
MANAGEMENT PLAN

FOR THE

MAÑAGAHA MARINE CONSERVATION AREA

APRIL 28, 2005

DEPARTMENT OF LANDS AND NATURAL RESOURCES

DIVISION OF FISH AND WILDLIFE
COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS
PO Box 10007, Lower Base
Saipan, MP 96950



PREPARED BY:

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Photograph courtesy of Parke Gregg
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Commonwealth of the Northern Mariana Islands

Division of Fish & Wildlife

Department of Lands and Natural Resources

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The Division of Fish and Wildlife of the CNMI Department of Lands and Natural Resources is pleased to present this Management Plan for the Mañagaha Marine Conservation Area. The Twelfth Legislature of the Commonwealth of the Northern Mariana Islands established a unique conservation area for Mañagaha Island and its surrounding waters through Public Law 12-12 in August 2000. The purpose of this important law is to ensure that Mañagaha Island and its surrounding waters continue to exist as protected recreational and educational areas, and provide safe habitats for fish and other marine life to exist and propagate for the continued use and enjoyment for the people of the Commonwealth and its visitors.

This Management Plan is an essential first step in managing for the wide variety of uses that occur at Mañagaha. The plan designates which uses are compatible with the mandates of Public Law 12-12, which uses may be conducted only within certain management zones, which uses will require permits, and which uses will not be allowed. The next crucial step will be to promulgate regulations following the guidelines outlined in this plan. Also provided herein are management goals, objectives and strategies, and recommendations for implementation.

We wish to thank Greg Schroer of Resources Northwest for researching the background, compiling data, consulting with staff, and writing this management plan under contract. We also wish to acknowledge the efforts of the many professionals on the staff of the Division of Fish and Wildlife and at the Attorney General's Office, both past and present, who have provided valuable insight and experience in the development of this document.

RICHARD SEMAN, Secretary
CNMI Department of Lands and Natural Resources

04/22/05

Date

PAUL HAMILTON, Director
Division of Fish and Wildlife

4/21/05

Date

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ACRONYMS AND ABBREVIATIONS

Agencies and Organizations

CNMI	= Commonwealth of the Northern Mariana Islands
CRMO	= CNMI Coastal Resources Management Office
DEQ	= CNMI Department of Environmental Quality
DFW	= CNMI Division of Fish and Wildlife
DLNR	= CNMI Department of Lands and Natural Resources
DPW	= CNMI Department of Public Works
EPA	= U.S. Environmental Protection Agency
HPO	= CNMI Historic Preservation Office
MPLA	= Marianas Public Land Authority
MVA	= Marianas Visitors Authority

Other

ac	= acre
C	= Celsius
cm	= centimeters
dbh	= tree diameter at breast height (4.5 ft. above ground)
ESA	= Endangered Species Act
F	= Fahrenheit
ft	= feet
ha	= hectare
in	= inch
km	= kilometer
m	= meter
mi	= mile
PL	= public law
spp	= species

1.0 INTRODUCTION

1.1 NEED

Mañagaha Island is a small (4 ha) reef-island located 2.5 kilometers (1.6 miles) off the west coast of Saipan in the Commonwealth of the Northern Mariana Islands (CNMI) (Figure 1). The island lies within a high quality coastal lagoon marine ecosystem that contains a rich diversity of coral and fish species. Mañagaha Island and its surrounding waters are an important part of the CNMI natural history, cultural history, and beauty. The area also is an ideal recreation destination that generates significant direct and indirect revenue for the CNMI.

Over the past decades Mañagaha Island and its surrounding waters have gained increasing popularity as a visitor destination. For example, since the 1980's the island has had an average of 500 to 800 visitors on most days of every year. Without proper management and protection, this intensive use and other impacts, such as water quality degradation and fishing, will lead to significant adverse impacts to the island's natural, cultural, and historic resources. Therefore, in 2000, the CNMI Legislature made a finding that "Mañagaha Island and its surrounding waters contain historical, cultural, and natural resources that must be protected." (Section 2 of Public Law (PL)12-12).

1.2 PURPOSE

As a result of the above stated need, the Mañagaha Marine Conservation Area was created (PL 12-12). The legislative purpose of this conservation area is "to protect and preserve, by strict regulatory enforcement, the land and water resources, flora, fauna, and marine life that are found in the conservation area for the enjoyment of future generations of Commonwealth residents and visitors" (Section 4(b) of PL 12-12).

To accomplish the legislative purpose of the Mañagaha Marine Conservation Act, the CNMI Department of Lands and Natural Resources (DLNR) was delegated the exclusive authority to manage the Mañagaha Marine Conservation Area, as well as other marine conservation areas in the CNMI (Section 6 of PL 12-12). The Secretary of the DLNR was also mandated to promulgate rules and regulations necessary to carry out the intent of the Mañagaha Marine Conservation Act (Section 10 of PL 12-12). It is under this legal mandate that the DLNR's Division of Fish and Wildlife (DFW) developed this management plan.





2.0 EXISTING CONDITIONS

2.1 MARINE RESOURCES

Mañagaha Marine Conservation Area encompasses 500 ha (1,235 ac) within the Tanapag Lagoon and the adjacent reef slope (Figure 2). The Tanapag Lagoon is the northern portion of the Saipan Lagoon that covers 3,500 ha (8,645 ac) along Saipan's western coastline. The conservation area encompasses approximately 12% of the Saipan Lagoon.

The conservation area is primarily within a coastal lagoon ecosystem consisting of relatively shallow water (generally 1-6 m deep) with reef flats, reef patches, sand flats, and rubble zones that are protected by an outer barrier reef. A small portion of the conservation area encompasses reef slope habitat along the outer barrier reef (outside of the lagoon). All of these habitats provide an excellent environment for coral reefs and their associated flora and fauna.

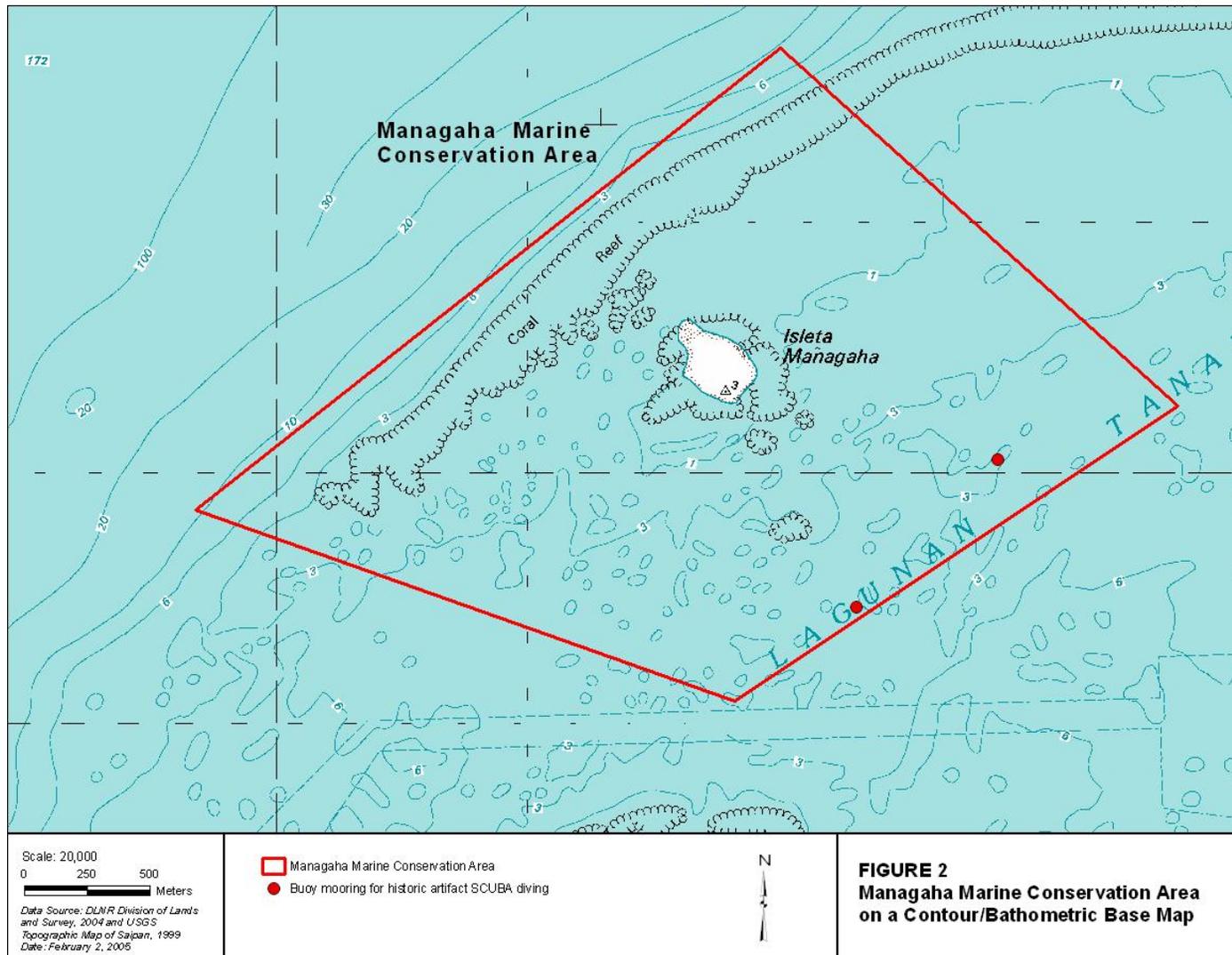


Coral Reefs: Coral reefs in the Northern Mariana Islands belong to the highly diverse Indo-West Pacific fauna (USFWS 1996). These coastal waters have an international reputation for their clarity and complex reef systems, including at least 240 species of hard corals and 31 species of soft corals and sea fans (USFWS 1996). Many of those species are found within the outer barrier reef and the reef patches of the Mañagaha Marine Conservation Area. Appendix A lists species found within coral reef patches near Mañagaha Island.

Fish: Approximately 900 species of reef fishes are believed to be present in the waters of the Northern Mariana Islands, and at least seven are considered endemic (Myers 1991). Additional endemic species will most likely be identified with future survey efforts. The Mañagaha Marine Conservation Area contains a high diversity of fish species that represents some of the greatest diversity found within the entire Saipan Lagoon. More than 100 fish species use the conservation area, including squirrelfish, trumpetfish, coronetfish, pipefish, cardinalfish, groupers, snappers, morey eels, lizardfish, emperors, brems, goatfish, hawkfish, butterflyfish, angelfish, damselfish, wrasses, parrotfish, surgeonfish, moorish idols, rabbitfish, blennies, gobies, triggerfish, filefish, a species of shark, and puffers. Appendix A contains a partial list of fish species known to use the conservation area.

Since 1999, the DFW has conducted annual surveys of fish populations in the area that is now designated at the Mañagaha Marine Conservation Area (Trianni 2003). Initial findings indicate that there are more fish in the conservation area now as compared to the earliest years of its establishment. This increased number of fish is most likely partially due to the enforcement of the Mañagaha Marine Conservation Area law (PL 12-12) which prohibits fishing in the conservation area (Trianni 2004).

Sea Turtles: Green sea turtles (*Chelonia mydas*) inhabit coastal waters throughout the Northern Mariana Islands, and are periodically observed in the waters of the conservation area, particularly near the outer barrier reef. Hawksbill sea turtles (*Eretmochelys imbricata*) also were historically present in Saipan's coastal waters, but are now considered rare in the waters surrounding Mañagaha Island.



Water Quality: The Division of Environmental Quality (DEQ) monitors marine water quality at Mañagaha Island beaches, as well as the quality of the fresh water used on Mañagaha Island for domestic consumption and food preparation. Between 1983 and the end of 2004, the DEQ issued 35 red flag warnings for excessive concentrations of fecal indicator bacteria along Managaha Island beaches that exceeded the CNMI Marine Water Quality Standards. Twenty-four of these violations were recorded after May, 2002, when a sudden increase in violations occurred. DEQ changed to a new violation criteria in October 2003 (using geometric mean over a five-week period instead of single-sample violations), which has resulted in fewer “red flag” violations since that time, although individual samples continue to show elevated bacteria counts similar to that recorded in 2002 and 2003.

Currently, all waste-water produced on Managaha Island is treated in a small treatment system and discharged into an underground leach field that lies either in, or immediately above, the shallow water table, and is approximately 100 feet from the shoreline. In response to the sudden increase in violations recorded during early 2002, the DEQ inspected the treatment system and found that it had fallen into disrepair and was no longer being operated in accordance with permit requirements. The DEQ initiated an enforcement action against the private operator of the Managaha commercial facilities for various violations of the treatment system permit and wastewater regulations.

During at least the past 10 years there also has been a growing concern among government agencies, and the Attorney General’s Office, regarding the significant degradation of water quality in the greater Tanapag Lagoon area due to pollution discharges from the Sadog Tasi Waste Water Treatment Plant. This and other sources of pollution east of the conservation area have significant long-term adverse affects on public health and safety, as well as degrading the water clarity, marine life, and visitor experiences in the Mañagaha Marine Conservation Area. The primary known or potential sources of pollution in Tanapag Lagoon are listed in Table 1, and their general locations are shown on Figure 1. Appendix D contains some existing and proposed approaches for assessing and addressing these issues.

Table 1. Known or potential sources of pollution in the Tanapag Lagoon.

Known or Potential Sources of Pollution	General Description of Known or Potential Pollutants
Sadog Tasi Waste Water Treatment Plant	Consistent discharge of raw sewage or improperly treated sewage from the Sadog Tasi Sewage Treatment Plant and its associated sewage trunk lines.
Non-point pollution from surface water run-off	Suspended sediments and a variety of other pollutants that are carried into the Tanapag Lagoon, particularly during and after major rain storms
Former Puerto Rico Solid Waste landfill	Leachate pollution emanating from the former Puerto Rico solid waste landfill
Saipan’s Industrial Sea-port	Pollution discharges from ships, boats, or barges that travel by or anchor near the conservation area and vessels that dock at the sea-port. Vessel activity also causes temporary suspension of fine sediments in the inner harbor area.
Smiling Cove Marina and Outer Cove Marina	Pollution discharges from ships, boats, or barges that travel close to the conservation area and that dock at the marinas.

2.2 TERRESTRIAL RESOURCES

Flora

The native plant communities of Managaha Island have been substantially altered as a result of past impacts from World War II military battles and a variety of other activities. Currently, more than half of Managaha Island's plant species are either introduced/naturalized species or exotic species. For example, Raulerson and Rinehart (1992) identified a total of 93 plant species on Mañagaha Island. Of that total, 40 are indigenous species, 44 are introduced/naturalized species, and 9 are introduced/exotic species (Appendix B). Twenty-eight of those species are considered medicinal plants and 13 are considered food plants (Appendix B). Thirty species also were recommended for use in landscape restoration (Appendix B).



Mañagaha Island is dominated by beach-strand plant communities (Raulerson and Rinehart 1992). The strand community generally consists of herbaceous plants, such as the beach morning glory (*Ipomoea pes-caprae*), and spider lily (*Hymenocallis littoralis*); shrubs such as *Pemphis acidula*, and *Scaevola sericea*; and trees such as ironwood (*Casurina equisetifolia*), coconut (*Cocos nucifera*); and tangan-tangan (*Leucaena leucocephala*) (PBEC 1985a; Raulerson and Rinehart 1992). Other tree species, such as banyan (*Ficus prolixa*), seedless breadfruit (*Artocarpus altilis*), soursop (*Annona muricata*), and *Thespesia populnea* are located further inland.

