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# Protecting Our National Marine Sanctuaries

*A report by the  
Center for the Economy  
and the Environment*



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### *Management Activities*

- sanctuary staff has conducted annual monitoring of physical and limited biological conditions at five locations since 1995
- University of California-Davis marine lab is planning large, multi-year study of currents, upwelling, and biological conditions in both sanctuaries
- free use of NOAA ship McArthur during annual 10-day visits
- review permits for research within sanctuary
- sanctuary education activities focus mostly on the Farallones, which are more familiar to the public

### *Opportunities for the Future*

- sanctuary research could document impacts of over-fishing and trawling on the unique physical and biological features of the sanctuary
- limited recreational use is likely, except for sport fishing
- the unique features of the bank could be a focus for public education in some settings, e.g., as part of more extensive education efforts

### *Strategic Questions and Choices*

- Should NOAA invest in raising public awareness about the sanctuary?
- If research shows that fishing, especially bottom trawling, is damaging the pinnacles and bottom, should the sanctuary seek authority to regulate fishing, or should it seek protective measures by NMFS and the Pacific Fisheries Management Council?
- How can the sanctuary best encourage and support research about the special conditions at the banks and more generally about the highly productive marine area of the Farallones and Cordell Bank area?

## **Profile: Fagatele Bay National Marine Sanctuary, June 1999**

### *Summary*

The smallest of the sanctuaries, the Fagatele Bay National Marine Sanctuary is a dramatic eyeful of clear blue water, reef, beach, jungle, and cliff on the

rugged coast of the main island of American Samoa. The bay is in relatively pristine condition and well-protected on the land side. No one lives beside the bay, and a high ridge borders it on three sides, so there is little surface runoff into the bay. It is difficult to reach the bay by land; the only road is gated and footpaths from the ridge to the water are steep and narrow, so very few visitors walk down to the small beaches to fish, picnic, and perhaps leave trash or harm the coral reef.

But from the ocean side, both natural forces and humans have hammered the sanctuary in recent years, seriously damaging the reef and depleting the fish. In 1979, crown-of-thorns starfish infested the bay and killed much of the coral, which had only partly recovered in 1990 and 1991 when hurricane waves smashed most of the coral as much as 30-feet below sea level. The bottom of the bay is still covered by rubble. However, coral is growing on the rubble rather more rapidly than expected, and a few large coral heads survived.

Some fishermen may also be hurting the reef. Sanctuary rules prohibit most forms of fishing in the inner two-thirds of the sanctuary, but there is little enforcement of fishing regulations anywhere on the islands. No one lives close enough to Fagatele Bay to watch what is happening at night and report violators to the territorial department of marine and wildlife resources. In Samoa, some fishermen dump bleach in the water to kill fish and others use dynamite. Also, in the past five years about 15 Samoans and a few other Pacific islanders have begun spear-fishing at night using scuba gear. They operate all around the island, especially in places like Fagatele which are far from villages and thus once had more big fish.

No one really knows how often scuba spear-fishermen or other fishermen work in the sanctuary or use illegal methods. Presumably they do visit the sanctuary, because most people feel that Fagatele Bay contains fewer big fish than ever, and a research scientist once heard dynamiting in the bay.

When American Samoa's delegate to Congress and the territorial government sought to create the sanctuary, they were looking not for more regulation but for more revenue. The island is heavily dependent on

federal funds. A special federal grant pays over two-thirds of the territory's budget, and the territorial government employs a third of the workforce. NOAA adds a small amount to the territorial budget by making a grant for managing the sanctuary. But the NOAA grant is tiny, just enough to pay one person part-time until 1993 and only two full-time since 1995. They work within the territorial department of commerce, closely linked to the coast zone management program.

The sanctuary management plan, written in 1984 before the sanctuary began operations, promised to build a visitor center near the sanctuary, have an active interpretive program, and conduct boat tours of the bay. There have never been sufficient funds to meet these commitments.

Instead, the sanctuary has focused its energies on marine and environmental education for schoolchildren. It provides most of the funds for a three-week, half-day summer camp for about 50 middle school children operated by the Department of Education. The sanctuary and four other agencies support a day-long summer program for younger children. Sanctuary staff also speak and organize field trips at many schools, help organize exhibits at fairs and festivals, distribute a coloring book they wrote in Samoan about coral reefs, and train teachers. The sanctuary's educational efforts describe the sanctuary in Fagatele Bay but primarily address island-wide issues, encouraging young Samoans to learn about the sea and to be good stewards.

The sanctuary's educational efforts are well-known and respected, even though access to the sanctuary is so limited that few schoolchildren will ever see it. Several other environmental agencies have joined the sanctuary in conducting educational programs, and the sanctuary staff has been a spark plug in coordinating their efforts.

