Marine Protected Area (MPA) Process Review: Case Studies of Five MPA Establishment Processes

May 2003

Prepared by the National Marine Protected Areas Center
in cooperation with the
National Oceanic and Atmospheric Administration
Coastal Services Center

Brianne Leigh Kessler, Primary Investigator
Coastal Management Specialist
Perot Systems Government Services

NOAA Coastal Services Center
National Marine Protected Areas Center
Training and Technical Assistance Institute
2234 South Hobson Avenue
Charleston, South Carolina 29405-2413
www.mpa.gov
www.csc.noaa.gov/cms/cls/mpa_training.html

Table of Contents

Introduction

Marine protected areas (MPAs) are used as management tools to protect, maintain, or restore natural and cultural resources in coastal and marine waters. Both internationally and throughout the United States, MPAs have been established specifically to conserve biodiversity, manage natural resources, protect endangered species, provide educational and research opportunities, and enhance commercial and recreational activities (Kelleher 1999; National Research Council 2001; Salm *et al.* 2000). Several themes have been found to be universal among MPA efforts. One such theme is that constructive stakeholder involvement in MPA planning is vital to achieving conservation goals, both in establishing sites and in ensuring their effective long-term stewardship (Kelleher 1999; National Research Council 2001; Salm *et al.* 2000). Conversely, when MPA planning processes go awry, the resulting controversy can result in compromises on siting and levels of protection. Any remaining confusion and mistrust among stakeholders has the potential to complicate future MPA efforts, particularly enforcement, in other settings (National Research Council 2001; Salm *et al.* 2000).

What remains unclear is how to design an MPA planning process that results in effective protection while actively engaging all stakeholders in meaningful, productive, and equitable dialogue and decision making. Clearly, there is much to be learned from existing MPAs and from past MPA planning processes. A variety of MPA programs and establishment processes are used internationally, as well as throughout the United States. Hence, there is no single formula for creating an MPA site (Kelleher 1999; National Research Council 2001; Salm *et al.* 2000). MPAs in the United States today are generally not the result of a systematic effort to design and implement MPAs. Rather, existing MPAs are rooted in a matrix of programs and policies under which various jurisdictions (federal, state, and local) use their authorities to manage ocean space, activities, and resources. As a result, planning processes will vary according to the level of government involvement, the goal of protection, the resource in question, and the views of local communities, resource users, or other interested parties (Brody 1998).

Background: The Lessons Learned Project

There is widespread interest in the topic of MPA process design, and specifically in understanding how processes can be structured to be both science-based and participatory. A recent MPA Needs Assessment documented that both marine resource managers and diverse stakeholder groups believe there are important lessons to be learned from past MPA processes (NOAA Coastal Services Center 2002). In response to growing interest in this topic, the National MPA Center has initiated a "lessons learned" project to investigate a number of past MPA establishment processes. The MPA Center's two supporting institutes – The Science Institute in California and the Training and Technical Assistance Institute in South Carolina – are cooperating on this work.

The 'lessons learned' project consists of two distinct phases. The first phase was an objective documentation of five recent MPA establishment processes, with specific process-related elements outlined for each of the case studies. This report presents results of this first phase. The second phase of the project will be a series of interviews with varied stakeholders to get their subjective perception of what worked and what did not for each case study. (Note: This second phase is currently being carried out by a contractor, and is projected to be completed during the fall of 2003.)

The Case Studies

Although each MPA process must be tailored to local issues, stakeholders, and environmental conditions, case studies can demonstrate effective tools and techniques and allow a comparison across MPA efforts. The case studies presented in this report are intended to contribute to future MPA establishment efforts by allowing the readers to identify best practices, to learn from past experiences, and to consider a range of approaches used in MPA establishment processes.

During the past few years, U.S. federal, state, and local agencies have undertaken a number of public planning processes to create new MPAs or to establish different use zones within existing MPAs. Five case studies were selected to demonstrate processes in a range of geographic locations that were established for a variety of purposes, and which had varying amounts of involvement by different levels of government. Approaches used to acquire stakeholder participation within the process varied widely depending on agency-specific requirements, policies, timelines, and other constraints. (Note: For the purpose of this report, "stakeholder" refers to anyone who has an interest in or is affected by the establishment of a protected area.) As a result, stakeholder involvement in these planning processes ranged from continual, substantive involvement over several years to more limited participation that focused primarily on commenting on preliminary plans.

The following MPA designation processes were developed as case studies for this report:

- ◊ Carl N. Schuster Horseshoe Crab Reserve (Delaware Bay)
- ◊ Channel Islands Marine Reserves (California)
- ◊ Gulf of Mexico Grouper Closures (Gulf of Mexico)
- ◊ San Juan County Bottomfish Recovery Zones (Washington)
- ◊ Tortugas Ecological Reserve (Florida)

The purpose of this report is not to suggest that following these approaches will always lead to a successfully established and managed MPA. Rather, this report summarizes the events, issues, and participants of each process and culminates in a number of findings about the research itself and about commonalities across the case studies.

Methodology

For each case study, the MPA establishment process was documented from nomination to designation in chronological order, and the process-related elements detailed below were fully developed and characterized. Internal documents were accessed as primary sources of information, as well as were primary public documents from libraries and Web sites. In addition, theoretical literature, press releases, and news articles were reviewed. Finally, attendance at MPA-related meetings and conferences provided supplementary information, in addition to the opportunity to interview stakeholders who have been involved in one or more MPA establishment processes. It would be impossible to account for all details unless one had been involved in the process itself; however, these various sources provided excellent information on the establishment context, the chronology of events, and the types of stakeholder participation involved in each process.

A rigorous review process was undertaken for each case study as it was produced. First, each case study went through an internal review process by employees of the NOAA Coastal Services Center who were not involved in the project. (Refer to Appendix A for a list of internal reviewers.) Allowing someone who had no previous knowledge, experience, or attachment to a particular case study to review each document was important in identifying gaps and increasing the clarity of the report. Second, each case study went through a standardized editing process. Third, each case study went through an external

review process, wherein several people knowledgeable about the process had an opportunity to provide additional information, make suggestions on how to improve its clarity, and most importantly, report any inaccuracies in the information. (Refer to Appendix B for a list of external reviewers.) Throughout the review process, all comments were taken into consideration, although not all were incorporated, and then each case study was finalized.

Report Format

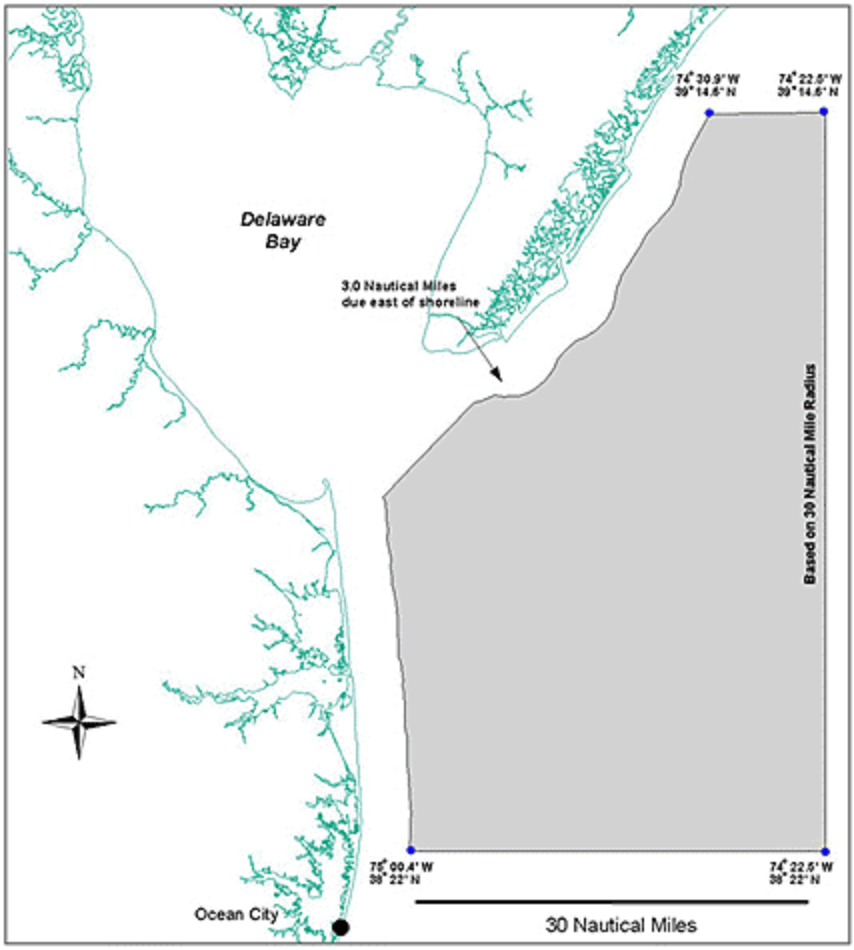
Case studies were created with a consistent format to facilitate comparisons across MPA efforts. The following components can be found within each case study:

- ◊ Site map
- ◊ Abstract
- ◊ Introduction
- ◊ Process Diagram (simplified visual of the process to complement the timeline)
- ◊ Timeline (details of the process from nomination to designation)
- ◊ Objectives (for the MPA)
- ◊ Current Status/Outcome
- ◊ Stakeholders (key players in the process – not meant to be an exhaustive list)
- ◊ Advisory Groups
- ◊ Economic Factors
- ◊ Areas of Conflict/Difficulty
- ◊ Technology-Based Decision-Support Tools
- ◊ Enforcement (measures planned or undertaken since implementation)
- ◊ Boundaries
- ◊ Legislation and/or Regulation (relevant to the MPA process)
- ◊ Media/Public Outreach
- ◊ References (specific to a particular case study)
- ◊ Appendices – tables of public meeting dates and locations, citations for additional readings, tables of advisory groups, panel members, and affiliations (if applicable), and supplementary information related to the process (if applicable)

A Note about Terminology

Executive Order 13158 defines MPA as "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." In this report, however, each case study uses the terminology adopted by that particular process, and is not based on a consistent definition. For example, some case studies used the term "marine reserve" in reference to areas that are completely no-take, while others used the term in reference to areas that have limited take. In another example, some sites preferred to use the term "consumptive," while others preferred to use the term "extractive." Definitions of terms are incorporated in each case study as appropriate.

Carl N. Schuster Jr. Horseshoe Crab Reserve



Source: (*www.nmfs.noaa.gov/horseshoecrb_map.htm*)

Note: Each case study uses the terminology adopted by that particular process, and is not based on a consistent definition.

Abstract

The National Marine Fisheries Service closed an area (comprising about 1,500 square nautical miles of federal waters) outside of Delaware Bay to horseshoe crab fishing beginning in 2001. The intent of this ruling was to provide protection for the Atlantic coast stock of horseshoe crabs and to implement the Atlantic States Marine Fisheries Commission's Interstate Fishery Management Plan for horseshoe crabs. No sunset provision was included with the establishment of the closure.

Introduction

Horseshoe crab (*Limulus polyphemus*) populations in the U.S. are most abundant in Delaware, Maryland, and Virginia around Delaware Bay. In this region, horseshoe crabs play a critical role. Nine species of migratory shorebirds rely on horseshoe crab eggs for food during their spring migration north to Canada. Eel, whelk, and catfish fisheries also depend on horseshoe crabs for bait. Furthermore, the biomedical industry utilizes horseshoe crab blood, which has an extensive infection fighting system, thereby improving the ability of pharmaceutical and medical device manufacturers to assure that their products are free of contaminating endotoxins.

Recent studies have shown a decline in both the horseshoe crab populations as well as in the shorebird populations they sustain. In the past three years, for example, the concentration of horseshoe crab eggs on shorebird feeding beaches in New Jersey has declined by almost fifty percent (New Jersey Department of Environmental Protection, 2003). In recent years, fishing efforts have also shifted dramatically from state waters to mid-Atlantic federal waters. "Under current state laws, all Atlantic coast states monitor and manage fishing for horseshoe crabs in state waters. However, adjoining exclusive economic zone (EEZ) waters have no federal restrictions on horseshoe crab harvest" (*Federal Register*, October 16, 2000a). For these reasons, there was general concern over the possible consequences of continued declines in horseshoe crab populations.

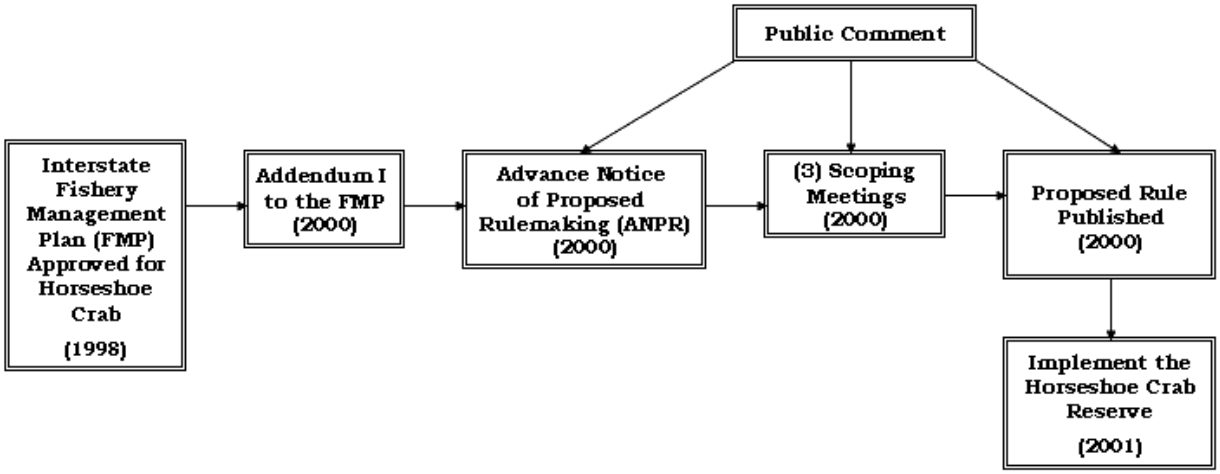
In 2001, to help avoid these consequences, the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) created a horseshoe crab closure that is roughly rectangular in shape, comprising about 1,500 square nautical miles of federal waters. It adjoins state waters south of Pecks Beach, New Jersey, to just north of Ocean City, Maryland. No sunset provision was included with the establishment of the closure. By definition, a sunset provision provides that a provision of the law is automatically repealed on a specific date, unless the law is reenacted. The closure was named the Carl N. Schuster Jr. Horseshoe Crab Reserve in honor of a retired College of William & Mary professor who is a leading horseshoe crab biologist and researcher.

The taking of horseshoe crabs is the only activity not permitted within the closure, but there are two exceptions written into the regulations. First, a biomedical company, Limuli Laboratories, was granted an "exempted fishing permit" to obtain blood from 10,000 horseshoe crabs per year for three years, with the condition that the crabs be released back into Delaware Bay water (*Federal Register,* August 15, 2001; NMFS 2000a). Second, the Virginia Polytechnic Institute and State University's Department of Fisheries and Wildlife Science obtained a "scientific research activity" permit to conduct a pilot trawl study to develop a protocol for coast-wide horseshoe crab monitoring (NMFS 2000b).

Process Diagram

"An important factor in the establishment of MPAs is the process by which they are nominated and designated" (Brody 1998).

The Horseshoe Crab Reserve process occurred as follows:



Timeline (1998 to 2001)

This section details the sequence of events in the establishment process.

- The Atlantic States Marine Fisheries Commission (ASMFC) approved an Interstate Fishery Management Plan (FMP) for the horseshoe crab in 1998, and Addendum I to the plan in February 2000. "Addendum I's intent is to protect and maintain horseshoe crab spawning stock at levels that can sustain fisheries and that will provide an abundance of horseshoe crab eggs as a food source for migratory shorebirds" (*Federal Register*, October 16, 2000a). Under Addendum I,
  - A variety of new requirements for state waters were implemented to better monitor and manage the horseshoe crab fishery, including the establishment of a state-by-state quota.
  - ASMFC recommended to NMFS that it should 1) establish an offshore horseshoe crab sanctuary in federal waters within a 30 nautical mile radius of the mouth of Delaware Bay, and 2) prohibit the transfer of horseshoe crabs in all federal waters.

- May 3, 2000: In support of the commission's horseshoe crab management efforts under Addendum I, NMFS published an advance notice of proposed rulemaking (ANPR) in the *Federal Register* to ask the public to consider a closed area.
  - NMFS asked if there was a need to close fishing for horseshoe crabs seaward from the mouth of Delaware Bay, and if so, what shape and size should a closure be.
  - Public responses were overwhelmingly in favor of proceeding with the proposed rule. "Two-hundred-eighty-one comments were received in favor of continuing the rulemaking process, and one was against" (*Federal Register*, October 16, 2000a).

        - Thirteen conservation organizations, with a collective membership approximated at over one million people, wrote in support of the closure.
        - The states of Delaware, Maryland, and New Jersey wrote in support of the closure.
        - One letter was written on behalf of two Virginia conch-processing companies (Chesapeake Bay Packing and Bernie's Conchs) opposing the closure. "It stated that a closed area in addition to the other measures in the commission's FMP for horseshoe crabs is not scientifically justified" (*Federal Register*, October 16, 2000a). The commenter felt the closed area would force horseshoe crab harvesters to move from offshore areas to nearshore areas where females are more abundant.
    - Comment period for the ANPR process closed June 2, 2000.

- During the closure development process, a separate action took place. In accordance with the Atlantic Coastal Fisheries Cooperative Management Act, NMFS determined on July 7, 2000, that Virginia was not in compliance with the ASMFC FMP. "The commission found that the Commonwealth of Virginia has not implemented and is not enforcing the commission's FMP for horseshoe crab because it has failed to establish a quota on commercial horseshoe crab landings of 152,495 horseshoe crabs as specified in Addendum I" (*Federal Register*, October 16, 2000b).
    - The ASMFC made a recommendation to the Secretary to take action on the issue with Virginia (Selberg, Personal Communication, 2002).
    - The Department of Commerce established a federal moratorium to ensure that Virginia complied with the ASMFC measures. This moratorium was to be effective October 23, 2000, but was immediately withdrawn as Virginia agreed to comply with FMP regulations.

- A series of three public scoping meetings was held on the proposed rule. (Refer to Appendix A for dates and locations of scoping meetings.)
        - "During the scoping meetings, NMFS received 22 comments in favor of the proposed closed area and 14 against" (*Federal Register,* February 5, 2001; Schaefer, no date).
            - Comments received in favor of the proposed rule included that it would protect the horseshoe crab population in the Delaware Bay Area, and would produce more horseshoe crab eggs for the migratory shorebirds.
            - Opposing comments said there were already enough regulations to protect the horseshoe crab, the closed area was too large to obtain needed bait, the closure was not based on good science, and it would inhibit interstate commerce.

- October 10, 2000: NMFS prepared an initial regulatory flexibility analysis (IRFA) that described the impact the proposed rule would have on small entities. By definition, the term small entity includes small businesses or small organizations. A summary of the IRFA can be found in the *Federal Register* (October 16, 2000a).

- October 16, 2000: NMFS published the proposed rule in the *Federal Register* (2000a), opening a comment period that ran until October 31, 2000.
    - "The proposed rule would prohibit fishing for and limit the possession of horseshoe crabs in an area in the EEZ encompassing a 30 nautical mile radius (in a shape roughly equivalent to a rectangle) seaward from the midpoint of the territorial sea line at the mouth of Delaware Bay. The proposed rule would also allow whelk fishing vessels to possess horseshoe crabs as bait on board in the closed area as long as the vessels do not have commercial fishing gear on board aside from whelk fishing traps" (*Federal Register*, October 16, 2000a). Other commercial gears such as trawls, dredges, or gill nets would be prohibited on vessels in the closed area with horseshoe crabs on board, and as a consequence, whelk vessels would not be able to fish for species other than whelks in the closed area. "The proposed rule would also require fishermen to return to the

water all horseshoe crabs caught in the closed area incidental to any fishing operations, including whelk fishing" (*Federal Register*, October 16, 2000a).

- "During the 15-day comment period on the proposed rule and the IRFA, NMFS received 58 written comments from the public. In general terms, 54 of the commenters were in favor of the proposed rule, and 4 objected to its implementation" (*Federal Register*, February 5, 2001; Schaefer, no date).
  - Local and national conservation groups, state agencies, biomedical companies, and the general public submitted comments in favor of the closed area.
  - Fishing organizations, biomedical companies, and the general public submitted comments in opposition to the closed area.
    - Refer to "Stakeholders" section for a list that includes those conservation organizations, state agencies, and private companies that commented on the proposed rule.
  - In general, comments received for the proposed rule were similar to those raised at the scoping meetings.
- "All comments received during the comment period were considered. An additional 38 persons submitted comments within seven days after the deadline for the comment period" (*Federal Register*, February 5, 2001; Schaefer, no date).
  - These comments did not raise new issues, and all but one of these late comments were in favor of the proposed rule.
- Several companies that use horseshoe crab blood for biomedical purposes and some of the conservation organizations requested a modification to the rule that would allow horseshoe crabs to be harvested in the closed area for biomedical use only.
  - "The biomedical fishery issue was addressed in the proposed rule and included in the final rule by authorizing NMFS to issue exempted fishing permits for the harvest of horseshoe crabs" (Schaefer, no date).
    - The exempted fishery process provides the opportunity to gather important fishery information. Because the majority of horseshoe crabs collected are released alive back to the water, the biomedical fisheries could provide useful information for horseshoe crab management with little stress to the resource.

- January 19, 2001: NMFS prepared a final regulatory flexibility analysis (FRFA) that described the impact of the final rule on small entities. The FRFA addresses the issues raised by public comments on the IRFA. A summary of the FRFA can be found in the *Federal Register* (February 5, 2001).

- Following preparation of the FRFA, the assistant administrator for fisheries, NOAA (AA), determined that these actions were compatible with the effective implementation of the commission's coastal fishery management plan and consistent with the national standards of the Magnuson-Stevens Fishery Conservation and Management Act.

- February 5, 2001: NMFS issued a final rule prohibiting fishing for horseshoe crabs in an area in the EEZ at the mouth of Delaware Bay (closed area); prohibiting the possession of horseshoe crabs on a vessel with a trawl or dredge while in the closed area; and requiring fishermen to return to the water all horseshoe crabs caught in the closed area incidental to any fishing operations, including whelk fishing.

- The closed area became effective March 7, 2001.

Objectives

In most cases, an MPA will have multiple objectives. These may include protection of representative habitats, conservation of rare species, fish stock restoration or enhancement, or safeguarding of historical sites, among others.

Objectives established for the Horseshoe Crab Reserve include the following:

- To conserve the Delaware Bay population of horseshoe crabs at a level that can sustain the fishery.
- To help ensure that declining populations of migratory shorebirds have an abundant source of horseshoe crab eggs to feed on when they stop to rest in the Delaware Bay before flying north to their Canadian nesting areas.

Current Status/Outcome

This section describes the current status of the MPA process, and includes information on any ongoing research that will help evaluate effectiveness.

Currently, the Horseshoe Crab Reserve:

- Prohibits fishing for horseshoe crabs in the closed area; prohibits the possession of horseshoe crabs on a vessel with a trawl or dredge while in the closed area; and requires fishermen to return to the water all horseshoe crabs caught in the closed area incidental to any fishing operations, including whelk fishing.
  - "What was more important is what could be done inside the lines, and there was some adjustments to the type of fishing gear allowed on whelk fishing vessels in the area. This was done after receiving public input about how the fisheries operate in the area" (Perra, Personal Communication, 2002).
- Prohibits the transfer of horseshoe crabs in all federal waters.

Few research efforts have been conducted in the closed areas since they were designated:

- NMFS awarded a $10,000 grant for a pilot program to introduce horseshoe crab bait bags into the Mid-Atlantic whelk fisheries. These plastic mesh bags dramatically reduced the amount of horseshoe crab bait needed per whelk trap. Use of the bags has reduced the amount of bait needed in some areas, especially in Virginia, where they have now been mandated. A second $10,000 has been issued in 2002 to extend the program into the New York and New England whelk fisheries (NOAA 2002; Perra, Personal Communication, 2002).
- A horseshoe crab stock assessment was conducted in 1998 and was unable to estimate the horseshoe crab stock size due to a lack of data. This report led to several research initiatives to collect the necessary information for future stock assessments (Selberg, Personal Communication, 2002).

Stakeholders

MPA establishment may impact a wide range of individuals and entities. This means a diversity of stakeholders have an interest in participating in the process.

Stakeholders interested in or affected by the establishment of the Horseshoe Crab Reserve include the following:

- Biomedical companies
  - Associates of Cape Cod
  - Bio-Whittaker
  - Limuli Laboratories
  - Virginia Polytechnic Institute
- Commercial Fishermen
  - American eel, conch/whelk, and catfish fishermen
- Conch processing companies
  - Chesapeake Bay Packing (Virginia)
  - Bernie's Conchs (Virginia)
- General public
- Recreational fishermen
  - American eel, conch/whelk, and catfish fishermen
- Scientists
  - University of Delaware Sea Grant College Program
  - Virginia Polytechnic Institute and State University Department of Fisheries and Wildlife Sciences (Horseshoe Crab Research Center)
- Nongovernmental organizations
  - American Bird Conservancy
  - Committee for the Conservation of Horseshoe Crabs
  - Defenders of Wildlife
  - Delmarva Ornithological Society
  - Delaware Audubon Society
  - Delaware Nature Society
  - Ecological Research and Development Group
  - Environmental Defense
  - Garden State Seafood Association
  - Maryland Audubon Society
  - Maryland Coastal Bays Program
  - Maryland Conservation Council
  - National Audubon Society
  - National Resources Defense Council
  - Nature Conservancy
  - Nature Society
  - New Jersey Waterman's Association
  - Sierra Club Chapters for New Jersey, Delaware, Virginia, and Georgia
  - Sierra Club National Marine Wildlife and Habitat Committee
  - Southern Environmental Law Center
  - Wildlife Conservation Society
  - World Wildlife Fund
- Government agencies
  - State agencies

- Delaware Division of Fish and Wildlife
- Maryland Department of Natural Resources
- New Jersey Fish and Wildlife
  - New Jersey Endangered and Nongame Species Advisory Committee

- Atlantic States Marine Fisheries Commission
- Potomac River Fisheries Commission
- Virginia Marine Resources Commission
- U.S. Department of Commerce
  - National Oceanic and Atmospheric Administration
    - National Marine Fisheries Service
    - National Ocean Service
      - Ocean and Coastal Resource Management
        - Coastal Programs Division

Advisory Groups

Advisory committees may be used during an MPA development process. The establishment of an advisory committee representing various interest groups and affected parties will facilitate local participation throughout the MPA establishment process, and may help to form partnerships by ensuring that all interests are represented in the final proposal (Brody 1998).

Advisory groups were not utilized during the establishment of the Horseshoe Crab Reserve. However, ASMFC organized a Horseshoe Crab Advisory Panel for the purpose of making changes to the horseshoe crab FMP. The panel had completed most of its comments on the ASMFC plan when the closed area was proposed late in the development of the FMP. While the panel had little to do with the development of the reserve, the chairman of the advisory panel was consulted on what fishing gear should be allowed (Perra, Personal Communication, 2002).

Economic Factors

"The acceptability of a MPA to the general public and to direct users will depend significantly on whether the perceived benefits are greater with or without the MPA"
(National Research Council 2001).

The following are economic factors taken into consideration during the establishment of the Horseshoe Crab Reserve:

- "NMFS estimates that in 1999 about 3 million horseshoe crabs worth about $3 million in landings were collected along the U.S. Atlantic coast for use as bait in eel, whelk, and catfish fisheries" (NOAA 2001).
- "In 2000, an estimated 1.8 million horseshoe crabs worth about $2 million in landings were collected along the U.S. Atlantic coast for use as bait in eel and whelk fisheries" (NOAA 2002).
- Out of the 18 vessels affected, 8 direct their fishing effort on horseshoe crabs, and 10 harvest and sell horseshoe crabs that were caught incidentally while directing their fishing effort on other species.

- "The reduction in annual total revenue for the 8 vessels that conduct directed fishing trips is likely to be much lower than the $694,650, which is the total 1998 EEZ horseshoe crab combined dockside landings for Maryland, Delaware, and Virginia" (*Federal Register*, October 16, 2000a).
- "The reduction in annual revenue for the 10 vessels that incidentally harvest horseshoe crabs is expected to be less than $3,000 per vessel or about $30,000" (*Federal Register*, October 16, 2000a).

Areas of Conflict/Difficulty

> **"**MPA proposals often raise significant controversy..." (National Research Council 2001).

The following are areas of conflict or difficulty that arose during the establishment of the Horseshoe Crab Reserve:

- Some fishermen thought the reserve was too large and that the regulations were premature and based on insufficient information (Schuster, Personal Communication, 2002).
- The initiative took months to work out, as the process was prolonged to allow the new presidential administration time to review (Schuster, Personal Communication, 2002; Selberg, Personal Communication, 2002).

Technology-Based Decision-Support Tools

> "MPA formulation and operation require, and benefit from, higher levels of technology in information handling and onsite management… Computer assisted mapping tools, used in storing, retrieving, processing, and displaying spatial data may be particularly useful" (Salm and others 2000).

Technology-based decision-support tools were not utilized during the establishment of the Horseshoe Crab Reserve.

Enforcement

> "Effective enforcement is essential to achieve MPA objectives and sustain cooperation from the general public and affected user groups" (National Research Council 2001).

- The U.S. Coast Guard enforces the closure with assistance from the States of Delaware and Maryland through a joint enforcement agreement.
- To date, no apprehensions have been made or reports filed for illegal taking in reserve waters (Meyer, J., Personal Communication, 2002; Moro, Personal Communication, 2002).

Boundaries

Clear delineation of spatial boundaries is important so that both managers and users know where structured management has been implemented.

- Due to difficulty of enforcing a closed area in the shape of a semicircle, NMFS established a closed area that would be roughly rectangular in shape. Refer to *Federal Register* (February 5, 2001) for a posting of boundary coordinates.
- NMFS drew boundary lines after consultation with adjoining state fisheries agencies (New Jersey, Delaware, Maryland, and Virginia), and after a review of biological survey data and literature on the area (Perra, Personal Communication, 2002).
- Based on scientific data on crab migration, NMFS believed that an area encompassing a 30 nautical mile radius was adequate to protect horseshoe crabs in Delaware Bay. NMFS also believed the closure reasonably balanced the need to protect horseshoe crabs and the need to consider impacts on the fishing and biomedical industries (*Federal Register,* February 5, 2001).

Legislation and/or Regulation

MPA establishment is typically authorized by existing legislation, but implementation frequently requires new regulations. Existing legislation may guide and/or provide context for MPA processes.

- ASMFC, consisting of 15 Atlantic coastal states, works in cooperation with the District of Columbia and the Potomac River Fisheries Commission to manage horseshoe crab fisheries in state waters. Through Addendum I to the FMP, the commission required that all Atlantic coastal states reduce their horseshoe crab bait catch by 25 percent.
  - ASMFC also recommended a prohibition on fishing for horseshoe crabs in federal waters within a 30 nautical mile radius of the mouth of the Delaware Bay.
- In the absence of a federal fishery management plan, regulations have been established under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, which gives the Department of Commerce authority to implement federal measures compatible with the interstate commission's fishery management plan.
  - Under this authority, NMFS banned fishing for horseshoe crabs in federal waters off the mouth of Delaware Bay. NMFS also suggested "permitting and reporting requirements for vessels that catch horseshoe crabs in federal waters, and dealers that sell them, along with prohibiting at-sea vessel transfers of horseshoe crabs, which are currently not counted among state quotas" (NOAA 2001).
    - According to Tom Meyer, "the commission has stated that there does not appear to be any more problems in reporting or transfer at sea, so we do not plan on going forward with any regulations at this time" (Personal Communication, 2002).
- New England, Mid-Atlantic, or South Atlantic Fishery Management Councils could develop regulations, but have chosen not to do so.

Media/ Public Outreach

Entities involved in MPA designation processes frequently undertake a variety of public outreach and education activities.

Sources of media/public outreach used throughout the Horseshoe Crab Reserve process include the following:

- NOAA press releases
- National Audubon Society Press Releases
- New Jersey chapter of the Sierra Club compiled strong scientific facts to share with activists via the Web and list servers.
- New Jersey Division of Fish and Wildlife encouraged the general public to assist in identifying horseshoe crab spawning habitat throughout the state during the spring of 2002, and to report their observations on horseshoe crab spawning activity on the division's Web site or by phone.
    - All data received will be analyzed, summarized, mapped, and reported to the ASMFC and state regulatory agencies so that critical habitat can be protected.
- Public scoping meetings

Refer to Appendix B for a listing of additional readings.

References

Note: All World Wide Web addresses listed in this section were accessible on January 31, 2003, and accurately reflected information referenced here and in the text. Site content at these links may change, or the links may become inactive at any time.

Atlantic States Marine Fisheries Commission (ASMFC). 1998. "Horseshoe Crab Stock Assessment Report for Peer Review." Stock Assessment Report No. 98-01. February. Web site: <www.asmfc.org/PUB/Stock%20Assmt%20Reports/Crab%20Stock%20Assmt%20Report.PDF>.

ASMFC. 2000. "Addendum I to the Fishery Management Plan for Horseshoe Crab." Fishery Management Report No. 32a. April. Web site: <www.asmfc.org/PUB/FMRs/Horseshoe%20Crab%20Addendum%20I.pdf>.

ASMFC. 2001. "ASMFC Board Approves Draft Addendum II to the Horseshoe Crab FMP for Public Review and Comment." Washington, D.C. January 30. Web site: <www.asmfc.org/NEWS/press_releases/2001/PR05%20HSC%20Addendum%20II.pdf>.

ASMFC. 2001. "ASMFC Approves Addendum II to the Horseshoe Crab FMP/ Addendum Provides for State-to-State Quota Transfers." Washington, D.C. April 24. Web site: <www.asmfc.org/NEWS/press_releases/2001/PR0118.pdf>.

ASMFC Horseshoe Crab Plan Development Team. 1998. "Interstate Fishery Management Plan for Horseshoe Crab." Fishery Management Report Number 32 of the ASMFC Interstate Fishery Management Plan for Horseshoe Crab. December. Web site: <http://www.asmfc.org/PUB/FMRs/hcrabfinal1.htm>.

