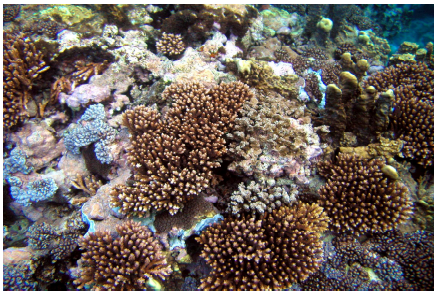
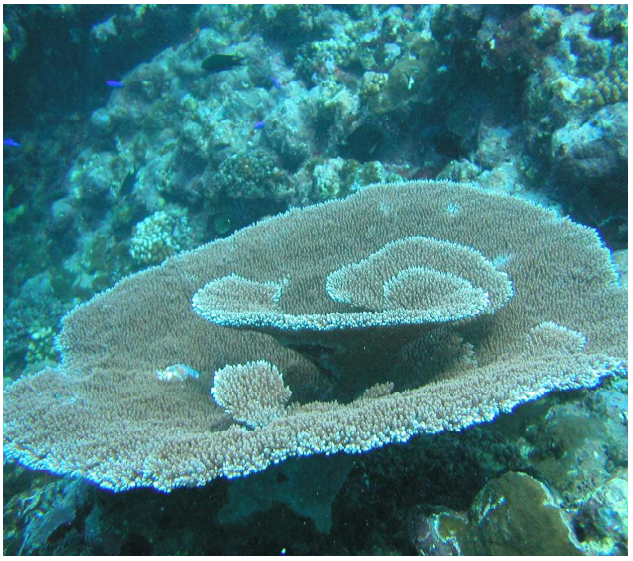
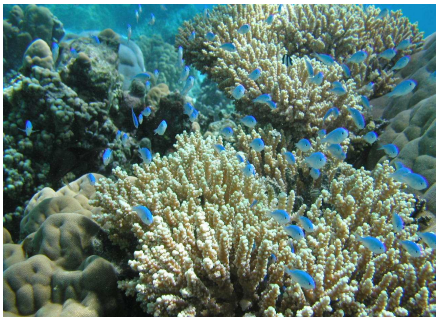
# The United States Territory of American Samoa







*Three-Year Local Action Strategies 2004-2007:*

- **Land-based Sources of Pollution**
- **Overfishing**
- **Global Climate Change**

**Prepared by: The Governor's Coral Reef Advisory Group**
**February 2004**

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## *Executive Summary*

The local action strategies contained in this document are the result of a nearly two-year process that saw input from territorial agencies, non-profit groups, interested individuals, sectoral groups (such as fishers), and federal agency partners. The scope of work is both short and long term, and prioritizes items for funding via the US Coral Reef Conservation Grant Program. Where possible, current and ongoing activities have been incorporated into each local action strategy (LAS), to give a sense of continuity and networking, and to underscore that individual agency mandates and projects are supported by the Coral Reef Advisory Group (CRAG) as a whole. Thus, included are programs and projects that are not within the scope of CRAG's mandate. However, each action plan was developed, and is viewed as, a spend plan to focus funding requests. Each action plan consists of goals, success indicators, projects, and timelines. Each LAS will continue to evolve and develop, as new resources identified, and as projects are completed. This comprehensive plan addresses the U.S. Coral Reef Task Force's resolution for the development of local action strategies for U.S. jurisdictions.

## 1. Introduction.

American Samoa is a U.S. Territory located approximately 4,200 kilometers south of Hawai'i. It is the southernmost of all U.S. possessions and the only U.S. jurisdiction in the South Pacific. American Samoa comprises seven islands (five volcanic islands and two coral atolls) with a combined land area of approximately 150 $km^2$. The five volcanic islands, which are the major inhabited islands of American Samoa, are Tutuila, Aunu'u, Ofu, Olosega and Ta'u. Tutuila, the largest island, is also the center of government and business. The three islands of Ofu, Olosega and Ta'u, collectively referred to as the Manu'a Islands, are 107 kilometers east of Tutuila. Two outer islands, Rose Atoll and Swain's Island, are approximately 259 kilometers and 327 kilometers from Tutuila respectively. Both are quite small. Rose Atoll is uninhabited and is protected as a National Wildlife Refuge, while Swain's is inhabited by a subsistence population of about 10 people.