Educating schoolchildren is a good way to protect the sanctuary over the long run. The same factors threaten the sanctuary and other reefs and in-shore fishing grounds. American Samoa's population grows 3.7 percent annually; although Samoa imports much of its food, the market for local fish is much stronger than are efforts to enforce fishing regulations; and lots of

trash finds its way into the ocean from ships, when torrential rains wash backyard litter into the sea, and sometimes when people simply throw bags of garbage off cliffs into the ocean.

The Department of Marine and Wildlife Resources is proposing to attack over-fishing directly. It has drafted regulations to prohibit scuba-spearfishing. Also, it is developing a program that would provide technical assistance to any village councils that would assume legal authority to regulate off-shore fishing and would agree to establish no-take zones. Village councils traditionally managed fishing on adjacent reefs, but recent court decisions say that villages have no legal authority beyond mean high tide level. The department's proposal thus enters a legal thicket with a proposal to blend scientific fishery management with traditional cultural practices.

If more resources were available, the sanctuary might expand its educational efforts. However, with several other agencies now providing marine and environmental education, the sanctuary would have to consider what its unique contribution might be.

Or the sanctuary might use additional resources to help the Department of Marine and Wildlife Resource's efforts to enforce existing regulations and write better ones. The sanctuary is already providing its comments on the department's plans and has offered to pay for enforcement in the bay, if it were effective in reducing damaging and illegal activity.

Another option would be to invest in research on the bay. The sanctuary has provided moderate grants to support monitoring of the bay in 1985, 1988, 1995, and 1998 but much more could be done.

Or the sanctuary could encourage eco-tourism in the bay, as envisioned in the original management plan. There is little tourism in American Samoa, and many Samoans would rather rely on federal subsidies than risk further erosion of *fa'asamoa*, the traditional Samoan way of life, by opening the gates to foreign tourists. However, if the sanctuary could design and spark a small tourist presence in the bay, it might persuade local landowners and other Samoans that protecting the coastline is both profitable and consistent with traditional values.

*The Site*

## The sanctuary

- 163 acres—just over one-quarter square mile
- a bay on the southern coast of Tutuila, the largest island in American Samoa
- jungle along most of the shore; three short, thin sandy beaches; cliffs; shallow reef; and deeper reefs averaging 20-50 feet below the surface near shore and dropping to 200 feet at the deepest

## Inland

- The ridge behind the bay is private land, with a few temporary homes and small plots that are farmed intermittently.
- The ownership of the ridge and of the land between the ridge and public roads is disputed, with one influential elected official claiming most of the area, and several claimants of smaller portions.
- The bay is not easily accessible from land; the nearest public road is almost a mile away; a private access road is rough and gated; near the bay visitors must walk down a steep, over-grown path through jungle to the shore.
- The landfill for the island lies behind the ridge; there is no surface water drainage from the landfill to the bay, but the underlying rock is highly porous and perhaps some day ground-water will carry pollutants to the bay.
- The bay is easily accessible by boat (about 40 minutes from the closest boat ramp) during the six months of the year when winds come from the north; access is tricky in stormy weather.

## Marine resources

- excellent water quality
- much of coral reef in the sanctuary destroyed by large waves during the 1990 and 1991 hurricanes; some areas recovering more rapidly than expected
- a calving ground for the endangered southern Pacific humpback whales
- a nesting site for endangered hawksbill sea turtles; visited by endangered green sea turtles
- a relatively rich population of fish; the area has been fished comparatively lightly until recently
- a dramatic, beautiful spot

## Environmental threats

- pollution
  - not significant because little nearby human activity and few visits to the sanctuary
- fishing
  - Local landowners do some fishing and may also “glean” parts of the reefs periodically—a traditional use, taking all edible plants and animals in a small area.
  - In the past five years, American Samoans and, according to most people on the islands, fishermen from Independent Samoa and Tonga spear-fish with scuba at night; scuba spear-fishermen catch almost three times as many fish per hour as other fisherman.
  - There is little effective enforcement of fishing regulations at present.
  - As elsewhere along the coast, dynamiting for fish has reduced some parts of the Fagatele reef to rubble; and some fishermen may use chemical poisons which kills all marine life (as well as traditional poisonous plants which serve the same purpose but are somewhat less effective).
- Other problems
  - In 1979, crown-of-thorns starfish destroyed coral in much of the bay, but these areas had largely recovered until hit by hurricanes.
  - In 1990 and 1991, hurricane waves smashed much of the coral.
  - In 1994, unusually warm water caused coral bleaching from 90 feet to at least 120 feet and killed one-third of the coral; rising sea temperatures near Samoa suggest there may be similar events in the future.

