

Marine Protected Area Program Master Plan



**A manual to guide the establishment and
management of no-take marine protected areas**

Risa Grace Oram

DEPARTMENT OF MARINE AND WILDLIFE RESOURCES



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Executive Summary

Purpose of this master plan

The Marine Protected Area (MPA) Program Master Plan is meant to be a simple and easy to follow step-by-step roadmap to assist the American Samoa Government (ASG), Department of Marine and Wildlife Resources' MPA Program in meeting the goal to ensure protection of unique, various and diverse coral reef habitat and spawning stocks. This will also assist efforts to meet the Governor's mandate of protecting 20% of American Samoa's coral reefs by declaring no-take MPAs.

The MPA Program Master Plan will provide new Program Leaders with a description of the activities that the MPA Program staff has been involved with, along with a vision of what is to come, and a foundation upon which to move forward. This structured guide will allow MPA Program Leaders to track their progress towards creating no-take MPAs. It is hoped that this plan will help to minimize the loss of institutional memory due to high staff turnover.

The Master Plan will help the local staff to understand what activities the MPA Program plans to conduct. By having a plan, the MPA Program can be more transparent with the public by announcing opportunities for the public to be involved in implementing no-take MPAs. This long-term plan will help to guide the writing of future grant proposals and can assist the coordination of activities with other natural resource agencies and entities.

This Master Plan is written with the assumption that the MPA Program staff and budget will remain at about the same level throughout implementation (1 program leader and 2-3 staff, plus volunteers). If opportunities arise to increase staff and funding, the timeline may change for activities. Also, additional activities may be undertaken.

How the manual is organized

The introduction discusses the importance of American Samoa's reefs and some of the threats that they face. MPAs are discussed as a tool to address the threats occurring to coral reefs.

Section one of the Master Plan discusses the MPA Program process and the activities that the MPA Program will conduct as it moves toward implementing 20% of American Samoa's coral reefs as MPAs. The four phases of the MPA Program Process are meant to be followed sequentially, they include: research phase; candidate phase; proposal phase; and implementation phase.

Section two describes some of education and outreach tools and themes that the MPA Program will use to educate the general public and to engage specific stakeholders throughout this process.

Section three describes the scientific exchange and capacity building activities that the MPA Program will undertake throughout the MPA implementation process. A description of some of the conferences and workshops already attended is given. Several additional conferences are suggested as venues for exchanging scientific information about the MPA Program. Further, a description of the training activities that the current MPA Program staff has already undertaken (at the time of writing this plan) is given along with recommendations on future training needs.

The appendices of this manual include several supporting documents that will assist the MPA Program staff with implementing no-take MPAs, including: an activity timeline checklist that should help to guide the staff by showing a big picture of activities they should undertake and in what order. Also included are a list of biologically important areas (based on a previous territorial planning meeting) and a list of contact information for key partners. Future Program Leaders can update and add to these appendices as further documents are developed.

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Preface

Coral reefs are an important natural resource in American Samoa providing protection, food, and other benefits. American Samoa's reefs have suffered numerous destructive threats including fishing impacts (over fishing, outsiders fishing, illegal fishing) and poaching of sea turtles. Marine Protected Areas (MPAs) are one form of management that can be used to address some of these threats to the reefs. Studies have shown that well-designed no-take reserves are particularly effective in maintaining biodiversity, productivity and ecological integrity of coral reefs (NOAA, 2002). MPAs also maintain trophic systems and enhance ecosystem resilience.

In 2000, the U.S. Coral Reef Task Force (USCRTF) adopted the Coral Reef National Action Plan that set the goal of establishing 20% of all U.S. coral reefs into no-take MPAs (USCRTF, 2000). Following the recommendation by the USCRTF, late Governor Tauese Sunia requested a plan be developed for protecting twenty percent (20%) of Territorial coral reefs as "no-take" MPAs (Sunia, 2000). Former Governor Sunia directed the Coral Reef Advisory Group (CRAG¹) to develop the plan. Numerous planning efforts continued from this point and are explained below.

The Department of Marine and Wildlife Resources has the power and duty to manage, protect, preserve and perpetuate the marine and wildlife resources in the Territory (ASC, 2007a). Consequently, DMWR is the primary agency responsible for making regulations on take of marine resources and for no-take MPA management and enforcement. DMWR, utilizing Coral Reef Initiative (CRI) funds, began a MPA program in 2000 to begin implementing the Governor's 20% no-take MPA declaration as part of their Federal Assistance for Sports fish Restoration 2000-2005 five-year plan.

Meanwhile in 2002, CRAG sponsored a workshop to produce an integrated plan for increasing collaboration among agencies and identifying potential areas for the establishment of no-take MPAs. During this workshop, the decision was made to hire an MPA Coordinator to develop this plan, building upon the results of the workshop and to ensure coordination of American Samoa MPA activities. In 2004, CRAG hired the MPA Coordinator, Ms. Risa Oram, who then developed several drafts of an American Samoa Coral Reef MPA Strategy (Oram, 2005a and Oram, 2006) and worked to ensure coordination among territorial agencies and that best management practices were followed.

In 2006 Ms. Risa Oram completed her contract with CRAG and was hired to lead the MPA Program at DMWR. At that point, the primary source of funding for the MPA Program was changed from CRI to Federal Assistance for Sports fish Restoration. Federal Assistance for Sports fish Restoration grants continues to be the primary source of funds for the MPA Program from 2007 to 2011. Two assistants were hired and staff

¹ CRAG is a collaboration of five different agencies in the Territory, all of which have some link to the coral reef environment: The Department of Marine and Wildlife Resources (DMWR); the Department of Commerce (DOC); American Samoa Environmental Protection Agency (ASEPA); the American Samoa Community College (ASCC); and the National Park of American Samoa (CRAG, 2007).

began to conduct biological surveys to select sites to become no-take MPAs. A Master Plan for the MPA Program was being conceptualized at this time.

In 2007 Chromis, an MPA policy consulting company, was selected by CRAG to finalize the American Samoa Coral Reef MPA Strategy with a goal to effectively coordinate existing and future MPAs to ensure the long-term health and sustainable use of the Territory's coral reef resources. The emphasis of the strategy is on collaboration and integration among the agencies within the existing programs through enhanced coordination and integration of education, research and monitoring, enforcement, and program administration.

In 2008, DMWR finalized this MPA Program Master Plan to assist the MPA Program in meeting the goal to ensure protection of unique, various and diverse coral reef habitat and spawning stocks plus meet the Governor's mandate of protecting 20% of American Samoa's coral reefs by declaring no-take MPAs.

Introduction

Importance of American Samoa's reefs

American Samoa is a group of seven islands located 14° S 170° W in the South Pacific Ocean. The inhabited islands of American Samoa are Tutuila, Aunu'u, Ofu, Olosega, Ta'u, and Swains. These islands are characterized by a natural reef flat that extends steeply to the shelf. Rose is the only atoll reef and is being co-managed by the American Samoa Government (ASG) and the United States Fish and Wildlife Service (USFWS). Other reef areas are located on the offshore banks (i.e. Taema, Nafanua, East and South).

American Samoa's total coral reef area has been reported in different ways by various authors. The disparity is based on the water depth measured, whether offshore banks were included, and the base maps that were used. Therefore, a total coral reef area for the territory has not been agreed upon. A declaration by the Department of Marine and Wildlife Resources (DMWR) of the total coral reef area is crucial for understanding how the Territory plans to protect 20% of the coral reefs as no-take MPAs.

“Coral reefs are an important natural resource in American Samoa. Not only are they important habitats for fishes, but for traditional and recreational activities as well” (Saucerman, 1995). Coral reefs provide protection, food, medicines, plus social, cultural, economic and aesthetic benefits. The significance of fishing traditions and practices in the social, economic, and ceremonial aspects of the Samoan way of life (Fa'aSamoa) have been documented by several studies (Kramer, 1902; Buck, 1930; Copp, 1950; Schultz, 1953; Auap'au, 1956; Holmes, 1974; Severance and Franco, 1989) making coral reefs at the center of their cultural heritage. A recent economic valuation study conducted by Jacobs Inc. indicated that the current total annual coral reef value (US\$/year at 2004 market prices) of American Samoan reefs is \$10,057,000. The current total product added value of the direct coral reef subsistence fishery is estimated to be around US\$ 544,000/year (Jacobs, et al. 2004).

Threats to American Samoa's reefs

American Samoa's reefs have suffered numerous ecologically destructive events. “Natural events include a crown-of-thorns starfish infestation in 1978, hurricanes in 1987, 1990, and 1991, which reduced much of the live coral to rubble, and a massive coral bleaching event in 1994. Live coral cover has dropped from 60% in 1979 (Wass 1980 in Saucerman, 1995) to 3-13% in 1993” (Maragos et al. 1994 in Saucerman, 1995) and 22-34% in 2006 (Fenner et al. in Waddell et al., 2008).

The reef ecosystem has also been impacted as a result of significant human population growth that has occurred over the last two decades. American Samoa has a population of 64,000 people and a high population growth rate of 2% per year (American Samoa Statistical Yearbook, 2001). Rapid development and the accompanying environmental degradation have affected the South of Tutuila Island in many ways: road encroachment on shoreline, new construction, siltation problems, an increase in the amount of waste

that the canneries discharge into inner Pago Pago Harbor until the mid-90's (Coutures, 2003).

“Added to this are continuing land-based human-induced impacts such as eutrophication and sedimentation which inhibit recovery of the coral reef ecosystem.” (Saucerman, 1995). Eutrophication and sedimentation are likely responsible for the destruction of many coral reefs in Pago Pago Harbor (Banner and Bailey, 1970, Caperon, et al. 1971, Smith, et al. 1973 in Dahl and Lamberts, 1977). Sedimentation is significant because “...elevated levels of suspended sediment (and nutrients) represent perhaps the greatest single human-induced threat to nearshore reef that has been documented to date...” (Hubbard, 1997).

ASEPA regularly highlights the chronic negative environmental impacts occurring in the waters of American Samoa (likely due to unsafe piggeries and sewage systems) through weekly Beach Advisory notifications in the Samoa News newspaper. Advisories are issued when *E. coli* bacteria (an indicator of contamination by human and/or animal wastes) concentrations exceed levels determined safe for human exposure (ASEPA, 2005). Coral reef organisms are susceptible to diseases caused by pathogens and parasites as well as to those conditions caused or aggravated by exposures to anthropogenic pollutants and habitat degradation (Peters, 1997). Fish caught in the inner Pago Pago Harbor are seriously contaminated with lead, other heavy metals and other contaminants. The fish in the inner Pago Pago Harbor are not safe to eat, and the sale of these fish is prohibited (ASEPA, 1991).

Uncertainty of the status of coral reef fishery prevails in American Samoa. Scientists are in disagreement as to what is occurring with coral reef fish stocks. One view presents that some species (particularly large bodied fish species) have been over fished due to infrequent encounters on the reef and sightings recorded on belt transects. The opposing view holds that other factors may have contributed to the present distribution (i.e. habitat variations, degradation of shallow juvenile fish habitats) since they have not been specifically targeted in the subsistence and commercial fishery which has shown a significant decrease in effort in the past 30 years. Nonetheless, MPAs can provide insurance against scientific uncertainty in fisheries management (Roberts and Hawkins, 2000).

MPAs as a management tool

MPA is one form of management that can be used to address many threats to the reefs. The U.S. Government defines MPAs as “Any area of the marine environment that has been reserved by Federal, State, Territorial, tribal or local laws or regulations to provide lasting protection to part or all of the natural or cultural resources therein” (Executive Order 13158, 2000). MPAs are designated for special protection that enhances the management of marine resources. No-take reserves, also called no-take areas, ecological reserves, harvest refugia, and fully -protected MPAs; are one type of marine protected area where all extractive uses are prohibited. Many studies have shown that no-take reserves are particularly effective in maintaining biodiversity, productivity and ecological integrity of coral reefs (NOAA, 2002). The use of marine reserves in the management of fisheries on coral reefs, has been advocated as a cost-effective strategy to sustain fish stocks (e.g., Alcala, 1988; Davis, 1989; Alcala and Russ; 1990, Bohnsack 1990, 1993, Polacheck, 1990; Roberts and Polunin, 1991; Carr and Reed, 1993;

DeMartini, 1993; Dugan and Davis, 1993; Polunin and Roberts, 1993; Rowley 1994; and Man, et al. 1995 in Russ and Alcala, 1996).