Brody, S.D. 1998. "An Evaluation of the Establishment Processes for Marine Protected Areas in the Gulf of Maine: Understanding the Role of Community Involvement and Public Participation." Marine State Planning Office Gulf of Maine Council on the Marine Environment, Augusta, ME. July. Web site: <http://www.gulfofmaine.org/library/mpas/process_eval_0798.PDF>.

Delaware Audubon Society. 2001. "Horseshoe Crabs Given Sanctuary By National Marine Fisheries Service." April 8. Web site: <www.delawareaudubon.org/conservation/sanctuary.html>.

Federal Register. May 3, 2000 (Volume 65, Number 86). Pages 25698 to 25699.

Federal Register. October 16, 2000a (Volume 65, Number 200). Pages 61116 to 61121.

Federal Register. October 16, 2000b (Volume 65, Number 200). Pages 61135 to 61139.

Federal Register. August 22, 2000 (Volume 65, Number 163). Pages 50952 to 50953.

Federal Register. February 5, 2001 (Volume 66, Number 24). Pages 8906 to 8911.

Federal Register. August 15, 2001 (Volume 66, Number 158). Pages 42832 to 42833.

Holloway, M. 2002. "Ancient Rituals on the Atlantic Coast." *Scientific American.* New York, NY. March. Pages 94 to 97.

Lazaroff, C. 2000. "Horseshoe Crabs Win Protections in Delaware Bay." *Environment News Service*. Washington, D.C. August 9. Web site: <http://ens.lycos.com/ens/aug2000/2000L-08-09-06.html>.

Meyer, J. 2002. Record of telephone conversation regarding the Carl N. Schuster Horseshoe Crab Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Joe Meyer, Captain, New Jersey Division of Fish and Wildlife, July 22.

Meyer, T. 2002. Record of telephone conversation and email exchange regarding the Carl N. Schuster Horseshoe Crab Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Tom Meyer, Program/Policy Analyst, Office of Intergovernmental and Recreational Fisheries, National Marine Fisheries Service, March 2, July 17, and August 29.

Moro, G. 2002. Record of telephone conversation regarding the Carl N. Schuster Horseshoe Crab Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Gino Moro, Acting Special Agent in Charge, Northeast Law Enforcement Office, National Marine Fisheries Service, July 22.

Murray, M. 2001. "Horseshoe Crabs Get a Haven." *The News Journal*. February 6. Web site: <www.delawareonline.com/newsjournal/local/2001/02/06crabs.html>

National Marine Fisheries Service (NMFS). 2000a. "Exempted Fishing Permit: Experimental Fishing Activity." Issued to Capt. Louis Bufalo, vessel owner, Barbara Ann, and Benjie Lynn Swann, project coordinator, Limuli Laboratories. Effective September 27 to October 31, 2001. Permit number 596095.

NMFS. 2000b. "Scientific Research Activity: Letter of Acknowledgment." Issued to Dr. Jim Berkson and Dr. David Hata, Department of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University, for R/V *Tony and Jan.* Effective September 1 to October 31, 2001. Permit number 240208.

National Oceanic and Atmospheric Administration (NOAA). 2000. "Declining Numbers of Migratory Shore Birds and Horseshoe Crabs Have NOAA Fisheries Considering a Closure in Federal Waters." NOAA 2000-116. May 11. Web site: <www.publicaffairs.noaa.gov/releases2000/may00/noaa00r116.html>.

NOAA. 2000. "Commerce Secretary Mineta Acts to Protect Horseshoe Crabs." NOAA 2000-149. October 12. Web site: <www.publicaffairs.noaa.gov/releases2000/oct00/noaa00r149.html>.

NOAA. 2001. "NOAA Fisheries Close Area to Fishing for Horseshoe Crabs." NOAA 2001-R104. February 5. Web site: <www.publicaffairs.noaa.gov/releases2001/feb01/noaa01r104.html>.

NOAA. 2002. "NOAA Fisheries Awards $10,000 Grant to Continue Horseshoe Crab Conservation." NOAA 2002-R108. February 22. Web site: <www.publicaffairs.noaa.gov/releases2002/feb02/noaa02r108.html>.

National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems.* Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, Commission on Geosciences, Environment, and Resources. National Academy Press, Washington, DC.

New Jersey Department of Environmental Protection. 2003. "New Jersey and Delaware Join Forces to Protect Delaware Bay Horseshoe Crab: Joint Plea Made to Federal Commission to Establish Coast-Wide Harvest Quota." Trenton, NJ. February 26. Web site: <www.state.nj.us/dep/newsrel/releases/03_0021.htm>.

New Jersey Division of Fish and Wildlife. 2002. "Help Identify Horseshoe Crab Spawning Habitat." Trenton, NJ. May 14. Web site: <www.state.nj.us/dep/fgw/news/2002/crabid.htm>.

Perra, P. 2002. Record of telephone conversation and email exchange regarding the Carl N. Schuster Horseshoe Crab Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Paul Perra, State/Federal Coordinator, Office of Intergovernmental and Recreational Fisheries, NMFS, March 3, April 3, April 5, and July 19.

Plumart, P. 2000. "Public Comment on ASMFC Addendum I to the Horseshoe Crab Fishery Management Plan." National Audubon Society. January 21. Web site: <www.audubon.org/campaign/horseshoe/comments.html>.

Salm, R.V., J.R. Clark, and E. Siirila. 2000. *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. Washington, DC: International Union for the Conservation of Nature and Natural Resources. Washington, DC. 371 pages and prologue.

Schaefer, R.H. 2000a. Decision memorandum regarding the clearance of an advance notice of proposed rulemaking to prohibit fishing for horseshoe crabs within an area in Federal waters encompassing a 30-nautical mile radius from the mouth of Delaware Bay. From Richard H. Schaefer, Chief, Staff Office for Intergovernmental and Recreational Fisheries, NMFS. To Penelope D. Dalton, Assistant Administrator for Fisheries, NMFS. April 3.

Schaefer, R.H. 2000b. Decision memorandum regarding the clearance of a proposed rule to close an area to fishing for horseshoe crabs in the exclusive economic zone (EEZ) off Delaware Bay. From Richard H. Schaefer, Chief, Staff Office for Intergovernmental and Recreational Fisheries, NMFS. To Penelope D. Dalton, Assistant Administrator for Fisheries, NMFS. September 8.

Schaefer, R.H. No date. Decision memorandum regarding the approval of final rule to close an area to fishing for horseshoe crabs in the exclusive economic zone (EEZ) off Delaware Bay. From Richard H. Schaefer, Chief, Staff Office for Intergovernmental and Recreational Fisheries, NMFS. To Penelope D. Dalton, Assistant Administrator for Fisheries, NMFS.

Schuster, C.N. 2002. Record of telephone conversation regarding the Carl N. Schuster Horseshoe Crab Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Dr. Carl N. Schuster, Jr., horseshoe crab biologist and researcher, February 25.

Selberg, C. 2002. Record of telephone conversation regarding the Carl N. Schuster Horseshoe Crab Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Carrie Selberg, Horseshoe Crab FMP Coordinator, Atlantic States Marine Fisheries Commission, July 19, October 4, and October 7.

US Department of Commerce. 2000. "Fact sheet- Horseshoe Crab Protections." Washington, D.C. October 12.

APPENDIX A. **Public Scoping Meetings** [Horseshoe Crab Reserve]

Date	**Location**
September 5, 2000	Dover, Delaware
September 6, 2000	Cape May, New Jersey
September 7, 2000	Salisbury, Maryland

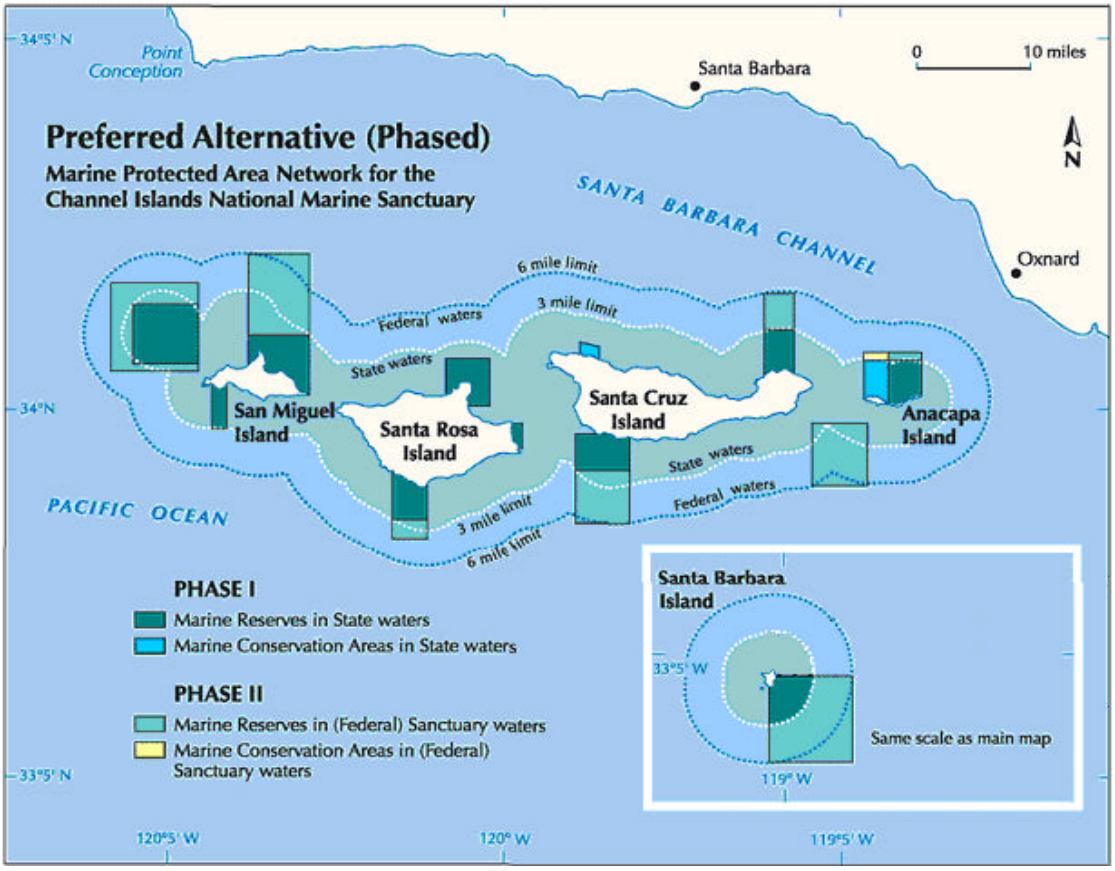
APPENDIX B. **Additional Readings** [Horseshoe Crab Reserve]

Clines, F.X. 2000. "U.S. Acts to Protect Embattled Horseshoe Crab." *New York Times On The Web.* August 9. Web site: <www.nytimes.com/library/national/science/080900sci-environ-crabs.htm>.

National Oceanic and Atmospheric Administration (NOAA). 2000. "Commerce Secretary Mineta, Delaware Governor Carper Announce Proposal to Protect Horseshoe Crabs in Delaware Bay." NOAA 2000-141. August 8. Web site: <http://www.publicaffairs.noaa.gov/releases2000/aug00/noaa00r141.html>.

Stokstad, E. 2000. "Virginia Gets Crabby About Harvest Limits." *Science*. Volume 289, number 5482. Page 1122.

Channel Islands Marine Reserves



Source: (*www.dfg.ca.gov/mrd/channel_islands*)

Note: Each case study uses the terminology adopted by that particular process, and is not based on a consistent definition.

Abstract

California's Channel Islands, which include the islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara, host a unique variety of marine habitats and species. However, growing human populations, in addition to naturally occurring factors such as oceanographic regime shifts and increasing sea lion populations, have led to degradation of the marine environment and excessive harvesting of marine species. A group of recreational fishermen were the first to come forward with a proposal to close 20 percent of the shoreline around the northern Channel Islands. This proposal both raised awareness and generated contention, eventually leading to a joint state-federal initiative to establish a network of marine protected areas within the Channel Islands National Marine Sanctuary**,** which encompasses 1,252 square nautical miles. A multi-stakeholder process was undertaken and resulted in a recommendation for a network of marine protected areas that would be implemented in two phases. The first phase consists of a network of ten state marine reserves (no-take), one state marine park (recreational fishing only), and one state marine conservation area (limited recreational and/or commercial fishing), encompassing a total of 132 square nautical miles (or 19 percent) of state waters within the sanctuary. The first phase was approved by the California Fish and Game Commission in October 2002 and implemented on April 9, 2003. A second phase is anticipated, and this phase would make a recommendation on how to expand the network of marine protected areas into federal waters.

Introduction

The Channel Islands, which include the islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara, have earned a reputation as "the American Galapagos" and draw millions of visitors to nearby coastal communities each year (Environmental Defense 2001a). A host of marine habitats are found around the islands, including rocky reefs, submarine canyons, and kelp forests. Part of what makes this area unique is that it is a transition zone between the cool waters off the coast of central and northern California and the warm waters that move north from Baja, California. Natural variations in water temperature have created distinct habitats, each sustaining a rich proliferation of marine species. A national marine sanctuary and national park have been created to protect these valuable resources. The Channel Islands National Marine Sanctuary (CINMS) encompasses 1,252 square nautical miles, ranging from the mean high tide line of the northern Channel Islands and Santa Barbara Island out to six nautical miles offshore. The Channel Islands National Park includes the same five islands and consists of 249,354 acres, half of which are under the ocean.

It is widely acknowledged that the marine environment surrounding the Channel Islands is in serious decline. Abalone, southern sea otters, Guadalupe fur seals, and several species of fish—including cowcod, lingcod, and bocaccio—have declined to low levels and, in some cases, have been hunted to local extinction. In addition to increased human use, several factors have contributed to these biological declines, including water pollution from marine and land-based sources, climate-driven variability in ocean productivity, and excessive harvesting.

In 1998, the Channel Islands Marine Resources Restoration Committee, a group of recreational fishermen and other citizens from Oxnard, California, submitted a proposal to close 20 percent of a one-mile zone surrounding the Northern Channel Islands. The proposal aimed to work within the California Fish and Game Commission's (FGC) existing authority to establish ecological reserves. With the support of the National Park Service (NPS), the proposal was brought to public attention and submitted to the FGC for review. However, the proposal evoked contention from commercial fishermen, who opposed proposals for establishing fully protected reserves (no-take). The CINMS staff, in partnership with the California Department of Fish and Game (DFG), and with the support of the Sanctuary Advisory Council,

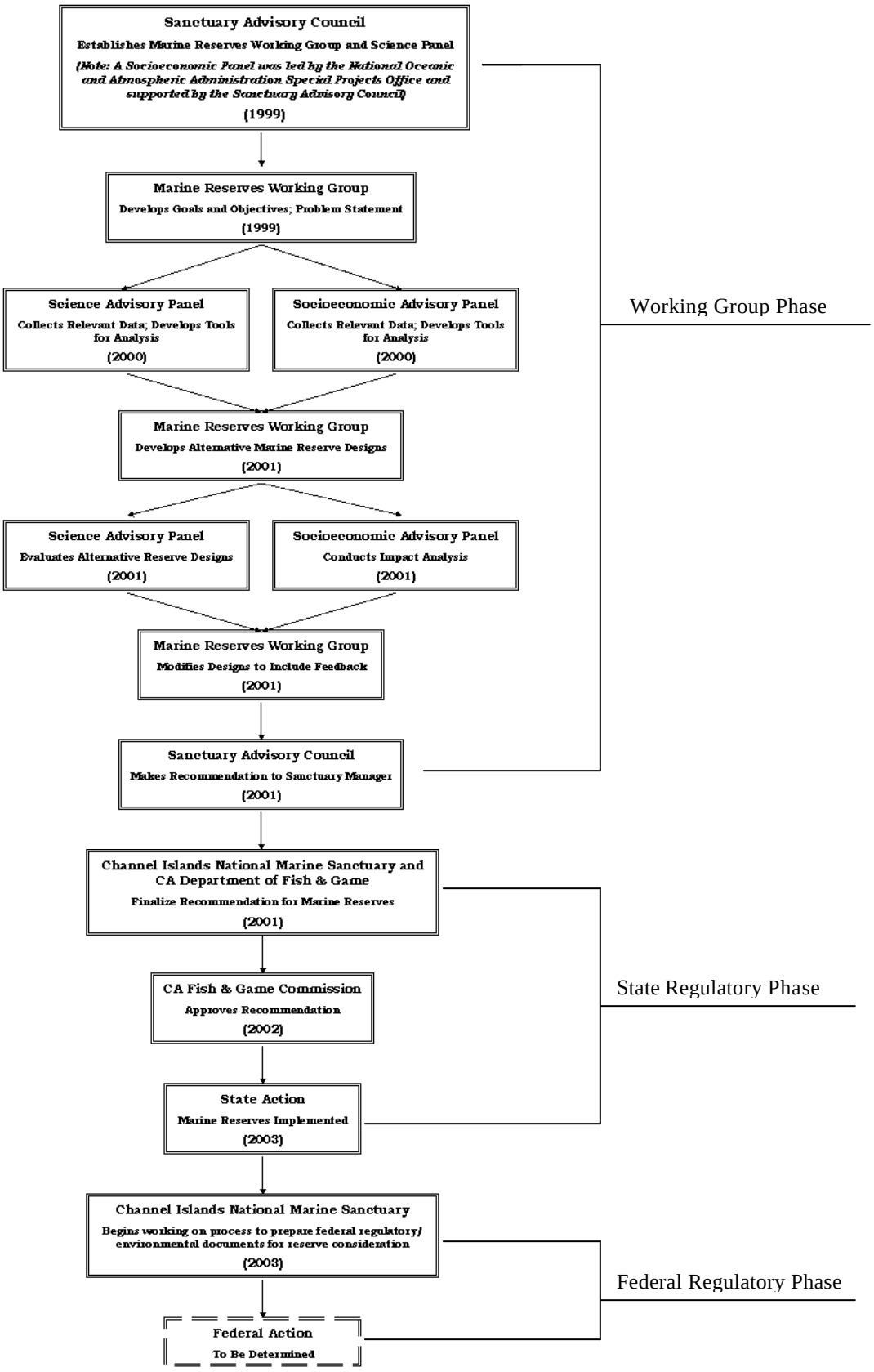
reconfigured the proposal into a multi-stakeholder process involving the general public, recreational and commercial fishermen, environmentalists, as well as state and federal agency staff.

The multi-stakeholder process resulted in a recommendation for a network of marine protected areas, although no agreement was reached on the exact number and size of reserves. The DFG and CINMS provided an array of alternatives to the FGC, including a preferred alternative. The preferred alternative was divided into two phases based on differences in jurisdiction between state and federal waters. The first phase consists of a network of ten state marine reserves (no-take), one state marine park (recreational fishing only), and one state marine conservation area (limited recreational and/or commercial fishing), encompassing a total of 132 square nautical miles (or 19 percent) of state waters within the sanctuary. This first phase was approved by the California Fish and Game Commission in October 2002 and implemented in April 2003. A second phase is anticipated that would provide recommendations on how to expand the network of marine protected areas into federal waters.

Process Diagram

"An important factor in the establishment of MPAs is the process by which they are nominated and designated" (Brody 1998).

The Channel Islands Marine Reserve process to date has occurred as follows (next page):


Sanctuary Advisory Council
Establishes Marine Reserves Working Group and Science Panel
(Note: A Socioeconomic Panel was led by the National Oceanic and Atmospheric Administration Special Projects Office and supported by the Sanctuary Advisory Council)
(1999)
Marine Reserves Working Group
Develops Goals and Objectives; Problem Statement
(1999)
Science Advisory Panel
Collects Relevant Data; Develops Tools for Analysis
(2000)
Socioeconomic Advisory Panel
Collects Relevant Data; Develops Tools for Analysis
(2000)
Marine Reserves Working Group
Develops Alternative Marine Reserve Designs
(2001)
Science Advisory Panel
Evaluates Alternative Reserve Designs
(2001)
Socioeconomic Advisory Panel
Conducts Impact Analysis
(2001)
Marine Reserves Working Group
Modifies Designs to Include Feedback
(2001)
Sanctuary Advisory Council
Makes Recommendation to Sanctuary Manager
(2001)
Channel Islands National Marine Sanctuary and CA Department of Fish & Game
Finalize Recommendation for Marine Reserves
(2001)
CA Fish & Game Commission
Approves Recommendation
(2002)
State Action
Marine Reserves Implemented
(2003)
Channel Islands National Marine Sanctuary
Begins working on process to prepare federal regulatory/ environmental documents for reserve consideration
(2003)
Federal Action
To Be Determined
Working Group Phase
State Regulatory Phase
Federal Regulatory Phase

Timeline (1938 to present)

This section details the sequence of events in the establishment process.

- Initial Development (1938 to 1998):
  - In 1938, the Channels Islands were federally recognized as a national monument by Franklin D. Roosevelt. In 1949, submerged lands within one mile of Anacapa and Santa Barbara Islands were added to Channel Islands National Monument.
  - Authority to regulate use of the submerged lands was returned to the state with the Submerged Lands Act of 1953, as affirmed by the U.S. Supreme Court in 1978. Following this U.S. Supreme Court decision in 1978, the state of California created ecological reserves in the Channel Islands that allowed fishing in all but small portions of the reserves.
  - In 1980, Congress designated the Channel Islands as a national park. This law expanded the park to include three additional islands and re-established the park boundary to the waters one nautical mile offshore to include the submerged lands and waters in the park, while recognizing the authority of California to manage the living marine resources in the park.
  - Also in 1980, in response to federal proposals to expand offshore oil and gas drilling, local residents and elected officials secured designation of 1,252 square nautical miles (all of the waters within six nautical miles of the islands) as a national marine sanctuary. This status provides permanent protection from new offshore oil rigs and also bans ocean mining operations.
  - In April 1998, the California Fish and Game Commission (FGC) received a recommendation from the Channel Islands Marine Resources Restoration Committee to set aside 20 percent of the shoreline and waters out to one mile in marine reserves, or no-take zones, around the northern Channel Islands (Santa Barbara, Anacapa, Santa Cruz, Santa Rosa, and San Miguel Islands).
  - In 1999, in response to this proposal and the need for a community process, the Channel Islands National Marine Sanctuary (CINMS) and the California Department of Fish and Game (DFG) developed a joint federal/state partnership to consider establishing marine reserves in the sanctuary.

- Channel Islands Marine Reserve Process (1999 to present):
  - March 25, 1999: The Sanctuary Advisory Council (SAC), an advisory group to the sanctuary manager, held an update meeting on the marine reserve issue. (Refer to Appendix C for a listing of SAC members.)
  - May 20, 1999: The SAC held a meeting to initiate development of a stakeholder group that would consider the marine reserve issue.
  - July 1999: The SAC created a stakeholder-based community group called the Marine Reserves Working Group (MRWG). Note: The group was originally known as the Marine Ecological Reserves Working Group (Davis, Personal Communication, 2002). (Refer to Appendix C for a listing of MRWG members.)
    - The MRWG agreed to operate by consensus, working with a locally contracted facilitator and a National Oceanic and Atmospheric Administration (NOAA) facilitator.
      - "The MRWG's definition of consensus was that each member could state 'whether or not I prefer this decision above all others, I will support it because it was reached fairly and openly'" (DFG 2002b).
  - Two advisory panels were established to inform the SAC's decision-making in addition to the work of the MRWG.
    - The Science Advisory Panel was established and travel was funded by the CINMS. (Refer to Appendix C for Science Panel Members)
      - The Science Panel 1) reviewed the literature on marine reserves and provided the MRWG with potential natural resource consequences of reserves; 2) defined scientific criteria to

achieve the goals for biodiversity and fisheries defined by the MRWG; 3) identified and evaluated existing data sets for geographic information system (GIS)-based ecological characterization; and 4) evaluated the scientific merit of different reserve scenarios provided by the MRWG (DFG 2002b).
        - The Science Advisory Panel adopted a habitat-based approach, and used a GIS computer model with maps of the locations of substrate type (e.g. rock, sand, mud), kelp, eelgrass, and surfgrass, as well as bird and mammal breeding colonies.
    - The Socioeconomic Advisory Panel was established and funded by the National Oceanic and Atmospheric Administration (NOAA) Special Projects Office with support from the SAC.
        - The Socioeconomic Panel was asked to provide baseline information and analyses on the use values associated with the project area, potential costs, and, where feasible, benefits of the establishment of reserves.
        - The panel collected and synthesized existing studies, records of catch or harvest, and other information to develop economic impact analyses of various marine reserve scenarios.
- The MRWG met monthly from July 1999 through May 2001 to receive, consider, and integrate advice from the Science Advisory Panel, the Socioeconomic Advisory Panel, and the general public to develop consensus.
    - The MRWG hosted a majority of its meetings, which were open to the public, in Ventura and Santa Barbara Counties. Individual meetings are chronicled below; however, consult the CINMS Marine Reserves Web site (*www.cinms.nos.noaa.gov/marineres/main.html*) for detailed meeting minutes. (Refer to Appendix A for dates and locations of all public meetings.)
        - July 7, 1999: Introduction to the issues and proposed process.
        - October 21, 1999: Adopted draft ground rules.
        - November 10, 1999: Discussed revisions and finalized ground rules.
        - December 9, 1999: MRWG presentations on the relationships between issues identified at last meeting; worked on preliminary goals and objectives for marine reserves; developed preliminary set of questions for the science and socioeconomic panels.
        - January 10-11, 2000: Joint meeting held with science and socioeconomic panels to learn the status of marine reserves worldwide; continued development of preliminary goals and objectives to guide development of marine reserve scenarios; adopted categories/themes as a method of framing goals and objectives, including research/education, natural and cultural heritage, socioeconomics, sustainable fisheries, ecosystem biodiversity, and reserve administration.
        - February 23, 2000: Responded to questions raised by the science panel during the January meeting; discussed goals, objectives, and task group caucuses.
        - March 16, 2000: Task group break-out sessions to work on developing goals and objectives for each individual category/theme; update on MRWG process, progress, and development.
        - April 13, 2000: Update on data collection efforts; science panel discussion on marine reserve design theory; science panel feedback on draft goals and objectives; reviewed relationships among information collection, reserve design, and management plan issues.
        - June 8, 2000: Update on science panel progress; revised and adopted goals and objectives related to ecosystem biodiversity, sustainable harvested populations, and research.
        - June 22, 2000: Update on socioeconomic panel progress; discussion on map drawing.
        - July 18, 2000: Adopted revised goals and objectives related to education and natural and cultural heritage; update on science panel progress.
        - August 22, 2000: Preliminary discussion of exclusion and inclusion areas; revised and adopted goals and objectives related to reserve administration and research, which was

revised again specifically to take the place of goals and objectives already established for sustainable harvested populations; socioeconomic panel presentation on socioeconomic analysis process.

- September 26-27, 2000: Discussed prioritization of goals and objectives; received data and recommendations from the science and socioeconomic panels.
  - According to Satie Airame, Science Coordinator for the Channel Islands National Marine Sanctuary, MRWG members were unable to assign relative importance to the goals because they agreed that all goals were equally important (Personal Communication, 2003).
  - Recommendations from the science and socioeconomic panels include the following:
    - To achieve the biodiversity and fisheries goals for the species of interest, the science panel advised creating at least one reserve—but no more than four—comprising between 30 to 50 percent of the representative habitats in each of three biogeographic regions in the sanctuary.
    - In reference to this recommendation, "analysis by the socioeconomic advisory panel indicated that a closure of 50 percent of the sanctuary would result in a maximum potential loss of about 50 percent in fishing industry revenue (commercial and recreational)" (Davis 2001a).
- October 18, 2000: Ecological analysis of marine reserve options; refined options into alternative recommendations for reserve design.
- November 15, 2000: Determined areas of agreement, unresolved issues, and a timeline to address these issues, as well as ultimately achieve consensus.
- December 14, 2000: Revised and adopted goals and objectives related to socioeconomics and sustainable fisheries; developed questions for the science and socioeconomic panels.
- January 17, 2001: Science and socioeconomic panel presentations and discussion.
- February 15, 2001: Discussed and tried to resolve key issues prior to crafting spatial options.
- February 21, 2001: Developed preliminary spatial options for review by science panel, socioeconomic panel, and general public; review of socioeconomic data.
- March 21, 2001: Science and socioeconomic analyses presented on the spatial options for marine reserves, in preparation for negotiations.
- April 18, 2001: MRWG presented new spatial options for reserves; negotiated and mapped spatial options.
- May 16, 2001: (Final meeting) Sorted through reserve options in an effort to craft a preferred option; prepared a recommendation for the SAC including the problem statement; goals and objectives, and two maps indicating areas of overlap and non-overlap between MRWG members.

- In addition to having all of its meetings open to the public, the MRWG hosted four public forums. (Refer to Appendix A for dates and locations of public forums.)

- By mid-May, CINMS and DFG received 9,161 public comments on the Channel Islands Marine Reserve process. During the monthly public meetings and forums, comments were submitted in the form of electronic mail, phone messages, letters, postcards, faxes, and comment forms (DFG 2002b). (Refer to Appendix D for specific examples of concerns expressed.)
  - "There were 8,597 comments received in support of establishing marine reserves in the Channel Islands National Marine Sanctuary. The majority suggested that at least 30 percent and up to 50 percent of the current sanctuary should be set aside in reserves to protect and replenish marine ecosystems" (DFG 2002b).
  - "There were 564 comments received in opposition to the establishment of marine reserves. Some of these comments suggested that no reserves be designated, while others called for reducing reserve size (e.g. not larger than 20 percent, 10 percent, 5 percent, etc.). Many

comments supported restricting commercial fishing but not sportfishing or diving" (DFG 2002b).
    - "The majority of opposition comments came from within the tri-county region, with a few coming from other locations within the state. Supportive comments came mostly from within the local area and the state. The balance of comments came from 46 states and three foreign countries" (DFG 2002b).
- May 23, 2001: The MRWG shared its final work with SAC. As directed by the group's ground rules, the MRWG forwarded to the SAC information developed during the process, including the problem statement, goals and objectives, and two maps indicating areas of overlap and non-overlap among MRWG members.
    - Overall, MRWG came to consensus on a set of ground rules, mission and problem statement, issues of concern, goals and objectives for reserves (i.e., ecosystem biodiversity, socioeconomics, sustainable fisheries, natural and cultural heritage, and education), and implementation recommendations. (*Note: The goals and objectives previously adopted for research and reserve administration were rolled into implementation recommendations.*)
    - The MRWG was not, however, able to arrive at one unified spatial recommendation. The MRWG developed 37 potential marine reserve designs during the two-year process, and in the end delivered a composite map that depicted two different reserve network options.
- June 19, 2001: SAC deliberated over the marine reserves recommendation and then forwarded all material developed by the MRWG, the Science Advisory Panel, and the Socioeconomic Panel, including all maps, to the CINMS sanctuary manager.
- Between June and August (2001), DFG and CINMS used feedback and materials from the SAC, the MRWG, and the advisory panels to develop a single proposal (or preferred alternative).
- August 24, 2001: CINMS and DFG staff presented the preferred alternative to the California Fish and Game Commission (FGC). Extensive public testimony was received at this meeting.
    - The DFG-recommended preferred alternative would establish eleven new no take marine reserves, one marine conservation area where only spiny lobster and pelagic finfish may be taken by recreational anglers, and one state marine conservation area where the commercial and recreational take of spiny lobster and recreational take of pelagic finfish is allowed. These areas comprise approximately 25 percent of sanctuary waters, and the initial state phase comprises approximately 19 percent (reduced from 22 percent that was initially proposed) of state waters within the sanctuary.
    - The state's boundaries extend to a distance of three nautical miles oceanward of the mainland, offshore islands and rocks. The proposed regulations were developed jointly by the DFG and CINMS, and each alternative includes some marine protected areas (including both marine reserves and marine conservation areas) in federal waters. The areas within state waters are addressed as the first phase. NOAA has indicated its intent to consider establishment of complimentary marine protected areas within federal waters.
- October 4, 2001: The FGC held a meeting in San Diego, California, that included public testimony on the proposed alternatives.
- December 6, 2001: The FGC held a meeting in Long Beach, California, that included public testimony on the proposed alternatives.
- January 9, 2002: The FGC produced an "Initial Statement of Reasons for Regulatory Action."
- February 8, 2002: The FGC held a discussion hearing in Sacramento, California to hear the Science Panel's recommendation for MPAs at the Channel Islands, and the Pacific Fishery Management Council's Scientific and Statistical Committee status of MPA proposals for CINMS.
- March 7, 2002: The FGC held a discussion hearing in San Diego, California, where public testimony was received regarding the designation of marine reserves within the CINMS.
- April 4, 2002: The FGC held a discussion hearing in Long Beach, California, where public testimony was received regarding the designation of marine reserves within the CINMS. An

advisory panel also presented a socioeconomic analysis of the proposed designation of MPAs within the CINMS.

- May 30, 2002: On behalf of the FGC, DFG released a "Draft Environmental Document, Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary" for public review and comment.
  - DFG provided public notice of the availability of the document for public review and comment.
  - DFG also made hard copies available at numerous locations including the following: the California Fish and Game Commission (FGC) office in Sacramento; the California Department of Fish and Game (DFG) offices in Sacramento, Redding, Yountville, Rancho Cordova, Fresno, Los Alamitos, San Diego, Santa Barbara, Morro Bay, Monterey, Menlo Park, Bodega Bay, Fort Bragg, and Eureka; the State Clearinghouse at the Governor's Office of Planning and Research; the county libraries in areas that may be affected; and DFG's Marine Region Web site.
- The DFG and the FGC accepted comments regarding the draft document until July 15, 2002. The FGC then directed the DFG to extend the deadline for comments until September 3, 2002. Following this extension, written and oral comments were solicited again at a public hearing on August 1, 2002 in San Luis Obispo, California.
  - Overall, 2,492 letters, e-mails, and oral comments were received on the draft document, 2,445 of which were form letters. Thirty-nine letters and e-mails, one form e-mail, and seven oral comments (representing 221 individual comments) specifically addressed the "Draft Environmental Document" (DFG 2002b).
- October 23, 2002: The FGC held a meeting in Santa Barbara for consideration of regulations regarding marine reserves. A vote was held and the preferred alternative passed 2-1.
- The Office of Administrative Law approved the proposed regulations in March 2003.
- Marine reserves (in state waters) were implemented on April 9, 2003.