Some introduced plant species present a serious threat to the long-term sustainability of native communities due to their ability to compete for resources. For example, the climbing vine *Cuscuta campestris* was reported on the island in 1985 (PBEC 1985). That parasitic vine covers other plants and subsequently inhibits their growth and survival. Raulerson and Rinehart (1992) recommended invasive, exotic plant species be removed from the island, including: *Cenchrus brownii*; *Cenchrus echinatus*; *Achyranthes aspera*; *Thevetia peruviana*; *Bidens alba*; *Chromolaena odorata*; and *Mikania scandens*.

Fauna

Bird species known to inhabit Mañagaha Island are the wedgetail shearwater (*Puffinus pacificus*); white fairy tern (*Gygis alba*); cardinal honeyeater (*Myzomela cardinalis*); collared kingfisher (*Halcyon chloris*); and Eurasian tree sparrow (*Passer montanus*). The golden plover (*Pluvialis dominica*) also was reported in 1985 (PBEC 1985a). Other species may periodically use the island, such as the Mongolian dotterel (*Charadrius mongolus*); reef egret (*Egretta sacra*); golden honeyeater (*Cleptornis marchei*); common sandpiper (*Actitis hypoleucos*); sharp-tailed sandpiper (*Calidris acuminata*); wandering tattler (*Heteroscelus incanus*); brown noddy (*Anous stolidus*); ruddy turnstone (*Arenaria interpres*); and the white-throated ground dove (*Gallicolumba xanthonura*) (PBEC 1985a).

During 2001, wedge-tail shearwaters were confirmed nesting on the northern portion of Mañagaha Island, and this is the only known wedge-tail nesting site in the Northern Mariana Islands. These large seabirds (adults are 40-46 cm (16-18 in) long) with a one meter (3 ft) wing span) spend a majority of their life over the ocean but return to land for breeding and nesting. Wedge-tails dig nest burrows in sandy soils where they incubate one egg for approximately 60 days and raise their fledglings for 3 to 4 months. Their nest burrows are vulnerable to impacts from visitor activities, as well as from cat and rat predation. During 2003 and 2004, portions of

the northern part of Mañagaha Island were posted off-limits to visitors, and a trail was rerouted away from their core nesting area.

Green sea turtles and hawksbill sea turtles historically have nested on beaches of the Mariana Islands (Pritchard 1982). A green sea turtle was observed nesting on Mañagaha Island during the late 1990's, although eggs were poached from that nest (Trianni 2004, pers. comm.). Other than that sighting, no other recent sea turtle nesting has been documented for Mañagaha Island. Other reptiles on Mañagaha Island include the anole (*Anolis carolinensis*); blue-tailed skink (*Emoia cyanura*); and brown skink (*Emoia* sp.) (PBEC 1985a).

The musk shrew (*Suncus murinus*) is the only native small mammal reported on the island (PBEC 1985a). Cats (*Felis catus*) and rats (*Rattus* spp.) previously were common on Mañagaha Island, and both species adversely impact native bird species. Cats were removed from the island during 2003 with the help of the Pet Assistance and Welfare Services (PAWS), and the DFW has trapped and baited rats during 2003 and 2004. This work appears to have eliminated all cats and most rats from the island, although the DFW continues to monitor and eliminate rats as needed, and as funding allows. The ultimate goal is to keep rats and cats from reestablishing populations on the island.

Permits issued by the Marianas Public Lands Authority (MPLA) and the Office of Coastal Resources Management Office (CRMO) require the recreation concession permit holder for Mañagaha Island to remove all trash from the island daily. However, DFW staff has seen trash left in garbage cans and on the ground in and near the public pavilions after the last concessionaire boats have left the island for the day. This trash often is a food source for rats, and thus tends to defeat efforts to control and eliminate that pest from the island. The DFW has attempted to convince the MPLA and the Concessionaire operator of the importance of keeping trash picked up and stored in animal-proof containers. Further actions will be needed in the future to meet the mandates of Public Law 12-12.

2.3 CULTURAL AND HISTORIC RESOURCES

Carolinian Culture

Carolinian immigrants settled on Mañagaha Island in 1815, and their leader, Chief Aghurubw, was buried there in 1819. To this day, Mañagaha Island is sacred to the Carolinian community because of the burial site and the island's historic importance to their culture. The Carolinian community performs the sacred *Firowrowa* ceremonies on and near the island, which is the traditional practice of burning personal possessions of the deceased. Today, a monument commemorating Chief Aghurubw's life, and the Carolinian canoe journey to the Northern Mariana Islands, is located on the southern part of Mañagaha Island (Figure 3). Additionally, at least 28 species of medicinal plants exist on Mañagaha Island, many of which are believed to have been originally established and cultivated by the Carolinian inhabitants (Appendix B).

Historic Sites

Historic resources on Mañagaha Island and its beaches, include World War II era relics such as the remnants of bunkers, gun placements, a barge, and landing craft. Currently, most of the relics are rusted and in poor condition.

At least 18 underwater historic properties exist in Tanapag Lagoon, and nearly all of them are relics from World War II (WWII) (PBEC 1985b). Eight of the historic properties are within the boundaries of the Mañagaha Marine Conservation Area, including a few WWII airplanes, or parts of airplanes, a barge, and a boat. The DFW is considering providing buoys for boat moorage

above the two most popular historic artifact dive sites (the “Chinsen” boat wreckage and at the “Zero” airplane wreckage) (Figure 2). Boats moored to these buoys reduce the need for anchoring, which can cumulatively destroy coral reefs in that area. Additional details of those two historical wrecks, as well as others in or near the conservation area, can be found in the 1985 Mañagaha Island Marine Park Management Plan (PBEC 1985).

2.4 FACILITIES

The visitor service facilities on Mañagaha Island primarily consist of a pier, six public shelters, a trail, and commercial buildings with a courtyard that include food service areas, restrooms, showers, and areas for visitor information, vendor sales, equipment rentals, offices, and storage (Figure 3). Temporary recreational structures in or adjacent to the commercial facilities area consist of a beach volleyball court, a swimming area marked with buoys, a trampoline, and portable rock climbing wall. The only major structure on the island that is not associated with visitor services is a U.S. Coast Guard solar-powered light used as a marine navigational aid.

The trail that extends along the island perimeter is approximately 0.6 k (0.4 mi) in length (Figure 3). Six public shelters are located along this trail (two within the Exclusive Concession Area), five shelters have picnic tables and four shelters have barbeque pits. During the late 1980’s, eight concrete/fiberglass interpretive signs were installed along the trail that addressed a variety of subjects, including: Japanese fortifications; coral reefs; seabirds and wildlife; plants; WW II battles; and Carolinian culture. The signs are either no longer present, in disrepair, or are illegible. Funding is available through the Coral Reef Initiative (CRI), and other sources, to replace those signs and/or create new signs along the trail. Current plans indicate those signs will be installed by late 2005 or early 2006.

During 1992, a cross-island nature trail was proposed as part of the Mañagaha Island Landscape Improvement Plan (MPLA 1992), however, that trail was never developed. Current proposals call for installing nature trail signs along the existing island perimeter trail (Figure 3), rather than constructing and maintaining a new trail that bisects the vulnerable plant communities on such a small island.

During 2000, beach erosion destroyed a public shelter on the southeastern shoreline (refer to Figure 3 for the current and past shorelines). This erosion was primarily the result of the removal of two partially submerged World War II vintage structures referred to as the “Samsung Wreck” during 1995 (USACE 2001). Those vintage structures served as hard points along the beach, creating well-defined beach cells that allowed sand to accrete along the shoreline and prevent erosion (USACE 2001). The U.S. Army Corps of Engineers completed an erosion study of that situation, including using multi-year aerial photography that showed more than 100 feet of shoreline was lost between approximately 1995 and 2001. The Corps provided options for the CNMI to control that erosion (USACE 2001), although no control actions are planned at this time.

Since 2002, the CNMI-Coastal Resources Management Office (CRMO) has been monitoring beach erosion at nine beach-profiles on Mañagaha Island. Currently, that monitoring is conducted monthly, with additional surveys conducted after major storm events. Preliminary data analysis indicates beach erosion rates have declined since the 1995-2001 period, and that the shoreline may be stabilizing within a dynamic equalization process of sand movement (Yuknavage 2004, pers comm.).

2.5 CONCESSION OPERATIONS

Every five years the MPLA opens competitive bidding for the exclusive right to operate the recreational concession on Mañagaha Island. The “Agreement for Special Recreational Concession - Mañagaha Island” includes “...the right to prepare, deliver, sell, and provide food or beverages on the Island...; the rental or sale of water sports equipment, recreational equipment, or beach equipment and related supplies; the conduct of tours on the Island and from the Island; the sale of goods on the Island; and the provision of entertainment for profit on the Island.” (Agreement for Special Recreational Concession - Mañagaha Island, August, 2001). Additionally, “The sale of food or beverages, the renting or sale of equipment and supplies, the sale of tours, and the sale of goods shall take place in the Exclusive Concession Area.” (shown in Figure 3). However, the Board of Public Lands may grant exceptions to that condition.

In the past, visitor services have included boat transportation to and from the island, SCUBA and SNUBA diving, tours, and surface water activities such as, parasailing, banana boat rides, power boat lagoon cruises, windsurfing, canoe rentals and tours, and kayak rentals and tours. The Concessionaire does not have exclusive rights to provide transportation to and from the island, although the MPLA permits them to carry the maximum number of visitors allowed on Mañagaha Island, as may be defined by any CNMI government agency.

Conditions of the 2001 Agreement require the Concessionaire, at its own expense, to perform the following services for the public’s benefit.

- Operate its concessions between 7:00 AM and 6:00 PM daily. The Board of Public Lands may approve night-time operations if the Concessionaire provides a written request at least 15 days in advance of that operation
- Clean up of trash on the entire island and dispose of it on a daily basis
- Maintain the toilet and shower facilities located within the Exclusive Concession Area by providing cleaning, upkeep and repair services on a regularly-scheduled basis
- Maintain the pavilion, generators, reverse osmosis plant; sewage plant and other improvements and equipment as listed in Exhibit No. 2 within the Exclusive Concession Area in good working order, reasonable wear and tear excluded
- Maintain the other improvements on the island (i.e., the visitor pala palas, picnic tables, and dock);
- Provide nighttime security services on the island
- Provide a trained lifeguard to monitor and supervise activities in the designated swimming area
- Cut and trim vegetation, preserve native vegetation and maintain nature trails
- Concessionaire shall not introduce new vegetation to the Island without written approval of the Board, except for coconut and ironwood trees

As part of the Agreement, the Board of Public Lands employs enough personnel to provide two “rangers” on the island seven days a week. Their salaries and benefits are paid by the Board. The responsibilities of those rangers include:

- Recording the number of passengers landing on Managaha Island;
- Collecting the Landing and User Fee, as provided by law;
- Enforcing the Rules and Regulations Regarding the Commercial Use of Managaha Island (Commonwealth Register Vol. 15, No. 9, pp. 10876-10891, September 15, 1993), and maintain public security; and
- Ensuring compliance with the terms of the Agreement.

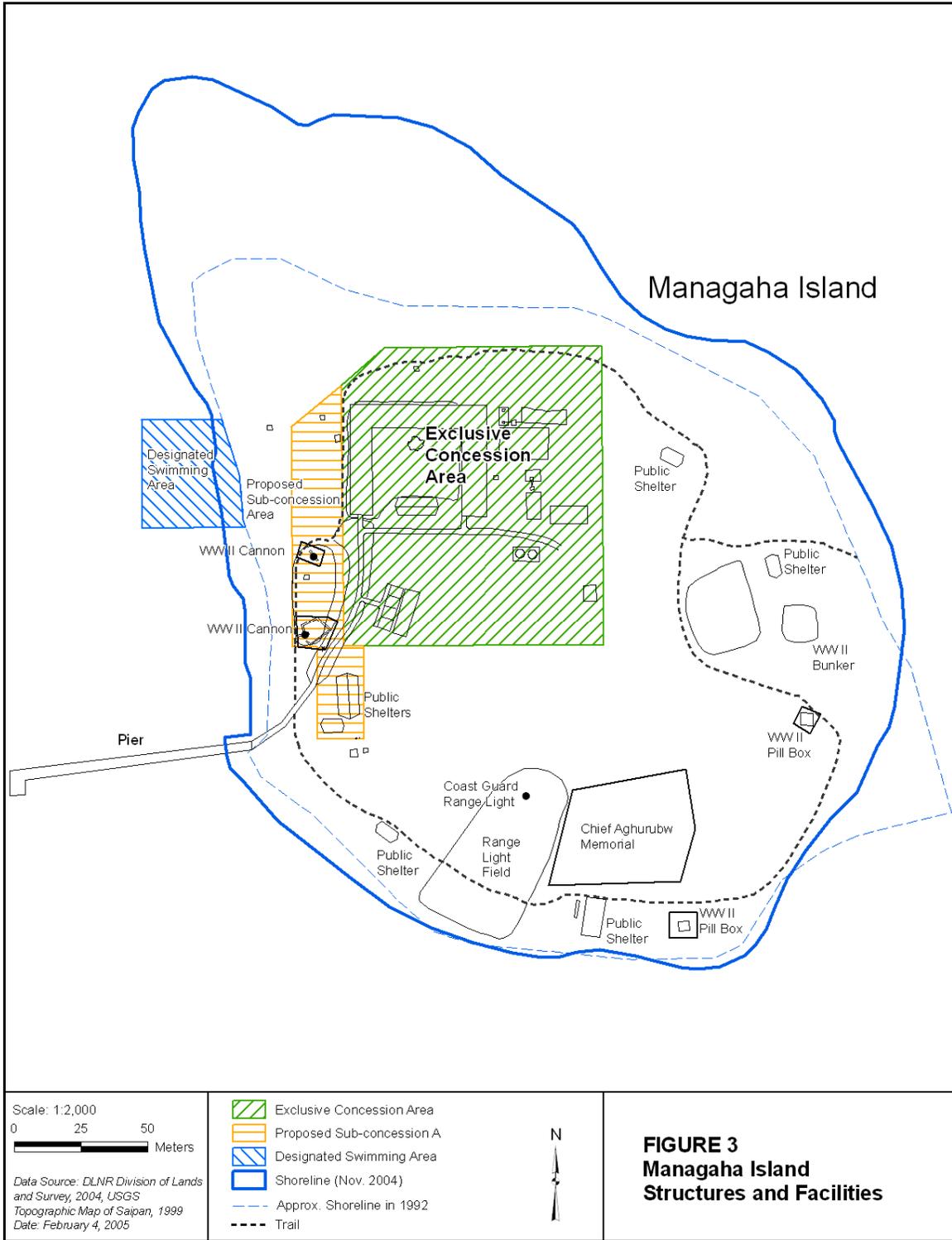
During 1993, the MPLA promulgated rules and regulations regarding the commercial use of Managaha Island (Commonwealth Register Vol. 15, No. 9, pp. 1087-10891, September 15, 1993). Those rules and regulations address the conditions stated in the Agreement, including defining regulations for the commercial use, management, and maintenance of the island, the use of the pier, collection of Landing and User Fees, cultural events, commercial photography, and collection of medicinal plants. These rules and regulations specifically state that “All vessels licensed to carry passengers shall land at the pier. No licensed vessel may land on any part of the beach without prior written permission of the MPLC [now the MPLA].”

