

Understanding Social and Economic Factors



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

Rationale for Action

Sustainable use and conservation of coral reefs require understanding the relationship between human behavior and human impacts to reef ecosystems. For effective management of human impacts, managers need to understand not only the natural science of coral reefs, but also the characteristics of the people who use the ecosystems. These characteristics include socioeconomic and demographic attributes, consumption and production patterns, the value placed on coral reefs as a usable resource (including passive

uses), and enthusiasm for alternative reef management strategies.

To date, the availability of information on the primary users of U.S. coral reefs and the value people place on the resources that reefs provide has lagged behind other areas. This is particularly true for such non-market-valued uses as recreation, preservation/existence, cultural, and spiritual uses. Because market-based prices are not available for these types of uses, assigning a monetary value to them is difficult and, consequently, little is known about the affects on reefs of changes in these attributes.

OBJECTIVES

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

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.



Summary of Implementation

The National Park Service (NPS), NOAA, and state and territory governments are working together to implement research and monitoring programs that enhance understanding of the social and economic factors underlying the use and management of coral reef ecosystems. Since 2002, USCRTF members have implemented various research and monitoring projects, most of which are taking place in states and territories, resulting in the active collaboration of local agencies and researchers. For example, federal agency members of the USCRTF have supported projects to:

- Better understand the economic and cultural uses of coral reefs in Hawai'i, Puerto Rico, and the Pacific territories;
- Determine the economic and cultural importance and environmental impacts of commercial, subsistence, and recreational fisheries located in U.S. coral reef ecosystems;
- Monitor the human use of coral reef ecosystems domestically and internationally;
- Evaluate alternative management options in the United States and internationally; and
- Encourage local involvement in the decision-making and implementation processes.

The USCRTF is committed to understanding how humans use and value coral reefs. Recognizing the fundamental importance of this human dimension is critical to successful coral reef conservation and management. Therefore, the social, economic, and cultural dimensions of coral reef issues are also addressed in other goal areas.

Highlights of Task Force Member Activities

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

Native Hawaiian Involvement in Managing the Northwestern Hawaiian Islands (NWHI) Coral Reef Ecosystem Reserve

The NWHI Coral Reef Ecosystem Reserve has taken steps to include native Hawaiians in the advice and decisionmaking processes for the Reserve and the proposed NWHI National Marine Sanctuary. Three seats on the Reserve Advisory Council are for native Hawaiian representatives. A cultural working group within the council involves a larger representation of the Hawaiian community, which is integral to the management and conservation of the Reserve and proposed Sanctuary. Various Hawaiian institutions are now studying traditional, cultural, and religious uses of the NWHI.

Cost and Earnings Study of the U.S. Caribbean Trap Fishery

Various studies have shown that a large percentage of trap fishing activities are done haphazardly on coral reefs. Such activities cause physical damage to the reef structure and target overexploited reef fish species, further threatening coral reef health and stability. To protect coral reef habitats and ensure the sustainable use of fish resources, the Caribbean Fishery Management Council (CFMC) plans to implement regulations for fish trapping. NOAA

collected socioeconomic information on the U.S. Caribbean trap fishery to support CFMC management and conservation efforts. Designed to complement ongoing coral reef biological research on trap and coral reef habitat interactions, information from the studies will be used to describe the socioeconomic condition of the fishery, establish socioeconomic baselines, and develop models to investigate the consequences of various management proposals.

Global Socioeconomic Monitoring Guidelines

The Global Socioeconomic Monitoring Initiative published region-specific socioeconomic monitoring guidelines to complement the *Socioeconomic Manual for Coral Reef Management* (2000). *SocMon Caribbean* (October 2003) and *SocMon Southeast Asia* (March 2003) (<http://ipo.nos.noaa.gov/socioeconomic/>) provide a standardized process by which to conduct socioeconomic monitoring specific to each region. They also provide the priority indicators to assess, questions to ask, and tables to analyze the data. The *Socioeconomic Manual for Coral Reef Management* explains how to implement the study. The manual and its companion regional publications were developed through substantial collaboration among social scientists and coastal managers in each region.

Global Socioeconomic Monitoring Initiative Training Opportunities

The Global Socioeconomic Monitoring Initiative has supported regional and national training workshops around the world to help reef managers incorporate

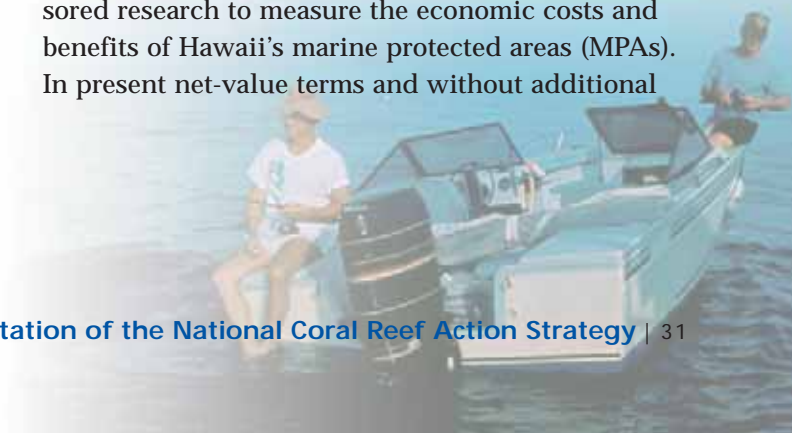


socioeconomic assessments and monitoring into their reef management programs. Workshops have been conducted in Barbados, the Philippines, Kenya, and the Maldives. The initiative has provided funds for individual sites to conduct socioeconomic monitoring after the workshops, including incorporating results into management actions.

