also be visible as different spectra. A major disadvantage is that interpretation of the images requires advanced technology and training. Specific interpretation projects, perhaps as graduate student research, could be contracted out to universities with Geography departments that specialize in remote sensing,

Compliance codes :

Explanation:

Project Statement

WAPA-N-012.000
Priority: 18
Page Num: 0063

Last Update: 10/18/96
Initial Proposal: 1993

Title : REMOVE SEWAGE DISCHARGE

Funding Status: Funded: 0.00 Unfunded: 10.00

Servicewide Issues : N11 (WATER QUAL-EXT)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 147

Problem Statement

A sewage treatment facility located in the park and owned by the Government of Guam discharges 1.5 million gallons of treated sewage per day into park waters at Gaan Point. During overflow conditions, which occur occasionally, unknown volumes of raw sewage are also discharged. This effluent threatens visitor health and precludes unencumbered access to significant submerged natural and cultural resources. The Guam Environmental Protection Agency has been aware of the situation since 1981 and has identified the site as a health hazard. Consultation with local officials [date?] resulted in their agreement to realign the outfall and relocate the treatment facility outside the park in four years [date?] The area within the park has been closed to public access until discharge is diverted. The preliminary proposal for an underwater SCUBA trail in the Agat Unit has been abandoned until the sewage problem is resolved.

References:

Rob Myers, University of Guam Marine Lab
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants

Description of Recommended Project or Activity

Continued negotiations with appropriate officials will press for prompt removal of discharge.

Project Statement WAPA-N-012.000

Last Update: 10/18/96 Priority: 18
Initial Proposal: 1993 Page Num: 0064

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	RES	One-time	10.00	0.00
		Total:	10.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

The Gaan Point area could be permanently closed, thereby ensuring public safety. A significant unit of the park will remain unsafe and inaccessible to both park staff and the public and park natural resources will continue to be stressed unless and until other agencies take action to remove the discharge.

Compliance codes :

Explanation:

Project Statement WAPA-C-007.000

Last Update: 10/17/96 Priority: 19
Initial Proposal: 1993 Page Num: 0014

Title : LOCATION OF SEALED JAPANESE EARTHEN TUNNELS/CAVES

Funding Status: Funded: 0.00 Unfunded: 50.00

Servicewide Issues : C14 (MAINTENANCE)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number : 153

Problem Statement

During the course of the fighting, American forces used explosives to seal an unknown number of Japanese earthen tunnels in the Mt. Alifan Unit, and possibly in the Mt. Tenjo/Chachao Unit and Fonte Unit. Knowledge of most of their locations has been lost. Proper management of the cultural resource, combined with the possiblity of researching certain aspects of the battle, requires that these tunnels be located. These tunnels also present a possible public safety hazard both because the surface soil may be unstable and because they may contain ordnance which may detonate if disturbed. The locations of known tunnels have been mapped[?], and notations have been made of some suspicious surface features that might indicate additional tunnels. Some tunnels have been broken into and vandalized by people looking for war artifacts.

References:

Park and Pacific Area Office archaeology files and historical photographs
Micronesian Area Research Center archives, historical photogaphs, and battle reports
Russell Apple, Pacific Historian
Pacific Area Archaeologist, PAAR
Roger Kelly, Regional Archaeologist, WRO
Nobuo Ichihara, Environmental Agency for Japan, Tokyo
Mitsu Watanabe, Japanese Council General

Description of Recommended Project or Activity

Contract with the University of Guam or other university to undertake a magnetometer and/or resistivity survey of approximately 100 acres of the Mt. Alifan Unit [other units?]. After contact with the appropriate Japanese officials, only excavations essential to authenticate readings will be conducted. A map of the tunnels should be produced. [What about stabilization of potentially hazardous sites? What about any human remains or artifacts that might be found during

excavations?]

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	50.00	0.00
		Total:	50.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If there is no action, tunnel locations will continue to be unknown to park management, which may result in developments which might inadvertently damage the resource. Without knowledge of tunnel locations, park management will be unaware of possible vandalism until after it has occurred. Park management cannot effectively warn visitors of potentially dangerous ordnance or unstable surface conditions if the tunnel locations are not known. Possible protective measures cannot be undertaken, and possible research and interpretive opportunities will be lost.

Compliance codes :

Explanation:

Project Statement WAPA-C-008.000

Last Update: 10/17/96 Priority: 20
Initial Proposal: 1993 Page Num: 0016

Title : UNDERWATER CULTURAL RESOURCES SURVEY

Funding Status: Funded: 0.00 Unfunded: 75.00

Servicewide Issues : C14 (MAINTENANCE)
C10 (INVENTORY)
Cultural Resource Type: COMB (Combination)
N-RMAP Program codes :

10-238 Package Number : 133

Problem Statement

The park includes about 405 ha (1000 acres) of submerged areas off the Asan and Agat invasion beaches. Because of the size of the invasion forces, the intensity of defense fire by the Japanese, and the nature of the underwater area, it would be expected that numerous World War II resources are located underwater within the park. However, a complete underwater archaeological survey has not been conducted. Park staff has acquired random bits of information from the park's dive team and various other swimmers and divers about several underwater items of military equipment sunk during the invasion. By means of an on-site visit in February 1981, the National Park Service Submerged Cultural Resources Unit (SCRU) from Santa Fe assessed what needs to be done. In September 1983, the Unit returned and, together with the WAPA park dive team, conducted a seven-day assessment of the Agat and Asan water areas. The Apra Harbor outside of the park, was also assessed. This preliminary assessment collected basic information in order to determine what is needed for a more comprehensive survey involving a complete inventory of submerged cultural resources in the park. Data, video, and slides of the September survey are on file with the Submerged Cultural Resources Unit in Santa Fe. Because no formal and organized data exist on park underwater cultural resources, no preservation actions are possible, and no protective management can be done. Also, a survey is needed to locate possible hazards such as unexploded ordnance and to determine the stability of such pieces because the area will be used for recreational snorkling and diving.

References:

Rob Myers, University of Guam Marine Lab
Dan Lenihan, Chief, Submerged Cultural Resources Unit
David J. Mclean, Regional Dive Officer, WR-LAME

Description of Recommended Project or Activity

Location, identification, assessment of significance and condition, and recommended maintenance, management, and interpretive treatment of all underwater cultural resources within the park are needed. The compilation of an underwater topographical map done in conjunction with the survey would provide additional management information. The work would be done by the NPS underwater archaeology team from Santa Fe, employing a magnetometer, electronic positioning system, and recording fathometer in an interfaced package, assisted by local divers and with local logistical support for boat charters and some equipment.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	75.00	0.00
		Total:	75.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

By relying solely on the WAPA dive team, currently only two persons who also have other major duties, several years would be needed to complete a survey. Insufficient data will preclude adequate protection, preservation, or interpretation of significant historical resources within the park. There may be harm to visitors who come across live ordnance in the water.

Compliance codes :

Explanation:

Title : DEVELOP WATER RESOURCES MANAGEMENT PLAN

Funding Status: Funded: 0.00 Unfunded: 5.00

Servicewide Issues : N11 (WATER QUAL-EXT)
N12 (WATER FLOW)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 211

Problem Statement

In compliance with Public Law 92-500 (Federal Water Pollution Control Act) and as amended by Public Law 95-217 (Clean Water Act of 1977) and the Service Memorandum of Understanding with the Environmental Protection Agency, each area must develop a Water Resources Management Plan. The Service has responsibility to maintain water quality and quantity standards in the park's marine environment and in streams that pass through. Executive Order 11988 (Floodplain Management Guidelines) mandates that each park assess its area for floodplains (by definition, floodplains include flood waves or tsunamis) and will post signs to the public identifying flood hazard areas. The extent of reports and data is unknown, but it is likely that little background information exists.