MPAs are valuable for managing biodiversity, trophic structure function and ecosystem resilience. (Bellwood, et al., 2004; Hughes, et al., 2003; Sobel and Dahlgren (eds), 2004; Lubchenco, et al., 2003 in Hughes et al., 2005). The most commonly documented effects that marine reserves have on marine ecosystems are those in which the abundance, density, population structure or composition of exploited species is changed within them. By eliminating fishing and other forms of exploitation from an area, a significant source of mortality is removed, and a greater number of target or exploited fish and invertebrates survive (Sobel and Dahlgren (eds), 2004). MPAs can also protect ecosystem services provided by natural communities, including "...goods (e.g. seafood and shells...), life support processes (e.g. carbon sequestration, nutrient recycling), quality of life (beauty, enjoyment of natural seascapes), and potential future uses (drug discovery, genetic diversity) (Daily, et al., 2000 in Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, et al., 2001). In addition, MPAs can support the maintenance of marine ecosystems and the services they provide, including water purification; protection of coastal areas from storm damage, bioremediation of chemical spills.

MPAs are likely to ensure the conservation of diverse species assemblages and maintain genetic diversity by preserving representative ecosystems (Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, et al., 2001). Opportunities for the public to learn about the diversity of marine life and how human activities both on land and sea affect the health of the marine environments are also afforded by MPAs.

On August 2, 2002 Governor Tauese Sunia requested a plan be developed for coral reef protection to reach the goal of protecting twenty percent (20%) of territorial coral reefs as "no-take" MPAs (Sunia, 2000). To ensure effective management, the ASG has acknowledged the need for a MPA Master Plan that can guide the creation of new no-take MPAs.

The MPA Program goal is to establish permanent no-take areas in order to ensure protection of unique, various and diverse coral reef habitat and spawning stocks in order to meet the Governor's mandate of protecting 20% of American Samoa's reefs as no-take MPAs.

SECTION 1. NO-TAKE MPA PROGRAM PROCESS

The process that will be followed in order to launch the MPA Program and to ultimately create no-take MPAs is described in this section and is shown in Figure 1 below. The different phases involved in this process include: 1) research phase; 2) candidate phase; 3) proposal phase; and 4) implementation phase. The following subsections describe the four phases of the MPA Program process. Within each phase is a description of specific program responsibilities with its corresponding activities. Activities that DMWR accomplished at the time of writing this manual are described. Future activities that DMWR shall undertake are also described.

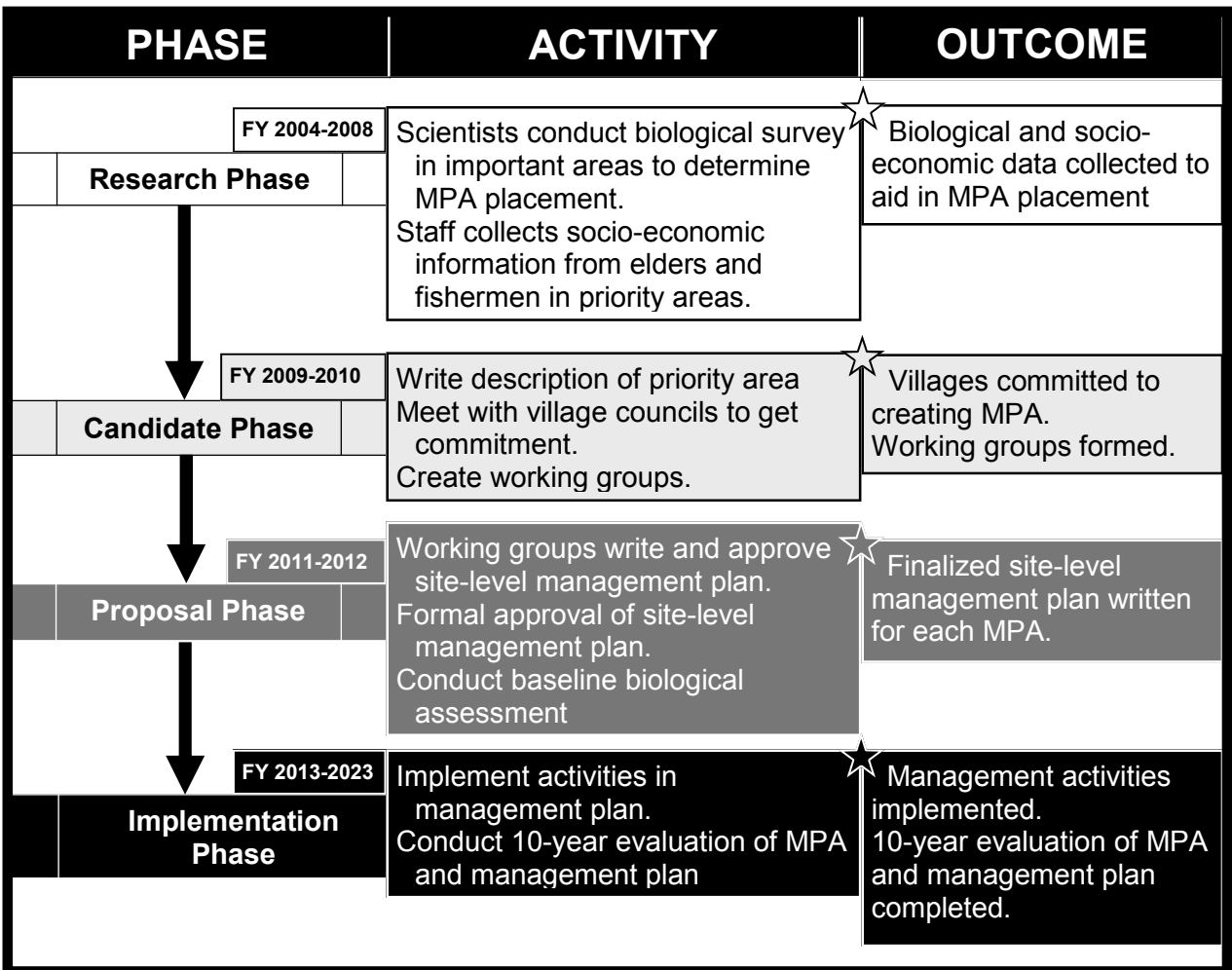


Figure 1. MPA Program Process Diagram

Research phase (FY 2004 – 2008)

Biological reconnaissance survey

The research phase began in 2004 with a review of available scientific literature and documentation of data and professional opinions from scientists and natural resource managers about potential MPA sites. Reports from biological research conducted in American Samoa were reviewed and recommendations for potential no-take MPAs were extracted. Scientists and managers were also consulted regarding their professional opinions about appropriate sites to establish no-take MPAs within the territory. The scientific literature and local knowledge was compiled that included a description of the site, reason for its biological importance, potential management authority, and source of the recommendation. A territorial planning meeting was held with the purpose of reviewing the information, adding recommended sites and prioritizing these sites based on data and professional opinions of local landowners, scientists, natural resource managers, tourism representatives and existing MPA authorities. As a result, the document was updated to incorporate newly recommended sites (now totaling 34 sites) and listed sites from highest to lowest priority in order of biological importance (Oram (ed) 2005b - See Appendix 2. Biologically important areas). Note that the reasons for the site recommendations by members of the planning team varied based on their observations and data gathered from those sites (i.e. either from biodiversity, coral cover, studying fish biomass, or presence of unique site characteristics, etc.).

DMWR began a biological reconnaissance survey in August 2005 in order to evaluate the 34 recommended sites from the territorial planning meeting. The MPA Program staff began surveys in areas highly recommended by scientists around Tutuila. Figure 2 and Figure 3 below show the sites that have been surveyed and those remaining at the time of writing of this manual.

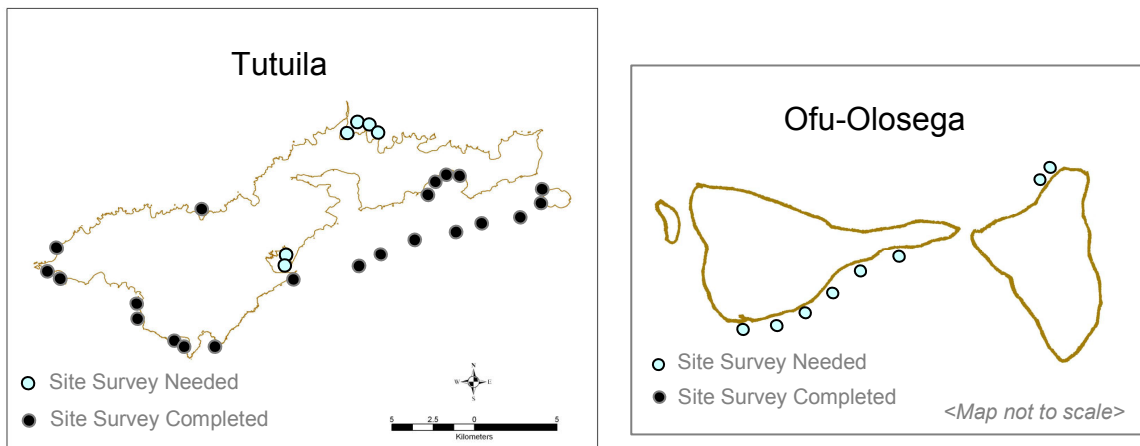


Figure 2 Tutuila, Ofu and Olosega biological reconnaissance sites

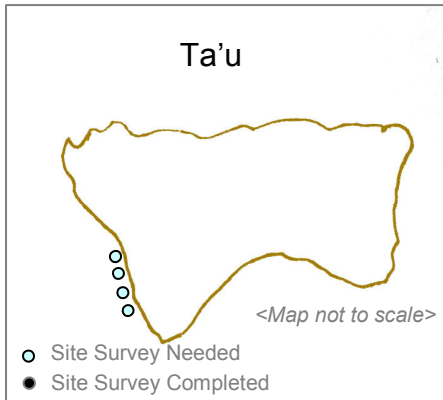


Figure 3 Ta'u biological reconnaissance sites

The objective of the biological reconnaissance survey is to get a standardized quantitative overview of the biological and ecological attributes of these recommended sites. This would address the issue of variability in the reasons why the site was recommended as a possible no-take site. This broad-scale comparison of biological and ecological parameters is expected to provide managers with basic information for informed decision making. This biological reconnaissance survey allows the scientists to make objective and standardized observations of all sites. The survey provides actual data on which the MPA Program can base recommendations for creating MPAs. The biological reconnaissance survey is conducted by a two-diver team, one assesses fish and the other assesses benthic parameters. Two non-overlapping roving dives were conducted on the reef slope of each site at depths between 10-26m (for offshore submerged reef sites, the dive was conducted along the top and edge of the reef).

For the benthic survey, the total observation period of the timed swim is divided into eight five-minute observation stations. Instead of using a transect tape, the divers followed the reef contour starting at deeper depths. Each sampling station has a 5 meter radius giving an area of is 78.5 m^2 . A total of 628 m^2 was covered during each dive. Upon descent to desired depth, observations were made for five minutes at the first station. The divers then swam 10 meters ahead and began sampling the second station for five minutes, and so on until all eight stations were sampled. In the analysis, every 5-minute sample station was considered as 1 sampling point ($n=8$ or $n=16$ depending on the size of the site). Each diver records supplementary data like cloud cover, sea state and visibility. The diver surveying benthic parameters scores level of disturbance occurring, coral abundance, % coral cover, coral diversity, % algae cover, invertebrate abundance and diversity, species uniqueness and habitat uniqueness. Each of these parameters were scored on a scale of 0 to 10 representing parameter values increasing exponentially along the progressive scale. For example, 0 equals no individuals or instances found; 1 equals one to two individuals or instances noted; 2 equals three to five individuals found; 9 equals 25% to 49% individuals or instances noted; and 10 equals 50% to 100% individuals or instances noted. For disturbances such as coral bleaching or solid waste pollution, the parameters were scored using the same scale, except that a negative value was assigned to it (thereby reducing the total site score).

The fish reconnaissance survey involved the same roving dive procedure where the observer runs a continuous visual count estimate of the fish population for each 5-minute observation period. The dominant species by size and numbers were recorded and an average length estimate for the dominant group of fish was recorded. A cumulative species listing was made for the whole dive, and not per observation period, to determine relative fish species diversity per site. Damselfish, gobies and blennies were not included in the survey in the interest of time. Special attention was given to the detection of species of concern like *Bulbometopon muricatum* (bumphead parrotfish), *Cheilinus undulatus* (humphead wrasse) and all *Elasmobranchii* (sharks and ray species). Occurrences of these species in a particular site may indicate habitat utilization that needs to be protected since these species are considered vulnerable to over exploitation.

In addition to the biological reconnaissance survey on the reef slopes, this study will also assess the adjacent reef flat areas using a complementary method. After the reef slope and reef flat biological reconnaissance data has been collected, the survey team will add the scores for all of the parameters and get a total score for each site. Then, each site's biological priority will be ranked according to their total score.



