15536

Final Environmental Impact Statement Proposed Looe Key National Marine Sanctuary

October 1980

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Coastal Zone Management

U.S. National Oceanic and Atmospheric Administration.
Office of Coastal Zone Management.

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

C.2.
15536

U.S. National Oceanic Atmospheric Administration.
Office of Coastal Zone Management.
QH91.75 .F56 1980
7440447
DEC 4 1996

FINAL ENVIRONMENTAL IMPACT STATEMENT

PREPARED ON THE PROPOSED

LOOE KEY NATIONAL MARINE SANCTUARY

COASTAL ZONE
INFORMATION CENTER

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413

November 1980

U. S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Coastal Zone Management

Property of CSC Library

TABLE OF CONTENTS

COVER i

NOTE TO READER ii

INTRODUCTION AND SUMMARY 1

CHAPTER ONE: PURPOSE AND NEED FOR ACTION 21

CHAPTER TWO: ALTERNATIVES INCLUDING THE PREFERRED ALTERNATIVE 23
- I. Introduction 23
- II. No Action Alternative: Rely on the Legal Status Quo
- III. Preferred Alternative 25
  - A. Goals and Objectives 25
  - B. Management 26
  - C. Preferred Boundary Alternative 29
  - D. Preferred Regulatory Alternatives 30
- IV. Regulatory Alternatives Eliminated From Detailed Study 36
- V. Summary of Analysis of Alternatives 38

CHAPTER THREE: AFFECTED ENVIRONMENT 45
- I. Marine Environment 45
- II. Socio-Economic Setting 59
- III. Historic and Cultural Resources 67
- IV. State and Other Federal Resource Management Provisions in Adjacent and Nearby Areas 69
- V. Legal Status Quo 73

CHAPTER FOUR: ENVIRONMENTAL CONSEQUENCES 93
- I. Introduction 93
- II. Boundary Alternatives 94
- III. Environmental Consequences of the Proposed Regulations 99
  - A. Coral Collecting 99
  - B. Commercial Fishing 103
  - C. Spearfishing 119
  - D. Historical and Cultural Resources 121
  - E. Discharges 123
  - F. Anchoring 125

LIST OF PREPARERS 129

DISTRIBUTION LIST 131

BIBLIOGRAPHY 135

APPENDIX A: DRAFT DESIGNATION DOCUMENT AND DRAFT REGULATIONS

APPENDIX B: SITE ANALYSIS RESEARCH METHODS

APPENDIX C: LOOE KEY ONSITE SURVEY

APPENDIX D: FLORDIA STATE LAWS AND EXISTING STATE AND FEDERAL MARINE RESERVES AND PARKS

APPENDIX E: COMMENTS ON THE DEIS AND NOAA RESPONSES

LIST OF FIGURES

FIGURE 1: LOCATION OF LOOE KEY	2
FIGURE 2: LOOE KEY BIOLOGICAL ZONES	6
FIGURE 3: BOUNDARY ALTERNATIVES	16
FIGURE 4: BOUNDARY ALTERNATIVES	27
FIGURE 5: LOOE KEY BIOLOGICAL ZONES	49
FIGURE 6: HABITAT AREA OF PARTICULAR CONCERN	82
FIGURE 7: BOUNDARY ALTERNATIVES	95
FIGURE 8: LOOE KEY CORE TRAPEZOID AREA	110

LIST OF TABLES

TABLE 1: CORAL COLLECTING/ WIRE FISH TRAPPING ANALYSES 39

TABLE 2: TROPICAL SPECIMEN COLLECTING/ SPEARFISHING ANALYSES 40

TABLE 3: LOBSTER TRAPPING ANALYSIS 41

TABLE 4: HISTORIC AND CULTURAL RESOURCES/ DISCHARGING ANALYSES 42

TABLE 5: ANCHORING ANALYSIS 43

TABLE 6: SUMMARY INCOME AND BUSINESS VOLUME 65

DESIGNATION: Final Environmental Impact Statement

TITLE: Proposed Looe Key Marine Sanctuary

ABSTRACT: The National Oceanic and Atmospheric Administration (NOAA) proposed the designation of the waters at Looe Key, a submerged section of the Florida Reef Tract, located 12.4 km (6.7 nautical miles) southwest of Big Pine Key in the Florida Keys, as a marine sanctuary. The proposed sanctuary consists of 5 square nautical miles of high sea waters under Federal jurisdiction.

The designation of a marine sanctuary would establish a program of comprehensive management, including research, assessment, monitoring, public education, long-term planning, coordination and regulation for this section of the Florida reef tract. The preferred alternative provides sanctuary management goals and objectives which will serve as a framework around which sanctuary activities will be structured.

Specific regulations are proposed which would apply only within the sanctuary boundaries. The proposed regulations allow the following activities only under NOAA permit for scientific and educational purposes: possession and collecting of coral, disturbance of historical and cultural resources and marine specimen collecting. The proposal prohibits: spearfishing and possession of spearfishing gear; the use of lobster traps within a core area on the Fore Reef; use of wire fish traps; anchoring on coral within the core area; the discharge of substances except cooling waters from vessels, fish or fish parts and chumming materials and discharges from marine sanitation devices.

Alternatives to the proposed action include the no action or status quo alternative, modification of the sanctuary boundaries, and more and less stringent regulations.

LEAD AGENCY: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Coastal Zone Management

CONTACT: Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office
OCZM
3300 Whitehaven Street, N.W.
Washington, D. C. 20235
(202)634-4236

INTRODUCTION AND SUMMARY

I. BACKGROUND

The Marine Protection, Research and Sanctuaries Act of 1972 (16 U.S.C. 1431-1434) authorizes the Secretary of Commerce, after consultation with appropriate Federal agencies, and the affected State, and with Presidential approval, to designate ocean areas having distinctive conservation, recreational, ecological, or aesthetic values as marine sanctuaries. In 1977, the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce sent out a nationwide letter asking for recommendations of sites appropriate for consideration as marine sanctuaries.

The response to this request included a recommendation by the Florida Keys Citizens Coalition (an association of approximately 21 public interest groups) for the designation of Looe Key as a marine sanctuary "to establish a recreational and aesthetic area managed to protect the coral and coral reef ecosystem" (Nomination letter of November 23, 1977) (see Figure 1 for location of Looe Key).

As part of the process for scoping out issues early in the designation process, NOAA held a public workshop on the proposal at Big Pine Key in January 1978. At the workshop the Lower Keys Chapter of the Organized Fishermen of Florida (OFF) and many individual fishermen, testified that they were opposed to any designation of Looe Key as a marine sanctuary. OFF members were opposed to: (1) any regulation of fishing activities; (2) any additional presence of the Federal government in the area; and (3) the size of the proposed sanctuary which was rumored to be 20 sq nm.* In addition to these concerns OFF members expressed belief that enough of the Florida Keys and adjacent water areas were in some form of protective status. Other residents opposed a sanctuary on the belief that a sanctuary would only attract more tourists to the area which, in turn, would further deplete and damage renewable resources.

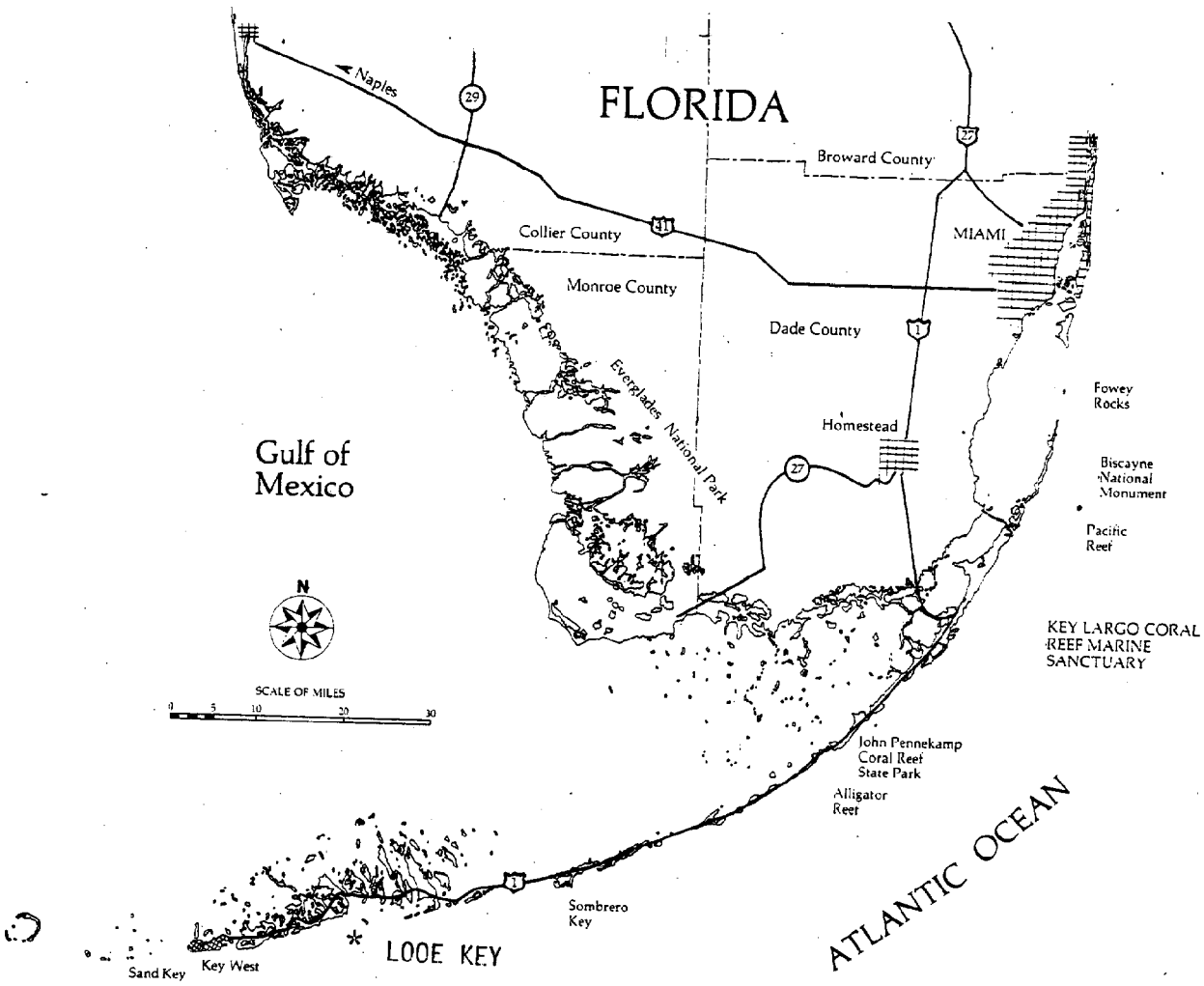
On the other hand, a number of individuals and local groups spoke in favor of some type of a sanctuary at Looe Key. The Florida Audubon Society; Big Pine Key Citizens Association; the Isaak Walton League, Florida Chapter; the Florida Keys Citizens' Coalition; and the Upper Keys Citizens' Association testified on behalf of the proposal. The Newfound Harbor Marine Institute

---

* Rumors circulated in the Big Pine Key area that NOAA was proposing a sanctuary consisting of approximately 20 sq nm. However, at that time NOAA was merely investigating the feasibility of designating the sanctuary and did not have any proposal that discussed size.

FIGURE 1

LOCATION OF LOOE KEY



spoke in support of a core area where only non-consumptive uses would be permitted. The majority of those testifying spoke of the importance of the reef, although there was disagreement as to the best way of protecting its unique and significant value for future generations. Most emphasized that effective coral protection depended upon the onsite presence of enforcement personnel.

Following the workshop, the South Atlantic and Gulf of Mexico Regional Fishery Management Councils requested that NOAA delay further steps until the Councils' coral reef study was completed. NOAA agreed to the delay. Upon later recommendations of the Councils, NOAA resumed the evaluation of Looe Key as a Marine Sanctuary candidate. To determine the desirability and feasibility of proceeding with the designation, NOAA began preparation of a Draft Environmental Impact Statement (DEIS) on October 1, 1979.

In October 1979, NOAA printed a Notice of Intent to Prepare an Environmental Impact Statement in the Federal Register and held a scoping meeting on the proposal. NOAA gathered and analyzed information and consulted with other Federal agencies, State agencies, the Gulf of Mexico (GMFMC) and South Atlantic Regional Fishery Management Councils (SAFMC), and local interest groups.

In May 1980, NOAA issued proposed regulations and the DEIS for public review. NOAA held public hearings on the DEIS in Miami, June 17, and in Key West and Big Pine Key, June 18. The comment period on the DEIS ended July 15 and the comment period on the regulations, July 21. Reaction to the proposed sanctuary has been mixed. In general many local residents, mostly fishermen, opposed the designation; while regional, state, and national civic and environmental organizations, including the State of Florida, support the designation.

At the public hearings, the majority of those testifying spoke against the proposal. At all three hearings a number of individuals and environmental and civic organizations, such as the Marine Wilderness Society, Tropical Audubon, the Sierra Club, and National Audubon supported the designation. Members of OFF and a number of individual fishermen and private citizens spoke in opposition. At the Big Pine Key hearing members of OFF presented NOAA with a petition of over 500 names opposing the proposal. Other organizations such as Newfound Harbor Marine Institute, the Lower Keys Chamber of Commerce, and the Big Pine Key Civic Association supported a smaller (1 sq nm) sanctuary (for a detailed summary of the public hearings see Appendix E).

Over 100 written comments were received in response to the DEIS. In contrast to the reaction at the public hearings, the written comments were overwhelmingly in support of the NOAA proposal. Approximately 82 comments were received representing membership in national, regional and local conservation organizations, civic groups, recreational diving associations, boating groups, and including Federal agencies and individuals. These commentors either supported the proposal, or suggested an enlarged boundary and/or more restrictive regulations. Approximately 10 written comments were received that advocated a smaller area or opposed the proposal (see Appendix E for a compilation of letters and NOAA responses).

The Final Environmental Impact Statement (FEIS) summarizes and responds to all of the comments received through July 21, 1980. It proposes the designation of a marine sanctuary in high seas waters at Looe Key and describes the proposed regulations for this sanctuary. The boundary and regulations are summarized in this chapter and discussed more fully in Chapters Two and Four and are presented in full in Appendix A. The major changes to the proposal from the preferred alternative in the DEIS are as follows:

1. The Designation Document (Appendix A) has been changed to acknowledge the importance of Looe Key to commercial fishing in Article 3. Characteristics of the Area That Give It Particular Value.

2. The description of the sanctuary boundary has been inserted in Article 2. of the Designation Document (Appendix A).

3. The regulation on anchoring has been changed to prohibit anchoring on coral within the Fore Reef area as defined by the Loran "c" points 1, 2, 3, 4 of Appendix A (see Chapter Four, 7. Alternatives Regulating Anchoring). Sand anchoring is encouraged, but not required, elsewhere within the sanctuary.

4. The regulation on tropical specimen collecting has been changed to prohibit collecting within the sanctuary except with a permit for scientific and educational purposes (see Chapter Four, 3. Regulations Affecting Tropical Specimen Collecting and Generic Response #4, Appendix E).

If NOAA decides to proceed with the designation, the Secretary of Commerce must receive Presidential approval and final regulations for the sanctuary will be issued.

II. NATIONAL MARINE SANCTUARY PROGRAM (NMSP) PURPOSES

The National Marine Sanctuary Program (NMSP) focuses on comprehensive management of marine ecosystems for the long-term protection of natural resources and the enjoyment and benefit of society.

The following program purposes present a framework for the national sanctuary system:

- To provide long-term protection to special marine areas with unique conservation, recreational, ecological or aesthetic values;

- To provide a focus for comprehensive management of these areas;

- To enhance public awareness of special marine areas and emphasize wise use of these natural resources;

- To encourage research and exchange of information about marine ecosystems.

III. THE RESOURCE

° General Biology of Coral Reefs

The reefs off eastern Florida begin at Fawrey Rock near Miami and extend all the way to the Dry Tortugas. There is little coral growth along the Florida west coast due to the limiting nature of the colder water and sediment content of the Gulf of Mexico. Looe Key Reef is a submerged section of this east coast Florida reef tract located 6.7 nautical miles southwest of Big Pine Key in the Lower Florida Keys. The proposed sanctuary area includes a Fore Reef, Reef Flat, Patch Reef, Deep Reef and Deep Ridge.

Coral reefs such as Looe Key are among the most biologically productive of all natural communities. Looe Key supports a wide variety of life: fish, sponges, molluscs, crabs, octopi, starfish, shrimp, feather duster worms and octocorals. The octocorals--fanlike, fernlike--are among the most decorative creatures on the reefs.

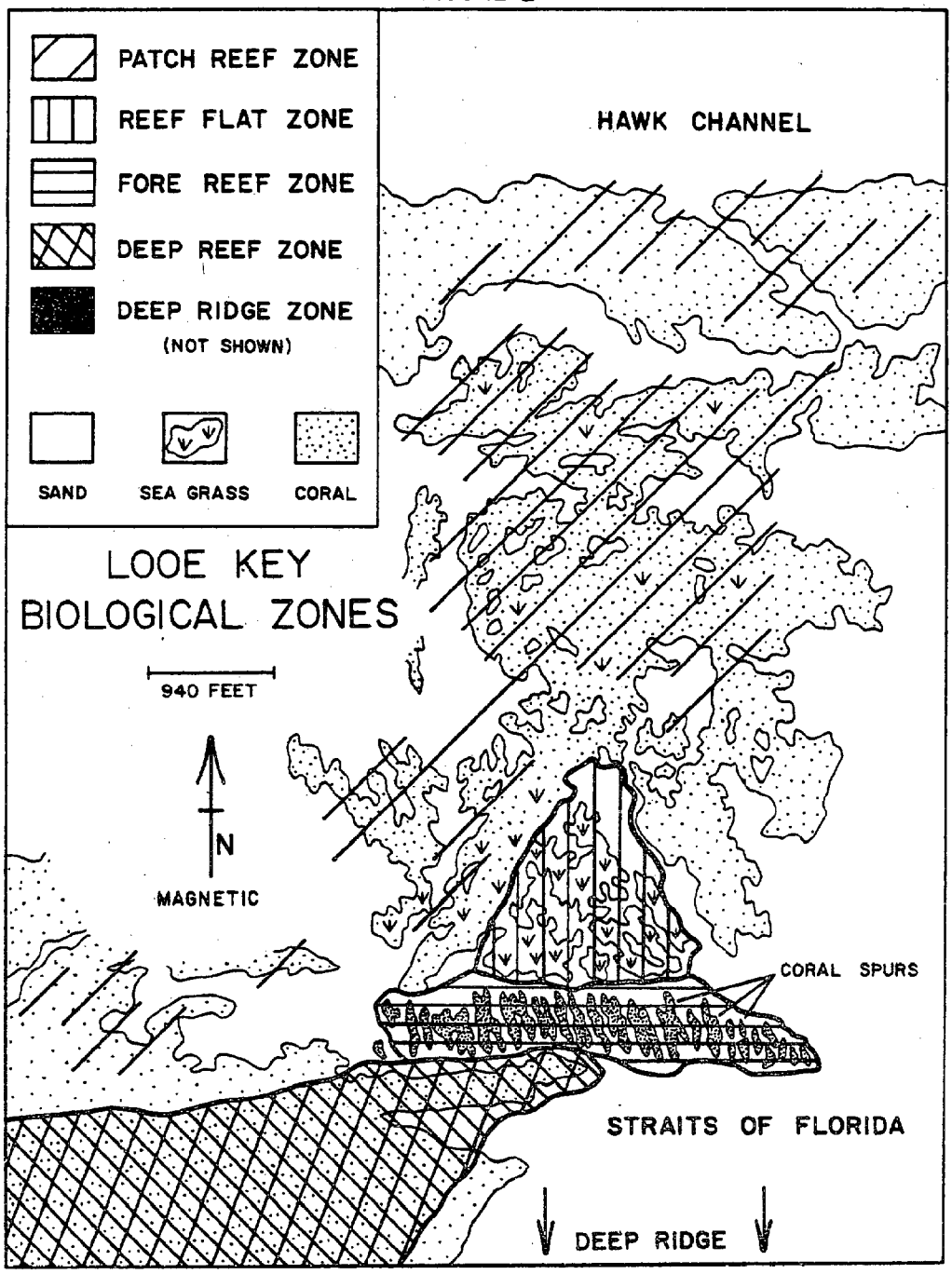
The rich colors of the reefal organisms also provide an attraction to swimmers. Looe Key, because of its wide range in depth, is accessible to both the beginning swimmer and the experienced diver. In addition to contributing to aesthetic experiences, colors are used by organisms for identification, camouflage, and signals, and to establish territoriality and attract mates. The solid substrate formed by the corals at Looe Key provides for this tremendous diversity of life, all directly or indirectly dependent upon the corals and coral rock for shelter, food or for a place to attach and grow. On the seaward slope, the reef flat and on the sandy bottom around the reef, one finds animal communities or assemblages different from those on the reef itself. In the soft bottom areas, grasses and algae cover the sediment and they in turn support still different communities.