Objectives

In most cases, an MPA will have multiple objectives. These may include protection of representative habitats, conservation of rare species, fish stock restoration or enhancement, or safeguarding of historical sites, among others.

The Marine Reserves Working Group (MRWG) developed and adopted goals and objectives for the Channel Islands Marine Reserves, and these include the following:

- Ecosystem biodiversity goal: To protect representative and unique marine habitats, ecological processes, and populations of interest.
  - To include representative marine habitats, ecological processes, and populations of interest.
  - To identify and protect multiple levels of diversity (e.g., species, habitats, biogeographic provinces, trophic structure).
  - To provide a buffer for species of interest against the impacts of environmental fluctuations.
  - To identify and incorporate representative and unique marine habitats.
  - To set aside areas that provide physical, biological, and chemical functions.
  - To enhance long-term biological productivity.
  - To minimize short-term loss of biological productivity.
- Socioeconomic goal: To maintain long-term socioeconomic viability while minimizing short-term socioeconomic losses to all users and dependent parties.
  - To provide long-term benefits for all users and dependent parties.
  - To minimize and equitably share short-term loss in activity for all users and dependent parties.

  - To maintain the social and economic diversity of marine resource harvests by equitably sharing the loss of access to harvest grounds among all parties to the extent practical when designing reserves.
  - To address unavoidable socioeconomic losses created by reserve placement through social programs and management policy.
- Sustainable fisheries goal: To achieve sustainable fisheries by integrating marine reserves into fisheries management.
  - To increase abundance, distribution, reproductive capacity, and individual sizes of harvested populations within marine reserves in the Channel Islands region.
  - To facilitate rebuilding and sustaining harvested populations.
  - To enhance spillover into non-reserve areas.
  - To establish a recognition program for sustainable fisheries in the Channel Islands region.
- Natural and cultural heritage goal: To maintain areas for visitor, spiritual, and recreational opportunities that include cultural and ecological features and their associated values.
  - To conserve exceptional ecological and cultural resources that stimulate and encourage human interaction with the marine environment and promote recreational activities.
  - To conserve outstanding areas that encompass seascape, adjoining coastal landscapes, or that possess other scenic or visual qualities.
  - To maintain areas of particular importance that support traditional nonconsumptive uses.
  - To maintain opportunities for outdoor recreation as well as the pursuit of activities of a spiritual or aesthetic nature.
  - To facilitate ease of access to natural features without compromising their value or uniqueness.
- Education goal: To foster stewardship of the marine environment by providing educational opportunities to increase awareness and encourage responsible use of resources.
  - To develop and distribute off-site interpretations and displays allowing indirect observation, study, and appreciation of marine resources.
  - To provide current pamphlets, project ideas and worksheets for use on- and off-site.
  - To promote personal and organized visits for direct observation and study.
  - To link monitoring and research projects to support classroom science curriculum.

  (DFG 2002b)

Current Status/Outcome

This section describes the current status of the MPA process, and includes information on any ongoing research that will help evaluate effectiveness.

- The DFG released a California Environmental Quality Act (CEQA) document describing the preferred alternative (also referred to as the "proposed project") and the five alternatives.
- On October 23, 2002, the FGC approved the preferred alternative on a vote of 2-1.
- The Office of Administrative Law approved the proposed regulations in March 2003.
- Marine reserves (in state waters) were implemented on April 9, 2003.

Stakeholders

MPA establishment may impact a wide range of individuals and entities. This means a diversity of stakeholders have an interest in participating in the process.

Stakeholders interested in or affected by the Channel Islands Marine Reserves include the following:

- Businesses
  - International Specialty Products (ISP) Alginates
- Commercial fishermen
- Recreational fishermen
- Divers (consumptive and nonconsumptive)
  - Channel Islands Council of Divers
- Conservationists
- General public
- Marinas
- Resource managers
- Scientists
  - California State University Channel Islands
  - California State University Fullerton
  - Scripps Institute
  - Stanford University
  - University of California at Santa Barbara
  - University of California at Santa Cruz
- Nongovernmental agencies:
  - The Ocean Conservancy (formerly the Center for Marine Conservation)
  - Environmental Defense
  - Natural Resources Defense Council
  - Pacific Marine Conservation Council
  - Sportfishing Association of California
  - Surfrider Foundation
- Government agencies:
  - U.S. Department of Commerce
    - National Oceanic and Atmospheric Administration
      - National Marine Sanctuaries Program
        - Channel Islands National Marine Sanctuary
      - National Marine Fisheries Service
  - U.S. Department of the Interior
    - National Park Service
  - State of California
    - Resources Agency
      - Coastal Commission
      - Department of Fish and Game
      - Fish and Game Commission
      - Department of Parks and Recreation
- Pacific Fishery Management Council
- California Sea Grant

Advisory Groups

Advisory committees may be used during an MPA development process. The establishment of an advisory committee representing various interest groups and affected parties will facilitate local participation throughout the MPA establishment process, and may help to form partnerships by ensuring that all interests are represented in the final proposal (Brody 1998).

- The Channel Islands National Marine Sanctuary Advisory Council (SAC) consists of twenty voting members and twenty alternates, whose members represent the following:
  - Conservationists
  - General public
  - Tourism
  - Business
  - Recreation
  - Fishing
  - Education
  - Research
  - Local, state, and federal government agencies

- The Marine Reserves Working Group (MRWG) consists of seventeen members, including five members from the SAC. MRWG membership was designed to represent the full range of community perspectives, and included representatives from the following:
  - California Sea Grant
  - Conservation organizations
  - Consumptive and nonconsumptive divers
  - Commercial fishermen
  - General public
  - Kelp harvesters
  - Recreational fishermen
  - State and federal government agencies
  - *Note: Only three MRWG members represented nonconsumptive uses exclusively, including a political science professor, and representatives from Surfrider Foundation and the Ocean Conservancy (Davis, Personal Communication, 2002).*

- The Scientific Advisory Panel consists of sixteen members with expertise in marine science.
  - Members of the panel represent a variety of disciplines including the following:
    - Physical oceanographers
    - Biological oceanographers
    - Ichthyologists
    - Invertebrate zoologists
    - Statisticians
    - Ecologists
    - Modelers
  - Science Panel members were selected on a variety of criteria, including local knowledge, having no published advocacy for reserves, and geographic and institutional balance.

- The Socioeconomic Advisory Panel consists of five members with expertise in fisheries economics and social science.
  - Members of the panel include two NOAA economists and three locally-based contractors who collected economic data for various industries.

Economic Factors

> **"**The acceptability of a MPA to the general public and to direct marine resource users will depend significantly on whether the perceived benefits are greater with or without the MPA" (National Research Council 2001).

The following are economic factors taken into consideration regarding the Channel Islands Marine Reserves:

- The MRWG developed and adopted the following socioeconomic goal: To maintain long-term socioeconomic viability while minimizing short-term socioeconomic losses to all users and dependent parties (refer to 'objectives' section for further information).
- Economic impact information came from the *State of California Fish and Game Commission Initial Statement of Reasons for Regulatory Action* (2002).
- This document projected the potential impacts of DFG's recommended preferred alternative as well as the five alternatives, specifically noting the following for the preferred alternative:
  - The maximum potential loss to commercial fish landings, assuming total loss of all consumptive activities in the proposed reserves, could vary between 1.7 percent and 16.5 percent of annual ex-vessel value generated in sanctuary waters. This reflects a combined maximum potential annual ex-vessel loss of $3,222,810 to commercial fisheries.
  - This can be expanded to included losses in total income for processors, fish buyers, and other related businesses. The maximum potential loss in income from commercial activities to all counties is estimated at $9,910,520 per year.
  - The maximum potential loss to income derived from recreational fishing varies between 9.9 percent and 26.2 percent annually, representing a maximum potential loss in income of $5,720,077 annually.
  - The maximum potential impact to income derived from existing nonconsumptive activities (diving, whale watching, kayaking, sightseeing, and sailing) in the proposed reserves is estimated to range between 10.8 percent and 29.1 percent annually, representing a maximum potential annual value of $1,385,756. No loss to nonconsumptive activities is expected.
  - The maximum potential numbers of jobs lost relating to commercial and recreational fishing activities is estimated to be 435, while the number of jobs related to nonconsumptive activities is estimated to be 37. No loss of jobs associated with nonconsumptive activities is expected. (FGC 2002c)
  - "In the long-term, the potential negative impacts are expected to be balanced by the positive impacts of sustainable fisheries, nonconsumptive benefits, and ecosystem function in the reserve areas. In addition, potential benefits may be realized through adult fish spillover to areas adjacent to marine reserves and larval transport to distant fished sites" (FGC 2002c).

Areas of Conflict/Difficulty

> "MPA proposals often raise significant controversy…" (National Research Council 2001).

The following are areas of conflict or difficulty that arose during the Channel Islands Marine Reserve process:

- Some fishermen and environmentalists could not agree on the size, shape, and location of the marine reserves (Burns 2001).
- A couple recreational fishermen vetoed all no-fishing zones around Anacapa and Santa Barbara, the two islands most easily reached by boat from Southern California (Burns 2001).
- There was a significant divergence of opinion regarding the relative importance of advice from the two advisory bodies to the MRWG (Jostes and Eng 2001).
- There was discrepancy about phasing the reserves, specifically 1) the size of the initial phase, 2) the certainty of future phases, and 3) the use of performance standards or criteria to determine the specific implementation of subsequent phases (Jostes and Eng 2001).
- The process used economic information that estimated only maximum negative impacts, but not likely impacts or potential positive impacts associated with improvements in natural resources (Davis, Personal Communication, 2002).
- "Consensus rules, as enforced, failed to prevent vetoes during negotiations" (Davis, Personal Communication, 2002).
- "Balancing different scales of social representation—local vs. state vs. national interests for national park and national marine sanctuary." (Davis, Personal Communication, 2002).
- MRWG members had differing levels of familiarity with ecological principles, and some members equated ecological requirements for reserve design with social values. Both factors added to the difficulty of agreeing on goals and objectives. (Davis, Personal Communication, 2003).
- Some MRWG members lacked authority to negotiate, or were not free to negotiate because their jobs would be in jeopardy if they allowed reserves to be placed in certain areas. In addition, lack of communication between representatives and constituents left some interest groups, such as commercial fishermen and nonconsumptive divers, feeling unrepresented. This was expressed through a letter to the MRWG, SAC, and CINMS from dive clubs and dive boat operators (Davis, Personal Communication, 2002).

Technology-Based Decision-Support Tools

> "MPA formulation and operation require, and benefit from, higher levels of technology in information handling and onsite management… Computer assisted mapping tools, used in storing, retrieving, processing, and displaying spatial data may be particularly useful" (Salm and others 2000).

Technology-based decision-support tools were utilized during the Channel Islands Marine Reserve process. The overall goal was to develop alternatives for marine reserves within sanctuary waters using the best available scientific and socioeconomic data. The Channel Islands Spatial Support and Analysis Tool (CI-SSAT) was developed by the NOAA Coastal Services Center in conjunction with the Channel Islands National Marine Sanctuary. This geographic information system (GIS)-based tool was developed to support stakeholders in participatory problem-solving by providing a visualization and query mechanism to investigate the relative impacts of a variety of potential marine reserve siting options.

- The MRWG used CI-SSAT to view ecological and economic data in different reserve configurations to ultimately recommend a preferred alternative. (Refer to Killpack *et al.*, no date, for more information.)
- The Science Advisory Panel used SITES Volume I (now MARXAN) to identify locations with high conservation value. This program identifies a set of sites that collectively represent specified amounts of habitats, populations, or other natural features (Airame *et al.* 2003). In this case, the scientists used SITES Volume I to identify the smallest areas possible that included all representative and unique habitats and species of interest identified by the MRWG. The areas of highest conservation value also tended to have high habitat heterogeneity (Airame *et al.* 2003).
- The Science Advisory Panel used SITES Volume I to:
  - Identify locations of different habitat types.
  - Predict the potential distribution of species of interest.
  - Identify areas of high habitat heterogeneity with potential for meeting the MRWG goals.
- Results of the SITES Volume I analysis were included in the CI-SSAT model.

Enforcement

"Effective enforcement is essential to achieve MPA objectives and sustain cooperation from the general public and affected user groups" (National Research Council 2001).

- The DFG's marine region division currently employs 57 law enforcement officers throughout the state. Specifically in the Santa Barbara and Ventura county area, 3 lieutenants and 4 warden/boarding officer positions are funded.
  - A 54-foot patrol boat is stationed in Dana Point and assists with enforcement in the Channel Islands. A second DFG patrol boat is now stationed in Ventura specifically for reserve patrols.
  - Marine region wardens currently enforce a range of regulations around the Channel Islands. The proposed regulations may change the specific enforcement duties but not the level of effort.
- CINMS donates funds directly to the DFG to enhance enforcement capabilities in sanctuary waters. This funding is estimated at $30,000 per year, and is expected to continue.
  - The sanctuary conducts aerial surveys for marine mammal and vessel monitoring, and is currently working on a memoradum of understanding with the state to broaden enforcement measures for the reserves using aerial surveys as another enforcement tool.
- Channel Islands National Park (CINP) employs six full time rangers stationed on the islands. These rangers enforce all federal, state, and county laws and regulations in the national park, within one nautical mile of the shoreline.
  - The national park has three patrol boats stationed at the islands that are used exclusively for public safety and the enforcement of marine laws and regulations.
  - Three additional national park boats are based in Ventura and provide surveillance.

Boundaries

Clear delineation of spatial boundaries is important so that both managers and users know where structured management has been implemented.

- Refer to DFG (2002) for draft boundary coordinates of the proposed reserves.
- The proposed reserves include some areas with existing regulations, and, where necessary, these regulations (such as the brown pelican fledgling area on Anacapa Island) are specifically included in the new proposal. The proposed regulation repeals the existing ecological reserves at Anacapa, San

Miguel, and Santa Barbara Islands in order to simplify the overall network, facilitate understanding of the new regulations, and eliminate unnecessary duplication.

Legislation and/or Regulation

MPA establishment is typically authorized by existing legislation, but implementation frequently requires new regulations. Existing legislation may guide and/or provide context for MPA processes.

A variety of state and federal laws and regulations are relevant to the Channel Islands Reserve process.

- State legislation:
  - State Interagency Marine Managed Areas Workgroup (1998-2000):
    - The Resources Agency of California established the state interagency marine managed areas (MMA) workgroup to evaluate MMA classifications and recommend improvements.
  - Marine Life Management Act (MLMA) (1998):
    - The MLMA states that fishery management plans will form the primary basis for managing the state's sport and commercial fisheries. The act mandated that the DFG prepare a status report on state-managed fisheries and a master plan for developing fishery management plans by September 2001. The act stresses using the best available science and an adaptive approach to decision making, including collaboration from a wide array of perspectives and expertise.
  - Marine Life Protection Act (MLPA or Assembly Bill 993) (1999):
    - The MLPA sets goals for a comprehensive MPA program in California's marine waters; establishes criteria for selecting MPA sites, including fully protected marine reserves; requires development by 2005 of a statewide MPA master plan; and creates processes that require a sound scientific basis for the master plan and involvement by interested parties. *(Note: In the Channel Islands Marine Reserve process, the FGC used existing authority and not the MLPA. In the California Code of Regulations, FGC has the authority to create ecological reserves (refer to sections 200, 203.1, 205(c), 219, and 220 of California Fish and Game Code). While the MLPA calls upon FGC to create a statewide network of MPAs, it does not create or change existing authority (Hastings, Personal Communication, 2003).*
  - Marine Managed Areas Improvement Act (Assembly Bill 2800) (2001):
    - Based on the work of the state interagency work group, this act establishes a new classification system for marine managed areas (MMAs) that consolidates over a dozen classifications into six and simplifies terminology. The act incorporates existing MMAs into the new system, without changing existing resource protection, in a manner consistent with the MLPA; eliminates the use of existing classifications by January 2002; and establishes a consistent designation process to be used by all state entities for MMAs.
      - The six new classifications are state marine reserve, state marine park, state marine conservation area, state marine cultural preservation area, state marine recreational management area, and state water quality protection area.

- Federal Legislation:
  - Organic Act of the National Park Service (1916): To conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment for the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. Channel Islands National Monument was expanded and declared a national park in 1980 by public law.
  - The National Marine Sanctuaries Act (NMSA) (1972): Authorizes the secretary of commerce to designate and manage areas of the marine environment with special national significance due to

their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities as National Marine Sanctuaries (NMS). The Channel Islands were declared a national marine sanctuary in 1980.

- Since the act was put into effect in 1972, it has been amended and reauthorized in 1980, 1984, 1988, 1992, 1996, and 2000.

Media/Public Outreach

Entities involved in MPA designation processes frequently undertake a variety of public outreach and education activities.

Sources of media/public outreach used throughout the Channel Islands Marine Reserve process include the following:

- The CINMS Marine Reserves Web site (*www.cinms.nos.noaa.gov/marineres/main.html*) and the California Department of Fish and Game's Marine Region Web site (*www.dfg.ca.gov/mrd/channel_islands/index.html*) were used to disseminate information, and have continued to be updated throughout the process.
  - The California Environmental Quality Act (CEQA) document describing the preferred alternative (also referred to as the "proposed project") and the five alternatives is available on DFG's Marine Region Web site, and hard copies were also made available in Santa Barbara and Ventura public libraries.
  - The draft reserve network map is available on DFG's Marine Region Web site, and the draft proposal was featured in local, regional, and national newspapers.
- DFG made hard copies of "Draft Environmental Document, Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary" available at numerous locations, including the following: the California Fish and Game Commission (FGC) office in Sacramento; the California Department of Fish and Game (DFG) offices in Sacramento, Redding, Yountville, Rancho Cordova, Fresno, Los Alamitos, San Diego, Santa Barbara, Morro Bay, Monterey, Menlo Park, Bodega Bay, Fort Bragg, and Eureka; the State Clearinghouse at the Governor's Office of Planning and Research; the county libraries in areas that may be affected; and DFG's Marine Region Web site.
- A document compiled by the Channel Islands National Marine Sanctuary (2001), and located at the sanctuary office in Santa Barbara, contains copies of 124 articles of print media coverage, primarily from Santa Barbara and Ventura counties, on the Channel Islands Marine Reserves process from 1997 through August 20, 2001.
- Several radio talk shows, as well as local televised news channels covered the Channel Islands Marine Reserve process in their broadcasts.

Refer to Appendix B for a listing of additional readings.

References

Note: All World Wide Web addresses listed in this section were accessible on January 31, 2003, and accurately reflected information referenced here and in the text. Site content at these links may change, or the links may become inactive at any time.

Airame, S. 2002-2003. Record of e-mail exchange regarding the Channel Islands Marine Reserves. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Satie Airame, Science Advisor, Channel Islands National Marine Sanctuary, May 20, May 31, and March 21.

Airame, S. J.E. Dugan, K.D. Lafferty, H.M. Leslie, D.A. McArdle, and R.R. Warner. 2003. "Applying Ecological Criteria to Marine Reserve Design: A Case Study from the California Channel Islands." *Ecological Applications, 13*(1S): S170-S184.

American Oceans Campaign. "Marine Protected Areas for California." Web site: <www.americanoceans.org/mpa/california.htm>.

Berenson, N. 2003. Record of e-mail and exchange regarding the Channel Islands Marine Reserves. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Nancy Berenson, Outreach Project Coordinator, Channel Islands National Marine Sanctuary, January 6.

Brody, S.D. 1998. "An Evaluation of the Establishment Processes for Marine Protected Areas in the Gulf of Maine: Understanding the Role of Community Involvement and Public Participation." Marine State Planning Office Gulf of Maine Council on the Marine Environment, Augusta, ME. July. Web site: <www.gulfofmaine.org/library/mpas/process_eval_0798.PDF>

Burns, M. 2001. "Talks Over Marine Reserves Crumble." *Santa Barbara News Press.* May 17. Web site: <www-ccec.ece.ucsb.edu/people/dan/reserve1.html>.

Channel Islands National Marine Sanctuary (CINMS). 2001a. "Draft: How Large Should Marine Reserves Be?" May 23. Web site: <www.cinms.nos.noaa.gov/SPpdfs/questions1A.pdf>.

CINMS. 2001b. "Sanctuary Advisory Council Supports Locally Designed Reserve Proposal." June 20.

Channel Islands National Marine Sanctuary Foundation. 2001. "Marine Reserves in CINMS." *Alolkoy.* Volume 14, number 1. Web site: <www.cinms.nos.noaa.gov/publications/14.1Alolkoy.pdf>.

Davis, G. 2002. Record of e-mail exchange regarding the Channel Islands Marine Reserves. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Gary Davis, Channel Islands National Park, May 23.

Davis, J. 2001a. "Science as a Central Tool in Planning Marine Reserves: Case Study of the Channel Islands." *MPA News.* Volume 2, number 10. May. Web site: <depts.washington.edu/mpanews/MPA19.htm>.

Davis, J. 2001b. "Interview: Channel Islands Scientists Discuss their Work." *MPA News.* Volume 2, number 10. May. Web site: <depts.washington.edu/mpanews/MPA19.htm>.

Department of Fish and Game (DFG). 2002a. "Draft Environmental Document, Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary." April.

DFG. 2002b. "Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary." Final Environmental Document: Volume I & II. October. Web site: <www.dfg.ca.gov/mrd/ci_ceqa/index.html>.

DFG. 2002c. "Channel Islands Notice of Proposed Changes in Regulations." January 22. Web site: <www.dfg.ca.gov/mrd/channel_islands/ci_notice.pdf>.

DFG and Channel Islands National Marine Sanctuary (CINMS). 2001. "A Recommendation for Marine Protected Areas in the Channel Islands National Marine Sanctuary." August 6. Web site: <www.cinms.nos.noaa.gov/marineres/cimpa2.html>.

Environmental Defense. 2001a. "Citizen's Guide to Marine Reserves: Reclaiming Paradise in California's Channel Islands." New York, New York.

Environmental Defense. 2001b. "Commission to Consider Reserves in Channel Islands." August 22. Web site: <www.environmentaldefense.org/article.cfm?contentid=60>.

Fish and Game Commission (FGC). 2002a. "Fish and Game Commission Meeting Will Focus on DFG's Proposed Regulations for Channel Islands Marine Reserves Process." February 7. Web site: <www.dfg.ca.gov/news/news02/02018.html>.

FGC. 2002b. "Fish and Game Commission Will Receive Public Comments on Channel Islands Marine Reserves and Mammal Regulations in San Diego." March 5. Web site: <www.dfg.ca.gov/news/news02/com02003.html>.

FGC. 2002c. "State of California Fish and Game Commission Initial Statement of Reasons for Regulatory Action." January 9. Web site: <www.rain.org/pipermail/science-panel-l/pdf00005.pdf>

Hastings. S. 2002-2003. Record of e-mail exchange regarding the Channel Islands Marine Reserves. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Sean Hastings, Policy Coordinator, Channel Islands National Marine Sanctuary, June 4, October 15, December 5, and January 6.

Killpack, D., B. Waltenberger, and C. Fowler. No date. "Using the Channel Islands – Spatial Support and Analysis Tool to Support Group-based Decision Making for Marine Reserves." Web site: <www.csc.noaa.gov/pagis/html/web_cissat_paper.pdf>.

Leeworthy, V.R., and P.C. Wiley. 2002. "Socioeconomic Impact Analysis of Marine Reserve Alternatives for the Channel Islands National Marine Sanctuary." National Oceanic and Atmospheric Administration, National Ocean Service, Special Projects Office: Silver Spring, MD. 375 pp. Web site: <http://marineeconomics.noaa.gov/reserves/analysis/analysis.pdf>.

National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems.* Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, Commission on Geosciences, Environment, and Resources. National Academy Press, Washington, DC.

Natural Resources Defense Council. 2002. "Groups Endorse State Preferred Alternative for Channel Islands Marine Reserves." February 8. Web site: <www.nrdc.org/media/pressReleases/020208.asp>.

National Oceanic and Atmospheric Administration. No date. "Socioeconomic Impacts of Marine Reserves." Coastal and Ocean Resource Economics (CORE). (Revised July 3, 2002). Web site: <http://marineeconomics.noaa.gov/reserves/welcome.html>.

Polakovic, G. 1999. "Saving a Place for Marine Life." *Los Angeles Times*. August 27. Web site: <www.pcffa.org/mpacal1.htm>.

Resources Agency of California. 2000. "Improving California's System of Marine Managed Areas: Final Report of the State Interagency Marine Managed Areas Workgroup." January 15. Sacramento, California.

Salm, R.V., J.R. Clark, and E. Siirila. 2000. *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. Washington, DC: International Union for the Conservation of Nature and Natural Resources. Washington, DC. 371 pages + prologue.

Southwick, R. 2002. "The Economic Effects of Sportfishing Closures in Marine Protected Areas: The Channel Islands Example." American Sportfishing Association United Anglers of Southern California. March.

Weiss, K. 2002. "Channel Islands Fish Reserve Ready." *Los Angeles Times.* February 8. Web site: <www.csc.noaa.gov/mbwg/htm/n_20802.htm>.

Zieralski, E. 2002. "Channel Islands Proposal Fire Up Debate." *San Diego Union Tribune.* March 8.

APPENDIX A. Public Hearings, Workshops, and Meetings [Channel Islands]

Public Meeting Dates and Locations

Date	Public Meeting	Location
March 25, 1999	Sanctuary Advisory Council	Oxnard, California
April 2, 1999	CA Fish and Game Commission	Long Beach, California
May 20, 1999	Sanctuary Advisory Council	Santa Barbara, California
July 7, 1999	Marine Reserves Working Group	Santa Barbara, California
July 22, 1999	Sanctuary Advisory Council	Ventura, California
October 5, 1999	Sanctuary Advisory Council	Santa Barbara, California
October 21, 1999	Marine Reserves Working Group	Santa Barbara, California
November 10, 1999	Marine Reserves Working Group	Santa Barbara, California
November 18, 1999	Sanctuary Advisory Council	Oxnard, California
December 9, 1999	Marine Reserves Working Group	Santa Barbara, California
January 10-11, 2000	Marine Reserves Working Group	Santa Barbara, California
January 18, 2000	Sanctuary Advisory Council Conservation Working Group	Santa Barbara, California
January 20, 2000	Sanctuary Advisory Council	Oxnard, California
February 23, 2000	Marine Reserves Working Group	Santa Barbara, California
March 15, 2000	Sanctuary Advisory Council	Santa Barbara, California
March 16, 2000	Marine Reserves Working Group	Santa Barbara, California
April 13, 2000	Marine Reserves Working Group	Santa Barbara, California
April 19, 2000	Sanctuary Advisory Council	Ventura, California
May 17, 2000	Sanctuary Advisory Council	Santa Barbara, California
May 30, 2000	Sanctuary Advisory Council	Oxnard, California
June 8, 2000	Marine Reserves Working Group	Santa Barbara, California
June 14, 2000	Sanctuary Advisory Council	Goleta, California
June 22, 2000	Marine Reserves Working Group	Santa Barbara, California
July 18, 2000	Marine Reserves Working Group	Santa Barbara, California
August 16, 2000	Sanctuary Advisory Council	Ventura, California
August 22, 2000	Marine Reserves Working Group	Santa Barbara, California
September 19, 2000	Sanctuary Advisory Council Conservation Working Group	Santa Barbara, California
September 20, 2000	Sanctuary Advisory Council	Lompoc, California
September 26-27, 2000	Marine Reserves Working Group	Santa Barbara, California
October 18, 2000	Marine Reserves Working Group	Santa Barbara, California
November 14, 2000	Sanctuary Advisory Council Conservation Working Group	Santa Barbara, California
November 15, 2000	Marine Reserves Working Group	Santa Barbara, California
November 16, 2000	Sanctuary Advisory Council	Ventura, California
December 14, 2000	Marine Reserves Working Group	Santa Barbara, California
January 17, 2001	Marine Reserves Working Group	Santa Barbara, California
January 18, 2001	Sanctuary Advisory Council Conservation Working Group	Santa Barbara, California
February 9, 2001	Sanctuary Advisory Council	Goleta, California
February 15, 2001	Marine Reserves Working Group	Santa Barbara, California
February 21, 2001	Marine Reserves Working Group	Santa Barbara, California

March 12, 2001	Sanctuary Advisory Council Conservation Working Group	Santa Barbara, California
March 14, 2001	Sanctuary Advisory Council	Oxnard, California
March 21, 2001	Marine Reserves Working Group	Santa Barbara, California
April 18, 2001	Marine Reserves Working Group	Santa Barbara, California
May 14, 2001	Sanctuary Advisory Council Fishing Working Group	Santa Barbara, California
May 16, 2001	Marine Reserves Working Group	Santa Barbara, California
May 21, 2001	Sanctuary Advisory Council Conservation Working Group	Santa Barbara, California
May 23, 2001	Marine Reserves Working Group & Sanctuary Advisory Council	Santa Barbara, California
June 19, 2001	Sanctuary Advisory Council	Santa Barbara, California
August 24, 2001	Sanctuary Advisory Council & CA Department of Fish and Game	Santa Barbara, California
October 4, 2001	CA Fish and Game Commission	San Diego, California
October 18, 2001	Sanctuary Advisory Council	Ventura, California
December 6, 2001	CA Fish and Game Commission	Long Beach, California
January 9, 2002	Sanctuary Advisory Council	Santa Barbara, California
February 8, 2002	CA Fish and Game Commission	Sacramento, California
March 7, 2002	CA Fish and Game Commission	San Diego, California
March 15, 2002	Sanctuary Advisory Council	Ventura, California
April 4, 2002	CA Fish and Game Commission	Long Beach, California
May 8, 2002	Sanctuary Advisory Council	Santa Barbara, California
July 12, 2002	Sanctuary Advisory Council	Ventura, California
August 1, 2002	CA Fish and Game Commission	San Luis Obispo, California
October 23, 2002	CA Fish and Game Commission	Santa Barbara, California
February 6, 2003	CA Fish and Game Commission	Sacramento, California

Marine Reserves Working Group Public Forums

Date	**Location**	**Number of Participants**
January 20, 2000	Oxnard, California	Approximately 200 in attendance
October 12, 2000	Goleta, California	Approximately 300 in attendance
March 21, 2001	Santa Barbara, California	Approximately 300 in attendance
May 23, 2001	Santa Barbara, California	Approximately 300 in attendance

APPENDIX B. Additional Readings [Channel Islands]

California Resources Agency. 2002. "Governor Davis Announces Creation of Largest Marine Reserve on West Coast." PR02: 549. Santa Barbara. October 23. Web site: <www.californiafish.org/channelreserve_davis.html>.

Kay, J. 2002. "State Makes Waters Off-Limits to Fishing Ban—Starting with 130 Square Miles Near Channel Islands—is a major policy shift." *San Francisco Chronicle*. October 24.

Ortega, T. 2002. "Fish Story: Is Overfishing Ruining the Waters around the Channel Islands, Known as North America's Galapagos? Scientists Say Yes, but Local Fishermen Don't Seem to Care." *Los Angeles Times*. March 28.

Thomas, P. 2002. "Sanctuary Proposal under Fire." *Los Angeles Times*. March 8.

Weiss, K. 2002. "Fishing Permanently Banned around the Channel Islands: A Reserve, Encompassing 175 Square Miles, Takes Effect Jan. 1 and Is One of the Largest in the U.S." *Los Angeles Times*. October 24. Web site: <www.democraticunderground.com/forum_archive_html/DCForumID29/1765.html>.