The output from this activity is a written report showing biological reconnaissance survey results.

After the data has been analyzed, then the data will be entered into GIS format in order to make layers and maps that can assist with future outreach and extension efforts.



The output from this activity is a series of GIS maps showing biological reconnaissance survey results.

Socio-economic Research and Extension

As the MPA Program staff starts to analyze the biological data collected through the reconnaissance survey, some very high and high biological priority sites will begin to emerge. At that point, it will be important to target these higher biological priority sites and begin to work with the stakeholders involved. The stakeholder group that is engaged for each site will depend on which scenario best describes the site:

1. Offshore banks: For the offshore banks scenario, the stakeholder group is likely to be any of the resource users that utilize this area, rather than a single village or village council. As DMWR moves forward with planning management strategies for offshore banks, it will be important for them to engage these stakeholders. For the offshore banks, it is likely that DMWR will implement all the management activities in the area and will be responsible for any enforcement that occurs.
2. Unoccupied village and occupied village: For unoccupied and occupied villages, the stakeholder group is the village that claims jurisdiction over the area. The extension process that will be used to engage these villages will be very similar to the one used by the Community-based Fisheries Management Program. This process would

involve the Office of Samoan Affairs to make initial contact with the village, after which a formal meeting between the Director of DMWR and the village council is held. During this initial meeting, the MPA Program staff will discuss the MPA Program and the benefits of MPAs. Results from our research will also be presented to the community. The management activities that will occur in these sites will be determined by the village council and the MPA Program staff. Enforcement activities are likely to be conducted by both the village and the DMWR Enforcement Officers.

At the time of writing this manual, socio-economic research has already begun concurrent with the biological reconnaissance survey. The following sections describe two primary projects that will be undertaken in order to collect socio-economic information that is important to creating MPAs.

Traditional Knowledge

A Preserve America Initiative Grant (PAIG) titled “Documenting Traditional Knowledge of Marine Use and Resource Management in American Samoa” was applied for and awarded to Arielle Levine² of the Human Dimensions section of NOAA Pacific Islands Fisheries Science Center (Levine, 2007). DMWR is one of the primary partners for this grant and has agreed to help out in kind (staff time; transportation; facilitation; and coordination, etc) since this project has the potential to provide useful information to the MPA Program. This project will document traditional knowledge of marine use and resource management in American Samoa through the following components:

1. *Conducting interviews with elders from American Samoan coastal villages documenting traditional methods of fishing and natural resource management.*



The output from this activity is a report that transcribes and translates the information gained from the oral histories with elders that is at risk of being lost as elders pass away. This report will be accessible to partner organizations and the public.

2. *Film interviews with elders and individuals still engaged in traditional methods of fishing and produce a video documentary.*



The output from this activity is a video documentary of the interviews with elders, and additional historical information in order to provide a unique education and outreach material for partners in American Samoa.

3. *Recover existing information on traditional fishing and marine management.*



The output from this activity is the recovery of originals or copies of the tapes of interviews regarding traditional fishing that were conducted with select elders in 1997 under the supervision of Daniel Sua. The tapes of these interviews will be

² Contact Dr. Arielle Levine at Pacific Islands Fisheries Science Center (or PIFSC), 2570 Dole Street, Honolulu, HI 96822. Telephone: (808) 983-5739. Email: Arielle.Levine@noaa.gov

retrieved from Western Samoa, transcribed, translated, and incorporated into the PAIG project's final products.

4. *Collect information from the archives of the Bishop Museum in Honolulu regarding historic fishing methods and traditional marine resource management.*



The output from this activity is a written report describing the information gathered from the archives of the Bishop Museum regarding methods of historic fishing and traditional marine resource management in American Samoa.

To help conduct the above PAIG project, DMWR and Arielle Levine are also partnering with Taito Fale Tuilagi from the American Samoa National Parks and Fatima-Sauafea-Leau from the National Oceanic and Atmospheric Administration on a Coral Reef Initiative Grant to interview elders about their knowledge of big fish and traditional management practices.

Targeted Focus Groups with Fishermen

It is recommended that focus group discussions be organized with fishermen and resource users for each priority site. A participatory coastal resource assessment activity should be conducted with the fishermen and other resource users. For this activity, it might be useful to break the stakeholders into smaller working groups to get people talking. Each working group should be provided with a large simplified map of the targeted reef area that they can write on. The groups should all be provided with a set of different colored markers.

MPA Program staff should facilitate this activity and instruct the groups to gather resource information regarding:

- 1) Resource Availability: Use their blue colored marker to draw on the map each of the different types of fish, habitats and marine resources they know that live in the targeted reef area, and their relative locations. Pay particular attention to species of concern like *Bulbometopon muricatum* (bumphead parrotfish), *Cheilinus undulatus* (humphead wrasse) and all *Elasmobranchii* (sharks and ray species), species that are known to be important to local livelihoods, and protected species.
- 2) Resource Use: Use their green colored marker to draw on the map each of the following resource use activities:
 - a. Types/Gear/Location of Fishing Activities: Indicate each of the different types of fishing activities that are happening in the targeted reef area, the gear used and the location of these activities.
 - b. Frequency of Use: If they are knowledgeable about the frequency of these fishing activities, then this should also be indicated on the map. For example, if hook and line fishing is happening in three main spots within the targeted reef area, then they would write "hook and line fishing" with a green marker on these three separate areas on the map. If they also know that this hook and line fishing occurs daily, then they could also write "daily" next to each spot that they wrote "hook and line fishing".

- c. Intensity of Use: Staff can also ask the villagers to indicate the number of people who are engaging in this fishing activity per time period indicated above. For example, three people hook and line fishing per day.
 - d. Purpose of Use: Staff can also ask the villagers to indicate the purpose of their fishing activities. For example, are the fish being used for personal and home consumption, cultural uses such as fa'alavelaves, exchange or gift, or selling and where they sell to and other uses on their maps.
- 3) Resource Conflicts: Use their red colored marker to draw on the map the different threats that are occurring to the reefs, and conflicts or problems. For example, this might include sewage outfall pipe, outside fishermen, illegal fishing activities etc.

After each of the small groups has successfully completed their maps, then the MPA Program staff should combine the results from all the groups onto one main map for the entire group to see. The map showing the combined results should be discussed with the entire group with the intention of getting more detailed information about the targeted reef area and clarifying discrepancies from the different maps. The idea is to get the whole group of fishermen and resource users to understand resources that are available in the reef area, the resource uses, and resource conflicts that are occurring in this area. This activity will help to validate and enrich the biological reconnaissance survey results. This information can be presented back to villagers during future activities as a means to gain buy-in and acceptance of the MPA Program.



The output from this activity is a consolidated map of each targeted priority area indicating the fishermen's knowledge about the resource availability, the resource use, and the resource conflicts in the area.

After the maps have all been completed, then the data should be entered into GIS in order to make layers and maps that can assist with future outreach and extension efforts.



The output from this activity is a series of GIS maps showing fishermen's knowledge of each targeted priority area indicating the fishermen's knowledge about the resource availability, the resource use, and the resource conflicts in the area

Candidate phase (FY 2009 – 2010)

Write description for each targeted priority area

The MPA Program will know that they have reached the candidate phase after the primary research described above (and any additional research that is deemed important) is completed. The candidate phase will begin with the MPA Program staff drafting a written description about each targeted priority biological areas. The data and maps generated during the research phase should be used to help write this description. Other existing documented information, including reports, planning and legal documents, maps, satellite images, and photographs should also be tracked down for each site. The purpose of this written description is to have a documentation of a site profile needed for site selection. These documents would also be used for future focus groups and outreach meetings to try to gain support from the targeted villages for creating MPAs in their area. The written descriptions should each include the following:

1. What are some of the fisheries and marine resources that can be found in the area? (Maps can be used to show biological reconnaissance survey data and the data collected about fishermen's knowledge). This section should describe why the site is biologically important.
2. What types of fishing and resource-use activities are occurring in the area?
3. At what frequency are the fishing and resource-use activities occurring in the area?
4. What are some of the things threatening the area? (Data collected from the biological reconnaissance survey and the fishermen's knowledge survey can be combined in this section). It may be important to also include a description of land-based sources of pollution, development, and other threats that are not specifically described in the aforementioned data sets.
5. What existing natural resource management activities are occurring in the area? This should include activities conducted by village council, youth group, other government and non government agencies and other projects within DMWR. This should include describing profiles of each management structure and should also describe opportunities for future partnerships.
6. What sorts of natural resource management activities are missing in the area that can help to address the threats? This section should describe proposed management activities that should occur in the area and what sorts of benefits they may expect to gain from this increased management.
7. Anything else that the MPA Program staff deems relevant.



The output from this activity is a written description for each targeted priority area that can be used to gain support from the targeted villages to create MPAs in their areas.

Meet with Village Councils of priority areas; get commitment

After the written description for each very high and high priority sites are written, then it is time to set up formal meetings between the DMWR Director, MPA Program staff and the village councils (or fishermen and resources users in the case of offshore banks) in the targeted priority areas. The function of these formal meetings is to: introduce the MPA Program; to educate the stakeholders about no-take MPAs and their benefits; to show the data that we have gathered during the research phase; to present the written description of each site; and to get agreement from the village council to participate by creating working groups. It is understood that this activity may require several meetings to work toward the goal of gaining approval from the village council to create a no-take MPA in their village.

During these meetings it will be important for the MPA Program staff to present to the village and the working groups the unique aspects about each area in terms of resources, prestige value and the important contributions that the area can make to the American Samoa's marine protection and conservation initiatives. Looking at the results of the focus groups with fishermen, MPA Program staff should discuss what the local threats are that the MPAs can help to mitigate (like overfishing, outsiders fishing, illegal fishing). It will be important to keep in mind local livelihood strategies and how people will be impacted by the MPA during these meetings.

In American Samoa, traditional land owners claim ownership over the coral reef areas adjacent to their family land. Family chiefs, called *matai's*, are entrusted with the management of any claims made on these lands and any subsequent building or land use changes that may transpire (Tulafono, pers. comm., 2007). Matai's need to be involved with any and all planning that will affect their coral reef area. Permission must be gained from these landowners before MPA management can commence. Working with the village councils will be an important step in this process because this is how decisions are made at the village level in American Samoa. It will be important to educate the general public, and other people who use the resources in the village area (or offshore banks) in question, about decisions that are made at the village or territorial level.

Local stakeholders are the ones that are likely to be most affected by the new no-take MPA (e.g. fishermen who are prohibited fishing in an area). Therefore, it is understood that if stakeholders are part of a process, they are to be educated about why MPAs are a good management method, and take ownership over the decisions that are made; it will improve compliance over these management decisions. If a 'no-take' area is designated without stakeholder involvement, then stakeholders may be largely unaware of the site, its regulations or purpose and may continue using the area unknowingly violating existing regulations. This would, therefore, require enormous enforcement effort that ASG does not have, and it will likely be tens of years before ASG gains a large enough enforcement capacity. Public meetings and participation need to be made convenient to key stakeholders (both in location and time). For example, meetings can be held within local villages during evenings and on weekends to accommodate people who have full-time jobs and individuals that stay within the village.

The plan is for the MPA Program to begin engaging different targeted priority sites at the same time. Thus, the process for continuing on with creating a no-take MPA in each village may progress at different rates for each site (or not at all). During the process of holding meetings and educating stakeholders, the MPA Program may encounter some villages that would agree and commit to the Program. If they do, then the process will continue on into the activities listed in the next section. However, if the village councils neither agree, nor disagree, then it will be important to continue educating these village members in hopes that they may eventually agree and commit to the Program. For these villages that are undecided, it may be necessary to conduct a site-level socio-economic survey to determine the percentage of villagers in favor of having a MPA and the percentage of villagers not in favor of having a MPA. Finally, some villages may not want to participate in the no-take MPA Program. If these villages feel very strongly about this, then it is best to abandon the process for a site such as this.

In gaining support from villages, it will be very important for the MPA staff to assist the village in determining boundaries for the MPA and to record those using Global Positioning Systems (GPS). If adjacent to land, the landward side of the MPA should be marked by a natural feature or with a cement fixture. The seaward boundaries need to be clearly marked. Scientists will need to provide technical guidance to the working groups for each targeted priority area about minimum acceptable size for the new no-take MPA area. The proposed no-take MPA should be large enough so that it helps to ensure unique various and diverse coral habitat and spawning stocks plus meet the Governor's mandate of protecting 20% of American Samoa's reefs as no-take MPAs.



The output from this activity is a Memorandum of Understanding (MOU) for each targeted priority area stating that the village council (or fishermen and resource users for the case of offshore banks) is committed to creating a no-take MPA in their village. This MOU is to be signed by the village council (or fishermen and resource users for the case of offshore banks) claiming ownership over the targeted priority area, and by the Director of DMWR.