Many fish and invertebrates leave the safety of the Fore Reef at night to search the nearby Reef Flat and Patch Reefs for prey. These areas are also used as nursery grounds for juvenile fish. On the other hand, sessile reef species often feed on planktonic stages of animals found away from the Fore Reef in other habitats. The Reef Flat zone consists of rock and rubble areas which serve as excellent habitat for small invertebrates. The Fore Reef and surrounding communities form a complex and intricate ecosystem which owes its evolution primarily to the corals' unusual ability to extract dissolved salts from the ocean and convert them into the limestone reef formations.

° General Ecological Relationships

Reefs depend upon two basic factors: solar energy and chemical nutrients. Sunlight and nutrients in combination are utilized by plants in the process called primary productivity. The majority of the plants at Looe Key engaged in primary productivity are algae, microscopic in size and sheltered within the tissues of soft and hard corals, sea anemones and sponges. This is a form of symbiosis (mutual aid) in which algae produce the food and in return receive shelter and sustenance from the corals.

FIGURE 2


PATCH REEF ZONE
REEF FLAT ZONE
FORE REEF ZONE
DEEP REEF ZONE
DEEP RIDGE ZONE
(NOT SHOWN)
SAND
SEA GRASS
CORAL
HAWK CHANNEL
LOOE KEY
BIOLOGICAL ZONES
940 FEET
N
MAGNETIC
CORAL SPURS
STRAITS OF FLORIDA
DEEP RIDGE

Cnidarians, sponges, echinoderms and molluscs all contribute to reef building in that they can remove dissolved material from the water and deposit it as hard mineral compounds. Calcium carbonate ($CaCO_3$), the building material of reefs, comprises much of this material. Stony corals and molluscs contribute with their hard skeletal remains; gorgonians and certain sponges, by secretions of microscopic rods of $CaCO_3$ released with the death of the animals; echinoderms, through skeletal remains composed of carbonate plates.

The Looe Key Reef System

All major taxa of coral reef-dwelling organisms are represented at Looe Key. A report, based on a resource inventory conducted by Antonious et al, in 1978, indicates the existence of several hundred species of marine organisms, co-existing in the intricate functional web of the reef ecosystem.

The inventory divides the Looe Key Reef area, from an ecological/topographical point of view, into five zones: (1) a Patch Reef area between Hawk Channel and the Looe Key reef flat, (2) the Reef Flat, triangular in shape, with the Looe Key marker in the southeast corner, (3) the Fore Reef, facing Florida Straits to the south, consisting of a spur and groove system, and the reef crest (4) a Deep Reef area with a drop-off, southwest of the Fore Reef and (5) a Deep Ridge, separated from the Deep Reef by an estimated 1 km of sand bottom (Figure 2). The proposed sanctuary boundary was selected to insure inclusion of portions of all five zones.

Patch Reef

A flat and relatively shallow area of about 8 m in depth stretches from Hawk Channel south to the Looe Key Flat. The area is dominated by a mixed association of seagrasses, such as turtle grass and manatee grass, and green algae and octocorals.

Continued survival of the seagrass beds is critical for maintenance of the habitat utilized by numerous fishes and the spiny lobster. Utilization of the patch reefs for shelter from predators allows both juveniles and adults to exploit an enormous and nearby source of energy, the biomass of seagrass association.

Due north of the Looe Key Reef Flat are numerous patch reefs scattered throughout the seagrass community. Most of these reefs have little profile and generally project up less than 2 m from the shallow bottom.

Among the faunal components in all the Patch Reefs, octocorals are by far the most dominant. They not only grow densely enough to give certain Patch Reefs the appearance of a heavily vegetated landscape, but also attain unusual sizes. Octocoral species diversity is greater in the Patch Reefs than on the more spectacular Fore Reef. Among giant sea feathers and sea whips, the largest specimens are close to 2 m in height.

Reef Flat

The Looe Key Reef Flat is roughly the shape of an isosceles triangle, its base facing south towards the Straits of Florida and the apex pointing landward to the north. On this landward side there is a very gradual transition from the seagrass coral association of the Patch Reef area into the Reef Flat, marked mainly by the beginning of extensive sand flats and an elevation of the bottom to about 2 m in depth. The bottom consists primarily of calcareous sand, rubble, coarse sediments and extensive seagrass beds, a mixture of turtle grass, manatee grass and algae.

The rock and rubble grass beds of the Reef Flat provide excellent habitat for small invertebrates. Abundant populations of other organisms, such as brittle stars, small crustaceans, small gastropods, pelecypod mollusks, and echinoderms abound in this area. The Reef Flat together with the Patch Reef serve as nursery areas for juvenile fish and the seagrass beds of both zones are feeding grounds for deep-water fish migrating to these areas at night.

Fore Reef

The Fore Reef zone of Looe Key is a well-developed and especially spectacular formation. This zone is the principle diving attraction for both local residents and tourists. Its main portion is a high profile spur and groove system, bordering the Reef Flat in very shallow water and sloping down to a sand bottom in 9-11 m of depth with some of the spurs showing a profile of up to 7 m high, caused mainly by the vigorous construction activity of "mountainous" star coral (*Montastraea annularis*). Massive growths of fire coral (*Millepora complanata*) are mainly found in the shallowest part of the spurs, with substantial concentrations of elkhorn coral immediately seaward of the fire coral complex. Almost all of the species of fish encountered in the reef system can be found here, with the exception of some species which prefer deeper water and can only be observed beyond a depth of 10 m. The whole system, from easternmost to westernmost spur, is about 1500 m long and, at the main center portion, about 350 m wide, (Antonius *et. al.*, 1978).

Deep Reef

The western half of the Fore Reef is intersected by a deeper reef, which begins here as a finger-like extension of scattered coral outcrops just beyond the terminus of the spur and groove system. From here, a reef flat of 10-12 m depth stretches several hundred meters to the west without showing much profile, representing a comparatively shallow subzone of the Deep Reef.

Sponges are fairly common and grow to larger sizes in the Deep Reef than in the Patch Reefs. Octocorals are dominant, but stony corals are more numerous than in the Patch Reefs. Towards the south, the Deep Reef gradually changes into a slope of increasing steepness with considerable profile caused by surge channels.

While species composition of stony corals in the deeper part of this zone remains about the same, the number and size of individual colonies increases, making them the dominant component here. Also with increasing depth, changes in the octocoral fauna take place. Among Pseudopterogorgia species, P. binnata far outnumbers all others, and two deepwater species occur only here: the rare monofilament Ellisella barbadensis, and the abundant fan-shaped Iciligoria schrammi.

Although species composition resembles that of shallower parts of the reef, a number of hard or stony corals with branching and flower-like growth forms occur on the Deep Reef, which are either not present or very rare in more accessible areas of Looe Key. Species of the genera Madracis and Oculina grow in clusters of small finger-like branches while colonies of Mussa angulos and Eusmilia fastigiata resemble bouquets of densely packed flowers. Disc-like growth forms of striking shape are found among many species of Agariciidae and Mussidae, which only at this depth occur in appreciable numbers.

Deep Ridge

This Deep Ridge runs parallel to the margin of the continental shelf in about 45 m depth. It shows very little profile and is only a few meters wide, but, nevertheless, is an outcrop of living coral reef. The reef is formed mainly by plate-like colonies of Montastraea cavernosa and several secies of Agaricidae. Also present are deep water octocorals, such as Iciligoria schrammi and Ellisella barbadensis, with the latter much more abundant here than on the Deep Reef.

° Cultural Values

Looe Key also offers unique cultural resources including the remains of the H.M.S. Looe. The latter is used for research and as an educational tool by the nearby Newfound Harbor Institute. In addition to providing marine archeological information, shipwrecks become coral encrusted and offer unique dive experiences. The potential exists for other shipwrecks in the Looe Key area as such resources are common in the Florida Keys.

° Commercial Values

Fishery resources are an extremely valuable component of the proposal area. Commercial fishermen with home ports adjacent to Looe Key derive about 28 percent of their annual catch from the 5 sq nm area which includes the Fore Reef. This catch primarily includes spiny lobster, snapper and grouper.

In addition, Looe Key is widely used by public charter boats, dive boats, recreational divers and fishermen.

IV. THE STATUS QUO

One alternative to marine sanctuary designation of Looe Key is the no action alternative (see Chapter 2). Under this alternative, existing authorities as described in the Legal Status Quo would continue to control activities and

protect the environment in and around Looe Key. No comprehensive management programs for research monitoring or education would be instituted. In addition, long range planning focused on ensuring continued ecosystem viability would be lacking.

° Concerns

The close proximity to land of the Florida Reef Tract, including Looe Key Reef, makes these areas accessible to large numbers of people who are able to drive or fly to the Keys. The Overseas Highway and its 44 bridges link the Keys to the mainland, and jet air service connects Key West and Marathon to all major American urban areas. In addition, public charter boat operators, dive boats, recreation divers and fishermen, utilize the reef throughout the year.

Monroe County statistics indicate that the Keys are expanding rapidly in both permanent resident and tourist populations. In the area nearest Looe Key, from Seven Mile Bridge up to and including half of Ramrod Key, the population is expected to grow from 1,833 in 1974 to 5,845 in 1998 (See Black, Crow & Eidsness, pp 3-4). Tourism is increasing. In 1979 the number of visitors to Bahia Honda State Park, in the vicinity of Looe Key, rose from 293,256 to 351,700.

Observations from the Looe Key Resource Inventory (Antonius et. al., 1978) and interviews with frequent visitors to Looe Key indicate that souvenir coral collecting is an ongoing practice today, and as such constitutes a serious strain on the reef's coral resources. The lack of certain species in accessible reef areas of suitable habitat provide circumstantial evidence of the removal of the more attractive growth forms.

Anchoring by hook and line fishermen, commercial and amateur tropical specimen collectors, recreational fishermen, and divers can also cumulatively damage reef structure. Physical damage to coral species from commercial fishing can occur when wire fish traps and lobster traps are dropped on coral, dragged across the bottom during retrieval or tossed about during rough weather.

There is widespread evidence of anchor damage to stony corals and octocorals within the area of the proposed sanctuary. Broken pieces of elkhorn and staghorn coral are easily visible in the Fore Reef and Reef Flat zones where the water is shallow and the more spectacular coral is found. Some of this type of damage may be related to wave damage or other natural factors. The extent to which it is anchor-related is unknown at the present time. Numerous observations have been made of boat anchors lying on living corals and of anchor chains and ropes chafing corals.

The use of wire fish traps is a highly controversial issue. The traps are extremely efficient gear. Fishing near the coral reefs with these traps can cause adverse ecological impacts by killing or injuring non-target species and removing too many of the predator species important to the coral reef system. Traps lost by the separation of the buoy line (ghost traps) drift uncontrolled and can continue to trap fish for unknown periods of time. Unregulated use of wire traps can also impair recreational value.

Both amateur and limited commercial tropical fish and invertebrate collecting occur throughout the Looe Key area. Tropical specimen collectors take a large variety of fish, but concentrate primarily on a small number of the more popular species. The most commonly collected fishes, according to a recent study, are angelfishes, damselfishes, and butterflyfishes. Individually, the most sought after fishes are the queen angelfish, rock beauty and neon goby.

Dredging, dredged material disposal and ocean outfalls do not appear to pose a realistic threat to the area at this time. However, due to the increasing number of visitors, disposal and discharge of certain other substances such as trash and litter are sources of concern. Current disposal and discharge activities are generally incidental to recreation and research; i.e., disposal of fish parts from cleaning and dressing fish caught in the area, release of marinetype chumming or bait and materials, discharge of effluents from marine sanitation devices, discharges of cooling waters from normal vessel engine operations and disposal of trash and litter from pleasure and research watercraft and transient vessels.

Finally, there is currently no protection for potentially important archaeological resources found in the area, including the shipwreck HMS Looe.

° Statutory Authorities

Looe Key is located on the continental shelf seaward of the territorial sea and State jurisdiction. A variety of Federal statues and regulations apply to activities in the area. Those that apply to activites posing significant threats are analyzed in Chapter Three, The Legal Status Quo. The mandates of existing authorities are often too broad to focus adequately on small discrete areas requiring special management measures. Jurisdictions include, in some cases, all waters or seabed out to 200 nautical miles off the entire United States coastline. In other cases, mandates are often too narrow to provide holistic attention; statutes directed at a particular resource may neglect or exclude components of the entire ecosystem. Finally, decentralized management of multiple use areas can result in policy conflicts, and does not lend itself to integrated management including education, research, recreation and information exchange.

Regulation of coral collecting, tropical specimen collecting, spearfishing and anchoring activities does not presently exist. Fishery Management Plans (FMP) are in preparation for some, but not all species of interest. The SAFMC and the GMFMC are jointly preparing a draft Coral and Coral Reef Resources FMP as the initial step in the management of all coral species under the jurisdiction of these two Councils. The current plan proposes to approve for harvest limited quantities of certain soft coral species, and to prohibit taking of hard corals except under permit for scientific and educational purposes. This draft FMP further proposes to designate Looe Key as a 1 sq nm Habitat Area of Particular Concern (HAPC) with special management measures for additional protection of the Fore Reef area (see Legal Status Quo).

In addition to the Coral and Coral Reef Resources FMP, the SAFMC and the GMFMC are jointly preparing a FMP for Spiny Lobster, and the SAFMC is preparing a FMP for Snapper-grouper. Restrictions on fishing for these resources may be

proposed pursuant to the plans. In lieu of enough information to warrant preparation of a FMP for reef resources such as tropical fish and invertebrates, the Councils are considering the preparation of a profile or description of the resource and fishery.

The final scope and content of all FMPs is uncertain at this time because they are in draft form and subject to change. None of these FMPs is likely to be implemented until late 1981.

Although a variety of Federal laws, regulations and policies apply to activities occurring in the general area of the proposed sanctuary (see Chapter 3, Section V), they do not appear adequate to assure long-term protection of Looe Key.

Given these special resources, their particular vulnerability, and the multiple, increasing human pressures on the area, assurance of long-term preservation of Looe Key requires (a) a management framework that will monitor, assess and act on information about the cumulative effects of human uses, (b) a mechanism to coordinate and encourage research that will lead to necessary management decisions, and (c) efforts to educate the public about the value and the fragility of the reefal system. The no-action alternative appears to meet none of these requirements.

The status quo provides no focal point for comprehensive long-term management, and no programmatic mechanism to promote and coordinate research on coral reef ecology and ecosystem recovery or to provide information to the direct and indirect user public. There are currently no programs to provide education and information aimed at increasing long-term protection of these areas by increasing public awareness of the distinctive resources and their susceptibility to disturbance.

The marine sanctuary program proposes to provide a comprehensive mechanism through long-term management to protect this ecosystem and to respond in a timely fashion to marine conservation issues and to the interests of affected user groups as those issues arise.

V. THE PROPOSAL

The Office of Coastal Zone Management (OCZM), which is responsible for the marine sanctuary program within NOAA, proposes the designation of Looe Key as a marine sanctuary. The sanctuary area consists of 5 sq nm of high sea waters under Federal jurisdiction surrounding Looe Key, a submerged section of the Florida Reef Tract, located 6.7 nautical miles (12.4 km) southwest of Big Pine Key in the lower Florida Keys at latitude 24°33' north and longitude 81°24' west (see figs. 1 and 3).

Looe Key is part of a curving reef tract off the Florida Keys containing the only living coral reefs in the United States (Ginsburg 1974). The Looe Key area includes:

- Portions of Patch Reefs, a Reef Flat, Fore Reef, Deep Reef and Deep Ridge in a small manageable unit which allows for a focus on public education and research aimed at a better understanding of reef dynamics;

- Shallow water reef areas easily accessible to the public; ideal for recreational uses by both amateur and experienced individuals.

The 5 sq nm boundary alternative will provide a reasonable slice of the reef tract which will permit management to achieve the proposed sanctuary objectives as described below and result in minimal economic impact. For these reasons it was selected as the preferred boundary.

Proposed Management

The management of Looe Key as a marine sanctuary will focus on the attainment of several goals and objectives (Chapter Two Preferred Alternative):

Goal 1: To maintain, protect and enhance the quality of the natural, biological, aesthetic and cultural resources of Looe Key reef system.

Objectives:

- Promulgate protective regulations;
- Provide a framework for onsite management;
- Provide for adequate enforcement;
- Utilize research data to assess management needs and priorities, modify regulations and to determine management strategies.

Goal 2: To promote and stimulate marine research efforts directed toward identification and analysis of marine ecological interrelationships.

Objectives:

- Encourage and cooperate with interested parties in research and study of reef interrelationships;
- To establish competitive funding mechanisms encouraging a wide range of scientific expertise to focus attention on reef dynamics;
- Establish a clearing house for dissemination and exchange of sanctuary research data; and
- To facilitate effective management of Looe Key.

Goal 3: To enhance public awareness of the need for conservation and protection of the Looe Key coral reef system.

Objectives:

- Provide a means for education and information exchange;
- Develop educational programs that will increase awareness and appreciation of Looe Key through a public information effort (including slides, brochures, lectures, etc.);
- Establish a sanctuary information center; and
- Develop interpretative services.