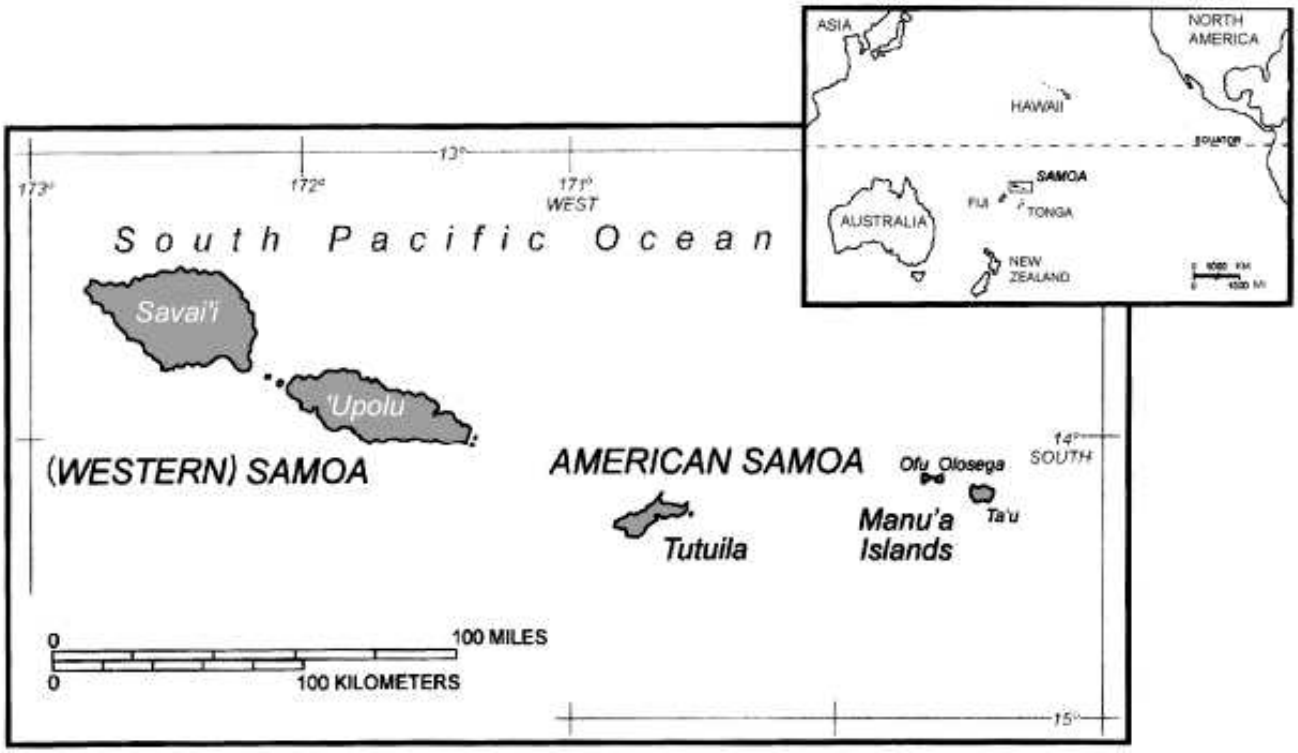



**Figure 1** Location of American Samoa Map credit: National Park Service

The islands are encircled by fringing coral reefs, with a steep drop-off to the deep ocean occurring not far from shore. The main islands are all mountainous, and flat land is at a premium. The climate of the Territory is tropical humid and rain showers are frequent.

American Samoa's Coral Reef Program met informally for the first time in the mid-1990s in response to issues escalating threats to coral reefs locally and worldwide. In 200, the American Samoa Environmental Protection Agency, the Department of Commerce and the Department of Marine and Wildlife Resources convened to develop a plan that would address coral reef degradation. Shortly

thereafter, this group expanded to include the National Park of American Samoa and American Samoa Community College's Marine Science Program. At this time it also adopted the name *Coral Reef Advisory Group* and formalized its procedures for agency representation and priority setting for funding. It now receives its mandate via the office of the Governor of American Samoa.

Since its inception, CRAG has participated in and overseen many successful management and science activities. It has increased the effectiveness of member agency collaboration on projects and creates greater alignment with non-CRAG agencies that have common interests.

Resource management of the Territory's fragile coastal and marine assets is an on-going challenge for CRAG agencies. Innovative tools and creative negotiation mechanisms to inform landowners, fishermen, children, tourists and cultural leaders on the importance of resource preservation are requirements, given the limited economy, landmass, and cultural practices in American Samoa. CRAG is a voluntary organization and its financial needs are federally funded, with in-kind services provided by member agencies.

## 2. Corals Reefs in American Samoa.

Until recently, coral reefs in American Samoa were in a long recovery phase after numerous perturbations ranging from poor water quality in the harbor, crown of thorns starfish outbreaks, storms, and coral bleaching. Most recently, as a result of Tropical Cyclone Heta, great damage occurred to our north shore reefs.

Although many of the more remote reefs have recovered from many of these incidents, those impacted by human activities have been slower to mend. The reefs in Pago Pago Harbor remain the most affected. Population density, commercial activity on and near the water, and historical dumping of civilian and military industrial waste in the inner harbor area are all contributing factors to the ecological damage and slow improvement of coral habitats.

However, the Territory has also experienced, within the past several years, increased incidents in bleaching and disease. American Samoa, like other island jurisdictions, is faced with a multitude of potential impacts, with increasingly apparent shifts in global climate schemes significantly affecting the Territory's weather. Physical dangers posed by wave action due to coral loss, increased or decreased rainfall, phase and community shifts on reefs, and sea level rise are just a few of the things that the islands may have to contend with in coming years. Having relied on the reef ecosystem for protection, food, and goods and services for millennia, residents of American Samoa may face severe disruptions of lifestyle, public health hazards, and a decreased ability to be self-supportive

Other threats, such as unmanaged land use, which has led to an alarming proliferation in non point-source pollution (e.g. sediments, pesticides, organic nutrients, oil, etc.), and the effects of overexploitation of reef species, are also contributing to general and site specific degradation in reef health.

## 3. Local Action Strategies.

American Samoa considers the LAS process and outcome to be useful for achieving management aims. In particular, the LAS method has allowed CRAG agencies to focus efforts and to formulate a spend plan for Coral Reef Initiative funds. This has resulted in more holistic approach, and one that is structured, transparent, achievable, and defendable.

**Figure 2.** Stream flooding in Nu'uuli village

The final threat areas are the culmination of months of work by CRAG members to determine the most insidious problems facing the Territory's reefs. Members utilized the National Ocean Service threat matrix approach to finalize the focal areas.