Expansion into adjacent villages:

In order to expand and possibly create a larger MPA area, it may be good to first try to gain support of the villages that claims ownership over the areas we studied in the MPA biological reconnaissance survey. If this targeted village shows interest and is committed, it may be good to then conduct further biological reconnaissance surveys in the neighboring villages to determine if these habitats are suitable for a no-take MPA. If the area is suitable, then it is suggested that the MPA Program take a similar approach mentioned above to try to engage the village councils of the neighboring villages. For this scenario where multiple adjacent villages all agree to create a no-take MPA in their village, then each of these village councils may need to meet together in order to create an MOU or some sort of treaty agreement that says they agree to work together and cooperate towards common goals.

Create working groups with management entities working in priority areas

Recall that the output of a previous activity was a written description of the different natural resource management activities that are occurring in the targeted priority areas. From this description we should be able to see a listing of all the management activities occurring in the site, and its respective management body. The written description for each targeted priority area should also describe much needed management activities that are lacking in order to address the threats. If existing management activities are already occurring, the other managing authorities should be contacted in order to discuss interest in collaborating with the no-take MPA Program. For each targeted priority site that the MPA Program starts working with, then the MPA Program should create a working group made up of representatives from the village council, fishermen, resource users, and youth group members, MPA staff and other natural resource agencies and programs. When formalized, this working group will decide what sorts of management activities should take place in the targeted priority area. It will be important for the future MPA Project Leaders to continually update the Appendix 3 Contact Information for Key Partners so that it includes the names and contact information for the key people participating in the working groups. Some examples of how other natural resource agencies and programs may be involved are detailed below:

Community-based Fisheries Management Program (CFMP):

If one of the targeted priority sites overlaps with an existing CFMP site, then it will be important to engage CFMP staff in discussions before the community is contacted so that a uniform message can be provided to the village about creating a no-take area in their village. If a CFMP area overlaps with one of the targeted priority sites, and the village in question is agreeable to creating a no-take area, then it is recommended that CFMP continue to be the primary contact for the village. This means that CFMP will be the lead project to determine activities that are to occur within this particular village and the lead project to conduct these activities. CFMP has spent a lot of time and resources to create strong relationships with their villages, and it would be best to maintain these relationships if they are already working well. If CFMP would like to request any assistance from the MPA Program like personnel time for monitoring, outreach or enforcement activities, this should be discussed. It is very important that the activities under the MPA Program be closely coordinated with the CFMP. In the coming years, it is hoped that expertise across these two programs be shared to improve department efficiency, to minimize overlap, and to improve community members' understanding of MPAs.

Fagatele Bay National Marine Sanctuary (FBNMS):

At the time of writing this report, the FBNMS is currently recruiting for the Sanctuary Superintendent position. The FBNMS is planning to move forward with their management plan review (MPR) once this position is filled. The MPA Program Project Leader sits on the FBNMS's Sanctuary Advisory Committee (SAC). It is critical that this relationship and involvement with the FBNMS and the SAC be maintained. The MPR may involve similar research and data collection that the MPA Program has already

assembled. Sharing of this information will help to minimize duplication of efforts. Also, the FBNMS may choose to collect information that the MPA Program may not have collected, and which may help with MPA Program's decision-making. If one of our targeted priority sites overlaps with Fagatele Bay or an area selected by FBNMS for possible expansion, then we can combine our efforts to improve implementation of the MPA at the site. For example, the MPA Program staff can help with outreach and community organizing, and the FBNMS could help with drafting laws and gaining additional funding for enforcement.

National Parks American Samoa (NPAS):

If one of the targeted priority areas overlaps with a NPAS site, it will be very important to engage NPAS in the discussions. The NPAS is unique in the National Park system in that they do not actually own the land on which the parks are situated. Rather, they have a 50-year lease in which they pay a fee to have the landowners maintain the site in its untouched state. Limited subsistence fishing and farming activities are allowed in the park according to NPAS enabling legislation, US Public Law 100-571 - October 31, 1988. So, if any of these sites are approved by the village council to create a no-take area, then special legislation will need to be designed to account for the more stringent regulations. Also, it will be important to assess what opportunities exist for collaboration in the selected site. For example, partnering can occur between NPAS and the MPA Program in order to conduct biological and socio-economic monitoring for the site. MPA Program staff could possibly work on outreach and community organizing for these sites to provide assistance to the villages.

American Samoa Coastal Management Program (ASCMP):

If any of the targeted priority areas overlap with an existing or new Special Management Area (SMA), then the Department of Commerce's ASCMP should be engaged in the discussions. ASCMP's general purpose is to provide effective resource management by protecting, maintaining, restoring, and enhancing the resources of the coastal zone. Coastal zone management may be accomplished through protection of unique areas and resources, including wetlands, mangrove swamps, aquifer recharge areas, critical habitat areas, streams, coral reefs, watersheds, near shore waters, and designated or potential historic, cultural or archaeological sites, from destructive or inappropriate development (ASC, 2007b). ASCMP has the authority to issue land-use permits and stop-orders for illegal developments through their Project Notification and Review System (PNRS). ASCMP also has the authority to create SMAs that provide stringent development regulations within the designated area (ASAC, 2007a and ASAC, 2007b). SMAs can be used as a tool to manage and protect the land adjacent to the no-take MPAs. At the time of writing this report there were three SMAs: Pago Pago Harbor, Nu'uuli Pala Lagoon, and Leone Pala Lagoon. It will be important to assess what opportunities exist for collaboration in the selected priority site. For example, partnering can occur between DOC and MPA Program in order to conduct biological and socio-economic monitoring for the site. MPA Program staff could work with outreach and community organizing for these sites to provide more assistance to the villages. Development restrictions can be made more stringent once a no-take MPA is in place. Also, SMAs can be looked at as a possible management regime for other targeted priority areas. The regulation of development on land, and the resulting land-based

sources of pollution, can be critical components to ensure the success of a no-take MPA.

Department of Parks and Recreation (DPR):

If any of the targeted priority areas overlap with a park under the Department of Parks and Recreation (DPR), then discussions with DPR should occur. The only marine park under DPR's authority is the Ofu-Vaoto Marine Park. However, there are many land-based parks in Tutuila. Activities can be coordinated for these park areas to help to promote the recreational, tourism, and non-consumptive use of the no-take MPA. Also DPR regulates sand mining activities and can assist the MPA Program by enforcing these laws in the priority areas.

American Samoa Environmental Protection Agency (ASEPA):

ASEPA was established in 1987 (American Samoa Executive Order 16-1987, issued on October 23, 1987) under the authority and responsibility of the Environmental Quality Commission to carry out the consolidated environmental program established by Executive Order 12-1985 issued on June 14, 1985. The program encompasses water pollution control, safe drinking water, solid and hazardous waste, air pollution control, pesticides use and certification, and environmental awareness and education. ASEPA oversees stream management and has the authority to require piggery owners to move their piggeries away from streams to protect water quality and to issue citations for illegal sewage systems. ASEPA's authorities can support MPA efforts in all areas by ensuring the waters entering the coastal areas from village streams are clean and safe.



The output from this activity is that a working group is formed for each targeted priority area made up of representatives from the village council, fishermen, resource users, and youth group members, MPA Staff and other natural resource agencies and programs. These working groups will discuss opportunities for collaboration in the priority sites.

Proposal phase (FY 2011 - 2012)

The MPA Program will know that they have reached the proposal phase after the village council has agreed to commit to the MPA Program and signed the MOU with the DMWR Director. Also, working groups will have been created that are made up of representatives from the village council, fishermen, resource users, youth group members, MPA Staff and other natural resource agencies and programs. As mentioned previously, the advancement through each phase in the MPA Program process may be at different stages for different sites depending on the feedback that is gained through the village meetings.

Write the site-level management plan

The proposal phase will begin with the working groups for each targeted priority area meeting together to discuss the management activities that are occurring, and should occur, in the site. Ultimately, this working group will write a management plan for the targeted priority MPA area. It is expected that this activity is likely to take multiple meetings over time in order to come up with a site-level management plan agreeable to all parties. The MPA Program will be responsible for coordinating these meetings, facilitating the events and keeping track of meeting minutes and outcomes. In addition to ensuring adequate cooperation and participation from all stakeholders, the MPA Program will also be responsible for the actual writing (both in English and Samoan) and editing process to complete the management plan. The components of a site-level management plan are detailed in the following sections.

MPA Program Authority

A description of the MPA Program's authority should be written by a qualified attorney. This description can be used to create and enact laws or other regulatory mechanisms that codify the existence and purpose of the MPA Program to operate towards the goal of creating new no-take areas in order to ensure unique, various and diverse coral reef habitat and spawning stocks plus meet the Governor's mandate of protecting 20% of American Samoa's coral reefs as no-take MPAs. Laws that are created should also codify the site-level management plans so that they are enforceable by DMWR's Enforcement Division.

Description of Fisheries and Marine Resources

A description of the fisheries and marine resources found in the priority site should have already been written during previous activities. That description includes biophysical description from the biological reconnaissance survey, and data collected about fishermen's knowledge. Also included in this section is a description of the types of fishing and resource-use activities occurring in the area and the frequency of use of these methods. This section can also be supplemented with additional data gained from conducting detailed baseline biological assessments in the site and from data from the Key Reef Species and National Ocean Service monitoring on standing biomass of fish and habitat condition (if site is within the monitoring sites of these projects), fishing effort

level, and catch characteristics from the Inshore Fisheries Documentation (IFD) and Assessment (IFA) projects.

MPA Purpose

A clearly stated purpose of the no-take MPA, and how the no-take MPA meets the MPA Program goal which is “to create new no-take areas in order to ensure unique, various and diverse coral reef habitat and spawning stocks plus meet the Governor’s mandate of protecting 20% of American Samoa’s reefs as no-take MPAs” are essential components to a well-developed management plan. The purpose of the management plan may include an explanation of the conservation benefit that is expected to be gained with management. The description of how the MPA meets the goals of the MPA Program should be linked to, and supported by the monitoring planned for the site.

Threats/Opportunities

A description of the threats and opportunities to the natural resources found in the priority site should have already been written during previous activities. That description includes data from the biological reconnaissance survey and the data collected about the fishermen’s knowledge. This should be further refined in this section of the management plan to include descriptions of land-based sources of pollution, development plans, road improvements, and other threats that are not specifically mentioned previously. The threats should be described in complete enough manner so that clear and measurable objectives can be written to address the threats.

Clear and Measurable Objectives

Completing a management plan includes developing objectives for MPA management. “Objectives are specific statements detailing the desired accomplishments or outcomes of a project” (Margoluis and Salafsky, 1998). In the manual, *Measures of Success: Designing Managing, and Monitoring Conservation and Development Projects*, Margoluis and Salafsky, (1998) suggest that a good objective meets the following criteria:

- Impact Oriented. Represents desired changes in critical threat factors that affect the project goal.
- Measurable. Definable in relation to some standard scale (numbers, percentages, fractions, or all/nothing states). These would be used as performance measures during evaluation.
- Time Limited. Achievable within a specific period of time.
- Specific. Clearly defined so that all people involved in the project have the same understanding of what the terms in the objective mean.
- Practical. Achievable and appropriate within the context of the project site.

Management Activities

Constructing a comprehensive management plan also includes designing management activities for the MPA. Activities are specific actions or tasks undertaken by working group members and others to reach each of the management plan’s objectives. A good activity meets the following criteria (Margoluis and Salafsky, 1998):

- Linked. Directly related to achieving a specific objective.
- Focused. Outlines specific tasks that need to be carried out.
- Feasible. Accomplishable in light of the project's resources and constraints.
- Appropriate. Acceptable to and fitting within site-specific cultural, social, and biological norms”

The management activities may be internal or external to the MPA, examples of activities internal to the MPA include: a) Deploy marker buoys and signage along defined borders; b) Remove marine debris (old nets, bottles, etc.) within the borders; c) Map significant features of MPA. The activities external to the MPA may consist of: a) Meeting with landowners to discuss erosion control; b) Offering assistance with waste management; c) Scheduling stream clean-ups.

Proposed Timeline

Each no-take MPA management plan should contain a proposed timeline. A timeline (also known as a Gantt chart) is a bar graph that lists the major activities and tasks involved in the project. It also shows how long the various activities are supposed to last and the relationship between different activities (Margoluis and Salafsky, 1998). A Gantt chart can graphically illustrate what tasks the project needed to be accomplished at any one point in time and what the limiting steps are that may prevent the project from moving forward. A Gantt chart can be depicted in monthly, quarterly, or annual format. Typically, management plan timelines span from the project's commencement to the first evaluation cycle, describe when activities are proposed to occur, and end with the approval of the next timeline. Ideally, the person responsible for conducting the activity, and the expected product should also be detailed. The timeline may be redundant with other sections of the management plan. Despite the expected overlap, the timeline helps to illustrate all the activities and their relationships with one another in one location.