The Management Plan and Enforcement

If the sanctuary designation occurs, development of a formal Management Plan (MP) will be undertaken and completed within the first 9-12 months. NOAA proposes to work with the Florida Department of Natural Resources in the formulation of this plan. The MP development process will emphasize public

involvement and review. Alternative means of insuring user participation in sanctuary management will be explored in the public forum. If advisory committees are desired, they will become a part of the formal management structure.

NOAA proposes to contract for day-to-day management of the sanctuary, if such an arrangement can be reached under a Cooperative Agreement. The management staff will consist of trained personnel with experience in special area planning and management. The manager will be charged among other things with responsibility for coordinating enforcement and surveillance activities within the proposed sanctuary. The manager will be responsible for administering the sanctuary and providing reports to include (but not limited to) the following items:

- Environmental analysis studies;
- Visitor use and visitor use capacity studies, user-related impacts, and such other information as necessary;
- Enforcement analysis, including a summary of activities, notices of violations, case dispositions, including statistical information on number of visitors, points of entry and areas and types of use, and conclusions and recommendations, including ways to improve management.

The MP would provide for a visitor information station to distribute information on regulations within the sanctuary and other public information concerning knowledge of the Looe Key Coral Reef system and ongoing research projects in the sanctuary and appropriate uses of the natural resources.

NOAA has initiated consultation with the U.S. Coast Guard headquarters on the question of the proposed Looe Key Marine Sanctuary enforcement. The Coast Guard will provide the Looe Key Marine Sanctuary enforcement and surveillance for NOAA and arrangements will be worked out to insure an onsite presence. NOAA believes that the level of enforcement required in the Looe Key Sanctuary cannot be achieved through routine patrols or as an add-on to other duties.

Proposed Designation

The Designation Document (Designation) serves as a constitution for the sanctuary (the draft Designation for the proposed Looe Key Marine Sanctuary is presented in app. A). It establishes the boundary and purpose of the sanctuary, identifies the types of activities that may be subject to regulation, and specifies the extent to which other regulatory programs will continue to be effective within the sanctuary. Its content can be altered only after repeating the entire designation process and securing Presidential approval.

The draft Designation proposes that the following activities be subject to necessary and reasonable regulation:

- Anchoring;
- Coral collecting and damage;
- Wire trap fishing;
- Lobster trapping;

- Tropical specimen collecting;
- Spearfishing;
- Bottom trawling and specimen-dredging;
- Discharging or depositing any substance;
- Tampering with, removing, or otherwise damaging, cultural or historic resources; and
- Dredging or alteration of or construction on the seabed.

Hook and line fishing, net fishing and activities such as snorkeling and SCUBA diving will not be subject to regulation under the current Designation except where regulations relating to the damaging of natural resources apply.

Proposed Regulations

The proposed restrictions on activities are set forth in the draft regulations (Appendix A). At the present time NOAA is not proposing to regulate alteration of or construction on the seabed or bottom trawling and specimen-dredging. However, by listing these activities in the Designation, restrictions could be proposed in the future should conditions warrant it. NOAA may legally promulgate regulations only in relation to the specific activities listed in the Designation, but the Designation itself does not constitute regulations or impose restrictions. Specific regulations must be proposed, subjected to public review and comment and promulgated if NOAA wishes to control any aspect of the activities listed in the Designation.

Specific regulations summarized here and presented in detail in Chapter Two, are proposed for the protection of the natural resources and the safety of the various user groups as part of NOAA's preferred alternative. To the extent possible, the sanctuary managers will coordinate with existing authorities in both the administration and enforcement of the regulations. These regulations will apply only within the sanctuary boundaries. The full text of the proposed regulations as they appear in the Federal Register is presented in Appendix A.

The proposed regulations would impose the following controls:

(1) Prohibit damage to or the collecting of coral except by permit for research and educational purposes;

(2) Prohibit the collecting of tropical marine specimens except by permit for scientific and educational purposes;

(4) Prohibit the use of wire fish traps;

(5) Prohibit lobster trapping on the Fore Reef (consisting of a trapezoid within Loran "C" points 1, 2, 3 and 4 consistent with the Habitat Area of Particular Concern (HAPC) proposed by the Gulf of Mexico and South Atlantic Fishery Management Councils);

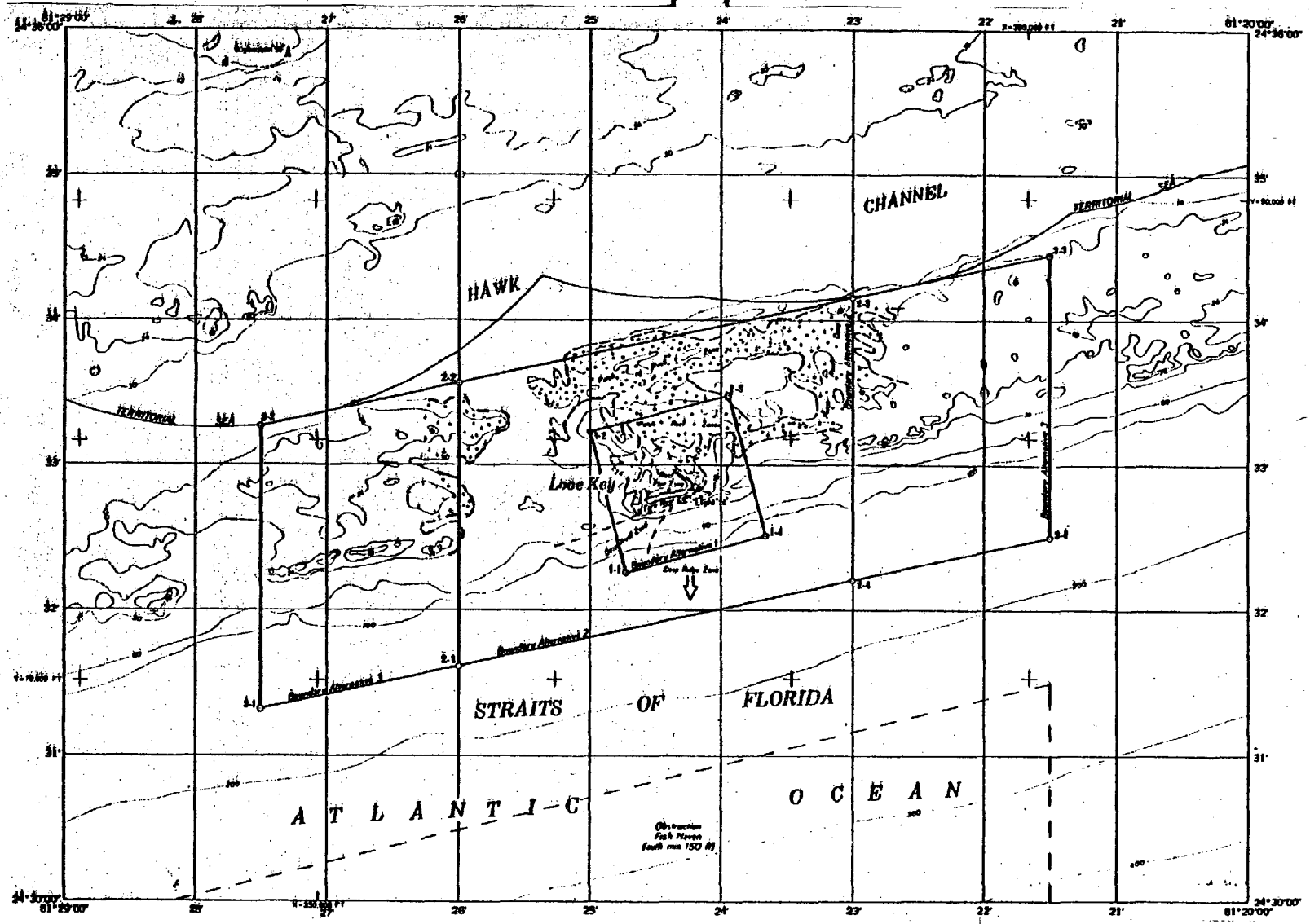


FIGURE 3

LEGEND

1-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 1
2-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 2
3-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 3

TRANSVERSE MERCATOR PROJECTION
FLORIDA STATE PLANE COORDINATE SYSTEM - EAST ZONE
NORTH AMERICAN 1927 DATUM
SCALE 1:20,000

UNITED STATES - GULF COAST
FLORIDA
FLORIDA KEYS
LOOE KEY
PROPOSED MARINE SANCTUARY
BOUNDARY ALTERNATIVES

(6) Prohibit anchoring on coral on the Fore Reef (consisting of a trapezoid within Loran "C" points 1, 2, 3, 4, and encourage sand anchoring elsewhere within the sanctuary;

(7) Prohibit tampering with, damaging or removal of natural historical and cultural resources except by permit for scientific and educational purposes; and

(8) Prohibit all discharges except vessel cooling waters, fish parts, chumming materials and effluents from marine sanitation devices.

VI. SUMMARY OF ENVIRONMENTAL CONSEQUENCES OF THE PREFERRED ALTERNATIVE

Sanctuary designation will provide long-term protection for a representative section of the Florida reef tract from Patch Reefs out to the Deep Ridge. Comprehensive management of this area will include emphasis on increasing the level of public awareness of resource values and of the potential for harm through a public education program and research on reef biology and system interactions. Management of a section of the reef tract will allow for appropriate distribution of visitor uses and consequent control of certain harmful effects.

Minimal economic impacts will result from proposed restrictions within the preferred boundary alternative (See Chapter Four Environmental Consequences).

° Boundary

The preferred alternative for the boundary (5.32 sq nm) will protect the entire Fore Reef and Reef Flat and portions of the adjacent Patch Reef, Deep Reef, and Deep Ridge. A sanctuary of this size will result in the protection and management of a system, rather than simply individual components (see Figure 3). It will help insure accomplishment of all sanctuary goals (See p. 4) by encompassing a "slice of the ecological pie", affording opportunity for focus on education and research. The preferred alternative emphasizes the maintenance of the biological interrelationships of the reef system components in order to maximize public benefits and minimize resource threats. The 5 sq nm sanctuary will also maximize the enforcement capability for sanctuary regulations. In addition, the 5 sq nm will have minimal adverse economic impact on commercial fishing as compared to larger boundary options.

° Anchoring

The proposed regulation would prohibit anchoring on coral on the Fore Reef. The regulation will help protect the Fore Reef coral assemblages from snagging, breaking and other anchor damage. Sand anchoring will be encouraged outside the Fore Reef. This will not provide maximum protection for coral growths in this area but will have minimal impact on sanctuary users. An educational program to advise users on anchoring procedures and frequent site inspections will be utilized in order to ensure the success of this regulation. A mooring buoy design and feasibility study will be initiated upon designation, and if such a system seems desirable the proposed regulation would be modified at the time buoys are installed.

° Coral Collecting and Damage

The proposed regulation would prohibit the collection or possession of all corals, living or dead, within the proposed sanctuary (except as permitted for scientific and education purposes). The regulation will protect the coral assemblages from stress and physical damage. This will maintain the reef habitat for fish and preserve aesthetic qualities.

° Wire Fish Traps

The proposed regulation would prohibit the use of wire fish traps within the entire preferred sanctuary boundary. This regulation would prevent both the physical and ecological damage to the coral reef system from wire fish traps. The recreational and aesthetic values of the sanctuary will also thereby be maintained and enhanced. The regulation would not prohibit the setting of traps beyond the sanctuary boundaries. The regulation will, however, adversely affect those fishermen who presently use wire fish traps within the 5 sq nm area and therefore will be forced to move elsewhere to trap.

° Lobster Trapping

The banning of lobster traps from the Fore Reef will prevent the physical damage that frequently occurs when lobster traps contact the coral due to improper placement or storm surge. However, because the prohibition is limited to a small geographic area, the regulation will result in minimal, if any, economic loss to the fishing community. The proposed regulation is the same as the special management measure for Looe Key under consideration in the draft Coral and Coral Reef Resources FMP.

° Tropical Marine Specimen Collecting

A prohibition on tropical specimen collecting (except by permit for scientific and educational purposes) would protect and enhance the tropical fish population at Looe Key, prevent the depletion of ecologically important species, add to the aesthetics of the sanctuary, and maintain and enhance the long term productivity of the Looe Key coral reef for future generations.

Many suitable areas for tropical specimen collectors to catch tropical fish and invertebrates exist in the south Florida area including shallow inshore areas, inshore coral heads, mid-channel reefs (in the middle of Hawk's Channel), and the entire outer reef. This alternative would cause limited economic loss to present commercial collectors.

The total economic loss of revenue per year estimated in the socio-economic analysis for Boundary Alternative 2 would be $25,000 to $43,000 or $80,075 to $137,729 using regional multipliers. At least some of this loss could be made up by collecting elsewhere and by commercial collecting under permit for sale to public aquaria and education research institutions.

° Spearfishing

The proposed regulation would prohibit spearfishing within the entire preferred sanctuary boundary. One of the primary impacts of prohibiting the spearing of fish will be to create better conditions for observing, studying and photographing fish. This prohibition will also benefit the ecological system by ameliorating the continued disturbance and removal of territorial reef predators such as grouper, eliminating physical damage to coral from inexperienced spearfishmen, reducing the inadvertent kill of non-edible tropical reef fish species, and eliminating the potential for human injury.

° Discharges

The prohibition of discharges will help insure a high degree of water quality by preventing the discharge or deposit of most material within the sanctuary. The regulation allows the discharge of chumming materials and fish parts, cooling waters, and effluents from marine sanitation devices. The regulation will not impact fishing activities. The economic impact on sanctuary users is minimal, although they will be required to retain their trash for disposal in proper sites.

° Historical or cultural resources

Tampering with, removing or damaging historical or cultural resources is prohibited. The regulation will protect the HMS Looe from possible tampering or removal.

VII. ACTIVITIES LISTED IN THE DESIGNATION DOCUMENT FOR WHICH REGULATIONS ARE NOT CURRENTLY BEING PROPOSED

° Alteration of or construction on the seabed.

° Bottom trawling and specimen-dredging.

The Army Corps of Engineers (COE) exercises authority over construction and the dumping of dredged materials but not the actual dredging. The Bureau of Land Management (BLM) has jurisdiction over dredging activities related to mineral leasing such as sand and gravel mining. However, no other existing Federal regulatory authority has jurisdiction over other activities that might alter the seabed such as dredging. Exploratory trawling for reef fish on live bottoms in the South Atlantic has proven economically and technically feasible. It is possible that some time in the future modified gear such as roller trawls would be contemplated for use in areas such as Looe Key.

While adverse impacts of both of the above activities are well documented, NOAA has no evidence to indicate that they pose realistic threats to the resources at this time. For this reason NOAA is not promulgating regulations but is listing these activities in the Designation Document, and may issue regulations at a future date if the need arises.

VIII. MARINE SANCTUARY PERMITS

Marine sanctuary permits, issued by NOAA, will be required for an activity which would otherwise violate the regulations. The permit procedure is specified in the regulations (app. A).

IX. CERTIFICATION OF OTHER PERMITS

The regulations propose to certify in advance any permit, license, or other authorization issued pursuant to any other authority within the sanctuary as long as the activity does not violate marine sanctuary regulations. This notice of validity avoids duplicating permit delays and costs where there is no violation.

CHAPTER ONE PURPOSE AND NEED FOR THE ACTION

The Office of Coastal Zone Management (OCZM) of the National Oceanic and Atmospheric Administration (NOAA) has identified the Looe Key Reef as a special marine area with important conservation, recreational, ecological and aesthetic resources, threatened by existing and potential human use and deserving of marine sanctuary designation. The goals of this proposed Looe Key Marine Sanctuary are as follows (for a more detailed discussion see Chapter Two):

- To maintain, protect and enhance the quality of the natural biological aesthetic and cultural resources of the Looe Key Reef system;
- To promote research and study of sanctuary resources;
- To enhance public awareness of the functioning of the Looe Key coral reef system and to provide a means for education and information exchange.

The Looe Key area offers an opportunity to focus management attention on a small, highly used cross section of the Florida Reef tract. Looe Key management will concentrate on encouraging coral reef research within the sanctury, ensuring a coordinated approach to data exchange and availability, and developing effective public education programs, and long-term plans for the preservation of the resources. Each of these programs will contribute to increased knowledge and understanding necessary to ensure wise use of our marine ecosystems.

The accessibility of Looe Key to commercial, recreational and educational users, its high productivity, and superior scenic beauty have led to frequent and increasing use of the area, with resulting physical and ecological damage to the reef system. Monroe County socio-economic studies indicate that both permanent and tourists populations, in the area nearest Looe Key, are increasing; corresponding increases in the use of Looe Key have potential for long-term adverse environmental consequences. Sanctuary designation will provide the long term integrated management necessary to protect and use wisely these resources.

As a part of the proposed management system certain additional regulations appear necessary. Most significantly, in a recent legal opinion, the U.S. Court of Appeals, Fifth Circuit, ruled that the Bureau of Land Management's jurisdiction to regulate the taking of coral and other activities damaging to coral reefs is restricted to offshore activities associated with mineral exploration and development by lessees and their agents, leaving coral reefs such as Looe Key unprotected from damage due to coral collecting, improper anchoring, and certain potentially harmful fishing techniques.

OCZM, therefore, proposed to designate Looe Key as a National Marine Sanctuary under Title III of the Marine Protection, Research and Sanctuaries Act of 1972. Such an action will allow for long term protection of a valuable section of the Florida reef tract and comprehensive management which will include both research and educational components (See Chapter Four, Environmental Consequences).

CHAPTER TWO ALTERNATIVES INCLUDING THE PREFERRED ALTERNATIVE

I. INTRODUCTION

NOAA proposes to designate Looe Key as a marine sanctuary to protect and enhance its natural features and to promote scientific understanding, public appreciation and wise use of its resources. Various management, boundary and regulatory alternatives have been considered in the evaluation of the proposed action.

This section presents a brief analysis of all reasonable alternatives, including a no action alternative (status quo) and the preferred alternative, and a brief discussion of the physical, biological, ecological and socioeconomic impacts resulting from the proposed action. A detailed impact analysis is presented in Chapter Four, Environmental Consequences.

II. NO ACTION ALTERNATIVE: RELY ON THE STATUS QUO

Looe Key is located on the high seas just seaward of State jurisdiction. A variety of Federal laws, regulations, policies and procedures apply to activities occuring in the general area of the proposed sanctuary (for a detailed description please see Chapter Three, Section V The Legal Status Quo).

An alternative to the proposed action is the "no action alternative" (status quo), meaning that Looe Key would not be designated as a marine sanctuary. Under this alternative, the existing authorities as described in the Legal Status Quo would continue to control activities and protect the environmemt in and around Looe Key. No comprehensive management program for research, monitoring or education would be instituted. In addition, long range planning focused on insuring continued ecosystem viability would be lacking.