Post-matrix planning process was initiated in January 2003, with a workshop attended by both on and off-island partners. Numerous subsequent working group sessions collated information, and better organized goals, projects, and actions. Local action strategies were completed in February 2004

## 4. Focal Areas.

***Land-based Sources of Pollution.*** Explosive population growth in American Samoa, especially Tutuila Island, has led to rapid development. Most of the population of American Samoa resides on Tutuila. However, only approximately 30% of the land area has a slope of less than 30%. As a result, the population density of the island is 2,800 people per square mile. This density has placed considerable demands on American Samoa's coastal areas. Though all of the Territory's lands are within the coastal zone, most of the land favorable for development lies immediately adjacent to the coast. Several hundred land-use permit applications are received per year, a majority of which are approved with conditions.

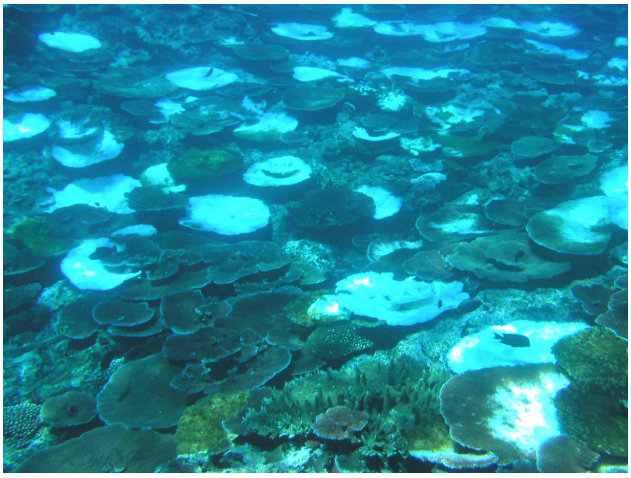
The main road runs along the water's edge, and has historically been a convenient place to dump unwanted debris. Streams entering coastal waters carry large amounts of sediments and nutrients, as many homes and businesses are located along them. The flow can be heavy during rainfalls, since the

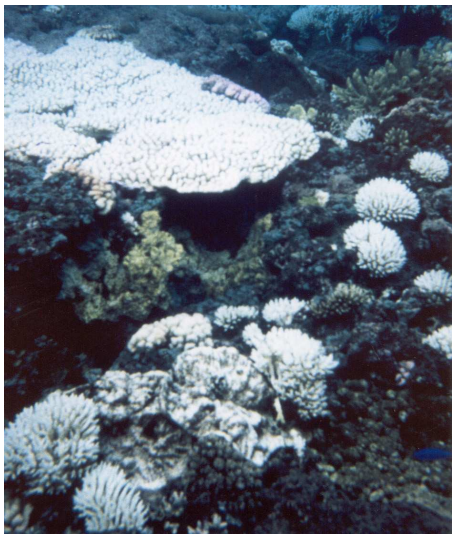
topography is steep. Exacerbating this is the amount of impermeable surface that has been constructed along the low, flat coastal lands. In addition, vegetation clearing for crops often occurs on lands with slopes greater than 30%, which in turns leads to excessive erosion. As a consequence, most villages in the Territory have experienced major flooding, stream sedimentation, and impacts to reef conditions.

**Figure 3.** Stream and runoff flooding homes
Photo credits: C. Hawkins

In 2003 and 2004, American Samoa was affected by two natural disasters that underscore the need to change land-use practices. In May 2003, devastating flooding occurred on Tutuila Island. Numerous structures were damaged, and four people were killed, primarily as a result of poor construction locations and non-compliance of stream regulations (setbacks, channelization, etc.).

**Global Climate Change**. American Samoa, like other island jurisdictions, is faced with a multitude of potential impacts should increasingly apparent shifts in global climate schemes significantly affect the Territory's natural environment.





**Figures 4-5** Bleached coral around Tutuila

Photo credits: P. Craig

Physical dangers posed by wave action due to coral loss, increased or decreased rainfall, phase and community shifts on reefs, and sea level rise are just a few of the things that the islands may have to contend with in coming years. Predictions for the Pacific include

increased incidents of hurricanes, dramatic sea level rise, and impacts to nearshore areas that currently serve as breeding and nursery grounds for reef and pelagic fish.

Having relied on the reef ecosystem for protection, food (all fisheries are expected to be impacted by Pacific climate change), and goods and services for millennia, residents American Samoa may face severe disruptions of lifestyle, public health hazards, and a decreased ability to be self-supportive.

**Overfishing.** American Samoa is faced with a rapidly growing population (approximately 2% per year) with respect to habitable land area and capacity. Nearshore fisheries have always been an important component in the Samoan way of life. Historically, Samoans have fished to feed their families, using traditional methods and gear. Today, there are two types of fisheries that harvest coral reef fishes and invertebrates in American Samoa. The first is subsistence fishing, which is usually a shoreline activity, using rod and reel, spears, and nets. The second type of fishing is artisanal fishing by free-divers who spear fish and small-boat fishermen who fish for bottomfish. All fish are sold locally; there is currently no export of coral reef fish to off-island markets or the aquarium trade.

**Figure 6.** A typical creel

While the fisheries have supported Samoa for thousands of years, two trends of concern in coral reef fisheries have recently been documented: subsistence fishing activity has declined over the past two decades and coral reef fish and invertebrates have declined in abundance and size. It has been recognized that harvested species, such as giant clams and parrotfish are overfished. A recent estimate of a six-fold decrease in fish densities between the territory's main islands and the remote atolls further supports the case that the reefs on the main islands are overfished.

**Figure 7.** Fishing boats in Pago Pago harbor
Photo credit: unknown

In 2005, the Territory will embark on a Coral Reef Fishery Management Plan that will address three primary fisheries: shallow-water species, bottomfish, and invertebrates. An effective plan will increase average size of fish, species composition, and catch per unit effort (CPUE). With a focus on long-term subsistence, we will consider both the economic and biological components of the system. The plan will also address issues such as enforcement, co-management and cultural values.