The MPLA collects a “Landing and User Fee” from all boat and tour operators who bring tourists (non-CNMI residents) to the island for a fee or other compensation. Currently that fee is \$5 per tourist, and those funds are deposited into the “Managaha Island Landing and User Fee Trust Account.” The Concessionaire is allowed to use those funds to provide: “...free public services, protect public safety, pay for insurance, maintain the cleanliness and appearance of Mañagaha Island, and to construct, maintain, and repair public facilities, improvements, equipment, and infrastructure...” on Mañagaha Island (First Amendment to Agreement for Special Recreational Concession - Managaha Island, 27th September 2002). Funds that remain in the account at the end of each fiscal year are subject to legislative appropriation for other projects outside of the Mañagaha Marine Conservation Area, pursuant to Public Law 13-16 and Public Law 11-64.

To date, none of the MPLA’s Landing and User Fees have been allocated to the DLNR/DFW for their management of the Mañagaha Marine Conservation Area, even though the DLNR/DFW has the responsibility for managing the visitor uses and resources of that conservation area.

2.6 PUBLIC ACCESS

A majority of the visitors to Mañagaha use charter boats operated by the Mañagaha Island concession permit holder, as well as numerous other entities, such as hotels and tour operators. The capacity of these boats ranges from a few individuals to approximately 75 passengers per trip. These boats depart from the Smiling Cove Marina, Outer Cove Marina, and Charlie Dock, as well as from hotels and other locations along Saipan’s western coastline. As a condition of the Agreement with the MPLA, the Concessionaire must provide up to 20% of their boat’s capacity as free transportation to CNMI residents, if those reservations are made at least 24 hours in advance. Otherwise, free transportation is provided only on a space available basis. Some local residents and CNMI visitors also access the island by private boats, typically by small boats that are less than 7 meters in length.



3.0 MANDATES AND RESPONSIBILITIES

3.1 LEGISLATIVE MANDATES

Article XIV of the CNMI Constitution mandates that the CNMI marine resources be managed, controlled, protected, and preserved by the Legislature for the benefit of the people (Section 1, Article XIV of the CNMI Constitution). That Article also mandates that Mañagaha Island be used for cultural and recreational purposes (Section 2, Article XIV of the CNMI Constitution). As a result, the Legislature established the Mañagaha Marine Conservation Area (PL 12-12) to protect the terrestrial and marine natural resources, while also providing for cultural and recreational uses. The following are key provisions of Public Law 12-12:

- No harvesting or catching of fish or other marine life or natural resources within the designated boundaries of the conservation area shall be permitted, except as approved by regulation for scientific research, cultural and traditional practices, or educational studies.
- No motorized or non-motorized watercraft, floating or submersible, or other means of aquatic transport shall be permitted within the conservation area, except as allowed by regulation for enforcement, scientific, recreational and educational purposes, or the transport of persons to and from the isle of Mañagaha, and for any other purpose deemed necessary by the Division [of Fish and Wildlife] to advance the policies set forth by this act and regulations.
- No person may engage in any exempt activity [of the above stated provisions] ... unless a permit has been issued by the Division [of Fish and Wildlife] for such purpose pursuant to regulations.
- No swimming, diving, snorkeling or other human activity shall be permitted within the conservation area, except as provided by regulation.
- The Division [of Fish and Wildlife] may further prohibit by citation, order, rule or regulation any activity which in any way would make a significantly negative or long-lasting impact on the conservation area.
- The Division shall provide to the Board of Education and other non-public educational institutions the necessary assistance for the implementation of any curriculum or course of instruction that actually takes place within a conservation area that the Board or a non-public educational institution may establish for its students; provided that such curriculum or course of instruction is consistent with the intent of this act [PL 12-12] and has a negligible impact on the conservation area.
- Any person who knowingly violates any provision of this act [PL 12-12] or regulations hereunder shall be fined not less than \$500.00 but not more than \$10,000.00. Each day that a violation occurs shall constitute a separate violation.

3.2 DLNR RESPONSIBILITIES

Department of Lands and Natural Resources

Public Law 12-12 gives the Department of Lands and Natural Resources the exclusive authority to manage marine conservation areas. The DLNR's responsibility and authority for that management also is defined by Public Law 10-57 (codified at 1 CMC Section 2653) as:

§ 2653. Department of Lands and Natural Resources: Duties.

The Department of Lands and Natural Resources shall have the following powers and duties:

- (a) To be responsible for the protection and enhancement of the natural resources of the islands, including the marine environment;
- (b) To protect wildlife resources including fish, game, and endangered species;
- (c) To be responsible for the management and disposition of public lands subject to the supervision of the Board of Public Lands as provided by this Chapter;
- (d) To conduct surveys of public lands;
- (e) To maintain and provide for the conservation of agricultural and aquatic resources;
- (f) To issue permits for fish weirs;
- (g) To perform the duties, functions, and responsibilities previously vested in the Marianas Fishing Authority;
- (h) To maintain and provide for the conservation of forests;
- (i) To establish landscaping and beautification projects;
- (j) To promote, develop, and administer agricultural programs, including but not limited to, plant industry, agricultural extension services, and animal industry and health;
- (k) To be responsible for the management, use and disposition of submerged lands off the coast of the Commonwealth, pursuant to the Submerged Lands Act, as amended;
- (l) To simplify, coordinate, and to the extent practicable, integrate the development permitting process and public land leasing process within the Department;
- (m) To perform, under the guidance of the Special Assistant for Planning and subject to the approval of the Board of Public Lands established by this Chapter, the land use planning functions previously performed by the Special Assistant for Planning and Budgeting.”
- (n) To manage and operate the Commonwealth Mitigation Bank, as provided by law;
- (o) To construct, maintain, and repair recreational facilities as defined in 1 CMC § 2674(g);
- (p) To conduct administrative adjudication for the Department and its subdivisions as required by law.

Division of Fish and Wildlife

The Division of Fish and Wildlife, within the Department of Natural Resources, has specific responsibilities for managing fish and wildlife species and their habitats. Those responsibilities and authority are defined by PL 2-51 (Codified at 2 CMC), including Sections 5104 and 5107.

§ 5104. Director of Fish and Wildlife: Powers and Duties.

- (a) The protection of fish, game, and endangered and threatened species is vested exclusively in the department.
- (b) In addition to any other power or duty provided in this chapter or otherwise provided by law, the director may:
 - 1) Determine the status of, and any requirement for the survival of, resident species of fish, wildlife, or plants;
 - 2) Conserve and ensure the survival of species of fish and game of significant value for sport, recreational, subsistence, or commercial purposes;
 - 3) Ensure the survival of endangered and threatened species pursuant to 2 CMC § 5108;
 - 4) Consider the needs of nongame fish and wildlife and of marine mammals;
 - 5) Acquire land or aquatic habitat, or easements thereon, as necessary to carry out the purposes of this chapter, subject to the receipt of any appropriate guarantee or assignment from the Marianas Public Lands Corporation [now defined as the Marianas Public Land Authority];
 - 6) Accumulate necessary data on fish, game, and endangered and threatened species...
 - 7) Issue in accordance with existing law, regulations necessary to carry out the purposes of this chapter, which may include regulations to:...
 - (E) Set any necessary geographical limits on fishing or hunting...
 - 8) Establish a system of rewards for persons, other than government employees in the course of their official duties, who furnish information which leads to a finding of civil violation or a conviction of a criminal violation...

§ 5107. Fish and Game Conservation Revolving Fund. (as amended by Public Law 13-8).

“There is established in the Commonwealth Treasury a ‘Fish and Game Conservation Revolving Fund’..., which shall be non-lapsing, separate and apart from the General Fund, and shall not be subject to a continuing resolution. All collections from the issuances of licenses and permits and from penalties or fines collected under this chapter shall be deposited into the fund. The Secretary of Finance shall administer the fund and shall expend moneys from the fund..., on the order of the Secretary of the Department of Lands and Natural Resources or his or her authorized designee only for the purpose of the administration or programs under the Division of Fish and Wildlife...”

3.3 INTERAGENCY RESPONSIBILITIES

Requirements to Consult with the DLNR

Public Law 2-51 (codified at 2 CMC Section 5105) states that “Any department, agency, public corporation, or other instrumentality of the Commonwealth which plans to conduct, permit, or license any activity involving commercial fishing or hunting, or which otherwise adversely affects any fish, game, or endangered or threatened species, regulated under this chapter, including destruction of any critical habitat, shall first consult with the director [Secretary of the Department of Lands and Natural Resources as defined by Executive Order 94-3, 1 CMC § 2001].

Requirements for Interagency Cooperation

Section 6 of Public Law 12-12 states that “...the Department [of Lands and Natural Resources] may coordinate and assist other Commonwealth or Federal agencies in performing their emergency or other agency functions within marine conservation areas, if the exercise of such functions is deemed prudent or necessary by the Department, or the performance of such functions is clearly permitted by law within marine conservation areas.”

The DLNR is mandated the exclusive authority to manage marine conservation areas, therefore it is imperative that other agencies operating or working in the conservation area consult with the DLNR prior to commencing work in the conservation area, so that the DLNR can assess whether a special use permit is needed.

Permitting: Special use permits will be required for agencies, or any other entities, that intend to use the conservation area in a manner that is not permitted by regulation. It is not the intent of the DLNR to unduly restrict other agency operations in the conservation area, rather the purpose of permitting is for the DLNR to ensure all actions in the conservation area are compatible with the regulations and management of that area. Agencies that require special use permits could be issued umbrella permit coverage on an annual or multi-year basis by the DLNR. Such permits could potentially be issued if the agency documents their planned actions in a manner that allows the DLNR to fully understand the details and ramifications of their actions, and that those conditions are defined within the permit.

During past years, other CNMI agencies have issued permits for activities conducted within the area that is now designated as the Mañagaha Marine Conservation Area. Specifically, Mañagaha Island is CNMI public land, and public land falls under the jurisdiction of the Marianas Public Land Authority (MPLA). Although MPLA is not mandated to manage natural resources in marine conservation areas, it does have jurisdictional authority for leasing public domain land for private uses. In the case of Mañagaha Island, the MPLA has issued permits in the past to private companies to provide visitor service concession businesses. These types of uses could continue under the provisions of Public Law 12-12, if those uses meet the requirements of Public Law 12-

12 and the associated regulations. This continued use will require the MPLA to consult with the DLNR prior to issuing new permits for activities in the conservation area in order for the DLNR to determine whether the proposed uses are compatible with Public Law 12-12, as well as the associated regulatory and management conditions established by the DLNR for that conservation area.

The MPLA, and any other entity, that constructs or renovates structures or facilities, or conducts earth moving activities on Mañagaha Island also may be required to obtain permits from the Division of Environmental Quality (DEQ) and Coastal Resources Management Office (CRMO). For example, during the early 1990's, the CRMO issued permits to the MPLA for the renovation of the pier (Permit SLR-92-X-03), and the construction and renovation of picnic pavilions (Permit SLR-90-X-137).

In conclusion, any activity that is permitted by another agency in the conservation area also may need a permit, from the DFW, or at least DFW's concurrence. These permitting requirements could be streamlined by the DFW by granting annual or multi-year permit coverage, as defined by an MOU, and as allowed by the conservation area regulations. The MOU and the permit would require the agency to consult with the DLNR in a manner that allows the DLNR to understand the details and ramifications of all proposed actions.

Surveys: In addition to the above agency activities, some CNMI agencies may have the need to conduct surveys of resources in the conservation area. For example, DEQ or CRMO may need to survey water quality, coral reefs, or other resources in order to meet their agency mandates. These agencies will need to consult and coordinate with the DFW prior to conducting surveys in the conservation area to ensure the work is compatible with the conservation area purpose. Additionally, those agencies, as well as others, may need to obtain permits from the DFW to conduct surveys or management actions in the conservation area, if those actions are not allowed by regulation. As stated previously, these permitting requirements could be streamlined by the DFW granting annual or multi-year umbrella permit coverage, as defined by an MOU, and as allowed by the conservation area regulations.



4.0 USES

4.1 TYPES OF USES

4.1.1 Recreation

Mañagaha Island is small, yet it is a highly popular recreational destination that is intensively used by an average of 500 to 800 visitors most days throughout each year. This popularity appears to be primarily due to the easy access for recreating in a remote and high quality marine/island environment that has beautiful coral sandy beaches.

Island Recreation: Recreation activities on the island primarily include lounging, beach games, and picnicking. Other activities such as hiking and photography also are common. Some local residents camp overnight on the island, typically in small groups (i.e., 2-6 individuals). This infrequent camping is typically centered at or near the four public pavilions, and campfires are occasionally built for those uses.

Marine Recreation: Marine recreation primarily consists of swimming and snorkeling, and the outer barrier reef provides a generally protected environment for such uses. SCUBA diving also is periodically conducted in the conservation area, typically at sites with historic artifacts. Kite boarding, wind surfing, and motor-boat-propelled parasailing also occur in the area that is now designated as a conservation area.

Sail boating and motorized boating are common around Mañagaha Island, particularly in areas south and east of the island where the deepest waters are located. Smaller boats occasionally use other portions of the conservation area, including traveling through the most popular swimming and diving areas. Such boat travel can be extremely hazardous to swimmers and divers and also degrade the visitors' experiences. Additionally, some boaters travel through the general area to access areas to the north or south, although that travel primarily is conducted east of the island in deeper water.

Large boats and some smaller boats dock at the Mañagaha Island pier, although most small sail boats (i.e., Hobie Cats) and small motorized boats (i.e., tour boats) typically are beached immediately west of the pier or are anchored or moored near the pier (Figure 3). Some small boats also have previously been beached elsewhere on the island or anchored in various locations in the area now defined as the conservation area. However, indiscriminate boat anchoring can have cumulative adverse impacts on the coral reefs in the conservation area.

4.1.2 Education

Some local schools hold single-day or multi-day educational workshops or retreats on Mañagaha Island. These events typically consist of environmental education and a variety of recreational pursuits. The Mañagaha Marine Conservation Area provides an excellent location for such education due to its easy access to a remote, high quality marine/island environment.

4.1.3 Cultural

The Carolinian community annually celebrates Chief Aghurubw Day on Mañagaha Island as well as periodically conducting private ceremonies (i.e., *Firowrowa*). Historically, medicinal plants

were planted on the island by the Carolinian Community, and 28 species are found there today (Appendix B). Some members of the Carolinian community continue to harvest small portions of those plants (Olopai 2004).

Historically, fishing occurred in the waters that are now within the conservation area. That use is now illegal in the Mañagaha Marine Conservation Area, and its occurrence is rare to non-existent.

4.2 COMPATIBILITY WITH PUBLIC LAW 12-12

4.2.1 Compatible Uses

Table 2 lists known or potential uses of Mañagaha Island and its surrounding waters that can be compatible with Public Law 12-12 if those uses are conducted in a manner that does not destroy or substantially degrade the natural resources and visitor experiences in the conservation area.

Therefore, regulations will need to be developed and implemented for these and other uses in the conservation area to help assure they meet the purpose of the enabling legislation.

4.2.2 Compatible Uses Restricted to Management Zones

Some uses, such as the construction and operation of commercial facilities and the use of motorized water craft have the potential for creating significant long-term impacts to natural resources in the conservation area. In the case of motorized watercraft, that use also could create significant visitor hazards, as well as degrading visitors' experiences and the marine ecosystem. Therefore, the uses defined in Table 3 will be restricted to management zones to help ensure those uses remain compatible with the purposes of Public Law 12-12.

Specific management zones currently planned for the Mañagaha Marine Conservation Area are the: Motorized Vehicle Zone and the Commercial Facility Zone. A third type of management zone, the No Entry Zone, also will be established by the DFW on a case-by-case and site-by-site basis to protect natural resources that are especially rare and vulnerable to human disturbances. This No Entry Zone will be designated for areas where other regulatory capabilities are inadequate for protecting particularly rare and vulnerable natural resources. For example, the recently discovered wedge-tailed shearwater nesting sites on the northern portion of Mañagaha Island require reasonably implemented restrictions for human entry in order to sustain the nesting habitat of that rare species.