References:

Gerald Witucki, Chief, Water Resources Division, WRO
Director, Pacific Area Office

Description of Recommended Project or Activity

There are four courses of action:

1) Cooperate with local and Federal government agencies in carrying out water quality programs and mandates as necessary to assure proper consideration and protection of natural resources within the park. In this context, a plan will be developed for overall management of the park's water resources.

2) Continue the extremely limited protective action of monitoring of and patrolling park units, and extend the scope of these efforts as funds for additional personnel become available.

3) Educate the public through on-site explanations of the ecological resources in both fresh-water and marine environments. Discourage concentrated use in order to preent localized

over-use of and damage to resources. Additional personnel will be necessary to provide conservation and ecological resource information and to protect the resources by preventing both intentional and unintentional collection violations (eg., collecting of coral souvenirs).

4) A monitoring program is suggested to assess long-term changes in biota of fresh-water streams and nearshore marine habitat.

[5) What about posting signs about flood hazard, flood waves, and tsunamis?]

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	MON	One-time	5.00	0.00
		Total:	5.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If there is no action, Service non-compliance with the above federal laws, possible degradation of water quality, and possible negative impacts on biota and humans will result. Without a comprehensive plan, park management will have no choice but to react to emergencies as they arise.

Compliance codes :

Explanation: PUBLIC LAW 92-500, 95-217

Project Statement

WAPA-N-013.000
Priority: 22
Page Num: 0065

Last Update: 10/18/96
Initial Proposal: 1993

Title : MISSION GRASS ECOLOGICAL STUDY

Funding Status: Funded: 0.00 Unfunded: 10.00

Servicewide Issues : N05 (NON-NAT PLANTS)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 212

Problem Statement

Misssion grass [Latin name?] is a recently introduced grass which dominates the savanna ecosystem and inhibits the re-establishment of the native swordgrass, eventually replacing it, when fires are frequent ["when fire ratings are high"?]. It is doubtful that it has caused an impact on the historic scene. However, it is suspected that the dense shade provided by mission grass at the savanna-ravine forest ecotone interferes with the reproduction and establishment of the endangered tree fern. The precise effects of fire on the competition between mission grass and swordgrass must be known before the potential impacts of mission grass on the tree fern can be ascertained.

References:

Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Pete Togas, Environmental Specialist, U.S. Navy
Lynn Raulerson, Professor of Biology, University of Guam

Description of Recommended Project or Activity

An ecological study of the interrelationships among fire, mission grass, and swordgrass would provide information to managers on the extent to the problem and the possibility of intervening in the process to prevent or reduce future impacts. Of particular interest is the possible threat of savanna dominated by mission-grass extending its range into and replacing the ravine forest, thereby eliminating the tree fern. While this particular study would concentrate on the savanna ecosystem, a companion study [see WAPA-N-14] would specifically be concerned with the tree fern. This project would be appropriate for graduate student research through the University of Guam or other biology departments at Hawaii or mainland universities.

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	RES	One-time	10.00	0.00
		Total:	10.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

Without precise knowledge of the relationship of fire, mission grass, and swordgrass, park management will not know whether or not mission grass poses a threat to any natural resources, either savanna or ravine forest and tree ferns.

Compliance codes :

Explanation:

Project Statement

WAPA-N-014.000
Priority: 23
Page Num: 0067

Last Update: 10/18/96
Initial Proposal: 1993

Title : ENDANGERED TREE FERN STATUS STUDY

Funding Status: Funded: 0.00 Unfunded: 36.00

Servicewide Issues : N03 (T&E PLANTS)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 213

Problem Statement

The endangered tree fern is currently being collected for sale in the commercial trade, pushing the fern to the brink of extinction. [Is it being collected within park boundaries?] The tree fern is also being out-competed by the alien mission grass which shades out the fern at the savanna-ravine forest ecotone. Wildfires also impact tree ferns by encouraging mission grass over the native swordgrass, possibly extending the range of the savanna into the ravines. Fires may also directly kill tree ferns. Park managers do not know (1) the precise locations of tree ferns within the park, (2) the extent or threat of illegal collecting, or (3) the ecological effects of fire and/or mission grass on tree ferns.

References:

Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Lynn Raulerson, Professor of Biology, University of Guam

Description of Recommended Project or Activity

Two actions are required, a survey and an ecological study. A survey needs to be undertaken to determine the status of tree ferns in the park areas, to include (1) the locations, and (2) evidence of the degree of collecting which may take place. An ecological study of the impact of mission grass competition and fire on the tree ferns would provide the necessary information to park managers to effectively protect the endangered plants. These two projects would both be appropriate for graduate student research, through the University of Guam, Hawaiian, or mainland universities. [This study is a companion to WAPA-N-013, which involves the relationships of fire, mission grass and swordgrass.]

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	12.00	0.00
Year 2:	RES	One-time	12.00	0.00
Year 3:	RES	One-time	12.00	0.00
		Total:	36.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No action will result in continued and increased threat to the endangered tree ferns within park boundaries.

Compliance codes :

Explanation:

Project Statement

WAPA-N-015.000
Priority: 24
Page Num: 0069

Last Update: 10/18/96
Initial Proposal: 1993

Title : REEF DISTURBANCE STUDY

Funding Status: Funded: 0.00 Unfunded: 36.00

Servicewide Issues : N06 (LAND USE PRAC)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 214

Problem Statement

Sealife is collected daily from reefs and reef flats within the park, primarily by local residents. The nature, extent, cultural basis, and impacts of this activity are unknown but are presumed to be deleterious to the outstanding natural values the park was created to conserve (PL 95-348). As a result, it is not possible to intelligently manage these activities or institute necessary controls. There is also use by some individuals of explosives and bleaches to harvest fish and invertebrates, a practice which undoubtedly has a devastating effect on the marine life and any cultural objects that may be located in the area. Park staff occasionally monitor submerged resource conditions. Except when explosives or caustic agents are used, no attempts have been made to restrict collecting from the reefs.

References:

Rob Myers, Marine Lab, University of Guam
Dr. Charles W. Birkeland, Marine Lab, University of Guam
Dirk Ballendorf, Micronesian Area Resource Center, University of Guam
Guam Humanities Council

Description of Recommended Project or Activity

Contract with the Micronesian Area Research Center for a study of local subsistence activities within park waters. The goals will be to determine extent of collecting done on park reefs, types of biota exploited, and population dynamics of exploited species. Information on collecting activity will also include number of users, frequency of collection, areas of collection, and total harvest. The basis and patterns of traditional reef collection and potential impacts of restrictions on traditional users will be documented. Extent, rate and distribution of habitat damage caused by destructive techniques will be determined.

Project Statement WAPA-N-015.000

Last Update: 10/18/96 Priority: 24

Initial Proposal: 1993 Page Num: 0070

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	12.00	0.00
Year 2:	RES	One-time	12.00	0.00
Year 3:	RES	One-time	12.00	0.00
		Total:	36.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Appropriate reef management cannot be undertaken without a determination of reef damage and extent of impact on park resources. Impacts on the reef can be inferred only from extreme changes in resource appearance, beyond which, recovery may be extremely slow or impossible.

2. Concurrence with local agencies will be sought to prohibit all collecting in the park. A prohibition on all reef collecting will conserve natural resources but may also cause undue economic and/or social stress on traditional users.

Compliance codes :

Explanation:

Project Statement

WAPA-N-017.000
Priority: 25
Page Num: 0071

Last Update: 10/18/96
Initial Proposal: 1993

Title : ALIEN PIG STATUS

Funding Status: Funded: 0.00 Unfunded: 2.00

Servicewide Issues : N01 (NAT ANML OVPOP)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 215

Problem Statement

Wild [feral?] pigs disturb the forest floor by uprooting seedlings and young plants as they search for invertebrates, roots, etc. Populations of certain forest species may be reduced by direct predation; others may be affected because they are sensitive to disturbance. Destruction of the forest floor vegetation permits erosion to begin. Pigs are seen in limestone forests, but their population densities and impacts are unknown. [Are we talking about "natural" limestone forests such as near the Fonte Plateau or about tangantangan thickets? And does it matter?] [Were feral pigs part of the historic scene? Are they currently hunted by natives?] [Are they really a potential problem? The previous RMP says "a few wild pigs."] [The pig problem is addressed in N-8, Re-establish the Historic Scene.]