***Population Pressure.*** No aspect of life in the Territory will be untouched by ever-increasing population. As the population grows (at about 2% per year) and diversifies, land disputes will increase and there may be pressure to replace the communal land tenure, which been practiced in the Samoan Archipelago and throughout much of Polynesia, for thousands of years, with a more equitable land distribution. Supplies of drinking water may not keep up with population growth and factors such as road building, shoreline hardening, increased fishing effort, and waste disposal will further impact coral reefs. Finally, natural resources cannot assimilate waste without degrading environmental quality.

**Figure 8.** Increasing population results in demands for public services
Photo credit: unknown

Though American Samoa has diversified its food sources in recent decades, it has been estimated that three consecutive cargo ships missing Pago Pago Harbor would result in a food shortage, while the impending tuna cannery operation's withdrawal from the Territory may result in an increased reliance on our already overtaxed reefs for food and money.

## 5. Monitoring.

Monitoring is an important management tool. It gives managers and stakeholders information on the state of the ecosystem that, with the correct data, can help determine cause and effect relationships between management actions and ecological outcomes. Like enforcement and education, it is also a cross-cutting item. In recognition of this, CRAG hired a Coral Reef Monitoring Coordinator in 2004 to lead the development of a Territorial Coral Reef Monitoring Program. The Department of Marine and Wildlife Resources houses this program, and have augmented it by added a Coral Reef Monitoring Ecologist to their staff. The plan was finalized in early 2005 and field monitoring began at that time. In addition, this program will also assist individual agency monitoring efforts. For the first time, the Territory will have a single point of reference and contact for monitoring activities, as well as a centralized database.

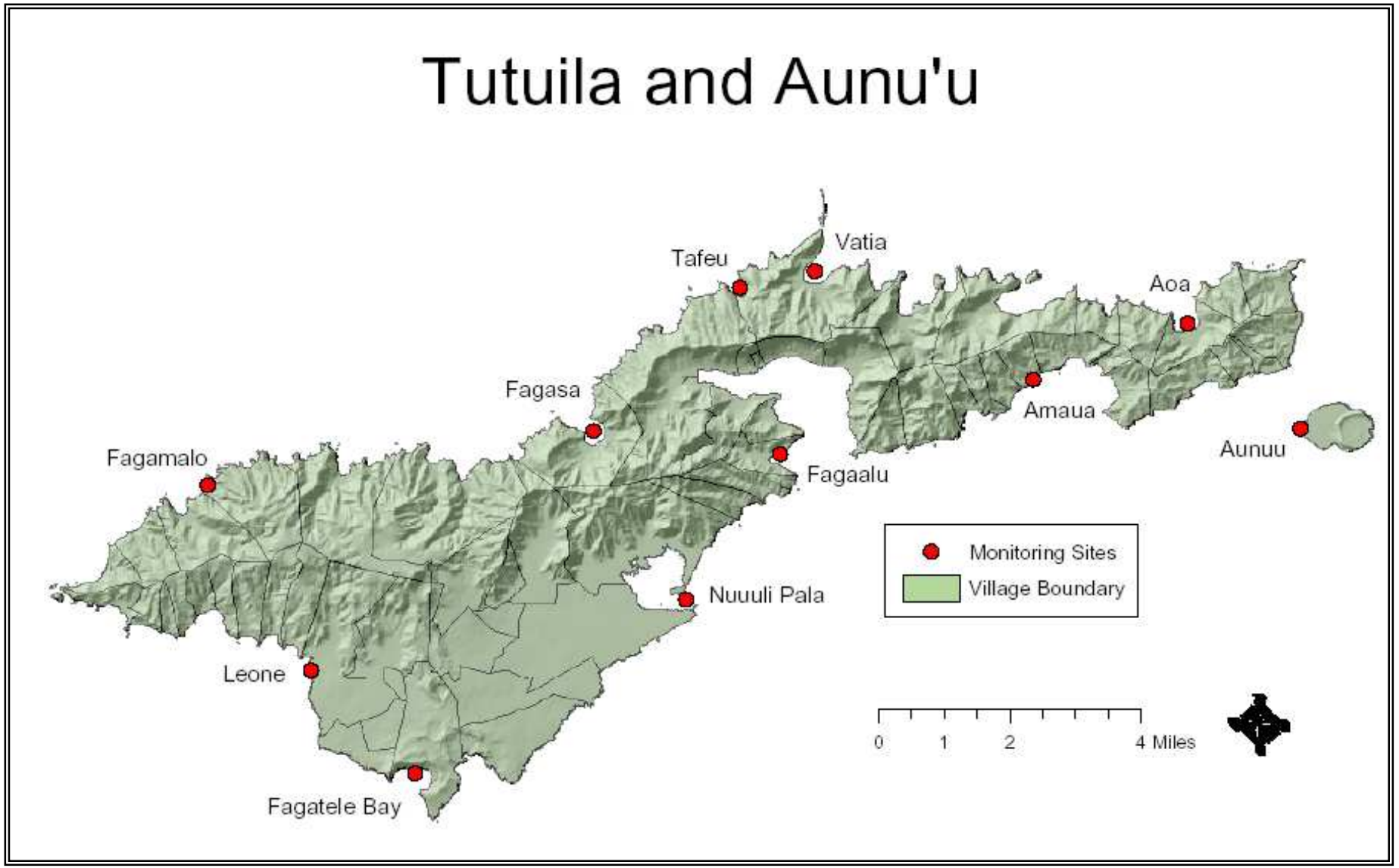



**Figure 9.** Territorial Coral Reef Monitoring Program sites

Map credit: T. Curry, ASCMP

**CORAL REEF ADVISORY GROUP**

## Local Action Strategy Year 1 Project Funding Summary

1. **Overfishing**
2. **Land-based Sources of Pollution**
3. **Population Pressure**
4. **Global Climate Change**

