

CHAPTER 4:

Understandi Social and Economic Fa



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Goal:

Assess the human dimension of coral reef resources and incorporate social, economic, and cultural values into conservation and management activities.

Understanding the value and human use of coral reefs is critical to reducing threats and sustaining healthy coral reef ecosystems. In particular, coral reef ecosystems in near-shore waters are vulnerable to the impacts of human activities, both directly by exploitation of reef resources and indirectly by land-based activities. The livelihoods and prosperity of people living in coastal tropical areas depend on, and influence, the conditions of marine resources. Coastal activities and their eventual impacts on reefs are inextricably linked, woven into the social, cultural, and economic fabric of regional coastal communities.

USCRTF members and partners have implemented various research and monitoring projects to determine the economic valuation of reef resources, and the impacts on local communities of coastal management activities such as marine protected areas. Improving our understanding of the underlying human motivations, beliefs, and perceptions

Total Economic Value of Coral Reefs in Guam (million US\$/year)

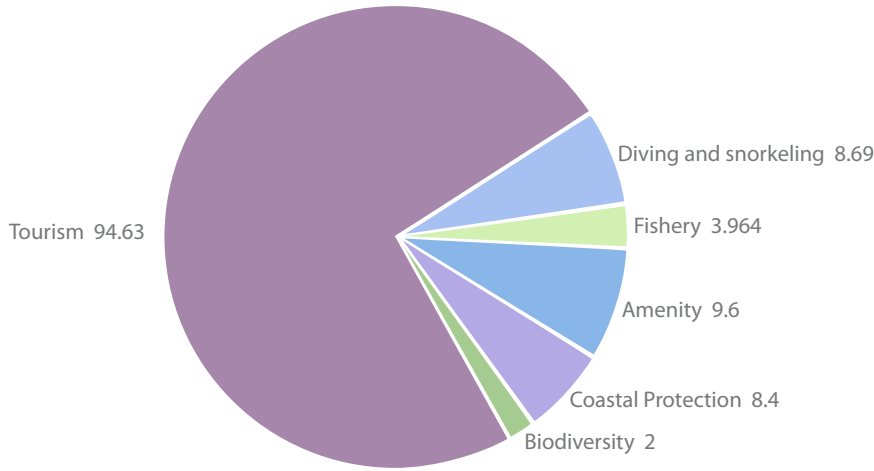


Figure 5: Total Economic Value of Guam’s coral reefs.

regarding coral reef ecosystems is vital to the conservation and adaptive management of these valuable resources.

Accomplishments by Objective

Objective 1: *Assess the social and economic uses of coral reef systems and monitor human communities that use or depend on coral reef ecosystems.*

Economic Valuation of Coral Reefs in American Samoa, Guam, and CNMI

Between 2004 and early 2007, three major economic valuation projects were completed for the coral reefs of Guam, CNMI, and American Samoa. These studies, described below, used a combination of household interviews, economic impact analysis, and stated preference surveys to estimate a total value for coral reef resources in the three jurisdictions. Two more projects are planned for Puerto Rico and the USVI. Conducted by

independent researchers, these studies will be used to highlight the economic importance of coral reefs to the economies and cultures of our U.S. coral reef jurisdictions.

The Economic Value of Guam’s Coral Reefs.

This study, which included interviews of 400 local residents, showed over 90 percent of Guam residents make regular use of the beach and ocean for activities such as swimming, barbequing, fishing, and snorkeling. Approximately 40 percent of local residents fish on a regular basis, and fishing was identified to be more important as a social activity rather than for generating income.

In economic terms, the value of Guam’s coral reefs is derived from tourism, diving and snorkeling, fishing, property values, coastal protection, and biodiversity. Total economic value for Guam’s reefs was estimated at \$127.28 million per year, with tourism accounting for approximately 75 percent

of this value (see Figure 5). This report is available online at: http://www.coralreef.gov/taskforce/pdf/guam_susfin_palau.pdf.