References:

Dr. C. P. Stone, Research Scientist, HAVO

Description of Recommended Project or Activity

Survey the pigs in the forested areas and obtain estimates of the population densities in park units. Evaluate their impact on the vegetation.

BUDGET AND FTEs:

FUNDED				
Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

Project Statement WAPA-N-017.000

Last Update: 10/18/96 Priority: 25

Initial Proposal: 1993 Page Num: 0072

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	2.00	0.00
		Total:	2.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

Without information, park managers could inadvertently allow pigs to seriously impair the ecological processes of the limetone forested areas.

Compliance codes :

Explanation:

Project Statement

WAPA-C-101.000
Priority: 26
Page Num: 0029

Last Update: 10/18/96
Initial Proposal: 1993

Title : SUB-SURFACE ARCHAEOLOGICAL TESTING

Funding Status: Funded: 0.00 Unfunded: 20.00

Servicewide Issues : C14 (MAINTENANCE)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number : 151

Problem Statement

Sub-surface prehistoric Chamorro cultural materials are suspected to occur in the Asan Beach, Asan Inland, and Agat park units but have not been located. Archaeological surveys have been completed for approximately 90% of the park's surface areas. A series of test excavations made at Asan Point by a local contract archaeologist yielded no positive results. However, without a thorough survey of potential sub-surface resources, damage or destruction of those deposits could occur with each development involving excavation, and the opportunity to develop necessary data on Guam prehistory will be lost.

References:

Park archaeological survey files

Description of Recommended Project or Activity

A controlled program of sub-surface testing is necessary to determine presence, exact locations, nature, significance, and extent of sub-surface prehistoric materials. The work could be contracted out to the University of Guam or to local archaeology consulting firms or done by the Pacific Region archaeologist and staff on detail.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	RES	One-time	20.00	0.00
		Total:	20.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If no action is taken, sub-surface prehistoric sites may be inadvertently damaged or destroyed by park developments. In lieu of a comprehensive survey, sub-surface testing could be done on each site just prior to individual developments.

Compliance codes :

Explanation:

Title : RE-ESTABLISH HISTORIC SCENE

Funding Status: Funded: 0.00 Unfunded: 804.00

Servicewide Issues : N24 (OTHER (NATURAL))
N17 (BIODIVERSITY)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 169

Problem Statement

The historical scene has changed substantially since World War II, especially along the two invasion beaches, both in terms of cultural and vegetational changes. Post-war construction of buildings in some areas prevents adequate interpretation and appreciation of the historic aspects of the sites. Many areas of the park serve as unofficial dumping grounds for junk cars, trash, and rubble. Exotic vegetation, particularly tangantangan, has altered the visual impact of the landscape from what it was during the war.

As funding permits, private inholdings are acquired and structures demolished. Four tracts of land have been purchased and one structure demolished. When staffing permits, some junk is removed, but without adequate fencing, additional junk and trash reappears. When maintenance staffing permits, some exotic vegetation is cut or removed, particularly around historical structures, but control of exotics in the tropical climate requires constant attention and cleared sites are quickly reclaimed by exotics.

Description of Recommended Project or Activity

The subprojects under this heading outline the variety of actions necesssary to re-establish the historic scene.

References:

Dirk Ballendorf, Micronesian Area Resource Center, University of Guam
Lynn Raulerson, Professor of Biology, University of Guam
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Bryan Harry, Director, PAAR
Gary Barbano, Planner, PAAR
Nobuo Ichihara, Environmental Agency for Japan, Tokyo

Micronesian Area Research Center, University of Guam,
Oral History Tapes, Transcript, and Translations
Jennison-Nolan, June 197, "Land and Lagoon Use in Prewar Guam -- Agat, Piti, and Asan"

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	MIT	Recurring	45.00	0.00
	MIT	Cyclic	294.00	0.00
		Subtotal:	339.00	0.00
Year 2:	MIT	Recurring	75.00	0.00
	MIT	Cyclic	189.00	0.00
		Subtotal:	264.00	0.00
Year 3:	MIT	Recurring	12.00	0.00
	MIT	Cyclic	189.00	0.00
		Subtotal:	201.00	0.00
		Total:	804.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: The historic scene will not be re-established, the situation will further deteriorate, and interpretive efforts will continue to be hindered.

2. Continue Present Efforts By Inadequate Staff: Without sufficient staffing, park management cannot even maintain the status quo and will continue to lose ground to exotic vegetation, construction, boundary encroachments, and illegal dumping.

Compliance codes :

Explanation:

Project Statement WAPA-N-010.001
Last Update: 10/18/96 Priority: 28
Initial Proposal: 1993 Page Num: 0051

Title : RE-ESTABLISH HISTORIC SCENE, BOUNDARY SURVEY
Sub-title: BOUNDARY SURVEY

Funding Status: Funded: 0.00 Unfunded: 70.00

Servicewide Issues : N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 164

Problem Statement

The park has never had a boundary survey[?], and as a result there may be unknown encroachments onto park lands.

Description of Recommended Project or Activity

Knowledge of current and accurate boundaries are basic to effective park management. A boundary survey needs to be conducted in all seven units of the park, with permanent markers put in place.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	RES	One-time	70.00	0.00
		Total:	70.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: Without accurate boundaries, park management and planning will be hindered. Possible encroachments and illegal or inappropriate park uses will continue to be unknown and there will be no opportunity for correction or mitigation.

Project Statement

WAPA-N-010.001
Priority: 28
Page Num: 0052

Last Update: 10/18/96
Initial Proposal: 1993

Compliance codes :

Explanation:

Project Statement

WAPA-N-010.002
Priority: 29
Page Num: 0053

Last Update: 10/18/96
Initial Proposal: 1993

Title : RE-ESTABLISH HISTORIC SCENE
Sub-title: FENCING OF NPS LANDS

Funding Status: Funded: 0.00 Unfunded: 80.00

Servicewide Issues : N20 (BASELINE DATA)
N24 (OTHER (NATURAL))
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Because no fences exist along any of the park boundaries, there may be unintentional or undiscovered encroachment. The lack of fencing also facilitates illegal and unsightly dumping of junk cars, trash, and rubble into all units of the park. Feral pigs have free access between non-park and park lands, where they may cause damage to vegetation which then results in undue erosion.

Description of Recommended Project or Activity

Lands that are owned by the NPS need to be fencd in order to control vehicle access, illegal dumping, and feral pigs. Staff will be needed to maintain the fences.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	PRO	One-time	80.00	0.00
		Total:	80.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: Without fences, the encroachment, illegal dumping, and possibly destructive activity of feral pigs will continue, to the detriment of both the natural resources of the park and to the historic interpretation.

Compliance codes :

Explanation:

Project Statement

WAPA-N-010.003
Last Update: 10/18/96
Priority: 30
Initial Proposal: 1993
Page Num: 0055

Title : RE-ESTABLISH HISTORIC SCENE, JUNK REMOVAL
Sub-title: REMOVAL OF JUNK

Funding Status: Funded: 0.00 Unfunded: 0.00

Servicewide Issues : N08 (CULT LANDSCAPE)
N24 (OTHER (NATURAL))
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Junk cars, trash, and rubble are continually dumped on park lands, creating a significant intrusion on both the natural and historic scene. Because of shortages of maintenance personnel, only sporadic removal is possible, and without adequate fencing, park lands continue to be a dumping ground.