| LAS | Project No. | Projects (non-personnel) | Lead | Timeframe | Cost | Funding |
|---|---|---|---|---|---|---|
| **1** | 1 | Monitoring Workshops for Community Based Fisheries Villages | DMWR | Year 1 | $12,541 | CRI |
| **1** | 2 | Creel Survey Evaluation and Recommendations | DMWR | Year 1 | $8,500 | CRI |
| **1** | 3 | Evaluation of Fish Imports/Exports | DMWR | Year 1 | $8,500 | CRI |
| **1** | 4 | Training of Enforcement Officers | DMWR | Year 1 | $14,000 | CRI |
| **1** | 5 | MPA Plan workshop | DMWR | Year1 | $2,000 | CRI |
| **1** | 6 | Overfishing education program | DMWR | Year 1 | $45,000 | NMFS |
| **2** | 1 | ASCC Quality Program enhancement | ASCC | Year 1 | $25,000 | CRI |
| **2** | 2 | Erosion control applications | SWCD | Year 1 | $5,000 | CRI |

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|---|---|---|---|---|---|---|---|
| **2** | 3 | Erosion control projects assistance | SWCD | Year 1 | $10,000 | CRI | |
| **3** | 1 | Re-printing of Governor's Population Implementation Plan | DOC | Year 1 | $3,500 | CRI | |
| **3** | 2 | Printing of Governor's Population Implementation Plan summary booklet | DOC | Year 1 | $2,500 | CRI | |
| **3** | 3 | Workshop for Population Implementation Committee Working Groups | DOC | Year 1 | $4,500 | CRI | |
| **3** | 4 | Logistical Support for PIC meeting | DOC | Year 1 | $2,500 | CRI | |
| **4** | 1 | Logistical support for studies of susceptibility for corals to global climate change, disease, and other associated ecosystem stressors | NPS | Year 1 | $30,000 | FWS | |
| **4** | 3 | Identification of areas of temperature tolerant corals | NPS | Year 1 | $3,600 | CRI | |
| | | | | **TOTAL** | **$177,141** | | |

**CORAL REEF ADVISORY GROUP**

## Local Action Strategy Year 2 Project Funding Summary

1. **Overfishing**
2. **Land-based Sources of Pollution**
3. **Population Pressure**
4. **Global Climate Change**

| LAS | Project No. | Projects (non-personnel) | Lead | Timeframe | Cost | Funding |
|---|---|---|---|---|---|---|
| **1** | 1 | Linking managers and scientists to information | DMWR | Year 2 | $7,800 | CRI |
| **1** | 2 | Development of a Coral Reef Fishery Management Plan | DMWR | Year 2 | $8,800 | DMWR / CRI |
| **1** | 3 | Market Survey program development | DMWR | Year 2 | $7,238 | DMWR |
| **1** | 4 | Legal review of fisheries regulations | DMWR | Year 2 | $5,000 | DMWR |
| **1** | 5 | MPA training workshop | DMWR | Year 2 | $3,400 | DMWR |
| **1** | 6 | Community-based MPA socioeconomic assessment and monitoring | DMWR | Year 2 | $11,345 | DMWR |
| **1** | 7 | MPA Plan public comment meetings | DMWR | Year 2 | $3,500 | DMWR |
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|---|---|---|---|---|---|---|---|
| **2** | 1 | No littering signs near selected streams and coastal areas | DOC | Year 2 | $5,500 | CRI | |
| **2** | 2 | Plastic bag reduction campaign | DOC | Year 2 | $4,000 | CRI | |
| **2** | 3 | Recycling campaign and contest | DOC | Year 2 | $12,000 | CRI | |
| **2** | 4 | ASCC Internship program | DOC | Year 2 | $2,000 | CRI | |
| **2** | 5 | Park Ranger pilot program | ASPR | Year 2 | $9,750 | CRI | |
| **2** | 6 | Coral Disease Monitoring | DMWR | Year 2 | $3,498 | CRI | |
| **3** | 1 | Address increased infrastructure needs due to population growth | DOC | Year 2 | $12,960 | CRI | |
| **3** | 2 | Village Delegate Workshop | DOC | Year 2 | $7,000 | CRI | |
| **4** | 1 | Ofu marine field station support | NPS/DOC | Year 2 | $6,900 | CRI | |
| **4** | 2 | Climate change vulnerability studies | NPS/DOC | Year 2 | $30,000 | CRI | |
| | | | | **TOTAL** | **$140,691** | | |

| **Threat:** OVERFISHING | *1/05* |
|---|---|
| *Goal:* To restore stocks of commercially and ecologically important fish and prevent non-sustainable harvest of these resources | |

**Success Indicators:**

- Fish populations show recovery
- Key species are present/abundant again on reefs
- Average fish size increases
- Subsistence and artisanal CPUE for coral reefs increased

| **Projects** | *Lead agency/individual* | *TIMELINE* *Y1* | *Y2* | *Y3* |
|---|---|---|---|---|
| **1. Project: Improve the effectiveness of existing management programs** | | | | |
| a. Action: Determine useful indicators of management effectiveness, such as presence of key species, with the assistance from the University of Guam and NOAA partners study. | *NPS, DMWR, NMS, NMFS* | *X* | *X* | *X* |
| b. Action: Evaluate existing management programs for needs or changes | *NMS, DMWR, NPS, NMFS* | *X* | *X* | *X* |
| b1. Action: begin socioeconomic evaluation project(s) | *NMFS, DMWR* | *X* | *X* | *X* |
| b2. Action: FBNMS begins its management plan review | *FBNMS/DOC* | *X* | | |
| c. Action: Revise existing management plans as necessary, incorporating evaluation for effectiveness. | *NMS, DMWR, NPS, NMFS* | | | *X* |
| **2. Project: To promote and facilitate the development of marine protected areas to meet the 20% goal of the USCRTF** | | | | |
| a. Action: Revise plan and determine realistic timeframe for implementation; hold workshop. | *CRAG/MPA Coordinator/DMWR/NMFS* | *X* | *X* | |