As discussed below under the Preferred Alternative and in more detail in Chapter IV, Looe Key is a special marine area; a complex, fragile ecosystem containing valuable natural resources. Part of it's uniqueness lies in the fact that it is readily accessible to all user groups and it offers a range of water depths which will accommodate novice to expert swimmers, snorklers and divers. These factors in combination with its spectacular beauty have resulted in increasing levels in human uses (Please see Chapter One - Purpose and Need for Action). Human activities that either singularly or in combination may place stress on the reef system include anchoring, wire trap fishing, spearfishing, tropical specimen collecting, and damage to or removal of historical and cultural resources. The current literature suggests that coral reef resources, are unusually susceptible to some forms of environmental perturbation. In addition, when a reef system is seriously damaged the ecological conditions that follow cannot be expected to coincide with those preceeding so that it cannot be taken for granted that the reef will ever replace itself.

Given these unique resources, their particular vulnerability, and the multiple, increasing human pressures on the area, assurance of long term preservation for Looe Key requires (a) a management framework that will monitor, assess and act on information about the cumulative effects of human uses, (b) a mechanism to coordinate and encourage research that will lead to necessary management decisions, and (c) efforts to educate the public about the value and the fragility of the reefal system. The no action alternative appears to meet none of these requirements.

Existing statutes, including the Outer Continental Shelf Lands Act, the Clean Water Act, and the Marine Mammal Protection Act, are directed either at the accomplishment of a single purpose or the regulation of a single activity, such as the extraction of oil and gas resources, the preservation of water quality, and the conservation of marine mammals. These authorities do not provide a comprehensive management mechanism. These statutes also do not address all aspects of human threats to the area. To take one example, the regulations controlling ocean discharge and dumping do not consider all shipboard wastes. For example, Federal regulation of sewage wastes from marine sanitation devices does not extend beyond State waters (see the January 30, 1980 amendment to the Clean Water Act in Section IV F). The discharge of oil beyond the territorial sea (3 nm) from tankers under 150 gross tons and other vessels under 500 gross tons is unregulated, and regulations pertaining to discharges from machinery space bilges require that the activity must take place as far as practical from nearest land, while in route, and must not exceed 60 liters per mile or have oil content exceeding 100 parts per million. Finally, there are no regulations to control the disposal of trash and litter in high seas areas.

In addition, the status quo provides no programmatic mechanism to promote and coordinate research on coral reef ecology and ecosystem recovery or to provide information to the direct and indirect user public. There are currently no programs to provide education and information aimed at increasing long-term protection of these areas by increasing public awareness of the distinctive resources and their susceptibility to disturbance.

The regulatory regime closest in purpose and scope to the marine sanctuary program is that provided by the Fishery Conservation and Management Act of 1976 (FCMA). Even that regime, however, does not satisfy all of the management requirements described above. Under the FCMA, Regional Fishery Management Councils propose and implement necessary regulations for the management of selected commercial and recreational fisheries which are in need of management pursuant to Fishery Management Plans (FMP). These FMP's will provide for some protection of selected fishery resources at Looe Key but will not likely focus on the site specific ecosystem management. FMP's do not necessarily consider elements of the ecosystem which are not harvested, nor do they address the entire range of threats to which an ecosystem may be subject. Moreover, none of the FMPs is final and projected time schedules are uncertain.

The FMP most relevant to Looe Key is the Coral and Coral Reef Resources Plan. This FMP proposes to create a Habitat Area of Particular Concern (HAPC) consisting of 1 sq nm which emphasizes protection of the actual spur and groove Fore Reef from physical damage. However, the Coral and Coral Reef Resources FMP will not necessarily provide protection to components of the system which are not exploitable fishery resources. In addition, the long-term biological productivity of a system is by no means assured by such protection efforts. Finally, the Coral and Coral Reef Resources FMP does not focus on management, particularly as it relates to environmental monitoring, visitor uses, public education, research aimed at assessing the effectiveness of protective measures and the health of the total system.

Thus, the management protections offered by the FCMA are at best uncertain. Nor does the FCMA assure the site-specific research, monitoring and education elements that long term preservation of the area requires. A marine sanctuary would provide a useful complement to the FMP process.

In conclusion, available information indicates that perpetuation of the status quo will not adequately protect the Looe Key area from present or future impacts on the physical, biological, and ecological environment nor enhance scientific, educational, recreational and aesthetic values of the ecosystem. The marine sanctuary program proposes to provide a comprehensive mechanism through long-term management to protect this ecosystem and to respond in a timely fashion to marine conservation issues and to the interests of affected user groups as those issues arise.

III. PREFERRED ALTERNATIVE

A. Goals and Objectives

To determine the preferred alternative boundary and regulations that adequately address the issues and problems of Looe Key, a set of management goals and objectives has been developed and out of this management framework appropriate controls will be determined. The goals and objectives are as follows:

Goal 1: To maintain, protect and enhance the quality of the natural, biological, aesthetic and cultural resources of the Looe Key system.

Objectives:

- Promulgate protective regulations to provide a framework for onsite management.
- Provide for adequate enforcement.
- Utilize data to modify regulations and to determine management strategies; assess management needs and priorities.

Goal 2: To promote and stimulate marine research efforts directed toward identification and analysis of marine ecological interrelationships.

Objectives:

- Encourage and cooperate with interested parties in research and study of reef interrelationships.
- Establish competitive funding mechanisms encouraging a wide range of scientific expertise to focus attention on reef dynamics.
- Establish a clearing house for dissemination and exchange of sanctuary research data.

Goal 3: To enhance public awareness of the functioning of the Looe Key coral reef system.

Objectives:

- Provide a means for education and information exchange.
- Develop educational programs that will increase awareness and appreciation of Looe Key through a public information effort (including slides, brochures, lectures, etc.)
- Establish a sanctuary information center.
- Develop interpretive services.

B. Management Plan

If the sanctuary designation occurs, development of a formal Management Plan (MP) will be undertaken and completed within the first 9-12 months. NOAA proposes to work with the Florida Department of Natural Resources in the formulation of this plan. The MP development process will emphasize public involvement and review. Alternative means of insuring user participation in sanctuary management will be explored in the public forum. If advisory committees are desired they will become a part of the formal managment structure.

The MP will be periodically reviewed and management measures including regulations, evaluated for effectiveness in achieving sanctuary goals and objectives. This periodic review will also involve a high degree of public participation.

In order to provide an efficient system for the management of the proposed Looe Key sanctuary, the following basic strategies are proposed:

Sanctuary Manager

NOAA proposes to contract with the State Department of Natural Resources for day to day management of the sanctuary. The management staff will consist of objective personnel with experience in special area planning and management. The manager will be charged among other things with responsibility for coordinating enforcement and surveillance activities within the proposed sanctuary. The manager will be responsible for administering the sanctuary and providing reports to include (but not limited to) the following items:

- environmental analysis studies;
- visitor use and visitor use capacity studies, user-related impacts, and such other information as necessary;

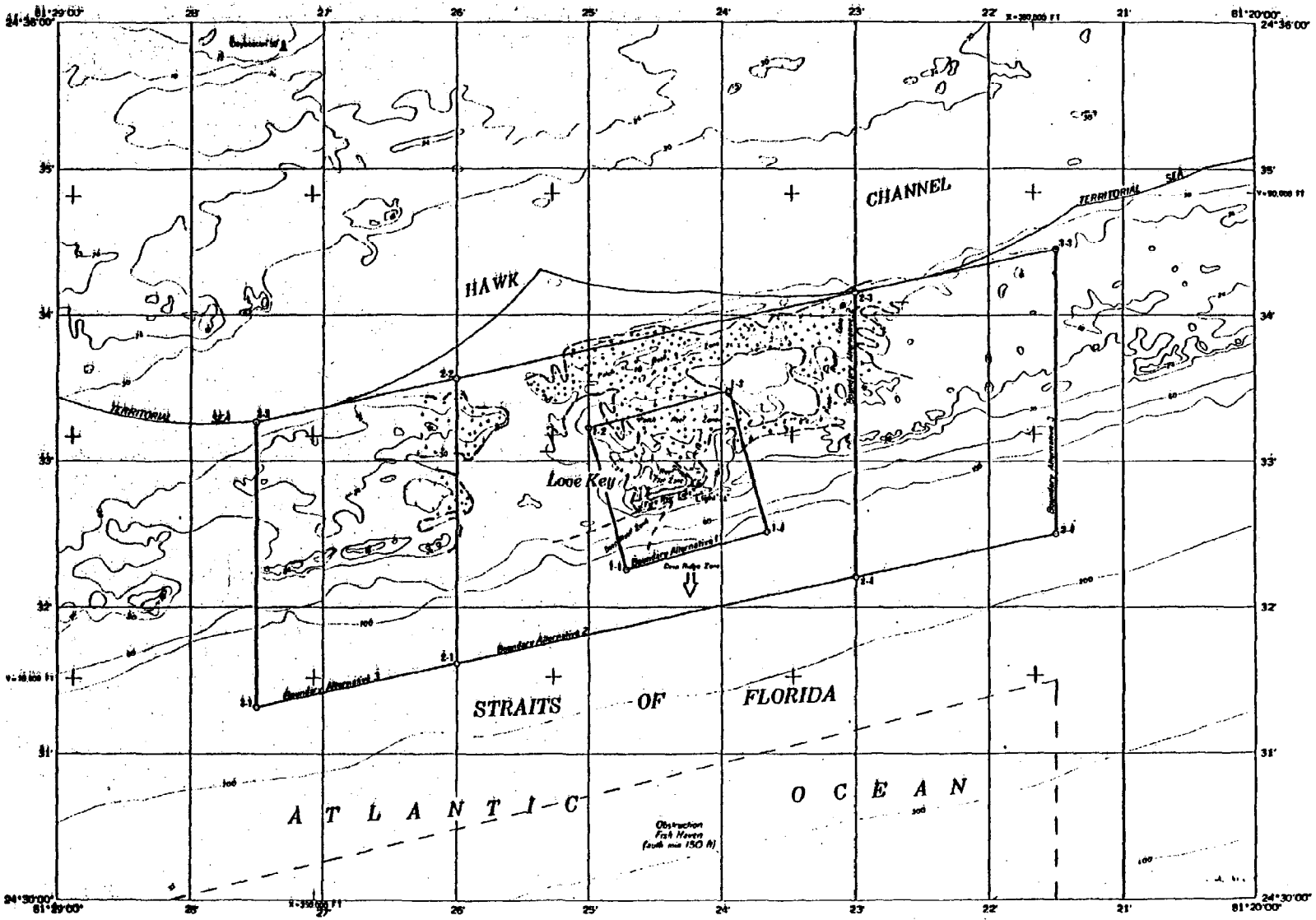


FIGURE 4

LEGEND

1-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 1
2-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 2
3-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 3

TRANSVERSE MERCATOR PROJECTION
FLORIDA STATE PLANE COORDINATE SYSTEM - EAST ZONE
NORTH AMERICAN 1927 DATUM
SCALE 1:20,000

UNITED STATES - GULF COAST
FLORIDA
FLORIDA KEYS
LOOE KEY
PROPOSED MARINE SANCTUARY
BOUNDARY ALTERNATIVES

- enforcement analysis, including a summary of activities, work that will entail survey, inventory and assessment of submerged cultural resources. Attention will be given to the interrelationship between cultural resources and biological processes.

The MP would provide for a visitor information station to distribute information on regulations within the sanctuary and other public information concerning knowledge of the Looe Key Coral reef system and ongoing research projects in the sanctuary.

Enforcement

NOAA has initiated consultation with the U.S. Coast Guard headquarters on the question of enforcement for the proposed Looe Key Marine Sanctuary. The Coast Guard will provide the Looe Key Marine Sanctuary enforcement and surveillance for NOAA. Arrangements will be worked out to insure an on-site presence. NOAA believes that the level of enforcement required in the Looe Key Marine Sanctuary can not be achieved through routine patrols or as an add-on to other duties.

Anchoring Study

To explore methods of lessening the effects of improper anchoring, NOAA will undertake a study to determine the feasibility and design of a mooring buoy system for Looe Key or a suitable alternative. The study will include a discussion of the impacts of placement of mooring buoys on the physical environment and resources. Proper anchoring information will be disseminated to users.

Public Education and Information

The "living laboratory" aspects of Looe Key can be fully utilized to provide learning opportunities for the public to view the interrelationship between man and the environment, and the implications of marine management. This educational aspect will be developed through field activities, media materials, lectures and brochures. A sanctuary user's guide will better enable the public and educators to understand and safely utilize the resources.

Research

In an effort to provide scientific data upon which future change can be evaluated and management decisions based, NOAA will give priority to completing a biological inventory, reef health assessment, and water quality assessment. Research at Looe Key will not duplicate but rather will compliment research efforts at the Key Largo Marine Sanctuary/John Pennekemp State Park, and the national marine parks in the Florida Keys.

Cultural Resources

The proposed sanctuary has a diversity of cultural resources (such as the HMS Looe). To understand more fully their history and to provide a mechanism that will ensure their survival, NOAA will competitively fund work that will entail survey, inventory and assessment of submerged cultural resources. Attention will be given to the interrelationship between cultural resources and biological processes.

C. Preferred Boundary Alternative

Three boundary alternatives were considered for the proposed marine sanctuary (see fig. 4, Boundary Alternatives).

1. Alternative 1 - an area 1 sq nm containing only the Fore Reef and Reef Flat;
2. Alternative 2 - an area consisting of 5 sq nm containing the Fore Reef, Deep Reef and Deep Ridge;
3. Alternative 3 - an area consisting of 10 square nautical miles including the resources contained within the 5 sq nm alternative plus more extensive portions of the Patch Reef area.

The 5 square nautical mile boundary alternative was chosen as the preferred alternative (See Chapter Four - Environmental Consequences for a detailed analysis of the various alternatives, including the preferred). The 5 sq nm alternative encompasses representative portions of all five ecological zones found at Looe Key: Patch Reef; Reef Flat; Fore Reef; Deep Reef and Deep Ridge. It also covers an extension of the Fore Reef to the east discovered only recently as part of the survey work for this EIS.

The Patch Reef zone is a relatively shallow flat bottom area, covered with extensive turtle grass and manatee grass. Interspersed among the seagrass beds are numerous patch reefs with very little profile. The patch reefs within this zone are usually dominated by densely growing, large octocorals. The species diversity of octocorals on the Patch Reef is greater than that of the Fore Reef and certain octocorals exist only on the Patch Reef. The scattered stony corals reach only moderate size, but nevertheless give the patch reefs enough structure to provide shelter for fishes and invertebrates. In addition, the naturally rare pillar coral (Dendrogyra cylindrus); is more likely to be found in the Patch Reef area than at the Fore Reef (Antonus, 1979).

The significance of the Patch Reef zone as a shelter for a variety of finfish and shellfish has been pointed out in a number of publications (e.g., Zieman & Roblee, 1979). Without the protection of the interspersed patch reefs these animals would be unable to use the surrounding seagrass beds as feeding grounds. This zone, together with the even shallower Reef Flat, are Looe Key's nursery for juvenile fish. In addition, the extensive seagrass beds of both zones constitute the feeding ground for many deep-water fishes migrating to these areas at night.

The Fore Reef provides the deep sheltered channels for these migrations from the Deep Reef to the shallow reef zones, while the much wider channels on either side of the Fore Reef provide access for pelagic species.

The Deep Reef today still harbors territorial fishes such as groupers which, given protection and time, may repopulate the apparently overfished Fore Reef zone. This could also be the case for conspicuously missing corals which might, in time, repopulate the Fore Reef from the stocks that live on the Deep Reef.

Other fish found on the Fore Reef but occurring in greater abundance on the Deep Reef are butterflyfishes, and hamlets, blue chromis and creole wrasses which prefer depths greater than 30-46 feet. Fish found only on the Deep Reef by the Looe Key Resource Inventory are purple reef fish, sunshine fish, spotfin, and hogfish which naturally range between 55 and 120 feet (Noyes, 1980, public hearing testimony).

The main part of the Deep Reef exhibits a coral community of intermediate to deepwater species, with some coral species growing abundantly here but which no longer occur on the Fore Reef. The Deep Reef, on the seaward side, is a slope of increasing steepness, ending in a small dropoff to about 25 to 35m depth.

Since the 5 sq nm alternative contains portions of the Deep Ridge as well as the main four reef zones of Looe Key, it forms a representative "slice of the ecological pie" through the reef tract in this area. This is one of the basic reasons for its selection as the preferred boundary. The 5 sq nm boundary alternative would create a sanctuary containing representative components of each reef zone and would establish a sanctuary that protects a piece of the reef tract system rather than one component as is the case in boundary alternative #1. This approach is consistent with the goals and objectives developed for a possible sanctuary at Looe Key.

The 5 nm area will pose less of an economic hardship to local fishermen than would be the case in the 10 nm proposed sanctuary and yet will meet the goals desired for the sanctuary. A sanctuary with this boundary would represent all of the reefal zones and be "systematic" in scope providing for the maintenance and enhancement of long-term productivity of the entire Looe Key ecological unit. This boundary alternative would provide a geographic basis for achieving the sanctuary goals.

D. Preferred Regulatory Alternative

1. Coral Collecting

The following alternatives were analyzed for regulating coral collecting:

a. Unregulated collecting (status quo);

b. Prohibiting collection or possession of all coral (living or dead) except by permit for scientific and educational purposes; and

c. Prohibiting the collection or possession of all coral (living or dead) within the sanctuary.

NOAA has chosen alternative b as the preferred alternative. This alternative would protect present and future coral resources while permitting coral specimen collecting for educational and scientific purposes under permit from NOAA. Since the current level of commercial coral collecting is insignificant in the proposal area, the economic impact of this alternative will be negligible. The proposed restriction is more stringent than that being considered in the Coral and Coral Reef Resources Fishery Management Plan (FMP) in that the latter permits limited harvest of soft coral outside the 1 sq nm Habitat Area of Particular Concern (HAPC) at Looe Key. OCZM will work closely with the Fishery Management Councils to insure as nearly as possible compatible non-duplicative permitting procedures.

A regulation similar to the preferred alternative is presently in force in John Pennekamp State Park and in the Key Largo Marine Sanctuary. As discussed in Chapter Three, the inclusion of a provision for prohibition of possession of coral, living or dead, within the proposed boundaries has resulted in fewer enforcement difficulties within these two protected areas. On the other hand Florida State Law, applicable in the territorial sea, does not prohibit possession of cleaned or cured sea fans, hard and soft corals and fire coral, and enforcement difficulty has arisen in State waters because these organisms can be quickly killed and bleached on board ship before enforcement agents can board for inspection (Tingley, personal communication, 1979).

2. Wire Trap Fishing

The following alternatives were analyzed for regulating wire trap fishing within the proposed sanctuary:

a. Unrestricted use of wire traps (status quo);

b. Prohibiting wire fish traps on the Fore Reef and Reef Flat areas of the sanctuary and allowing wire fish traps elsewhere; and

c. Prohibiting wire fish traps.

NOAA has chosen alternative c as the preferred alternative. This alternative would prevent both physical and ecological damage to the coral formations and resident fish species. Fishermen, although prohibited from laying traps within the 5 sq nm area, could continue to utilize the area seaward of the reef beyond approximately 140 ft and those areas adjacent to Looe Key, along the outer reef tract.

This proposed regulation is slightly more restrictive than that presently under consideration in the draft Snapper-Grouper FMP. This FMP includes a proposed prohibition out to the 100 ft contour. The sanctuary prohibition would extend to the proposed sanctuary boundary at approximately the 140 ft contour.