Description of Recommended Project or Activity

A one-time massive effort to remove all existing junk, trash and rubble needs to be conducted. However, even with adequate fencing that limits illegal access to park lands, some junk will continue to be found, and maintenance staff will be required to remove it as necessary.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

Activity	Fund Type	Budget ($1000s)	FTEs
	Total:	0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: Accumulations of junk, trash, and rubble will continue to dominate both the natural and historical scene, violating the integrity and aesthetics of the park.

Compliance codes :

Explanation:

Project Statement

WAPA-N-010.004
Priority: 31
Page Num: 0057

Last Update: 10/18/96
Initial Proposal: 1993

Title : RE-ESTABLISH HISTORIC SCENE, VEG STUDY
Sub-title: HISTORIC VEGETATION STUDY

Funding Status: Funded: 0.00 Unfunded: 0.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Current Conditions:

In terms of visual impact, the primary component of the historical scene is not terrain contours but vegetation. The vegetational landscape that existed before and during the recapture of Guam was very different from the tangantangan-dominated landscape that park visitors now see. A major part of the re-establishment of the historic scene is a re-creation, as far as is possible, of the "native" plant life. However, park management does not know the precise composition and distribution of the plant communities that existed on pre-war Guam.

Past Actions:

An oral history project conducted by the Micronesian Area Research Center at the University of Guam and a study of available historical photographs by park staff has yielded sufficient information to get a general idea of historical vegetation. Coconut palms have been planted on the western side of the Asan Beach Unit, a re-establishment of the historic scene on the invasion beach.

Description of Recommended Project or Activity

Park management needs informaton on the composition and distribution of vegetational communities that existed on pre-war Guam. This goal might best be accomplished by (1) review of historic literature and by (2) interviews with individuals who resided on Guam prior to World War II. The results could then be incorporated into a revegetation plan.

Project Statement

WAPA-N-010.004
Priority: 31
Page Num: 0058

Last Update: 10/18/96
Initial Proposal: 1993

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: Without specific knowledge of the pre-war vegetational landscape, park management cannot adequately restore the historic scene for effective interpretation.

Compliance codes :

Explanation:

Project Statement WAPA-N-010.005

Last Update: 10/18/96 Priority: 32
Initial Proposal: 1993 Page Num: 0059

Title : RE-ESTABLISH HISTORIC SCENE, CONTR TANGENTANGEN
Sub-title: REMOVAL OF TANGANTANGAN

Funding Status: Funded: 0.00 Unfunded: 0.00

Servicewide Issues : N05 (NON-NAT PLANTS)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Current Condition:

Tangantangan (Leucaena sp.) is the most troublesome and invasive of the exotic plants in Guam and within the park. This pioneer plant, which originated in Latin America, was part of the historic scene because it was intentionally spread throughout the tropics for its use as browse, fuel, and poles. However, after the war it was extensively seeded throughout the island to prevent erosion on the denuded hillsides and has subsequently acquired dominance in the altered ecosystem, particularly on limestone soils. Its presence has not only changed the natural landscape but its root growth often damages historical structures.

Past Action:

As time and personnel permit, maintenance workers clear tangantangan away from key historical sites to allow for visitor access, but such control is only temporary and minimally effective.

Description of Recommended Project or Activity

The recommendations of Lee and Bjork in their report "Effect of Various Herbicides on the Control of Weeds in Proposed War in the Pacific NHP" should be implemented[?]. Further research must be done on effective control of tangantangan that does not significantly harm the native flora and fauna. Various university biology departments should be contacted to ascertain interest in such a project.

Project Statement

WAPA-N-010.005
Priority: 32
Page Num: 0060

Last Update: 10/18/96
Initial Proposal: 1993

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: With no attempt at controlling the spread of tangantangan on park lands, this exotic will continue to dominate the natural landscape and damage fragile historic sites and structures.

Compliance codes :

Explanation:

Project Statement

WAPA-N-004.000
Priority: 999
Page Num: 0037

Last Update: 10/18/96
Initial Proposal: 1993

Title : TANGANTANGAN CONTROL

Funding Status: Funded: 0.00 Unfunded: 0.00

Servicewide Issues : N05 (NON-NAT PLANTS)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 184

Problem Statement

Tangantangan (Leucaena), an exotic tree native to Latin America, is a serious disruptive element in the natural ecological processes of the park. Although present prior to the historic period, it was broadcast over very wide areas after World War II as a means of erosion prevention on the denuded hillsides and is now an aggressive and dominant plant in the landscape of the island. The dense thickets which formed prevent the re-establishment of "natural" vegetation which typified the historic scene. Tangantangan also intrudes on the historic scene, both by hiding historic structures and growing within them, causing damage with its roots. Techniques, such as herbicide treatment or prescribed fire, are needed to eradicate the tangantangan in several historical areas.

Limited control by mowing and pruning [?] of tangantangan is carried out in parts of the park, but this attempt at reduction is only short-term effective because of limited personnel and limited knowledge about control technology. A one-year research contract was completed in late 1981. Drs. Claron Bjork and Chin Tian Lee of the University of Guam experimentally applied various herbicides/soil treatments on test plots to establish an herbicide-based technique to eradicate tangantangan. Only one herbicide [what?], now banned from use in National Parks, showed positive results in controlling tangantangan. Tangantangan has recently been set back but not controlled by a psyllid which allows other plants, particularly vines, to co-exist with it. This growth, however, obscures historic structures more than before.

References:

Bjork, C. & Lee, C.T., 1981, "The Effect of Various Herbicides on the Control of Weeds," College of Agriculture and Agricultural Extension Service, University of Guam
Lynn Raulerson, Professor of Biology, University of Guam
Clifford Smith, CPSU/UH Unit Leader
Kathy Davis, Regional Fire/Plant Ecologist, WRO
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants

Description of Recommended Project or Activity

Research will have two principal phases: Phase I will evaluate all types of existing techniques used to eliminate plant species in Guam. An evaluation of techniques deemed successful on other islands or elsewhere will also be included for their possible transfer value to Guam. Herbicides developed since the 1981 study may be appropriate and effective. Prescribed fire should also be evaluated because in Hawaii, regular annual fires convert tangantangan thickets into open grassland [reference?]. This phase will involve a summary of literature and consultation with plant management specialists.

Phase II will focus on experimental use of herbicides, soil treatment/alteration, possible biological control methods, fire, etc. The study's goal will be recommendations to the Superintendent for a practical and comprehensive action plan for effective control (or possibly eradication) of tangantangan, particularly in sensitive areas such as historic structures.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

Activity	Fund Type	Budget ($1000s)	FTEs
	Total:	0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

Continuation of the current methods of ah hoc limited control lacks a sound scientific basis, is time-consuming, and is only marginally effective. Tangantangan will continue to intrude on the historic scene and destroy historic structures.

Compliance codes :

Explanation:

Project Statement

WAPA-N-006.000
Priority: 999
Page Num: 0042

Last Update: 10/18/96
Initial Proposal: 1993

Title : FAUNAL SURVEY

Funding Status: Funded: 0.00 Unfunded: 45.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 185

Problem Statement

[This study should be postponed and/or rewritten to reflect that the tree snake has already decimated the native terrestrial forest fauna]

A large percentage of many native species have decreased significantly in recent years as development in Guam spreads around the park and habitat is altered. Little is known about native and exotic populations of land animals present within the park. A few native and exotics species have been identified, such as the African tree snail and toad (Bufo bufo). Except for a few wild pigs known to occur in one location [see N-17], no large feral mammals are found within the park. It is possible that species exist which should have special consideration for protection or interpretation. Similarly, information is lacking on stream biota in the park. Fresh-water streams in some of the park units contain fish, probably both native and exotic species. It is also possible that some endangered species reside in or pass through park waters. Various general studies on animal life have been completed on Guam, but none specifically within park boundaries. The information is too general and is of little use to management.

References:

Tony Aguon, Aquatics and Wildlife
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Lynn Raulerson, Professor of Biology, University of Guam
Raulerson, L., 1979, "Terrestrial and Freshwater Organisms within and Limnology and Hydrology of the Guam Seashore Study Area and the War in the Pacific national Historical Park," University of Guam.