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|---|---|---|---|---|
| b. Action: Implement the Marine Protected Areas Plan | *MPA Coordinator//CRAG* | | *X* | *X* |
| **3. Project: Strengthen current fisheries regulations** | | | | |
| a. Action: Review/recommend changes to current fisheries regulations, including strengthening of scuba fishing ban. | *DMWR/CRAG* | *X* | | |
| b. Action: Shift management paradigm from prohibited to allowable gear. Determine allowable gear. Review minimum/maximum size allowances for key reef species. | *DMWR/ Working Group* | *X* | | |
| c. Action: Revise regulations to incorporate new information. | *DMWR* | *X* | | |
| d. Action: Contract lawyer to review and revise regulations. | *DMWR* | *X* | | |
| e. Action: Promulgate new rules. | *DMWR* | *X* | | |
| f. Action: Public awareness campaign, workshops for fishers, implement regulations | *DMWR/Fisheries Education Coordinator* | *X* | *X* | *X* |
| g. Action: Evaluate effectiveness of regs with regard to fishery, fish populations, public awareness and enforcement | *DMWR* | | *X* | *X* |
| h. Action: Review and revise regs as needed | *DMWR* | | | *X* |
| **4. Project: Improve fisheries and other marine resource monitoring** | | | | |
| a. Action: Strengthen Inshore Creel Survey based on recommendations from study. | *DMWR* | *X* | | |
| b. Action: Implement monitoring program: to include biophysical (including fisheries monitoring), socioeconomic and assessment of governance. | *Monitoring Coordinator/ CRAG Monitoring Working Group/NMFS* | *X* | | |
| c. Action: Review and analyze Inshore Creel Survey data annually | *DMWR/WESTPACFIN* | *X* | *X* | *X* |
| d. Action: Develop GIS based monitoring database. | *GIS Specialist/Monitoring Coordinator* | *X* | | |
| e. Action: Produce annual report highlighting trends, problems, etc. | *Program managers (coordinated by Monitoring Coordinator)* | | *X* | *X* |

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| f. Action: Assist Community Based Fisheries Management villages in establishing monitoring programs. | *Monitoring Coordinator/DMWR/NMFS/ MPA Coordinator* | *X* | | |
| g. Action: Provide training for village monitoring programs. | *DMWR/NMFS/MPA Coordinator* | *X* | *X* | *X* |
| h. Action: Incorporate data from village monitoring into database, provide reports for the villages. | *DMWR/Monitoring Coordinator* | | *X* | *X* |
| i. Action: Monitoring Plan reviewed and revised as needed. Incorporate effectiveness measures developed in Project 1. | *CRAG Monitoring Working Group* | | *X* | *X* |
| j. Action: Develop Market Survey Program | *DMWR* | *X* | *X* | *X* |
| **5. Project: Improve regulation of fisheries imports/exports** | | | | |
| a. Action: Quantify import activity | *DMWR (contract a consultant/ graduate student)* | *X* | | |
| a1. Action: Develop scope of work for contractor, hire contractor, begin program | *DMWR* | *X* | | |
| b. Action: Review existing import/export system for effectiveness, make recommendations. | *DMWR (contract a consultant/ graduate student)* | *X* | | |
| c. Action: Establish database. | *DMWR* | | *X* | |
| d. Action: Expand regulatory power to examine all import and export of fish | *DMWR* | | *X* | *X* |
| **6. Project: Strengthen enforcement at all levels** | | | | |
| a. Action: Assess enforcement activity, provide recommendations, establish a database of enforcement actions. | *DMWR (contract a consultant/ graduate student)* | *X* | | |
| b. Action: Conduct an enforcement workshop for local enforcement officers. | *DOJ/NMFS/NOLE* | *X* | | |
| c. Action: Establish a formal officer training program; hold annual refreshers. | *DMWR/NOAA OLE/WildAid?* | *X* | *X* | *X* |
| **7. Reduce catch of coral reef fish** | | | | |
| a. Action Develop a long term coral reef fishery management plan for the Territory; may be in collaboration with UCSB | *DMWR (contract a consultant/ graduate students)* | *X* | *X* | |

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|---|---|---|---|---|
| b. Action: Promote utilization of pelagic bycatch through a marketing strategy | *DMWR/Fisheries Ed. Co.* | *X* | *X* | *X* |
| c. Action: Monitor (quantify) recovery by DMWR | *DMWR* | *X* | *X* | *X* |
| **3. Project: Assess, coordinate, and promote education and outreach programs that target overfishing on coral reefs** | | | | |
| a. Action Develop links with appropriate Pacific and international organizations which can provide support, advice, and technical assistance into work plan related to fisheries activity education | *CRAG Education Coordinator/ Fisheries Ed. Coordinator* | *X* | | |
| b. Action: Increase awareness of the effects of overfishing on coral reefs through the media (TV, radio, and newspaper) | *Fisheries Education Coordinator/FBNMS/DMWR* | *X* | *X* | *X* |
| c. Action Identify and develop targeted educational strategies for school campaigns. | *Fisheries Education Coordinator/FBNMS/DMWR* | *X* | *X* | *X* |
| d. Action Develop educational and awareness programs that target managers and the public based on the outcome of scientific studies | *Fisheries Education Coordinator/FBNMS/DMWR/NMFS* | *X* | *X* | *X* |