APPENDIX C. Advisory Group and Panel Members [Channel Islands]

Sanctuary Advisory Council (SAC) Members (1998 to present)

Name	Representation
Michael Hanrahan	Business
Rebecca Roth	California Coastal Commission
Brian Baird	California Resources Agency
Harry Liquornik	Commercial Fishing
Linda Krop	Conservation
Diane Meester	County of Santa Barbara
Lyn Krieger	County of Ventura
Patricia Wolf	Department of Fish and Game
Larry Manson	Education
Jon Clark	General Public
Matthew Cahn	General Public
Robert Duncan	General Public
Drew Mayerson	Minerals Management Service
Mark Helvey	National Marine Fisheries Service
Tim Setnicka	National Park Service
Jim Brye	Recreation
Robert Warner	Research
Jeannette Webber	Tourism
Lt. J. Wade Russell	U.S. Coast Guard
Alex Stone	U.S. Department of Defense

APPENDIX C. Advisory Group and Panel Members (continued)

Marine Reserves Working Group (MRWG) Members (June 1999 – May 2001)

Name	Affiliation	Representation
Patricia Wolf (Co-Chair)	California Department of Fish and Game	California Department of Fish and Game
Deborah McArdle	California Sea Grant	California Sea Grant
Ed Cassano (Former Co-Chair)	Former Sanctuary Manager	Channel Islands National Marine Sanctuary
Matthew Pickett (Co-Chair)	Sanctuary Manager	Channel Islands National Marine Sanctuary
Chris Miller	California Lobster Trappers Association	Consumptive
Dale Glanz	ISP Alginates Inc.	Consumptive
Neil Guglielmo	Squid Seiner and Processor	Consumptive
Tom Raftican	United Anglers	Consumptive
Marla Daily	Sanctuary Advisory Council	General Public
Craig Fusaro	Sanctuary Advisory Council	General Public
Robert Fletcher	Sportfishing Association of California	Marina/Business
Mark Helvey	National Marine Fisheries Service	National Marine Fisheries Service
Dr. Gary Davis	National Park Service	National Park Service
Steve Roberson	Channel Islands Marine Resource Restoration Committee	Nonconsumptive
Warner Chabot (Replaced by Greg Helms)	Ocean Conservancy	Nonconsumptive
Greg Helms	Ocean Conservancy	Nonconsumptive
Alicia Stratton (Replaced by Mr. Kelly)	Surfrider Foundation	Nonconsumptive
Shawn Kelly	Surfrider Foundation	Nonconsumptive
Michael McGinnis	UCSB Ocean and Coastal Policy Center (Resigned)	Nonconsumptive
Locky Brown	Channel Islands Council of Divers	Sport Diving

APPENDIX C. Advisory Group and Panel Members (continued)

Science Advisory Panel Members (June 1999 – May 2001)

Name	Affiliation	Disciplines
Peter Haaker	California Department of Fish and Game	Invertebrate Zoology, Marine Ecology, Fisheries Management
Dan Richards	Channels Islands National Park	Invertebrate Zoology, Marine Ecology
Dr. Matthew Cahn (Chair)	California State University Channel Islands	Public Policy
Dr. Steven Murray	California State University Fullerton	Invertebrate Zoology, Phycology, Marine Ecology
Dr. Russ Vetter	National Marine Fisheries Service	Ichthyology, Reserve Design/ Management, Rock Fish, Larval Transmission
Dr. Ed Dever	Scripps Institute	Physical Oceanography
Dr. Joan Roughgarden	Stanford University	Invertebrate Zoology, Statistical Modeling, Population Dynamics, Larval transmission
Dr. Allan Stewart-Oaten	University of California Santa Barbara	Statistical Modeling, Population Dynamics
Dr. Bruce Kendall	University of California Santa Barbara	Population Dynamics
Dr. Daniel Reed	University of California Santa Barbara	Phycology, Marine Ecology, Statistical Modeling, Reserve Design/ Management
Dr. Dave Siegel	University of California Santa Barbara	Physical Oceanography
Dr. Libe Washburn	University of California Santa Barbara	Physical Oceanography
Dr. Robert Warner	University of California Santa Barbara	Ichthyology, Marine Ecology, Population Dynamics, Reproduction
Dr. Steve Gaines	University of California Santa Barbara	Invertebrate Zoology, Marine Ecology, Statistical Modeling, Population Dynamics, Larval Transmission
Dr. Steve Schroeter	University of California Santa Barbara	Invertebrate Zoology, Marine Ecology, Statistical Modeling, Reproduction, Larval Transmission
Dr. Mark Carr	University of California Santa Cruz	Ichthyology, Marine Ecology, Rock Fish

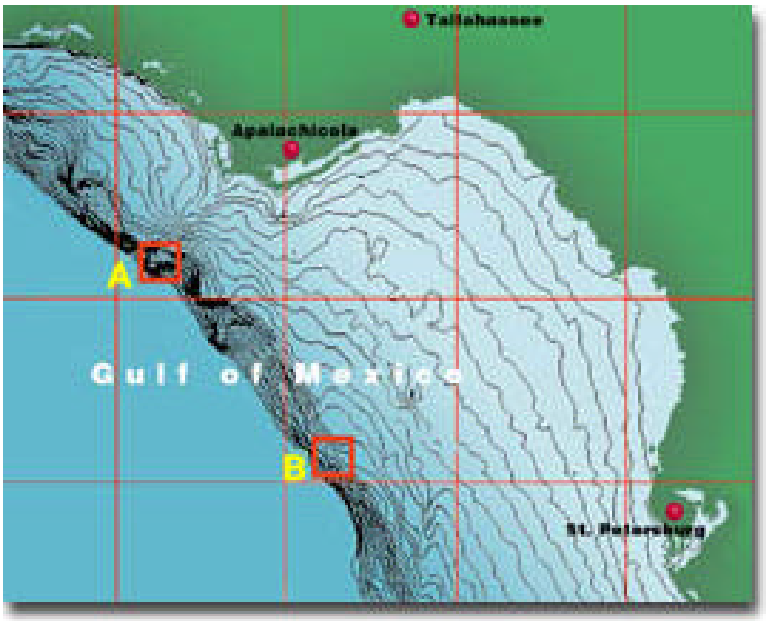
Socioeconomic Panel Members (June 1999 – May 2001)

Name	Affiliation	Industries Researched
Dr. Bob Leeworthy	NOAA Special Projects Office	Commercial Fisheries
Peter Wiley	NOAA Special Projects Office	Recreational Fisheries
Dr. Craig Barilotte	Sea Foam Enterprises	Commercial Fisheries
Dr. Charles Kolstad	UC Santa Barbara	Charter/ Party Boats
Dr. Carolyn Pomeroy	UC Santa Cruz	Squid Fishery

APPENDIX D. Examples of Public Concerns Expressed throughout the Process (DFG 2002b)
[Channel Islands]

General Concerns	• Are other management alternatives for protection more appropriate? • Do reserves allow use of public trust resources? • Boundaries need to be clear and easily recognizable.
Science Concerns	• Is there a scientific method to determine appropriate reserve sizes and locations? • Is it more appropriate to take a species-specific versus a habitat or ecosystem approach? • Will the extra pressure on non-reserve areas create crowding or congestion of fishing effort?
Administrative Concerns	• Is there adequate funding for administration, monitoring and evaluation and enforcement of reserves? • Cooperation between state and federal resource management agencies is critical to the success of reserves. • It is critical to keep the community involved after the reserves are established.
Economic Concerns	• International competition may eliminate markets if U.S. fishermen can not supply during closed seasons. • Will there be financial mitigation to displaced commercial fisheries? • Increased cost-of-living in coastal areas creates a need for more income.

Gulf of Mexico Grouper Closures
(Madison/Swanson and Steamboat Lumps Marine Reserves)



A: Swanson and Madison site;
B: Steamboat Lumps

Source: (www.research.fsu.edu/researchr/2000/abstracts/images/gulf.jpg)

Note: Each case study uses the terminology adopted by that particular process, and is not based on a consistent definition.

Abstract

In June 2000, the National Marine Fisheries Service implemented a series of management actions to prevent the overfishing of grouper species off the coast of Florida in the Gulf of Mexico. The agency took these steps after stock assessments revealed that gag grouper populations were in danger of becoming overfished, and the National Marine Fisheries Service listed gag grouper as 'approaching an overfished condition'. New actions and rules to protect grouper spawning aggregations and to prevent overfishing were proposed in the Gulf of Mexico Fishery Management Council's August 1999 regulatory amendment to the *Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures*. These actions included size limits, seasonal closures, and area closures that are closed to all fishing except for highly migratory species, such as tunas, swordfish, oceanic sharks, and billfishes.

Introduction

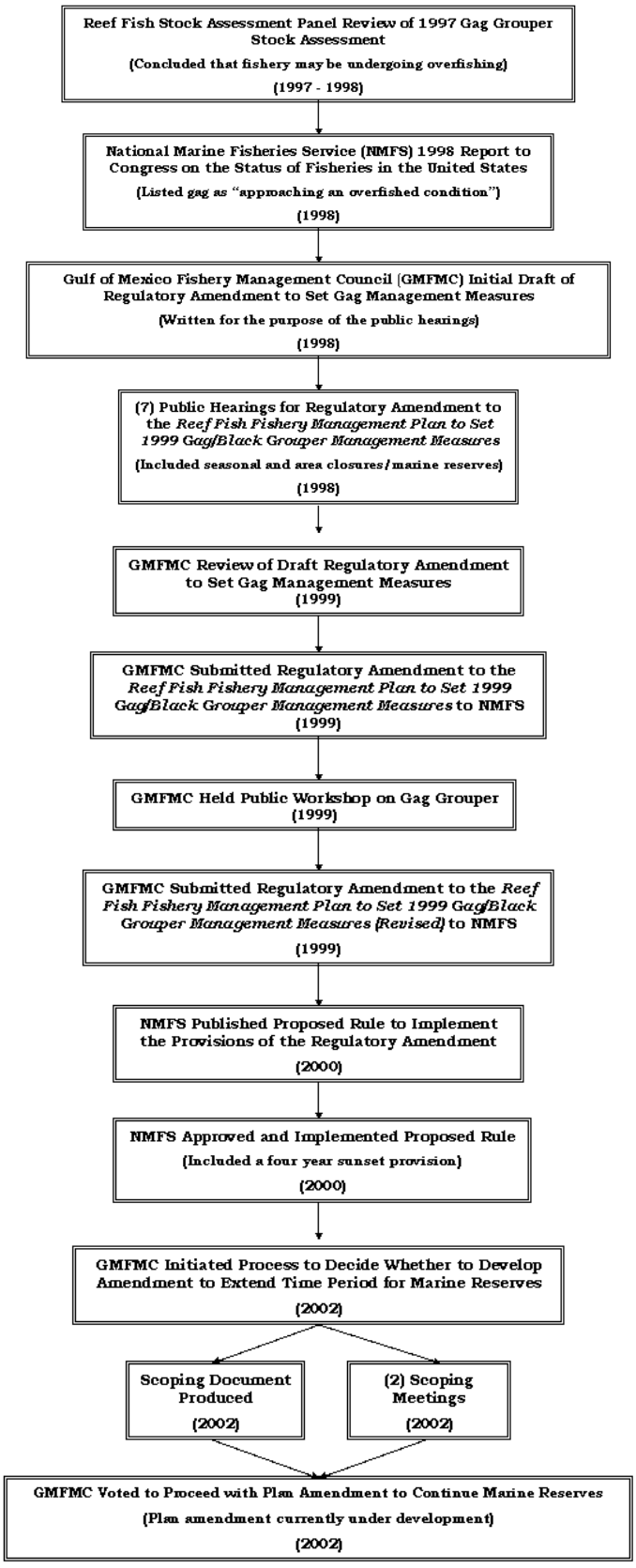
"Many economically important reef fish species share a suite of life history characteristics that make them particularly susceptible to overexploitation. In addition, their behavioral characteristics exacerbate the problem" (Coleman and others 2000). Because of these facts, conventional management practices have not been effective for reef fish management (Coleman and others 2000). To prevent overfishing, the Gulf of Mexico Fishery Management Council (GMFMC) proposed new rules and regulations to protect gag grouper spawning aggregations, including the use of seasonal and area closures. Significantly, the Gulf of Mexico grouper closures are the first management plans in use designed to preserve the social structure and the sex ratio of grouper populations. According to Jim Bohnsack, research fisheries biologist with the NMFS Southeast Fisheries Science Center, "this is also the first plan to take an ecological approach to conservation by adopting the 'umbrella species' concept in a fishery management plan. Closing gag spawning sites, in effect, uses gag as an 'umbrella species' since protection is also provided for a variety of other reefs species in addition to critical spawning habitat used by gag" (Personal Communication, 2003). "To study the potential effects of area closures on gag grouper spawning aggregations, the Gulf of Mexico Fishery Management Council selected two areas for year-round closure to all fishing where gag spawning is known to occur" (GMFMC 2002a). Combined, the two closed areas cover approximately one fifth of the area identified as dominant spawning grounds for gag, and they provide contrasting habitats. The Madison/ Swanson site (115 square nautical miles in size) lies south of Panama City, Florida, near the northern part of the primary spawning range, and has high relief habitat. The Steamboat Lumps site (104 square nautical miles in size) lies west of Tarpon Springs, Florida, near the southern part of the primary spawning range, and has low relief habitat. "This would allow evaluation of the effectiveness of area closures as well as the relative importance of site type (high versus low relief)" (GMFMC 2002a).

Process Diagram

"An important factor in the establishment of MPAs is the process by which they are nominated and designated" (Brody 1998).

The Grouper closure process to date has occurred as follows (next page):

Terminology Note: The GMFMC refers to the Madison/Swanson and Steamboat Lumps sites as both "area closures" and "marine reserves."


Reef Fish Stock Assessment Panel Review of 1997 Gag Grouper Stock Assessment
(Concluded that fishery may be undergoing overfishing)
(1997 - 1998)
National Marine Fisheries Service (NMFS) 1998 Report to Congress on the Status of Fisheries in the United States
(Listed gag as "approaching an overfished condition")
(1998)
Gulf of Mexico Fishery Management Council (GMFMC) Initial Draft of Regulatory Amendment to Set Gag Management Measures
(Written for the purpose of the public hearings)
(1998)
(7) Public Hearings for Regulatory Amendment to the Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures
(Included seasonal and area closures/marine reserves)
(1998)
GMFMC Review of Draft Regulatory Amendment to Set Gag Management Measures
(1999)
GMFMC Submitted Regulatory Amendment to the Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures to NMFS
(1999)
GMFMC Held Public Workshop on Gag Grouper
(1999)
GMFMC Submitted Regulatory Amendment to the Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures (Revised) to NMFS
(1999)
NMFS Published Proposed Rule to Implement the Provisions of the Regulatory Amendment
(2000)
NMFS Approved and Implemented Proposed Rule
(Included a four year sunset provision)
(2000)
GMFMC Initiated Process to Decide Whether to Develop Amendment to Extend Time Period for Marine Reserves
(2002)
Scoping Document Produced
(2002)
(2) Scoping Meetings
(2002)
GMFMC Voted to Proceed with Plan Amendment to Continue Marine Reserves
(Plan amendment currently under development)
(2002)

Timeline (1984 to present)

This section details the sequence of events in the establishment process.

- Overview of Reef Fish Management (1984 to 2000):
  - November 1984: Reef Fish Fishery Management Plan (FMP) was implemented (Reef fish include snapper-grouper complex).
  - 1990 to 2000: Amendments I through XVII implemented. These amendments made numerous changes to the FMP, including the following:
    - Imposed size limits, bag limits, and catch quotas.
    - Established a moratorium on new reef fish permits for a maximum of three years.
    - Established restrictions on the use of fish traps in the Gulf of Mexico exclusive economic zone (EEZ), as well as a ten-year phase-out for the fish trap fishery.
    - Established reef fish dealer permitting and record keeping requirements.
    - Created a special management zone with gear restrictions off the Alabama coast.
    - Implemented a new reef fish permit moratorium for a maximum of five years while the council considered limited access for the reef fish fishery.
    - Imposed an aggregate bag limit of 20 reef fish for all reef fish species not having a bag limit.
    - Extended the commercial reef fish permit moratorium for another five years.

- Gag Grouper (1993 to 2002):
  - August 1993: The Reef Fish Stock Assessment Panel (RFSAP) reviewed available landings data as well as a literature review on gag grouper. (Note: The RFSAP is composed of biologists who are trained in the field of population dynamics. They advise the GMFMC on the status of stocks and, when necessary, recommend a level of allowable biological catch needed to prevent overfishing or to effect a recovery of an overfished stock. They may also recommend catch restrictions needed to attain management goals.)
    - Concern was expressed over a reduction in catches of male gag and potential changes in sex ratio over time due to fishing on spawning aggregations (Atran, Personal Communication, 2002). For this reason, the RFSAP recommended that a stock assessment be conducted on gag grouper.
  - August 1994: The RFSAP reviewed the first gag stock assessment and concluded that the stock was not overfished. However, the practice of fishing on spawning aggregations caused concern (Atran, Personal Communication).
  - October 1995: The concept of marine reserves was taken into consideration because the RFSAP thought that "the reserve area concept was interesting and could be tested in small areas in the Gulf of Mexico" (Atran, Personal Communication, 2002). At that time, however, no specific recommendations on the reserve area concept were made due to a lack of data on the relationship between reserve size and fishery stock protection (Atran, Personal Communication, 2002).
  - October 1997: The RFSAP reviewed a second gag grouper stock assessment prepared by the National Marine Fisheries Service (NMFS) in October 1997.
    - According to Atran (Personal Communication, 2002), the continuing problem of fishermen targeting spawning aggregations had resulted in a greater emphasis on large breeders within the fishery, a decrease in the proportion of males, possible disruption of spawning groups, and the apparent loss of some spawning groups.
    - The RFSAP made a recommendation that the GMFMC close an area of recognized spawning habitat for gag through the use of no-take fishery reserves. In addition, a request was made for additional time to review the stock assessment results.
  - August 1998: The RFSAP completed its review of the 1997 stock assessment.

- The RFSAP concluded that "gag are not considered to be in an overfished state at this time, but the fishery may be undergoing overfishing" (Atran, Personal Communication, 2002).
- RFSAP noted that "some evidence indicates that fishing on spawning aggregations can disrupt spawning, result in a reduction in size of spawning fish, and even result in a loss of an entire aggregation" (Atran, Personal Communication, 2002). As a result, another recommendation was made for the GMFMC to consider spatial and/or temporal closures to protect the integrity of gag aggregations.

- September 1998: Besides increasing the size limit to 24 inches, the Reef Fish Advisory Panel recommended that gag management measures be left at status quo. The Standing and Special Reef Fish Scientific and Statistical Committee (SSC) acknowledged the acceptable biological catch recommendations in the RFSAP report as the best available scientific information, and made no further management recommendations (Atran, Personal Communication, 2002).
- October 1998: NMFS listed gag grouper as "approaching an overfished condition" in their *Report to Congress on the Status of Fisheries in the U.S.*
  - This designation is used when NMFS estimates a stock will become overfished within two years. The designation triggered a requirement based on the Magnuson-Stevens Act that the GMFMC take action within one year and implement rules to prevent overfishing from occurring (GMFMC 1999i).
- In preparation for the public hearings, the GMFMC drafted a preliminary regulatory amendment for gag grouper, which included management options such as minimum size limits, bag limits, commercial trip limits, seasonal closures, and year-round area closures.
- December 1998: GMFMC held seven public hearings (approximately 385 attendees overall) for the regulatory amendment to the *Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures.* (Refer to Appendix A for dates and locations of public hearings)
  - "Public comments included both support and opposition for the positions of no area closures, two to four month area closures, and year-round area closures" (Atran, Personal Communication, 2002).
- January 1999: The GMFMC reviewed the draft regulatory amendment.
- March 1999: The GMFMC received public testimony on the gag grouper regulatory amendment, in addition to scientific information on the gag grouper fishery from NMFS, Dr. Bob Chapman of the South Carolina Department of Natural Resources, and Dr. Lew Bullock of the Florida Department of Environmental Protection.
- March 1999: The GMFMC voted to include marine reserve sites identified as "40 Fathom Contour West of the Florida Middle Grounds" and "Steamboat Lumps." The sites would be closed to all reef fishing year-round.
  - The GMFMC simplified the coordinates to facilitate enforcement, creating a single contiguous area totaling 422.6 square nautical miles.
  - At this time, the four-year sunset provision was not included in the proposed regulatory amendment.
- April 1999: Before the regulatory amendment was published, several members of the GMFMC filed minority reports to object to the proposed actions. Objections were made because the needs of fishing communities had not been considered, the proposed restrictions were not distributed fairly and equitably among the sectors of the fishery, and the proposed restrictions were not based on the best scientific information available (Atran, Personal Communication, 2002; Kenchington 1999).
- May 1999: The GMFMC submitted the regulatory amendment to the *Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures* to the NMFS.
  - As a result of the concerns raised in April, the GMFMC voted to re-evaluate the gag grouper regulatory amendment during its July meeting.

- June 1999: The GMFMC held a public workshop on gag grouper in Panama City, Florida (approximately 67 attendees).
  - A presentation was given by Dr. Chris Koenig of Florida State University on the status and spawning biology of gag grouper, followed by a response to the biological information on gag by Dr. Trevor Kenchington of Gadus Associates, on behalf of the Southeastern Fisheries Association.
  - Members of the public were then invited to speak. Nineteen speakers, representing commercial fishermen, environmental organizations, recreational fishermen, and seafood dealers, made presentations about various issues related to gag grouper.
- July 1999: The GMFMC received public testimony on the gag grouper regulatory amendment. The GMFMC voted to apply a sunset provision, proposing year-round closure of the "Madison/Swanson" and "Steamboat Lumps" sites for a period of four years. The GMFMC also voted to apply the closure to all fishing under the jurisdiction of the council rather than just to reef fish fishing.
  - NOAA's Office of General Counsel reminded the GMFMC that highly migratory species are under the jurisdiction of the Highly Migratory Species (HMS) division of NMFS, and recommended that they forward a letter to the HMS division to coordinate efforts for the closed areas.
  - "By a roll call vote, the motion to forward the gag regulatory amendment as modified to NMFS for implementation carried by a vote of 9 to 6 with two members absent" (GMFMC 1999d).
- August 1999: The GMFMC submitted the regulatory amendment to the *Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures (Revised)* to the NMFS.
  - Proposed measures include the following:
    - Increase the minimum size limit of gag for the commercial fishery from 20 inches total length to 24 inches, effective immediately upon implementation.
    - Increase in the minimum size limit of gag for the recreational fishery from 20 inches total length to 22 inches, effective upon implementation; then increase the minimum size limit for the recreational fishery at a rate of 1 inch per year until the minimum size limit reaches 24 inches total length.
    - Implement a seasonal closure on the commercial harvest of gag, black, and red grouper from February 15 to March 15, and a prohibition on the commercial sale of these species during this closed season.
    - Establish two no-take marine reserves (Madison/Swanson and Steamboat Lumps) within which all fishing – except for highly migratory species – is prohibited for four years.
  - As part of the regulatory amendment, the GMFMC prepared an initial regulatory flexibility analysis (IRFA) that described the impact this proposed rule would have on small entities. By definition, the term small entity includes small businesses or small organizations. A summary of the IRFA can be found in the *Federal Register* (January 26, 2000).
- September 1999: The GMFMC sent a letter to the HMS division of NMFS to request that fishing for species under its jurisdiction, including tunas, swordfish, oceanic sharks, and billfishes, be prohibited in the proposed closed areas.
- October 1999: A conference call was held by the RFSAP to review the scientific information presented by Dr. Chris Koenig and Dr. Trevor Kenchington at the last workshop.
  - The RFSAP endorsed the closures, but emphasized that there is a lot about closed areas that is not known. The panel also recommended that funding be in place for the evaluation studies, and that the objectives, response variables, and evaluation criteria be identified prior to initiating any projects (Atran, Personal Communication, 2002).

- October 1999: After reviewing a summary of the conference call, the Standing and Special Reef Fish SSC found that "there was sufficient knowledge and opinion that closures will increase the abundance of male gag, at least within the limits of the experiments, to justify the establishment of year-round closed areas as proposed by the GMFMC, and that a scientific monitoring plan should be also be prepared and approved to assure that performance of this management action can be evaluated" (Atran, Personal Communication, 2002).
- November 1999: Summaries of the RFSAP conference call and SSC meeting were presented to the GMFMC, but no action was taken at that time.
- January 2000: NMFS published a proposed rule in the *Federal Register* to implement the provisions of the regulatory amendment, which included the seasonal and area closures. The comment period ended on February 10, 2000. The following comments were expressed:
  - NMFS Southeast Fisheries Science Center expressed the following concerns:
    - "Existing baseline data are inadequate to evaluate changes in gag populations that could be attributed to the closure;
    - The duration of the closure (four years) is too short to expect measurable benefits and changes resulting from the closure;
    - No criteria are proposed with which to judge the success or failure of the closure;
    - Gulf-wide conclusions about the efficacy of closed areas would necessitate an experimental design utilizing replicate closed areas and controls."

    (*Federal Register,* January 26, 2000)
  - GMFMC members opposing portions of the regulatory amendment submitted three minority reports. These reports made the following arguments:
    - "The proposed measures are insufficient to prevent overfishing and would place a greater share of the burden from the reduction in harvest on the recreational sector;
    - The one-month closure of the commercial fishery was too short to be effective;
    - The closure of the two areas to all fishing unnecessarily restricts fishing for species other than reef fish;
    - The closure should apply only to reef fish fishing and bottom fishing with gear capable of catching reef fish;
    - The delay in increasing the recreational minimum size limit to 24 inches is unjustified, and an immediate increase to 24 inches is recommended;
    - The measures in the regulatory amendment are not based upon the best available science, specifically the comments by a consultant hired by the commercial industry;
    - The one-month closure of the commercial fishery only is unfair and the recreational fishery should also be closed; and
    - The regulatory amendment fails to reduce bycatch in the recreational fishery."

    (*Federal Register*, January 26, 2000)
  - NMFS received over 600 comments on the proposed rule.
    - Some comments stated that closing two areas to all fishing is too restrictive, and that the economic impacts on fishing communities were not adequately considered. Still, other comments gave strong support to the two closed areas;
    - "A total of 273 individuals questioned the effectiveness of a one-month closure, with some noting that the closure should be extended to encompass the entire spawning season (3 to 4 months)."

    (*Federal Register,* May 19, 2000)
- May 2000: NMFS prepared a final regulatory flexibility analysis (FRFA) on May 12, 2000, that describes the impact of the final rule on small entities. The FRFA addresses the issues raised by public comments on the IRFA. A summary of the FRFA can be found in the *Federal Register* (May 19, 2000).

- May 2000: NMFS published the final rule in the *Federal Register* (May 19, 2000) to implement the provisions of the regulatory amendment, including closure of the Madison/Swanson and Steamboat Lumps sites to all fishing except for highly migratory species.
  - After considering the comments received on the proposed rule, NMFS partially approved the regulatory amendment. However, NMFS rejected the additional proposal to continue increasing the recreational minimum size limit for gag and black grouper by 1 inch per year until it reached 24 inches total length because it was felt that it would have a disproportionate impact on the recreational fishery versus the commercial fishery.
- June 2000: Final rule implemented on June 19, 2000.
  - A four-year sunset clause was included in the proposed alternative. "As a result, if GMFMC chooses to continue the Madison/Swanson and Steamboat Lumps marine reserves beyond June 2004, it must do so through a reef fish plan amendment. On the other hand, non-action will result in the two reserves expiring on June 19, 2004, and the areas reopening to all fishing" (GMFMC 2002a). (See "Current Status/Outcome" for further discussion.)
- August 2000: Coastal Conservation Association (CCA) filed a suit in federal district court in Tampa against NMFS with the stated purpose of protecting the rights of recreational fishermen.
- June 2001: On June 7, 2001, a settlement was reached between CCA and NMFS, which allows recreational anglers to troll for pelagic species, such as billfish and tunas, while still prohibiting bottom fishing for stressed gag grouper stocks. (See "Conflicts" for further discussion.)
  - Under the settlement, NMFS will perform a two year research project on the potential impacts of recreational trolling on deep reef fish in the areas. The results of that research will be presented to the GMFMC at their May 2003 meetings (Atran, Personal Communication, 2002).
- June 2002: The GMFMC held scoping meetings to solicit input on whether to continue the marine reserves, and on what issues should be taken into consideration. (Refer to Appendix A for dates and locations of meetings.)
- July 2002: Comments received at the public scoping meetings were presented to the GMFMC, at which time the GMFMC voted to proceed with a plan amendment to continue the reserves. According to GMFMC staff, the amendment (Amendment 21) is under development (Atran, Personal Communication, 2002).

- During the closure development process, a separate public education process took place.
  - July–August 1999: GMFMC conducted an educational process to provide information to the public about the concept of marine reserves.
    - July 1999: Two documents were produced: *Marine Reserves for Fishery Management: Questions and Answers* and the *Marine Reserves Technical Document: A Scoping Document for the Gulf of Mexico.*
    - August 1999: GMFC conducted ten public workshops in ten coastal communities. The purpose of the workshops was twofold—first, to provide information on the concept of marine reserves and the role they have played as management tools elsewhere; second, to begin to identify (with public help) the critical issues and concerns individuals may have with regard to their use within the Gulf of Mexico.
      - Refer to Appendix A for dates and locations of public workshops.
      - Over 400 statements concerning uses, criteria, and problems with reserves were made at the public workshops. Refer to Appendix D for a summary of comments.
    - September 1999: A final report was prepared by the facilitator: *Public Responses to Marine Reserves as a Potential Management Tool for the Gulf of Mexico.*

Objectives

In most cases, an MPA will have multiple objectives. These may include protection of representative habitats, conservation of rare species, fish stock restoration or enhancement, or safeguarding of historical sites, among others.

Objectives established for the grouper closures include the following:

- To protect some habitat known to be spawning areas for gag grouper along with other groupers and snappers.
- To protect a portion of the male gag population, which appears to have declined drastically in recent years (although gag change sex from female to male, males tend to stay offshore year-round while females redistribute closer to shore outside of spawning season).
- To protect representative spawning habitat and known gag assemblages as a conservation experiment on the effectiveness of closed areas.
- (Seasonal closure) "To reduce the commercial gag and black grouper landings by around seven percent (under the assumption that commercial fishing effort will not shift in response to this measure)" (*Federal Register*, January 26, 2000).

Current Status/Outcome

This section describes the current status of the MPA process, and includes information on any ongoing research that will help evaluate effectiveness.

Currently, the grouper closures

- Prohibit all fishing except trolling for Atlantic highly migratory species (tuna, marlin, oceanic sharks, sailfishes, and swordfish).
- Include a four-year sunset provision where the no-take areas expire June 19, 2004. This provision allows the GMFMC time to evaluate their effectiveness before deciding whether to allow them to continue, and time to stop possible negative impacts if the objectives are not met (GMFMC 2002a; NOAA 2002).
  - In June 2002, GMFMC prepared a scoping document intended to provide background information to the public during a series of scoping meetings on the question of whether to initiate development of a plan amendment to continue the Madison/Swanson and Steamboat Lumps reserves, and if so, what scope of alternatives should be considered.
  - Additionally, GMFMC held two scoping meetings in June 2002 on the issue of whether they should begin developing an amendment to the Reef Fish Fishery Management Plan to extend the time period for the Madison/Swanson and Steamboat Lumps marine reserves.
    - Refer to Appendix A for dates and locations of scoping meetings.
    - Dr. Chris Koenig, Florida State University, who is one of the researchers studying the marine reserves, gave a presentation on his research to date (GMFMC 2002a).
  - Comments received at the public scoping meetings were presented to the GMFMC in July 2002, at which time the GMFMC voted to proceed with a plan amendment to continue the reserves. At the present time, this amendment is under development.

A number of research efforts have been conducted in the closed areas since they were designated:

- Sustainable Seas Expedition

- Scientific studies have been conducted as part of the NOAA Islands in the Stream Sustainable Seas Expedition. Findings are reported on the Web site at *http://oceanexplorer.noaa.gov/explorations/islands01/log/jun20/jun20.html*.
  - During the Sustainable Seas Expeditions, efforts were concentrated in the Madison/Swanson reserve because of existing knowledge about the location of spawning aggregation sites.
  - "One study focuses on whether the closed area protects male gag, thus allowing them to recover from their current low population levels" (GMFMC 2002a).

- NMFS Southeast Fisheries Science Center (SEFSC) Research
  - "NMFS in cooperation with the United States Geological Survey, the Minerals Management Service, the University of New Hampshire, and the National Ocean Survey, has been conducting detailed mapping operations of the Madison/Swanson and Steamboat Lumps sites" (GMFMC 2002a).
    - Multi-beam mapping has been completed in the Steamboat Lumps site, as well as a majority of the Madison/Swanson site, and a control area in-between referred to as Twin Ridges.
  - Research has been conducted during February and April 2001, using panoramic video camera arrays, digital cameras, chevron traps, and an underwater remotely operated vehicle (ROV).
    - "At Madison/Swanson, spawning aggregations of gag and/or scamp were confirmed at 11 sites and suspected at 5 others through surveillance from 20 ROV dives" (GMFMC 2002a).
    - "Histological and otolith samples were taken from 59 fish for reproductive and aging studies" (GMFMC 2002a).
- Florida State University Research
  - In May 2001, Dr. Chris Koenig presented his research to date on the Madison/Swanson and Steamboat Lumps sites to the GMFMC. Objectives for this research include the following (GMFMC 2002a):
    - Develop acoustic mapping using side-scan sonar or multi-beam.
    - Locate spawning aggregations of gag grouper.
    - Track aggregation demographics over time.
      - It is possible that gag grouper males might remain within the spawning sites or in their vicinity throughout the year.
    - Examine the sex ratios, size, and age structure within the aggregations.
    - Determine movements of all economically important species relative to the MPAs by tagging.
  - In June 2001, Dr. Koenig and his team went out again to further characterize the habitats.

Stakeholders

MPA establishment may impact a wide range of individuals and entities. This means a diversity of stakeholders have an interest in participating in the process.

Stakeholders interested in or affected by the establishment of the grouper closures include the following:

- Charter boat industry
- Commercial fishermen
- General public
- Recreational fishermen
- Restaurants
  - Florida Restaurant Association

- Scientists
  - Florida State University
- Seafood retail and wholesale
  - Apalachicola (Water Street Seafood)
- Nongovernmental organizations
  - Coastal Conservation Association of Florida
  - Environmental Defense Fund
  - Gulf Restoration Network
  - Organization for Artificial Reefs
  - ReefKeeper International
  - Southeastern Fisheries Association
  - Southern Offshore Fishing Association
  - The Ocean Conservancy (Formerly the Center for Marine Conservation)
- Government agencies
  - State agencies
    - Alabama Department of Conservation and Natural Resources
      - Marine Resources Division
    - Florida Department of Environmental Protection
    - Florida Fish and Wildlife Conservation Commission
    - Louisiana Department of Wildlife and Fisheries
    - Mississippi Department of Marine Resources
    - Texas Parks and Wildlife Department
  - Gulf States Marine Fisheries Commission
  - Gulf of Mexico Fishery Management Council
  - U.S. Department of Commerce
    - National Oceanic and Atmospheric Administration
      - National Marine Fisheries Service
        - Highly Migratory Species Division
        - Southeast Fisheries Science Center
        - Southeast Regional Office (St. Petersburg, Florida)
      - National Ocean Service
      - Office of Oceanic and Atmospheric Research
        - National Sea Grant College Program

Advisory Groups

Advisory committees may be used during an MPA development process. The establishment of an advisory committee representing various interest groups and affected parties will facilitate local participation throughout the MPA establishment process, and may help to form partnerships by ensuring that all interests are represented in the final proposal (Brody 1998).

No advisory groups were established specifically for the grouper closure process. However, when reviewing potential rule changes, the council draws upon the services of knowledgeable people from other state and federal agencies, universities, and the public who serve on the following panels and committees:

- "Advisory panels (APs) consist of recreational and commercial fishermen, charter vessel and party boat operators, representatives of conservation groups, and other resource users and persons with a nonscientific expertise or interest in the Gulf of Mexico fisheries. The APs review the provisions of

proposed amendments to FMPs, as well as stock assessment information used by the council to set the total allowable catch (TAC) for a stock and the measures necessary to prevent TAC from being exceeded, i.e., bag limits, size limits, quotas, seasonal closures, etc." (GMFMC 2000a). (Refer to Appendix C for a listing of Reef Fish Advisory Panel members.)

- "Scientific and statistical committees (SSCs) consist of biologists, economists, sociologists, and natural resource attorneys who are knowledgeable about the technical aspects of fisheries in the Gulf. They advise the council on the scientific validity of analyses supporting the provisions of all amendments to FMPs, as well as for stock assessment information used by the council. The Standing SSC meets for nearly every SSC meeting. The species SSCs meet in conjunction with the Standing SSC when appropriate to the species being considered" (GMFMC 2000a). (Refer to Appendix C for a listing of SSC committees and members.)

Economic Factors

> **"**The acceptability of a MPA to the general public and to direct marine resource users will depend significantly on whether the perceived benefits are greater with or without the MPA" (National Research Council 2001).