3. Lobster Trapping

The following alternatives were analyzed for regulating lobster trapping within the proposed sanctuary:

a. Unrestricted trapping for spiny lobster;

b. Prohibiting trapping on the Fore Reef only; and

c. Prohibiting lobster trapping.

NOAA has chosen alternative b as the preferred alternative. This option would prohibit the setting of traps on the Fore Reef consistent with the HAPC special management measure currently proposed by the South Atlantic and Gulf Fishery Management Councils (see Chapter Three). No lobster trapping would be allowed within the core trapezoid area (Loran C Readings points 1, 2, 3, and 4 see map Chapter Three). Lobster trapping would be allowed within the sanctuary on the Reef Flat, Patch Reefs, the Deep Reef and Deep Ridge.

This preferred alternative would protect the most spectacular coral assemblages from lobster trap damage and contribute to protection of spiny lobster as a major predator in the reef system. Restricting this part of the reef system from further human activity would protect a significant habitat for spiny lobster in the area which will, in the long term, benefit the fisheries interest. Completion of the spiny lobster FMP will also contribute to sustaining a viable lobster fishing industry over the long term, but the degree of protection cannot be determined at this time.

An estimated 232,000 lbs. of spiny lobster were caught in the 5 sq nm area in 1978. Personal communication with local residents and fishermen revealed that, most of this catch was taken from outside the Fore Reef and Reef Flat zones. According to interviews with local people, lobster boats avoid shallow coral reef areas, preferring sites with greater maneuverability and open sandy areas on which to place traps. This alternative would minimize the economic losses to the commercial lobster fishermen and regional businesses in the area by permitting fishing to continue in the major portion of the reef area. It would afford site specific protection now to the Fore Reef which will be enhanced by the Spiny Lobster FMP when it is final.

NOAA's Office of Coastal Zone Management (OCZM) and the South Atlantic and Gulf of Mexico Fishery Management Councils (GMFMC) will continue to work cooperatively under their Memoranda of Understanding in their efforts to protect and enhance the Looe Key coral reef habitat and the spiny lobster fishery. Continued monitoring of the area by the NMFS and the Councils would aid in maintaining the stock of a valuable renewable resource, both in the restricted area and in the area adjacent to the sanctuary.

4. Tropical Marine Specimen Collecting

The following alternatives were analyzed for regulating tropical specimen collecting within the proposed sanctuary:

a. Unrestricted collecting (status quo);

b. Restricting tropical specimen collecting to collectors with permits and prohibiting the use of chemicals; and

c. Prohibiting tropical specimen collecting except by permit for scientific and educational purposes.

NOAA has chosen alternative c as the preferred alternative based on information and written comments subsequent to the DEIS. Prohibiting tropical specimen collecting would protect and enhance the tropical fish population at Looe Key, prevent the depletion of ecologically important species, add to the aesthetics of the sanctuary, and maintain and enhance the long term productivity of the Looe Key coral reef for future generations. The Key Largo Marine Sanctuary and the Biscayne National Park prohibit such taking.

The many suitable areas for tropical specimen collectors to catch tropical fish and invertebrates in the south Florida area include shallow inshore areas, inshore coral heads, mid-channel reefs (in the middle of Hawk's Channel), and the entire outer reef. This alternative would thus cause limited economic loss to present commercial collectors. The total economic loss of revenue per year estimated in the socioeconomic analysis for Boundary Alternative #2, would be $25,000 to $43,000 or $80,075 to $137,729 using regional multipliers. At least some of this could be made up by collecting elsewhere. This restriction would not prohibit commercial collecting for scientific and educational purposes with a NOAA permit.

Prohibiting tropical specimen collecting rather than allowing collecting by permit as proposed in the DEIS, would not require the establishment of an administratively burdensome permit system of questionable value and utility.

5. Spearfishing.

The following alternatives were analyzed for regulating spearfishing within the proposed sanctuary:

a. Unrestricted spearfishing (status quo);

b. Restricting spearfishing to devices such as pole spears and Hawaiian slings; and

c. Prohibiting spearfishing and possession of spearfishing equipment.

NOAA has chosen alternative c as the preferred alternative. A primary basis for this alternative is to enhance the quality of recreation experiences by divers, snorklers and observers. Since spearfishing is believed to contribute to wariness in reef fish and to the absence of large predators, this alternative should enhance the return of larger grouper, snapper and other predators to the reef and may, in time, lead to fish becoming less cautious. In addition, it would lessen the human injury potential, the

inadvertent killing of non-edible tropical reef fish species found within the sanctuary, and physical damage to the coral from divers in pursuit of fish. All of the above would help ensure high quality recreational experiences by divers and snorklers.

Although local residents and visitors will no longer have the opportunity to spearfish in the Looe Key 5 mile area, there are many other areas nearby suitable for spearfishing.

This prohibition will cause some revenue loss to dive and charter boat companies who are hired to take spearfishermen to Looe Key. It is difficult to estimate this loss. However, a portion of their revenue also comes from hook and line recreational fishermen and snorkelers/SCUBA divers who only wish to view the underwater coral formations.

6. Historic and Cultural Resources

The following alternatives were analyzed for regulating the taking or disturbance of cultural and historic resources within the proposed sanctuary:

a. Unrestricted tampering with, damage to, or removal of cultural and historic resources (status quo);

b. Prohibiting tampering with, damage to, or removal, except with a NOAA permit for educational and scientific purposes; and

c. Prohibiting tampering with, damage to or removal.

NOAA has chosen alternative b as the preferred alternative. This alternative would protect the submerged historical and cultural resources of the sanctuary. Shipwrecks of interest in and adjacent to the area, particularly the HMS Looe, could be explored and artifacts could be recovered under a NOAA permit. The permit would be based on the educational and research value of the proposed actions. This alternative, however, would not completely preclude reef damage and other disruptions to the marine resources from salvage and recovery operations.

The marine sanctuary program is the only vehicle for designation and preservation of such resources. Under a recent court decision, the Antiquities Act, which provides that the Department of the Interior may designate and protect certain historically important sites, does not authorize such action in relation to antiquities located on the OCS. In addition, neither the Abandoned Property Act nor the National Historic Preservation Act offer protection for valuable marine artifacts.

7. Discharges

The following alternatives were analyzed for regulation of discharges within the proposed sanctuary:

a. Relying on existing Federal regulation (status quo):

b. Prohibiting all discharges; and

c. Prohibiting the discharge of substances except cooling waters from vessels, fish or parts and chumming material, and discharges from marine sanitation devices.

NOAA has chosen alternative c as the preferred alternative.

This alternative would prohibit littering and discharge of solid waste from vessels. It would prohibit the discharge of raw, untreated sewage into the sanctuary. The large number of people using Looe Key has led to a high incidence of litter and trash being discharged overboard. The proposed regulation prohibiting discharging and littering will maintain the areas' overall recreational and aesthetic appeal. It would prevent floating or submerged waste debris such as platic and metal objects.

The Coast Guard regulations prohibit the discharge of untreated wastes within the territorial sea for public health reasons - the presence of swimmers and relatively shallow water. Because Looe Key is heavily used for water contact activities such as swimming and diving and portions have relatively shallow water depths, NOAA has proposed regulations for the sanctuary.

Impacts of the regulation will be minor. Sanctuary users will have to retain trash for disposal at proper facilities. Vessel operators will have to utilize their MSD or holding tanks and will be unable to empty the latter. Fishermen will be allowed to discharge fish or parts and use chumming materials. By not restricting the discharge of cooling waters, this alternative will allow the use of motorized vessels.

8. Anchoring

The following alternatives were analyzed for regulating anchoring within the proposed sanctuary:

1. Unrestricted anchoring (status quo);

2. Prohibiting anchoring on the Fore Reef and encourage anchoring in sand areas elsewhere;

3. Instituting a mooring buoy system; and

4. Requiring the use of sand anchors.

NOAA has chosen alternative b as the preferred alternative. This proposed management measure is consistent with that being proposed for the HAPC in the Coral Reef Resources FMP. Anchor abraision of corals is common in the Fore Reef zone of Looe Key. It is here that anchor chains and lines, primarily from the smaller draft boats anchored in the sand bottom between the coral spurs chafe the adjacent corals. Raising anchors snagged on the coral spurs also has resulted in significant damage. The preferred alternative would protect the Fore Reef by preventing this type of anchor damage. This regulation would result in boats anchoring on the Reef Flat and seaward of the Fore Reef. Recreationists and hook and line fishermen would have to anchor off the Fore Reef and drift into the area of troll or anchor in sand channels of the Fore Reef.

IV. REGULATORY ALTERNATIVES ELIMINATED FROM DETAILED STUDY

A. Regulations for Snorkeling and SCUBA Diving

Snorkeling and SCUBA diving for the purposes of observation, underwater photography, nature study, non-collecting scientific research and educational training were not judged to have the potential for causing significant damage to the reef. Therefore, alternative regulations for these activities were reviewed but not proposed. All sanctuary users are regulated to the extent that they must abide by regulations aimed at protecting the natural system.

B. Regulations for Commercial Fishing Beyond the 5 Square Nautical Mile Boundary Alternative but Inside the 10 Square Nautical Mile Boundary Alternative

Although the northern portion of this area contains extensions of the patch reefs found in the 5 sq nm boundary, the southern portions do not contain any reef comparable to the center portion of the 5 sq nm proposed sanctuary. There is also low probability that the deepest parts of this area include coral communities similar to the Deep Reef within the 5 mile area. It therefore seemed unnecessary to include this area in the proposed sanctuary since the five ecological zones were included in the smaller boundary alternative.

In addition, the Looe Key Onsite Survey indicates that local fishermen depend on the 5 sq nm sanctuary proposal area for approximately one-third of their catch and the area beyond the 5 sq nm boundary for approximately two-thirds of their catch. Regulating commercial fishing within a 10 sq nm area would thus cause considerable economic hardship on local long-term commercial fishermen.

It was therefore determined that the environmental benefits of regulating commercial fishermen to protect the natural resources in this area were not substantial enough to propose regulations.

C. Regulations for Net Fishing

Only 12 percent of the fishermen use nets to catch fish at Looe Key. Netting does not require anchoring and cannot be undertaken close to the coral reefs. For these reasons, alternative regulations for netting were not considered.

D. Regulations for Hook and Line Fishing

Commercial hook and line fishing for yellowtail snapper, mangrove, mutton snapper, grouper, mackerel, some dolphin, pompano and lane snapper occurs primarily along the outer reef track between and including American Shoal and Big Pine Shoal with approximately 24.9 percent of the total catch (671,880 lbs.) coming from the Boundary Alternative 2 area (Onsite Survey). Ecological damage from commercial hook and line fishing does not seem to be a major problem.

The Reef Flat bottom consists primarily of sand, coral fragments, seagrass, algae, and occasional colonies of living coral. As a result, this area can withstand much greater anchoring pressure than the Fore Zone with its well developed coral structure. Because of the substrate and protected location of the Reef Flat, small sand anchors, e.g., Danforth are capable of holding all but the largest boats with a shallow enough draft to enter this zone. Divers and snorklers entering the water can swim through this shallow (less than two meters) area and pass through one of the surge channels of the reef crest and dive on the Fore Reef. Only in rough weather is passage through the reef crest somewhat hazardous. The area seaward of the Fore Reef is less protected but convenient to the Fore Reef and would also be suitable as an anchoring area.

E. Activities Listed In The Designation Document For Which Regulations Are Not Currently Being Proposed

- Alteration or construction of the seabed.

The Army Corps of Engineers (COE) exercises authority over construction and dumping of dredged materials but not the actual dredging. The Bureau of Land Management (BLM) has jurisdiction over dredging activities related to mineral leasing such as sand and gravel mining. However, no other existing Federal regulatory authority has jurisdiction over other activities that might alter the seabed such as dredging. While dredging or alteration of the seabed could lead to damage and destruction of the coral reefs and other habitat within the sanctuary, the likelihood of such activities does not pose a realistic threat to the resources at this time. For this reason NOAA is not promulgating regulations, but listing alteration of the seabed as an activity in the Designation Document, and may issue regulations at a future date if the need arises.

- Bottom trawling and specimen dredging.

Trawling for reef fish at live bottoms in the South Atlantic (off the Carolinas) has proven economically and technically feasible, and it is possible that certain types of commercial bottom trawling may occur off Florida, in areas such as Looe Key, in the future. Gear modifications include rollers, runners or skids which elevate trawls and sleds above the irregular ocean bottom. Even when elevated above the surface, however, various parts of the gear (e.g., rollers, runners, skids, bottom guard-chains, nets and specimen bags) still come into contact with the bottom and benthic organisms.

Various impacts on the environment are associated with bottom trawling and specimen dredging. These include suspension of sediments dislodging or breaking coral and generally degrading the physical benthic environment.

As with alteration or construction on the seabed, the likelihood of bottom trawling and specimen dredging does not pose a realistic threat at this time. Accordingly, NOAA is not promulgating regulations, but listing the activity in the Designation and may issue regulations at a future date if the need arises.

Hook and line fishing requires anchoring and sometimes fishing at night when it can be difficult to set anchors away from coral. However, it appears from personal interviews with fishermen that most boats avoid the Fore Reef to prevent hull damage.

V. SUMMARY OF ANALYSIS OF ALTERNATIVES

The regulatory alternatives were developed in relation to the location and size of the boundary alternatives and the environmental, social economic consequences of such regulations. The detailed analyses of the environmental consequences of these boundary and regulatory alternatives are found in Chapter 4. This section summarizes these detailed analyses in tabular form. The various proposed boundary and regulatory alternatives are summarized in Tables 1 through 5 -- The Alternative Matrices.

Tables 1 through 5 compare the various regulatory alternatives summarizing the impacts of each alternative on the marine resources, and on the human users of Looe Key. Three regulatory alternatives are presented for the control of each of the human activity categories at Looe Key. The regulations representing the status quo or no action are identified by the initials "s.q."

In most cases, the proposed regulations apply to all three boundary alternatives. If the regulation only applies to some but not all three boundary alternatives, then the appropriate boundary alternative is identified at the top of the matrix. "Restricted" regulations indicate a partial but not complete prohibition of the activity (i.e., banning in the one mile area but not in the 5 mile area) or, in the case of anchoring and spearfishing, different ways of approaching regulation of the activity.

The preferred alternative for the regulation of each human activity, outlined at the top of each matrix, is the result of weighing the environmental, social and economic benefits and costs of each proposal as evaluated in each matrix with an X. "Protection" in the context of the matrices means ecological as well as physical protection. For example, by controlling the removal of living coral, the regulation benefits or partially protects the tropical fish and invertebrates belonging to the same ecological system. By prohibiting the use of wire fish traps in boundary alternatives 1 and 2, the regulation would partially protect tropical specimens. In some cases the regulation neither adversely nor positively impacts a marine resource and is therefore rated "Not Applicable."

TABLE 1

ACTIVITY: Coral Collecting

Preferred Alternative: Prohibit the collection of coral, dead or alive within the sanctuary, except by permit for scientific/educational purposes

ACTIVITY: Wire Fish Trapping

Preferred alternative: Prohibit wire fish trapping in the 5 square nautical mile santuary

Environmental Factors	Regulatory Alternatives			Environmental Factors	Regulatory Alternatives		
MARINE RESOURCES	Unregulated	Restricted	Prohibited	MARINE RESOURCES	Unregulated	Restricted	Prohibited
Coral Reef	s.q.			Coral Reef	s.q.	#1, not #2,3	#1,2 not 3
Significant Damage	X			Significant Damage			
Mod. Damage		X		Mod. Damage	X	X	
Low/No Damage			X	Low/No Damage			X
Not Applicable				Not Applicable			
Tropical Specimens (Fish, Invertebrates)				Tropical Specimens (Fish, Invertebrates)			
Fully Protected				Fully Protected			
Partially Protected		X	X	Partially Protected		X	X
Unprotected	X			Unprotected	X		
Not Applicable				Not Applicable			
Lobster/Fish Popul.				Lobster/Fish Popul.			
Fully Protected				Fully Protected			
Partially Protected		X	X	Partially Protected		X	X
Unprotected	X			Unprotected	X		
Not Applicable				Not Applicable			
SOCIOLOGICAL: Controversy				SOCIOLOGICAL: Controversy			
High				High			
Moderate				Moderate		X	X
Low	X	X	X	Low	X		
Not Applicable				Not Applicable			
ECONOMIC: Revenue Loss				ECONOMIC: Revenue Loss			
High				High			
Moderate				Moderate			
Low	X	X	X	Low	X	X	X
Not Applicable				Not Applicable			

TABLE 2

ACTIVITY: Tropical Specimen Collecting
Preferred Alternative: Prohibit tropical specimen collecting except by permit for scientific and educational purposes.

Environmental Factors	Regulatory Alternatives		
MARINE RESOURCES	Unreg-ulated	Restric-ted	Prohib-ited
Coral Reef	s.q.	Partial Permit-ing	#1,2 not 3
Significant Damage			
Mod. Damage	X		
Low/No Damage		X	X
Not Applicable			
Tropical Specimens (Fish, Invertebrates)			
Fully Protected			X
Partially Protected		X	
Unprotected	X		
Not Applicable			
Lobster/Fish Popul.			
Fully Protected			
Partially Protected		X	X
Unprotected	X		
Not Applicable			
SOCIOLOGICAL: Controversy			
High			X
Moderate		X	
Low	X		
Not Applicable			
ECONOMIC: Revenue Loss			
High			
Moderate			X
Low	X	X	
Not Applicable			

ACTIVITY: Spearfishing

Preferred alternative: Prohibit spearfishing and possession of spearfishing equipment

Environmental Factors	Regulatory Alternative		
MARINE RESOURCES	Unreg-ulated	Restric-ted	Prohi ited
Coral Reef	s.q.	Partial limits	
Significant Damage			
Mod. Damage	X	X	
Low/No Damage			X
Not Applicable			
Tropical Specimens (Fish, Invertebrates)			
Fully Protected			X
Partially Protected		X	
Unprotected	X		
Not Applicable			
Lobster/Fish Popul.			
Fully Protected			X
Partially Protected		X	
Unprotected	X		
Not Applicable			
SOCIOLOGICAL: Controversy			
High			
Moderate		X	X
Low	X		
Not Applicable			
ECONOMIC: Revenue Loss			
High			
Moderate			
Low	X	X	X
Not Applicable			

TABLE 3

ACTIVITY: Lobster Trapping

Preferred Alternative: Prohibit lobster trapping on the Fore Reef

Environmental Factors	Regulatory Alternatives		
MARINE RESOURCES	Unregulated	Restricted	Prohibited
Coral Reef Significant Damage	s.q.	#1, not, #2,3	#1, 2, not #3
Mod. Damage	x	x	
Low/No Damage			x
Not Applicable			
Tropical Specimens (Fish, Invertebrates) Fully Protected			
Partially Protected			
Unprotected			
Not Applicable	x	x	x
Lobster/Fish Popul. Fully Protected			
Partially Protected		x	x
Unprotected	x		
Not Applicable			
SOCIOLOGICAL: Controversy High			x
Moderate		x	
Low	x		
Not Applicable			
ECONOMIC: Revenue Loss High			
Moderate			x
Low	x	x	
Not Applicable			

TABLE 4

ACTIVITY: Historic and Cultural Resources

Preferred Alternative: Prohibit tampering with damage to, or removal, except with a NOAA permit for educational and research purposes

Environmental Factors	Regulatory Alternatives		
MARINE RESOURCES	Unregulated	Restricted	Prohibited
Coral Reef			
Significant Damage	x		
Mod. Damage		x	
Low/No Damage			x
Not Applicable			
Tropical Specimens (Fish, Invertebrates)			
Fully Protected			x
Partially Protected		x	
Unprotected	x		
Not Applicable			
Lobster/Fish Popul.			
Fully Protected			x
Partially Protected		x	
Unprotected	x		
Not Applicable			
SOCIOLOGICAL: Controversy			
High			
Moderate			
Low	x	x	x
Not Applicable			
ECONOMIC: Revenue Loss			
High		x	x
Moderate			
Low	x		
Not Applicable			

ACTIVITY: Discharging

Preferred alternative: Prohibit the discharge of substances except cooling waters from vessels, fish or parts and chumming materials and discharges from marine sanitation devices

Environmental Factors	Regulatory Alternatives		
MARINE RESOURCES	Unregulated	Restricted	Prohibited
Coral Reef			
Significant Damage			
Mod. Damage	x		
Low/No Damage		x	x
Not Applicable			
Tropical Specimens (Fish, Invertebrates)			
Fully Protected			x
Partially Protected		x	
Unprotected	x		
Not Applicable			
Lobster/Fish Popul.			
Fully Protected			x
Partially Protected		x	
Unprotected	x		
Not Applicable			
SOCIOLOGICAL: Controversy			
High			
Moderate		x	x
Low	x		
Not Applicable			
ECONOMIC: Revenue Loss			
High			
Moderate			
Low			
Not Applicable	x	x	x

TABLE 5

ACTIVITY: Anchoring

Preferred Alternative: Prohibit anchoring on coral within the core trapezoid area (Fore Reef), initiate research on the use of a mooring system.