Sustainable Financing

The management plan should include details about financing the no-take MPA receives and information about how the no-take MPA will continue to seek and receive funds for management operations. In addition to federal grants, other financing schemes, such as user fees, and an environmental trust should be explored. Individuals managing the no-take MPA are also responsible for hiring and training necessary staff. The management plan ought to detail how many staff members are necessary and the associated costs. If volunteers are utilized, the management plan should explain how the volunteers will be recruited, organized, coordinated and utilized. The sustainable financing section will detail what funds are required for outreach and education, enforcement, monitoring activities and other activities.

Outreach

Details of planned outreach measures by the agency implementing the no-take MPA are a significant component to the management plan. Outreach activities will identify target audiences, which may include: Governor, Fono members, Pulenu'u, church groups, youth groups, managers, educators, fishermen, schools, students, women's groups,

general public, landowners, commercial and subsistence fishers, government agencies and recreational users. The outreach topics may include: management planning, facilitation; conflict resolution; grant writing; leadership and values formation, evaluation, community empowerment, fisheries ecology and management; biological monitoring; socio-economic monitoring; marine resource conditions; threats and management efforts; no-take areas, coral reef resilience; environmental stewardship. The plan should identify the products that will be produced from the outreach efforts, which may include: PowerPoint slides, no-take MPA awareness booklets, newspaper ads, radio ads, TV ads, posters, brochures, signboards, road shows, songs, skits, etc.

Enforcement

Mechanisms that are being used to gain compliance of the no-take MPA and to enforce rules and regulations of the no-take MPA are essential to incorporate in the management plan. Mechanisms might consist of: clearly written regulations and rules in Samoan, English and other appropriate languages; a discussion about signs used to explain no-take MPA rules; who to call (and contact information) to report a violation, opportunities for stakeholders to learn about no-take MPA rules and regulations; and the location of boundary markers. The management plan should also include a clear statement of who does the actual enforcement (i.e. surveillance, patrol, monitoring, apprehensions, etc.) Other instruments to take into account are:

- A clear conflict-resolution adjudication process;
- Adequate penalties for rule violations;
- A clear process for arrests, citations, fines and confiscation of gear and boats;
- A clear process for bringing violators to court; and
- A clear process that can be followed to resolve any lack of accountability in any of the steps that contribute to adequate enforcement.

The enforcement section is to be written with the MPA Program Leader and the enforcement divisions that have jurisdiction over the no-take MPA. The enforcement divisions or their supervising authority must sign-off on all rules and regulations, a copy of which is to be included in the plan. Stakeholders should be involved in the conceptualization of the enforcement mechanisms. The enforcement system needs to be tailored to existing structures (coast guard, maritime police, DMWR enforcement division, and village police). Giving small incentives to support voluntary enforcement may work in some areas where volunteers are really concerned about the reefs.

The enforcement section of the management plan should detail what enforcement staff is needed, plus the training and resources essential to carry out their work. Staff may require training on fisheries regulations; patrolling; enforcement techniques; apprehension of violators; maintenance of buoys; no-take MPA boundaries and regulations; environmental laws; user-fees; refresher courses; and other opportunities to update skills. Ideally, the management plan will include an explanation of how to coordinate enforcement with other management components. Clearly defined boundaries, rules and a map indicating boundaries are also expected features of this section.

Monitoring

A monitoring section in the management plan will detail the methodology followed to collect regular data on the MPA. A BACI (before, after, control, impacted) sampling design should be employed. The monitoring should include fixed sites, regular surveys, biological, socio-economic and governance parameters.

Biological monitoring should be conducted to determine the biological and ecosystem effects of full protection without the possibility of extraction. A baseline assessment of the sites must be established and unprotected areas (of similar ecological characteristics) should be selected as a basis for comparison. Other studies like possible spill-over, recruitment, home range of species of concerns should be conducted in order to re-evaluate the current management efforts. These studies will further refine the protected area as well as re-adjust the boundaries if the biological and ecological processes do not meet the scale of the MPA. Biological monitoring could also be used to gauge the enforcement and socio-economic efforts if the link between these activities can be established.

Socio-economic monitoring can be conducted to determine: economic costs and benefits from the MPA, and opportunities created; non-monetary costs and benefits to society; sustainability of cultural activities and practices within MPA affiliated villages (i.e. fa'alavelaves); compatibility between management and local culture; equity of resource access and whether or not costs and benefits are equally distributed between different sectors of society; villager's understanding and acceptance of the MPA; changes in resource use and livelihood strategies after creation of the MPA; and local perception of fairness and effectiveness of enforcement

Governance monitoring can serve to determine whether effective management structures and strategies are maintained, effective legal structures and strategies for management are maintained, effective stakeholder participation and representation is ensured, management plan compliance by resource users is enhanced, and whether resource use conflicts are managed and reduced in the area.

The results from these studies should be checked against one another and against the baseline surveys to assess change and time-trends. The monitoring program ought to be specifically targeted toward measuring whether the MPAs are successful in achieving the goal to ensure protection of unique, various and diverse coral reef habitat and spawning stocks. The results of monitoring should be relayed to managers and communities in a timely manner.

Get formal approval of site-level management plan

After the management plan is written for the priority site, the working group for that site should approve the plan through a consensus approach. Sincere attempts should be made to create a plan that all parties can live with. It will be important to address all issues that any member strongly disagrees with. If a conflict arises during this process, it may be good to consider hiring a neutral facilitator that can help bring about agreement.

The working group will approve the site-level management plan through a consensus process, and will bring it to their department directors and village councils for approval. The MPA Program staff can play a coordinating role to help facilitate this process. It is crucial that formal written documents be drafted to show that support exists for the priority area. Copies of approval documents such as MOUs for inter-agency cooperation, MOUs for village council approval, and MOUs for agency director approval of the plan, and letter of support from enforcement agencies showing approval for plan, should all be included in the management plan.



The output from these activities is a site-level management plan for each priority area and an MOU signed by all village councils and department directors showing approval and support for each priority area.

Conduct baseline assessment of priority site

The MPA Program staff will conduct a full-scale baseline assessment in each priority site after commitment is gained from the village. A baseline assessment is the “before” portion of the BACI sampling design and can serve as a reference for future years to compare the effects of creating a no-take MPA in the area over time.

The MPA Program will conduct a biological assessment of the priority sites in order to set the baseline for future comparison. This will provide important information on how the protection affects the ecological and biological attributes of the MPA over time. Some of the baseline data that needs to be gathered are: fish diversity, density, biomass, benthic assemblage, benthic cover, coral diversity, benthic rugosity. Any increase in these parameters over time would indicate positive effects of protection. This “within-MPA” data would be compared with an unprotected reef area to determine effects of protection. This baseline will have to be monitored on a regular basis to determine trends over time.

MPA staff will perform a baseline socioeconomic assessment to determine: employment; resource use and livelihood strategies; incidences of fishing (both legal and not) within the targeted MPA site; basic understanding of MPA benefits; acceptance of MPA in their village area; resource use conflicts; and the perpetuance of cultural activities. It may be worthwhile to continue partnering with NOAA’s Pacific Island Fisheries Science Center’s Human Dimensions program for this assessment.

MPA staff will complete a baseline governance assessment to determine: local management structures and strategies, existing legal structures and strategies for management, local stakeholder participation and representation in management strategies.



The output from this activity is a report indicating results from the baseline biological, socio-economic and governance assessments for each priority site.

Seek additional funding for regulations and enforcement

Alternative supplementary funding sources will need to be acquired in order to implement the management plan activities that relate to regulations and enforcement. It should be noted that the existing Federal Assistance for Sports Fish Restoration funds that the MPA Program receives from the U.S. Fish and Wildlife Service will not allow certain activities to occur, like writing regulations and conducting enforcement activities. Funding agencies should be contacted well in advance of finalizing this phase to see whether they would be able to fund salaries and project costs to implement the MPA. In order to cut down on any delays in implementing the MPAs, the MPA Program staff should begin writing grant proposals while the management plan is being written and finalized. One potential funding source is NOAA's Coral Reef Management Grants that are earmarked towards Territorial needs on an annual basis and accessed through the American Samoa Governor's Coral Reef Advisory Group. The projects that are funded under this funding source are organized within four Local Action Strategies: Fisheries Management, Population, Climate Change and Land-based Sources of Pollution. The MPA Program Leader should work to integrate the MPA Program's planned activities into this LAS structure. By doing this, the likeliness of receiving funds from this source may increase because MPA Program is requesting funds to implement a project that is listed in the LAS.

The funding that is required for the regulation and enforcement activities will largely depend on what activities the working groups develop while writing the management plan. Within funding proposals, it may be appropriate to consider contracting an attorney to draft and finalize laws for the program. It may also be necessary to contract a facilitator to gain public input during this rule-making process, and also to educate the public about new rules that are developed. This person could be shared with the MPA Program and the Enforcement Division.



The output from this activity is grant proposals are submitted, and funding is received to implement the regulations and enforcement activities in the management plans.

Implementation phase (FY 2013 - 2023)

Conduct activities in management plan

The implementation phase begins with DMWR working with the public, other relevant resource agencies and village councils to coordinate their efforts to implement all of the activities described in the site-level management plans. Even if funding has not yet been secured for regulations and enforcement activities, work can continue on many of the other activities listed in the management plans. For example, full biological baseline assessments will be conducted for each new site. Ongoing biological and socio-economic monitoring and education and outreach activities will be conducted as identified in the management plan.



The output from this activity is that all site-level management plan objectives and activities are implemented for the MPAs. Completion of the regulation and enforcement activities is contingent on securing adequate funds.

Evaluate effectiveness of MPA and update management plan

Evaluating the effectiveness of the no-take MPA is an important component of management. "Evaluation consists of reviewing the results of actions taken and assessing whether these actions are producing the desired outcomes" (Pomeroy, et al., 2004). The *How is your MPA doing? Guidebook* offers managers and other conservation practitioners a process and methods to evaluate the effectiveness of MPAs for the purposes of adaptive management.

Ten years after the site-level management plan is formally approved for each site and activities in the management plan have been conducted, it is recommended that an evaluation of each site then be made. This should include a quantitative evaluation of performance measures to determine if the no-take MPA is meeting the management objectives, and a qualitative evaluation in relation to the overall MPA Program goal.

A working group should be developed consisting of members from the original working group who drafted the site-level management plan, and any pertinent new partners. This working group will be responsible for conducting an evaluation of the MPA based on a thorough review of monitoring results. The working group will make recommendations on what shall happen to the MPA. Some of the options that may be recommended including choosing to:

- a) Expand the boundaries of the no-take MPA for an agreed upon number of years allowing additional data to be collected, or additional activities to be conducted that show whether management plan objectives are being met. The expanded site would then be re-evaluated after that for 'permanent status' consideration.
- b) Consider and promote non extractive use of the reef system
- c) Expand the site but make the expanded area as limited use zones.

- d) Consider zoning strategies.
- e) Conduct more scientific research studies on the impact of MPAs on fishing and coral reef resources. i.e. spillover, recruitment, etc.
- f) Continue looking for sustainable financing for management and enforcement activities.

The MPA Program staff will lead the working group through a management plan review and will assist with incorporating the recommendations made by the working group into the updated management plan. A notice should be published in the local paper and TV to announce to the public that an updated management plan has been drafted for the site and that public comments are being sought. Public meetings can be held to gain comments. Efforts should be made to incorporate the public's concerns and comments into the management plan. The updated management plan will then need formal approval by department directors and village councils. An education and outreach campaign should then be developed to give proper notice to the public about the updated plan. It will be important to also seek funding to sustain management activities.



The output from this activity is that an evaluation of the MPA and its site-level management plan is conducted that includes public input. Recommendations from the evaluation will be made and incorporated into an updated management plan for the MPA and will be presented to the public during future education and outreach campaigns.

SECTION 2. EDUCATION AND OUTREACH

Education and outreach are vital components in implementing the MPA Program in American Samoa. Understanding of no-take MPA benefits and issues is limited in American Samoan stakeholders. A great deal of education and outreach is needed if the people are to fully understand the concept of no-take MPAs. Presenting unambiguous and uniform messages is in creating no-take MPAs. The general public, and the targeted priority villages, need to be educated about the benefits of no take MPAs so that by the time the MPA Program begins to discuss the possibility of creating a no-take MPA, these groups will be prepared to make informed decisions.