| **Threat:** LAND-BASED SOURCES OF POLLUTION TO CORAL REEFS | *1/05* |
|---|---|
| **Goal:** To protect coral reefs in American Samoa from land-based sources of pollution | |
| **Success Indicators:**<br>• Less nutrients in water<br>• Lower levels of sediments<br>• Coral cover unaffected by macro algae and phytoplankton growth from nutrification | |

| **Projects** | *Lead agency/individual* | *TIMELINE* *Y1 Y2 Y3* | | |
|---|---|---|---|---|
| **1. Project: To reduce the level of non-point source pollution entering coastal waters by implementing the American Samoa Non-Point Source Pollution Program Plan** | ***ASEPA/ASCMP*** | | | |
| **2. Project: To monitor parameters of coral health and water quality at reef sites adjacent to selected watersheds to help determine the efficacy of the NPS Program** | ***ASEPA/CRAG*** | | | |
| **a. Action:** Develop and finalize the CRAG Territorial Coral Reef Monitoring Program (TCRMP) | *Working Group/Monitoring Coordinator* | X | | |
| **b. Action**: Implement general monitoring activities | *Working Group/Monitoring Coordinator* | X | | |
| **c. Action:** Create site specific monitoring to help determine the efficacy of the NPS Program | *Individual agencies/Monitoring Coordinator* | X | X | |
| **d. Action:** Foster and assist as needed in individual agency monitoring efforts | *CRAG/Working Group/Monitoring Coordinator* | X | X | X |
| **e. Action:** Develop a database to collate data from all monitoring activities | *Monitoring Coordinator* | X | | |
| **f. Action:** Review and provide mangers with data resulting from monitoring activities | *Monitoring Coordinator/individual agencies* | X | X | X |

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|---|---|---|---|---|
| **g. Action**: Assess data to determine any needed changes to BMPs arising from monitoring data | *ASCMP/ASEPA* | X | X | X |
| **3. Support other agencies and organizations conducting work that will curtail land-based sources of pollution** | ***LBS Working Group*** | | | |
| **a. Action:** Support ASCC's Community and Natural Resources watershed program | *ASCC WQ Coordinator* | X | | |
| **b. Action:** Assist ASCC land Grant in implementing a piggery management demonstration project | *ASCC WQ Coordinator* | | | |
| **c. Action:** Support the American Samoa Soil and Water Conservation District's efforts (vegetative barrier program, manpower, etc.) | *NRCS District Conservationist* | X | X | X |
| **d. Action:** Assist ASPA with the purchase of a mulcher for erosion control projects | *CRI Coordinator/ASPAS Solid Waste personnel* | | X | |
| **e. Action:** Assist ASPA with solid waste reduction projects | *CRI Coordinator/ASPAS Solid Waste personnel* | | X | X |
| **f. Action:** Develop an educational program to promote usage of residential trash bins from ASPA | *CRAG Education Coordinator* | | X | |
| **g. Action:** Create anti litter signs to be placed alongside high profile streams | *CRAG Education Coordinator* | | X | |
| **h. Action:** Assist American Samoa Swimming Association project to educate youth about coral and threats to our reefs | *ASSA President/CRI Coordinator* | | X | |
| **i.** Assist the Soil and Water Conservation District in a pilot project to collect litter by entrapment at he mouth of Pago Pago stream | *NRCS District Conservationist* | X | | |
| **3. Project: Develop, coordinate, and implement education and outreach programs that target land-based impacts on coral and human health** | ***CRAG*** | | | |
| **a. Action**: Identify key stakeholders | *CRAG Education Coordinator* | X | | |
| **b. Action**: Ascertain which Pacific and international organizations might be able to lend material support, advice, or other expertise | *CRAG Education Coordinator* | X | | |

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| **c. Action:** Develop links with such organizations and incorporate into work plan related to land-use activity education | *CRAG Education Coordinator* | X | | |
| **d. Action:** Develop no littering signs for streams and coastal areas | *CRAG Education Coordinator/Coral Management Fellow* | | X | |
| **e. Action**: Increase awareness of the effects of land-based sources on coral reefs through the media (TV, radio, and newspaper) | *CRAG Education Coordinator* | X | X | X |
| **f. Action** Identify and develop targeted educational strategies for school campaigns. | *CRAG Education Coordinator* | X | X | X |
| **g. Action** Develop educational and awareness programs that target managers and the public based on the outcome of scientific studies | *CRAG Education Coordinator* | X | X | X |
| **h. Action:** Plastic bag reduction campaign | *Coral Management Fellow* | | X | |
| **i. Action:** Implement programs | *CRAG Education Coordinator* | | X | X |