Environmental Factors

MARINE RESOURCES	Unregulated	Prohibition on	Mooring System	Require sand anchors
Coral Reef	s.q.	Coral of Fore Reef in #1 & 2		
Significant Damage	x			
Mod. Damage				
Low/No Damage		x	x	x
Not Applicable				
Tropical Specimens (Fish, Invertebrates)				
Fully Protected				
Partially Protected		x	x	x
Unprotected	x			
Not Applicable				
Lobster/Fish Popul.				
Fully Protected				
Partially Protected		x	x	x
Unprotected	x			
Not Applicable				
SOCIOLOGICAL: Controversy				
High		x		x
Moderate			x	
Low	x			
Not Applicable				
ECONOMIC: Revenue Loss				
High				
Moderate		x	x	x
Low	x			
Not Applicable				

CHAPTER THREE AFFECTED ENVIRONMENT

I. MARINE ENVIRONMENT

A. LOCATION

Looe Key Reef is a submerged section of the Florida Reef Tract located 12.4km (6.7 nm) southwest of Big Pine Key in the lower Florida Keys at latitude 24°, 33' north and longitude 81°, 24' west. It is bounded on the south by the Straits of Florida and on the north by Hawk Channel. (See Figure 1)

The Florida Reef Tract extends from the Miami area southwesterly, paralleling the Florida Keys and terminating in the Dry Tortugas. The most seaward portion, or Outer Reef Tract, lies to the east and south of the emergent Keys at a distance of from 4.8 to 11.3 km (2.6 to 6.1 nm). Beyond the outer reef, the bottom slopes gradually for a few miles and then drops sharply to about 900 meters in the trough of Florida Straits.

Although the reef tract extends for a linear distance of approximately 370 km (200 nm), it is actually composed of a chain of individual living reefs separated from each other by considerable areas which do not contain living coral formations. According to Marszalek, et al (1977), approximately 96 km of outer bank reefs occur between Fowey Rocks Lighthouse near Miami and the Marquesas Keys west of Key West, a distance of 270 km. The existence of these living reefs in this latitude is, to a great extent, a result of the proximity of the Florida Current, which carries warm, clear water of normal salinity northward along the seaward edge of the outer reef.

The most extensive living reef areas occur in the northern portion of the tract, while in the southern sector, well developed reefs are generally smaller and are separated from each other by greater distances than those of the northern tract. Between the outer reef and the emergent Florida Keys, there exists a broad, shallow platform with an average water depth less than ten meters. This area is known as Hawk Channel and contains more than 6,000 patch reefs (Marzalek et al, 1977).

B. ENVIRONMENTAL SETTING

Coral reefs occur in clear, tropical waters, and tolerate only minor fluctuations of physical and chemical oceanographic parameters. Kissling (1975) has measured some of these parameters over a four year period for the Looe Key Reef area.

Maximum and minimum amplitudes for the mixed, semidiurnal tides are 80 cm and 20 cm, respectively. Dissolved oxygen content of surface water varies

from 5.2 to 8.4 milligrams per liter, changing with the hour of day and season. Salinity is relatively uniform at 36 to 38 parts per thousand, and pH values vary from 8.1 to 8.5, all of which is well within the optimal range for coral reef development. The area undergoes an annual wet-dry hydrological cycle, with rainfall highest during the summer and fall, and a relatively dry season extending from about December through April. The air temperatures and prevailing wind directions which accompany these weather conditions exert some influence on the reef ecology.

In summer, as is usual in tropical marine environments, and with winds mostly from the southeast, air temperatures may climb to 35°C. Surface water temperatures on the outer reefs then measure usually 30 to 31°C, which is close to optimal for reef-corals (Vaughan and Wells, 1943). In the winter months, winds prevail from the east, northeast, and north, and frost may reach the southern tip of continental Florida, resulting in an air temperature in the Keys only slightly above freezing. These extremes are caused by cold fronts with strong northerly winds. Due to the east-west orientation of the Reef Tract and open passages in the lower Keys, wind-driven winter currents may carry large masses of cold Florida Bay water to the outer reefs and lower water temperature there to less than 20°C. This phenomenon may also be aided by movements of the Loop Current (Marszalek, 1977). Ginsburg and Shinn (1964) observed that reefs occur mainly opposite land where they are less exposed to Florida Bay water. For this reason, reefs are least developed in the widely spaced middle Keys, and the largest reefs are found in the upper Keys, where they are protected from cold Bay water by landbarriers, by their north-south orientation, and close proximity of the Gulf Stream. Measurements of minimum water temperatures made by Vaughan (1918) over a period of 20 years, were 15.6°C. at Fowey Rocks, 18.2°C at Carysfort Reef, and 17.9°C off Key West.

The seasonal drop in water temperature is the most severe natural factor controlling coral reef development in Florida. Although a few species of hermatypic corals endure colder water, most species die at about 16°C (Mayer, 1916), while exposure to about 18°C will block their growth (Mayer, 1914). Although the situation may be different in certain IndoPacific reefs (Glynn, 1977), fluctuating water temperatures that remain below 24°C seem to inhibit prominent coral reef development in the Caribbean Sea (Antonius, 1972). Dr. Antonius, as well as other marine biologists have measured growth-rates of several species of corals in Florida and areas of the Caribbean Sea (Antonius, personal communications). In many cases, coral growth-rates in Florida were found to be only about half or less the values found in central Caribbean reefs. For example, an easily measured growth-rate is that of the staghorn coral, Acropora cervicornis. It is about 10 cm per year in the Florida Reef Tract, but in excess of 20 cm in reefs of the Virgin Islands as well as the Barrier Reef of Belize, Central America (Robinson, personal communication, 1974).

It appears, therefore, that Florida's coral reefs, including Looe Key, could grow only about half as fast as central Caribbean reefs, and any damage done to the coral framework can take twice as long to heal or regrow.

C. GEOLOGY

The bedrock of the Florida Keys is of a dual origin. The Keys from Big Pine Key through Key Largo, are underlaid by Key Largo Limestone, an elevated coral reef of Pleistocene age. According to Hofmeister and Multer (1964), the Key Largo Limestone underlies Miami Beach to the north, comes to the surface at Soldier Key and is submerged beneath the Miami Oolite from Big Pine Key through Key West. The latter formation is an oolitic limestone composed of many small spherites of calcium carbonate. The oolite covers all of the Lower Keys and is thinnest over their southern borders, increasing in thickness to the north (Hofmeister, 1974).

The general consensus regarding the origin of the Florida Keys suggests that about 95,000 years ago, during the last interglacial period (Sangamon), the coral reefs which make up the Key Largo Limestone were a line of patch reefs in the back reef area of a broad reef platform similar to the Florida Reef Tract of today. Hofmeister and Multer (1968) hypothesize that marine and subaerial erosion following the withdrawal of the sea during the Wisconsin glacial period, possibly accompanied by a structural downward tilting or faulting of the area, or both, resulted in the lowering of the platform to a depth of about 23 meters at its seaward edge and progressively less further inland. With the return of the sea, new reef growth began on the eroded platform and continued to the present.

D. FLORIDA REEF TRACT DISTINCTIVE CHARACTERISTICS

As reported by Marszalek, et al (1977):

> "The outer bank reefs are typically elongate features of variable vertical relief which occur at the shallow shelf edge between the 5 meter and 10 meter depth contours. Their long axes form a discontinuous line of reefs oriented parallel to the shelf edge. The northernmost reefs trend N/S and the reefs near Key West E/W reflecting the change in orientation of the arcuate shelf edge. Approximately 56 km of linear bank reefs are located north of Tavernier Creek (at the south end of Key Largo Key), 17 km of reefs in the middle Keys and 23 km in the lower Keys (west of Big Pine Key). A spur and groove system is developed on the seaward face of most of the bank reefs, with the spurs and grooves oriented generally perpendicular to the shelf edge and to the oncoming waves of the Florida Current. Spurs and grooves are best developed on outer bank reefs of the upper Keys and lower Keys; the spur and groove pattern on reefs in the middle Keys is generally less developed and exhibits a more random orientation."

Although the outer reefs are highly variable in their degree of development, several distinctive features are held in common by reefs well advanced in the successional sequence leading to the mature, climax seral stage. These characteristics include:

- the presence of the elkhorn coral (Acropora palmata) at shallow depths. According to Shinn (1963), the spur and groove formations result from in situ growth of elkhorn colonies. A significant proportion of these formations is composed of encrusted rubble and skeletal material, derived from this species, which has been incorporated into the spur and groove system;

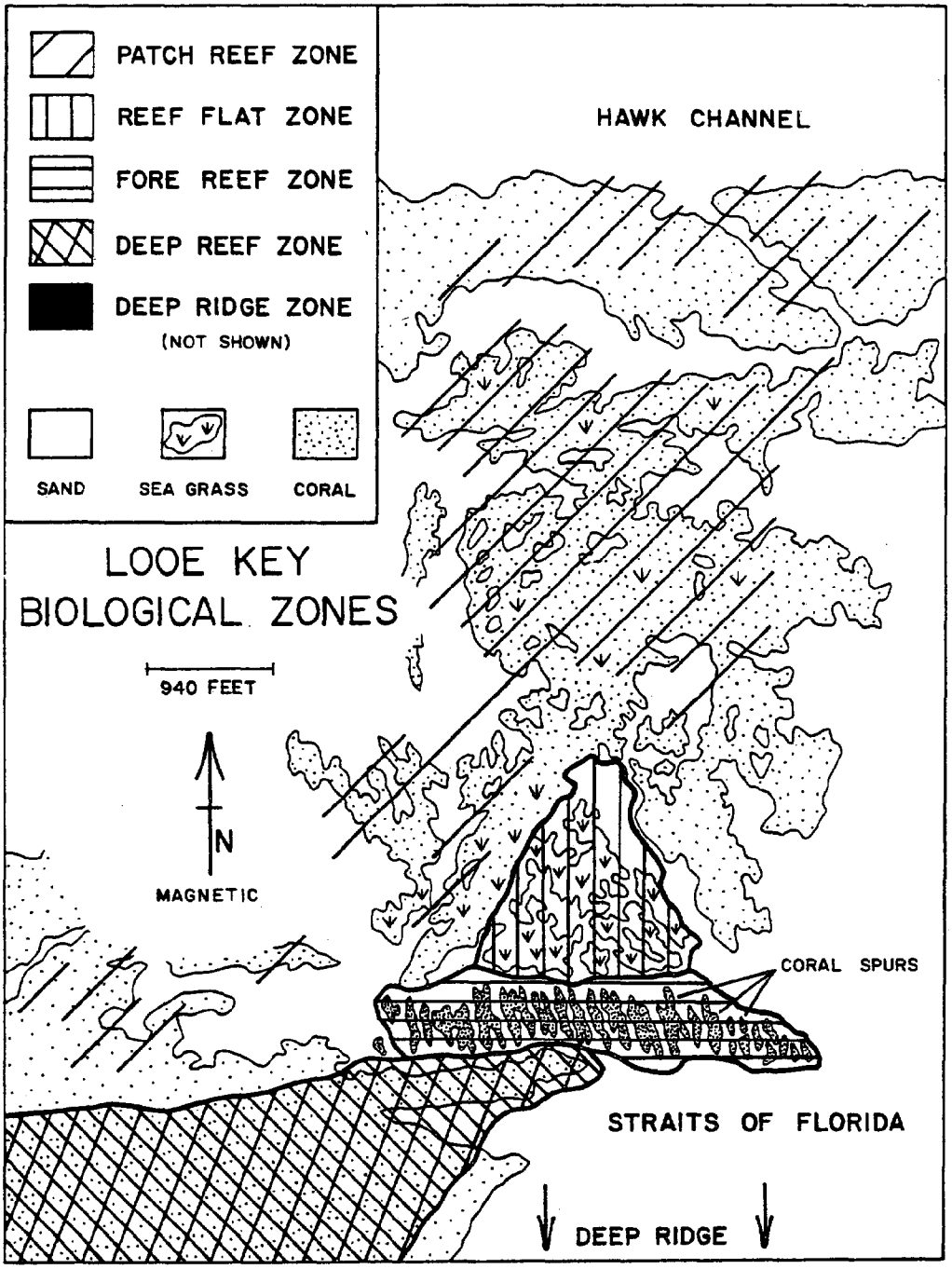
- a vertical coral zonation characterized in the deeper zones of the reef by large, massive heads of brain (Diploria spp.) and star corals (Montastraea spp.) and, in the shallow, more turbulent areas, branching colonies of Acropora (A. palmata and A. cervicornis), several types of fire coral, (Millepora spp.) and extensive colonies of the colonial zoanthids Palythoa and Zoanthus;

- a benthic macrobiota consisting of large populations of the sea urchin (Diadema antillarum, numerous species of cryptic ophiuroids (brittle stars), a diverse group of octocorals (sea fans and sea whips) and sponges and the calcareous green alga Halimeda opuntia;

- a highly diverse finfish fauna. Stark (1967) reported a total of 517 fish species from Alligator Reef, of which 389 are coral reef forms. Many of these fish populations are characteristic of particular zones or specific habitats on the reef while others have been found to be nonselective. There is an apparent dependency relationship between the abundant and diverse fish populations of the Florida Reef Tract and the variety of available habitat in the area, not the least of which is the highly productive seagrass community in Hawk Channel.

Much of the reef's structure is derived from the mechanical and biogenic breakdown of calcareous material. Kissling's analysis (1975) of reef sediments indicate that coral rubble in cobble and boulder sizes represents the vast bulk of reef sediment. Fine sediments result from further breakdown of the coarse material and from contributions by foraminifera, echinoderms, molluscs and calcareous algae.

FIGURE 5


PATCH REEF ZONE
REEF FLAT ZONE
FORE REEF ZONE
DEEP REEF ZONE
DEEP RIDGE ZONE
(NOT SHOWN)
SAND
SEA GRASS
CORAL
HAWK CHANNEL
LOOE KEY
BIOLOGICAL ZONES
940 FEET
N
MAGNETIC
CORAL SPURS
STRAITS OF FLORIDA
DEEP RIDGE

E. LOOE KEY REEF AREA

Looe Key Reef has recently been described in the Looe Key Reef Resource Inventory prepared by the Florida Reef Foundation and conducted by Antonius in 1978. (See app. B, Site Analysis Research Methods.) According to a draft fishery management plan for coral and coral reef resources prepared for the Gulf of Mexico and South Atlantic Fishery Management Councils (1979), Looe Key Reef: ". . . is better known scientifically than most others in South Florida" because of the resource inventory.

The inventory divides the Looe Key Reef area, from an ecological/topographical point of view into five zones: (See Figure 5)

> A Patch Reef area between Hawk Channel and the Looe Key Reef Flat;
>
> The Reef Flat, triangular in shape, with the Looe Key marker in the southeast corner;
>
> The Fore Reef, facing Florida Straits to the south consisting on a spur and groove system;
>
> A Deep Reef area with a drop-off, southwest of the Fore Reef;
>
> A Deep Ridge, separated from the Deep Reef by an estimated 1 km of sand bottom;

The proposed Looe Key marine sanctuary area encompasses all five zones.

All major taxa of reef-dwelling organisms are represented on Looe Key. Inventory data indicate the existence of several hundred species of marine organisms, joined together in the intricate functional web of the reef ecosystem. Ecological diversity on Looe Key reef manifests itself in the existence of distinct natural communities or associations within the reef ecosystem. It is apparent that exchanges of energy and information occur between the various associations, and between the reef biota proper and the adjacent seagrass beds. Both demersal and pelagic fishes move freely throughout the entire ecosystem, and large invertebrates, such as the spiny lobster, are known to travel considerable distances.

1. Dominant Species of the Looe Key Area*

a. Patch Reef

A flat and relatively shallow area of about 8 m in depth stretches from Hawk Channel south to the Looe Key Reef Flat. The area is dominated by a mixed association of marine spermatophytes and green algae. The seagrasses include: turtle grass (Thalassia testudinum) and manatee grass (Syringoduim

* See Appendix B for complete list.

filiforme). The algae, which represent a much smaller biomass than that of the grasses, consist primarily of species of the genera Halimeda, Udotea, and Penicillus.

Due north of the Looe Key Reef Flat are numerous Patch Reefs scattered throughout the seagrass community. Most of these reefs have little profile and generally project up less than 2 m from the shallow bottom.

The algal flora is quite sparse on the Patch Reefs themselves. The coralline red algae Goniolithon sp. and Amphiroa rigida are most abundant.* Scattered clumps of the attached brown alga (Sargassum polyceratium), the red alga (Laurencia intricata), and the green alga (Bryopsis pennata) were observed. This scarcity of algae is a result of grazing pressure by herbivorous fish and invertebrates.