The above described management zones are shown on Figures 4 and 5. Just as with the other compatible uses described above, regulations will need to be developed to help ensure those uses do not destroy or degrade the natural resources or visitor experiences in the conservation area.

4.2.3 Incompatible Uses Except for Special Use Situations

Some uses are not generally compatible with the purpose of the Mañagaha Marine Conservation Area, although some exceptions may be permitted by the DFW if those uses meet the requirements and intent of Public Law 12-12. Those uses are listed in Table 4, and uses that could be considered for special use permits include, commercial services and indigenous cultural activities.

4.2.4 Incompatible Uses

Some uses are not compatible with the purpose of the Mañagaha Marine Conservation Area at any time, and those uses are listed in Table 5. Those particular uses will be restricted from occurring throughout the conservation area, unless a permit has been issued by the DFW for such purposes, pursuant to regulations.

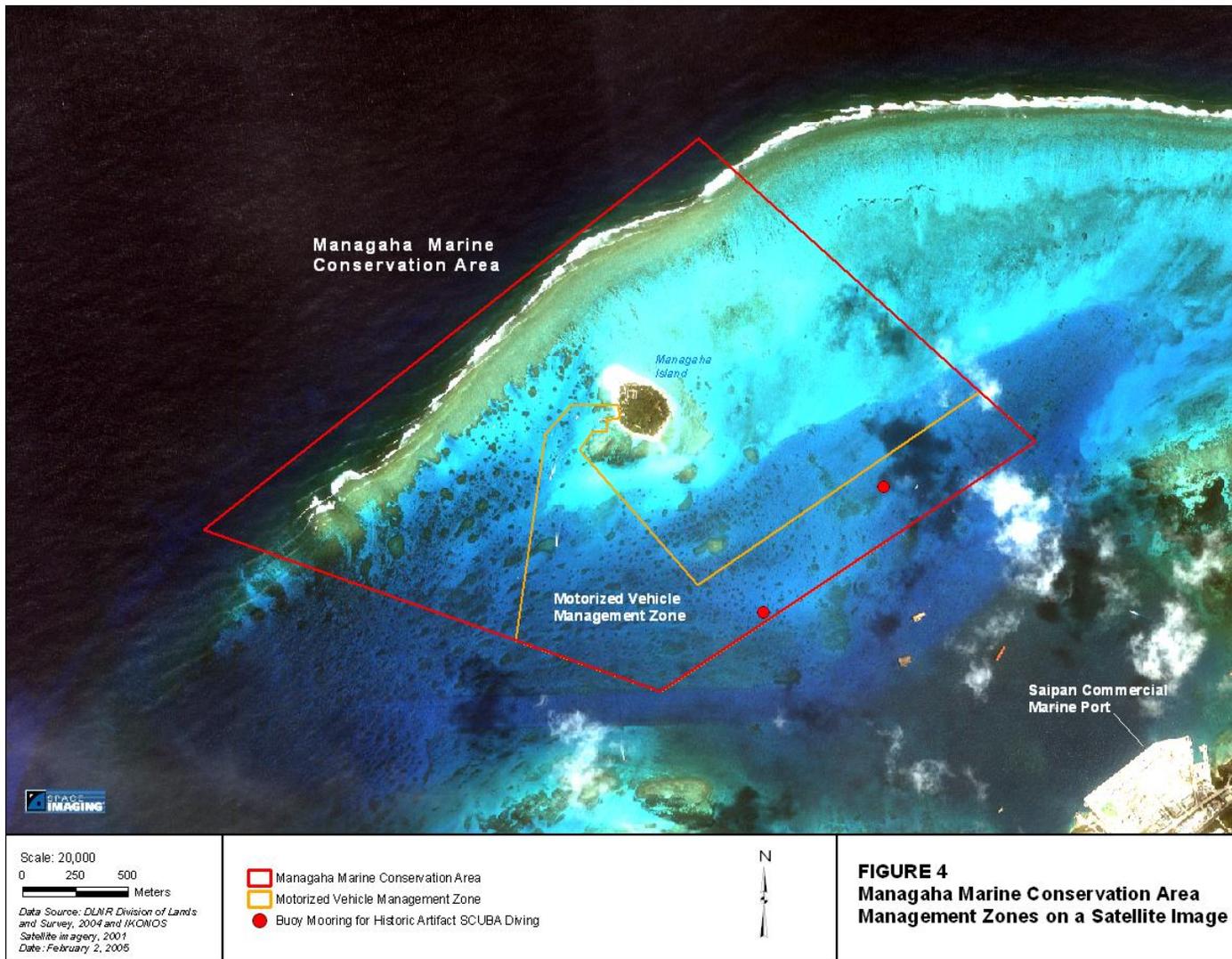


Table 2. Uses compatible with the Mañagaha Marine Conservation Area law (PL12-12) when they are regulated in a manner that protects the conservation area resources.

Uses that are Compatible throughout the Mañagaha Marine Conservation Area when Regulated in a Manner that Protects the Conservation Area Resources^a
Conducting non-motorized recreation on land, including lounging, picnicking, hiking, photography, adventure sports, and games (e.g., volleyball)
Conducting non-motorized recreation in water, including swimming, snorkeling, skin diving, and SCUBA diving
Operating water craft without the use of motors, such as sail boats, kayaks, canoes, surf boards, and wind and kite surf equipment
Overnight camping
Building or maintaining open fires in established structures designed for such use, only when firewood is not gathered from the conservation area
Conducting educational programs for individuals or schools
Conducting cultural ceremonies, festivals, or other cultural performances

^a All activities conducted contrary to regulations would require a DFW Special Use Permit.

Table 3. Uses compatible with the Mañagaha Marine Conservation Area law (P.L.12-12) when they are conducted in specific management zones and regulated in a manner that protects the conservation area resources.

Uses that are Compatible with the Mañagaha Marine Conservation Area when Conducted in Specific Management Zones and Regulated in a Manner that Protects the Conservation Area Resources^a	Management Zone (Refer to Figs. 4 and 5)
Soliciting for commercial services or goods, such as tour services, food, beverages, or goods	Commercial Facility Management Zone
Planting, growing, or sustaining domesticated ornamental plants	Commercial Facility Management Zone
Constructing or erecting permanent or non-permanent buildings, structures, or roads	Commercial Facility Management Zone & Motorized Vehicle Management Zone
Operating watercraft with the use of motors on or in water, including boats and submersible vessels	Motorized Vehicle Management Zone
Docking at piers, offshore anchoring, or mooring at buoys	Motorized Vehicle Management Zone
Operating above-water breathing mechanisms, such as “hooka,” “snuba” or “sea-walker” systems	Motorized Vehicle Management Zone
Operating motorized vehicles on land	Motorized Vehicle Management Zone

^a All activities conducted contrary to regulations would require a DFW Special Use Permit.

Table 4. Uses incompatible with the Mañagaha Marine Conservation Area law (P.L.12-12), except with a DFW Special Use Permit.

Uses prohibited in the Mañagaha Marine Conservation Area Except When Allowed by DFW Special Use Permit
Operating Commercial Services for a fee or other compensation ^a
Building or maintaining open fires on the ground (e.g., campfires)
Killing, cutting, collecting, removing, or relocating plants or plant parts
Killing, harming, harassing, baiting, collecting, or removing animals, fish, coral, or their live or dead parts, including shells, nests, burrows, and dens

^a *The term “Commercial Services” pertains to those activities conducted within a conservation area for any type of fee or other compensation, such as the preparation, delivery, or sale of food, beverages, goods, or services, including providing tours or guide services for a fee in or from a conservation area, selling or renting sports or recreation equipment, or other goods or related supplies; or providing entertainment for profit.*

Table 5. Uses incompatible with the Mañagaha Marine Conservation Area law (P.L.12-12) at all times.

Uses prohibited in the Mañagaha Marine Conservation Area
Dumping, discharging, depositing, or littering items such as trash, dead vegetation, oil, gas, poisons, or other pollutants on or in land or water
Leaving trash on the ground or in containers that allow rodent access during night-time hours (e.g., sunset to sunrise)
Introducing, growing, or sustaining non-native-invasive plants
Introducing, establishing, raising, or sustaining domesticated animal and fish species
Removing, excavating, destroying, defacing, or damaging cultural or historic artifacts
Extracting, exploring, removing, or excavating minerals, sand, rock, limestone, or soils.

5.0 MANAGEMENT PLAN GOALS, OBJECTIVES, AND STRATEGIES

5.1 GOALS AND OBJECTIVES

As previously stated, the purpose of the Mañagaha Marine Conservation Area is to protect and preserve, by strict regulatory enforcement, the land and water resources, flora, fauna, and marine life that are found in the conservation area for the enjoyment of future generations of Commonwealth residents and visitors (Section 4(b) of PL 12-12). Table 6 defines the management goals and objectives developed to meet that purpose. Strategies for implementing those goals and objectives are provided on the following pages.



Table 6. DLNR management goals and objectives for the Mañagaha Marine Conservation Area.

Goal 1: Develop and promulgate regulations and permit fees, and develop visitor use guidelines, which meet the purpose of the Mañagaha Marine Conservation Area as defined in Public Law 12-12.
<u>Objective 1.1:</u> Within one year of completing this management plan, the DFW will develop and promulgate regulations and permit fees for the Mañagaha Marine Conservation Area.
<u>Objective 1.2:</u> Within three years of completing this management plan, the DFW will develop visitor use guidelines for the Mañagaha Marine Conservation Area.
Goal 2: Dedicate staff and material resources to implement the Mañagaha Management Plan and to enforce associated regulations.
<u>Objective 2.1:</u> Within two years of completing this management plan, the DFW will employ a Conservation Area Manager whose partial responsibilities will be to implement the Mañagaha Marine Conservation Area Management Plan.
<u>Objective 2.2:</u> Immediately after the regulations have been promulgated, the DLNR Conservation Officers will monitor uses in the conservation area and enforce the regulations.
<u>Objective 2.3:</u> Prior to or immediately after regulations have been promulgated, the DFW will communicate with other CNMI agencies that may need to conduct permitting or monitoring in the conservation area to assure they understand DFW management and permitting requirements.
Goal 3: Survey and monitor natural, cultural, and historical resources, and visitor uses to assess their status through time.
<u>Objective 3.1:</u> The DFW will continue monitoring marine resources in the conservation area to assess marine ecosystem health and to provide a baseline of conditions against which future survey results will be compared.
<u>Objective 3.2:</u> The DFW will continue monitoring terrestrial resources in the conservation area to assess plant and animal health and to provide a baseline of conditions against which future survey results will be compared.
<u>Objective 3.3:</u> Within six months of completing this management plan, the DFW will obtain and assess past and present visitor use data in the conservation area and obtain such data annually during subsequent years to assess visitor uses through time.
Goal 4: Inform and educate visitors about the conservation area resources, potential impacts of their uses, and the regulations and guidelines for the conservation area.
<u>Objective 4.1:</u> Within one year of when the Conservation Area regulations have been promulgated, the DFW (with funding support provided by the Mañagaha Island Concessionaire) will design, produce, and distribute visitor information brochures and posters.
<u>Objective 4.2:</u> Within three years of completing this management plan, the DFW will design a Mañagaha Visitor Information Center that will be constructed and maintained by the Mañagaha Island Concessionaire.
<u>Objective 4.3:</u> Within three years of completing this management plan, the DFW (with funding support provided by the Mañagaha Island Concessionaire) will develop and install visitor information signs along trails or elsewhere on Mañagaha Island.
<u>Objective 4.4:</u> Within five years of completing this plan, the DFW will develop a trail management plan that will be implemented by the Mañagaha Island Concessionaire.
<u>Objective 4.5:</u> The DFW will continue to assist schools, and other institutional education organizations, in using the conservation area for educational programs.
Goal 5: Annually evaluate the effectiveness of the conservation area management and regulations.
<u>Objective 5.1:</u> The DFW will annually prepare a brief report that describes the status of the conservation area resources and evaluates the effectiveness of the management and regulations.

5.2 IMPLEMENTATION STRATEGIES

Goal 1: Develop and promulgate regulations and permit fees, and develop visitor use guidelines, which meet the purpose of the Mañagaha Marine Conservation Area as defined by Public Law 12-12.

Objective 1.1: Within one year of completing this management plan, the DFW will develop and promulgate regulations and permit fees for the Mañagaha Marine Conservation Area.

Short-term Strategies:

- With assistance from the CNMI Attorney General's Office, the DFW will develop and promulgate regulations, including the schedule of permit fees for the Mañagaha Marine Conservation Area that meets the purpose of Public Law 12-12. Appendix C provides a framework for developing and enforcing the regulations and Section 6.3 provides a preliminary schedule of permit fees.
- The regulations will clearly define DLNR's authority for management and regulatory enforcement in the conservation area.
- The regulations and permit fees will be communicated to the public through visitor education materials defined by Goal 4 implementation strategies.

Long-term Strategies:

- Continue to enforce the regulations, and annually review their effectiveness.

Adaptive Management:

- If regulations are not adequate for protecting the conservation area, as defined by Public Law 12-12, then the DFW will revise those regulations to make them more effective.

Objective 1.2: Within three years of completing this management plan, the DFW will develop visitor use guidelines for the Mañagaha Marine Conservation Area.

Short-term Strategies:

- The DFW will develop guidelines for visitor use practices that reduce or prevent adverse impacts resources in the conservation area or that reduce hazards to visitors. These uses may include snorkeling, diving, boating, and hiking.
- The DFW will consult with user groups or agencies to assess their needs and preferences for guidelines, and they may request the use of established guidelines that may be appropriate for the conservation area.
- The visitor use guidelines will be communicated to the public through visitor education materials, such as those defined under Goal 4.

Long-term Strategies:

- Annually review the effectiveness of the guidelines and determine what changes are needed to make them more effective at meeting the purpose of Public Law 12-12.

Adaptive Management:

- If the guidelines are not adequate for protecting the conservation area resources then the DFW will revise those guidelines to make them more effective at meeting the purpose of Public Law 12-12.

Goal 2: Dedicate staff and material resources to implement the Mañagaha Management Plan and enforce associated regulations.

Objective 2.1: Within two years of completing this management plan, the DFW will employ a Conservation Area Manager whose partial responsibilities will be to implement the Mañagaha Marine Conservation Area Management Plan.

Short-term Strategies:

- The DFW will prepare a job description and qualifications for a Conservation Area Manager (CAM) position that allocates a maximum of 50% of that person's time to implementing the Mañagaha Marine Conservation Area management plan during the first five years the position is filled; thereafter the time allocation may be reduced depending on management needs for conservation areas on Saipan.
- The Conservation Area Manager will be responsible for implementing conservation area management plans and actions, and they also may provide other assistance to DFW staff for other work associated with the conservation areas.
- The DFW will assign the Conservation Area Manager job to an existing DLNR employee, or hire a new employee that effectively meets the job description.
- The DFW will obligate funds each year to personnel and material resources that will be needed to implement this management plan.
- The DFW will solicit the assistance of non-government volunteer organizations for helping implement management projects in the conservation area.