Target audiences of these education and outreach activities include the fishermen, resource users, educators, students, church groups, youth groups, managers, women's groups, and social groups, Governor, Fono members, Pulenu'u, village councils, both men and women.

Educational Tools

Based on a survey conducted in American Samoa in 2006, the most frequently accessed fishery education resources (those with a frequency of most days) are TV and radio (with 43% respondents), newspapers (41%), and schools (41%). Family as a source of fishery education, is also a frequently obtained source, with 37% of the respondents receiving this source most days. Internet and off-island information was not a significant source of education with 70% of the respondents never accessing these media (Kilarski et al., 2006). The MPA Program has decided to prioritize the use of the most frequently accessed education resources for their education and outreach campaigns. The following sections describe some of the educational tools that are and will be utilized by the MPA Program to engage the public. The following descriptions each include an overview of the educational tool, the intended audience and message, distribution methods and how we will evaluate whether the audience is learning the message.

Infomercial

Definition: A TV infomercial is a short (2-3 min) film that informs or instructs, especially in an original and entertaining manner. MPA TV Infomercials will be filmed and edited by our film producer, Fred Ahoia, from Rootz Islands Productions.

Intended audience: MPA infomercials target the general public, especially those who own, and frequently have access to, TV.

Intended message: MPA infomercial messages will vary depending upon what activity they are trying to highlight or what key piece of information the general public needs to know about. For example, the intended message of the first infomercial was to introduce the MPA program, to make contact with the public and make image of ourselves, and to

introduce the idea of MPAs and the former Governor's Tauese Sunia's executive order on creating 20% no-take coral reef areas.

Distribution: Infomercials will be aired on KVZK TV and Malama channels prior to meetings and special events. For example, before the public outreach meetings in 2007, a two-minute MPA infomercial was created to inform the public about the MPA Program and was aired through KVZK TV and the Malama channel at least twice a week for 3 weeks prior to the MPA Outreach Meetings.

Evaluation: An evaluation of this method of education can be made by counting the number of times a new person provides feedback about seeing the commercial. The MPA Program staff recorded at least 40 people that called the DMWR office or talked to the MPA Program staff, reporting that they have seen the infomercial. We suspect that many more people had seen this infomercial than what had been reported to us. Therefore, we believe that the infomercial is a useful tool to advertise and market our program to the public.

Newsletters

Definition: A short written report, in a newspaper style format with pictures, prepared by the MPA Program staff to present updates on recent program activities and accomplishments. MPA Program staff members are responsible for writing the newsletter and creating the layout of the stories. The MPA Program Leader/Editor will assist with story ideas, providing important details for the stories, and editing. The editorial advisory board, composed of DMWR Fishery Biologists, will provide further review and suggestions.

Intended audience: The audience for these newsletters includes other natural resource government agencies; local, regional and international MPA practitioner partners, funding agencies, the press and the public and DMWR Division Heads and staff.

Intended message: MPA Quarterly Newsletters were produced by the MPA Program staff. The purpose of the Newsletter is to publicize the program activities and accomplishment, as well as upcoming events. So far, four newsletters were already produced. The first one included an overview of the MPA Program and the activities that we planned to undertake in FY2007. The second issue briefly explained about our biological reconnaissance survey, the infomercial that we produced and our new program logo. The third issue explained the results of the MPA outreach meetings that were held in March 2007, and the socioeconomic monitoring training that the MPA Program participated in. The fourth issue explained about the Quantitative Underwater Ecological Survey Techniques course where MPA Program staff traveled to Hawaii to participate, as well as the launching of the new *Pualele* boat. So far, only English versions of the newsletters were produced. In the future, they should also be translated into Samoan.

Distribution: These newsletters are created and distributed quarterly in February, May, August, and November to leave adequate time to also prepare other quarterly reports due a month after each of these. Newsletters should be distributed to internal

department mailboxes, via email, given to public during outreach meetings, and made available on a stand in the DMWR office or upon request from visitors.

Evaluation: A simple evaluation of this method of education can be made by counting the number of newsletters that were distributed. Future detailed evaluations of education methods can be made by creating questionnaires and surveys to ask people whether they ever read the MPA Program newsletters, whether they learned from these newsletters and whether they changed their behavior based on what they learned.

Fact sheets

Definition: A fact sheet is a presentation of data or facts from studies about MPAs. The MPA Program staff will read technical papers and reports and create simplified fact sheets showing information they learned from the studies.

Intended audience: Intended audiences for fact sheets may vary depending on what message you are trying to get across. For example, the first fact sheet that the MPA Program produced was aimed at DMWR and other natural resource agency staff and the general public. This fact sheet was somewhat technical, but the intention was that educators could create simplified versions of this information.

Intended message: The content of the fact sheet was based on reading of several scientific literature sources. The fact sheet covered the following sections: What is an MPA, what is a no-take area, what can a strict no-take MPA accomplish, and what are the benefits of having an MPA.

Distribution: The fact sheets were disseminated during the outreach meetings and are also available on a stand in the DMWR office or upon request from visitors.

Evaluation: A simple evaluation of this method of education can be made by counting the number of fact sheets that were distributed. Future detailed evaluations of education methods can be made by creating questionnaires and surveys to ask people whether they ever read the MPA Program fact sheets, whether they learned from these fact sheets and whether they changed their behavior based on what they learned.

Posters

Definition: A printed placard, announcement, often illustrated that is posted to advertise our MPA Program, or to teach an important concept related to MPAs. A series of posters were designed by the Foundation of the Peoples of the South Pacific, Inc. (FSPI) in Fiji. The MPA Program partnered with FSPI to get each poster translated into Samoan language and printed.

Intended audience: The intended audiences for the MPA posters are other natural resource government agencies, local, regional and international MPA practitioner partners, funding agencies, the press, schools and the general public and DMWR Division Heads and staff. The posters are really simple enough that an ordinary person that does not know anything about science could still understand.

Intended message: The MPA posters were created to help the public especially the youth to easily understand and have an idea of what MPA is all about. The posters' short titles include: 1) Breaking corals destroys homes of fish; 2) Coral reproduction; 3) Corals are important fish houses; 4) Crown of Thorns kills corals; 5) Sea cucumbers clean the soil; 6) Healthy fisheries, healthy people; 7) No fishing areas help...; 8) Taking the large ones can leave behind one sex making reproduction impossible; 9) Prevent pollution; 10) Marine protected areas; 11) Activities on land...; 12) Babies from healthy reefs; 13) Spawning aggregations; and 14) Animals that cannot move. The back of many of these posters contain more detailed text created for a teacher to use when explaining the poster to his students.

Distribution: Upon arrival, an official launching should be made to announce the arrival of these new posters. The press and noteworthy educators should be invited to this launching. The posters will then be disseminated to the schools, other natural resource agencies, to the public during outreach events and to others upon request.

Evaluation: A simple evaluation of this method of education can be made by counting the number of each type of poster that was distributed. Future detailed evaluations of education methods can be made by creating questionnaires and surveys to ask people whether they ever read the MPA Program posters, whether they learned from these posters and whether they changed their behavior based on what they learned. Also, teachers may choose to create quizzes based on the content of these posters.

Newspaper, TV and Radio Ads

Definition: Printed or live announcement that is designed to attract the public attention or patronage about our MPA Program.

Intended audience: The audience for the newspaper, TV and radio ads may be tailored to a specific group depending on what activity is coming up, or who we need to reach with an important message. Otherwise, it is understood that these ads are aimed at, other natural resource government agencies; local, regional and international MPA practitioner partners, funding agencies, the press and the general public, and DMWR Division Heads and staff.

Intended message: The ads are to inform the public about MPA Program upcoming meetings or events, or to educate them about a particular aspect of our Program or about MPAs.

Distribution: Newspaper, TV and radio ads can be created and aired prior to upcoming events in hopes for a larger turnout. For example, prior to our MPA Program outreach events in FY2007, newspaper ads were printed in "Samoa News" newspaper three times per week for two weeks before the event. This amount of time that the ads are aired can be adjusted based on need. KVZK has free TV slots for government agencies, so this time can be utilized to have a discussion aired on TV about an upcoming event. Live interviews can also be conducted on KSBS and KHJ radio stations to promote events.

Evaluation: An evaluation of this method of education can be made by counting the number of times a new person provides feedback about seeing or hearing the newspaper, TV or radio ads. If the intended message was to get people to attend an

event, a questionnaire or survey could be administered at the event to ask people how they learned of the event and whether they saw or heard the newspaper, TV or radio ads.

Brochures

Definition: A small booklet or pamphlet, often containing promotional material about our MPA Program.

Intended audience: The audience for these brochures includes other natural resource government agencies; local, regional and international MPA practitioner partners, funding agencies, the press and the general public, and DMWR Division Heads and staff.

Intended message: The message of these brochures is likely to change based on the needs of the MPA Program. For example, the first brochure that the MPA Program produced was designed to introduce people to the MPA Program, describe briefly how it came about, some of the activities the Program is involved with and the process it intends to follow in order to implement MPAs. The topics for future brochures are likely to be formulated based on questions that are repeatedly asked about the MPA Program. Some ideas for future brochures include “What is the difference between the MPA Program and the CFMP?”

Distribution: These brochures can be created prior to, and distributed at, public education and outreach events. Brochures should be distributed to internal department mailboxes, via email, given to public during outreach meetings, and made available on a stand in the DMWR office or upon request from visitors. For example, the first brochure that the MPA Program created was distributed at the US Coral Reef Task Force Meeting held in August 2007.

Evaluation: A simple evaluation of this method of education can be made by counting the number of brochures that were distributed. Future detailed evaluations of education methods can be made by creating questionnaires and surveys to ask people whether they ever read the MPA Program newsletters, whether they learned from these newsletters and whether they changed their behavior based on what they learned.

Public Outreach Meetings

Definition: An educational outreach meeting to teach the public about some aspect of the MPA Program and to gain feedback from the public.

Intended audience: The targeted audience of these outreach events will vary depending upon what key piece of information about the MPA Program needs to be conveyed. Some of the messages will be intended for the general public, while others are meant for key groups. For example in March 2007, the no-take MPA Program launched their first three public outreach meetings within the islands of Tutuila and Manu’a. One was at Pita Ili’s Guest House in Ofu, the other was at the Ta’u High School Gymnasium; and the other was at the Utulei Convention Center. These meetings were targeted the high chiefs, village leaders, the Organization of the Elders, fishermen, and youth.

Intended messages: MPA education and outreach messages will vary depending upon where the MPA Program is in the process to create MPAs. For example, the intended message of the first three public outreach meetings included an overview of the MPA Program, with an explanation of what a no-take MPA is, why we should establish no-take MPAs (goal of the program), the benefits of having a no-take MPA, and the process that will be undertaken by the program to implement no-take MPAs.

Distribution: At least three public outreach meetings should be held each year, one in Ta'u, Ofu, and Tutuila, in order to educate the general public about the MPA Program. Additional meetings can be held in order to further educate people about the specific aspects of the MPA Program Process.

Evaluation: A quantitative evaluation of the public outreach meetings can be made through the use of a pre and post survey to see whether the participants learned anything new from the presentation and the meeting. A qualitative evaluation of the public outreach meetings can be made by MPA staff writing detailed meeting minutes of everything that occurred during the meeting. It is crucial to keep track of everything that happens at these meetings and to then enter them into the computer for archiving. When MPA staff enters the meeting minutes into the computer, they can also add their thoughts on what the participants learned and whether the participants are in support of the MPA Program. Furthermore, a database can be devised that records information about specific people who attend MPA Program outreach meetings. Short questionnaires can be distributed at each meeting to keep this information current in the database. The database can show the number of meetings that a person attended, which specific topics the person was trained in, etc. Once this data is compiled, an analysis can be made about how educated the public is on MPAs.

SECTION 3. SCIENTIFIC EXCHANGE & CAPACITY BUILDING

Scientific Exchange

DMWR staff need access to professional publications and meetings to present their work, participate in professional review processes, gather information, and keep current with scientific developments regarding MPAs. The need is also to improve scientific communication both in and out of the Territory by facilitating direct communication between DMWR staff and out-of-territory partners.

The MPA Program Leader will engage in scientific exchange at regional and international conferences to share information about DMWR's no-take MPA Program. Important lessons that were learned during the development of the no-take MPA Program will be written in reports and presented at these meetings.

Examples include annual meetings for the American Fisheries Society, Australian Coral Reef Society, and the Society for Conservation Biology. Others include regular symposiums International Marine Protected Area Congress, International Coral Reef Symposium, International Symposium on Integrated Coastal Zone Management, Coastal Zone Asia Pacific Conference, and other Pacific focused meetings.