Among the faunal components in all Patch Reefs, octocorals are by far dominant. They not only grow dense enough to give certain Patch Reefs the appearance of the heavily vegetated landscape, but also attain unusual sizes. Among giant sea feathers and sea whips, the largest specimens, close to 2 m in height, are mainly Plexaurella nutans and Pseudoplexaura flagellosa. Compared with prominent main reef structures, the abundance of stony corals is quite low, while sponges are comparatively well represented. Both stony corals and sponges grow here to small or medium size and comprise about an equal share of the Patch Reefs' biomass. The most important species of stony corals in this zone are the hydrocoral (firecoral)(Millepora complanata), the scleractinians (Colpophyllia natans), (Diploria labyrinthiformis), (D. strigosa), (D. clivosa), (Siderastrea siderea), and especially the staghorn coral (Acropora cervicornis) that occurs here with greater frequency than in any other part of the Looe Key Reef. Elkhorn coral (Acropora palmata) is not found in the Patch Reef association. The pillar coral (Dendrogyra cylindrus), is found on several patch reefs. Four colonies of this rare species were located on one patch. One colony was especially impressive with six large pillars rising 1 m from the base, along with several smaller spires adjacent to it.

Frequently observed inhabitants of the patch reefs include: the anemones (Bartholomea annulata), (Condylactis gigantea), and the mat-forming zoanthids (Palythoa mammillosum) and (Zoanthus sociatus); serpulid and sabellid worms, a variety of small crustaceans, especially the arrow crab (Stenorhynchus seticornis). In the sandy and grassy areas adjacent to the Patch Reefs, the echinoids Plagiobrissus grandis, Clypeaster rosaceus, and Diadema antillarum are common. The latter are most abundant at the interface between the reef and the surrounding halo. Summarizing all these data, the sand-sea-grass-reef community of the Patch Reef zone appears to be a lagoon-type reef environment, sheltered from violent wave action by the Looe Key Reef Flat, but subject to a considerable sediment load suspended in the water column during rough weather.

Numerous consumers utilize patch reefs as habitat and feed directly on seagrasses, their epiphytes and associated macro-algae (Ogden and Zieman, 1977).

*See Appendix B for complete list.

According to these authors:

> "Carnivorous fishes (e.g. grunts, Pomadasyidae) resting on coral reefs by day and feeding on seagrass invertebrates by night are largely responsible for the enhanced fish biomass characteristic of coral reefs near seagrass beds. The proximity of seagrass beds to coral reefs provides food for fishes and invertebrates feeding within the beds, shelter for juveniles, and organic material exported to reefs. The primary limit to further exploitation is lack of shelter within the beds."

Thus the patch reef community represents a distinct natural system whose biota is adapted to the environmental conditions of the back reef zone. Continued survival of this system is critical for maintenance of the habitat utilized by numerous fishes and the spiny lobster. Utilization of the patch reefs for shelter from predators allows both juveniles and adults to exploit an enormous and nearby source of energy, the biomass of the seagrass association. Much of this energy, in the form of finfish and shellfish biomass is harvested by both the commercial and sport fishing industry of the Florida Keys.

b. Reef Flat

The Looe Key Reef Flat is roughly in the shape of an isosceles triangle, its base facing south towards the Straits of Florida and the apex pointing landward to the north. On this landward side there is a very gradual transition from the seagrass association of the Patch Reef area into the Reef Flat, marked mainly by the beginning of extensive sand flats and an elevation of the bottom to about 2 m in depth. From here toward the south, the Reef Flat becomes gradually shallower with the main part of the area showing a depth of approxmately 1.5 m. The Reef Flat terminates in a sharply defined rock and rubble zone immediately behind the uppermost rim of the Fore Reef. The water depth in this area is no greater that about 0.5 m. The Reef Flat does not show any profile other than the elevation of seagrass ridges approximately 0.5 m above the sand bottom. The benthos consists primarily of calcareous sand, rubble, coarse sediment and extensive seagrass beds. The latter are vegetated by pure stands of turtle grass, or a mixture of turtle grass, manatee grass, and algae. In some areas without seagrass, the bottom community consists of algae and invertebrates.

The algae, in most area of the Reef Flat, include: species of the genera Halimeda, Udotea, Penicillus, Caulerpa, Rhipocephalus, Cladophoropsis, Dasycladus vermicularis, and several other chlorophycean algae, as well as representatives of the red algal genera Laurencia, Goniolithon, Spyridia, and Chondria. Older blades of turtle grass are almost invariably covered with the red algal epiphyte Melobesia membranacea, and much of the manatee grass was observed to be densely covered with an epiphytic species of Ceramium. Brown algae are represented by species of the genus Dictyota, as well as Padina sanctae-crucis, and Stypopodium zonale. In the rock and rubble sector of the Reef Flat behind the Fore Reef the algal community consists of those species requiring a hard substrate. These include: Goniolithon spp., Lithothamnium incertum, large clumps of Halimeda opuntia, Dictyotota spp., Stypopodium zonale.

Compared to the seagrass and algal cover, the sessile benthic fauna of the Reef Flat has only minor significance. Occurrence of sponges is negligible and the number of stony corals very limited. Specimens are usually small, encrusting, and rather scattered, with the species Porites astreoides, Diploria clivosa, Millepora squarrosa, M. complanata, and Siderastrea siderea, most noticeable. A number of medium-sized coral colonies, mainly of the species Montastrea annularis, Siderastrea siderea, Acropora palmata, and Diploria clivosa, can be found within about a 100 m distance from the seaward terminus of the Reef Flat. Within this belt, several patches, almost a zone, of octocorals occur. Most noticeable is Pterogorgia citrina, the smallest of all Looe Key octocoral species (about 15 cm in height), which grows only on the Reef Flat but is the most abundant species here. The sea fan, Gorgonia ventalina, is a close second, while sea whips are represented by several species of the genera Eunicea and Plexaura and sea feathers by two species of Pseudopterogorgia. Although the number of octocoral species, as well as their size, remains rather small, they nevertheless represent the only benthic faunal component of some significance on the Reef Flat.

Within and adjacent to the seagrass beds of the Reef Flat, the most commonly observed invertebrates include: the queen conch (Strombus gigas); the pen shell (Atrina rigida); the holothurians (Holothuria floridana and Actinopygia agassizii); and the reef squid (Sepioteuthis sepiodea).

The rock and rubble areas of the Reef Flat provide an excellent habitat for small invertebrates. Numerous serpulid and sabellid worms protrude from the surfaces of the eroded rocks, whereas terebellids are commonly found beneath them. Abundant populations of other cryptic organisms, such as brittle stars and small crustaceans abound in this area. Among crabs, the majids (Mithras spp. and Stenorhynchus seticornis), the grapsid (Percnon gibbesi), the xanthids (Leptodius floridanus and Glyptoxanthus erosus), and the portunid (Portunus spinimanus) were most frequently observed. Small gastropod and pelecypod molluscs are to be found in this area in considerable abundance. Echinoderms are prolific, especially ophiuroids. A large population of Diadema antillarum reside in this area. Other echinoids and holothurians were observed but are not common.

c. Fore Reef

The Fore Reef zone of Looe Key is a well developed and especially spectacular formation. Its main portion is a high profile spur and groove system, bordering the Reef Flat in very shallow water and sloping down to a sand bottom in 9-11 m of depth. The whole system, from easternmost to westernmost spur, is about 1500 m long and, at the main center portion, about 350 m wide. There are two associations, or subzones, that comprise the Fore Reef complex.

The shallowest part of the spurs, just below the surface at low tide, could be called the "reef crest". However, at Looe Key it is so narrow a zone (less than 20 m) that it is treated here simply as the leeward end of the spur and groove system. The benthic community of this subzone consists of a massive growth of firecorals, mainly Millepora complanata, but lacks

the elkhorn coral (Acropora palmata) component which is usually characteristic of reef crests. Moreover, this shallow Millepora zone does not form a proper barrier but is transected by many valleys. Several of these are extensions of the seaward grooves, others are transverse channels, running perpendicular to the grooves, thus breaking up the Millepora zone into huge, block-like segments. Sections of the walls and bottoms of these channels are lined with the urchin Diadema antillarum.

Seaward, some portions of the Millepora zone drop abruptly to the rubble-filled ends of the grooves. The sections in between gradually develop into spurs, the tops of which are not deeper than about 2 m, for the first 20 to 30 m seaward. These platform-like "backs" of the leeward spurs, and their almost vertical walls, are two distinctly different biotopes. On top, large areas are covered by soft mats of colonial zoanthids Palythoa mammillosum and Zoanthus pulchellus. Millepora complanata is the dominant stony coral here although single colonies or clusters of elkhorn coral, (Acorpora palmata), are irregularly interspersed. The only substantial concentration of Acropora palmata is immediately seaward of the Millepora complex, exactly where one would expect the highest part of the reef crest to be developed. Close inspection of the reef's framework, on the spur's vertical walls, indicates that the main construction element of the spurs has apparently been Acropora palmata, which today does not seem to be that dominant. Discussions of origin and zonation of spur and groove systems are given by Shinn (1963), and Geister (1977).

Following the spurs seaward, in depth increasing from 3 to 8 m, (= depth of spur's top), one finds a zone which may well be the most important, certainly the most spectacular part of the Looe Key reef. Some of the spurs show a profile here of up to 7 m high, caused mainly by the vigorous construction activity of the "mountainous" star coral (Montastraea annularis). This species builds buttresses of 2 to 3 m in diameter and 4 to 5 m from bottom to top: the vertical walls of these form most of the spurs' steep sides. On top of the spurs, (Montastraea annualaris) is still represented in boulders of 1.5 to 2 m in diameter, accompanied by similar sized specimens which are primarily brain corals such as Diploria strigosa and Colpophyllia natans. Due to the massive nature of the reef-builders in this subzone, there are few holes in the reef framework, consequently allowing little insight into the history of construction.

The last segment of the spurs is a rather flat extension of the proceeding high profile. The spurs' elevation over the sand bottom here is not more than about 1 m, formed mainly by Montastraea cavernosa, which occurs in cone-shaped colonies 30-40 cm in height. Similarly sized specimens of Siderastrea siderea, Montastraea annularis, Colpophyllia natans, Diploria strigosa, D. labyrinthiformis, and Meandrina meandrites also occur here, but are much less frequent.

Among other invertebrates, bivalve molluscs are relatively common in recesses on the surfaces of the spurs, but are almost invariably encrusted and very difficult to distinguish from the background. Gastropods are ubiquitously distributed in this zone. Brittle stars are both numerous and diverse in the Fore Reef; they appear most abundant in recesses and grooves

of the stony corals as well as under and behind rubble. They become quite obvious at night when they expose their arms to feed. At least one species, on Looe Key is bioluminescent and displays pulsating light patterns when disturbed.

The dominant vegetation on the Fore Reef are encrusting species of red algae of the genera Goniolithon, Lithothamnium, and Peyssonellia. Widely scattered small clumps of Halimeda opuntia f. minor. Bryopsis pennata, and Dictyota spp. occur on the tops and sides of the spurs. The distinct paucity of the algal flora found here is probably a reflection of grazing pressure from organisms such as sea urchins.

The Fore Reef zone has by far the greatest numbers of fish. Almost all of the species encountered in the reef system can be found here, with the exception of some deeper water species only observed beyond a depth of 10 m. Two of the most abundant species, found in the Fore Reef zone, are tomate grunts, (Haemulon aurolineatum), and yellowtail snappers, (Ocyrus chrysurus). Absent or rarely seen, according to the Inventory, (Antonius et al 1978) were grey or mangrove snapper, (Lutjanus griseus), and larger serranids, such as black, red and nassau groupers. Black grouper and mangrove snapper, where seen, were usually on the western end of the reef and moving away, out of the range of visibility.

d. Deep Reef

At the seaward edge of the spur and groove system a sandflat begins in about 9-11 m depth, very gradually sloping down with a slight incline. In front of the eastern half of the Fore Reef this sandflat is uninterrupted. At the western half it is intersected by a deep reef, which begins here as a finger-like extension of scattered coral outcrops just beyond the terminus of the spur and groove system. From here a reef flat of 10-12 m depth stretches several hundred meters to the west without showing much profile, representing a comparatively shallow subzone of the Deep Reef.

Towards the south, the Deep Reef gradually changes into a second subzone. Here, the reef flat curves into a slope of increasing steepness with a considerable profile caused by surge channels. In the deepest portion of this subzone, the slope forms a small but true drop-off which ends on a sandflat in about 30 to 35 m depths. In this deepest sector of the Deep Reef, the sediments are quite fine and silt-like and are easily raised up from the bottom.

The shallower, plateau-like part of the Deep Reef is somewhat similar to the previously described Patch Reefs. Octocorals are dominant here, with a very similar species composition to that of the Patch Reefs, but they do not outnumber stony corals here as much as they do in the Patch Reefs. The most frequently encountered octocoral on this part of the Deep Reef is the plexaurid Muriceopsis petila. Sponges are fairly common and grow to larger sizes than in the Patch Reefs. Stony corals do not exceed medium sizes and are scattered in distribution.

Although species composition resembles that of shallower parts of the reef, a number of scleractinians with branching and flower-like growth forms occur on the Deep Reef which are either not present or very rare in more accessible areas of Looe Key. Species of the genera Madracis and Oculina grow in clusters of small finger-like branches while colonies of Mussa angulosa and Eusmilia fastigiata resemble bouquets of densely packed flowers. Disk-like growth forms of striking shape are found amongst many species of Agariciidae and Mussidae, which occur in appreciable numbers at this depth only.

While species composition of stony corals in the deeper parts of this zone remains about the same, the number and size of individual colonies increases, making them the dominant component here. Also with increasing depth, an interesting change in the octocoral fauna takes place. Among Pseudopterogorgia species, P. bipinnata far outnumbers all others, and two deep water species occur only here: the rare, monofilament Ellisella barbadensis, and the abundant, fan-shaped Iciligorgia schrammi.

Among other invertebrates, serpulid worms (Polychaetes) were noted to be common in this area. Only one lobster was observed. The plant community on the Deep Reef consists primarily of encrusting red algae, which become less frequent with increasing depth. In the shallower subzone, an association of green algae can be found, mainly attached to the coarse bottom sediments; they include: Caulerpa spp., Udotea spp., Penicillus spp., Halimeda incrassata, Dasycladus vermicularis, and Rhipocephalus phoenix. Other greens, such as Valonia ventricosa. Halimeda opuntia f. minor, as well as the brown algae Dictyota dichotoma occur frequently on hard substrates.

Fish found only in the Deep Reef zone, according to the Looe Key Reef Resource Inventory (Antonius et al, 1978) were purple reeffish, (Chromis scotti), sunshine fish, (Chromis insolatus), spotfin hogfish, (Bodianus pulchellus), and scamp, (Mycteroperca phenax). Other fish found on the Fore Reef, but more abundant on the Deep Reef were butterflyfishes, hamlets, groupers, blue chromis, and creole wrasse. These distributions appears normal, as many reef species prefer only certain depth zones (Noyes, 1980).

On the seaward edge of the coral reef, partially within the proposed sanctuary boundaries extends a blue water environment, characterized by extremely clear transparent water, due to a lack of phytoplankton. This area is the home of many commercially and recreationally valuable fishes. Along the Florida coast, high populations of these fishes are at least partially supported by the productivity of the reefs and inshore grass beds. Along the reef tract, the large pelagic (open-ocean) fishes feed on bottom fishes and animals which, in turn, have fed on benthic plants and detritus. This short food chain permits more top carnivores to be supported by the extremely high productivity of the reef and inshore environments. Commercially valuable species mostly found in blue water but observed within the proposed sanctuary boundaries are amberjack, grouper, hammerhead shark, king mackerel, spanish mackerel, and cero mackerel. Others which depend partially on habitat within the proposed boundary include dolphin, ballyhoo, and pompano.

e. Deep Ridge

During the summer of 1973, an attempt was made to explore the deep parts of several reefs in the Florida Reef Tract with the "Johnson-Sea-Link" research submersible. At Looe Key, as well as at other reefs, a deep ridge was discovered, separated from the end of the Deep Reef by an estimated distance of at least 1 km of sand bottom (Antonius, 1974).

This Deep Ridge runs parallel to the margin of the continental shelf. It shows very little profile and is only a few meters wide, but is, nevertheless, an outcrop of living coral reef. It lies in about 45 m depth and is formed mainly by plate-like colonies of *Montastraea cavernosa* and several species of Agariciidae, which show considerable sedimentation damage. Also present are deep water octocorals, such as *Iciligorgia schrammi* and *Ellisella barbadensis*, with the latter much more abundant here than on the Deep Reef.

One major significance of this deep ridge formation may lie in its potential for elucidating the geological past of the area. Its biological importance to the total Looe Key reef ecosystem has not been evaluated.

2. Trophic Relationships

Primary production generated by seagrasses and macro-algae on Looe Key occurs mainly in two zones: the Patch Reefs and the Reef Flat. Many of the herbivorous fish populations, as well as numerous invertebrates rely on these seagrass beds both as their primary source of food and for protection. The ecological significance of the interrelationships between patch reefs and seagrass associations has been well documented (e.g., Ogden & Zieman, 1977).

Numerous consumers utilize patch reefs as habitat, but feed directly on seagrasses and their epiphytes, as well as on associated macro-algae. Thus, the Patch Reef ecosystem provides the two most important requirements for the mobile, herbivorous reef fauna: shelter from predators and an unlimited supply of food. The high productivity of areas like this is harvested in the Florida Keys in the form of finfish, lobster, and other shellfish by both the commercial and sport fishing industry.

With regard to feeding relationships, the importance of the coral reef areas proper, (i.e., the reefs in the Patch Reef, the Fore Reef, and the Deep Reef zones), lies mainly in their production of plankton, and, to an unknown extent, excretion of non-living organic material, i.e, mucous.

Transport of planktonic larvae, eggs, spores, and other reproductive entities between the various zones and subzones is probably considerable. Dissolved organics, exocrines and a wide array of other metabolic excretions, originating in any of these natural communities, are distributed throughout the reef by tide and wind-driven currents. *In situ* primary production fixes a certain percentage of the energy requirement of the reef ecosystem. However, imports of energy from adjacent seagrass beds and phytoplankton populations are probably of great importance to the reef's consumers.

Also, an unknown, but undoubtedly significant, contribution of dissolved organic material and particulate detritus is carried to the reef from mangrove wetlands by outgoing tides. The tremendous superiority of coral reefs over other ecoystems in terms of productivity has been documented by Odum (1971).

There is no doubt that all four reef zones (and possibly, also the Deep Ridge), identified in this study, are tied together by trophic relationships, just as the total coral reef ecosystem is tied in with the surrounding ocean. The coral reef - open ocean relationship, is illustrated by the frequent visits to the reef by large schools of jacks, mackerel and other pelagic fishes. These fishes use the reef not only as a feeding ground, but also participate in, and benefit from, the cleaning-mutualistic symbiotic relationship with reef-dwelling finfish and invertebrates (i.e., "cleaning stations").

3. Endangered Species

There have been no reported endangered species in the Looe Key proposal site. Although the Looe Key area is suitable habitat for three marine turtles protected under the Endangered Species Act, no sightings, to date, have been verified. Pillar coral (*Dendrogyra cylindrus*) found in the patch reefs north of the main section of Looe Key was nominated but did not qualify as a federally designated endangered species.

II. SOCIO-ECONOMIC SETTING

A. SOCIOLOGICAL CONDITIONS

The proximity of most of the Florida Reef Tract, including Looe Key Reef, to the Florida Keys in Monroe County makes these reefs accessible to the large numbers of people who are able to drive or fly to the archipelago. The Overseas Highway and its 44 bridges link the Keys to the mainland, and jet air service connects Key West and Marathon to all major American urban areas.