Long-term Strategies:

- The Conservation Area Manager and their supervisor will annually assess whether other assistance is needed for managing the Mañagaha Marine Conservation Area and implementing this management plan. If such assistance is needed, the DFW will obtain the assistance from within the DLNR staff or hire others as needed to implement this plan and meet the purpose of Public Law 12-12.
- The supervisor of the Conservation Area Manager will periodically consult with the DFW Director and the DFW Fisheries Program Supervisor each year to assess whether the time allocated to the manager position is appropriate for the management of the Mañagaha Marine Conservation Area as well as other conservation areas on Saipan, and changes will be made in the time allocation if warranted.

Adaptive Management:

- If the Conservation Area Manager, or any other DLNR staff assigned to work in the Conservation Area, is determined by DLNR or DFW to fail in performance of their duties, then the DLNR or DFW will replace them with qualified personnel as soon as possible, in accordance with CNMI Office of Personnel Management regulations.

Objective 2.2: Immediately after the regulations have been promulgated, DLNR conservation officers will monitor uses in the conservation area and enforce the regulations.

Short-term Strategies:

- The DLNR will allocate at least 4 FTE (full-time equivalent) DLNR Conservation Officers to monitor uses and enforce regulations in the Mañagaha Marine Conservation Area (currently three officers are budgeted for that work).
- The DLNR Conservation Officers will directly and indirectly assess visitor uses in the conservation area by making observations when traveling in or near the conservation area, and by talking with visitors, CNMI government employees, Concessionaire staff, and others to gain information about potential violations of the law.
- The Conservation Area Manager and other DLNR staff will assist with this work by immediately notifying the DLNR Conservation Officers of violations occurring in the conservation area.
- The DLNR Conservation Officers will take action to address violations by communicating with those causing the infractions and issuing citations as needed to enforce the law.
- The DLNR will establish a system of rewards for persons, other than government employees in the course of their official duties, who furnish information which leads to a finding of civil violation or a conviction of criminal violation inside or outside CNMI conservation areas, as provided by 2 CMC Section 5104.

Long-term Strategies:

- The DLNR Conservation Officers will continue assessing the uses and enforcing regulations in the conservation area through on-site investigations and discussions with others.
- The DLNR Conservation Officers, and other DLNR staff that work in the conservation area, will obtain the latest information regarding conservation area management and regulations to ensure they conduct the most accurate and effective monitoring and enforcement.
- The DLNR Conservation Officers will communicate with the Conservation Area Manager and other DLNR staff to assess the regulatory violations and resource impacts that occur in the conservation area each year. Those assessments will be recorded as they occur, and they will be summarized in the annual report (Goal 5).
- The DLNR Supervisory Conservation Officer will periodically consult with the DFW Director regarding the status and effectiveness of law enforcement in the conservation area, as well as assess and implement methods to improve that work.

Adaptive Management:

- If enforcement problems persist, and public outreach appears to be an effective means for addressing the problems, then the Conservation Area Manager will consult with the DLNR Conservation Officers and DFW staff, to develop public education (i.e., signs, brochures, one-on-one communication, or community meetings), to communicate the conservation area regulations and purposes to the public.
- If law enforcement actions are found to be ineffective at enforcing conservation area regulations, then the Conservation Area Manager and/or the DLNR Conservation Officers will work with the DFW Director, and others, to obtain other information, methods, or assistance to improve law enforcement, and the DFW will implement those changes in law enforcement that appear to be most effective and that can be accommodated by DLNR personnel and funding.

Objective 2.3: Prior to or immediately after the regulations have been promulgated, the DFW will communicate with other CNMI agencies that may need to conduct permitting or monitoring in the conservation area to assure they understand DFW management and permitting requirements.

Short-term Strategies:

- The DFW will communicate with other CNMI agencies and concessionaires that have operational, management, or permitting needs in the conservation area to assure those entities have a clear understanding of DLNR's management and regulations for the conservation area. Those agencies include, the Marianas Public Lands Authority (MPLA), the Coastal Resources Management Office (CRMO), the Division of Environmental Quality (DEQ), and the Historic Preservation Office (HPO), and the Mañagaha Island Concessionaire Permittee.
- The communication stated above will include at least one interagency meeting each year that includes all the agencies defined above.
- During these discussions, the DFW will clarify its management and regulatory needs, and requirements, and request comments. The DFW will request those entities comply with the DLNR management and regulations of the conservation area, including providing assistance to the DLNR for monitoring and reporting regulatory infractions. The DFW will in-turn assist those entities, wherever feasible, in meeting their needs for monitoring and permitting, as allowed by law.

Long-term Strategies:

- The DFW will continue to communicate with the above listed agencies every year, including at least one annual interagency meeting, to update them regarding the latest management, issues, and regulations for the conservation area.

Adaptive Management:

- If the agencies or Mañagaha Island concessionaires do not cooperatively work with the DLNR within the framework of the conservation area management plan and regulations, then the Director of DFW and Secretary of DLNR will be consulted for assistance in fostering such cooperative working relationships.

Goal 3: Survey or monitor natural, cultural, and historic resources, and visitor uses to assess their status through time.

Objective 3.1: The DFW will continue monitoring marine resources in the conservation area to assess the marine ecosystem health and to provide a baseline of conditions against which future survey results will be compared.

Short-term Strategies:

- The DFW scientists will continue existing surveys and implement other surveys in the conservation area to provide a population and trend assessment through time. That work is currently funded by the U.S. Fish and Wildlife Service (USFWS), and it could be supplemented with other funding. Appendix D summarizes existing or potential marine surveys and research.

Long-term Strategies:

- The DFW scientists will continue to assess the needs for marine surveys and research in the conservation area to provide effective monitoring of the marine ecosystem.

Adaptive Management:

- If additional surveys and research are found to be needed to monitor marine resource changes in the conservation area, then the DFW will design plans, obtain funding, and implement that additional work as needed.
- If surveys or research show that marine resources have been degraded, then the DFW scientists will consult with the DFW and DLNR supervisors to develop the means for reducing, minimizing, or halting that resource damage.
- If surveys or research show that marine resources have been degraded, and that restoration measures can effectively restore those resources, then the DLNR will develop such restoration measures and obtain funding and voluntary assistance, as needed to implement them.

Objective 3.2: The DFW will continue monitoring terrestrial resources in the conservation area to assess plant and animal health and to provide a baseline of conditions against which future survey results will be compared.

Short-term Strategies:

- The DFW scientists will continue existing surveys and implement new surveys of terrestrial fauna and flora species to assess changes in those species and populations through time. Appendix D summarizes existing or potential terrestrial surveys and research.

Long-term Strategies:

- The DFW scientists will continue to assess the needs for terrestrial surveys and research in the conservation area as needed to provide effective monitoring of the terrestrial ecosystem.

Adaptive Management:

- If additional surveys and research are found to be needed to monitor terrestrial resource changes in the conservation area, then the DFW will design plans, obtain funding, and implement that additional work as needed.
- If surveys or research show that terrestrial resources have been degraded, then the DFW scientists will consult with DFW and DLNR supervisors to develop the means for reducing, minimizing, or halting the resource damage.
- If surveys or research show that terrestrial resources have been degraded, and that restoration measures can effectively restore those resources, then the DFW will develop such restoration measures and obtain funding and voluntary assistance as needed to implement them. A framework of suggestions for terrestrial habitat restoration is provided at the end of Appendix D.

Objective 3.3 Within six months of completing this management plan, the DFW will obtain and assess past and present visitor use data in the conservation area and obtain such data annually during subsequent years to assess visitor uses through time.

Short-term Strategies:

- The DFW will request that the MPLA and the CRMO continue to require the Mañagaha Concessionaire to collect and record the number of daily visitor users to Mañagaha Island and that the data be submitted to the DFW each quarter of every year.

Long-term Strategies:

- The DFW will compare the number of visitors among years to assess changes through time and also to determine whether those uses require changes in management, permitting, or regulations in the conservation area.
- The DFW will conduct visitor use surveys at least once every 10 years to assess the visitor use patterns, preferences, and suggestions for changes in management, as well as visitor knowledge and understanding of the conservation area regulations.
- The DFW will annually review the effectiveness of the above actions and provide recommendations for improvements as part of the annual evaluation requirements (Goal 5).

Adaptive Management:

- If the DFW is unable to obtain visitor use data from the CRMO, MPLA, or other sources, then they will seek other means for obtaining that data from those agencies or the concessionaires.
- If the results of the quarterly visitor use data, or the DFW visitor use surveys, indicate a need for change in management or regulation of the conservation area to meet the purpose of Public Law 12-12, then the DFW will make those changes as personnel and funding allow.

Goal 4: Inform and educate visitors about the conservation area resources, potential impacts of their uses, and the regulations and guidelines for the conservation area.

Objective 4.1: Within one year of when the Conservation Area regulations have been promulgated, the DFW (with funding support provided by the Mañagaha Island Landing and User Fees) will design, produce, and distribute visitor information brochures and posters.

Short-term Strategies:

- The DFW will develop a high quality visitor information brochure and poster that conveys the purpose, need, and benefits of the conservation area, as well as a map that shows the conservation area boundaries, management zones, and other features, and a summary of regulations and important visitor use guidelines. Appendix E contains recommendations for these brochures and posters.
- These educational materials will consist of text (in multiple languages), maps, and photos with the goal of making the brochures attractive and easy to understand, as well as to encourage compatible tourism activities while also minimizing impacts that those uses will have on the resources.
- Initially, approximately 4,000 copies of the brochure, and 400 copies of the poster (at least 50% of the total will be laminated), will be created to provide an initial supply for distribution, as well as provide some for restocking.
- Approximately 800 brochures and 50 posters will be initially distributed to government agencies (such as the MPLA, CRMO, DEQ, and the Marianas Visitor Authority (MVA)) that have responsibilities for visitor use management or permitting on Mañagaha Island, coastal resources protection, or visitor education. These agencies will be asked to post the posters and make the brochures available to the general public that visit their offices.
- Approximately 1,000 brochures and 50 posters also will be distributed to the Mañagaha Island Concessionaire for distribution to their tour leaders and posting on their tour boats, offices, and on Mañagaha Island. The Concessionaire will be asked to post the laminated posters on their tour boats and facilities on Mañagaha Island and to distribute the brochures to their staff and the general public.

- The remaining brochures will be distributed to the public at the DFW office reception area, as well as distributing them to public news sources (i.e., newspapers, television, and radio), tourism agencies, visitor information centers, and other locations on Saipan.
- The DFW will provide the Concessionaire the brochure template and allow the Mañagaha Concessionaire authorization for making subsequent copies at their cost.

Long-term:

- The DFW will review the need and effectiveness of the brochure and provide recommendations for additional printing and distribution.

Adaptive Management:

- If the brochure and poster supply has been exhausted, and there continues to be a need for that information to be distributed, then additional copies will be created and distributed as needed.
- If the brochures or poster have inaccuracies, misleading information, or inadequate information, then that information will be updated and clarified in subsequent versions so that information provides the most effective communication possible.

Objective 4.2: Within three years of completing this management plan, the DFW will design a Mañagaha Visitor Information Center that will be constructed and maintained by the Mañagaha Island Concessionaire.

Short-term Strategies:

- The DFW will design, and the Mañagaha Island Concessionaire will construct and maintain, a high quality visitor information center on Mañagaha Island near where the pier meets the beach (preferably in or near tree shade) to help educate visitors and reduce resource degradation caused by visitor uses. Appendix E provides recommendations for that visitor center.
- The Mañagaha Island Concessionaire shall maintain the Mañagaha Visitor Information Center to the highest standards of maintenance and repair.
- This visitor information center structure will consist of a typhoon-resistant kiosk or a pavilion center complex that has a full or partial roof that provides visitors full or partial protection from sun and rain. The kiosk area will be large enough to accommodate the large tour groups.
- Information panels within the kiosk will be large and widely spaced to accommodate large groups sorting through the information. Text will be provided in multiple languages to address at least the four primary user groups.
- The Visitor Information Center will include protected locations for conservation area pamphlets, and possibly nature trail brochures that may be distributed at that center. However, at this time, the DFW is not proposing that brochures or pamphlets be stocked at the visitor information center, as long as a high quality information center can be developed and maintained by the Concessionaire in such a manner that meets the visitor information communication needs required by the DFW, thus reducing the need for communication on paper.
- The DFW will assess the needs, options, and effectiveness for obtaining volunteers from the CNMI public, non-government organizations (NGO's), and elsewhere to work as interpreters at the visitor information center.

Long-term Strategies:

- The DFW will annually assess the effectiveness of the visitor center and provide recommended changes in the annual report (Goal 5).

- The Mañagaha Island Concessionaire will continue to meet the Concessionaire conditions as defined above, including maintaining and repairing the Mañagaha Visitor Information Center to the highest standards.
- The DFW will implement a part-time or full-time volunteer interpreter program on Managaha Island if such a program would provide effective visitor education and volunteer personnel or other personnel are available to implement such a program.
- The DFW will assess the cost/benefits of creating an environmental learning center on Mañagaha Island as described in Appendix E (also refer to Objective 4.5).

Adaptive Management:

- If the Concessionaire is not repairing or maintaining the Visitor Information Center to the standards defined in their DFW permit, the DFW will take actions that either compels the Concessionaire to conduct such work or find other means for accomplishing the work.
- If the Mañagaha Visitor Center has ineffective or incorrect information, then that DFW will revise or update that information as needed to best meet the needs for visitors to learn and understand the resources, uses, and regulations of the conservation area.
- If use by visitors and educational institutions on Mañagaha Island justify an environmental learning center on Mañagaha Island, then the DFW will solicit funding from the MPLA and other sources to establish such a facility (refer to Appendix E and Objective 4.5).

Objective 4.3: Within three years of completing this management plan, the DFW (with funding support provided by the Mañagaha Island Landing and User Fees) will develop and install visitor information signs along trails or elsewhere on Mañagaha Island.

Long-term Strategies:

- Within one year of completing this management plan, the DFW will conduct a comprehensive assessment of the need for signs on Mañagaha Island. Those needs could include general information, trail use guidance, interpretation of resources, or specific management guidance.
- Within two years of when this plan is completed, signs will be begin to be installed according the highest priority needs and the remaining signs will be installed within three years.

Long-term Strategies:

- The DFW will annually assess the need for signs in the conservation area and establish those signs as needed. Recommendations for signs will be included in the annual report (Goal 5).

Adaptive Management:

- If existing signs are found to be ineffective or in disrepair, the DFW will replace, repair, or relocate those signs as needed to improve communication with visitors and to minimize environmental degradation.

Objective 4.4: Within five years of completing this management plan, the DFW will develop a trail management plan that will be implemented by the Mañagaha Island Concessionaire.

Short-term Strategies:

- The DFW will assess the condition of the trails on Mañagaha Island, including assessing the maintenance work that MPLA requires the Concessionaire to perform on those trails per the “Agreement for Special Recreational Concession” with the MPLA.

- The DFW will prepare a trail management plan to provide a high quality trail system for visitors, and that also protects the natural, historic, and cultural resources of the conservation area. This work may include developing a nature trail with numbered posts and an associated brochure or interpretive signs, or various trail maintenance, such as trail rerouting, improved signage, placement of natural barriers or other features that better direct visitor traffic.
- The MPLA Mañagaha Island Concessionaire will be required to implement the trail management plan, as part of their DFW Special Use Permit.
- As part of this plan, the DFW will assess the need for a marine underwater trail in the conservation area. If projected use can justify its development and maintenance, then the DFW will solicit funding and other resources to establish the trail.

Long-term Strategies:

- The DFW will continue to assess the condition of the trails and other visitor use facilities on Mañagaha Island to determine whether those facilities comply with regulations and the intent of Public Law 12-12.

Adaptive Management:

- If the trail system and signage is inadequate or requires more maintenance than is provided by the Concessionaire, then the DFW will work with the Concessionaire to change or improve that management.