The following are economic factors taken into consideration regarding the establishment of the grouper closures:

- "GMFMC determined that 242 commercial vessels historically fishing in the Gulf of Mexico EEZ would be negatively affected by the seasonal and year-round area closures" (*Federal Register*, May 19, 2000).
- (Seasonal closure) Logbook data of the approximate percentage of total commercial landings of gag, black, and red grouper made between February 15 and March 15 for the years 1993 to 1998 were used to calculate economic impacts (GMFMC 1999i).
  - Assuming no changes in the distribution of effort, the seasonal closure would reduce commercial landing of gag, black, and red grouper by 9.9 percent, 9.9 percent, and 7.4 percent, respectively, using the 1993 to 1998 as a base period.
  - Applying the percent reduction in landings to the 1990 to 1998 average total revenues for each of the three species, the resulting reductions in commercial revenues would be approximately $0.43 million for gag, $0.13 million for black grouper, and $0.97 million for red grouper.
  - The seasonal closure would not directly affect the recreational fishery because it applies only to the commercial sector. Indirectly, the recreational sector would stand to benefit from the commercial closure because fishing competition between the commercial and recreational sectors would be reduced, at least in those areas where both sectors fish. (GMFMC 1999i)
- (Year-round closure) Exacted economic impacts cannot be properly assessed in the absence of necessary information on fishing activities in the subject areas (GMFMC 1999i).
  - If the closure contributes significantly to the long-term sustainability of the stock, then it will be perceived as beneficial. However, results are still waiting to be seen. "The economic issue can be characterized as a tradeoff between the short-term (and long-term) costs of having an area closed to fishing and the future benefits from that management measure" (GMFMC 1999i).

Areas of Conflict/Difficulty

"MPA proposals often raise significant controversy…" (National Research Council 2001).

The following are areas of conflict or difficulty that arose during the establishment of the grouper closures:

- The council's initial intent was to prohibit the use of all fishing gear within the closed areas in order to maximize enforceability of the closed area, as well as to minimize the negative impact from incidental catch and release of reef fish while targeting other species (GMFMC 2002a).
  - GMFMC asked that the NMFS HMS Division implement a compatible closed area for the species under its management jurisdiction (tunas, swordfish, oceanic sharks, and billfishes) (GMFMC 2002a).
  - "This led to a legal challenge from a recreational fishing organization (Coastal Conservation Association, or CCA). CCA felt that the no-take areas unfairly restricted access to the resource by recreational fishermen, and that restrictions on fishing for migratory species higher up in the water column were unwarranted because they would have no impact on the bottom reef fish species" (GMFMC 2002a).
  - "As part of a settlement to the legal challenge, NMFS agreed to hold the council's request to implement an HMS closure in abeyance, while research is conducted into the impact of the no-take areas, the effect of pelagic trolling on and ability to reach reef fish species, and the impact on enforceability by allowing pelagic trolling in the no-take areas" (GMFMC 2002a).

Technology-Based Decision-Support Tools

"MPA formulation and operation require, and benefit from, higher levels of technology in information handling and onsite management… Computer assisted mapping tools, used in storing, retrieving, processing, and displaying spatial data may be particularly useful" (Salm and others 2000).

Technology-based decision-support tools were not utilized during the establishment of the grouper closures.

Enforcement

"Effective enforcement is essential to achieve MPA objectives and sustain cooperation from the general public and affected user groups" (National Research Council 2001).

- The grouper closures are enforced by the U.S. Coast Guard, but rely heavily on self-policing.
  - There is also potential for vessel monitoring systems (VMS) to monitor commercial vessel locations in the future.
    - Amendment 16A to the Reef Fish FMP, submitted to NMFS in June 1998, was partially approved and implemented on January 10, 2000. The approved measures provided that "…NMFS establish a system design, implementation schedule, and protocol to require implementation of a vessel monitoring system (VMS) for vessels engaged in the fish trap fishery, with the cost of the vessel equipment, installation, and maintenance to be paid or arranged by the owners as appropriate…" (GMFMC 2002b).
- During the Sustainable Seas Expedition, while the NOAA Ship *Gordon Gunter* cruised the reserve, commercial vessels were spotted actively engaged in fishing near the spawning sites. The U.S. Coast Guard intercepted two of these vessels and found reef fish on board (GMFMC 2002a).

Boundaries

Clear delineation of spatial boundaries is important so that both managers and users know where structured management has been implemented.

- Refer to the *Reef Fish Fishery Management Plan to set 1999 Gag/Black Grouper Management Measures (Revised)* and/or the *Federal Register* (January 26, 2000) for boundary coordinates.

Legislation and/or Regulation

MPA establishment is typically authorized by existing legislation, but implementation frequently requires new regulations. Existing legislation may guide and/or provide context for MPA processes.

- Magnuson-Stevens Fishery Conservation and Management Act works to set a national standard for fishery conservation and management, and apply those national standards by authorizing regional fishery management councils to prepare fishery management plans for each fishery.
  - Closed areas will continue to be considered as part of the development of the council's Reef Fish Plan Amendment 18, which is intended to be an overall review of grouper management in general.
- February 15 through March 15 closure: "no one is allowed to buy or sell gag, black, or red grouper and no one aboard a vessel who holds only a commercial permit for Gulf reef fish may possess any of these three species in the Gulf. However, people who hold charter vessel or headboat permits in addition to commercial Gulf reef fish permits may continue to retain gag, black, and red grouper under the recreational bag and possession limit, provided the vessel is operating as a charter vessel or headboat" (NOAA 2000).

Media/Public Outreach

Entities involved in MPA designation processes frequently undertake a variety of public outreach and education activities.

Sources of media/public outreach used throughout the grouper closure process include the following:

- NMFS news releases
- NOAA press releases
- A toll-free twenty-four hour hotline is provided for reporting violations. Violation reports and questions are addressed to the Florida Fish and Wildlife Conservation Commission, or the NOAA Fisheries Office of Law Enforcement.
- GMFMC educational process on marine reserves:
  - Publications available on the GMFMC Web site (www.gulfcouncil.org):
    - *Marine Reserves for Fishery Management: Questions and Answers*
    - *Marine Reserves Technical Document: A Scoping Document for the Gulf of Mexico*
  - Public Workshops

Refer to Appendix B for a listing of additional readings.

References

Note: All World Wide Web addresses listed in this section were accessible on January 31, 2003, and accurately reflected information referenced here and in the text. Site content at these links may change, or the links may become inactive at any time.

Atran, S. 2002. Record of telephone conversation and e-mail exchange regarding the Gulf of Mexico grouper closures. Between Brianne Kessler, Coastal Management Specialist, National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center, and Steve Atran, Population Dynamics Statistician/Network Administrator, Gulf of Mexico Fishery Management Council, March 27, May 3, July 22, August 2, August 21, and November 7.

Bohnsack, J. 2003. Record of e-mail exchange regarding the Gulf of Mexico grouper closures. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Dr. James Bohnsack, Research Fisheries Biologist, NMFS Southeast Fisheries Science Center, April 1.

Brody, S.D. 1998. "An Evaluation of the Establishment Processes for Marine Protected Areas in the Gulf of Maine: Understanding the Role of Community Involvement and Public Participation." Marine State Planning Office Gulf of Maine Council on the Marine Environment, Augusta, ME. July. Web site: <www.gulfofmaine.org/library/mpas/process_eval_0798.PDF>.

Coastal Conservation Association Florida. 2001. "CCA Suit Protects Recreational Anglers' Freedom to Fish." Houston, Texas. June 12. Web site: <www.joincca.org/html/releases/2001/cca_suit_protects_recreational_a.htm>.

Coleman, F. 2002. Record of telephone conversation and e-mail exchange regarding the Gulf of Mexico grouper closures. Between Brianne Kessler, Coastal Management Specialist, National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center, and Felicia Coleman, Ph.D., FSU/NMFS Institute for Fishery Resource Ecology (IFRE), April 26.

Coleman, F. C., C. C. Koenig, G. R. Huntsman, J. A. Musick , A. M. Eklund, J. C. McGovern, R. W. Chapman, G. R. Sedberry and C. B. Grimes. 2000. "American Fisheries Society Position Statement: Long-Lived Reef Fishes: The Grouper-Snapper Complex." *Fisheries.* Volume 25, number 3. Pages 14 to 21.

Federal Register. January 26, 2000 (Volume 65, Number 17). Pages 4221 to 4225.

Federal Register. May 19, 2000 (Volume 65, Number 98). Pages 31827 to 81831.

GMFMC. 1998a. Draft Minutes: Gulf of Mexico Fishery Management Council One Hundred and Sixtieth Meeting. Mobile, Alabama. September 16-17.

GMFMC. 1998b. "Regulatory Amendment to the Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures Public Hearing Summary." Key West, Florida. December 17.

GMFMC. 1999a. "Council Revises Proposed Gag Rules and Closed Area." *Gulf Fishery News.* Volume 21, number 3.

GMFMC. 1999b. Draft Minutes: Gulf of Mexico Fishery Management Council One Hundred and Sixty-Second Meeting. Biloxi, Mississippi. January 13-15.

GMFMC. 1999c. Draft Minutes: Gulf of Mexico Fishery Management Council One Hundred and Sixty-Third Meeting. Baton Rouge, Louisiana. March 3.

GMFMC. 1999d. Draft Minutes: Gulf of Mexico Fishery Management Council One Hundred and Sixty-Fifth Meeting. Key West, Florida. July 14-15.

GMFMC. 1999e. "Gag Workshop Summary." Panama City, Florida. June 23.

GMFMC. 1999f. "Marine Reserves for Fishery Management: Questions and Answers." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA97FC0010. July 29.

GMFMC. 1999g. "Marine Reserves Technical Document." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA97FC0010. July 27.

GMFMC. 1999h. "Public Scoping Workshops Scheduled on Use of Marine Reserves in the Gulf of Mexico." *Gulf Fishery News.* Volume 21, number 2.

GMFMC. 1999i. "Regulatory Amendment to the Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures (Revised)." GMFMC pursuant to NOAA. Tampa, Florida. August 25. Web site: <www.gulfcouncil.org/downloads/regamend.gag99-e.pdf>.

GMFMC. 2000a. "Apply Now for Appointment to Council's Advisory Panels and/or Scientific Committees." November 29. Web site: <www.gulfcouncil.org/oldstories/2000-11-29-Apply%20AP-SSC.htm>.

GMFMC. 2000b. "Closed Areas in Gulf EEZ Remain in Effect Through June 16, 2004." *Gulf Fishery News.* Volume 22, number 2.

GMFMC. 2000c. "New Grouper Regulations to Take effect June 19, 2000." *Gulf Fishery News.* Volume 22, number 2.

GMFMC. 2000d. "New Grouper Regulations to Take Effect June 19, 2000." May 22.

GMFMC. 2002a. "Scoping Document for a Potential Amendment 21 to the Reef Fish Fishery Management Plan." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA17FC2203. May 29. Web site: <www.gulfcouncil.org/downloads/Amend21-scoping-document.pdf>.

GMFMC. 2002b. "Secretarial Amendment I to the Reef Fish Fishery Management Plan to Set a 10-year Rebuilding Plan for Red Grouper, with Associated Impacts on Gag and Other Groupers and Draft Supplemental Environmental Impact Statement." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA17FC2203. May 11. Web site: <www.gulfcouncil.org/downloads/Secretarial-1-RG-DSEIS-May2002.pdf>.

Kenchington, T.J. 1999. "Management of the Gulf of Mexico Gag Grouper Fisheries: A Reconsideration." June. Southeastern Fisheries Association, Inc. Tallahassee, Florida. Web site: <www.gulfcouncil.org/downloads/Kenchington99.pdf.>

Kennedy, T. 2002. Record of e-mail exchange regarding the Gulf of Mexico grouper closures. Between Brianne Kessler, Coastal Management Specialist, National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center, and Trish Kennedy, Administrative Assistant, Gulf of Mexico Fishery Management Council, August 21.

National Oceanic and Atmospheric Administration (NOAA). 1998a. "Public Hearings Scheduled on Possible Regulatory Changes to Gag and Black Grouper Management." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA87FC0003. November 13. Web site: <www.gulfcouncil.org/prrel/pr1998-33.htm>.

NOAA. 1998b. "Reef Fish Stock Assessment Panel to Review Stock Assessments for Gag and Vermillion Snapper." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA87FC0003. July 13. Web site: <www.gulfcouncil.org/prrel/pr1998-14.htm>.

NOAA. 1999. "Public Scoping Workshops Scheduled on Use of Marine Reserves in the Gulf of Mexico." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA97FC0010. July 16. Web site: <www.gulfcouncil.org/prrel/pr1999-11.htm>.

NOAA. 2000. "New Regulations Announced for the Gulf of Mexico Gag, Black, and Red Grouper Fisheries." NOAA 2000-123. June 15. Web site: <www.publicaffairs.noaa.gov/releases2000/jun00/noaa00r123.html>.

NOAA. 2001. "Gulf of Mexico Grouper Closure to be Closely Monitored." NOAA 2000-SERO 01-008. February 15. Web site: <www.publicaffairs.noaa.gov/releases2001/feb01/noaasero01008.html>.

NOAA. 2002. "Scoping Meetings Scheduled on Continuation of Madison/Swanson and Steamboat Lumps Marine Reserves." GMFMC pursuant to NOAA. Tampa, Florida. Award No. NA17FC2203. May 29. Web site: <www.gulfcouncil.org/prrel/pr2002-18.htm>.

National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems.* Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, Commission on Geosciences, Environment, and Resources. National Academy Press, Washington, DC.

Salm, R.V., J.R. Clark, and E. Siirila. 2000. *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. Washington, DC: International Union for the Conservation of Nature and Natural Resources. Washington, DC. 371 pages and prologue.

Thomas, J.S. 1999. "Public Responses to Marine Reserves as a Potential Management Tool for the Gulf of Mexico." Mobile, Alabama. September 9.

Williams, R. 2002. Record of telephone conversation regarding the Gulf of Mexico grouper closures. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Roy Williams, Chairman, Florida Fish and Wildlife Conservation Commission, May 10 and July 24.

APPENDIX A. Public Hearings, Workshops, and Meetings [Gulf of Mexico Grouper Closures]

Public hearings for the regulatory amendment to the *Reef Fish Fishery Management Plan to Set 1999 Gag/Black Grouper Management Measures* (which included the proposed closures)

Date	Location
December 7, 1998	Key West, Florida
December 8, 1998	Steinhatchee, Florida
December 9, 1998	Madeira Beach, Florida
December 10, 1998	Fort Meyers, Florida
December 14, 1998	Panama City, Florida
December 15, 1998	Orange Beach, Alabama
December 17, 1998	Larose, Louisiana

Public workshops during marine reserves educational process

Date	Location
August 9, 1999	Brownville, Texas
August 10, 1999	Port Aransas, Texas
August 11, 1999	Galveston, Texas
August 12, 1999	New Orleans, Louisiana
August 16, 1999	Biloxi, Mississippi
August 17, 1999	Orange Beach, Alabama
August 18, 1999	Panama City Beach, Florida
August 19, 1999	Steinhatchee, Florida
August 23, 1999	Key West, Florida
August 24, 1999	Tampa, Florida

Public scoping meetings for continuation of reserves

Date	Location
June 19, 2002	Panama City, Florida
June 20, 2002	Tampa, Florida

APPENDIX B. Additional Readings [Gulf of Mexico Grouper Closures]

Environmental Defense. 2002. "Gulf of Mexico: Fishery Management Council Creates MPAS." Austin, Texas. June 19. Web site: <www.environmentaldefense.org/documents/2138_fisherymanagement.pdf>.

Gulf of Mexico Fishery Management Council (GMFMC). 2002. "Scoping Meetings Scheduled on Continuation of Madison/Swanson and Steamboat Lumps Marine Reserves." In *Louisiana RodnReel.com.* May 30. Web site: <www.rodnreel.com/news/news.asp?cmd=view&NewsID=894>.

National Marine Fisheries Service. 2000. "New Regulations Announced for the Gulf of Mexico Gag, Black, and Red Grouper Fisheries." St. Petersburg, Florida. June 13.

APPENDIX C. Advisory Panel and Committee Members [Gulf of Mexico Grouper Closures]

Reef Fish Advisory Panel Members

Name	State	Representation
Philip Horn, Chair	Mississippi	Processor
Robert Shipp, V. Chair	Alabama	Science/ Academia
Ralph Allen	Florida	Charterboat
Gary Bonanno	Louisiana	Charterboat
Michael Dolfi	Texas	Processor
Marty Harris	Florida	Commercial Fishermen
Chris Jenkins	Louisiana	Recreational Fishermen
Gus Loyal	Florida	Charterboat
Gilmer Nix	Florida	Recreational Fishermen
Mike Rowell	Alabama	Charterboat
Eric Schmidt	Florida	Commercial Fishermen
Robert Spaeth	Florida	Commercial Other
Frank Stephenson	Florida	Recreational Fishermen
Ed Thompson	Florida	Charterboat
Eddie Toomer	Florida	Commercial Fishermen
Bill Tucker	Florida	Commercial Fishermen
Tom Turke	Florida	Charterboat
William Ward	Florida	Commercial Fishermen
Wayne Werner	Louisiana	Commercial Fishermen
Bob Zales, II	Florida	Charterboat

APPENDIX C. Advisory Panel and Committee Members (continued)

Standing Scientific and Statistical Committee (SSC) Members

Name
Stephen Thomas, Chair
Walter Keithly, V. Chair
Charles Adams
Robert L. Colura
James H. Cowan, Jr.
Sandra L. Diamond
Billy F. Fuls
James Geaghan
Douglas Gregory, Jr.
Albert Jones
Frank Kennedy, Jr.
John Roussel
Mike Wascom
James G. Wilkins
Charles Wilson, III.

Special Reef Fish SSC Members

Name
Page Campbell
Gary Fitzhugh
Gene Huntsman
Rick Kasprzak
Bill Lindberg

Ad Hoc Marine Reserves SSC

Name
Walter Milon, Chair
James Bohnsack
Billy Causey
Felicia Coleman
Christopher Koenig
Don Levitan
Eugene Proulx
Stephen Thomas
John “Wes” Tunnell, Jr.
Fredrick C. Whitrock

APPENDIX D. Stakeholder Responses to Questions on Marine Reserves
[Gulf of Mexico Grouper Closures]

*Note: Most Common Responses in **Bold***

Appropriate Uses: The following are categorized responses to the prompt:

"An appropriate use for a marine reserve would be…"

Research
Habitat Protection
Spawning Area Protection
Protection of Biological Entities
Biodiversity
Management
Artificial Reefs
Ecotourism
Protection of Marine Ecosystems
Ensuring Survivability
Protection of Critical Life-Stages
Promote Inter-Jurisdictional Cooperation
Provide Incentives
Reduce Bycatch
Benefit Users
Provide Socioeconomic Benefits

Criteria: The following are categorized responses to the prompt: "What criteria need to be considered if marine reserves were to be established in the Gulf of Mexico?"

Siting/Location
Socioeconomic
Enforcement
Evaluation
Management
Compensation for Loss of Activity
Stakeholder Involvement
Science
Inter-Jurisdictional Cooperation
Size
Artificial Reefs
Degree of Human Use
Sunset Provision
Common Sense
Public Interest
Conservation Not Preservation

APPENDIX D. Stakeholder Responses to Questions on Marine Reserves (continued)

Problems: The following are categorized responses to the prompt: "What problems do the council need to consider if marine reserves are to be established in the Gulf of Mexico?"

Enforcement
Displacement
Credibility/Mistrust
Unnecessary Management
Promise More Than Deliver
Uncertainties
Adequate Data
Jurisdiction
"NIMBY"
Compression Into Limited Areas
Disrupt Predator/Prey Relations
Conflict of Interests
Navigation
Migratory Species
Incorporation of Local Knowledge
Education
Compensation

San Juan County Bottomfish Recovery Zones

Source: (*www.co.san-juan.wa.us/mrc/ntz.html*)

Note: Each case study uses the terminology adopted by that particular process, and is not based on a consistent definition.

Abstract

In 1996, the San Juan County Marine Resources Committee created a Bottomfish Recovery Program in an effort to protect declining bottomfish populations in Washington State. This program created eight voluntary no-take areas called bottomfish recovery zones, and consists of an education/outreach program as well as a monitoring program. The effectiveness of the recovery zones for protecting fisheries has not yet been demonstrated given that fisheries impacts take a long time to quantify. However, the Bottomfish Recovery Program has led to a sense of stewardship in the county, where people recognize, value, and actively protect their resources.

Introduction

In an effort to protect declining bottomfish populations in Washington State, a local entity, the San Juan County Marine Resources Committee, established eight voluntary bottomfish recovery zones in 1996. This local process occurred after a failed attempt to create a National Marine Sanctuary, and after a state initiative implemented five marine reserves known as the San Juan Island Marine Preserves. Overlapping with, and stemming from, this local process has been a regional effort that led to the Northwest Straits Marine Conservation Initiative. While this case study will focus on the establishment of the bottomfish recovery zones, the local process will be set within the broader context of these other federal, state, and regional activities.

Rising human populations are causing alterations to the natural resources and native ecosystems of Northwest Washington. Activities such as over-harvesting, pollution, and destruction and alteration of habitats have caused declines in many species living in the Northwest Straits marine ecosystem. While federal and state regulations have provided some protection to resources, there is little evidence to suggest that current management policies have slowed or reversed the trends of resource decline (Murray-Metcalf Northwest Straits Citizens Advisory Commission 1998). Beginning in the 1980s, attempts were made to establish a National Marine Sanctuary in the Northwest Straits. "These efforts failed as many citizens and local governments opposed the idea of federal control – leaving the region with significant natural resource issues and limited means for addressing them" (Winger 2001).

When the sanctuary efforts failed, local citizens who wanted the protection that a federal program could have provided were left with concern for their deteriorating local marine resources (Winger 2001). The San Juan Board of County Commissioners (BOCC) decided that protection of the area's natural resources could be managed at the local level and, as a result, established the San Juan County Marine Resources Committee (MRC). Representing the community's interests regarding marine resource issues, the MRC took action to protect the declining bottomfish populations by initiating the San Juan County Bottomfish Recovery Program (BFRP). BFRP established eight voluntary no-take areas called bottomfish recovery zones (BRZs) and consists of an education/outreach program as well as a monitoring program. The most common types of bottomfish found in the islands include lingcod, cabezon, and several species of rockfish. The recovery areas are intended to help assure the survival of spawners in bottomfish populations because they are expected to produce an increase in offspring in recovery areas, as well as in adjacent areas through a spillover effect.

The process by which the BRZs were created was simple, with little formal structure, which is why the process was thought to have worked so well (Slocomb, Personal Communication, 2002). Additionally, because this program depends largely on voluntary participation, it will only succeed through the goodwill of fishermen who recognize the value of allowing spawners to survive in the protected areas (Osborne and others 2001). As an alternative to typical regulations, voluntary marine protected areas (MPAs) have no legal standing and therefore can be proposed or changed at any point in time, as well as

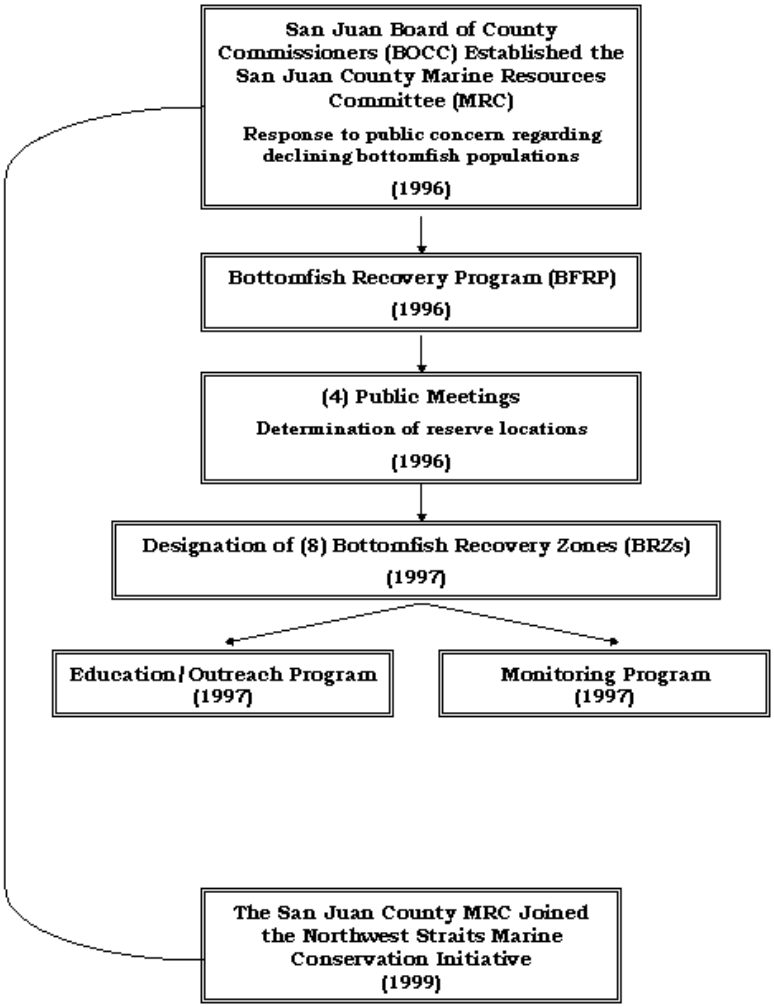
put into practice more quickly (Koski 2001). Therefore, voluntary MPAs provide the flexibility required to adjust management strategies when needed, and are thought to do so with less cost and better compliance (Osborne and others 2001).

Both the MRC process and the original sanctuary proposal served as a catalyst for the development of the Northwest Straits Marine Conservation Initiative, a state-based program that coordinates local action through the establishment of county-based MRCs. As the first local group of its kind, the San Juan County MRC served as a model for the other six counties that have since joined the Northwest Straits Marine Conservation Initiative (Winger 2001).

Process Diagram

"An important factor in the establishment of MPAs is the process by which they are nominated and designated" (Brody 1998).

The San Juan County Bottomfish Recovery Zone process has occurred as follows:



Timeline: (1972 to present)

This section details the sequence of events in the establishment process.

- Federal and State MPA Initiatives:
  - Federal Initiative (1972 to 1996):
    - The National Marine Sanctuaries Act (NMSA) of 1972 authorizes the secretary of commerce to designate and manage areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities as National Marine Sanctuaries.
    - In 1983, the National Oceanic and Atmospheric Administration (NOAA) published a proposed site evaluation list (SEL) based on a program development plan, program regulations, and recommendations made by regional resource evaluation teams.
    - In the SEL, published on August 4, 1983 (*Federal Register*, September 15, 1999), the Northwest Straits site was listed as "Washington State Nearshore" and included the following seven counties: Whatcom, Skagit, Snohomish, Island, San Juan, Clallam, and Jefferson.
      - "The proposed designation was based on the natural beauty of the area, and perceived value of the local biological resources, and the anticipated threats to their persistence posed by increasing urbanization" (Klinger 2001).
    - The Northwest Straits site was chosen from the SEL as an active candidate for designation, listed as "Northern Puget Sound" by the 1988 reauthorization of the Marine Protection, Research, and Sanctuaries Act of 1972 (*Federal Register*, September 15, 1999).
    - In 1993, a discussion paper was drafted for public review that presented the rationale for a federal sanctuary entirely in state waters, as well as a description of ways in which the sanctuary could address threats to marine resources.
    - Throughout 1995, NOAA, in conjunction with the Washington State Department of Ecology, held focus group meetings and workshops to ensure that the information under consideration was accurate before developing a draft environmental impact statement/management plan.
    - In 1996, NOAA decided to end the sanctuary consideration process in the Northwest Straits. The agency stated, "for reasons related to designation guidance contained in the 1996 reauthorization of the NMSA, the findings of a Congressionally-convened Northwest Straits Citizens Advisory Commission and limited agency resources, NOAA is withdrawing from consideration at this time the site for designation as a national marine sanctuary" (*Federal Register*, September 15, 1999).
      - While local citizens were initially interested in the sanctuary designation, opinions changed because NOAA was unable to explain exactly how the sanctuary designation would affect the community (Winger 2001; Slocomb, Personal Communication, 2002).
        - Dennis Willows, director of the University of Washington's Friday Harbor Labs, said that although fishermen in the Northwest Straits were encouraged to attend meetings throughout the sanctuary process, they felt they were asked to agree with someone else's ideas and not contribute their own (Personal Communication, 2002).
      - Many government officials and business leaders in San Juan County strongly opposed the National Marine Sanctuary because they viewed it as a federal power grab over their local waters (Moriarty 1999).
        - "Every city, county, town and port—except Port Townsend—signed resolutions opposing the sanctuary designation" (Winger 2001).

- State Initiative – San Juan Island Preserves (1969 to present):
  - The Washington Department of Fish and Wildlife (WDFW) has established a total of 18 marine sites as either Marine Preserves or Conservation Areas. Five of these sites are located in the San Juan Islands.
    - The first area protected by WDFW was Edmonds Underwater Park, which was adopted at the request of local divers and the city of Edmonds in 1969.
  - In the late 1980s, University of Washington staff at Friday Harbor Laboratories (FHL) approached WDFW with a proposal for eight no-take marine preserves in the San Juan Islands.
  - After considering FHL's proposal, WDFW developed a proposal for five sites to be partially closed to harvest.
  - The Department of Fisheries included the proposed areas in the annual regulation hearings, during which a large number of concerns and issues were raised.
    - Criticisms raised led to reconsideration of the proposal over the next three years. Some local residents did not want their area or fishery closed to harvest and did not understand why it was needed. Others saw this as only benefiting the University of Washington, which was not only the initiator of the proposal, but the owner of the land adjoining the sites (Mills, Personal Communication, 2002).
  - As a result of hearings, testimony, and letters, the five preserve sites were modified in various ways and eventually adopted in 1990.
    - The preserves were established to protect marine biodiversity and to provide undisturbed habitats for scientific research in an area that is considered to be heavily affected by fishing.
    - Fishing restrictions vary among the preserve sites, but in general, they restrict all forms of fishing except for salmon, herring, and in some areas, crab.
  - The preserves are patrolled sporadically by commissioned WDFW officers. However, no enforcement program has been developed specifically for the sites.

- San Juan County Initiative (1996 to present):
  - The San Juan County Marine Resources Committee (MRC) was established in 1996.
    - "The debate over the National Marine Sanctuary had raised the citizens' awareness levels regarding the area's resources and the community was vocalizing their concerns to the Board of County Commissioners (BOCC)" (Winger 2001). In an effort to prove that resource management could be handled locally, the San Juan BOCC initiated the MRC, which was designed to be a citizen-based committee for advising the BOCC on marine issues (Winger 2001).
    - The MRC's overall goals were to protect the existing high quality of the marine resources in San Juan County as a healthy habitat for indigenous marine species and to assure sustainable uses of the marine waters by county residents and visitors (San Juan County Board of Commissioners, Resolution Number 35-1996).
    - The MRC was given the following five tasks:
      - Assess the effectiveness of current state and federal regulations and programs that have an impact on the county's marine resources;
      - Recommend appropriate methods of handling issues that affect the marine environment;
      - Recommend the best approach to create a plan for San Juan County marine resources while taking existing laws and political entities into consideration;
      - Propose programs, regulations and actions;
      - Establish and encourage nongovernmental efforts with county support, but without monetary support from the county itself. (San Juan County Board of Commissioners, Resolution Number 35-1996).

- Members of the MRC have special knowledge about marine resource issues or are citizens concerned with the quality of the marine environment and its uses (Winger 2001). (Refer to Appendix C for a listing of MRC members.)

- San Juan County Bottomfish Recovery Program (1996 to present)
  - "Rockfish and lingcod population have been in decline since the 1970's, with continued long-term declines in abundance" (Palsson and others 1997). "Declining stock trends have continued despite enacting traditional restrictions on commercial and recreational fisheries. Because of this, alternative strategies have been sought to rebuild rockfish populations and have led to an investigation of no-take refuges as a fisheries management tool" (Palsson 1998).
  - As a result of this evidence, the MRC made depleted bottomfish populations the first priority and established the Bottomfish Recovery Program (BFRP).
  - (~March 1997) Approximately one year was spent developing a program that was modeled after other MPA success stories from the region, such as Edmonds Underwater Park.
  - The MRC consulted with scientists, resource managers, and government specialists to better understand the problem of overfishing and use of marine reserves as a fishery management tool.
  - The MRC held four public meetings with interested local stakeholder groups on each of the major islands to determine possible locations for the marine reserves.
    - The meetings took place concurrently on San Juan, Orcas, Lopez and Shaw Islands. (Refer to Appendix A for dates and locations of public meetings.)
      - Attendance was low for all of these meetings. Approximately six to seven people attended the meeting in San Juan Island, while approximately fifteen people attended the meeting at Shaw Island. However, attendance is unknown for the meetings on Orcas and Lopez Islands (Davis, Personal Communication, 2002).
    - Meeting attendees, who were mostly fishermen, were asked the following question: "Where did you catch fish in past years, but cannot at this time, because of probable 'fished-out' status of the location?" (Kaill 1999; 2001).
      - In response to this question, attendees noted locations with tick marks on a chart.
        - Dennis Willows, director of the University of Washington's Friday Harbor Labs, noted that using this technique to identify sites allowed the attendees to feel they had "nothing to lose" (Personal Communication, 2002).
      - The largest assemblages of tick marks were identified as the most popular site candidates, and biologists were consulted to screen the appropriateness of these potential sites.
    - Ultimately, eight sites were selected as recovery areas (Refer to Table 1 for BRZ site locations and descriptions.)
      - "The number and sizes of the reserves were based on political feasibility" (Klinger 2001).
  - After meeting with managers from the WDFW, the MRC learned it was unrealistic to get protection for the BRZs in a timely manner through conventional fishing regulations. As a result, the MRC asked the community to respect these reserve areas on a voluntary basis (Kaill 1999; 2001).
  - In June 1997, after receiving recommendations from the MRC, the BOCC passed a resolution officially designating eight voluntary no-take reserves, or bottomfish recovery zones (BRZs), for the protection and recovery of bottomfish species (San Juan County Board of Commissioners, Resolution Number 49-1997).

- The reserves are relatively small, ranging from about 12 to 60 hectares, and protect less than one percent of the shoreline within the county (San Juan County Marine Resources Committee, unpublished data, in Klinger 2001).