Description of Recommended Project or Activity

Contract with the University of Guam to conduct a biological study of the terrestrial fauna and fresh-water fish resources in the park by means of literature search and field work. A final report detailing species, populations, distributions, significance, and management recommendations is necessary. On an on-going basis, scientists visiting the University of Guam should be encouraged to visit park units and contribute information on their specialties.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	RES	One-time	15.00	0.00
Year 2:	RES	One-time	15.00	0.00
Year 3:	RES	One-time	15.00	0.00
		Total:	45.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Without a comprehensive study, knowledge of any terrestrial animal and fresh-water fish populations will not be available to guide management, development, and interpretation decisions, possibly resulting in inadvertent danage or destruction of significant species or their habitats. Invading exotics may be competing for food and space, threatening sensitive native species without our knowledge. As development continues in private lands around the park, native species will continue to decline.

2. A staff biologist could be hired or an NPS biologist could be detailed to the park to conduct the study. Either alternative would be more costly than contracting out to local university personnel.

Last Update: 10/18/96
Initial Proposal: 1993

Compliance codes :

Explanation:

Project Statement

WAPA-N-008.000
Last Update: 10/18/96
Priority: 999
Initial Proposal: 1993
Page Num: 0045

Title : ENDANGERED BIRD STATUS SURVEY

Funding Status: Funded: 0.00 Unfunded: 0.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

[This project is abandoned because the tree snake has decimated the park forest avifauna]

All of Guam's native forest birds are either extinct or endangered. They used to occur in the limestone units of the park, but since the introduction and rapid spread of the brown tree snake, their numbers have decreased dramatically and numbers were already low in the late 1970s. Surveys in the limestone inland areas have not been conducted since at least 1982, and no survey has been conducted of the shorebird populations(?).

Description of Recommended Project or Activity

A multi-season survey of both the coastal units and inland units should be conducted to document the status of birds, if any, within the park. The Biology Department of the University of Guam, possibly as a class project, would be a logical entity to conduct such a survey.

References:

Tony Aguon, Aquatics and Wildlife
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Andy Yuon, Fish & Wildlife, Honolulu
Biology Department, University of Guam
Government of Guam, Division of Wildlife
U.S. Fish & Wildlife Service, Honolulu, HI

Project Statement

WAPA-N-008.000
Priority: 999
Page Num: 0046

Last Update: 10/18/96
Initial Proposal: 1993

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

Activity	Fund Type	Budget ($1000s)	FTEs
	Total:	0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: Without knowledge of the status of possible remnant bird life within the park, managers may act in such a way to inadvertently have a negative impact on an extremely limited natural resource.

Compliance codes : EA (ENV. ASSESSMENT)

Explanation:

Project Statement

WAPA-N-009.000
Priority: 999
Page Num: 0047

Last Update: 10/18/96
Initial Proposal: 1993

Title : ENDANGERED BAT STATUS SURVEY

Funding Status: Funded: 0.00 Unfunded: 0.00

Servicewide Issues : N02 (T&E ANIMAL)
N20 (BASELINE DATA)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

[This project is abandoned because the tree snake has decimated the park native terrestrial fauna]

Three bat species are native to Guam, all of which are endangered: Short-tailed emballanura, little Marianas fruit bat, and Marianas fruit bat. The Chamorro have traditionally eaten the fruit bats as a delicacy. Although fruit bats have been observed in the park [WHERE?], the species and its habits are unknown.

Description of Recommended Project or Activity

A survey of the status of bats, particularly fruit bats, should be undertaken in the park to determine population(s), if any, and what park units are used for feeding, roosting, breeding, flight paths, etc., and possible sites where they may be illegally hunted within park boundaries. To be of most benefit to park managers, the final report should also include a literature review of basic fruit bat biology. Such a study could be accomplished by the Biology Department at the University of Guam, by a graduate student or as a class project.
References:

Gary Wiles, Aquatics and Wildlife
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants
Lynn Raulerson. 1979. "Terrestrial and Freshwater Organisms Within and Limnology and Hydrology of the Guam Seashore Study Area and War in the Pacific National Historical Park," p. 93.
Lynn Raulerson, Professor of Biology, University of Guam
Harry Cox, Ph.D., Harvard University

Project Statement WAPA-N-009.000

Last Update: 10/18/96 Priority: 999
Initial Proposal: 1993 Page Num: 0048

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

Activity	Fund Type	Budget ($1000s)	FTEs
	Total:	0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

No Action: Without a survey of the status of the fruit bats, management actions may inadvertently be detrimental to any remnant population(s). Any possible poaching activity will remain unknown.

Compliance codes :

Explanation:

Project Statement WAPA-N-011.000

Last Update: 10/18/96 Priority: 999
Initial Proposal: 1993 Page Num: 0061

Title : CONTROL OFF-ROAD VEHICLE DAMAGE

Funding Status: Funded: 0.00 Unfunded: 600.00

Servicewide Issues : C18 (IPM)
Cultural Resource Type: COMB (Combination)
N-RMAP Program codes :

10-238 Package Number : 125

Problem Statement

All types of vehicles (dirt bikes, off-road, and standard) illegally enter many areas of the park because of a lack of vehicle control barriers and enforcement capability. Such entry results in damage to and possible destruction of park cultural and natural resources, causes erosion, increases fire hazards, and introduces visual intrusions on the historic scene. It is also possible that such vehicle use may be damaging endangered species' habitats.

Vehicle barriers that have been erected in the Asan Beach Unit, Asan Inland Unit, and Agat Unit have been somewhat effective. However, many have been damaged and broken from attempts to enter these areas and illegal access remains a problem. No vehicle barriers exist in the Mount Alifan Unit, where most of the vehicle damage occurs. When vehicles are sighted by park personnel, only verbal warnings are given because there are no commissioned law enforcement rangers on the staff. Such verbal warnings are not effective in controlling vehicle access.

Description of Recommended Project or Activity

Adequate fencing [see WAPA-N-010-002] would help to eliminate part of the vehicle access problem. In the heavily visited units of Asan Beach and Agat, there is a need for substantial barriers that will withstand abusive attempts at removal or destruction. The provision of parking areas delineated by curbing is insufficient because many drivers overrun the curbs and park at will. Adequate barriers that effectively prevent unauthorized vehicle access would decrease the need for law enforcement on this matter. Staff and equipment would be required for routine maintenance of the barriers.

BUDGET AND FTEs:

Source	Activity	Fund Type	Budget ($1000s)	FTEs
FUNDED				
		Total:	0.00	0.00
UNFUNDED				
	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	PRO	Recurring	100.00	0.00
	PRO	Recurring	100.00	0.00
		Subtotal:	200.00	0.00
Year 2:	PRO	Recurring	100.00	0.00
	PRO	Recurring	100.00	0.00
		Subtotal:	200.00	0.00
Year 3:	PRO	Recurring	100.00	0.00
	PRO	Recurring	100.00	0.00
		Subtotal:	200.00	0.00
		Total:	600.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action: Without effective control of unauthorized vehicle access, there will be increased damage to park resources and eventually the complete destruction of many historical resources.

2. Increase Law Enforcement Capability: Add four new GS-5 full-time ranger positions to patrol park areas seven days a week, twelve hours a day. Provide for law enforcement training, vehicles and equipment. The primary duties of this staff would be to patrol all park uits and enforce vehicular access regulations.

Compliance codes :

Explanation:

Project Statement

WAPA-N-102.000
Priority: 999
Page Num: 0077

Last Update: 10/18/96
Initial Proposal: 1993

Title : NATURAL HISTORY INTERPRETIVE TRAILS

Funding Status: Funded: 0.00 Unfunded: 5.00

Servicewide Issues :
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number : 114

Problem Statement

Part of the park mandate is to protect and interpret significant natural history resources within the park. Several areas appear to be likely candidates for the development of natural history trails, both terrestrial and marine; egs., Piti guns jungle trail, underwater reef trail, Fonte Plateau limestone forest trail; mahogany grove plantation. Park staff does not have adequate personnel with natural history expertise to select areas to be interpreted, determine the trail routes, or to develop interpretive materials.