Objective 4.5: The DFW will continue to assist schools, and other educational institutions, in using the conservation area for educational programs.

Short-term Strategies:

- The DFW will assist the Board of Education and other non-public educational institutions with implementing their curriculums that take place in the conservation area, provided that such curriculum is consistent with the intent of the conservation area, and as provided by Public Law 12-12.

Long-term Strategies:

- The DFW will continue to assist educational institutions as needed by them to provide educational opportunities in the conservation area.
- The DFW will assess the needs and costs of creating an environmental learning center on Mañagaha Island as described in Appendix E (also refer to Objective 4.2).

Adaptive Management:

- If educational opportunities and materials are found not to be meeting the needs of CNMI educational institutions, then the DFW will revise those opportunities and materials to better meet the educational needs.
- If the use by educational institutions and visitor use justify an environmental learning center on Mañagaha Island, then the DFW will solicit funding from the MPLA Mañagaha Island User and Landing Fee and other sources to establish such a facility (also refer to Appendix E and Objective 4.2).

Goal 5: Annually evaluate the effectiveness of the conservation area management.

Objective 5.1: The DFW will annually prepare a brief report that describes the status of the conservation area resources and evaluates the effectiveness of the management and regulations.

Short-term Strategies:

- The DFW will prepare a brief report each year that describes the status of the Mañagaha Marine Conservation Area and the effectiveness of the management and regulatory enforcement. This report may be included as a chapter within a larger report of the status of all CNMI conservation areas. The following are recommended chapters for the report.

Overview

- Provide an introductory overview of the conservation area status and management.

Management and Monitoring

- Describe the progress made toward accomplishing the goals, objectives, and implementation strategies in the management plan, including changes made to them, and any adaptive management actions taken. The section that addresses monitoring should briefly describe the results of surveys or research conducted during the year.
- Describe the overall effectiveness of the goals, objectives, and implementation standards for meeting the purpose of Public Law 12-12, and any problems, needs, and recommended changes for the management plan and/or the conservation area management.

Financial Budget

- Define the current budget and expected budgetary needs
- Describe problems, needs, and recommendations for the budget.

Long-term Strategies:

- The DFW will continue preparing annual reports according to the above listed standards, or similar standards, and annually assess those results and the actions needed for improved management.

Adaptive Management:

- If the recommended content or format of the annual reports is found to be ineffective, redundant, or excessive, then changes will be made to address those issues.

6.0 IMPLEMENTATION

6.1 SCHEDULE

The proposed schedule for implementing the management objectives during the first 15 years is shown in Table 7. The DFW has every intention of meeting this schedule, although changes may be necessary as a result of funding and personnel availability. And, as with any management plan, additional tasks may be needed to effectively manage the conservation area. Therefore, the DFW will continually assess the status of the conservation area and implement other management actions as needed to meet the purpose of Public Law 12-12.

6.2 STAFFING, MATERIALS, AND EQUIPMENT

This plan requires the commitment of personnel, materials, and equipment. Table 8 shows the estimated costs for labor and expenses that are needed to implement this plan. All costs will be borne by the DFW either directly, or indirectly. However, existing DFW budgets are inadequate to meet many of these demands, let alone the needs of the current DFW responsibilities and mandates. The needs and costs for key labor requirements are described here.

Conservation Area Manager

The DFW will create a Conservation Area Manager (CAM) to implement this management plan, and to manage other conservation areas on Saipan. The DFW will seek funding to fill this manager position, and half of that position (0.5 FTE) will be dedicated to managing the Mañagaha Marine Conservation Area for at least the first five years of this plan implementation. The other half-time of that position will be used to manage the other conservation areas on Saipan.

During 2005, a Marine Protection Specialist will be hired by the DFW under a one-time, two year grant from the National Oceanic and Atmospheric Administration (NOAA). The primary duties of that Specialist will be to assess the CNMI's marine ecosystems for conservation and management needs. This position is specifically dedicated to assessing the conservation needs of all marine ecosystems in the CNMI, rather than working on management of any one conservation area. However, the Specialist will work with the Conservation Area Manager where their tasks may overlap, or where assistance is needed.

Conservation Officers

As mandated by Public Law 12-12, the DLNR will need to enforce regulations in the Mañagaha Marine Conservation Area, and the DLNR Conservation Officers (CO) will be tasked with this duty. Other staff from the DLNR and other agencies also will be expected to assist the CO's by reporting regulatory violations that they may find during the course of their regular duties, or at other times. The DFW currently has three full-time Conservation Officers dedicated to monitoring and enforcing regulations in the conservation area. This staffing is only funded by short-term (i.e., 2-3 years) federal funding, and three personnel are not adequate to fill all the day-time and night-time shifts that are required for effective conservation area protection. Therefore, the DFW will request funding for at least one additional full-time equivalent (FTE) Conservation Officer, and their expenses, to meet these requirements, and will need to seek additional funding in the future to cover the three existing officer positions that are on short-term federal funding.

Table 7. Preliminary schedule for accomplishing the short-term strategies for the Mañagaha Marine Conservation Area Management Plan objectives, during the first 15 years.

Num	Management Plan Objective	Year															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1.1	Develop and promulgate regulations	X															
1.2	Develop visitor use guidelines	X															
2.1	Employ a conservation area manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.2	DLNR Conservation Officers enforce regulations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.3	Communicate with other CNMI agencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.1	Survey marine resources	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.2	Survey terrestrial resources	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.2	Survey visitor uses	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.1	Develop and distribute brochures and posters	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2	Design and install a visitor information center	X	X	X													
4.3	Assess, develop, and install signs	X	X	X													
4.4	Assess and repair or upgrade trails		X	X	X	X											
4.5	Assist educational institutions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.1	Prepare annual report	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = Proposed year that objectives will be accomplished.

Table 8. Preliminary costs and additional funding needed (beyond current budgets) for implementing the Mañagaha Marine Conservation Area Management Plan.

TASKS	SOURCE	ADDITIONAL LABOR COST	ADDITIONAL EXPENSE COST	ADDITIONAL FUNDING NEEDED YEARS 1-15
Existing DFW Staff				
Develop and promulgate regulations	DFW Staff		Existing DFW budgets	---
Develop visitor use guidelines	DFW Staff		Existing DFW budgets	\$3,000
Survey marine resources ^a	DFW Scientists	---	---	\$40,000
Survey terrestrial resources ^a	DFW Scientists	---	---	\$158,000
Existing DFW Conservation Officer Staff				
DFW Conservation Officers enforce regulations	One Conservation Officer (But 4 will be needed after about 2007)	\$55,000 / year	\$15,000 for start-up equip/materials	\$840,000
Conservation Area Manager (New Position)				
Employ a Conservation Area Manager (CAM) (0.50 FTE)	"CAM" ½-time position	\$30,000 / year	\$25,000 for start-up equip/supplies	\$475,000
Communicate with other CNMI agencies	CAM	CAM	---	---
Survey visitor uses	CAM	CAM	---	---
Develop and distribute brochures and posters	CAM	CAM	\$10,000 for design and printing	\$10,000
Design and install a visitor information center	CAM	Contractor	\$75,000	\$75,000
Assess, develop, and install signs	CAM	CAM	\$20,000 for contractors	\$20,000
Assess and repair or upgrade trails	CAM	CAM / NGO	\$20,000 for contractors	\$20,000
Assist educational institutions	CAM	CAM	---	---
Prepare annual report	CAM	CAM	---	---
Total estimated for the first 15 years	---			\$1,641,000

^a Refer to Appendix C for details.

6.3 COSTS AND FUNDING OPTIONS

The DLNR's Division of Fish and Wildlife is responsible for implementing this management plan and the associated regulations. Their mandate is to: "protect and preserve, by strict regulatory enforcement, the land and water resources, flora, fauna, and marine life that are found in the conservation area for the enjoyment of future generations of Commonwealth residents and visitors."

Visitor uses affect and impact flora and fauna and their habitats in the conservation area. Therefore, the DFW will need to monitor the status and health of the conservation area resources, and manage and regulate visitor uses of those resources. However, DFW's current staffing and funding are already taxed beyond reasonable capability for effectively implementing existing programs, let alone having to take on additional responsibilities for managing the Mañagaha Marine Conservation Area.

The DLNR will need an estimated total of \$1,641,000 to implement this management plan during the next 15 years, as shown in Section 6.2. This total does not include costs for the three existing conservation officers whose federal funding will be eliminated after approximately 2007. This amount also does not include all potential adaptive management that may be needed to meet Public Law 12-12. This total also does not include miscellaneous administrative support costs that will develop as a result of the various personnel and management actions taken, such as administrative costs for handling additional permitting, enforcement, and miscellaneous public outreach.

Public Law 12-12 states that funding for implementing the Mañagaha Marine Conservation Area law "...shall be annually appropriated by the Legislature" (Section 9 of PL 12-12). However, to date, adequate funding has not been provided to implement Public Law 12-12, and it is not expected in the foreseeable future given the limited funds available through annual appropriations. Therefore, the DLNR will pursue the following funding mechanisms.

Permitting:

Special Use Permits: The DFW will charge a \$25 fee for all Special Use Permits issued for the conservation area. Most uses, however, will not require individual permits. For example, Tables 2 and 3 identify many uses that will not require individual permits when the use is conducted according to regulation. Special Use Permits will be required for uses that are not allowed by law, as well as for some other uses, such as school group workshops and retreats. The regulations developed for this plan will define the specific permitting requirements for the conservation area.

Commercial Services Permits: In addition to the Special Use Permits, the DFW will require permits for all commercial services conducted in or from the conservation area. All DFW Commercial Services Permit fees will be paid to the Commonwealth Treasury for the specific purpose of the "Fish and Game Conservation Revolving Fund" (2 CMC § 5107 as amended by Public Law 13-8). Payees will obtain a receipt for such payments and those receipts will be identified as payments made for a "DFW Commercial Services Permit." The receipt of that payment will be attached to the permit application which is then submitted to the DFW main office located in Lower Base, Saipan. Individuals requesting Commercial Services Permits on Rota and Tinian, as well as those on Saipan, may also submit an application, with the attached receipt of payment, to the Division of Fish and Wildlife, Permit Applications, Caller Box 10007, Saipan, MP 96950.

The Secretary of Finance shall administer the Fish and Game Conservation Revolving Fund and shall expend moneys from the fund on the order of the Secretary of the Department of Lands and Natural Resources, or his or her authorized designee, only for the purpose of the administration of programs under the Division of Fish and Wildlife.

The DFW, through the regulatory requirements of the DFW Commercial Services Permit, may require the Mañagaha Island Concessionaire to implement DFW directed projects and actions in the conservation area. These projects and actions could include constructing visitor information centers or signs, conducting site restoration, or other actions such as those defined in Objectives 4.1 through 4.4 of this plan (Chapter 5). These projects and actions will be the responsibility of the Mañagaha Island Concessionaire to fund and implement, as specifically defined in each Commercial Services Permit. The Concessionaire may fund these projects and actions from the MPLA Landing and User Fee Account when such use is allowed by agreement between the Concessionaire and the MPLA. These projects and actions may include: "...free public services, protect public safety, pay for insurance, maintain the cleanliness and appearance of Mañagaha Island, and to construct, maintain, and repair public facilities, improvements, equipment, and infrastructure..." on Mañagaha Island (First Amendment to Agreement for Special Recreational Concession - Managaha Island, 27th September 2002).

7.0 REFERENCES

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APPENDIX A

**A Partial List of Coral and Fish Species
in the Managaha Marine Conservation Area**

Coral Species
<i>Acropora aspera</i>
<i>Acropora Formosa</i>
<i>Acropora palifera</i>
<i>Acrhelia horrescens</i>
<i>Favia matthaii</i>
<i>Favia stelligera</i>
<i>Fungia fungites</i>
<i>Fungia scutaria</i>
<i>Galaxia fascicularis</i>
<i>Goniastrea edwardsi</i>
<i>Heliopora coerulea</i>
<i>Leptoseris explanata</i>
<i>Lobophyllia corymbosa</i>
<i>Montipora hoffmeisteri</i>
<i>Montipora verrucosa</i>
<i>Montipora spp.</i>
<i>Pavona varians</i>
<i>Pavona spp.</i>
<i>Platygyra daedalea</i>
<i>Platygyra pini</i>
<i>Pocillopora damicornis</i>
<i>Pocillopora elegans</i>
<i>Pocillopora eydouxi</i>
<i>Pocillopora setschelli</i>
<i>Porites annae</i>
<i>Porites lutea</i>
<i>Porites rus</i>
<i>Seriatopora hystrix</i>
<i>Stylophora mordax</i>
Soft Corals
<i>Sarcophyton spp.</i>
<i>Sinularia spp.</i>

Source: Pacific Basin Environmental Consultants 1985.

A Partial List of Fish Species in the Managaha Marine Conservation Area

Fish Species	Fish Species
Carcharhinidae (Sharks)	Mullidae (Goatfish)
<i>Triaenodon obesus</i>	<i>Mulloidichthys flavolineatus</i>
	<i>M. vanicolensis</i>
Muraeidae (Moray eels)	<i>Parupeneus barberinus</i>
<i>Lycodontis meleagris</i>	<i>P. pleurostigma</i>
	<i>P. trifasciatus</i>
Synodontidae (Lizard fish)	
<i>Saurida gracilis</i>	Cirrhitidae (Hawkfish)
	<i>Paracirrhites arcatus</i>
Holocentridae (Squirrelfish)	<i>P. forsteri</i>
<i>Adioryx diadema</i>	
<i>Flammeo sammara</i>	Chaetodontidae (Butterflyfish)
<i>Flammeo opercularis</i>	<i>Chaetodon auriga</i>
<i>Myripristis murdjan</i>	<i>C. bennetti</i>
	<i>C. citrinellus</i>
Aulostomidae (Trumpetfish)	<i>C. ephippium</i>
<i>Aulostomus chinensis</i>	<i>C. lunula</i>
	<i>C. ornatissimus</i>
Fistulariidae (Coronetfish)	<i>C. punctatofasciatus</i>
<i>Fistularia commersonii</i>	<i>C. reticulatus</i>
	<i>C. trifasciatus</i>
Syngnathidae (Pipefish)	<i>C. ulietensis</i>
<i>Corythoichthys sp.</i>	<i>C. unimaculatus</i>
	<i>Heniochus chrysostomus</i>
Apogonidae (Cardinalfish)	<i>Megaprotodon trifascialis</i>
<i>Apogon novemfasciatus</i>	
<i>Apogon sp.</i>	Pomacanthidae (Anglefish)
<i>Cheilodipterus quinquelineatus</i>	<i>Centropyge flavissimus</i>
	<i>Pomacanthus imperator</i>
Serranidae (Groupers)	
<i>Epinephelus merra</i>	Pomacentridae (Damsel fish)
<i>Cephalopholis sp.</i>	<i>Abudefduf sexfasciatus</i>
	<i>Amphiprion melanopus</i>
Lutjanidae (Snappers)	<i>Chromis atripectoralis</i>
<i>Lutjanus fulvus</i>	<i>C. caerulea</i>
<i>L. kasmira</i>	<i>C. margaritifera</i>
	<i>Dascyllus aruanus</i>
Lethrinidae (Emperors)	<i>Plectroglyphidodon dickii</i>
<i>Gnathodentex aureolineatus</i>	<i>P. johnstonianus</i>
<i>Lethrinus harak</i>	<i>P. lashrymatus</i>
<i>L. ramak</i>	<i>Pomacentrus pavo</i>
<i>Lethrinus sp.</i>	<i>P. vaiuli</i>
	<i>Stegastes albifasciatus</i>
Nemipteridae (Breams)	<i>S. fasciolatus</i>
<i>Scolopsis cancellatus</i>	<i>S. nigricans</i>

Source: Pacific Basin Environmental Consultants 1985.