Training and Staff Development

Building the capacity of local Samoan staff through trainings will increase retention of skills and information in DMWR and will promote the long-term sustainability of the no-take MPA Program. During the 2007-2011 five-year plan, the DMWR no-take MPA Program intends to build staff's basic understanding of MPAs. The MPA Program also plans to build technical skills of the staff for designing biological and socioeconomic studies of MPAs, conducting interviews, analyzing data, and writing reports and make management decisions based on these data. Eventually, efforts should focus on building capacity to conduct regular effectiveness evaluations of MPAs once they are established.

Conduct cross-site visits

Cross-site learning exchanges with regional partners will allow staff from American Samoa to communicate and exchange ideas with MPA staff in other areas. Successful approaches from other places may be attempted in American Samoa, but more importantly failures need not be repeated. Capacity building for DMWR's MPA Program may involve cross-site learning exchanges with MPA managers and staff and regional partners including Samoa's Ministry of Natural Resources and Environment and Samoa Fisheries, which coordinate several MPA programs in that country, as well as the Samoa-based Secretariat of the Pacific Regional Environment Program, which provides regional assistance to environmental governance programs. Cross-site visits may be conducted with additional partners, including the WCPA/IUCN for their work on the "Establishing Networks of MPAs" publication, Western Regional Pacific Fisheries

Management Council (WRPFMC), Fiji's Locally Managed Marine Area Network (FLMMA), Palau's Protected Areas Network, Cook Island National Environment Service, the Secretariat of the Pacific Community, and the Pacific Island Marine Protected Area Community (PIMPAC). PIMPAC has developed regional priorities and a work plan for providing assistance on MPAs. PIMPAC may be able to facilitate cross-site visits in the future.

Species identification and survey techniques

MPA staff created slideshow presentations and quizzes on fish, coral, invertebrate and algae identification. MPA staff also participate in classroom and field snorkeling sessions of species identification trainings. Bert Fuiava traveled via the M/V Sili to Rose Atoll from March 19-23, 2007 where he learned additional survey techniques as well as enhanced his fish identification skills. Risa Oram and Bert Fuiava from the Department of Marine and Wildlife Resources' Marine Protected Area Program attended the Quantitative Underwater Ecological Survey Techniques (QUEST) course offered through the University of Hawaii, Hilo from May 13 – 26, 2007. During QUEST, MPA staff were introduced to surveying techniques including: visual surveying of fishes, surveying of benthic invertebrates, and photographic surveying of fishes and invertebrates. QUEST lectures covered basics in experimental design, statistical analysis, data reduction and graphic representation. MPA Staff were in the field utilizing SCUBA to survey the coral reefs at Kealakekua Bay, Hawai'i.

Socio-economic Assessment and Monitoring Training for MPAs

MPA staff helped to organize and participated in a two-week socio-economic assessment and monitoring training from April 30 to May 10 at the Utulei Convention Center. This training was co-coordinated by the MPA Program and the Pacific Islands Regional Office (PIRO). Trainers were sought from the Human Dimensions Research Program of the NOAA Fisheries Service Pacific Islands Fisheries Science Center (PIFSC). The goal of the training was to improve agency capacity to integrate socioeconomic analysis into the design, management, and monitoring of marine protected areas (MPAs), community-based fisheries programs, and other natural resource management programs in American Samoa. The training focused on the following areas: Survey Research Methodology; Development of Questions for Pilot Survey (using SurveyPro 3.0 software); Field Test of Pilot Survey; Workshop participants conducted approximately 200 interviews over two days in 3 villages: Alofau, Lauli'i, Amanave; Review of Survey Development and Field Issues; Data Entry and Analysis; Conclusion

Readings

MPA staff meet on a weekly basis to read and discuss selected scientific literature. This provides an opportunity for staff to become familiar with MPA topics and to ask the MPA Program Leader questions about the concepts in the literature. Some of the literature that MPA staff have read together include:

1. National Marine Protected Area Center, 2006. *Draft Framework for Developing the National System of Marine Protected Areas*. Silver Spring, MD.;

2. Sobel, Jack A. and Craig P. Dahlgren (eds), 2004. *Marine Reserves: A Guide to Science, Design and Use*. Island Press, Washington. Chapter 4: What Marine Reserves can Accomplish.;
3. Oram, R. 2006. *American Samoa Coral Reef Marine Protected Area Strategy*. Final Draft submitted to the American Samoa Governor's Coral Reef Advisory Group in April 2006. American Samoa Government, Pago Pago, American Samoa, 96799

Other trainings

Selaina Vaitautolu, CFMP's Program Leader, attended a Pacific Island Marine Protected Area Community (PIMPAC) training on MPA Management Planning. Upon return, Selaina offered this training to her staff and the MPA Program staff. MPA staff also participated in coral disease workshop by Greta Aeby and Theirre Work at the Utulei Convention Center. Bert Fuiava traveled to Fiji upon invitation from the Secretariat of the Pacific Community for fisheries stock assessment training. Fia Maiava was enrolled in American Samoa Swimming Association swimming lessons at Utulei Beach to improve her swimming skills. Risa Oram, MPA Program Leader (contractor) participated in Samoan Language classes to assist with project management.

Other critical training needs for existing MPA staff include group facilitation and conflict resolution. There is also a continuing need to build upon MPA staff's understanding of the science of MPAs. If any formal training courses exist on MPAs, it would be imperative for MPA staff to attend. It may be necessary to repeat some of the above trainings as new MPA staff are hired. Additional trainings should be planned depending on skills of available personnel at hiring: MPAs; fisheries management; fisheries regulations; leadership and values formation; database management; SCUBA; statistics and data analysis; socio-economic, and governance monitoring, and MPA effectiveness evaluation. Bert Fuiava was certified as PADI Open Water diver in August 2006. All MPA staff were certified in CPR and First Aid in March 2007.

Appendices

The following appendices include an activity timeline checklist, a table of biologically important areas, the benthic data reconnaissance survey data sheet, and contact information for key partners. As future MPA Program products are created, they should be added to this section of the plan. Future MPA Program Leaders should periodically update the list of contact information to include important partners.

Appendix 1. Activity timeline checklist

RESEARCH PHASE			
Years	Activity	Output	Date Completed
2004 - 2008	Conduct biological reconnaissance survey	The output from this activity is a written report showing biological reconnaissance survey results.	
2007 - 2008	After the data has been analyzed, then the data should be entered into GIS in order to make layers and maps that can assist with future outreach and extension efforts.	The output from this activity is a series of GIS maps showing biological reconnaissance survey results.	
2007 - 2008	Conduct oral histories with elders from American Samoan coastal villages regarding traditional methods of fishing and natural resource management.	The output from this activity is a report that transcribes and translates the information gained from the oral histories with elders that is at risk of being lost as elders die off. This report will be accessible to partner organizations and the public.	
2007 - 2008	Film interviews with elders and individuals still engaging in traditional methods of fishing to create a video documentary.	The output from this activity is a video documentary showing interviews with elders and individuals still engaging in traditional methods of fishing. Additional historical information will be incorporated into this video to provide a unique education and outreach resource for partners in American Samoa.	

RESEARCH PHASE (continued)			
Years	Activity	Outcome	Date Completed
2007 - 2008	Retrieve existing information on traditional fishing and marine management.	The output from this activity is the possession of originals or copies of the tapes of interviews regarding traditional fishing that were conducted with select elders in 1997 under the supervision of Daniel Sua. The tapes of these interviews will be retrieved from Western Samoa, transcribed, translated, and incorporated into the PAIG project's final products.	
2007 - 2008	Collect information housed in the archives of the Bishop museum in Honolulu regarding historic fishing methods and traditional marine resource management.	The output from this activity is a written report describing the information housed in the archives of the Bishop museum in Honolulu regarding historic fishing methods and traditional marine resource management in American Samoa.	
2007 - 2008	Conduct targeted focus groups with fishermen and resources users in each priority area to gain information on their knowledge of the resources.	The output from this activity is a consolidated map of each targeted priority area indicating the fishermen's knowledge about all of the fish, habitats and marine resources that are available, the fishing activities, gear and frequency of these activities, and also the threats that are occurring to these resources and conflicts or problems.	

RESEARCH PHASE (continued)			
Years	Activity	Outcome	Date Completed
2007 - 2008	Enter data into GIS in order to make layers and maps that can assist with future outreach and extension efforts.	The output from this activity is a series of GIS maps showing fishermen's knowledge of the fish resources available, the fishing activities and frequency, and the threats occurring in each of the very high and high priority sites.	
CANDIDATE PHASE			
2009 - 2010	Write a description about each targeted priority area.	The output from this activity is a written description for each targeted priority area that can be used to gain support from the targeted villages to create MPAs in their areas.	
2009 - 2010	Meet with the village councils to gain commitment to creating a no-take MPA in their village.	The output from this activity is a Memorandum of Understanding (MOU) for each targeted priority area stating that the village council (or fishermen and resource users for the case of offshore banks) is committed to creating a no-take MPA in their village. This MOU is to be signed by the village council (or fishermen and resource users for the case of offshore banks) claiming ownership over the targeted priority area, and by the Director of DMWR.	

CANDIDATE PHASE (continued)			
Years	Activity	Outcome	Date Completed
2009 - 2010	Create working groups with village councils and other resource agencies.	The output from this activity is that a working group is formed for each targeted priority area made up of representatives from the village council, fishermen, resource users, and youth group members, MPA Staff and other natural resource agencies and programs. These working groups will discuss opportunities for collaboration in the priority sites.	
PROPOSAL PHASE			
2011 - 2012	Write the site-level management plan and get it formally approved	The output from these activities is that the working groups from each priority site will write a site-level management plan for the priority area. The working group will approve the site-level management plan through a consensus process, and will bring it to their department directors and village councils for approval.	
2011 - 2012	Seek additional funds for regulation and enforcement activities	The output from this activity is grant proposals are submitted, and funding is received to implement the regulations and enforcement activities in the management plans.	

IMPLEMENTATION PHASE

Years	Activity	Outcome	Date Completed
2013 - 2023	Conduct all activities in management plan	The output from this activity is that all site-level management plan objectives and activities are implemented for the MPAs. Completion of the regulation and enforcement activities is contingent on securing adequate funds.	
2023	Conduct 10-year evaluation of MPA and management plan	The output from this activity is that an evaluation of the MPA and it's site-level management plan is conducted that includes public input. Recommendations from the evaluation will be made and incorporated into an updated management plan for the MPA and will be presented to the public during future education and outreach campaigns.	

Appendix 2. Biologically important areas³

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
2	Afuli Cove	Ta'u	Manua	The coral communities in Afuli Cove should be protected, because they comprise some of the largest coral colonies recorded in Samoa (up to 10m in diameter). Valuable climate records; redwood of the sea	World Heritage Center (UNESCO)	Allison Green (2002), Eric Trembl pers comm., and Leslie Whaylen, pers comm., Doug Fenner, pers comm.	Risa Oram	5	5	5	X	5
38	Ofu Lagoon	Ofu	Manua			?	Fed and Terr MPA group	5	5	5		5
9	Fagatele Bay	Futiga	Tutuila	Has only terminal phase of humphead wrasse that Leslie has seen here, saw 3-4 on one dive. Far from human contact. Grouper seen there that are not seen anywhere. Replenishment zone. Fish species that I haven't seen in other areas. High coral cover and diversity, largest <i>Pachyseris rugosa</i> Doug has ever seen, large massive porites	Fagatele Bay National Marine Sanctuary	Leslie Whaylen pers comm., Doug Fenner, pers comm.	Risa Oram	5	5	5	4.7	4.9

³ These areas were suggested and ranked during a Federal and Territorial MPA Working Group Meeting at the Department of Commerce conference room on Jan 2005??