- The BFRP contains two program elements that operate simultaneously: 1) education/ outreach and 2) monitoring:
  - Under the education/outreach program, the public is informed through advertising and making personal contact.
    - Advertising the benefits and limitations of the program to residents and visitors is seen as essential to achieving overall compliance (Koski 2001).
    - "This program cannot succeed without public support and participation" (Koski 2001).
  - Under the monitoring program, research divers use established procedures to systematically count fish and fish species in the reserve and reference areas.
    - To evaluate if the BFRP has been effective in increasing numbers, species, and age classes of bottomfish, it is necessary to first establish a baseline from which to compare (Koski 2001).
    - Life history characteristics associated with bottomfish indicate that it may be a decade or longer before results of such a program could be detectable. For this reason, the effectiveness of these efforts has not yet been demonstrated (Klinger 2001). However, a reduction in fishing effort within the BRZs has been noted as public awareness and support of the program continues to grow (Klinger 2001).
  - A coordinator was hired through an EPA grant to oversee both program elements.
- The MRC continues to support and develop the BFRP, and is evaluating the scope of each program element under the constraints of limited funding.

Table 1. Bottomfish Recovery Zones (BRZs): Locations and descriptions (Kaill 1999; 2001)

Zone 1	Lawrence Point	Located on the east side of Orcas Island. Zoned on northeast side, running from the point northwesterly to the round marker (1500 yards).
Zone 2	Bell Island	Located at the east end of Wasp Passage. Zoned on east side from the round marker on the north end, southerly to the reef (300 yards).
Zone 3	Charles Island	Located at the southwest end of Lopez Island. Zoned on southwest side, from the west point southeasterly to the round marker (600 yards).
Zone 4	Pile Point	Located on the west side of San Juan Island. Zoned from Pile Point northwesterly to the round marker (600 yards).
Zone 5	Lime Kiln Lighthouse	Located on the west side of San Juan Island. Zoned from the lighthouse north to the round marker and south to a second round marker (300 yards each direction).
Zone 6	Kellett Bluff	Located on the southwest side of Henry Island. Zoned from navigation light on bluff northerly to the round marker (800 yards).
Zone 7	Gull Rock	Located on the northwest side of Flattop Island. The entire shoreline of Gull Rock is zoned. Round marker is located on top of rock.
Zone 8	Bare Island	Located north of Waldron Island. The entire shoreline of Bare Island is zoned. Round marker is located on top of the island.

- Northwest Straits Marine Conservation Initiative (1997 to present):
  - "The overall goal of the Northwest Straits Marine Conservation Initiative is to reverse the decline of the region's marine resources through sound science and local-level support" (Winger 2001).

- In 1997, U.S. Senator Patty Murray and U.S. Congressman Jack Metcalf convened a diverse panel of citizens called the Northwest Straits Citizens Advisory Commission (CAC) to assess the ecological health of the Northwest Straits marine ecosystem and to recommend steps to improve the region's sustainability.
- The CAC initiated meetings in May 1997.
- In August 1998, after a year of research and discussion, the CAC issued the *Report to the Convenors.* The report concluded that a coordinated effort, blending good science with grassroots consensus building, would be the best approach to conserving local marine resources.
  - The CAC made a recommendation to create a federally-funded, regional, voluntary program for the seven counties bordering the Northwest Straits, modeled after the program established in San Juan County in 1996.
  - "A network of local, county-based Marine Resources Committees (MRCs) would be established in each of the seven Northwest Straits counties to protect and restore marine resources" (Northwest Straits Marine Conservation Initiative, 2000 through 2001).
    - The MRCs would utilize existing state and local authorities, and would base their actions on sound scientific information, as well as on the overall needs of the ecosystem.
    - The MRCs would coordinate their activities through the Northwest Straits Commission (NWSC), which was to be formed to provide technical assistance, integrate scientific information, develop ecosystem-level coordination, and guide funding.
- Also in 1998, the Northwest Straits Marine Conservation Initiative was adopted by the U.S. Congress, providing a mechanism for local, tribal, state, and community representatives to collaborate for the purpose of protecting local marine resources.
  - Performance of the initiative would be measured using the eight benchmarks for performance identified in the "Report to the Convenors."
  - The authorization for this local marine conservation initiative expires in six years and includes an authorization for funding to support the effort.
- The initiative became effective in March 1999, when funds were received and available for spending.
  - "Congress passed a $350,000 appropriation to support the initiative with funds made available through NOAA and administered by Terry Stevens, the Director of Padilla Bay National Estuarine Research Reserve" (Northwest Straits Marine Conservation Initiative, 2000 through 2001).
- In March 1999, San Juan County reauthorized its MRC, changing some provisions to conform to the requirements of the Northwest Straits Marine Conservation Initiative.
- Throughout the months of May and June, Skagit, Island, Whatcom, Clallam, and Jefferson counties passed resolutions establishing their MRCs and joining the initiative. Snohomish County passed its ordinance in September.
  - "The elected legislators from all seven counties passed their legislation unanimously, demonstrating their interest in protecting and restoring the vital marine resources in the Northwest Straits" (Northwest Straits Marine Conservation Initiative, 1999 through 2000).
- The counties solicited volunteers for their MRCs, and then made appointments by the fall of 1999, with the exception of Snohomish County, whose executive and council made its appointments in January 2000.
- "Congress appropriated $652,000 for the initiative's second year that was made available in May 2000" (Northwest Straits Marine Conservation Initiative, 2000 through 2001).

Objectives

In most cases, an MPA will have multiple objectives. These may include protection of representative habitats, conservation of rare species, fish stock restoration or enhancement, or safeguarding of historical sites, among others.

Objectives established for the BRZs include the following:

- To restore and conserve the bottomfish resources of San Juan County.
- To foster a sense of stewardship in the people of San Juan County, in that they recognize, value, and protect the resources of the waters surrounding the county.

Current Status/Outcome

This section describes the current status of the MPA process, and includes information on any ongoing research that will help evaluate effectiveness.

- The voluntary, no-take status of the BRZs refers to all marine life, except salmon. Some of the educational and research efforts under the BFRP are detailed below.

A number of educational efforts have been conducted that pertain to the closed areas:

- Hayashi (2001) surveyed the effectiveness of past education and outreach efforts under the BFRP.
- The University of Washington's Friday Harbor Lab is supporting the program with courses, education, and outreach.
- In conjunction with the San Juan Nature Institute, the MRC has had grants approved to develop additional educational materials (Murray 1998b).
- A one-page public opinion survey was completed during 1999 to determine familiarity and support of the BFRP. Refer to Kaill (1999) for detailed survey results.
- Refer to "Media/ Public Outreach" for a full listing of educational and public outreach activities.

A number of research efforts have been conducted in the closed areas since they were designated:

- Two sites (Bell Island and Lime Kiln Lighthouse) are used as long-term monitoring sites to document changes in fish density sites (Kaill 2001).
- In the fall of 2000, a study using sonar tags was initiated to better understand the behavior of certain fish in the reserve areas (Griffin 2000). This method will allow scientists to determine the location of a tagged fish at any given time, and over time, to further understand if the reserve areas are in the right places and of the appropriate size (Koski 2001).
- According to Laura Arnold, a member of the MRC, the Whale Museum was contracted in 2001 to coordinate an effort using acoustic tagging techniques to investigate whether the size of the Lime Kiln site (as one sample) was large enough to be effective for lingcod (Personal Communication, 2002).
- "A complete inventory of the eight BRZs was undertaken to assess the signs in each of the reserves" (Koski 2001).
- A San Juan County Bottomfish Recovery Program Biological Assessment Project was conducted in 2001, which includes "twelve months of data collection on bottomfish abundance, demographics, and seasonal habitat use for the purpose of establishing an ecological baseline at three of the eight BRZs" (Northwest Straits Marine Conservation Initiative, 2000 through 2001).

- Funding has continued for the acoustic tagging work, targeting copper rockfish and some larval sampling, to see if the BRZs are large enough to work as reserves (Arnold, Personal Communication, 2002).
  - According to Eric Eisenhardt, fisheries biologist at the University of Washington, "the acoustic tag study has shown that for some species of rockfish the bottomfish recovery zones are indeed large enough (contrary to some popular opinions)" (Slocomb, Personal Communication, 2003).
- Social science research is also being conducted. "Fishers are surveyed on their knowledge and support of the program to evaluate the effectiveness of outreach efforts and to determine overall participation by fishers" (Koski 2001).

Stakeholders

MPA establishment may impact a wide range of individuals and entities. This means a diversity of stakeholders has an interest in participating in the process.

Stakeholders interested in or affected by the establishment of the BRZs include the following:

- Charter boat operators
- General public
- Port operators
- Recreational boaters
- Recreational fishermen
- Scientists
  - University of Washington (Friday Harbor Labs)
- Treaty tribes (*Note: Treaty tribes were not initially included in the BRZ process; however, they are now represented on the MRC.*)
- Nongovernmental organizations
  - Friends of the San Juan's
  - People for Puget Sound
  - Whale Museum (Soundwatch)
- Government agencies
  - County
    - San Juan Board of County Commissioners
  - State agencies
    - Department of Fish and Wildlife
    - Department of Natural Resources
    - Department of Ecology
    - Puget Sound Water Quality Action Team
    - State Parks and Recreation Commission
- Washington Sea Grant Program

Advisory Groups

Advisory committees may be used during an MPA development process. The establishment of an advisory committee representing various interest groups and affected parties will facilitate local participation throughout the MPA establishment process, and may help to form partnerships by ensuring that all interests are represented in the final proposal (Brody 1998).

An advisory group was utilized during the establishment of the BRZs. Just as advisory groups are used in a federal process to gather input from stakeholders, the MRC played an equivalent role throughout this bottom-up process.

- The twelve members of the MRC have special knowledge about marine resource issues or are citizens concerned with the quality of the marine environment and its uses (Winger 2001).
  - MRC membership includes
    - Representatives from the environmental/naturalist sector
    - Representatives from the business/commercial sector
    - Representatives from the Town of Friday Harbor, the Port of Friday Harbor, and the San Juan County government.
  - All committee members are appointed by the BOCC.

Economic Factors

"The acceptability of a MPA to the general public and to direct users will depend significantly on whether the perceived benefits are greater with or without the MPA"
(National Research Council 2001).

No formal economic analysis was completed during the establishment of the BRZs.

Areas of Conflict/Difficulty

"MPA proposals often raise significant controversy..." (National Research Council 2001).

The following are areas of conflict or difficulty that arose during and after the establishment of the BRZs:

- Sites are thought to be too small to achieve fishery protection objectives; however, now that the community supports them, they might be easier to expand.
  - "Now that the MRC is realizing that the areas are too small to achieve protection objectives, they will probably have the support to expand them" (Atkinson and Hart 2001).
- Not excluding salmon trolling from the BRZs has led to bycatch problems because bottomfish do not survive capture and release (Arnold, Personal Communication, 2002; Kaill 1999; 2001).
- "Out of ignorance, the MRC and county did not consult the tribes before or during the site identification and adoption process" (Arnold, Personal Communication, 2002).
  - The tribes are now represented on the MRC as well as the NWSC.
  - Dialogue continues between the tribes and federal, state, and local entities in marine resource management efforts, such as MPA establishment.
- Boundaries are unclear since each zone is identified only on the shoreline by landmarks and small signs, with no markers in the water (Koski, Personal Communication, 2002). In addition, the program logo is ambiguously interpreted, and the signs marking each site are too small to be effective (Fluharty, Personal Communication, 2002; Koski, Personal Communication, 2002).

Technology-Based Decision-Support Tools

"MPA formulation and operation require, and benefit from, higher levels of technology in information handling and onsite management… Computer assisted mapping tools, used in storing, retrieving, processing, and displaying spatial data may be particularly useful" (Salm and others 2000).

Technology- based decision-support tools were not utilized during the establishment of the BRZs.

Enforcement

"Effective enforcement is essential to achieve MPA objectives and sustain cooperation from the general public and affected user groups" (National Research Council 2001).

- The no-take status is voluntary. However, the BFRP is supported through education and monitoring efforts, which have led to increased compliance.
- The Whale Museum's Soundwatch Boater Education Program was created to respond to boat traffic in the San Juan Islands and its effects on marine species. Although known primarily for educating whale-watching boaters, Soundwatch also patrols the boundaries of marine protected areas, such as the BRZs.

Boundaries

Clear delineation of spatial boundaries is important so that both managers and users know where structured management has been implemented.

- The zone's boundaries are marked on the adjacent shoreline of each reserve, and indicated by signs bearing the project logo, a rockfish held in two hands (Figure 1).
- All zones extend seaward one-quarter mile (approximately 400 yards) from the shoreline.
- Recent sign enhancement (2002): A marine reserve "bumper sticker" is being attached to existing signs. In addition, a second sign will be added to Bell Island and Pile Point, as well as Kellet Bluff upon approval from the Coast Guard.

Figure 1. Project Logo

Legislation and/or Regulation

MPA establishment is typically authorized by existing legislation, but implementation frequently requires new regulations. Existing legislation may guide and/or provide context for MPA processes.

The following is a review of the legal and institutional framework for the management of the BRZs:

- WDFW has management authority over all fish and wildlife species, while several regulations and programs have specifically contributed to the establishment and management of marine protected areas in Puget Sound.
  - Since the outset of the county's BFRP program, there has been close cooperation with WDFW through research and networking in the groundfish program.

Media/Public Outreach

Entities involved in MPA designation processes frequently undertake a variety of public outreach and education activities.

Resource users have been the prime target for outreach efforts since they have the most impact on the recovery zones, and their compliance with the BFRP guidelines is what makes the voluntary program successful (Hayashi 2001). Sources of media/public outreach used over the last few years include the following (Hayashi 2001; Koski 2001):

- BFRP brochures/posters are displayed and disseminated at local businesses, public marinas, boat launches and fuel stations.
- A BFRP Web page is accessible to the public.
- Signs mark the BRZs on the water. (See Figure 1.)
- The Whale Museum has an annual display booth at the San Juan County Fair and has incorporated the BFRP as part of its programs on display. In addition, the BFRP traveling exhibit is displayed annually at the Return of the Orcas Festival in Roche Harbor.
- A radio station in Bellingham runs BFRP public service announcements regularly during the morning talk show.
- The on-line publication of *San Juan Guide* includes a section of information on the BFRP.
- Public forums have been held on some of the islands in the county to increase general awareness of marine protected areas.
- The BFRP coordinator has given presentations to local clubs, such as the San Juan Kiwanis Club, San Juan Elderhostel Groups, and San Juan Cub Scouts.
- Local elementary school students learned about fish and the BFRP while creating artwork and a BFRP message that is now displayed at the Whale Museum.
- Local newspapers print articles related to the BFRP.
- Video cameras were deployed to survey the bottomfish habitat, and then made available to the public.
- The Emerald Seas Dive shop provides divers with opportunities to learn about and dive in the reserves through a "Dive the Reserve" program.
- Annually, the Port of Friday Harbor mails materials to port patrons. In 2001, this included BFRP brochures. Brochures were also included in pre-event mailers to yachting events at Friday Harbor and Roche Harbor.
- Soundwatch, a local organization focused on education of whale watching guidelines, monitors many of the BRZs while out on the water. Soundwatch approaches people fishing in the reserves,

distributes information about the BFRP, and asks the fishermen to respect the program by fishing in another area. Fishermen are also surveyed as to their knowledge and support of the program.

- Soundwatch has incorporated the BFRP message into regular regional boater education presentations.
- Through the Shorewatch Program, "Shorewatchers" are volunteers trained to estimate and monitor fishing pressure within the BRZs, as well as reference areas.
- The BFRP is present at the Einar Nielson Fishing Derby and Bayliner Convention held at Roche Harbor during the summer. An agreement was made to minimize possible damage to rockfish by
  - Removing rockfish as prize-winning species;
  - Preparing for BFRP presence at the award ceremonies, banquet, weigh-in station, and setting up space and facilities for a BFRP table at the show; and
  - Lobbying the organizers to be sympathetic to the goals of BFRP.
  - Soundwatch monitors the reserves during the derby days, talking with fishermen and monitoring by-catch from salmon trolling in the reserves.
- Various boater education classes around the county, such as Power Squadron, Mountaineers Paddling class, Camp Orkila's Seasonal Kayak Staff Training, and the Whale Museum's marine naturalist training classes have BFRP components to them.
- The MRC worked with local businesses to buy an ad on the back cover of the WDFW sport fishing regulations booklet for 2000 and 2001 (~750,000 copies). (*Note: This advertising program is an ongoing effort*.)
  - The ad includes the MRC and Bottomfish logos, a map of the reserve areas, and the logos of sponsors, and asks that fishermen support the program by not fishing in the BRZs.

Refer to Appendix B for a listing of additional readings.

References

Note: All World Wide Web addresses listed in this section were accessible on January 31, 2003, and accurately reflected information referenced here and in the text. Site content at these links may change, or the links may become inactive at any time.

Arnold, L. 2002. Record of e-mail exchange regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Laura Arnold, San Juan County Planning Director/ Marine Resources Committee member, May 6, May 7, May 9, May 30, and June 7.

Atkinson, J., and T. Hart. 2001. *Conservation Coast to Coast: Comparing State Action on Marine Protected Areas in California, Washington and the U.S. Gulf of Maine.* Conservation Law Foundation. September 1.

Broadhurst, G. 2002. Record of e-mail exchange regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Ginny Broadhurst, Puget Sound Water Quality Action Team, July 17.

Brody, S.D. 1998. "An Evaluation of the Establishment Processes for Marine Protected Areas in the Gulf of Maine: Understanding the Role of Community Involvement and Public Participation." Marine State Planning Office Gulf of Maine Council on the Marine Environment, Augusta, ME. July. Web site: <www.gulfofmaine.org/library/mpas/process_eval_0798.PDF>

Davis, J. 2000. "MPA Enforcement: Practitioners Employ Mix of High-Tech and Community-Based Strategies." *MPA News*, Volume 2, Number 5, November. Web site: <http://depts.washington.edu/mpanews/MPA14.htm>

Davis, S. 2002. Record of e-mail exchange regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Shannon Davis, Part-time staff to the Marine Resources Committee, September 10.

Devaux, N. 1998. "The Northwest Marine Sanctuary: Our Waters Are Still Unprotected." *Whatcom Watch Online*, Volume 7, Issue 2, February. Web site: <www.whatcomwatch.org/v7i2.html>

Federal Register. September 15, 1999 (Volume 64, Number178). Pages 50061 to 50062.

Fluharty, D. 2002. Record of e-mail exchange and interview regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and David Fluharty, Associate Professor, School of Marine Affairs, University of Washington, May 5, May 9, May 26, and August 5.

Griffin, M. 2000. "Evaluation of Acoustic Telemetry and Visible Implant Fluorescent Elastomer as Tracking tools of *Ophiodon elongatus* and *Sebastes caurinus* within a San Juan County 'No-Take' Reserve." Web site: <www.fish.washington.edu/classes/fish499/MNG/MNGPAPER.html>

Hayashi, K. 2001. "Effectiveness of the Bottomfish Recovery Program's Education and Outreach Efforts to San Juan County Residents." Masters Thesis, University of Washington. December 12.

Island County Marine Resources Committee. 1999. "Resolution Establishing an Island County Marine Resources Committee." Draft Resolution N. C-59-1999.

Kaill, W.M. 1999. “Bottomfish Recovery Project Final Report.” San Juan County Marine Resources Committee, Friday Harbor, WA. December 16.

Kaill, W.M. 2001. “Bottomfish Recovery Project Final Report.” San Juan County Marine Resources Committee, Friday Harbor, WA. February 27.

Klinger, T. 2001. “Marine Protected Areas: Examples from the San Juan Islands, Washington.” *Endangered Species Update*, Volume 18, Number 2. Page 55.

Klinger, T. 2002. Record of e-mail exchange regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Terrie Klinger, University of Washington’s Friday Harbor Laboratories/ Marine Resources Committee member, July 16, and August 14.

Koski, K. 2001. “Bottomfish Recovery Program Final Report, 2001.” San Juan County Marine Resources Committee. Friday Harbor, WA.

Koski, K. 2002. Record of e-mail exchange and interview regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Kari Koski, Soundwatch Boater Educator Program, Friday Harbor Whale Museum, July 31, August 6, August 7, and August 8.

Marine Resources Committee. “Voluntary ‘No Take’ Zones.” Bottomfish Recovery Program. Web site: <www.co.san-juan.wa.us/mrc/bottomfishrecovery.html>

Mills, M.L. 2002–2003. Record of e-mail exchange regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Mary Lou Mills, MPA Coordinator, Washington Department of Fish and Wildlife, August 19 and December 3, 2002, and January 3, 2003.

Moriarty, L. 1999. “High Hopes - The Northwest Straits Commission Takes Shape in a Flush of Unity and Optimism.” *Island Times*, November 24. Web site: <www.nwstraits.org/Article-IslandTimes.pdf>

Murray, M.R. 1998a. “The Status of Marine Protected Areas in Puget Sound (Volume I).” Puget Sound Water Quality Action Team. Olympia, WA. March. Web site: <www.wa.gov/puget_sound/shared/volume1/intro.html>

Murray, M.R. 1998b. “The Status of Marine Protected Areas in Puget Sound (Volume II: MPA Site Profiles & Appendices).” Puget Sound Water Quality Action Team. Olympia, WA. March. Web site: <http://www.wa.gov/puget_sound/shared/volume2/intro.html>

Murray-Metcalf Northwest Straits Citizens Advisory Commission. 1998. “Report to the Convenors.” Washington Sea Grant Program, University of Washington. August 20. Web site: <www.nwstraits.org/mmreport.pdf>

National Ocean Service (NOS). 1999. “NOAA Announces the Withdrawal of the Northwest Straits as an Active Candidate for Designation as a National Marine Sanctuary.” *Weekly Report Archives*. October. Web site: <www.nos.noaa.gov/For_Employees/AA_Office/Report_Archives/Rept_Oct99.html>

National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems.* Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, Commission on Geosciences, Environment, and Resources. National Academy Press, Washington, DC.

The Northwest Straits Commission. "The Northwest Straits Marine Conservation Initiative." Web site: <www.nwstraits.org>

Northwest Straits Marine Conservation Initiative. 1999 through 2000. "First Annual Progress Report." April 1 through March 31. Web site: <www.nwstraits.org/AnnualReport-3-00.pdf>

Northwest Straits Marine Conservation Initiative. 2000 through 2001. "Second Annual Progress Report." April 1 through March 31. Web site: <www.nwstraits.org/annualreport01/Annual_Report_01.html>

Osborne, R.W., K.L. Koski, and R.E. Tallmon. 2001. "Voluntary Marine Protected Areas and Adaptive Management in the San Juan Islands." The Whale Museum, Friday Harbor, WA. Web site: <www.wa.gov/puget_sound/Publications/01_proceedings/sessions/oral/8b_osbor.pdf>

Palsson, W.A., J.C. Hoeman, G.G. Bargmann, and D.E. Day. 1997. "1995 status of Puget Sound bottomfish stocks (revised)." Report Number MRD97-03, Washington Department of Fish and Wildlife, Olympia, WA.

Palsson, W.A. 1998. "Monitoring the Response of Rockfishes to Protected Areas." In Yoklavich, M. (ed.), *Marine Harvest Refugia for West Coast Rockfish: A Workshop*. NOAA Technical Memorandum NMFS NOAA-TM-SWFSC-255. Pages 64 to 73.

Palsson, W.A. 2002. Record of e-mail exchange and interview regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Wayne Palsson, Senior Fish and Wildlife Biologist, Washington Department of Fish and Wildlife, August 19 and November 12.

Partnership for Interdisciplinary Studies of Coastal Oceans. 2002. "The Science of Marine Reserves." Web site: <www.piscoweb.org>

People for Puget Sound. "Northwest Straits Commission." Web site: <www.pugetsound.org/articles/mm1198p6.html>

Ranker, K. 2002. Record of e-mail exchange and interview regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Kevin Ranker, Pacific Northwest Regional Coordinator, Surfrider Foundation/ Marine Resources Committee member, May 13 and August 7.

Salm, R.V., J.R. Clark, and E. Siirila. 2000. *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. Washington, DC: International Union for the Conservation of Nature and Natural Resources. Washington, DC. 371 pages + prologue.

San Juan County Board of Commissioners (BOCC). 1996. "Resolution Establishing a Marine Resources Committee." Resolution Number 35-1996.

San Juan County Board of Commissioners (BOCC). 1997. "Resolution to Designate Eight Sites for Bottomfish Recovery Voluntary-Only No-Take Areas." Resolution Number 49-1997.

Slocomb, J. 2002-2003. Record of e-mail exchange and interview regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Jim Slocomb, Chair, Marine Resources Committee, July 16, August 7, and February 5.

Smukler, K. 2001. "Measures of Success: Performance Benchmarks, The Status from the Start, March 1999. The Northwest Straits Marine Conservation Initiative. October. Web site: <www.nwstraits.org/NWSC_baseline.pdf>

Smukler, K. 2002. Record of e-mail exchange regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Kate Smukler, Knauss Sea Grant Fellow, NOAA National Center for Marine Protected Areas, March 11, April 17, April 29, and May 9.

Willows, D. 2002. Record of e-mail exchange and interview regarding the San Juan County Bottomfish Recovery Zones. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Dennis Willows, Director of the University of Washington's Friday Harbor Labs/ Marine Resources Committee member, May 29, August 2, and August 7.

Winger, S.R. 2001. "Local-Level Natural Resource Planning and Management: An Evaluation of the San Juan County Marine Resources Committee." Masters Thesis, University of Washington.

Wood, G. "The Northwest Straits Commission: Our Last Chance to Save Puget Sound?" Web site: <www.nwstraits.org/Article-GaryWood.pdf>

1998. "Remarks by Senator Patty Murray Introducing the Northwest Straits Marine Conservation Initiative Act." September 16. Web site: <http://murray.senate.gov/releases/97-98/980916a.html>

APPENDIX A. Public Scoping Meetings [San Juan County Bottomfish Recovery Zones]

Date	Location
November 23, 1996	San Juan Island – Community Theater
November 23, 1996	Orcas Island – Doty's A-1 Cafe
November 23, 1996	Lopez Island – Firehouse
November 23, 1996	Shaw Island – Community Center

APPENDIX B. Additional Readings [San Juan County Bottomfish Recovery Zones]

LaBossiere, P. 2002. "Legislation Would Expand MRC Concept to Entire Puget Sound." *San Juan Journal.* January 29. Web site: <http://depts.washington.edu/fhl/Publicity/MRC.html>

San Juan Islander. 2000. "$25,000 Grant Will Help Bottomfish." January 28. Web site: <www.sanjuanislander.com/county/mrc/mrcbottomfish.html>

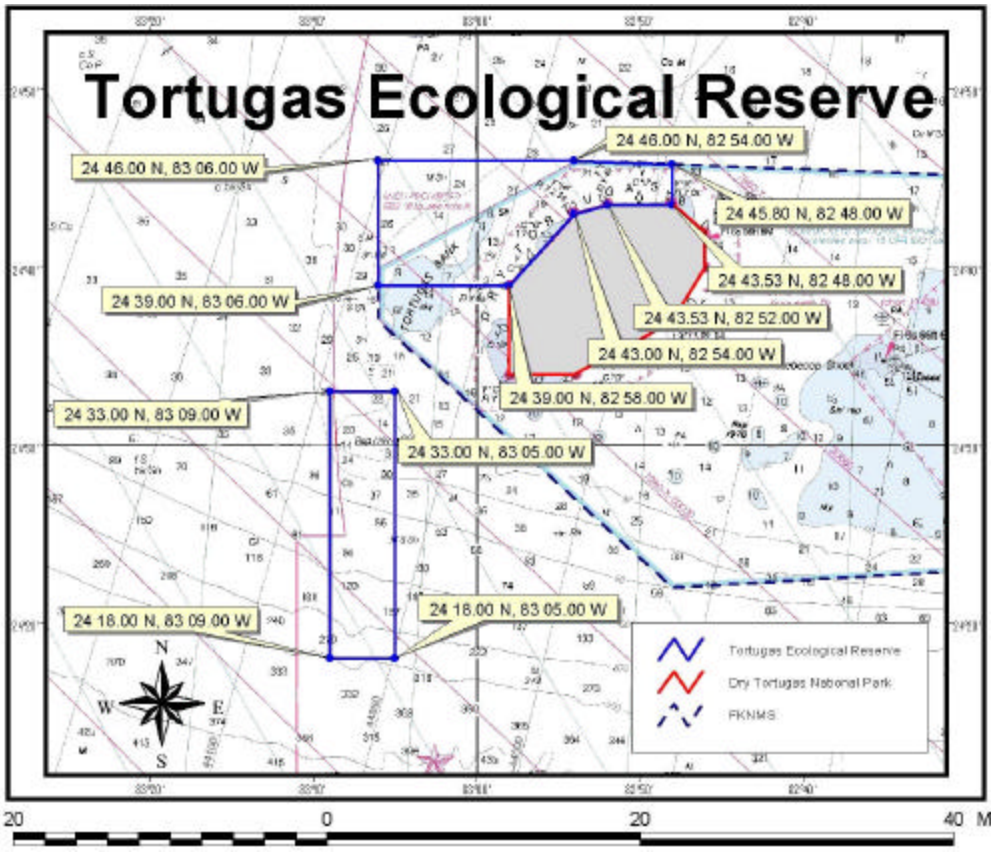
San Juan Islander. 2000. "Whale Museum Helping Bottomfish." October 22. Web site: <www.sanjuanislander.com/groups/whales/bottomfish.html>

San Juan Islander. 2001. "Nature Graffitti Gang Strikes Again." March 27. Web site: <www.sanjuanislander.com/groups/nature_graffiti_gang/rockfish.html>

Appendix C. MRC Members [San Juan County Bottomfish Recovery Zones]

Name	Representation
Jim Slocomb, Chair	Experience in the marine repair business, and knowledgeable about commercial and recreational boating issues
Mary Masters	Environmental consultant with experience in environmental engineering in the public and private sectors
David Loyd	Operator of Waldron Freight, and a member of the Island Oil Spill Association.
Brian Calvert	Commissioner with the Port of Friday Harbor and a yacht broker, diver and boater
Rich Osborne	Curator of science services at the Whale Museum on San Juan Island
Terrie Klinger	Researcher and instructor at the University of Washington's Friday Harbor Laboratories
Kelley Balcomb-Bartok	Associated with the Center for Whale Research, co-founder of The Orca Conservancy, and conducts field research on killer whales
Dennis Willows	Professor of Zoology at the University of Washington and the director of the UW Friday Harbor Laboratories
Kit Rawson	Senior Fishery Management Biologist for the Tulalip Tribes
Laura Arnold	San Juan County Planning Director
Mike Bertrand	Land Use Administrator for the Town of Friday Harbor
Kevin Ranker	Pacific Northwest Regional Coordinator of the Surfrider Foundation, a steering committee member of the Ocean Wilderness Network, and a member of the Olympic Coast National Marine Sanctuary and UC Davis Marine Ecosystem Health Program advisory boards
Tom McMillen	Owns and operates Salish Sea Charters, a whale and wildlife tour company
Jean Van Leuven	Operates Western Prince Cruises, a whale and wildlife tour company
Peter Fromm	Worked as a deckhand on tugs and fishing boats, and as a naturalist and captain on charter and whale watching boats. Author and publisher of "Whale Tales, Human Interactions with Whales," volumes I & II

Tortugas Ecological Reserve



Source: (*www.fknms.nos.noaa.gov/graphics/maps/tortugas.jpg*)

Note: Each case study uses the terminology adopted by that particular process, and is not based on a consistent definition.

Abstract

The National Oceanic and Atmospheric Administration's National Ocean Service, working in cooperation with the State of Florida, Gulf of Mexico Fishery Management Council, and the National Marine Fisheries Service, established a 151 square nautical mile "no take" ecological reserve to protect the critical coral reef ecosystem of the Tortugas, a remote area in the western part of the Florida Keys National Marine Sanctuary. The reserve consists of two sections, Tortugas North and Tortugas South, and required an expansion of the sanctuary boundary to protect important coral reef resources in the areas of Sherwood Forest and Riley's Hump. The ecological reserve in the Tortugas was designed to preserve the richness of species and health of fish stocks in the Tortugas and throughout the Florida Keys by prohibiting all extractive uses. Restrictions on vessel discharge and anchoring will protect water quality and habitat complexity. The reserve's geographical isolation will help scientists distinguish between natural and human-induced changes to the coral reef environment. The Tortugas Ecological Reserve complements a parallel process undertaken by the National Park Service to provide similar protection in the Dry Tortugas National Park.

Introduction

Marine zoning was implemented in the Florida Keys National Marine Sanctuary (FKNMS) to address several key management issues, such as the protection of biological diversity of the marine environment, reduction of user conflicts, and preservation of sensitive habitats and wildlife. As a management tool, marine zoning allows the sanctuary to focus management efforts on a small portion of the sanctuary while addressing issues in the broader, unzoned areas. The sanctuary, which encompasses approximately 2900 square nautical miles, currently uses five different marine zoning types. In addition to the Existing Management Areas (including Key Largo and Looe Key National Marine Sanctuaries, National Wildlife Refuges, state aquatic preserves, and state parks), Wildlife Management Areas, Ecological Reserves (including Western Sambo and Tortugas), Sanctuary Preservation Areas, and Special-Use Areas are zone types that have been established to ensure protection of sanctuary resources while allowing some uses to occur. (Refer to Appendix G for definitions of each zone type.) As defined in the FKNMS management plan, an Ecological Reserve is "designed to minimize human influences, to provide natural spawning, nursery, and permanent residence areas for the replenishment and genetic protection of marine life, and also to protect and preserve natural assemblages of habitats and species within areas representing the full range of diversity of resources and habitats found throughout the sanctuary" (USDOC 1996).

The Tortugas Ecological Reserve (151 square nautical miles in size) was created to protect the coral reef ecosystem of the Tortugas region, which lies in the western portion of the FKNMS. Due to its remote location, 70 miles west of Key West and more than 140 miles from Florida's mainland, the Tortugas region is viewed as having the best water quality in the sanctuary. Baitfish populations support seabird communities such as sooty and noddy terns, masked boobies, and the largest roosting population of frigate birds in the continental U.S. Additionally, the Tortugas have a high potential for producing and exporting the larvae of fish, lobster, and other marine organisms downstream to the Keys and east and west coasts of Florida due to their location at the juncture of major ocean currents (USDOC 2000b). Despite the Tortugas' beauty and productivity, studies show that decades of human use have led to resource loss and degradation, and recommend protection of the area's unique habitats (USDOC 2000b).