Description of Recommended Project or Activity

Contract with the University of Guam for assistance in developing a natural history interpretive program with appropriate land and water trails to be used by visitors. The contractor would examine various park areas to recommend good places for natural history interpretation, assist in designing trail routes, and work with park staff to develop necessary signing, brochures, and other interpretive devices.

References:

Lynn Raulerson, Professor of Biology, University of Guam
Pete Togas, Environmental Specialist, U.S. Navy
Ron Strong, Environmental Specialist, Pacific Basin Environmental Consultants

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

Project Statement

WAPA-N-102.000
Priority: 999
Page Num: 0078

Last Update: 10/18/96
Initial Proposal: 1993

----------UNFUNDED----------

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 1:	INT	One-time	5.00	0.00
		Total:	5.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If there is no contract, a natural scientist could be added to park permanent staff to develop and implement a comprehensive natural history interpretive program. Alternatively, an NPS biologist could be assigned temporary duty in the park to develop a plan. In the absence of any of the above, park staff will develop a natural history program as personnel and time permit, but it may lack the high quality and professionalism that characterize NPS standards.

Compliance codes :

Explanation:

Project Statement

WAPA-N-104.000
Priority: 999
Page Num: 0081

Last Update: 09/04/96
Initial Proposal: 1993

Title : ACQUISITION OF A PARK NATURAL HISTORY LIBRARY

Funding Status: Funded: 0.00 Unfunded: 5.00

Servicewide Issues : N24 (OTHER (NATURAL))
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

A number of manuscripts, books, scientific articles, "grey" literature[?], maps, and aerial photographs exist that concern Guam and Micronesian natural history. These information sources would be beneficial in providing both direct and indirect guidance to park management and interpretation. Although a few of these have been acquired by the park, master annotated bibliography or pertinent sources should be compiled and the most important works acquired for the park library.

References:

Irene Stachura, Librarian, WRO

Description of Recommended Project or Activity

Either contract with the Library at the University of Guam or engage the services of a VIP to compile an annotated bibliography of important natural history source materials that pertain to Guam and the park. After consultation with appropriate park and WRO personnel, make arrangements to acquire the most important publications to provide adequate reference material for use by park management and interpretation.

BUDGET AND FTEs:

FUNDED

Source	Activity	Fund Type	Budget ($1000s)	FTEs
		Total:	0.00	0.00

UNFUNDED

	Activity	Fund Type	Budget ($1000s)	FTEs
Year 4:	INT	One-time	5.00	0.00

Total:	5.00	0.00

(Optional) Alternative Actions/Solutions and Impacts

If no action is taken, the park library will gradually be built over many years without professional guidence about pertinent reference materials. The result is likely to be an incomplete and mixed assortment of reference materials which would be inadequate to properly guide management decisions concerning natural history resources in the park. Without a good on-site library, park staff would be forced to spend an inordinate amount of time commuting to the University of Guam library, a 30-minute drive each way.

Compliance codes :

Explanation:

APPENDICES

Appendix A. List of Related Action Plans.

General Management Plan and Environmental Assessment	May, 1983
Land Protection Plan	Sept, 1983
Statement for Management	1994

Appendix B. Speculative Plant List for War in the Pacific National Historical Park.

This speculative plant list is based largely upon Raulerson, 1979, *Terrestrial and freshwater orgasnisms and limnology and hydrology of, the Guam Seashore Study and the War in the Pacific National Park.* Because it covers all of the Guam Seashore Study Area it includes many more species than occur in the War in the Pacific Historical Park alone. In this working list those species we know occur in the Historical Park are checked (✓), and those we believe do not occur are lined out.

Columns A, B, and C reflect the species status-- Column A reflects their status in Guam [G= endemic to Guam and the Marianna Islands; I= indigenous to Guam and the Mariannas Islands; N= alien introductions which have become naturalized. Small e= suggested as endangered and r as rare]. Column B reflects growth form [H= herbaceous; Sh shrub; TU tree in the understory; TD dominent tree]. Column C reflects habitat [S= savannah; T= strand; R= ravine forest; L= limestone forest; A= aquatic].

	Scientific Name	Local Name	A	B	C
	Ferns and Fern Allies				
	Aspidiaceae				
	Thelypteris interrupta (Willd. Iwatsuki		I	H	RL
	Thelypteris unita (L.) C. V. Morton		I	H	S
	Aspleniaceae				
	Asplenium falcatum Lamarck		I	H	L
✓	*Asplenium nidus* L.	galak, bird's nest fern	Ie	H	L
	Cyatheaceae				
	Cyathea lunulats (Forester) Copealnd	tree fern	Ir	TU	R
	Lycopodiaceae				
	Lycopodium cernuum L.	club moss	I	V	S
	Blechnaceae				
	Blechnum orientale L.	fern	I	H	S
	Davalliaceae				
	Dallia solida (Forster fil.) Swartz	pugua-machena	Ie		RL
	Nephrolepis hirsutula (Forster) Presl.		I	H	S
	Marattiaceae				
	Angiopteris durvilleana deVriese	giant fern	Ir		R
	Gleicheniaceae				
	Dicranopteris linearis (Baumann) Underwood		I	H	S
	Polypodiaceae				
	Microsorum punctatum (L.) Copeland		Ie		RL

Phymatodes scolopendria (Burm.) Ching		I	H	RL
Parkeriaceae				
Ceratopteris gaudichandii Brongniart	guafak-uhong	Gr	H	A
Pteridaceae				
Acrostichum aureum L.	langayao	I	H	A
Lindsaea ensifolia Swartz		I	H	S
Pityrogramma calomelanos (L.) Link		?	H	R
Pteudaceae				
Pteris tripartita Swartz.		I	H	L
Pteris vittata L.		?	H	SRL
Cycadaceae				
Cycas circinalis L.	fadang, federico	I	TU	RL
Schizaeaceae				
Lygodium auriculatum (Willd.) Alston		?	V	S
Lygodium scandens (L.) Swartz		I	V	S
Polypodiaceae				
Phymatodes scolopendria (Burm.) Ching		I	H	T
Hypoxidaceae				
Curculigo orchioides Gaertn.	golden-eyed grass	I	H	S

Higher Plants

Annonaceae				
Cananga odorata (Lam.) Hook f. & Thompson	ilang-ilang	N	TU	R
Guamia mariannae (Safford) Merrill	pai-pai, pac-pac	G	TU	L
Lauraceae				
Cassytha filiformis L.	agashi, mayagas	I	V	ST
Hernandiaceae				
Hernandia labyrinthica T. Tuyama		G	TD	R
Hernandia nymphaeifolia (Presl.) Kubitzki	nonag	I	TD	T
Piperaceae				
Peperomia mariannensis C. DC.	putpupot-palaoan	G	H	L
Piper guahamense DC.	pupulu-n-aniti	G	H	L
Moraceae				
Artocarpus mariannensis Trecul	dugdug, breadfruit	I	TD	L
Ficus prolixa G. Forster	nunu	I	TD	R
Ficus tinctoria G. Forster	hotda, tagete	I	TU	L
Ficus prolixa G. Forster	nunu, banyan	I	TD	L