The Economic Value of the Coral Reefs of Saipan, Commonwealth of the Northern Mariana Islands. This report estimated the total economic value of CNMI's reef to be \$61.16 million per year, with tourism comprising about 70 percent of this value. The report concluded with three main recommendations, combining the findings of the valuation study and associated surveys with priorities identified in CNMI's Local Action Strategy. These recommendations include establishing measures to: (1) address the issue of non-point and point source pollution; (2) make use of the cultural importance residents place on marine ecosystems to improve coral reef management; and (3) develop a comprehensive system of user fees for visitors of MPAs on Saipan. The report is available online at: <http://cnmicoralreef.net/Saipan%20final%20report%20zip%20Feb2006.pdf>.

Economic Valuation of American Samoa's Coral Reefs and Adjacent Habitats. This study estimated the territory's coral reefs provide \$5 million in benefits each year to American Samoan residents and visitors. While still significant, this value was lower than expected because tourism and recreational access to corals are limited, extensive man-made shoreline defenses have already been constructed due to beach sand and rubble mining, and the population is relatively small and poor. The American Samoa reef valuation study was conducted by a different set of researchers than the Guam and CNMI studies, which may have resulted in different methodologies for determining total economic values and may account for some of the differences in the totals for American Samoa

versus Guam and CNMI. More information about the project is available online at: <http://doc.asg.as/crag/Projects.htm>, and a copy of the report is available online at: <http://doc.asg.as/crag/ASCoralValuation04.pdf>.

The American Samoa Department of Marine and Wildlife Resources (DMWR), in partnership with the Coral Reef Advisory Group and NOAA, hosted a training workshop in Socioeconomic Assessment and Monitoring. The training was designed to improve manager and staff capacity to integrate socioeconomic analysis into the design, management, and monitoring of MPAs in American Samoa.

Development of Climate Variability Tools

EPA and academic partners collaborated to develop a Draft EPA Report on information tools for integrating climate variability scenarios into linked models of ecosystem dynamics, socioeconomics, and decision support for management of coral reefs.

Facilitation of International Community-based Socioeconomic Monitoring through the Global Socioeconomic Monitoring Initiative

In 2006, NOAA began coordination of the Global Socioeconomic Monitoring Initiative (SocMon). SocMon supports regional and national training workshops around the world to help reef managers incorporate socioeconomic assessments and monitoring into their reef management programs. From 2004 to 2006, grants were provided to approximately 20 international sites to conduct socioeconomic monitoring activities following the workshops, which included information on incorporating results into management actions. This program will expand to include domestic areas, including Puerto Rico, the USVI, and the Pacific territories and FAS in 2007.



Students in India interview a traditional fisherman for a SocMon assessment.

Objective 2: *Assess the social and economic impacts of reef management on human communities.*

Objective 3: *Assess the social, economic, and cultural value of reef resources.*

Tortugas Integrated Assessment in the Florida Keys National Marine Sanctuary

In 2006, NOAA initiated an integrated assessment of the Tortugas Ecological Reserve in the Florida Keys National Marine Sanctuary (FKNMS). The Reserve is a 151-nautical-square-mile (119 square kilometers) no-take zone created in July 2001 and located approximately 70 miles west of Key West. The Tortugas Integrated Assessment, completed in 2007, involves a team of biophysical and social scientists assembled to assess the pre- and post-designation conditions of the Reserve and surrounding areas, as well as the impacts on both human and biophysical systems from establishment of the Reserve. This project,

when complete, will provide important data regarding the effectiveness of MPAs.

This study will also assess any short-term negative impacts on those users displaced from the Reserve and/or whether there have been any shifts in business patterns (i.e., from consumptive recreation to non-consumptive recreation) to offset any losses caused by displacement from the Reserve.

Ethnographic Profiles

Ethnographic community profiles related to fisheries and fish resources have been completed for the USVI and Puerto Rico (for more details see page 88).