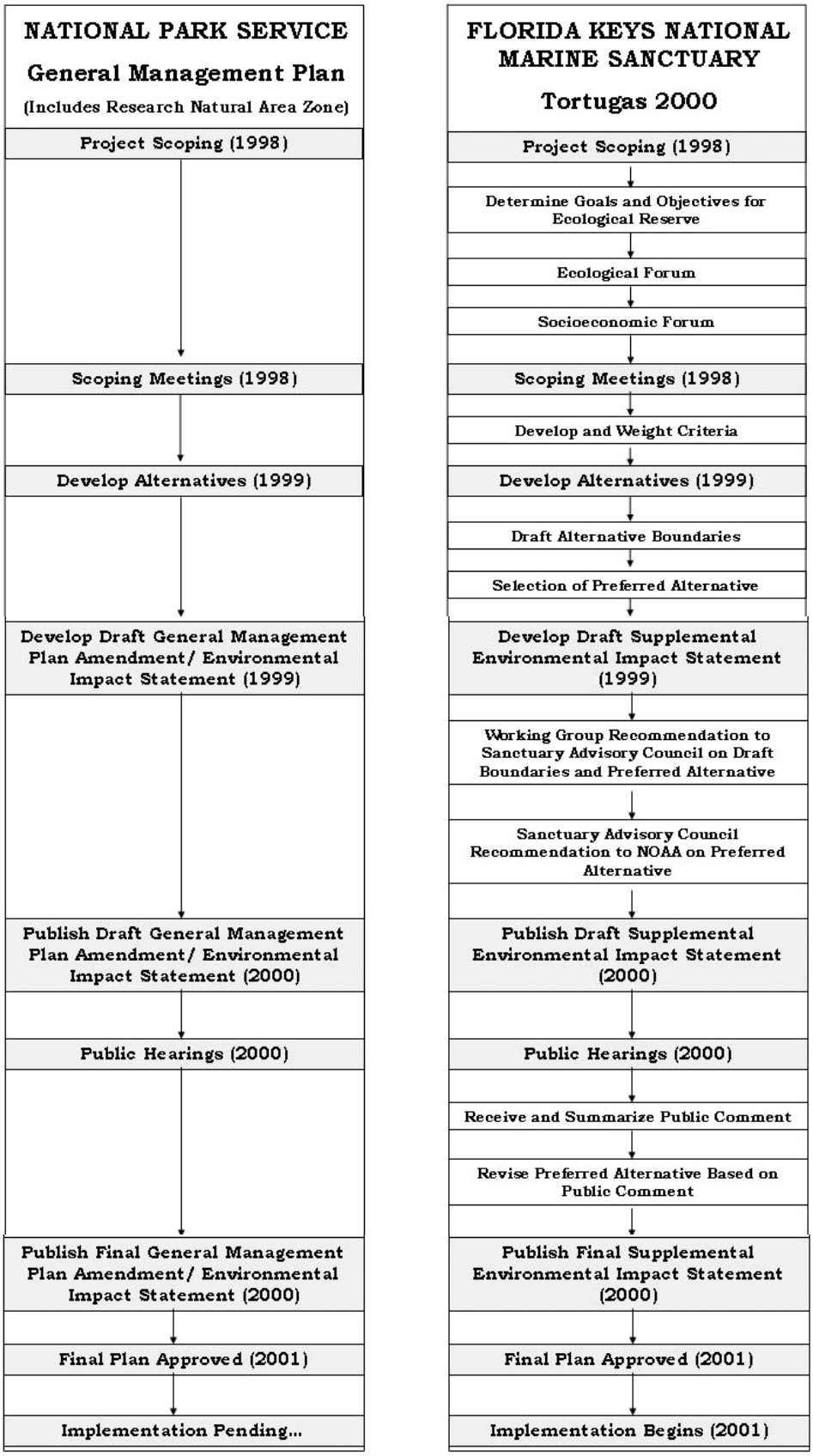
The Tortugas Ecological Reserve consists of two sections, Tortugas North and Tortugas South. Creation of the reserve required an expansion of the sanctuary boundaries to protect important coral reef resources in the areas known as Sherwood Forest, a site with abundant coral heads, and Riley's Hump, a low relief

coral bank that serves as a spawning aggregation site. Tortugas North and Tortugas South now fully protect all marine life through regulations that prohibit all extractive activities in these zones. Tortugas North is open to non-extractive diving, and the sanctuary has installed mooring buoys to protect the fragile coral reefs of the area from anchor damage. Tortugas South is open only to vessels in transit, and researchers and educators holding a valid sanctuary permit. Diving is prohibited in this section to protect fish spawning aggregations from possible disruption. In addition, the sanctuary is able to address anchor damage and water pollution from vessel discharges in the reserve (NOAA 2001).

Process Diagram

"An important factor in the establishment of MPAs is the process by which they are nominated and designated" (Brody 1998).

The Tortugas Ecological Reserve establishment process ("Tortugas 2000"), which was the culmination of a ten-year planning effort, has occurred as follows (next page). The National Park Service's General Management Plan revision, which occurred parallel with the Tortugas Ecological Reserve design process is also shown:


NATIONAL PARK SERVICE
General Management Plan
(Includes Research Natural Area Zone)
Project Scoping (1998)
Scoping Meetings (1998)
Develop Alternatives (1999)
Develop Draft General Management Plan Amendment/ Environmental Impact Statement (1999)
Publish Draft General Management Plan Amendment/ Environmental Impact Statement (2000)
Public Hearings (2000)
Publish Final General Management Plan Amendment/ Environmental Impact Statement (2000)
Final Plan Approved (2001)
Implementation Pending...
FLORIDA KEYS NATIONAL MARINE SANCTUARY
Tortugas 2000
Project Scoping (1998)
Determine Goals and Objectives for Ecological Reserve
Ecological Forum
Socioeconomic Forum
Scoping Meetings (1998)
Develop and Weight Criteria
Develop Alternatives (1999)
Draft Alternative Boundaries
Selection of Preferred Alternative
Develop Draft Supplemental Environmental Impact Statement (1999)
Working Group Recommendation to Sanctuary Advisory Council on Draft Boundaries and Preferred Alternative
Sanctuary Advisory Council Recommendation to NOAA on Preferred Alternative
Publish Draft Supplemental Environmental Impact Statement (2000)
Public Hearings (2000)
Receive and Summarize Public Comment
Revise Preferred Alternative Based on Public Comment
Publish Final Supplemental Environmental Impact Statement (2000)
Final Plan Approved (2001)
Implementation Begins (2001)

Timeline (1990 to 2001)

This section details the sequence of events in the establishment process.

- Establishment of the Florida Keys National Marine Sanctuary and Initial Planning for the Tortugas Ecological Reserve (1990 to 1997):
  - In 1990, the FKNMS was created by an act of Congress, and the Florida Keys National Marine Sanctuary and Protection Act was signed into law November 16, 1990 by President Bush.
  - From 1990 to 1996, sanctuary managers worked within the community and with local, state, and national agencies with interests in the Florida Keys marine environment to develop a comprehensive and integrated management plan for the 2800 square nautical mile sanctuary. A co-management agreement with the State of Florida was adopted, and a citizen-based Sanctuary Advisory Council was established to guide management plan development and promote public input.
  - In July 1997, the sanctuary implemented its *Final Management Plan*, which contained ten action plans to conserve and protect sanctuary resources. One strategy implemented at that time was a marine zoning plan that featured five marine zone types. Three of these marine zone types (Ecological Reserves, Sanctuary Preservation Areas, and Special-Use Areas) are fully protected zones that prohibit extractive activities. Twenty-three zones, encompassing 14.2 square nautical miles (one-half of one percent of sanctuary waters) were designated in 1997. Four of these areas allow catch-and-release fishing.
  - In the Draft Environmental Impact Statement and Management Plan released in April 1995, the National Oceanic and Atmospheric Administration (NOAA) proposed a fully protected reserve (110 square nautical miles in size) in the Tortugas region. This proposed reserve was not established because public comments indicated that 1) the proposed boundaries did not include the most significant coral reef resources, 2) the reserve would cause economic harm to several constituent groups, including commercial fishermen (USDOC 2000b), and 3) in order to be effective, waters in the Dry Tortugas National Park would also need to be protected in coordination with the Florida Keys National Marine Sanctuary (Bohnsack, Personal Communication, 2003).
  - The Final Environmental Impact Statement and Management Plan committed to undertaking a collaborative initiative to establish an Ecological Reserve in the most appropriate area. This process would include the National Park Service (NPS), which was revising its management plan for the Dry Tortugas National Park, and determine which areas of the Tortugas region needed protection and what degree of protection was appropriate. Although FKNMS and NPS have distinct missions and different management strategies, the agencies joined in a collaborative planning process by linking Web sites, holding joint scoping/ public meetings, and coordinating documents with the intention of minimizing confusion and maximizing public involvement (see process diagram on previous page) (National Park Service 2000).
  - The collaborative process known as "Tortugas 2000" was initiated in 1998 in compliance with the 1997 FKNMS Final Environmental Impact Statement and Management Plan (USDOC 1996).

- Tortugas 2000 (1998 to 2001):
  - February 1998: The Sanctuary Advisory Council (SAC), an advisory group to the sanctuary managers, established an *ad-hoc* working group composed of various stakeholders to recommend the size, shape, and placement of an Ecological Reserve in the Tortugas area. According to Billy Causey, Superintendent of the Florida Keys National Marine Sanctuary, "The concept of utilizing the SAC and a working group of the SAC was to broaden the amount of public input into the process. The working group provided the necessary conduit to the waterfront community"

(Personal Communication, 2003). (Refer to Appendix C for a listing of SAC and working group members).

- Working group members met five times over the course of 13 months to define operating goals, set ground rules, develop and weight criteria for the reserve, evaluate draft boundaries, and reach consensus on a recommended preferred boundary (USDOC 2000b).
- Working group meetings were publicly noticed and open to members of the community. The meeting agenda allowed time for caucusing between working group members and constituents present (Delaney, Personal Communication, 2003).
- All working group meetings were held in Key West, where the fishermen who would be most affected docked their vessels and sold their catch (Causey, Personal Communication, 2003).
- Individual meetings are chronicled below; however, consult the Tortugas 2000 Web site (*www.fknms.nos.noaa.gov/tortugas/*) for detailed meeting minutes. (Refer to Appendix A for dates and locations of public meetings.)

o In the beginning of the process, a foundation of knowledge on the Tortugas region was established using scientific and anecdotal information, personal knowledge, as well as knowledge passed on by constituents and users of the region (USDOC 2000b).
  - NOAA's National Ocean Service and the National Park Service created a site characterization document composed of three white papers. Topics, including physical oceanography and recruitment, fisheries, and benthic communities, were chosen for their relevance to reserve design (Cowie-Haskell and Delaney 2003).
  - In addition, Dr. Bob Leeworthy, a NOAA Economist, led an effort to gather socioeconomic data from the commercial and recreational users of that area. Information was obtained on the number of users, catch, trips, and costs (USDOC 2000b).
  - With help from the Florida Marine Research Institute and Monroe County, information contained in these analyses was used to create geographic information system (GIS)-based maps of the region to illustrate location of resources, where activities were occurring, and at what intensity (USDOC 2000b). Later in the process, this information was used to inform the working group about the resources and use of the Tortugas region.
o April 1998: The working group first convened to establish ground rules for the process (making the decision to use a consensus process) and to determine goals and objectives for the Tortugas Ecological Reserve.
o April and June 1998: Ecological and socioeconomic forums were held in April and June of 1998 respectively to 1) present the best available scientific information and traditional knowledge from the Tortugas area, 2) provide an outlet for community members to share their knowledge and experience in the region, and 3) provide information about the area's uses (Cowie-Haskell and Delaney 2003).
  - Ecological Forum—April 16 to 17, 1998: Panels of scientists and citizens who had worked in the area were convened to present their findings and observations to the working group (refer to Appendix C for panel members and affiliations). The panels represented the following topics:
    - Physical characterization
    - Local knowledge
    - Benthic characterization
    - Fish community
    - Lobster, seagrass, and megafauna
  - Socioeconomic Forum—June 22, 1998: Panels of scientists and citizens who were knowledgeable about human activities in the area were convened to discuss their activities with the working group (refer to Appendix C for panel members and affiliations). The panels represented the following topics:
    - Overview of uses

- Recreational fishing and diving
- Commercial fishing
- Socioeconomic considerations

- June 1998: The Tortugas 2000 Web site (*www.fknms.nos.noaa.gov/tortugas/*) became available on-line and was used to disseminate information throughout the process.
- October and November 1998: A series of scoping meetings were held to give members of the public an opportunity to comment on the types of protection needed for the Tortugas and learn about the Tortugas 2000 process.
  - The sanctuary held these meetings in conjunction with the NPS and used an innovative open-house format that encouraged asking questions and offering constructive comments (Delaney, Personal Communication, 2003).
  - The meeting locations were scattered throughout the Keys, south Florida, and Washington. This gave stakeholders at local, regional, and national levels broader access to the public process (Causey, Personal Communication, 2003). (Refer to Appendix A for dates and locations of public scoping meetings.)
  - Diverse formats for input during the scoping process were also used to encourage public participation (Delaney, Personal Communication, 2003).
  - "A total of 223 comments were received: 89 percent of which were in support of the idea of establishing a reserve, 9 percent were opposed, and 2 percent were undecided" (USDOC 2000b).
- January 1999: In preparation for the upcoming decision on appropriate boundaries and regulations for the reserve, sanctuary staff provided each working group member a binder of information relevant to reserve design.
  - Each workbook contained the following information: white papers, peer-reviewed science papers, definition and regulations for an Ecological Reserve as defined in the FKNMS management plan (1997), color GIS maps, transparent grid overlays, design criteria, newspaper articles on the Tortugas process, and meeting summaries (USDOC 2000b).
  - These workbooks were intended to serve as references. Therefore, as the process unfolded and information became available, it was added to the workbooks (Cowie-Haskell and Delaney 2003).
- February 1999: The working group selected criteria for the reserve to address specific ecological and socioeconomic concerns. The group then developed objectives for each of the following seven criteria (refer to Appendix D for reserve criteria and objectives):
  - Biodiversity and habitat
  - Fisheries sustainability
  - Sufficient size
  - Allowable activities
  - Socioeconomic impacts
  - Monitoring
  - Enforcement/compliance
- April 1999: On April 7, a packet of geographic information system (GIS) maps (generated by the Florida Keys National Marine Sanctuary and the Monroe County Division of Marine Resources) was given to each working group member. Members were instructed to overlay a grid cell transparency on each map in order to develop their own map of key concerns. From this map, each member formulated a draft alternative to bring to the April meeting (USDOC 2000b).
- April 1999: On April 22 to 23, the working group ranked the criteria to facilitate the selection of appropriate boundaries and regulations, and then drafted potential alternatives.
  - The criteria were first prioritized by the working group as a whole.
  - The facilitator then divided the group into those who supported change (those who tended to support different or new uses such as wilderness experiences or recreational diving) and those who supported the status quo (those who tended to support extractive uses) (Bohnsack,

Personal Communication, 2003). At this point, the criteria were reprioritized, producing less protective and more protective profiles. The end result of this exercise was a matrix of three criteria profiles (less protective, mid-range, and more protective), which were used to develop the draft alternatives (refer to Appendix E for criteria profiles).
    - To draw the alternatives, the facilitator split the working group into four groups of varied interests and instructed them to develop an alternative for each criteria profile.
    - Twelve potential alternatives were drafted representing a range of protection (USDOC 2000b).
- May 1999: On May 22, the working group selected two of the twelve alternatives for further discussion. Members of the working group then proposed a compromise using these two alternatives. After careful consideration, the working group endorsed the compromise, thereby reaching consensus on a preferred alternative for proposed boundaries and regulations for the Tortugas Ecological Reserve. The working group presented several rationales for the compromise alternative, including the following:
    - Protects biological diversity and achieves fisheries sustainability through sufficient reserve size;
    - Facilitates enforcement with simple boundaries;
    - Protects a range of contiguous neighboring habitats that include shallow areas in the Dry Tortugas National Park;
    - Leaves the southern half of Tortugas Bank open as a reference site to gauge impacts of fishing on the ecosystem (USDOC 2000b).
    - According to Dr. Jim Bohnsack, research fisheries biologist with the NMFS Southeast Fisheries Science Center and working group member, "The working group also supported the compromise alternative to avoid unnecessary conflict and polarization during the public review process as had occurred during the development of the original FKNMS management plan. Participants favoring less protection agreed not to 'hack and whack' during the review process while those favoring more protection agreed not to 'add and pad' the alternatives. Participants also agreed not to attempt to circumvent the review process through political or other means."
- June 1999: A presentation on the working group's process and recommended preferred alternative was given to the Sanctuary Advisory Council (SAC).
- The SAC voted unanimously to adopt the working group's proposal, and in turn recommended the same preferred boundary to the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida (USDOC 2000b). *Note: The Florida Keys National Marine Sanctuary, Dry Tortugas National Park, State of Florida, National Marine Fisheries Service, South Atlantic Fishery Management Council, and Gulf of Mexico Fishery Management Council all have jurisdiction in the Tortugas area.* (Refer to Appendix F for each agency's jurisdictional responsibilities.)
- November 1999: NOAA's National Ocean Service and National Marine Fisheries Service (NMFS) requested that the Gulf of Mexico Fishery Management Council (GMFMC) take steps to prohibit fishing under its authority consistent with the purposes and proposed location of the Ecological Reserve. The GMFMC accepted the request and developed an Essential Fish Habitat Amendment in the Gulf of Mexico Fishery Management Plan that includes the area of the reserve.
- May 2000: A Draft Supplemental Environmental Impact Statement/Supplemental Management Plan (DSEIS/SMP) was completed to describe the proposed reserve and to solicit public comments on the proposal.
- June and July 2000: The sanctuary held six public hearings on the reserve proposal in conjunction with the National Park Service, the Florida Fish and Wildlife Conservation Commission, and the Gulf of Mexico Fishery Management Council.

- Like the scoping meetings held in 1998, these hearings were held throughout the Keys, south Florida, and Washington in order to broaden stakeholder participation at all levels. (Refer to Appendix A for dates and locations of public hearings.)
- Also like the scoping meetings, the public hearings offered a round-table setting and multiple formats (including e-mail) for submitting comments to encourage public input into the Tortugas 2000 process (Delaney, Personal Communication, 2003).
- More than 4,000 comments were received on the DSEIS/SMP and the Tortugas Ecological Reserve proposal (USDOC 2000b):
  - 3,000 comments were form letters expressing general support for the creation of the Tortugas Ecological Reserve;
  - 245 persons commented by signing a petition;
  - Approximately 50 other comments are summarized, with agency responses, in the Final Supplemental Environmental Impact Statement/Final Supplemental Management Plan (USDOC 2000b).

- July 10 to 13, 2000: Before final action was taken, public testimony was also given to the GMFMC. Following public testimony, the GMFMC adopted the *Generic Amendment for Addressing Essential Fish Habitat Requirements for Fishery Management Plans of the Gulf of Mexico* (also referred to as the Tortugas Amendment), which amended seven fishery management plans to provide additional protection in the portion of Tortugas North that resides within the Gulf of Mexico exclusive economic zone, and in Tortugas South which resides entirely within the exclusive economic zone.
  - "The approved measures of the Tortugas Amendment prohibit fishing for any species, other than Atlantic highly migratory species, within these marine reserves. Additionally, the amendment prohibits anchoring by all fishing vessels within the marine reserves. These fishing and anchoring prohibitions are intended to achieve the maximum benefits from the two marine reserves over their initially anticipated duration of 10 years" (*Federal Register*, February 7, 2002). *(Note: NMFS later issued regulations that prohibited the catch of Atlantic highly migratory species within the reserve.)*
- November 2000: A Final Supplemental Environmental Impact Statement/Final Supplemental Management Plan was completed by NOAA, responding to public comments received during the previous phase, and developing federal and state rules to implement the reserve.
- March 2001: NOAA's National Marine Sanctuary Program announced that the reserve was effective for federal waters.
- April 2001: On April 24, Florida's Governor and Cabinet gave unanimous approval to include state waters in the Tortugas Ecological Reserve.
- The Tortugas Ecological Reserve was fully implemented on July 1, 2001.

Objectives

In most cases, an MPA will have multiple objectives. These may include protection of representative habitats, conservation of rare species, fish stock restoration or enhancement, or safeguarding of historical sites, among others.

Objectives established for the Tortugas Ecological Reserve included (but were not limited to) the following:

- To protect biodiversity and ecosystem integrity.
- To protect natural spawning, nursery, and permanent residence areas, including Riley's Hump.

- To protect unique coral formations and areas of high coral cover, including Sherwood Forest.
- To protect and enhance commercially and recreationally important fish species, as well as endangered, threatened, or rare species.
- To protect areas with physical oceanographic characteristics that will enhance larval dispersal.
- To provide a reference area in order to discriminate between human-induced and natural changes, as well as to monitor the effects of both extractive and non-extractive activities on ecosystem structure and processes.

Current Status/Outcome

This section describes the current status of the MPA process, and includes information on any ongoing research that will help evaluate effectiveness.

Currently:

- The Tortugas Ecological Reserve is the largest fully protected marine reserve in U.S. waters (Cowie-Haskell and Delaney 2003; NOAA 2001).
- Tortugas North remains open to non-extractive diving and snorkeling; however, visitors are required to obtain a simple, no-cost, phone-in permit to ensure that all vessels have access to mooring buoys, to ease enforcement, and to assist in monitoring visitor impacts. (There is no limit to the number of permits granted.) Regulations prohibit all taking of marine life, restrict vessel discharges to cooling water and engine exhaust, prohibit anchoring, and prohibit the use of mooring buoys by vessels more than 100 feet in combined length.
- Tortugas South prohibits all taking of marine life and restricts vessel discharges. Regulations also prohibit diving (the majority of which is beyond normal recreational diving depth) to protect potentially sensitive spawning aggregations from disruption, and require vessels to be in continuous transit through the area with fishing gear stowed. However, researchers and educators holding a sanctuary permit may utilize this region.
- The NPS, in collaboration with NOAA and FKNMS, was working to designate a type of no-take area called a Research Natural Area within the Dry Tortugas National Park that would be compatible with the Tortugas Ecological Reserve. However, actions by the NPS and the Department of Interior (DOI) are on hold until the State of Florida resolves its question concerning ownership of the submerged lands inside the Dry Tortugas National Park. While Florida supports an area that would protect all resources from extractive uses, it contests federal ownership of the submerged lands. Until the ownership issue is resolved, DOI will not approve, and NPS will not enforce, the proposed regulations for the Research Natural Area (Davis, Personal Communication, 2002).

A number of research efforts were conducted in the area during the planning process and have continued since its designation as an Ecological Reserve. Research has focused on establishing baseline reference information from both inside and outside the Ecological Reserve.

- Drs. Jim Bohnsack of NMFS and Jerry Ault of the University of Miami are conducting studies on reef fish populations and habitat utilization.
- Dr. Steven Miller of the National Undersea Research Center is conducting rapid assessments on benthic communities.
- Dr. Mark Fonseca of the NOAA Center for Coastal Fisheries and Habitat Research is conducting a study on trophic cascades to gain data on reserve effects.
- Bob Glazer of the Florida Fish and Wildlife Commission's Florida Marine Research Institute (FMRI) has conducted plankton surveys for conch larvae throughout the Tortugas region, specifically near Riley's Hump. John Hunt, Lyn Cox, Dr. Rod Bertelsen, and other scientists from FMRI are

monitoring the lobster populations inside the Tortugas Ecological Reserve and the Dry Tortugas National Park.

- The Reef Environmental Education Foundation (REEF) organized a volunteer diving program that conducts fish counts in several sites within no-take zones, including Sherwood Forest in Tortugas North.
- The Florida Institute of Oceanography, under the SEAKEYS program, provides oceanographic data, such as sea temperature and salinity, and meteorological data, such as wind speed, direction, and air temperature, to researchers and managers in the South Florida region.
- NOAA's Atlantic Oceanographic and Meteorological Laboratory and the University of Miami are conducting bimonthly oceanographic cruises to document variability of coastal currents in the region.
- Several other institutions and universities, including NOAA, FMRI, the United States Geological Survey, U.S. Environmental Protection Agency, University of South Florida, State University of New York at Buffalo, Mote Marine Laboratory, the American Museum of Natural History, and The Ocean Conservancy have continued or begun research in the Tortugas region. Projects include surveys of macrobenthic organisms, mollusks, deepwater fishes, and coral diseases, condition, and abundance. Reef connectivity, habitat mapping, relict reef geology, and reef fish abundance and spawning are also being studied.

Stakeholders

MPA establishment may impact a wide range of individuals and entities. This means a diversity of stakeholders has an interest in participating in the process.

Stakeholders interested in or affected by the establishment of the Tortugas Ecological Reserve include the following:

- Boating industry
- Conservationists
- Commercial fishermen
- Divers
- Educators
- General public
- Recreational fishermen
- Scientists
  - Florida State University
  - Florida Institute of Oceanography
  - Florida International University
  - Florida Fish and Wildlife Conservation Commission's Florida Marine Research Institute
  - National Undersea Research Center
  - University of Miami
  - University of South Florida
- Nongovernmental agencies
  - National Audubon Society
  - The Ocean Conservancy
  - The Nature Conservancy – Florida Keys Initiative
  - ReefKeeper International
  - World Wildlife Fund
- Government agencies
  - U.S. Department of Commerce
    - National Oceanic and Atmospheric Administration

        - National Marine Sanctuary Program
            - Florida Keys National Marine Sanctuary
        - National Marine Fisheries Service
    - U.S. Department of the Interior
        - National Park Service
        - U.S. Fish and Wildlife Service
    - Environmental Protection Agency
    - State of Florida
        - Florida Department of Environmental Protection
        - Florida Fish and Wildlife Conservation Commission
            - Florida Division of Marine Resources
        - Florida Governor and Cabinet
    - Gulf of Mexico Fishery Management Council
    - South Atlantic Fishery Management Council

Advisory Groups

Advisory committees may be used during an MPA development process. The establishment of an advisory committee representing various interest groups and affected parties will facilitate local participation throughout the MPA establishment process, and may help to form partnerships by ensuring that all interests are represented in the final proposal (Brody 1998).

Advisory groups were utilized during the establishment of the Tortugas Ecological Reserve.

- The Florida Keys National Marine Sanctuary Advisory Council (SAC) consisted of 19 voting members and 19 alternates, whose members represented the following:
    - Boating industry
    - Commercial fishermen
    - Conservationists
    - Divers
    - Education/Outreach
    - General public (lower, middle, and upper Keys)
    - Local government officials
    - Recreational fishermen
    - Research/Monitoring
    - Submerged and cultural resources
    - Tourism (lower and upper Keys)

- The Tortugas 2000 Working Group consisted of 25 members, including 8 members from the SAC. Working group membership was designed to represent the full range of stakeholder perspectives and included representatives from the following:
    - Charter boat operators
    - Commercial fishermen
    - Conservationists
    - Divers
    - General public
    - Recreational fishermen
    - Resource managers
    - Scientists

(Note: In February 1999 (one year into the process), two new members joined the Tortugas 2000 Working Group, which added representation for commercial handline fishermen and recreational fishermen.)

- The Ecological Forum Panel consisted of 20 participants, who represented the following topics:
  - Physical characterization
  - Local knowledge
  - Benthic characterization
  - Fish community
  - Lobster, seagrass, and megafauna

- The Socioeconomic Forum Panel consisted of 12 participants, who represented the following topics:
  - Overview of uses
  - Recreational fishing and diving
  - Commercial fishing
  - Socioeconomic considerations

Economic Factors

> **"**The acceptability of a MPA to the general public and to direct users will depend significantly on whether the perceived benefits are greater with or without the MPA"
> (National Research Council 2001).

The following are economic factors taken into consideration during the establishment of the Tortugas Ecological Reserve:

- The Tortugas 2000 Working Group adopted socioeconomic impacts as one of the criteria for the reserve, with the objective to choose an area and craft recommendations that minimize adverse socioeconomic impacts on established users of resources in the area.
- A thorough socioeconomic analysis was undertaken that described and quantified the effects of the proposed "no take" reserve regulations on users of the Tortugas. Benefits (non-extractive uses, and scientific and educational values, among others) were also articulated (USDOC 200b).
- The socioeconomic analysis further described potential mitigating and offsetting factors of economic losses to assess short versus long-term costs and benefits to displaced Tortugas users (USDOC 2000b).
- "Socioeconomic data was gathered from over 80 percent of all Tortugas users" (Leeworthy and Wiley 2000 IN Delaney 2003).
- The socioeconomic analysis indicated that the reserve would have moderate impacts on fishermen, primarily lobster and handline fishermen (Leeworthy and Wiley 2000; USDOC 2000b).
  - Catches of king mackerel, lobster, reef fish, and shrimp could be impacted by 14 percent, leading to an 844 thousand dollar loss in harvest revenue.
- Minimal to no impacts on recreational fishermen, commercial shippers, and treasure salvors were identified in the analysis (Leeworthy and Wiley 2000; USDOC 2000b).
  - In the socioeconomic analysis, recreational activity was broken down into extractive recreation (including diving for lobster, spearfishing, and hook-and-line fishing), and non-extractive recreation (i.e., non-extractive diving). All of these activities are conducted from 12 charter/party boat (for hire) operations. No private household boats were observed in the Tortugas Ecological Reserve site (Leeworthy and Wiley 2000; USDOC 2000b).
  - Nine of the 12 charter boat operations would be potentially affected.

- Direct business revenues were projected to decline 26.6 percent for lobster diving, 20.0 percent for spearfishing, and 6.3 percent for hook-and-line fishing. Across all three extractive recreational activities, 11.7 percent of revenue would be affected.

Areas of Conflict/Difficulty

> **"**MPA proposals often raise significant controversy..." (National Research Council 2001).

The following are areas of conflict or difficulty that arose during the establishment of the Tortugas Ecological Reserve:

- Initial boundaries proposed for the reserve in the early 1990s were not established because public comments indicated that the proposed boundaries did not include the most significant coral reef resources and would cause economic harm to commercial fishermen.
- During Tortugas 2000, concerns were raised that with Billy Causey, Florida Keys National Marine Sanctuary, and Ed Conklin, Florida Department of Environmental Protection, as co-chairs of the working group, it might appear that the state and federal governments were controlling the process, rather than it being a collaborative effort (Tortugas 2000 Working Group, 1998).
- Concern was expressed over whether diving should be allowed in Tortugas South. It was ultimately determined that except for research and monitoring, diving should not be allowed.
  - The Gulf of Mexico Fishery Management Council (GMFMC) had previously established a seasonal closure in this area to protect fish spawning aggregations from fishing and allow stocks to rebuild. It was widely acknowledged that diving during coral spawning events had become a major activity; however, no scientific data were available regarding the possible disruptive impacts of large numbers of divers on fishes during spawning events (Bohnsack, Personal Communication, 2003).
  - In the end, "the working group chose a precautionary approach because it was concerned that increased diving in Tortugas South could be disruptive to spawning aggregations and compromise FKNMS and GMFMC management goals" (Bohnsack, Personal Communication, 2003).
- The FKNMS had difficulty gaining representation as well as participation from stakeholder groups such as recreational fishermen, Hispanic fishermen, and shrimp fishermen in the Tortugas 2000 working group (Delaney, Personal Communication, 2003).
- Individuals representing two stakeholder groups, including shrimp fishermen and commercial sport fishermen, were concerned that they would suffer economic losses greater than those projected in the initial economic analysis that was contained in the Draft Supplemental Environmental Impact Statement/Supplemental Management Plan (SEIS/SMP). As a result, NOAA conducted an additional analysis using economic data that was supplied by those constituents, and published the revised results in the Final SEIS/SMP (Delaney, Personal Communication, 2003).
- "Although NOAA adopted an incremental approach to reserve design that included early groundwork in communication, group process, and consensus building, building trust among working group members, who represented a broad range of interests, was a challenge throughout the Tortugas 2000 process" (Delaney, Personal Communication, 2003).
- "Despite the participation by a local representative on the working group, a state-wide recreational fishermen's group that was backed by a national parent organization opposed the creation of the reserve throughout the process and lobbied state policy-makers to not adopt regulations for the area" (Delaney, Personal Communication, 2003).

Technology-Based Decision-Support Tools

> "MPA formulation and operation require, and benefit from, higher levels of technology in information handling and onsite management… Computer assisted mapping tools, used in storing, retrieving, processing, and displaying spatial data may be particularly useful" (Salm and others 2000).

Technology-based decision-support tools were utilized during the establishment of the Tortugas Ecological Reserve.

- Geographic information systems (GIS) maps of resources with consistent scales and grid cells were produced so comparisons could be made of uses and resources over space and time.
- "By using digital versions of NOAA nautical charts as base layers in GIS maps, the relevant data were displayed in a familiar context for fishermen" (Cowie-Haskell and Delaney 2003).

Enforcement

> "Effective enforcement is essential to achieve MPA objectives and sustain cooperation from the general public and affected user groups" (National Research Council 2001).

- An enforcement contract between NOAA's National Marine Sanctuary Program and the State of Florida Fish and Wildlife Conservation Commission states that Florida is the co-trustee for a significant portion (60 percent) of the waters and marine resources within the reserve, and will co-manage these resources with the FKNMS. The sanctuary funds 17 state enforcement officers, 7 of which are dedicated to the Tortugas Ecological Reserve.
- The FWCC Sanctuary Enforcement Team is cross-deputized to enforce all sanctuary regulations throughout the FKNMS. They are also authorized to enforce the Magnuson-Stevens Act, Lacey Act, Endangered Species Act, and the Marine Mammal Act.
- The NMFS manages fisheries in federal waters (40 percent) of the reserve. The Office of Law Enforcement has responsibility for enforcing fishing regulations and has assets and technology to use for enforcement.
- The U.S. Coast Guard (USCG) also has responsibility for enforcing fishing regulations in federal waters. The USCG has several large offshore patrol vessels based in Key West that could be used in conjunction with sanctuary patrol vessels for enforcement of the reserve areas.
- A permit issuance and tracking system was implemented in 2001 with reserve designation.
  - In Tortugas North, the sanctuary can ensure that all vessels visiting the reserve have access to mooring buoys by issuing permits. In addition, permitted vessels are required to call in upon entering and leaving the reserve.
  - In Tortugas South, vessels are required to be in continuous transit unless a sanctuary permit for research or education is granted.
- Enforcement efforts in the Tortugas Ecological Reserve have yielded over 12,500 pounds of illegal catch in 2002 (*www.fknms.nos.noaa.gov/news/*).