Urticaceae					
Procis pedunculata (J.R. & G. Forster) Weddell			I	H	L
Casuarinaceae					
✓ *Casuarina equisetifolia* L.	gogu. ironwood		I	TD	ST
Amarylliadaceae					
Hymenocallis littoralis (Jacq.) Salisbury	spiderlily. lirio		?	H	A
Nyctaginaceae					
Pisonia umbellifera (Forst.) Seemann			Ir	TD	L
Polygonaceae					
Polygonum minus var. *procerum* (Danser) Steward	knotweed. mamaka		I	H	A
Polygala paniculata L.			I?	H	S
Malvaceae					
✓ *Hibiscus tiliaceus* L.	pago		I	TU	RTA
Sida rhombifolia L.	escobill dalili		N	Sh	S
Icacinaceae					
Merilliodendron megacarpum (Hemsley) Sleumer	faniok		Ir	TD	L
Tiliaceae					
Muntingia calabura L.	Panama cherry		?	TV	S
Balanophoraceae					
Balanophora pentamera van Tieghem	chili-n-duendas		G	H	L
Lecythidaceae					
Barringtonia asiatica (L.) Kurz.	oyrubf		I	TD	T
Barringtonia samoensis A. Gray			Ir	TD	R
Passifloraceae					
Passiflora foetida var. *hispica* DC.			N	V	S
Euphorbiaceae					
Glochidion marianum Mueller-Argoviensis	chosga. abas duendes		I	Sh	S
Macaranga thompsonii Merrill	pengua		G	TU	L
Phyllanthus saffordii Merrill			G	Sh	S
Myrsinaceae					
Maesa sp.			Ir	Sh	L
Fabaceae (Leguminosae)					
Canavalia maritima (Aublet) Thouars	akangkang-tasi		I	V	T
Cynometra ramiflora L.	gulos		I	TD	RL
Derris trifoliata Loureiro	begin		I	V	T
Desmodium umbellatum (L.) DC.	palaga hilitai		I	Sh	T
Entada pursaetha DC.	gayi. bayogon dangkulo		G	V	R
- ~~*Intsia bijuga* (Colebr.) O. Kuntze~~	~~ifil~~		I	TD	L
Leucaena insularum (Guillemin) Daniker			G	Sh	T

✓	*Leucaena leucocephala* (Lam.) DeWit	tangentangen	N	TU	L
	Mimosa pudica L.	sleeping grass	N	H	S
	Mucuna gigantea (Willd.) DC.	diki gaogao	I	V	T
	Vigna marina (Burm.) Merrill	akangkang manulasa	I	V	T
	Lythraceae				
	Pemphis acidula Forst	nigas	I	Sh	T
	Melastomataceae				
	Medinilla rosea Gaud.	gafus	G	ShV	R
	Melostoma marianum Naudin	gafau	I	Sh	S
	Myrtaceae				
	Decaspermum fruticosum J.R. & G. Forster		I	TU	S
	Myrtella bennigseniana (Volkens) Diels		I	Sh	S
	Onagraceae				
	Ludwigia octovalis (Jacquin) Raven		?	H	A
	Thymelaeaceae				
	Wikstroemia elliptica Merrill	gapit atayake	I	Sh	S
	Rhizophoraceae				
	Bruguiera gymnorrhiza (L.) Lam	mangle manchu, oriental mangrove	I	TD	A
-	~~*Rhizophora mucronata* Lam.~~	~~mangle hembra, mangrove~~	I	TD	A
	Meliaceae				
✓	*Swietenia macrophylla* King	Honduras mahogany	?	TD	R
	Xylocarpus moluccensis (Lam.) Roemer	lalanyog, puzzle-nut tree	I	TU	T
	Rutaceae				
	Triphasia trifolia (Burm. fil.) P. Wils	limon-china, limoncito	I?	Sh	SRL
	Apiaceae (Umbelliferae				
	Centella asiatica (L.) Urban		I?	H	S
	Apocynaceae				
	Bleekeria mariannensis (DC.) Koidzumi	langiti	G	TU	R
	Cerbera dilata Markgraf	chiute	I	TU	R
	Loganiaceae				
	Fagraea galilai Gilg & Benedict		Ir	TU	L
	Geniostoma rupestreo J.R. & G. Forster	majlocjayo, anasser	I	Sh	S
	Convolvulaceae				
✓	*Ipomoea pes-caprae* (L.) Roth	alalag-tasi, beach morning glory	I	V	T
	Solanaceae				
	Solanum guamense Merrill	berenghenas halomtano	G	Sh	T
	Boraginaceae				
	Cordia subcordata Lam.	niyoron	I	TU	T

✓ *Messerschmidia argentea* (L.f.) Johnston	hunig	I	TU T
Lamiaceae (Labiatae			
Hyptis capitata Jacquin	botones	N	H S
Verbenaceae			
Avicennia alba (L.) Gaertn.	mangle, mangrove	I	TD A
Stachytarpheta indica (L.) Vahl.	false verbenia	N	H S
Lentibulariaceae			
Utricularia bifida L.		I	H A
Scrophulariaceae			
Limnophila indica (L.) Druce	gege	I	H A
Lindernia procumbens (Krock.) Philcox		G	H A
Goodeniaceae			
✓ *Scaevola taccada* (Gaert.) Roxburgy	nanaso	I	Sh T
Rubiaceae			
Hedyotis albido-punctata (Merrill) Fosberg		G	H T
Morinda citrifolia L.	lada	I	TU S
Psychotria rotensis Kanehira		Ir	S R
Randia cochinchinesis (Lour.) Merrill	sumac	I	TU L
Timonius nitidus (Bartling) Villar	sumac-lada	G	Sh S
Asteraceae (Compositae			
Adenostemma lavenia (L.) O. Kuntze	bulak-manuk	I	H R
Elephantopus mollis H.B.K.	papago vaca	N	H S
Eupatorium odoratum L.		N	H S
Mikania scandens (L.) Willd.		N	V SA
Wedelia biflora (L.) DC.	masigsig	I	H T
Hydrocharitaceae			
Hydrilla verticillata (L.F.) Royle	waterweed	N	H A
Arecaceae			
✓ *Areca cathecu* L.	pugua, betelnut palm	?	TU R
✓ *Cocos nucifera* L.	niyog, coconut palm	?	TD RT
~~*Nypa fruticans* Wurmb.~~	~~nipa~~	?	TU A
Pandanaceae			
Freycinetia reinecker Warb.	fianiti	G	V R
Pandanus dubius Sprengel	pahong	I	TU L
✓ *Pandanus fragrans* Gaud.	kafu, screw pine	?	TU SRTL
Araceae			
Alocasia macrorrhiza (L.) Schott	papao-apaka, piga ape	I	H R
Colocasia esculenta (L.) Schott	suni, taro	?	H A
Flagellariaceae (*Joinvilleaceae*)			
Flagellaria indica L.	bejuco halum-tano, false rattan	I	V RL