Commercial Fishing Panels in the Florida Keys National Marine Sanctuary (FKNMS): Years 7 and 8

In the Florida Keys, four groups of commercial fishermen (panels) have been studied each

year since 1998 to track impacts of fishing regulations. The panels were designed to monitor the impacts of the no-take areas in effect since July 1, 1997, and establish a baseline panel for the Tortugas Ecological Reserve, which went into effect on July 1, 2001. The four panels are: (1) general commercial fishermen not displaced from the no-take areas (used as the control panel); (2) marine life collectors for the aquaria trade; (3) fishermen displaced from the Sambos Ecological Reserve; and 4) Tortugas fishermen, all of whom were displaced from the Tortugas Ecological Reserve on July 1, 2001. Information collected from these fishermen each year includes total catch, spatial distribution of catch, revenue, costs, and net earnings.

An assessment will be made of the eight years of data to assess whether the no-take areas in the FKNMS had any financial impact on the commercial fisheries. Information from the Tortugas panel is also being used in the Tortugas Integrated Assessment (see Objective 2). The research team is recommending the panels be converted to regionally oriented panels and integrated with the biological/ecological monitoring in the region.

Knowledge, Attitudes, and Perceptions of Regulations and Management Strategies in the FKNMS

In 2005, NOAA funded a ten-year replication of a baseline study completed in 1995-1996 by researchers at the University of Florida and the University of Miami's Rosenstiel School of Marine and Atmospheric Sciences, through a Florida Sea Grant Project. Baseline information was obtained on the knowledge, attitudes, and perceptions about regulations and management strategies being proposed for the FKNMS, in particular the no-take areas, which went into effect in 1997. The baseline

and ten-year replication will assess changes in the knowledge, attitudes, and perceptions of FKNMS regulations and management strategies for three user groups: commercial fishermen, dive shop owners and operators, and members of local environmental groups.

In 2006, the surveys of commercial fishermen and dive shop owners/operators were completed. A 100 percent response rate was achieved on a random sample of 300 commercial fishing operations, and a 95 percent response rate was achieved for all 65 dive shop owners/operators in the Florida Keys in 2006. The survey of members of local environmental groups began in December 2006, were completed in May 2007, and the analyses and reports are expected to be completed by December 2007.



Status and Exploitation of Reef Resources on Navassa Island

Navassa Island, a USFWS National Wildlife Refuge, is a small, isolated island 35 miles (56 kilometers) west of Haiti. The reefs and waters around the island are home to 286 species of fish, and are rich in sponges, algae, and coral. The island provides nesting habitat for over 5,000 red-footed boobies, and is home to endemic lizards.

NOAA, along with the USFWS, has completed reef assessment cruises to Navassa Island. Recent results show fishing is having an impact on the area's fisheries, with significant declines in size and abundance of reef fishes (two very active hurricane seasons may be impacting ecosystem health as well). Other significant results from research on Navassa include a guide to the island's sponge community, completion of multibeam and single-beam hydroacoustic (partial) habitat maps, long-term monitoring of the island's benthic community structure, genetic characterization of Navassa's Acroporid corals, documentation of a coral disease outbreak in 2004, and discovery of 49 previously undocumented reef fishes (Miller, et. al., 2007).

Scientists uncovered an active fishery on Navassa Island, and contracted with the Fondation pour la Biodiversite Marine (FoProBIM), an NGO specializing in coastal resource issues in Haiti, to complete a comprehensive description of the fishery at Navassa. The study indicates 75 percent of Haiti's southwest region income is from fishery-related activities, and 1,000 to 1,500 families may be entirely dependent on fisheries operations. Between 300 and 400 fishermen frequent Navassa Island when not fishing close to home. The Navassa Island fisheries alone may account for \$200,000 to \$500,000 a year for those villages known to frequent the island (yearly total fishing-related value for these villages is between \$1 million and \$2 million). The distance from Haiti and dangers of crossing between the islands, along with a lack of food and water supply at the island, appear to be key contributing factors saving Navassa Island from over exploitation. None of the Haitian fishermen interviewed were aware of Haitian and U.S. fishery regulations. The study provided a range of recommendations related to research, management of the island resources, and outreach to the fishing community. As a follow-up to this study, Haitian fishermen have received outreach and education materials on coral reef habitats, endangered species, and about the refuge itself. In addition, dialogue with the fishermen continues and a representative from FoProBIM has visited them in their home towns.