*Samoa*

## Basic facts

- a U.S. territory since 1900, when it became a refueling station for the U.S. Navy
- 2,276 miles south and west of Honolulu, and about 4,400 miles southwest of San Francisco
- population of 60,000, over 95 percent of which is on Tutuila, where the sanctuary is located
- population has grown from 6,000 in 1900; growth rate is now 3.7 percent annually—higher than 19 of 22 countries in the southern Pacific

- Independent Samoa, a separate nation but with many family and cultural ties, lies about 70 miles west of American Samoa, and was once governed by Germany, later by New Zealand.

#### Society and culture

- Traditional culture was village-based subsistence agriculture, supplemented by fishing.
- Land is owned in common by the village, governed by chiefs who head families.
- Under traditional Samoan land tenure, the use of offshore waters out to the reef belonged to the owners of the shore. Court decisions have now determined that all land beyond mean high-tide is territorial.
- Traditional Samoan culture is resilient but changing to accommodate some Western practices.
- The culture is very conservative, with a great deal of respect for parents and chiefs.
- Samoans have extremely high attendance in large and beautifully-constructed Christian churches of multiple denominations.
- Many village chiefs are also deacons in local churches. There is a close interweaving of religious, cultural, social, family, and land-use governance.

#### Tourism

- a major industry in Independent Samoa but not American Samoa
- 10–20 day-long visits per year from cruise ships; most of the 10,000 visitors stay on the docks or nearby in the spectacular Pago Pago harbor
- estimate up to 8,000 overnight tourists per year
- only two airplanes per week from Honolulu
- very limited accommodations
- friendly people but cultural resistance to increased visits by Westerners
- no use of most beaches and few other tourist activities on Sundays, when Samoans go to church

#### Economy and government

- two large tuna canneries in the Pago Pago area (the territorial capital)
  - built in the late 1950s
  - serve fleets fishing in large parts of the Pacific
  - have duty-free access to U.S. markets

- provide one-third of all paid employment in the territory
- account for 94 percent of exports from American Samoa

#### ■ The rest of the economy

- limited farming (16 percent of surface area); much land is too steep to farm
- minimal local industry
- fewer than 150 commercial fishermen
- government provides one-third of paid employment
- many unemployed Samoans depend on Food Stamps and other federal food programs; a congressional staffer who helped write legislation making American Samoans eligible now says, with many others, this was a great mistake because it undercut the willingness to work

#### ■ Territorial government

- an elected governor, bicameral legislature, and non-voting representative in the U.S. House of Representatives
- a single U.S. Department of the Interior grant pays for over \$70 million of the territory's \$113 million budget (FY95)
- diet includes many imported foods—corned beef, salt beef, lamb from New Zealand; major shift in food preferences since World War II, when American troops used the island as a base
- much-reduced military importance; little visible presence today

#### *Resources and Authorities*

##### Mandate and purposes

- established in 1986 for “preserving and protecting this unique and fragile ecosystem”
- regulations on fishing gear forbid commercial fishing and prohibit other fishing, except with hand-thrown nets or fish traps, in the inner half of the sanctuary

##### Resources

- annual budget: \$99,000 (FY99); two full-time employees and two young Americorps volunteers
- crowded one-room office
- recent purchase of a small boat
- no sanctuary advisory council

### Original expectations for the sanctuary

- Territorial officials hoped that the sanctuary would bring funds to hire coastal and marine experts.
- Some landowners near the bay expected that the sanctuary would pay them for easements for public access and for facilities on shore.
- The management plan (written in 1984, before designation) promised a vigorous outreach and tourism program, including a visitor center and boat rides in the sanctuary.

### *Management Activities*

#### Educating schoolchildren

- annual marine science summer camp
  - 50–70 ninth-graders
  - two to three half-day sessions of three weeks each
  - held at local elementary schools
  - taught by teachers from the territorial school system, managed by sanctuary staff
- annual summer enviro-marine discovery camp
  - 150–200 elementary schoolers
  - four to six overnight campouts
  - held at local elementary schools
  - taught by staff of sanctuary and other environmental agencies plus a teacher
- presentations about marine stewardship to students at island schools
- teacher training sessions
- a coloring book on coral reefs in English, Samoan and Hawaiian, produced jointly with the Hawaiian Humpback Whale sanctuary

#### Public education and outreach

- annually publish a popular tide calendar, with color pictures by local students
- annual pamphlets on tides
- sponsor occasional public whale-watching trips
- starting evening village outreach programs—videos, talks, skits, cleanups
- cooperate with other environmental agencies to present environmental programs and exhibits on holidays and celebrations
- regular column in the local newspaper; periodic appearances on TV and radio
- sanctuary provides posters and signs about Fagatele and about marine life to other agencies