Cyperaceae					
	Cyperus brevifolius (Rottb. Hassskarl)		I	H	A
	Cyperus cyperinus (Retz.) Suringar		I	H	R
	Cyperus difformis L.		N	H	A
	Cyperus javanicus Hottuyn	marsh cyperus	?	H	A
	Cyperus kyllingia Endlicher	chaguan lemae, botoncillo	I	H	R
	Cyperus oderatus		?	H	A
	Eleocharis dulcis (Burm. f.) Trin. ex Henschel	uchaga-lane, water chestnut	N	H	SA
	Eleocharis geniculata (L.) Roemer & Schultes	spikerush	I	H	SA
	Fimbristylis autumnalis (L.) Roemer & Schultes		I	H	L
	Fimbristylis dichotoma (L.) Vahl	tall fringe rush	?	H	A
	Fimbristylis globulosa (Rotz.) Kunth		?	H	A
	Fuirena umbellata Rottb.		?	H	A
	Rhynchospora corymbosa (L.) Britton		?	H	SA
	Scirpus fuirena T. Koyama		I	H	R
	Scirpus litoralis Schrader	bullrush	N	H	A
	Scleris polycarpa Bockeler		I	H	RLA
Poaceae (Gramineae					
	Babusa vulgaris Schrader	piao palaoan	?	TD	R
	Bachiara mutica (Forsskal) Stapf	para grass	N	H	T
	Cenchrus echinatus L.	sand spur, burgrass, sandbur	N	H	T
	Centrotheca lappacea L. Desvaus		I	H	RL
	Chrysopogon aciculatus (Retz.) Trin.	inifuk, palaii, golden beardgr	?	H	S
	Coix lacryma-jobi L.	bilen, Job's tears	N	H	R
✓	*Cynodon dactylon* (L.) Persoon	Bermuda grass	N	H	T
	Digitaria mariannensis Merrill	crabgrass	I	H	T
	Digitaria robinsonii Merrill	crabgrass	I	H	T
✓	*Dimeria chloridiformis* (Gaud.) Schum & Lauterbach		G	H	S
	Eragrostis tenella (L.) Roemer & Schultes	lovegrass	N	H	T
	Lepturus repens (G. Forster) Brown	lesaga	I	H	T
✓	*Miscanthus floridulus* (Labill.) Warbug	net, swordgrass	I	H	S
	Oplidmrnud vompodiyud (L.) Beauvois		Ir	H	R
	Panicum maximum Jacquin	guinea grass	N	H	S
	Paspalum orbiculare Frost. fil.	ricegrass	I?	H	S
	Pennisetum purpureum Schumacher	napier or elephant grass	N	H	SL
	Pennisetum setosum (Swartz) Richard		?	H	S
	Phragmites karka (Retz.) Trin. ex Steud	karisso, giant cane	I	H	A
	Setaria sp.	foxtail grass	?	H	S
	Setaria pallide-fusca (Schumacher) Stapf & Hubbard	foxtail	I	H	L
	Sporobolus virginicus (L.) Kunth.	beach dropseed, saltgrass	I	H	T
	Thuarea involuta (G. Forster) Brown	las-aga	I	H	T
Zingiberaceae					
	Cucurma domestica Valeton	mango halumtano, tumeric	?	H	R
Taccaceae					
	Tacca leontopetaloides (l.) Kuntz	gabgab, arrowroot	I	H	T
Orchidaceae					
	Calanthe furcata Batem. ex Lindl.		Ir	H	R
	Phreatia samoensis (Kranzlin) Schlechter		Ie	H	L

Spathoglottis plicata	rain orchid	I?	H S

Appendix C. R-MAP/CR-MAP Profile 10/7/93 (for only non-0 entries)

GEOGRAPHICAL COMPONENTS		
1	Total Acres	1,961
2	Miles of Boundary	
3	Number of 7.5' USGS Quadrangles	3
4	Elevation Range	0-1042'
5	Miles from Pk Hqt to Center of Park	2
6	Primary Access to the Park	land
VISITATION, over previous 3 years		
7	Park Visitation	180,561
ROADS, TRAILS AND DISTRUBED AREAS		
11	Total Road Network	10
12	Miles of Abandoned Road	2
13	Number of Trailheads	2
14	Miles of Trails in Backcountry	5
	Acres for Rehab	143
TERRESTRIAL		
18	Forest Acres	800
19	Scrubland Acres	0
	Grassland Acres	150
WETLANDS AND DEEPWATER HABITATS		
22	Estuarine acres	?
23	Deep Marine Acres	1002
24	Shallow Marine Acres	500
25	Intertidal Unconsolidated Acres	?
26	Intertidal Other Acres	
27	Surface Riverine Miles	2
37	Palustrine Acres	1
SHORELINE PROCESSES		
43	Miles of Ocean Shoreline	4.5
GEOPHYSICAL PROCESSES		
53	# Rockslides/Landslides	
NATIVE SPECIES -- GENERAL		
55	Native Terrestrial Vascular Plant Species	<100
56	Native Aquatic Plant Species	>51
57	Native Resident Terrestrial Vertebrates	<10
58	Native Aquatic Animal Species	>178
ALIEN SPECIES		
59	Number of exotic Plants	<150
60	Area Impacted	1961
61	Area to Treat	0
62	Number of Exotic Animals	7

63	Area Impacted by Exotic Animals	1961
64	Extic Animals to Control	7

THREATENED AND ENDANGERED SPECIES

72	Candidate Category Animal Species	
	Animals Threatened	1
	Animals E/PE	2
	Animals C2	1

AIR QUALITY

89	Park Air Classification	
	Air Quality Condition	1

FISHING, HUNTING AND TRAPPING

117	Aquatic Species Harvested	20
118	Angeler Use Days	?

SUBSISTENCE AND AGRICULTURAL USE

121	Subsistence/Cultural Plant Species Used	0
122	Number of Users of Such Plants	0
123	Subsistence/Cultural Animal Species Used	30
124	Number of Users of Such Animals	50
125	Agricultural Uses Acres	0

CONTIGUOUS OR OVERLAPPING AUTHORITIES

127	Overlap State (Territory)	1
128	Overlap County (Islands)	0
129	Overlap Cities (Villages)	5

PLANS COMPLETED OR IDENTIFIED IN THE RMP AS NEEDED

130	Full Resource Management Plan	Y
133	Land Protection Plan	Y
139	Water R Mgt Plan	Y
141	Fire Mgt Plan	Y

COMPLIANCE DOCUMENTS IN PREVIOUS 5 YRS

162	Rights of Way or Easements	0
	Acreage of easements	0
	Total research	

CULTURAL COMPONENT

1. Archeology Inventory, Research and Management		
301	Acres susrveyed, complete (acres)	860
302	Dense vegetation (acres)	800
304	Caves not inventoried (#)	42
2. Cultural Landscape Inventory, Research, and Treatment		
308	Cultural Landscapes Survey (acres)	1961
3. Historic Structure Inventory, Research, and Treatment		
321	Historic Structure Treat/Stab/Pres	100
4. Ethnographic Resources and Research		
330	Traditionally Assoc Groups in Consultation	1

331	Critical Issues Included in Consultations (#)	3
340	Subsistence Use (acres)	1000
341	Resources Used for Subsistence (#)	10
342	Resources Identified in 341 that are Mobile (#)	10
347	Amer. Indian, Hawaiian, Alaskan Groups Affiliated w/pk	1
5. Museum Collection Documentation, Preservation and Use		
348	Archeology Collection Size (# of items)	200
350	Archeology Collection Documentation Activity	90
354	History Collection Size (# of items)	1831
356	History Collection Documentation Activity (acquired)(#)	1160
361	In-park Research Requests (#)	5
362	Outside Research Requests (#)	5
364	Moderate Transactions %	100
366	Collection Storage at the Park (square feet)	200
367	Exhibits with Collection Materials at the Park (sq ft)	160
6. Cultural Resource Library		
370	Items Awaiting Cataloging (Backlog) (#)	400
371	Cultural Resources Library Cataloged Items (#)	100
7. Cultural Studies and Reports		
380	Listed Reports Reviewed Within the Last 5 years (#)	6
8. Historic Preservation Compliance		
381	Programmatic Exclusions & No Effect last 5 yr (#)	2
382	No Historic Property Findings Within Last 5 yr (#)	2
383	No Adverse Effect Findings Last 5 yr (3)	1
384	Adverse Effect Findings Last 5 yr (#)	1
9. Special Monitoring and Conservation Needs		
392	Threatened Historic Buildings (#)	10

Appendix C. Resource Inventory Atlas

The following materials digitized on the park's GIS include the following:

- WAPAASP1 Asan Point w/ contours, spot elev and major roads
- ASANFLOD.DRG Flood prone areas at Asan Point
- Land Status Maps

184-82002/474-80038	Asan Beach Unit
184-82003/474-80049	Asan Inland Area
184-82004/474-80038	Piti Guns Unit
184-82005/474-80038	Tenjo & Chachao Units
184-83006/474-80038	Northern Agat Unit
184-82007/474-80049	Southern Agat & Alifan Units

- WAPA003.DWG Spruance Drive Topography
- WAPAMANT.DRG Maintenance Area

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