Continued - A Partial List of Fish Species in the Managaha Marine Conservation Area

Fish Species	Fish Species
Labridae (Wrasses)	
<i>Anampes twisti</i>	Zanclidae (Moorish Idols)
<i>Cheilinus chlorurus</i>	<i>Zanclus cornutus</i>
<i>C. oxycephalus</i>	
<i>C. trilobatus</i>	Siganidae (Rabbitfish)
<i>Cheilio inermis</i>	<i>Siganus argenteus</i>
<i>C. gaimard</i>	<i>S. punctatus</i>
<i>Epibulus insidiator</i>	<i>S. spinus</i>
<i>Gomphosus varius</i>	
<i>Halichoeres centriquadrus</i>	Blenniidae (Blennies)
<i>H. hortulanus</i>	<i>Salaria fasciatus</i>
<i>H. margaritaceus</i>	
<i>H. marginatus</i>	Gobidae (Gobies)
<i>H. trimaculatus</i>	<i>Valenciennea strigata</i>
<i>Labroides dimidiatus</i>	
<i>Stethojulis bandanensis</i>	Balistidae (Triggerfish)
<i>Thalassoma fuscum</i>	<i>Rhinecanthus aculeatus</i>
<i>T. hardwicke</i>	
<i>T. lutescens</i>	Monacanthidae (Filefish)
<i>T. quinquevittata</i>	<i>Cantherines pardalis</i>
<i>Xyrichtys taeniourus</i>	<i>Oxymonacanthus longirostris</i>
Scaridae (Parrotfish)	Tetraodontidae (Puffers)
<i>Calotomus spinidens</i>	<i>Arothron nigropunctatus</i>
<i>Scarus chlorodon</i>	<i>Canthigaster solandri</i>
<i>S. ghobban</i>	
<i>S. psittacus</i>	
<i>S. sordidus</i>	
Acanthuridae (Surgeonfish)	
<i>Acanthurus glaucopareius</i>	
<i>A. lineatus</i>	
<i>A. mata</i>	
<i>A. nigricans</i>	
<i>A. nigrofuscus</i>	
<i>A. olivaceous</i>	
<i>A. triostegus</i>	
<i>Ctenochaetus striatus</i>	
<i>Naso brevirostris</i>	
<i>N. literatus</i>	
<i>N. unicornis</i>	
<i>Zebrasoma flavescens</i>	
<i>Z. veliferum</i>	

Source: Pacific Basin Environmental Consultants 1985.

Note: This partial list of fish species in the Managaha Marine Conservation area consists of a total of 107 species in 27 families.

APPENDIX B**Plant Species Identified on Managaha Island ^a**

Scientific Name	Common Name	Chamorro Name	Type
<i>Achyranthes aspera</i>		Lasogado	I
<i>Acrostichum aureum</i>	Giant swamp fern	Langayao	I
<i>Amaranthus viridis</i>	Pigweed	Apaka	N
<i>Annona muricata</i>	Soursop	Laguanaha	E
<i>Artocarpus altilis</i>	Seedless breadfruit	Lemae	E
<i>Barringtonia asiatica</i>	Fish-kill tree	Putting	I
<i>Bidens alba</i>	Spanish needles		N
<i>Blechum brownii</i> v. <i>puberulum</i>		Yerbas babui	N
<i>Bougainvillea spectabilis</i>	Bougainvillea	Putitainobo	N
<i>Canavalia rosea</i>	Seabean	Akangkang-tasi	I
<i>Carica papaya</i>	Papaya	Pawpaw	N
<i>Cassytha filiformis</i>	Local dodder	Agasi	I
<i>Casuarina equisetifolia</i>	Ironwood	Gago	I
<i>Cenchrus brownie</i>			N
<i>Cenchrus echinatus</i>	Sandpsur		N
<i>Chloris inflata</i>	Finger grass		N
<i>Chromolaena odorata</i>		Masigsig	N
<i>Citrus reticulata</i>	Tangerine		N
<i>Cocos nucifera</i>	Coconut	Niyog	N
<i>Codiaeum variegatum</i>		Puyitos	E
<i>Colubrina asiatica</i>		Gasoso	I
<i>Cordia subcordata</i>		Niyoron	I
<i>Cordyline fruticosa</i>			E
<i>Crinum asiaticum</i> v. <i>pedunculatum</i>		Piga-palayi	N
<i>Cycas revolute</i>			E
<i>Cynodon dactylon</i>	Bermuda grass		N
<i>Cyperus kyllingia</i>	Cyperus	Chaguan Lemae	I
<i>Cyperus javanicus</i>	Cyperus		N
<i>Cyperus rotundus</i>	Cyperus	Chaguan humatag	N
<i>Dactyloctenium aegyptium</i>	Crowfoot grass		N
<i>Delonix regina</i>	Flame tree	Tronkon albot	N
<i>Desmanthus virgatus</i>			N
<i>Digitaria gaudichaudii</i>			I
<i>Digitaria insularis</i>			I
<i>Dodonaea viscosa</i>		Lampuaye	I
<i>Eleusine indica</i>	Goose grass	Umog	N
<i>Eragrostis amabilis</i>	Love grass		N
<i>Euphorbia cyathophora</i>	Dwarf poinsettia		N
<i>Euphorbia glomifera</i>			N
<i>Euphorbia hirta</i>			N
<i>Eustachys petraea</i>			N
<i>Ficus prolixa</i>	Strangler fig	Nunu	I
<i>Ficus tinctoria</i> v. <i>neo-ebudorum</i>	Dyer's fig	Hoda	I
<i>Guettarda speciosa</i>		Panao	I
<i>Hernandia sonora</i>		Nonak	I

Source: Raulerson and Rinehart 1992.

^a Types: I = Indigenous; N = Introduced/Naturalized; E = Introduced/Exotic.

Continued - Plant Species Identified on Managaha Island

Scientific Name	Common Name	Chamorro Name	Type
<i>Hibiscus tiliaceus</i>	Sea hibiscus	Pago	I
<i>Hibiscus rosa-sinensis</i>	Red hibiscus	Gunamela	E
<i>Hymenocallis littoralis</i>	Spiderlilly	Lirio	N
<i>Indigofera suffruticosa</i>	Indigo	Aniles	N
<i>Ipomoea pes-caprae</i> ssp. <i>brasiliensis</i>	Beach morning gloy	Alalag-Tasi	I
<i>Jatropha integerrima</i>	Rose-flowered	Tuba-tuba	E
<i>Lepturus repens</i> v. <i>subulatus</i>		Lesaga	I
<i>Leucaena leucocephala</i>	Tangan-tangan		N
<i>Manihot esculenta</i>	Tapioca	Mendioka	N
<i>Mikania scandens</i>		Mile-a-minute	N
<i>Morinda citrifolia</i>	Indian mulberry	Lada	I
<i>Neisosperma oppositifolia</i>	Fago	Fago	I
<i>Pandanus tectorius</i>	Screw pine	Kafu	I
<i>Paspalum conjugatum</i>	Hilo grass		N
<i>Paspalum distichum</i>	Saltgrass		I
<i>Paspalum setaceum</i> v. <i>ciliatifolium</i>			N
<i>Passiflora foetida</i> v. <i>hispida</i>	Love-in-a-mist	Kinahulo' Atdao	N
<i>Passiflora suberosa</i>			N
<i>Pemphis acidula</i>		Nigas	I
<i>Pithecellobium dulce</i>	Kamachile		N
<i>Pipturus argenteus</i>		Amahadyan	I
<i>Pisonia grandis</i>		Umumu	I
<i>Plumeria obtusa</i>	White plumeria	Frangipani	E
<i>Plumeria rubra</i>	Red plumeria	Frangipani	E
<i>Polypodium scolopendria</i>			I
<i>Polyscias fruticosa</i>		Papua	N
<i>Portulaca oleracea</i> v. <i>granulato-stellutata</i>	Puslane	Botdolagas	I
<i>Rhoeo spathacea</i>	Moses-in-the-cradle		N
<i>Sansevieria trifasciata</i>	Bowstring hemp	Tigre	N
<i>Scaevola sericea</i>	Half-flower	Nanasu	I
<i>Sesuvium portulacastrum</i>	Seaside purslane	Chara	I
<i>Sophora tomentosa</i>	Silver bush		I
<i>Sorghum halepense</i>	Johnson grass		N
<i>Spathodea campanulata</i>	African tulip tree		N
<i>Sporobolus virginicus</i>	Beach-dropseed		I
<i>Stachytarpheta jamaicensis</i>			N
<i>Stenotaphrum micranthum</i>			I
<i>Suriana maritima</i>			I
<i>Terminalia catappa</i>	Tropical almond	Talisai	I
<i>Thespesia populnea</i>		Banalo	I
<i>Thuarea involuta</i>		Las-aga	I
<i>Tournefortia argentea</i>	Beach helitrope	Hunig	I
<i>Tridax procumbens</i>	Wild daisy		N
<i>Trimfetta procumbens</i>		Kamang unai	I
<i>Veitchia merrillii</i>	Manila palm		N
<i>Vernonia cinerea</i>	Santa Maria	Chagun	N
<i>Ximania Americana</i>	Pacific olive	Pi'ut	N
<i>Wollastonia biflora</i> v. <i>canescens</i>		Masigsig	I

Source: Raulerson and Rinehart 1992.

^a Types: I = Indigenous; N = Introduced/Naturalized; E = Introduced/Exotic.

Medicinal Plants on Managaha Island

Species	Reported by Raulerson and Rinehart (1992)	Reported by Kastor and Tebit (1981)
<i>Calubrina asiatica</i>		X
<i>Carica papaya</i>	X	X
<i>Casuarina equisetifolia</i>	X	X
<i>Cassytha filiformis</i>	X	X
<i>Colubrina asiatica</i>	X	
<i>Cordia subcordata</i>	X	X
<i>Cyperus kyllingia</i>	X	X
<i>Ficus prolixa</i>	X	X
<i>Ficus tinctoria</i> v. <i>neo-ebudorum</i>	X	
<i>Guettarda speciosa</i>	X	X
<i>Hernandia hymphacifolia</i>		X
<i>Hernandia Sonora</i>	X	
<i>Hibiscus tiliaceus</i>	X	X
<i>Hymenocallis littoralis</i>	X	X
<i>Ipomoea pes-caprae</i> ssp. <i>Brasiliensis</i>	X	X
<i>Morinda citrifolia</i>	X	X
<i>Neisosperma oppositifolia</i>	X	X
<i>Pandanus fragrans</i>		X
<i>Pandanus tectorius</i>	X	
<i>Passiflora foetida</i> ver. <i>Hispida</i>	X	X
<i>Pemphis acidula</i>	X	X
<i>Pipturus argenteus</i>	X	X
<i>Pithecellobium dulce</i>	X	X
<i>Polypodium scolopendria</i>	X	X
<i>Scaevola taceoda</i>		X
<i>Sesuvium portulacastrum</i>	X	X
<i>Sophora tomentosa</i>	X	X
<i>Terminalia catappa</i>	X	X
<i>Thespesia populnea</i>	X	X
<i>Tournefortia argentea</i>	X	
<i>Wollastonia biflora</i> v. <i>canescens</i>	X	X

Source: Raulerson and Rinehart 1992, and Kastor and Tebit 1981.

Weeds, Pests, and Hazardous Plants on Managaha Island

- *Achyranthes aspera*
- *Amaranthus viridis*
- *Bidens alba*
- *Blechum brownie* v. *puberulum*
- *Cenchrus brownie*
- *Cenchrus echinatus*
- *Chloris inflata*
- *Chromolaena odorata*
- *Cuscuta campestris*
- *Cycas revoluta*
- *Cyperus javanicus*
- *Cyperus rotundus*
- *Dactyloctenium aegyptium*
- *Desmanthus virgatus*
- *Digitaria insularis*
- *Eleusine indica*
- *Eragrostis amabilis*
- *Euphorbia glomifera*
- *Euphorbia hirta*
- *Eustachys petraea*
- *Mikania scandens*
- *Pandanus tectorius*
- *Paspalum distichum*
- *Passiflora suberosa*
- *Sorghum halepense*
- *Strachytarpheta jamaicensis*
- *Thevetia peruviana*
- *Tridax procumbens*
- *Vernonia cinerea*

Source: Raulerson and Rinehart 1992.

Exotic Plant Species that Should be Removed from Managaha Island

- *Cenchrus brownii*
- *Cenchrus echinatus*
- *Achyranthes aspera*
- *Thevetia peruviana*
- *Bidens alba*
- *Chromolaena odorata*
- *Mikania scandens*
- *Cuscuta campestris*

Source: Raulerson and Rinehart 1992.

APPENDIX C

A FRAMEWORK FOR THE MANAGAHA MARINE CONSERVATION AREA REGULATIONS AND ENFORCEMENT

REGULATION PROMULGATION

The small island of Managaha and its surrounding waters are intensively used by a large number of visitors. If not properly managed and regulated, this intensive, high-level of use can result in chronic impacts that cumulatively degrade or destroy the environment. Therefore, the DLNR will develop and promulgate regulations and implement those regulations in a manner that ensures the natural resources are protected and sustained while also providing for continued recreational and cultural uses. All regulations will be developed to meet the legal purpose of the conservation area as defined by Public Law 12-12.

REGULATORY ENFORCEMENT

The DLNR will need to implement regulatory compliance monitoring in the conservation area as a part of its routine monitoring activities. DLNR conservation officers will be tasked with this duty, although other DLNR staff, or staff from other agencies, also will be expected to report regulatory infractions, or apparent infractions, to the DLNR Conservation Officers when they become aware of such actions. The existing DLNR conservation officer staffing will not be adequate to meet such needs unless work requirements are shifted from other areas of responsibility.

Various CNMI agencies monitor coastal resources and/or developments that may affect coastal resources. The DLNR will work with those agencies that are mandated to monitor resources or activities in the conservation area, which in turn will help supplement DLNR's monitoring. Although these other agencies are not specifically charged with implementing this management plan, their monitoring and reporting assistance to the DLNR will be a welcomed supplement for the conservation area protection and management.

For example, the CRM and DEQ monitor coastal resources, typically pertaining to water quality issues related to development, land uses, and water discharges. The CRM and MPLA also specifically issue permits for the operations of the Managaha Island concessionaire. The DLNR is prepared to maintain a cooperative working relationship with these agencies to help them understand DLNR's requirements for the conservation area.

PERMITS

The DFW may issue permits for uses that otherwise may be restricted in the conservation area, as long as those uses are not contrary to the purpose of Public Law 12-12. The following uses are those that currently are expected to require DFW permits, as promulgated by law. The DFW also may develop requirements for other permits, as the need arises, and as acceptable to meet the purpose of Public Law 12-12.

- 1) The operation of a commercial services in the conservation area.
- 2) The collection or harvest of plant or animals or their parts for scientific, educational, or cultural uses.
- 3) The operation of education workshops, classes, or retreats.

- 4) The anchoring within the conservation area (outside the motorized vehicle management zone), for uses that do not significantly degrade coral reefs, such uses could include research by other agencies (i.e., HPO surveys).