### Regulation and site management

- contract with territorial fish and game department for enforcement has proven ineffective; few visits made
- lack of a boat has precluded on-site management or enforcement by sanctuary staff in the past; small boat about to become available
- soon to sign an agreement to reimburse the territorial marine and wildlife resources department for patrols in the sanctuary; visits will be during the night and early morning
- placed mooring buoys in the sanctuary to substitute for anchoring in coral; buoys were cut loose, perhaps by local residents to discourage others from entering the bay; may place sub-surface buoys for use by agency staff and local residents

### Research

- supported baseline studies of coral and fish resources in Fagatele Bay in 1985, 1988, 1995 and 1998; journal article on changing conditions over 20 years was to be published in 1999
- participate in various professional conferences

### Management and inter-agency activities

- close links to the territorial coastal zone management program
  - sanctuary manager and educational coordinator have been territorial employees working with the coastal zone management program
  - the sanctuary manager will become a federal employee shortly but will continue to function as part of the territorial system
  - sanctuary manager participates as a program director in Department of Commerce, investing up to 15 percent of time in various management issues
- organization of environmental educators
  - sanctuary staff took the leadership in creating the organization
  - initially considered becoming a nonprofit to pool agency funds, but some agencies objected
  - now a mechanism for informal coordination
- some competition among agencies engaged in environmental education; little cooperation with the territorial fish and game department, which has a statutory mandate to conduct environmental education

- few direct links to village chiefs, who are powerful figures in land-use, village policing, cleanup, and many other matters of interest to the sanctuary and generally to environmental agencies
- substantial frustration with the territorial government in obtaining NOAA contract funds and in paying bills

### *Strategic Questions and Choices*

#### A continued role in environmental education

- sanctuary established itself as respected source of activities, materials, and assistance to teachers
- other agencies are now more active also
- education of the future generation is of fundamental importance in protecting the marine environment in the long run
- some public resistance to agency "preaching" about the necessity of cleanup
- questions about leadership if current sanctuary staff move on to other jobs
- questions about the sanctuary's role in environmental education

#### Marine reserves

- little sanctuary capacity to enforce existing no-take requirement; may require a "sting" operation to catch perpetrators in the act
- department of fish and game designing island-wide regulations to ban scuba spear-fishing at night and to help village councils create no-take zones; difficult to see how the sanctuary can help the department to get this program going or to manage it, given the sanctuary's limited links to village councils and the independence of the department

#### Potential for growth

- small size of NOAA contract and lack of available territorial funds limits activities
- small size of sanctuary limits impact
- solid, recognized niche for the sanctuary in education and outreach: Does this provide a foundation for future growth?

## **Profile: Gulf of the Farallones National Marine Sanctuary, June 1999**

### *Summary*

The Gulf of the Farallones National Marine Sanctuary includes about 70 percent of the continental shelf off San Francisco. (The Farallones sanctuary staff currently manages the Cordell Banks National Marine Sanctuary and used to co-manage the northern portion of the Monterey Bay sanctuary; together the first two sanctuaries and the northern portion of the third include all of the shelf off San Francisco.)

This is an area of rich fishing grounds and excellent seabird habitat, frequented by 13 species of whales and many marine mammals. Although the water is in almost pristine conditions, there are difficult natural resource conflicts in the area. Major shipping lanes run through the sanctuary, and there are small-to-medium sized oil spills every year. The sanctuary is intensively fished, and the stocks of rockfish are far below historic levels. An old radioactive dump in the sanctuary is the largest in the United States, and there are periodic proposals to dump other materials in the sanctuary.

The sanctuary receives far less public attention than nearby San Francisco Bay and the beautiful coastline which the sanctuary borders. One reason is that sanctuary waters are often rough and foggy, so most people stay on the beach or close to shore. Signs warn of riptides; winter waves erode the cliffs, sometimes undercutting highways and houses; and occasionally a great white shark attacks a swimmer. The Farallones Islands, which give the sanctuary its name, are the home of the largest seabird colony in the lower 48 states, but the islands are closed to the public.

The visibility of the sanctuary is also limited by its tiny staff—only 1/100 of the size of the two national parks that own much of the coastline.

To get its work, the sanctuary operates in close working partnership with the parks and with the many other non-profits and government agencies. The sanctuary often makes small contributions to multi-agency research projects, leads and thus helps take the heat when other agencies try to regulate jet skis or other vocal users, and plays a visible and useful role in cleaning up oil spills. A non-profit set up to help the sanctuary raises private funds to