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

Economic Costs and Benefits of Hawaii's Protected Areas

In 2003–2004, the Hawai'i Coral Reef Initiative Research Program and the State of Hawai'i sponsored research to measure the economic costs and benefits of Hawaii's marine protected areas (MPAs). In present net-value terms and without additional



management, the economic value of the MPAs ranges from \$6 million for Diamond Head to \$650 million for Hanauma Bay. In no case did the cost exceed the benefits and, in many cases, the economic benefit-to-cost ratio was high. To evaluate a system of user fees, financial benefit-cost ratios were also calculated.

Hawai'i Community-Based Management Planning Initiated

In 2002, NPS initiated community-based marine management planning at Kalaupapa National Historical Park, Hawai'i, which includes 2,000 acres (8 km²) of coral reefs in an adjacent marine area. Meetings were held in coordination with the Kalaupapa community to identify and prioritize options for a community-based approach to the park's marine management programs. These options include community participation in selecting monitoring programs, establishing special management areas in the park, and developing a legislative proposal for incorporating, in perpetuity, the fishing rules for residents into Hawai'i state law. NPS is participating with the local community and a multidisciplinary technical committee of partner

organizations, government agencies, and non-governmental organizations to propose fishing regulations and a monitoring plan for 2004.

Ecosystem Management of MPAs in the South Atlantic

To explore the possible use of MPAs in the South Atlantic (North Carolina to the east coast of Florida), NOAA and the University of Miami are developing an ecosystem-based model to assess the biological, economic, and social consequences of MPA implementation. The model will incorporate spatial and temporal information for both biological and economic dimensions. First, a conceptualized model describing the linkages among the various biological, fishery, and harvesting processes will be constructed. Then, stage-based biological models will be integrated with economic models of the harvesting sector. The resulting model will be used to evaluate a number of MPA proposals being considered by the South Atlantic Fishery Management Council to manage the snapper-grouper fishery. The model will help identify superior management alternatives that meet conservation goals while minimizing economic hardships.



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

Direct User Values for Hawai'i Coral Reefs

The Hawai'i Coral Reef Initiative Research Program sponsored an economic valuation study of Hawaii's nearshore coastal reefs in 2002–2003. Economists found Hawaii's nearshore reefs annually contribute nearly \$1 billion in gross revenues (\$364 million in value added) to the state's economy. The negative impacts

of algal blooms of invasive aquatic species—including significant depressions in property value and economic losses to the tourism industry—have prompted the private sector to play an active role in algal removal.

Hawai'i National Coral Reef Valuation Study

The Hawai'i National Coral Reef Valuation Study examines at a national level how people value the nonmarket resources (i.e., those that cannot be bought or sold) provided by the coral reefs of Hawai'i under alternative management approaches. Results of this study will help resource managers develop and implement policies that balance protection with multiple uses of reef resources and the value the public places on them. For example, total nonmarket resource values can be used to estimate the benefits and costs of alternative coral reef management strategies. The study is designed to complement recent studies of direct-user values for Hawaii's coral reefs.

Local Coral Reef and Coastal Resource Economic Valuation Initiative

In August 2002, NOAA held a Coral Reef Economic Valuation Workshop in Honolulu, Hawai'i. The workshop brought together more than 50 state and territory coral reef and coastal managers, economists, international experts, and federal agency representatives. Workshop goals included assessing information on natural resource valuation in the jurisdictions, identifying priority information and study needs, and developing an implementation plan for filling the identified needs in each jurisdiction. Representatives prioritized information gaps, needs, and management applications for economic valuation studies. NOAA is helping support studies in each of these jurisdictions and is helping support the development of a coral reef manager's guide to economic valuation.

Determining the Value of Puerto Rican Reefs

NOAA, in cooperation with the Puerto Rico Department of the Environment and Natural Resources (PRDENR), has begun a project to estimate the economic value of coral reefs to recreational users and the economic impacts of recreational activities in and around Puerto Rico. During the first phase of the project, NOAA compiled rough estimates from existing Marine Recreational Fisheries Statistical Survey data, which are designed to estimate catch-per-unit effort and participation. The results indicate the relative importance of the angler fishing industry in Puerto Rico. During the second phase, started in 2003, NOAA and PRDENR started collecting more direct economic data from local anglers. By 2005, the agencies plan to create a valuation and economic impact model that will help evaluate costs and benefits of potential future policies.

American Samoa Coral Reef Economic Valuation Study

The Economic Valuation of Coral Reefs and Adjacent Habitats in American Samoa final report details the results of an economic valuation study examining the current and potential values for corals and mangroves. The report focuses on the value of the reefs to artisanal and subsistence fisheries, shoreline protection and recreation/tourism (ecotourism). The study estimates the territory's coral reefs provide US\$5 million in benefits to American Samoa residents and visitors per year. When potential nonuse benefits accruing to U.S. citizens are included, the territorial reefs are estimated to convey at least US\$10 million per year. The results of this study supplies local managers with the information needed to develop effective resource use policies. This report can be found online at <http://doc.asg.as/crag/Projects.htm>.





Future Challenges

Significant progress has been made on understanding the use and value of coral reef ecosystems in the United States and abroad, but additional

socioeconomic data are needed. The following are important components of future socioeconomic research:

Continuation of data collection. A continuous collection of data is needed on the preferences and perceived tradeoffs of those directly affected by changes in proposed coral reef management strategies. Increased collaboration among the USCRTF, local organizations, and interest groups can help set project priorities and improve the efficiency of project implementation by providing support, guidance, and oversight.

Development of socioeconomic tools. An expanded use of tools is needed to help improve the design and implementation of socioeconomic data collection, analyses, and interpretation (e.g., manuals, seminars, workshops).