PENALTIES

Person’s who knowingly violate any provision of Public Law 12-12, or the associated regulations, shall be fined not less than \$500.00, but not more than \$10,000.00. Each day that a violation occurs shall constitute a separate violation. In addition to any other applicable Federal or Commonwealth penalty that may apply (such as the Federal Endangered Species Act), any violation related to the taking of a wildlife or fish species regulated by the DFW may be adjudicated according to the provisions of 2 CMC Section 5109. Those penalties are outline here, and 2 CMC Section 5109 defines the specific details.

Type of Violation	Endangered/Threatened Species (Hunted, Harvested, Fished and/or Taken)	Other Protected or Regulated Species (Hunted, Harvested, Fished and/or Taken)
Criminal	\$5,000 maximum fine and/or up to 6 months in jail	\$2,000 maximum fine and/or up to 30 days in jail
Civil	\$500 to \$5,000 maximum fine	\$100 to \$1,000 maximum fine

APPENDIX D

**PLANNED OR PROPOSED SURVEYS, RESEARCH, AND
ECOSYSTEM RESTORATION IN THE
MANAGAHA MARINE CONSERVATION AREA**

Marine

Fisheries Monitoring

The DFW has conducted annual surveys of fish species in the Managaha Marine Conservation Area beginning in 1999 (Trianni 2003). Results from these surveys are being used to monitor fish population changes through time and to assess the effectiveness of marine conservation area protection. These surveys will continue to be conducted annually for the foreseeable future in order to establish a strong baseline of data that can be effectively used for comparisons through time. This work is currently be funded by the U.S. Fish and Wildlife Service.

Coral Reef Monitoring

The DFW will assess the needs for a DFW coral reef monitoring study that would survey and monitor coral reefs through time. As part of this assessment, the DFW will evaluate other ongoing coral reef studies inside and outside the conservation area, and the known or potential areas of reef impacts. If there is a need for such monitoring, then the DFW will design and implement surveys of coral reefs, or work with other agencies to help ensure those studies are implemented. These surveys may consist of permanent plots that would be randomly distributed among stratified grids in areas of high visitor use and low visitor use, for comparison purposes. Or the surveys could potentially use visitor exclusion methods and materials for plots placed in high visitor use areas to assess coral reef recovery once visitor disturbances are removed. Alternatively to, or simultaneously with those studies, there could be surveys of coral reefs along the same transects used for the fish monitoring surveys (described above) to monitor habitats that are associated with the fisheries surveys. There is no cost estimate for this work at this time.

Water Quality Restoration

Reducing or eliminating the numerous known and potential sources of pollution in the Tanapag Lagoon will require the efforts of numerous other agencies. For example, the DEQ has notified the Commonwealth Utilities Corporation (CUC) that discharges from the Sadog Tasi treatment plant do not meet Environmental Protection Agency (EPA) water quality standards. To date, the CUC has not corrected that problem. Therefore, the matter has been forwarded to the CNMI Attorney General's Office for legal action.

Pollutants also have been shown to be leaching from the Puerto Rico solid waste landfill (now closed), although the exact amount and rate is unclear at this time. The CNMI Government is working with the EPA to design and find funding for the final closure of that landfill, in compliance with an EPA Administrative Order issued against the CNMI in 1994 for violations of the Clean Water Act.

Non-point pollutants resulting from surface water runoff originates from Tanapag Lagoon watersheds, although the exact amount and extent is uncertain. Numerous agencies (CRMO; DEQ; Natural Resource Conservation Service (NRCS); Coral Reef Task Force; etc.) have or are proposing projects in the watershed to reduce that pollution. The CRMO may be an agency for assessing those impacts as well as coordinating a comprehensive approach to reducing that

erosion by using methods such as storm water runoff retention ponds, improving drainage systems, and possibly paving secondary roads in the watershed, particularly those closest to the lagoon.

The DLNR is willing to assist CRMO, DEQ, and other agencies with resolving these issues, although it is assumed that the CRMO and DEQ will take the lead on these issues since they fall within the mandates and expertise of those agencies. Some of the issues described above will require multi-agency cooperation to reach solutions. For example, the DEQ, CRMO, NRCS, and the Department of Public Works (DPW), along with the DLNR, could combine their efforts into a Tanapag Lagoon Task Force which would assess and address these known and potential pollution issues.

Table D-1. Estimated additional funding needed for surveys, research, and habitat enhancement in the Managaha Marine Conservation Area during the first 15 years.

SURVEY AND RESEARCH TASKS	PRIMARY LABOR SOURCE	ADDITIONAL COSTS PER YEAR	COST PERIOD	TOTAL ADDITIONAL COST FOR YEARS 1- 15
Marine				
Fisheries monitoring	DFW Scientists	Not expected at this time	---	USFWS funding supplemented by other sources
Coral Reef monitoring	DFW Scientists	\$8,000	Years 3-9	\$40,000
Restoration of Tanapag Lagoon water quality	DEQ / CRMO	Unknown	Unknown	Unknown
Restoration of Managaha Island beach water quality	MPLA / DEQ / CRMO	Unknown	Unknown	Unknown
Terrestrial				
Shearwater research	DFW Scientists	\$10,000	Years 3-5	\$30,000
Shearwater habitat enhancement	DFW Scientists	\$7,000	Years 3-7	\$28,000
Rat monitoring and control	DFW Scientists	\$3,000	Years 1-15	\$45,000
Forest restoration	DFW Scientists	\$10,000	Years 5-8	\$40,000
Plant community monitoring	DFW Scientists	\$5,000	Every 5 th Year	\$15,000
Erosion control	Corps of Engineers	---	Not planned	Not planned
Terrestrial Subtotal				\$158,000
Total for the first 15 years	---			\$198,000

Terrestrial

Wedge-tailed Shearwater Research

Managaha Island is the only known location in the CNMI where wedge-tailed shearwaters are nesting. Currently, most nesting occurs on the eastern portion of the island, although some nesting also occurs elsewhere on the island. Detailed studies are needed of the nesting cycle, habitat requirements (i.e., soil and vegetation cover preferences), and potential impacts of users on the nesting, as well as methods for reducing those impacts. This information will be essential for helping DFW to develop effective habitat protection, restoration, and management of future visitor use patterns. Estimated timing and costs for these studies are provided in Table D-1.

Wedge-tailed Shearwater Habitat Enhancement

During 2003, the DFW implemented habitat enhancement measures for the wedge-tailed shearwater by: 1) re-routing a trail that bisected a nesting area; 2) restoring plant growth on the closed trail; 3) posting signs for no-entry into the core nesting area; and 4) introducing rodenticide bait stations across the island to eradicate rats, which are a nest predator. Refined habitat enhancement, protection, and habitat restoration measures will be introduced once additional information is developed regarding wedge-tailed shearwater habitat use patterns and adaptability with visitor uses. This work will help provide effective means for blending shearwater conservation with visitor uses of the island. Estimated timing and costs for this work is provided in Table D-1.

Rat and Cat Population Monitoring and Removal

The DFW has conducted rat (*Rattus* sp.) trapping and removal from Managaha Island during 2003 and 2004 with excellent success, and cats were trapped during previous years. This work appears to have eliminated cats, and most, if not all, rats from the island. The DLNR continues to monitor and bait the rat population, with the ultimate goal of eliminating those pests from the island (Hawley 2004, pers. comm.). Even if rats are totally removed from the island, they could reestablish a population, such as from an accidental introduction from boats that dock or beach on the island. Therefore, the DFW recommends that rodent snap-trapping and rodenticide baiting be conducted twice each year (e.g. every 6 months) for a minimum of two weeks to monitor and control rats. Table D-1 includes estimates of timing and costs for this work.

Forest Restoration

Plant communities of Managaha Island include numerous non-native and invasive plant species. Some of these species have the potential for spreading and dominating native plant communities, which in turn can significantly degrade the overall quality of the ecosystem and visitor experience. Additionally, plant communities in some areas of the island have been significantly impacted by visitor uses, which also adversely affect the value of the island as a visitor destination, as well as leading to other adverse impacts, such habitat degradation, and soil and beach erosion. A variety of measures could be instituted to help reduce or eliminate those adverse impacts.

The DFW proposes to implement a long-term forest restoration program on Managaha Island to reduce or eliminate exotic, invasive plant species and to establish additional native trees. The previous plant species surveys conducted on Managaha Island during 1985 (PBEC 1985a) and 1992 (Raulerson and Rinehart 1992) provide an inventory of species; however, the location of various key species and/or plant communities has not been defined. Therefore, the first step for this project will be to conduct plant community assessments to determine what communities and/or areas require restoration. The subsequent steps will involve restoration planning and implementation. A framework of suggestions for such assessments and planning is included at the end of this appendix. The estimated timing and costs for this assessment and restoration work are provided in Table D-1.

Plant Community Monitoring

The DFW will establish a plant community monitoring system using photo points to gain a general overview of changes in those communities through time. The photos will be taken at permanent markers that are also designed to be non-hazardous to visitors. Photos will be taken at 5 year intervals (or other intervals as needed to assess changes) using precise techniques that allow for comparisons among years. The intent of the photo surveying is to gain a long-term perspective of major changes of the plant communities, particularly near the most intensively used areas. More intensive vegetation inventories (i.e., plant survey plots and transects) may be

implemented at a later time, if the photo points or other indications show those detailed assessments are needed to document detailed plant changes through time. Table D-1 includes estimates of timing and costs for this work

Erosion Control

The U.S. Army Corps of Engineers has developed numerous alternatives for reducing or eliminating the shoreline erosion that they surveyed on the east side of Managaha Island (USACE 2001). Those alternatives, and their estimated costs, are the: installation of a groin (\$300,000), beach-fill berm (\$105,000), low profile breakwater (\$500,000), or armoring with revetment (\$500,000). The Corps also stated that an additional estimated \$400,000 would be needed for designing, constructing, equipping, and calibrating a scale model of the island to mimic water flow and erosion patterns. Results from this modeling would then be used to develop erosion control structures.

Erosion control measures are not proposed for Managaha Island at this time. Preliminary beach erosion surveys indicate the rate of erosion has declined from the original surge that occurred during 1995 to 2001, and there are indications the island beaches may be stabilizing. Monitoring will be continued during future years to determine the extent of beach stabilization.

A FRAMEWORK FOR HABITAT RESTORATION ON MANAGAHA ISLAND

The following are components that could be included in vegetation restoration plans for Managaha Island.

- Project goals
- A map of proposed restoration site boundaries
- Description of the restoration methods, such as natural regeneration, seeding, transplanting, and erosion control
- A list of plants (native species only) that will be transplanted and their sources
- Fencing, signing, or other visitor use controls needed to protect the site
- Personnel and resources needed for preparing the sites, planting, and follow-up maintenance and monitoring
- Schedule for plant propagation, site preparation, planting, and maintenance
- Needs for removing and disposing non-native plant materials

Prospective restoration sites could be prioritized according to the following criteria.

- Size and degree of adverse impact to the environment over the short and long-term
- Potential for the impacts to spread to other areas
- The amount and dominance of non-native species on the site
- The presence of invasive plant species and the potential for their expansion
- The availability of native planting stock and capabilities to produce such stock
- The costs, time, and personnel needed to restore each site
- The overall cost/benefit effectiveness of the restoration work
- The effects of restoration on the broader ecology, including native plants and animals

APPENDIX E

RECOMMENDED VISITOR EDUCATION PROJECTS FOR THE MANAGAHA MARINE CONSERVATION AREA

Visitor Information Center

Primary points of entry into conservation areas are critical locations for educating visitors about the area, uses, and regulations. Visitor Information Centers placed at these key entry points are an extremely cost effective method for reducing environmental impacts and enhancing the visitor's experience. Managaha Island is ideally suited for such an information center because nearly all visitors arrive on the island at one point. This type of entry-point educational center should be the highest priority for management projects on Managaha Island due to the high number of visitors that intensively use such that small island and its vulnerable resources.

A high quality visitor information center should be established on the island near where the pier meets the beach (preferably in or near tree shade) to help educate visitors and reduce resource degradation. This visitor information center structure should consist of a typhoon-resistant kiosk or a pavilion center that has a roof that fully or partially protects visitors from sun and rain. The kiosk area should be large enough to accommodate the large groups that arrive by tour boat. Information panels within the kiosk should be large and widely spaced to accommodate large groups sorting through the information. Text should be provided in multiple languages to address each of the four or five primary user groups. The following information is recommended for the panels.

Information Panel	Summary of Content
Introductory information	Brief text introducing visitors to the conservation area
Conservation Area Map	A large map showing the conservation area boundaries and locations of facilities, use zones, nature trails, pavilions, swimming areas (including the underwater trail), historic and cultural resources. This map will reference information from other panels through symbols and labels (i.e., swimming areas, management zones, historic sites).
Use Guidelines and Regulations	An introduction to recreational uses and facilities including guidelines and regulations for conservation area use.
Natural Resources	Text, photos, or sketches of marine and terrestrial flora and fauna.
Cultural and Historic Resources	Text, photos, or sketches of cultural and historic sites and uses.

The Visitor Information Center also could include a protected location for the Conservation Area pamphlets and nature trail brochures. This system could include a voluntary visitor payment process where a nominal fee (i.e. 25 cents) could be deposited for each item into a lock-box at the Visitor Information Center. Visitors also could be asked to return (and recycle) their brochures at the same site where they picked them up, if they do not wish to take them from the island. The printing and restocking of those pamphlets and brochures could be integrated into the concessionaire's responsibilities by making it a condition of CRM and/or MPLA permits. If such a condition is made, the concessionaire also could be allowed to keep funds paid by the visitors.

Pamphlets and Brochures

As part of the comprehensive approach to visitor education, a pamphlet also should be developed that includes a brief description of the conservation area (including a map) and its uses (such as recommended swimming areas, and trail system), management zones, and a summary of regulations and visitor use guidelines. The pamphlet could generally consist of some of the same information provided at the Visitor Information Center kiosk panels, albeit tailored to the space and attractiveness desired for a pamphlet. Recommendations for printing and distribution are provided in Section 5.0 of this management plan. These recommendations include making the printing and restocking a responsibility of the Managaha Island Concessionaire, while also allowing them to retain the fees that are voluntarily paid by the visitors. A copy of the existing DLNR pamphlet, that applies to all Saipan marine conservation areas, is provided on the following pages.

Posters

Moderately large laminated posters will provide a cost effective means for conveying important conservation area information to the public on a continual basis. These posters would be posted where they best reach potential Managaha visitors or agency staff that can relay the information to the public. For example, the posters could be displayed on the tour boats, at the front offices of the DFW, DLNR and other agencies, the concessionaire permittee's office, and at the visitor facilities on Managaha. These posters could be produced by the same firm that is contracted to produce the Kiosk panels, or they could be created earlier if that project will require an extended timeline. Information recommended for the posters includes: 1) a brief introduction to the conservation area and its natural resources; 2) a map, including management zones, recreational facilities, trails, and historic sites; and 3) a summary of regulations and visitor use guidelines. At least half the posters should be laminated to make them weather resistant.

Managaha Environmental Education Center

An environmental learning center could be developed on Managaha Island that provides detailed information pertaining to marine and island ecosystems. Templates for such centers are found at National Park visitor centers where general visitor information is combined with an environmental learning center that include, wall maps, panels with photos and text, 3-D images, and videos. However, the learning center on Managaha Island could be a separate facility integrated into the existing visitor service buildings which are located approximately 200 m from where the proposed Managaha Visitor Information Center would be located (as described above).

The size and detail of an environmental learning center on Managaha Island could vary from a small (i.e., 20 m²) simple facility that is limited to wall panels and possibly displays of corals, or it could be a much larger facility that provides more comprehensive education. This center could be made to be self tutorial or be managed by part-time DLNR or concessionaire staff and supplemented with volunteers from the local community.