Boundaries

Clear delineation of spatial boundaries is important so that both managers and users know where structured management has been implemented.

- Refer to the *Federal Register* (January 17, 2001) for the Tortugas Ecological Reserve boundary coordinates.
- The Tortugas Ecological Reserve expanded the boundary of the sanctuary in the northwestern corner by approximately 36 nautical miles, and added a noncontiguous portion of approximately 60 nautical miles to include significant coral reefs known as Sherwood Forest and Riley's Hump.
- According to Joanne Delaney, Research Interpreter for the Florida Keys National Marine Sanctuary, "The working group considered enforcement and compliance one of the important criteria for the reserve, and to that end, agreed that boundaries aligned along meridians (latitude and longitude) were important to facilitate interpretation of reserve boundaries and compliance" (Personal Communication, 2003).

Legislation and/or Regulation

MPA establishment is typically authorized by existing legislation, but implementation frequently requires new regulations. Existing legislation may guide and/or provide context for MPA processes.

Note: The Florida Keys National Marine Sanctuary, Dry Tortugas National Park, State of Florida, National Marine Fisheries Service, South Atlantic Fishery Management Council, and Gulf of Mexico Fishery Management Council all have jurisdiction in the Tortugas area. (Refer to Appendix F for each agency's jurisdictional responsibilities.)

- Several regulatory efforts were conducted in conjunction with Tortugas 2000 to ensure comprehensive protection of the unique resources of the Tortugas region.
  - Under the National Marine Sanctuaries Act, the Secretary of Commerce is authorized to designate and manage areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities as National Marine Sanctuaries (NMS).
  - The Florida Keys National Marine Sanctuary and Protection Act designated the Florida Keys National Marine Sanctuary in 1990. The primary goal of this act is to protect the health of the fragile ecosystem of the Florida Keys.
  - Under the Magnuson-Stevens Fishery Conservation and Management Act, the GMFMC developed and adopted a *Generic Amendment for Addressing Essential Fish Habitat Requirements for Fishery Management Plans of the Gulf of Mexico* (also referred to as the Tortugas Amendment), which is consistent with the Tortugas Ecological Reserve and the regulations governing Ecological Reserves within the FKNMS.
  - NMFS issued regulations for federal waters consistent with the no-take status of the Tortugas Ecological Reserve for species managed by the GMFMC, and for highly migratory species such as Atlantic tunas, swordfish, sharks, and Atlantic billfishes. These regulations became effective August 19, 2002.
  - The State of Florida promulgated fishing regulations to prohibit fishing in those portions of Tortugas North that lie within state waters.
  - NPS revised its General Management Plan, developing a "Preferred Alternative to create a Research/Natural Area" (RNA) within the park, which has not yet been accepted or enforced

(Refer to "Current Status/Outcome"). The proposed boundaries and regulations of the RNA are compatible with the Tortugas Ecological Reserve.

Media/Public Outreach

Entities involved in MPA designation processes frequently undertake a variety of public outreach and education activities.

In addition to opportunities for members of the public to provide input into the Tortugas Ecological Reserve design process, the FKNMS conducted extensive public outreach and education during Tortugas 2000. These efforts include the following:

- The Tortugas 2000 Web site (*www.fknms.nos.noaa.gov/tortugas*) was used to disseminate information and was constantly updated throughout the process. The Web site still serves as an important resource for visitors to the sanctuary and Tortugas region.
- Two public forums were held for the working group where scientists and knowledgeable local residents were invited to present information on ecological aspects and socioeconomic uses of the Tortugas region.
- Multiple press releases were issued to the local and national media, and articles were published in newsletters, journals, and magazines as appropriate. (Refer to the Tortugas Web site for links to press releases, newspaper articles, and research updates.)
- Media and press tours were offered to interpret and highlight all steps of the reserve process.
- Editorial Board meetings were held throughout the process.
- A brochure that details the regulations and boundaries for the Tortugas Ecological Reserve, the locations and numbers of mooring buoys, and unique ecological features in the area is under development.
- "Sanctuary staff had numerous formal consultation meetings and briefings with both the South Atlantic and Gulf of Mexico Fishery Management Councils during the development of the Tortugas Ecological Reserve. In addition, Sanctuary staff conducted more than five formal consultation briefings before the State of Florida Fish and Wildlife Conservation Commission and the former State of Florida Marine Fisheries Commission" (Causey, Personal Communication, 2003).

Refer to Appendix B for a listing of additional readings.

References

Note: All World Wide Web addresses listed in this section were accessible on January 31, 2003, and accurately reflected information referenced here and in the text. Site content at these links may change, or the links may become inactive at any time.

Bohnsack, J. 2003. Record of e-mail exchange regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Dr. James Bohnsack, Research Fisheries Biologist, NMFS Southeast Fisheries Science Center, January 14, March 11, and March 20.

Brody, S.D. 1998. "An Evaluation of the Establishment Processes for Marine Protected Areas in the Gulf of Maine: Understanding the Role of Community Involvement and Public Participation." Marine State Planning Office Gulf of Maine Council on the Marine Environment, Augusta, ME. July. Web site: <www.gulfofmaine.org/library/mpas/process_eval_0798.PDF>

Causey, B. 2003. Record of e-mail exchange and interview regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Billy Causey, Superintendent, Florida Keys National Marine Sanctuary, March 10, March 25, April 6, and May 13.

Causey, B. 2002. Unpublished Presentation. "Sustaining Seascapes through the Use of Marine Zoning in the Florida Keys National Marine Sanctuary." March 7 to 8. New York, NY.

Cowie-Haskell, B. D., and J. M. Delaney. 2003. "Integrating Science into the Design of the Tortugas Ecological Reserve." *Marine Technology Society Journal.* Volume 37, Number 1.

Cowie-Haskell, B. 2002. Record of e-mail exchange and interview regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Ben Cowie-Haskell, Operations and Program Coordinator, NOAA/Stellwagen Bank National Marine Sanctuary, March 1.

Cradick, J. 2003. Record of e-mail exchange and interview regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and June Cradick, Florida Keys National Marine Sanctuary, January 9.

Davis, G. 2002. Record of e-mail exchange regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Gary Davis, Channel Islands National Park, November 25.

Delaney, J. 2001. "Marine Reserve Design in Florida's Tortugas." *Earth System Monitor*. Volume 11, Number 3. Page 12. Web site: <www.nodc.noaa.gov/General/NODCPubs/ESM/ESM_MAR2001vol11no3.pdf.>

Delaney, J. 2002-2003. Record of e-mail exchange and interview regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Joanne Delaney, Research Interpreter, Florida Keys National Marine Sanctuary, April 30, May 3, December 31, March 20, April 3, and May 5.

Delaney, J. 2003. "Community Capacity Building in the Designation of the Tortugas Ecological Reserve." *Gulf and Caribbean Research, 14*(2), 163-169.

Engleby, L. 2002. Record of e-mail exchange and interview regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Laura Engleby, April 10.

Federal Register. May 18, 2000 (Volume 65, Number 97). Pages 31633 to 31680.

Federal Register. January 17, 2001 (Volume 66, Number 11). Pages 4267-4316, 4317- 4366, and 4367-4378.

Federal Register. February 7, 2002 (Volume 67, Number 26). Pages 5780-5784.

Gulf of Mexico Fishery Management Council (GMFMC). 2000. "Council Approves Tortugas Marine Reserves." *Gulf Fishery News*. Volume 22, Number 3. Web site: <*www.gulfcouncil.org/newslet/nlet0800.pdf*>

Keller, B. 2002-2003. Record of e-mail exchange and interview regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Dr. Brian Keller, Science Coordinator, Florida Keys National Marine Sanctuary, November 22, January 9, and April 7.

Leeworthy, V.R., and P.C. Wiley. 2000. "Proposed Tortugas 2000 Ecological Reserve Final Socioeconomic Impact Analysis: State and Federal Waters of the Proposed Alternative." National Oceanic and Atmospheric Administration, National Ocean Service, Special Projects Office: Silver Spring, MD. 158pp. Web site: <http://marineeconomics.noaa.gov/reserves/Tortugas.pdf>.

National Oceanic and Atmospheric Administration (NOAA). 2001. "Florida's Tortugas Becomes Nation's Largest Marine Reserve." NOAA 2001-076. July 1. Web site: <www.publicaffairs.noaa.gov/releases2001/jul01/noaa01076.html>.

NOAA. No date. "Socioeconomic Impacts of Marine Reserves." Coastal and Ocean Resource Economics (CORE). (Revised July 3, 2002). Web site: <http://marineeconomics.noaa.gov/reserves/welcome.html>.

National Park Service. 2000. "Final General Management Plan Amendment/Environmental Impact Statement." Dry Tortugas National Park, Monroe County, Florida. 488 pp. Web site: <*http://planning.nps.gov/document/drtofgmpeis.pdf*>.

National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems.* Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, Commission on Geosciences, Environment, and Resources. National Academy Press, Washington, DC.

Salm, R.V., J.R. Clark, and E. Siirila. 2000. *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. Washington, DC: International Union for the Conservation of Nature and Natural Resources. Washington, DC. 371 pages + prologue.

Tortugas 2000 Working Group. 1998. "Meeting Minutes." June 22. Web site: <*www.fknms.nos.noaa.gov/tortugas/pdf/wg62298.pdf*>.

United States Department of Commerce (USDOC). 1996. Florida Keys National Marine Sanctuary: Final Management Plan/Environmental Impact Statement (Volumes I & II).

USDOC. 2000a. “Strategy for Stewardship: Tortugas Ecological Reserve Draft Supplemental Environmental Impact Statement/Draft Supplemental Management Plan.” 227pp. Web site: <*www.fknms.nos.noaa.gov/regs/dseis.pdf*>.

USDOC. 2000b. “Strategy for Stewardship: Tortugas Ecological Reserve Final Supplemental Environmental Impact Statement/Final Supplemental Management Plan.” 310pp. Web site: <*www.fknms.nos.noaa.gov/regs/FinalFSEIS.pdf*>.

Wilmot, F. 2003. Record of e-mail exchange regarding the Tortugas Ecological Reserve. Between Brianne Kessler, Coastal Management Specialist, NOAA Coastal Services Center, and Fiona Wilmot, SAC Coordinator, Florida Keys National Marine Sanctuary, January 6.

Appendix A. Public Hearings, Workshops, and Meetings [Tortugas Ecological Reserve]

Public Scoping Meetings

Date	Location
October 27, 1998	Washington, D.C.
October 29, 1998	Fort Myers, Florida
November 9, 1998	Key West, Florida
November 10, 1998	Marathon, Florida
November 17, 1998	Miami, Florida

Public Hearings on Reserve Proposal

Date	Location
June 12, 2000	Homestead, Florida
June 13, 2000	Naples, Florida
June 14, 2000	St. Petersburg, Florida
June 21, 2000	Marathon, Florida
June 22, 2000	Key West, Florida
July 11, 2000	Washington, D.C.

Public Meeting Dates and Locations

Date	Public Meeting	Location
April 16 – 17, 1998	Working Group	Key West, Florida
June 22, 1998	Working Group	Key West, Florida
December 15, 1998	Sanctuary Advisory Council	Marathon, Florida
February 16, 1999	Sanctuary Advisory Council	Marathon, Florida
February 4 – 5, 1999	Working Group	Key West, Florida
April 20, 1999	Sanctuary Advisory Council	Marathon, Florida
April 22 – 23, 1999	Working Group	Key West, Florida
May 22, 1999	Working Group	Key West, Florida
June 15, 1999	Sanctuary Advisory Council	Marathon, Florida
August 17, 1999	Sanctuary Advisory Council	Marathon, Florida
October 19, 1999	Sanctuary Advisory Council	Marathon, Florida
December 7, 1999	Sanctuary Advisory Council	Key Colony Beach, Florida
February 15, 2000	Sanctuary Advisory Council	Marathon, Florida
April 18, 2000	Sanctuary Advisory Council	Marathon, Florida
June 20, 2000	Sanctuary Advisory Council	Marathon, Florida
August 15, 2000	Sanctuary Advisory Council	Marathon, Florida
December 12, 2000	Sanctuary Advisory Council	Marathon, Florida
February 20, 2001	Sanctuary Advisory Council	Marathon, Florida
April 17, 2001	Sanctuary Advisory Council	Marathon, Florida

Appendix B. Additional Readings [Tortugas Ecological Reserve]

Bohnsack, J.A. 1997. "Consensus Development and the Use of Marine Reserves in the Florida Keys, U.S.A." *Proceedings of the 8th International Coral Reef Symposium.* Volume 2. Pages 1922-30.

Florida Fish and Wildlife Conservation Commission. 2001. "Tortugas 2000 Ecological Reserve Taking of Marine Life Draft Rule." January 26. Web site: *<www.floridaconservation.org/whos-who/reports/jan01/t-2000.html>*.

National Oceanic and Atmospheric Administration (NOAA). 1999. "Tortugas 2000: Protecting Florida's Coral Reefs." NOAA 99-R418. October 29. Web site: *<www.publicaffairs.noaa.gov/releases99/oct99/noaa99r418.html>*.

NOAA. 2000. "Gulf Council Approves the Generic Amendment Addressing the Establishment of Tortugas Marine Reserves." NA07FC0015. July 19. Web site: <www.gulfcouncil.org/prrel/pr2000-19.htm.>

Ocean Conservancy. 2001. "No-Take Zone in Tortugas Provides Benefits to Anglers, Economy and Marine Ecology: Tortugas Proposal Provides Appropriate Balance between Consumption and Conservation." July 11. Web site: *<www.oceanconservancy.org/dynamic/press/releases/archive.htm?id=010711a>.*

Appendix C. Advisory Group and Panel Members [Tortugas Ecological Reserve]

Sanctuary Advisory Council Members (1998-2001)

Name	Representation
Joan Appelt	Boating Industry
Mike Collins	Charter Fishing – Flats/ Guide
Andy Griffiths	Charter Fishing – Sport Fishing
Don DeMaria	Commercial Fishing – Marine/Tropical
Tony Iarocci	Commercial Fishing – Shell/Scale
Debra Harrison	Conservation and Environment
Dave Holtz	Conservation and Environment
Rob Blesser	Diving
Victoria Weeks	Diving
Irene Hooper	Education/Outreach
Robert DeHaven	General Public (Lower Keys)
Fran Decker	General Public (Middle Keys)
Karen Lee	General Public (Upper Keys)
Jack London	Local Elected Official
Thomas N. Davidson	Recreational Fishing
Dr. Erich Mueller	Research/Monitoring
David Paul Horan	Submerged Cultural Resources
Sheri Appellis	Tourism (Lower Keys)
Ginna Thomas Drake	Tourism (Upper Keys)

Appendix C. Advisory Group Members (continued)

Tortugas 2000 Working Group Members (1998-2001)

Name	Affiliation
Peter Gladding	Commercial fishing/handline representative
Richard Diaz	Commercial fishing/lobster representative
Bruce Buckson	Division of Law Enforcement, Florida Department of Environmental Protection
Gene Proulx	Enforcement, National Marine Fisheries Service
Ed Conklin	Florida Department of Environmental Protection
Billy Causey	Florida Keys National Marine Sanctuary
Ben Cowie-Haskell	Florida Keys National Marine Sanctuary
Russell Nelson	Florida Marine Fisheries Commission
Dr. Felicia Coleman	Gulf of Mexico Fishery Management Council, Florida State University
Dr. Jim Bohnsack	National Marine Fisheries Service
Dr. Joe Kimmel	National Marine Fisheries Service
Dr. Robert Brock	National Park Service
Alex Stone	Recreational diver representative
John Brownlee	Recreational fishing representative
Andy Griffiths	Sanctuary Advisory Council: charter boat representative
Don DeMaria	Sanctuary Advisory Council: commercial fishing
Tony Iarocci	Sanctuary Advisory Council: commercial fishing
Debra Harrison	Sanctuary Advisory Council: conservation
Dave Holtz	Sanctuary Advisory Council: conservation
Don Kincaid	Sanctuary Advisory Council: diving representative
Fran Decker	Sanctuary Advisory Council: general public
Dr. Erich Mueller	Sanctuary Advisory Council: research community
Peter Moffitt	South Atlantic Fishery Management Council
BMC Bob Thomas	United States Coast Guard
Dr. Nick Funicelli	United States Geological Survey

Appendix C. Advisory Group Members (continued)

Ecological Forum Panel Participants

Panel	Name	Affiliation
Benthic Characterization	Dr. Michael Crosby	National Oceanic and Atmospheric Administration
Benthic Characterization	Dr. Steven Miller	National Undersea Research Center
Benthic Characterization	Walt Jaap	Florida Marine Research Institute
Benthic Characterization	Jenny Wheaton	Florida Marine Research Institute
Fish Community Panel	Dr. Jim Bohnsack	National Marine Fisheries Service
Fish Community Panel	Dr. Jerry Ault	University of Miami
Fish Community Panel	Don DeMaria (For Ann Marie Eklund)	Florida State University
Fish Community Panel	Laddie Akins	Reef Environmental Education Foundation (R.E.E.F.)
Lobster, Seagrass and Megafauna	Dr. Gary Davis	Channel Islands National Park
Lobster, Seagrass and Megafauna	Dr. Rod Bertelsen	Florida Marine Research Institute
Lobster, Seagrass and Megafauna	Dr. Jim Fourqurean	Florida International University
Lobster, Seagrass and Megafauna	Ben Cowie-Haskell (For Skip Snow)	Everglades National Park
Local Knowledge	Karen DeMaria	Anecdotal Reports by Residents - Changes in the Florida Keys Marine Ecosystem
Local Knowledge	Peter Gladding	Commercial handliner
Local Knowledge	Don DeMaria	Commercial spearfisherman
Local Knowledge	Wayne Hoffman	National Audubon Society, Key West
Physical Characterization	Dr. Tom Lee	University of Miami – Current regime
Physical Characterization	Dr. Joan Browder	National Marine Fisheries Service
Physical Characterization	Dr. Ron Jones	Florida International University – Water quality
Physical Characterization	Dave Mallinson	University of South Florida

Socioeconomic Forum Panel Participants

Panel	Name	Affiliation
Commercial Fishing	Peter Gladding	Commercial handliner
Commercial Fishing	Tony Lanassa	Commercial lobsterman
Commercial Fishing	Armando Gonzalez	Commercial handliner
Commercial Fishing	Richard Diaz	Commercial lobsterman and king mackerel fishermen (multi-fishery)
Overview of Uses	Reed Detring	Chief Ranger, Everglades National Park
Overview of Uses	Dr. Bob Leeworthy	NOAA economist
Recreational Fishing and Diving	Bob Demauro	Charter spearfisherman
Recreational Fishing and Diving	Rick Pitts	Charter boat fishing
Recreational Fishing and Diving	Vicki Weeks	Recreational divers
Socioeconomic Considerations	Dr. Daniel Suman	University of Miami
Socioeconomic Considerations	Alex Stone	ReefKeeper International
Socioeconomic Considerations	Tom Murray	Consulting economist

Appendix D. Reserve Criteria and Objectives [Tortugas Ecological Reserve]

Criteria	Objective
Biodiversity and habitat	Choose an area that contains the greatest level of biological diversity and widest range of contiguous habitats.
Fisheries sustainability	Choose an area that provides the greatest benefit in protecting and enhancing commercially and recreationally important fish species.
* Spawning areas	Choose an area that includes significant fish spawning aggregation sites.
* Full life cycles	Choose an area that encompasses all the habitats required to support the full life cycle of commercially and recreationally important fish.
Sufficient size	Choose a boundary that encompasses an area large enough to meet the criteria listed above and to achieve the potential benefits and goals of an ecological reserve.
Allowable activities	Choose to allow only activities in the ecological reserve that are compatible with achieving its goals.
Socioeconomic impacts	Choose an area and craft recommendations that minimize adverse socioeconomic impacts on established users of resources in the area.
Reference area/ monitoring	Choose an area that serves as a reference or control area to facilitate the monitoring of anthropogenic impacts and to evaluate the consequences of establishing the ecological reserve.
Enforcement/ compliance	Choose a boundary and craft recommendations that facilitate enforcement and encourage compliance.

Appendix E. Reserve Criteria Profiles [Tortugas Ecological Reserve]

Criteria Weighting Profile (Less Protective)	Criteria Weighting Profile (Mid-Range)	Criteria Weighting Profile (More Protective)
Fisheries Sustainability 25%	Biodiversity and Habitat 27%	Sufficient Size 50%
Socioeconomic Impacts 25%	Fisheries Sustainability 26%	Fisheries Sustainability 20%
Enforcement and Compliance 20%	Enforcement and Compliance 17%	Biodiversity and Habitat 15%
Biodiversity and Habitat 15%	Sufficient Size 16%	Reference Area and Monitoring 5%
Reference Area and Monitoring 10%	Socioeconomic Impacts 9%	Enforcement and Compliance 5%
Sufficient Size 5%	Reference Area and Monitoring 5%	Socioeconomic Impacts 5%
Total 100%	Total 100%	Total 100%

Table slightly modified from USDOC 2000b.

Appendix F. Resource Management Agencies with Jurisdictions in the Tortugas Region
[Tortugas Ecological Reserve]

Agency		Responsibility
Department of Commerce/ NOAA	National Ocean Service/ Florida Keys National Marine Sanctuary	Managing and protecting natural and cultural resources within the sanctuary
Department of Commerce/ NOAA	National Marine Fisheries Service	Approving and implementing Gulf of Mexico Fishery Management Council's fishery management plans for fishery resources in the exclusive economic zone of the Gulf of Mexico, for preparing and implementing fishery management plans for Atlantic highly migratory species, and for protecting marine mammals and threatened and endangered species
Department of Commerce/ NOAA	Gulf of Mexico Fishery Management Council	Preparing fishery management plans (including joint management plans with the South Atlantic Fishery Management Council) for fishery resources in the exclusive economic zone of the Gulf of Mexico, and for recommending fishery regulations for the sanctuary
Department of Commerce/ NOAA	South Atlantic Fishery Management Council	Preparing fishery management plans (specifically joint-management plans with the Gulf Council) for lobster and mackerel, both of which were impacted by the Tortugas Ecological Reserve
Department of Interior/ National Park Service	Dry Tortugas National Park	Protecting and interpreting the Dry Tortugas National Park (DRTO), a subtropical terrestrial and marine ecosystem with an intact coral reef ecosystem
State of Florida	Department of Environmental Protection	Managing the sanctuary's resources as a co-trustee with NOAA
State of Florida	Fish and Wildlife Conservation Commission	Managing fish and wildlife resources within state waters
State of Florida	Governor and Cabinet	Managing all public lands of the State of Florida, including sovereign submerged lands owned by Florida citizens

Table modified from USDOC 2000b.

Appendix G. Definitions of Marine Zones Used within the FKNMS [Tortugas Ecological Reserve]

Zone Type	Definitions
Existing Management Areas	This zone identifies areas that are managed by other agencies where restrictions already exist. These zones delineate the existing jurisdictional authority of other agencies (i.e. State parks, aquatic preserves, sanctuaries, and other restricted areas). Management of these areas within the sanctuary may require additional regulations or restrictions to adequately protect resources. Any additional management measures will be developed and implemented in coordination with the agency having jurisdictional authority. Their function is not to establish another layer of bureaucracy, but to recognize established management areas and, at a minimum, to complement the existing management programs, ensuring cooperation and coordination with other agencies.
Wildlife Management Areas	These areas are established to minimize disturbance to especially sensitive wildlife populations and their habitats to ensure protection and preservation consistent with the sanctuary designation and other applicable laws governing the protection and preservation of wildlife resources in the sanctuary. Such areas include bird nesting, resting, or feeding areas and turtle nesting beaches. Regulations governing access are designed to protect endangered or threatened species or their habitats, while providing opportunities for public use. Access restrictions include no-access buffer zones, no-motor zones, idle speed only/no wake zones, and closed zones.
Ecological Reserves	These areas are designed to encompass large, contiguous diverse habitats. They are intended to provide natural spawning, nursery, and permanent residence areas for the replenishment and genetic protection of marine life and to protect and preserve all habitats and species particularly those not protected by fishery management regulations. These reserves are intended to protect areas that represent the full range of diversity of resources and habitats found throughout the sanctuary. These objectives are met by limiting consumptive activities, while continuing to allow activities that are compatible with resource protection, providing the opportunity for these areas to evolve in a natural state, with a minimum of human influence. These zones protect a limited number of areas that provide important habitat for sustaining natural resources such as fish and invertebrates.
Sanctuary Preservation Areas	These areas focus on the protection of shallow, heavily used reefs where conflicts occur between user groups, and where concentrated visitor activity leads to resource degradation. They are designed to enhance the reproductive capabilities of renewable resources, protect areas critical for sustaining and protecting important marine species, and reduce user conflicts in high-use areas. A prohibition of consumptive activities exists within these areas. They have been chosen based on the status of important habitat, the ability of a particular area to sustain and protect the habitat, the level of visitor use, and the degree of conflict between consumptive and nonconsumptive users. The actual size and location of these zones was determined by examination of user patterns, aerial photography, and groundtruthing of specific habitats.
Special-Use Areas	These zones are used to set aside areas for scientific research and educational purposes, restoration, monitoring, or to establish areas that confine or restrict activities such as commercial personal watercraft operations and establish live-aboard mooring fields. These areas minimize impacts on sensitive habitats and reduce user conflicts. Special management programs (e.g., monitoring, research, special-use permits and restoration) are conducted without impediment in these areas. They have been used to set aside areas for specific uses such as long-term research and monitoring.

Source: FKNMS Web site (*www.fknms.nos.noaa.gov/regs/zoning.html*); USDOC 1996

Findings

The case study phase of the "lessons learned" project was conducted to document a variety of U.S. MPA processes. The purpose of this report is not to suggest that following these approaches will always lead to a successfully established and managed MPA, but rather just to summarize the events, issues, and participants of each process. These case studies are intended to contribute to future MPA establishment efforts by providing a factual foundation about the structure and events of recent MPA processes to interested parties. The following sections recount some of the challenges encountered while assembling the case studies, and outline some of the commonalities found across the processes.

Challenges in documenting the processes

MPA establishment processes are the series of actions taken to establish an MPA site or to implement zoning within an existing MPA site. These processes have many variables and are influenced by elements identified in the case studies (i.e., stakeholders, objectives, media/public outreach, etc.) As a result, MPA processes are complex in nature, and accurately documenting each case study proved a challenging task.

In addition to their inherent complexity, some of the documented processes were imbedded within other management regimes, such as fishery management plans. Identifying an MPA process within this larger process was a challenge in itself. It was difficult to tease out the actions specifically related to the MPA process from the larger context.

In order to depict an MPA process accurately and completely, each action that contributed to that process has to be identified. However, in a majority of the case studies these actions are not well documented. In many cases, the literature contained current information about an MPA site, highlighting its objectives, location, and specific restrictions, but did not detail the process that led to its establishment. For this reason, some process elements, such as objectives, stakeholders, and boundaries, were easy to characterize, but gaps remained within the timeline of events. This lack of detailed information about the process made it challenging to create the entire picture of what happened as an MPA site went from nomination to designation.

Another challenge to overcome was conflicting or contradictory information. For some of the case studies, detailed information was available about the process, but different sources had contradicting facts and statistics. In some cases published information seemed to capture the process accurately, but the review process revealed inaccuracies.

The challenge of clarifying conflicting information, as well as filling in gaps in information, was complicated by the fact that people remember processes differently. In some cases this may be a result of time, while in other cases this may be a matter of perspective. Individuals' different memories of the same process emphasized the need to consult with multiple participants from each site in an attempt to clarify information.

Commonalities across the case studies

Although each MPA process must be tailored to local issues, stakeholders, and environmental conditions, several common elements were found across the case studies documented. Five commonalities are discussed below:

◊ MPA establishment processes take time: All of the documented case studies were multiple-year processes. Clearly, MPA establishment processes take considerable time to complete and, as a result, require careful planning and realistic time frames.

◊ Stakeholder involvement is essential: MPA literature continually emphasizes the need for stakeholder involvement in MPA processes, and while each case study incorporated different mechanisms for stakeholder participation, multiple players representing a wide-range of interests were involved at some level throughout each of the processes.

◊ Conflicts exist over what should and should not be allowed within MPAs: In all the case studies, there was conflict over what should be allowed or not allowed within that MPA. This finding is at the core of why MPAs are so hotly debated, demonstrating that stakeholders have different views as to what restrictions should be established, and as to what extent these restrictions will inhibit certain activities. This type of conflict can be expected in an MPA process and further emphasizes the importance of having a structured process in order to work through these types of conflicts.

◊ Each process utilized similar sources for media/public outreach: Many of the same sources for media/public outreach were utilized across the case studies. Each process included participatory mechanisms such as public scoping meetings, forums, or workshops to receive public comment throughout the process. Newspaper articles and press releases were used to distribute information to the public for a variety of purposes, including publicizing upcoming public meetings, requesting public feedback on a proposal, or educating the public about implementation of new regulations. Web sites also played a role in each case study, whether they were used to disseminate information or to receive feedback from the public.

◊ History and political environment are important influencing factors: A final commonality, and one that provides an important lesson learned from these case studies, is that history and political environment are key influencing factors on any MPA process. Unlike a recipe, where specific ingredients lead to a specific result, different MPA processes may contain many of the same elements but lead to a variety of conclusions depending on how history and political environment influence the process.

References

References listed below are relevant to all case studies. References specific to a particular case study are listed with that case study.

Brody, S.D. 1998. *An Evaluation of the Establishment Processes for Marine Protected Areas in the Gulf of Maine: Understanding the Role of Community Involvement and Public Participation.* (July). Marine State Planning Office, Gulf of Maine Council on the Marine Environment. <*www.gulfofmaine.org/library/mpas/process_eval_0798.PDF*>

Kelleher, G. 1999. *Guidelines for Marine Protected Areas*. World Commission on Protected Areas, International Union for the Conservation of Nature and Natural Resources (IUCN). Gland, Switzerland: IUCN.

National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center. 2002. *Marine Protected Areas Needs Assessment Final Report.* In conjunction with the National Marine Protected Areas Center. Prepared by H. Recksiek and G. Hinchcliff. Charleston, SC: NOAA Coastal Services Center. <*www.csc.noaa.gov/cms/cls/MPANAFINAL.pdf*>

National Research Council. 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems.* Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the United States, Ocean Studies Board, Commission on Geosciences, Environment, and Resources. Washington, DC: National Academy Press.

Recksiek, H., and G. Hinchcliff. 2002. *See* NOAA Coastal Services Center. 2002.

Salm, R.V., J.R. Clark, and E. Siirila. 2000. *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. Washington, DC: International Union for the Conservation of Nature and Natural Resources.

MPA-Related Conferences and Meetings Attended

California and the Worlds Oceans Conference – Santa Barbara, October 2002

Investigation of MPA Process – San Juan Islands, Washington State, August 2002

APPENDIX A

Individuals Serving as Internal Reviewers

Kimberly Cohen	Donna McCaskill
Gerald Esch	Greg Moretti
Mark Finkbeiner	Geno Olmi
Tom Fish	Jeff Payne
Cindy Fowler	Heidi Recksiek
Hansje Gold	Nicholas Schmidt
Hanna Goss	Paul Scholz
Ginger Hinchcliff	Hamilton Smillie
Darcee Killpack	Dave Stein
Jan Kucklick	Bill Stevenson
Tony LaVoi	Megan Treml
Lisc Lott	Pace Wilber

APPENDIX B

Individuals Serving as External Reviewers

Carl N. Schuster Horseshoe Crab Reserve

David Dow, National Marine Fisheries Service (NMFS) Northeast Regional Office

Tom Meyer, NMFS, Office of Intergovernmental and Recreational Fisheries

Paul Perra, NMFS, Office of Intergovernmental and Recreational Fisheries

Carrie Selberg, Horseshoe Crab Faculty Mentor Program Coordinator, Atlantic States Marine Fisheries Commission

Channel Islands Marine Reserves

Satie Airame, Science Advisor, Channel Islands National Marine Sanctuary

Gary Davis, Visiting Chief Scientist, Ocean Programs, U.S. National Park Service

Sean Hastings, Policy Coordinator, Channel Islands National Marine Sanctuary

Scott Hill, Associate Regional Administrator, NMFS Southwest Regional Office

Tom Meyer, NMFS, Office of Intergovernmental and Recreational Fisheries

Gulf of Mexico Grouper Closures

Steve Atran, Population Dynamics Statistician/Network Administrator, Gulf of Mexico Fishery Management Council

Michael Barnette, NMFS Southeast Regional Office

Jim Bohnsack, NMFS, Miami Fisheries Science Center

Felicia Coleman, Florida State University (FSU)/NMFS Institute for Fishery Resource Ecology

Chris Koenig, FSU/NMFS Institute for Fishery Resource Ecology

San Juan County Bottomfish Recovery Zones

Yvonne deReynier, NMFS Northwest Regional Office

Dave Fluharty, University of Washington

Kari Koski, Soundwatch Boater Education Program, Friday Harbor Whale Museum

Mary Lou Mills, MPA Coordinator, Washington Department of Fish and Wildlife

Kevin Ranker, Pacific Northwest Regional Coordinator, Surfrider Foundation/San Juan County Marine Resources Committee

Jim Slocomb, Chair, San Juan County Marine Resources Committee

Tortugas Ecological Reserve

Jim Bohnsack, NMFS, Miami Fisheries Science Center

Billy Causey, Superintendent, Florida Keys National Marine Sanctuary

Ben Cowie-Haskell, Operations and Program Coordinator (current position), Stellwagen Bank National Marine Sanctuary

Joanne Delaney, Operations and Program Coordinator, Florida Keys National Marine Sanctuary

Brian Keller, Science Coordinator, Florida Keys National Marine Sanctuary