| **Threat:** GLOBAL CLIMATE CHANGE | | | | | ***1/05*** |
|---|---|---|---|---|---|
| **Goal:** Mitigate the negative effects of global climate change on coral reefs in American Samoa by supporting research and education initiatives | | | | | |
| **Success Indicators:**<br>• Progress in attracting climate change research projects to the territory and developing local climate change educational projects | | | | | |
| **Projects** | *Lead agency/individual* | *TIMELINE* | | | |
| | | *Y1* | *Y2* | *Y3* | |
| **1. PROJECT: Monitor long-term impacts of global warming/climate change to local reefs. This task would be a part of the territory's coral reef monitoring program (a cross-cutting issue for all LASs)** | **Monitoring Coordinator** | | | | |
| **a. Action:** Develop and implement a CRAG Territorial Coral Reef Monitoring Program (TCRMP) that includes measurements of coral bleaching and disease. | *Coral Reef Monitoring Coordinator/CRAG Working Group* | *X* | | | |
| **2. PROJECT: Create a rapid response contingency plan for actions to be taken during a bleaching event** | **Monitoring Coordinator** | | | | |
| **a. Action:** Develop an inter-agency response plan | *Monitoring Coordinator* | *X* | | | |
| **b. Action:** Communicate coral bleaching events and impacts to the media | *Monitoring Coordinator* | *X* | *X* | *X* | |
| **c. Action**: Establish mechanisms for public to report bleaching events | *CRAG Education Coordinator/Monitoring Coordinator* | *X* | | | |
| **3. PROJECT: Incorporate climate change concerns into broader reef management plans** | **Climate Change Working Group** | | | | |

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| **a. Action:** Review relevant management plans and determine their potential role in addressing climate change issues. | *CRAG* | | | |
| **b. Action:** Identify areas of temperature-tolerant corals and develop site-specific management strategies to protect them | *DMWR/ CRAG/NPS* | *X* | *X* | |
| **4. PROJECT: Promote American Samoa as a national field site for climate change research** | **CRAG** | | | |
| **a. Action:** Attract and facilitate off-island researchers, by building a Territorial Marine Lab on Tutuila, with a field station in Ofu; finalize site selection, secure funding. | *CRAG/NPS* | *X* | *X* | *X* |
| **b. Action:** Encourage and support research on climate change in the territory | *CRAG* | *X* | *X* | *X* |
| **c. Action:** Prepare a territorial Marine Research Plan | *FBNMS* | *X* | | |
| **d. Action:** Implement Plan | *CRAG* | | *X* | *X* |
| **5. PROJECT: Develop and implement a three-year public awareness campaign to promote climate change as an opportunity to build stewardship and awareness** | **CRAG** | | | |
| **a. Action**: Develop links with Pacific and international organizations that may be able to provide support or expertise for climate change issues. | *CRAG Education Coordinator* | *X* | | |
| **b. Action**: Increase local awareness of climate change impacts to coral reefs through the media (TV, radio, and newspaper) | *CRAG Education Coordinator* | *X* | *X* | *X* |
| **c. Action:** Develop targeted educational strategies for school campaigns. | *CRAG Education Coordinator* | *X* | *X* | *X* |
| **d. Action:** Develop educational and awareness programs that target managers and the public based on scientifically sound information | *CRAG Education Coordinator* | *X* | *X* | *X* |
| **6. PROJECT: Examine broader impacts of global climate change to the Territory, such as terrestrial impacts** | **Climate Change Working Group** | | | |

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| **a. Action:** Establish a Governor's Task Force on Global Climate Change | *Monitoring Coordinator* | | *X* | |
| **b. Action:** Sponsor a climate change workshop for managers as follow-up to proposed regional NOAA workshop | *CRAG Chair* | | | *X* |

| **Threat:** Population Pressure | | | | | ***1/05*** |
|---|---|---|---|---|---|
| **Goal:** Assist the Population Implementation Committee (PIC) to create policies, programs, and incentives that will stabilize population to reduce the harmful environmental effects of overpopulation | | | | | |
| **Success Indicators:**<br>• A functioning and effective Population Implementation Committee<br>• Stabilized and reduced birth rates<br>• Reduction in immigration | | | | | |
| **Projects** | *Lead agency/individual* | *TIMELINE* | | | |
| | | *Y1* | *Y2* | *Y3* | |
| **1. Project: Re-activate the Population Implementation Committee (PIC)** | | | | | |
| **a. Action:** Present local action strategy (LAS) to Governor and promote the re-activation of the PIC | *CRAG Chair* | *X* | | | |
| **b. Action:** Present LAS to PIC and PIC Working Groups and develop a consensus on future actions | *CRAG/Coral Management Assistant* | *X* | | | |
| **c. Action:** Facilitate infrastructure assessment to highlight impacts of population growth on DOE, ASPA, Immigration and DPH | *CRAG/DOC* | | *X* | | |
| **2. Project:** Update Governor's Population Action Plan | | | | | |
| **a. Action:** Gather accurate information from all Working Groups and 2000 Census and update plan | *Coral Management Assistant* | *X* | | | |
| **b. Action:** Print updated Plan | *Coral Management Assistant* | *X* | | | |
| **c. Action:** Post Plan on web-site | *Coral Management Assistant* | *X* | | | |
| **d. Action:** Develop and print Population Action Plan summary booklet | Coral Management Assistant | *X* | | | |

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| **3. Project: Develop and implement a three-year campaign to build awareness of the harmful environmental effects of unsustainable population** | | | | |
| **a. Action:** Develop links with such Pacific and international organizations as might be able to lend material support, advice, or other expertise, and incorporate into work plan related to population impacts on reefs | *CRAG Education Coordinator* | *X* | | |
| **b. Action:** Increase awareness of the effects of population on coral reefs through the media (TV, radio, and newspaper) | *CRAG Education Coordinator* | *X* | *X* | *X* |
| **c. Action:** Identify and develop targeted educational strategies for school campaigns. | *CRAG Education Coordinator* | *X* | *X* | *X* |
| **d. Action:** Develop educational and awareness programs that target managers and the public based on the outcome of scientific studies | *CRAG Education Coordinator* | *X* | *X* | *X* |
| **e. Action:** Develop Village Delegate program to equip village leaders with knowledge and resources to increase local awareness of population issues | *CRAG Education Coordinator* | | *X* | *X* |