



Benthic Marine Resources in American Samoa

Description: Hermatypic corals are the basis of the coral reef ecosystem. These tiny colonial animals utilize nutrients found in seawater to form their limestone skeletons. As individual coral colonies die and new generations colonize the reef, this calcium carbonate (CaCO_3) base can become several kilometers thick. While all this building is occurring, other creatures are living on the reef as well, sometimes digging in or tunneling through the CaCO_3 matrix in a process known as bioerosion. Together this build-up and break-down of the reef develops a very complex and diverse habitat. It is this complexity which allows many organisms to simultaneously inhabit the reef within their own small habitat niches. In general terms, as the structural complexity of the reef increases so does the biodiversity. It is for this reason that coral reefs are one of the most ecologically diverse habitats on the planet, rivaled in biodiversity only by tropical rainforests on land. In the Pacific Ocean basin, largely due to its age, the greatest numbers of species occur as they have had a greater time period in which to adapt, diversify, radiate and speciate. In the National Park of American Samoa

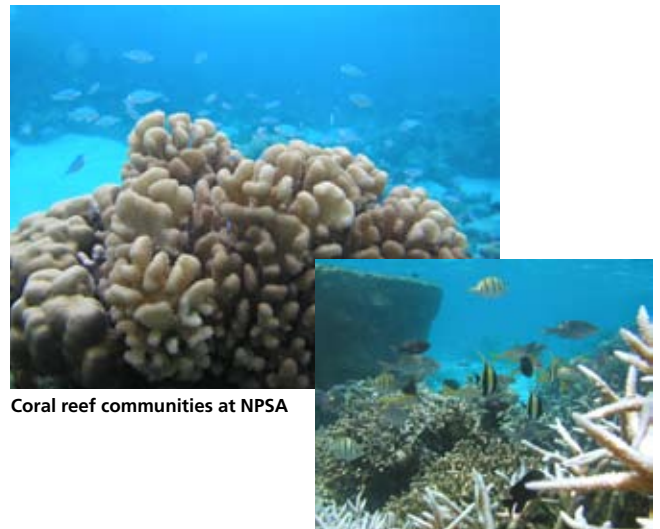


The Crown-of-thorns siphonfish (*Siphamia fuscolineata*) is a small cardinalfish which lives commensally within the venomous spines of the crown-of-thorns seastar. It is one of the 44 fish species recently discovered in American Samoa.



Giant clams (*Tridacna* spp.) which were once a common and colorful inhabitant of the Samoan reefs are now only seen in deeper waters, and usually only in the cryptic color phases

(NPSA) coral reefs line the entire coastline on all three park units (Tutuila, Ofu, and Ta'u). As a result, NPSA has over 250 different corals, 700 molluscs (mostly marine snails), and 900 species of nearshore reef fish, as well as thousands of other invertebrate species.



Coral reef communities at NPSA

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Cultural Significance: Like most other island cultures, the Samoan people traditionally had a great need for the resources available from the sea. Samoans, by way of cultural taboos and chiefly decrees, even had some of the first marine protected areas, allowing species to recover and repopulate the reefs for future generations. Unfortunately, with a greater human population and ever increasing demands, the populations of many traditional fisheries have collapsed. For example, the once common giant clams (*Tridacna spp.*, opposite page), known in Samoan as Faisua, are now rarely seen in the shallow waters easily accessible to local fisherman.



A coral reef community at NPSA

Inventories: Recently, a major push has occurred at NPSA to characterize and identify the species found within the reef communities. So far, there have been 44 new fish species sightings, including at least one (*Ostorhinchus leslie*), if not several, which are new to science. But NPSA and our reefs are not only home to fish. Two sea turtles can be found at NPSA, the endangered hawksbill turtle (*Eretmochelys imbricata*) and the threatened green turtle (*Chelonia mydas*). In addition, 17 marine mammals identified in a multi-year survey effort by researchers from the Hawaiian Humpback National Marine Sanctuary. In 2006, at least one humpback whale (*Megaptera novaengliae*) is thought to have given birth within park waters.

Monitoring: NPSA marine biologists, with help from University of Hawaii, Kalaupapa National Historical Park and National Oceanic and Atmospheric Association staff have recent-

ly conducted the inaugural year of the Inventory and Monitoring Program (I&M) benthic marine monitoring protocol. Survey work was also conducted for the I&M fish protocol currently under development. In February 2007, fifteen permanent survey stations were installed on the Tutuila unit of NPSA and field data was collected. Currently NPSA is finishing out this year's monitoring by completing data collections from 15 random sites in the park.

high and recolonization of the reefs is certainly achievable in the near future as the reefs remain relatively intact. During monitoring efforts this year, a near-pristine reef was found within park waters. Previously unknown, this reef showcased amazing biodiversity including numerous humphead wrasse (*Cheilinus undulatus*) and a pair of giant grouper (*Epinephelus lanceolatus*). These sightings provide great hope of repopulating the surrounding areas.



Humbag dascyllus (*Dascyllus aruanus*) swimming above antler coral

Humpback whales (*Megaptera novaengliae*) are transient yearly visitors to NPSA. They come up from their Antarctic feeding grounds from August-October to calve in the shallow warm waters surrounding American Samoa. Photograph taken under NOAA fisheries permit #774-1714

Data entry is ongoing and a database is being developed.

Status & Trends: Currently NPSA and American Samoa in general, lack sufficient law enforcement capabilities to adequately combat the significant problems of over-fishing, and poaching. Few large fish or apex predators remain on the reefs which is having dramatic effects on the population assemblages of fish and other reef inhabitants. Coral coverage remains

Conservation and Management: Like many other parks, the protection and preservation of NPSA's natural resources is one of the top management priorities. Inventory and monitoring practices using the newly developing I & M protocols will continue to be a major focus in order to gain enough data so that trends over time can be more easily discerned.

For more information:

<http://www.nps.gov/npsa/naturescience/index.htm>