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
22	Taema Banks	South of Utefei	Tutuila	Unique reef, submerged and separate from Tutuila's reefs. Only five miles away, difficult to enforce; some has been trashed, possible dynamite fishing - Jim Maragos pers comm. and observations 2004; High fish diversity, larger fish, possible "source". Whale sharks visit here - important species that possibly will be on the endangered species list. Whale sharks could also be important tourism opportunity. No shore fishing, may be good control site.	DMWR, Coast Guard	Eric Trembl, pers comm., Manou Tardy, pers comm., Jim Maragos, pers comm., Leslie Whaylen, pers comm., and Doug Fenner, pers comm.	Risa Oram	5	5	5	3.8	4.7
28	Rose Atoll	Rose Atoll	Rose Atoll	Proposed as part of the Central Pacific World Heritage Site	World Heritage (UNESCO)	Jim Maragos, pers comm.	Risa Oram	5	5	4	3.67	4.4
19	Sili	Olosega	Manua	Mostly abandoned village; formerly one of the most beautiful villages in Samoa until hurricanes in late 80s early 90s. Reefs offshore have moderately high coral cover. Large zebra shark seen by Leslie Whaylen.	National Park	Allison Green (2002), Jim Maragos, pers comm., and Leslie Whaylen.	Risa Oram	5	5	3	4.25	4.3
39	South Ta'u Drop-off	Ta'u	Manua			?	Fed and Terr MPA group	5	5	4	3	4.3

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
6	Aunu'u	southwest of harbor; facing SW ocean	Tutuila	Unbelievable for diving and diversity; faisua and bumphead wrasse; good reef; most giant clams of any site in AS; very diverse coral communities; abundant corals; fish popNs giant napolean wrasses; also wetland site important. It is separated from the main island by a channel, water quality is good, the reefs are in good condition, and it could be protected by the resident villagers on the island. However, some areas would need to remain open for subsistence fishing by local villagers.	DMWR's CFMP; ASCMP	Allison Green (2002), Fisk and Birkeland (2002), Jim Maragos, pers comm., Manou Tardy pers comm. and Leslie Whaylen pers comm., Doug Fenner, pers comm.	Risa Oram	4	5	4	3.8	4.2
12	Larson's Bay	Tutuila	Tutuila	Rare giant clam there; giant sand rays; high coral cover in patches, sand in middle; spectacular view	Extending National Marine Sanctuary or DMWR, or CFMP	Jim Maragos, pers comm. and Selaina Vaitautolu	Risa Oram	4	5	4	3.75	4.2
23	Tolisi Pt, Fagaitua	Fagaitua, near the big rocks	Tutuila	Rare cownose shells, high diversity, slipper lobster, living coral 100%; pools in lagoon very rich, octopus, giant clams. Community really enforces the Sunday swimming ban	DMWR's CFMP	Eric Tremi, pers comm., Manou Tardy, pers comm., Leslie Whaylen pers comm. and Doug Fenner pers comm.	Risa Oram	4	4	4	4.75	4.2

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
1	A'asu	Massacre Bay	Tutuila	Historic significance; high coral and fish biodiversity; high fish abundance; no one lives there; giant clams; Very high diversity.	DMWR or National Park	Jim Maragos, pers comm. and Leslie Whaylen, pers comm.	Risa Oram	5	3.5	3	4.5	4
26	Alofau	Alofau Lagoon	Tutuila	Good staghorn, finger corals (that will last through bleaching), snorkeling, access to reef slope good for research	CFMP	Doug Fenner, pers comm.	Risa Oram	4	4	4	4	4
16	Nu'uuli Pala Lagoon	South central Tutuila - from Vaitele Pt. to Coconut Pt. for larger area, or Lgogme Pt to Coconut Pt. for smaller area.	Tutuila	Enclosed lagoon; only place in Tutuila where there are mangrove crabs, mantis shrimp, it is a nursery for reef fish. Resource value = Level of biological productivity, rare species, species maintenance - fishing spawning/nursery area, special ecosystem structure. Human use value = recreational and subsistence fisheries, recreational boating and nature study, aquaculture potential.; Problem with sewage discharge, should be diverted out of the lagoon; prohibit cutting of mangroves and habitat disturbance in mudflats through fish corrals; possibly zoning for different activities. Juvenile groupers (apex predators), snappers use mangroves as nursery grounds. Leslie saw a mangrove red snapper in Nu'uuli which likely used the mangrove area as nursery area.	ASCMP, EPA, Public Works, Parks and Rec	Allison Green (2002), Manou Tardy, pers comm., Jim Maragos, pers comm. and Leslie Whaylen, pers comm.	Risa Oram	3	3	5	4.83	3.96

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
32	* <i>Amalau</i> & <i>Vatia</i>	north central Tutuila	Tutuila	Site suggested because of * Turtle nesting beaches				5	3	4	3.67	3.9
4	Amanave - (also called palagi beach)	South west Tutuila	Tutuila	Very high coral abundance and diversity in 2002, however flood damage in 2004. Abundant rare corals. High fish abundance. Didn't see any fishing. Possible cultural importance. Big parrot fish seen here	ASCMP	Allison Green (2002) also Jim Maragos, pers comm., Doug Fenner, pers comm.	Risa Oram	4	5	3	3.6	3.9
15	Nafanua Bank	South of Tutuila	Tutuila	High diversity, larger fish, possible "source" of fish for other areas	not specified	Leslie Whyalen pers comm.	Risa Oram	5	5	3	2.5	3.9
3	Airport Lagoon	near airport, Tutuila	Tutuila	Not high diversity, but you have to go a long way to get there. You see species you don't see elsewhere: turtles, eagle rays, barracuda. Major Palolo harvesting area (consider seasonal openings or quotas). Hard for enforcement. Lots of night spear fishing.	not specified	Manou Tardy, pers comm., Sabrina Mariner pers comm. and Leslie Whyalen pers comm.	Risa Oram	3	5	4	3	3.8

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
27	Auto	Slope to east of ava, Auto	Tutuila	Huge amount of <i>Lobophyllia hemprichii</i> cover, all healthy, most Doug has seen anywhere; good coral cover.	CFMP	Doug Fenner, pers comm.	Risa Oram	4	3	4	4	3.8
13	Leone Bay	Sogi	Tutuila	Did studies during bleaching and hurricane events, and this site survived, also COTs. (same for other four suggested sites); huge porities colonies; high fish cover.	DMWR's CFMP	Jim Maragos, pers comm.	Risa Oram	3	4	4	3.7	3.7
20	South Banks	South of Utelei	Tutuila	40 miles south of Tutuila. Big effort for fishermen to go there, serves as a defacto MPA already. This site would be very difficult to enforce.	not specified	Manou Tardy, pers comm.	Risa Oram	5	5	2	2.5	3.6
30	Poloa	western Tutuila	Tutuila			?	Fed and Terr MPA group	4	3	4	3.2	3.6
41	North Shelf of Tutuila (300ft)	North of Tutuila	Tutuila			?	Fed and Terr MPA group	5	1	4	4	3.5

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
29	<i>Atauloma/Nua & Se'etaga</i>	South western Tutuila	Tutuila			?	Fed and Terr MPA group	4	3	3	3.25	3.3
11	Gataivai	Across from IBM Laundromat after tank farm and continuing to the bend; from the houses to Matafau Elementary School	Tutuila	Seagrasses and sea turtle sitings here. Possibly less fishing occurring in this area than others. I've seen sand clam species there that I haven't seen elsewhere, lots of sand, and turtles. But, it is not a pristine place, you need to manage the stream, pollution and sediments. Healthy lagoon, live coral coverage and fish diversity. Leslie saw humphead wrasse there.	not specified	Sabrina Mariner, pers comm.	Risa Oram	4	2.5	4	2.6	3.3
7	Faga'alu	in front of hospital to Fatumafuti	Tutuila		Parks and Rec	Manou Tardy, pers comm., Chris Hawkins pers comm., and Leslie Whaylen pers comm.	Risa Oram	4	3	3	3	3.3

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
10	Fagamalo Cove	Ta'u	Manua	This site is comprised of healthy coral reef communities, are relatively free from human impacts, and support some of the highest densities of giant clams recorded in the main volcanic islands. Jim Maragos was there in 1971 and 1978 and noted abandoned village site mountain side of coastal trail. Could be important cultural site, why are they not living there now?	not specified	Allison Green (2002) and Fisk and Birkeland (2002) and Jim Maragos, pers comm.	Risa Oram	3	5	3	2	3.3
17	Nu'u silaelae Island and Nu'upule Rock	Ofu	Manua	Diving used to be great there; most spectacular area for diving; in 1991-1992 it had among the highest diversity of corals in AS. Many genera seen there were not seen in Tutuila; unique geological features; semi-protected bay. In 2004 most inner coral killed by a flood. There was a presence out there - very active surveillance by locals	National Park; DMWR's CFMP	Jim Maragos, pers comm. and Eric Tremi pers comm.	Risa Oram	2	4	3	4	3.3
25	Tank Farm	Park near tank farm, Utulei	Tutuila	Good staghorn, finger corals, turtles	not specified	Doug Fenner, pers comm.	Risa Oram	4	2.5	2	3.8	3.1

	Site Name	Location	Island Group	Site's importance as a no-take area / comments	Managing body	Source	Commenter's Name	Group 1	Group 2	Group 3	Group 4	Avg
14	Lepula	Ta'u	Manua	This site is comprised of healthy coral reef communities, are relatively free from human impacts, and support some of the highest densities of giant clams recorded in the main volcanic islands.	not specified	Allison Green (2002) and Fisk and Birkeland (2002) and Eric Tremi, pers comm.	Risa Oram	4	X	2	X	3
21	Swains Island	Swains Island	Swains	large reef area and very remote; both Rose and Swains proposed as part of Central Pacific Marine World Heritage Site	community living there; possibly World Heritage Center (UNESCO)	Eric Tremi, pers comm. and Manou Tardy, pers comm., Jim Maragos, pers comm.	Risa Oram	2	5	3	2	3
37	* Alao	Eastern Tutuila	Tutuila	Site suggested because of * Turtle nesting beaches		?	Fed and Terr MPA group	4	2	3	3	3
36	* Tu'ula	north eastern Tutuila	Tutuila	Site suggested because of * Turtle nesting beaches		?	Fed and Terr MPA group	4	2	3	2.75	2.9
5	Asaga	Ofu	Manua	not specified	not specified	Allison Green (2002)	Risa Oram	3	X	2	1.3	2.1

Appendix 4. Contact Information for Key Partners

<p>Charles Birkeland Hawaii Cooperative Fishery Research Unit U.S. Geological Survey Department of Zoology University of Hawaii Honolulu, Hawaii 96822 Tel: (808) 956-8678 Email: charlesb@hawaii.edu</p>	<p>Brad Damitz Chromis LLC Tel : (415) 259-5766 Email: brad@centralcalcoast.com</p>	<p>Stacey Kilarski The Nature Conservancy Global Marine Initiative 923 Nu'uuanu Avenue Honolulu, Hawaii 96817 Tel: (808) 587-6209 Cel: (805) 450-9859 Email: skilarski@tnc.org</p>
<p>Gene Brighthouse American Samoa Coastal Management Program Email: gene.brighthouse@noaa.gov</p>	<p>Gerry Davis Assistant Regional Administrator for Habitat Conservation National Marine Fisheries Service Pacific Islands Regional Office 1601 Kapiolani Blvd. Suite 1110 Honolulu, Hawaii 96814-4700 Tel: (808) 944-2283 Fax: (808) 973-2943 Email: Gerry.Davis@noaa.gov</p>	<p>Arielle Levine Social Research Project Manager Pacific Islands Fisheries Science Center 2570 Dole Street Honolulu, Hawaii 96822 Tel: (808) 983-5739 Cel: (510) 717-7095 Email: Arielle.Levine@noaa.gov</p>
<p>Peter Craig Marine Ecologist American Samoa National Parks Email: peter_craig@nps.gov</p>	<p>Meghan Gombos Coordinator Pacific Island MPA Community (PIMPAC) Email: Meghan.Gombos@noaa.gov</p>	<p>Jim Maragos Email: jim_maragos@fws.gov</p>
<p>(Edward) Flinn Curren Fish & Wildlife Biologist US Fish & Wildlife Service Federal Assistance Division P.O. Box 50167 Honolulu, Hawaii 96850 Tel: (808) 792-9570 Fax: (808) 792-9584 Email: Edward_Curren@fws.gov</p>	<p>Alison Green Senior Scientist Tropical Marine Program Asia Pacific Conservation Region The Nature Conservancy Indo-Pacific Resource Center PO Box 8106 Woolloongabba, Brisbane Queensland, Australia 4102 Tel : +61 7 3214 6902 Fax : +61 7 3214 6999 Email: agreen@tnc.org</p>	<p>Risa Oram MPA Program Leader (2004- 2008) Email: risaoram@yahoo.com</p>

<p>John Parks Pacific Islands Coastal Management Specialist NOAA National Ocean Service 737 Bishop Street, Suite 1550 Honolulu, Hawaii 96813-3213 Tel: (808) 532-3972 Fax: (808) 532-3224 Email: John.Parks@noaa.gov</p>	<p>Taito Fale Tuilagi American Samoa National Parks Email: Fale_Tuilagi@nps.gov</p>
<p>Lelei Peau Chair, Coral Reef Advisory Group Email: lelei.peau@noaa.gov</p>	
<p>Fatima Sauafea-Le'au NOAA Fisheries - PIRO Detailee Tel: (684) 633-7354 Email: fatima.sauafea-leau@noaa.gov</p>	
<p>Ufagafa Ray Tulafono Director Department of Marine and Wildlife Resources Pago Pago, American Samoa 96799 Tel: (684) 633-4456 Fax: (684) 633-5944</p>	

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