At the present time, 37 of the existing 44 bridges are being replaced, a major new fresh water aqueduct from the south Florida mainland to the Keys is under construction, and extensive additions to the electrical transmission and generation systems for the area are under way. Monroe County statistics indicate that the Keys are expanding rapidly in both permanent, resident population and tourist populations.

The unincorporated Monroe County population (outside Key West, Key Colony Beach and Layton) increased by roughly 30 percent, or from 22,803 to 28,435, between 1970 and 1978 (Monroe County Statistics, p.A-2). In the same period, tourism more than doubled, from 460,800 county tourists to 948,500 (Monroe County Statistics, p.E-1). Not only is tourism in Monroe County increasing absolutely but the county is increasing its share of Florida tourists, up in this period from 2.0 to 3.0 percent.

The increase in population is expected to continue. From a 1978 county population of 54,793, the permanent resident population is expected to reach 55,600 to 56,400 by 1980, 56,700 to 58,400 by 1985, and between 60,900 to 66,300 by 1990, (Monroe County Statistics, p.A-6). This last figure implies that in the next decade Monroe County is expected to grow by 10 to 20 percent.

In the area nearest Looe Key, from Seven Mile Bridge up to and including half of Ramrod Key, the population is expected to grow from 1,833 in 1974 to 5,845 in 1998 (Black, Crow & Eidsness, P.3-4.). Tourism is increasing. Bahia Honda State Park, in the vicinity of the proposed sanctuary, reported a 20 percent increase in visitors during Fiscal Year (FY) 1978-1979. The number of visitors rose from 293,256 in 1978 to 351,700 in 1979. (Bahia Honda Tabulation of Daily Visitors, FY 1978-1979.)

The impending construction of the new water aqueduct is predicted to increase population of the Florida Keys (Black, Crow and Eidsness, Inc., 1976). Construction in the Lower Keys hit an all time high in 1978, as permits for 208 residential units were issued by the county (Monroe County Statistics, p.B-5). The construction industry has clearly recovered from the recession in 1975 and is building as rapidly as before. Overall, the unincorporated Keys saw the housing stock increase by 59 percent in the 1970-1977 period (Monroe County Statistics, p.B-3.). With the new aqueduct, this number should increase.

As the number of persons in the Lower Keys increases, it is likely that the amount of human activity at Looe Key will increase. In addition, with the increasing popularity of SCUBA diving and snorkeling, it can be assumed that the number of persons diving at Looe Key will increase.

B. ECONOMIC CONDITIONS

The economic base of Monroe County has four main elements: (1) tourism (2) commercial and sport fishing, (3) retirement and second home communities, and (4) Federal government operations (military). The remaining segments of the economy center around wholesale and retail trade, services, light industry, trades and government.

Of the nearly 19,500 persons (1976) in the civilian labor force, approximately 40 percent were employed by businesses servicing the over 1 million tourists a year that visit the Florida Keys. The majority of this income is seasonal with peak periods from December to May (Monroe County Statistics, 1979).

Looe Key is widely used by commercial fishermen, public charter boat operators, dive boats, recreational divers and fishermen, and educational enterprises in the lower Florida Keys.

Recreational skin diving has become a significant commercial industry in the Keys in recent years. According to the Skin Diver Magazine, 1979 Reader Survey, 38.8 percent of skin divers (snorkelers and SCUBA divers) traveled to other States to dive. Of that 38.8 percent, 35.6 percent traveled to the Florida Keys in Monroe County. The median amount per diver spent in 12 months on diving trips, according to the survey, was $442.00; the average $718.00. Although expenditures of this nature, i.e., travel, equipment purchases, are not entirely spent in the Monroe County region, some, at least, of the income from these trips is realized by the local economy.

In the last fifteen years, pleasure boat registration almost quadrupled to 8,121 boats in Monroe County. Commercial boat registration rose by a third in the same fifteen years to 2,749 boats. If these trends continue, future human use of the area and all the Keys is much more likely to have a recreational orientation than a commercial one (Mathis et al, p.7, 1979).

The commercial fishing industry is an important source of income and employment. In 1976, Monroe County ranked first in fish and shellfish landings in Florida with fish catch valued at $23,605,000. Of that amount, $19,965,000 came from shellfish and $3,640,000 from fish. Over 18 percent, or about 28 million pounds, of the commercial fish landings in Florida in 1978 were brought into County docks. The 1978 value of Monroe County landings was about $38 million, or nearly 42 percent of the total value for commercial fish in Florida (Monroe County Statistics, 1979).

The continuously increasing population of retirees is not a major influence on the area's economy because most live on fixed incomes (Monroe County Statistics 1979, p.F-1). However, they, and the growing number of second home owners, are the primary stimulus for the relatively small construction industry in the Keys.

The largest single and least seasonal element of the Monroe County economy is the military. In 1976, the Naval Air Station provided 34 percent of all employment and 24 percent of all personal income in Key West, which amounted to almost $49 million.

B. LOOE KEY ONSITE SURVEY

The contribution of Looe Key to the economy of Monroe County can only be approximated. All income and catch information from commercial fishermen and income from commercial recreational businesses of Looe Key is only available at the County or Standard Metropolitan Statistical Area level. To obtain a more accurate socio-economic picture of the Looe Key area, NOAA undertook, through a consultant (SGW), a time limited Looe Key Onsite Survey of human activities and the estimated economic benefits to the Looe Key area from these activities. The information from the survey presented below is a part of the economically affected environment and was used in analyses to determine the preferred alternative.

Like the major portion of the Keys, the economy of the area near Looe Key is heavily dependent on fishing and tourism. The Onsite Survey concluded that commercial fishermen with home ports adjacent to Looe Key derive about 28 percent of their annual catch from the 5 sq nm area surrounding the main Looe Key reef.

1. Commercial Fishing

Using average 1978, Monroe County dockside prices computed by the National Marine Fisheries Service, the Onsite Survey results reported that the 1978 catch within the 5 sq. nm area at Looe Key was worth approximately $755,690 or $7,556.90 per boat/per year. The average annual income per boat for the overall Looe Key area could thus be expected to be $27,000 in 1978 (see app. C, Table 1,2). Comparing this figure based on actual information from the survey interview schedules with the reported average 1976 income per boat in Monroe County of $24,872 (Mathis et al 1979, Table 4), the Looe Key Onsite Survey reported income/per boat was higher. The average survey reported income for commercial fishermen from the Looe Key area was also higher than the estimated income reported by the Lower Keys Chapter of Organized Fishermen of Florida (OFF) at the public meetings in Big Pine Key, Florida. OFF testified, in January 1978, that the yearly catch value from the Looe Key area in 1978 ranged between $300,000 and $500,000. Survey information, as mentioned above, reported $755,690 for just the 5 sq nm area or approximately $255,000 more than OFF's higher estimate.

The differences between published data on fish catch value for Monroe County, the OFF testimony and the Survey data may result from (1) having overestimated the actual fishing boats at Looe Key, or (2) by inflated catch value estimates on survey interview schedules The Survey results, however, are well within the range of probability and appropriate for general economic analysis. Of the estimated $755,690 earned in the 5 sq nm area or Boundary Alternative #2, 61.7 percent came from lobster trapping, 14.5 percent from wire fish trapping, 17.7 percent from hook and line, 5.6 percent from netting and 5 percent from trapping Stone Crab.

To account for income generated by commercial fishing businesses in the Looe Key area other than the direct income earned by the fishermen, a regional multiplier was used. Using the economic value of commercial fishing in Boundary Alternative #2 ($755,690) and the appropriate regional multiplier from the Bureau of Economic Analysis USDC, 1977, the economic effect on the Lower Key economy of the fishing effort was reported to be $1,446,390 in 1978.

2. Commercial Recreational and Educational Businesses

Looe Key Coral Reef has come to be recognized as one of the more popular snorkeling and diving sites in the Florida Keys. Businesses have sprung up to serve the divers and others wishing to take advantage of the high recreational potential of the area.

Revenue from charter dive boat trips appears to be the major income producing activity outside of commercial fishing directly utilizing Looe Key reef. Other income producing businesses, such as marinas and fishing lodges, rent boats and equipment.

The Newfound Harbor Marine Institute on Big Pine Key, a non-profit organization offering one of the most comprehensive marine educational opportunities in the Florida Keys, focuses upon the nearby Looe Key coral reef and other coral assemblages in the general vicinity for year round teaching. Seacamp, a part of the Institute, offers a variety of educational programs to students in the 4th grade through graduate school. Between 5,000 and 6,000 persons participated in the 3 to 30-day programs in 1978.

The Onsite Survey estimated revenue from dive boat trips to be between $150,000 and $250,000 in 1978. This represents income from an estimated 7500 divers who charter dive boats annually, according to the Survey.

Divers charter boats, stay in hotels, motels and fishing lodges, visit restaurants, frequent marinas and purchase air and diving equipment. These economic multiplier effects were taken into account by using a regional service sector multiplier. The multiplier selected for these commercial dive boats was 3,203 (BEA 1977, p. 44). Thus, the total economic value of commercial recreational businesses was estimated to be between $480,450 and $800,750. Almost all of this income was derived from the 5 sq nm Boundary Alternative #2 since the most utilized coral areas were found within the 5 sq nm boundary.

No attempt was made to estimate the economic value of Seacamp and the activities of the Newfound Harbor Marine Institute although its apparently significant economic value was considered in the development of regulations for the sanctuary.

3. Tropical Specimen Industry

A preliminary unpublished draft study of the "Aquarium Reef Fish Industry of Monroe County, Florida" based on 1976 and earlier data (Hess/Stevely) was prepared for the Marine Resource Inventory Monroe County, Marine Advisory Program of the Florida Cooperative Extension Service, and submitted in 1979.

This appears to be the best available information on the Florida Keys tropical specimen industry to date although admittedly it is not a definitive study.

Both the following economic discussion and the Environmental Consequences Chapter 4 analysis of proposed tropical specimen collecting regulations are based largely on this draft study and personal interviews with tropical specimen collectors at Looe Key and in the Florida Keys as part of the Onsite Survey.

Areas of heavy boating traffic and dense coral relief of the reef structure, such as the Looe Key Fore Reef area are not generally considered suitable as collecting areas for tropical fish and invertebrates (Causey, personal communication, 1979). Boats carrying tourists and local residents can easily foul and disconnect lines leading to submerged collectors and their equipment. Dense coral structures offer multiple hiding places for desirable tropical fish species.

The Onsite Survey revealed that some collecting occurred in the Looe Key area. There are six full-time and two part-time collectors in the general area. Their annual income varies considerably, depending on their expertise, the amount and type of work they perform and changeable environmental conditions. Full time tropical specimen collectors fall into two categories; those who sell to wholesalers located along the Keys or large wholesale outlets in Miami, and those who not only collect specimens but package and ship the organisms directly to customers. The latter group's income falls within the higher estimated range of income for collectors (Causey, personal communication, 1979).

Income estimates based on best available but very preliminary information set the overall value of tropical fish and invertebrate collecting in the vicinity of Looe Key at between $105,000 and $175,000. Collecting activities inside the 5 sq nm boundary, according to the Onsite Survey, appear to amount to less than 25 percent of the total collecting. There is some reported activity among the rocky ledges of the Patch Reef zone, but minimal commercial activity in the Fore Reef and Reef Flat zones. Occasional amateur collecting, however, has been observed throughout the five mile area.

Thus the estimated range of income generated within the 5 sq nm proposed sanctuary area is between $25,000 and $43,000. The regional multiplier would increase these amounts to between $80,045 and $137,729.

4. Private Recreational Users

Commercial recreational questionnaires from the Onsite Survey estimated that the average number of daily private boat visits to the proposed Looe Key 5 sq nm sanctuary ranged between a low of 11 and a high of 23 in 1978. If these estimates are correct, then -- assuming 300 days of clear weather -- there were somewhere between 3,564 and 7,008 private boat visits to the reef last year. According to the Onsite Survey, 2,346 to 4,672 of these boats carried an estimated 9,694 to 19,061 divers to Looe Key reef in addition to the 4,500 from commercially chartered dive boats.

By attributing an economic value to these commercial, non-quantifiable activities (see app. C), it was possible to estimate the value of these private non-commercial activities at Looe Key. Using the combined commercial costs of snorkeling, and SCUBA diving, the economic value of the 9,694 to 19,061 private divers in Boundary Option No. 2 was estimated to be between $137,364 and $240,094 in 1978. Using the appropriate regional multiplier, the value of private recreational diving activity to the region was set between $439,976 and $769,021 for the region.

Recreational fishing and sightseeing was valued to be between $27,520 and $93,440. The multiplier effect of this activity would raise the total value of this activity to the region to between $152,200 and $299,288.

5. Summary

The income from commercial and recreational activities is approximately $1,300,000 per year, which, in turn provides about $3,154,000 in business for the area economy.

The economic impacts of human activity in the Looe Key area were considered in the drafting of regulatory alternatives. The approximate income and business volume in dollars is summarized in the following table:

TABLE 6

SUMMARY APPROXIMATE INCOME AND BUSINESS VOLUME

Activity	1978 Income 5 nm Area	1978 Local Economy Value
Fishing		
Commercial (Catch Value)	$ 755,690	$1,446,390 1/
Tropical Specimen Collecting	43,000 (max) Income (gross)	317,729 2/ (max)
Tourism		
Dive charter boats (Commercial recreational businesses)	250,000 (max)	800,750 2/ (max)
Sport fishing, diving, snorkeling (imputed value) (Private recreational businesses)	240,094 (max)	769,021 2/ (max)
Value	$1,288,784	$3,153, 890

1/ Economic Multiplier 1.914 (BEA 1977 p.44).
2/ Enonomic Multiplier 3.203 (BEA 1977 p.44).

III. HISTORIC AND CULTURAL RESOURCES IN AND ADJACENT TO THE PROPOSED AREA

A. A World War II wreck rumored to be a small U.S. Navy utility vessel is located 150 m north of the current marker post. Visible wreckage includes 6 rectangular steel tanks, much corroded, partially buried in the sand, and partially overgrown with small corals and sponges. Assorted beams, fittings and piping are scattered about the area.

B. About 1 km north of the current marker lie the remains of an unidentified wreck, discovered in the 1960's by local salvager, Captain Art Hartmann, who believed it to be the wreckage of the Snow which was in company with the H.M.S. Looe when they both went up on the reef in 1744. The keel and ribs are occasionally visible in the sifting sand at a depth of about 4 m. The British Admiralty records concerning the loss of the H.M.S. Looe state that the Snow was behind the Looe when she went up on the north side of the Reef Flat; it does not appear possible that the remains of the Snow are those discovered by Captain Hartmann.

C. An anchor which could very well be from the Snow has been sighted embedded in a ridge of coral in the mid-section of the Fore Reef spur and groove system.

D. In the shallow basins of the rubble sub-zone between the Reef Flat and Fore Reef, there are several scattered piles of the ballast stones commonly used in the 19th century ships. These occur in identifiable concentration at the southeastern end of the Reef Flat.

E. The wreckage of the H.M.S. Looe lies to the southwest of the current marker post in 4.5 to 9 m of water, within the proposed boundaries of the sanctuary. Some 14 cast iron ballast blocks, which are triangular in cross section, stair-step sided, and characteristic of British men-of-war of that period, lie only partially buried in the sand. These blocks, along with other scattered remnants of the ship's structure, are heavily coral encrusted and partially buried in the sand. When Ed Davidson, a local dive boat captain, examined this wreck site in the company of a State of Florida underwater archaeologist in the summer of 1977, "hand-fanning" revealed fragments of flint, pieces of the original oak timbers, and corroded iron fastenings in the vicinity of the ballast blocks under only 18 inches of sand. Mendel L. Peterson, curator of naval history for the Smithsonian, and Edward Link (Harbor Branch Foundation) visited, salvaged and identified items from the wreck site in 1950-1951. A variety of recovered ballast blocks, cannons, shots, fasteners, pottery, bottles, and coins were shipped to the Smithsonian Institution.

Investigations by Peterson (1955) into letter correspondence, British Admiralty records, court martial proceedings, etc., reveal the following facts about this ship and her fate. The H.M.S. Looe was a 44 gun British frigate, armed with batteries of 6 and 12 pounders, launched in 1706 with a complement of 190 men. She saw varied service as a hospital and convoy ship in mid-career, before being refitted to her original warship configuration and posted to the American Colonies under the command of Captain Utting. She was headquartered at Port Royal in South Carolina and assigned to cruise the Florida Straits in winter.

The Bureau of Land Management of the Department of the Interior is preparing a Submerged Cultural Resource Plan to identify shipwreck sites between Key West and Cape Hatteras out to 200 miles. Additional information on shipwrecks in the Looe Key area will become available as these surveys are completed.

IV. STATE AND OTHER FEDERAL RESOURCE MANAGEMENT PROVISIONS IN ADJACENT AND NEARBY AREAS

Although the proposed sanctuary lies solely within Federal jurisdiction it is adjacent to State waters. There are numerous protected areas adjacent or in relatively close proximity to the proposed boundary. Federal and State management measures for similar resources must be taken into account when planning for sanctuary resource protection and use. Knowledge of related programs will help insure that proposed sanctuary regulations are not duplicative and that they are reasonable, necessary, and complement existing protective measures and that sanctuary education and research objectives take advantage of and enhance other research and education efforts.

Individual regulations of existing Florida Keys Federal and State marine parks and the marine sanctuary at Key Largo reflect the concern for the adverse impacts of commercial and recreational marine activities in the Florida Keys area on the marine system.

Florida State laws protect certain marine species in territorial waters. Most of these same species are also found in waters surrounding Looe Key. Therefore these laws and protective measures are of interest in the consideration of marine sanctuary designation. In some instances, such as the Biscayne National Park, some State marine regulations have been adopted as Federal regulations. Details are found in Appendix D.

The John Pennekamp Coral Reef State Park and Key Largo Coral Reef Marine Sanctuary, located in the upper keys, are actually two preserves, consisting of an area extending out three miles from shore administered by the State of Florida (Department of Natural Resources, (DNR), Division of Recreation and Parks) and a Federally operated sanctuary beginning at the edge of State jurisdiction and extending seaward 5 miles, administered by NOAA's Office of Coastal Zone Management (OCZM) The Florida DNR, Division of Recreation and Parks serves as on site manager for the Key Largo Sanctuary.

State law makes it illegal to possess certain species of "fresh, uncleaned, or uncured sea fan, hard or soft coral or fire coral." The law is considered difficult to enforce because the corals can be quickly killed and bleached on a boat, before a patrolman can inspect the boat (Captain Tingley, Florida Marine Patrol, 1979). The fine of $35.65, set at the present time by a Circuit Court Judge in the Florida Keys, for a misdemeanor of the second degree (prescribed in the statute) is also considered by most as little deterrent to the taking of coral from State waters. The regulation for the John Pennekamp Coral Reef State Park, on the other hand, which states, "It is unlawful to take coral from, or possess it," appears to be the most effective for enforcement.

Spearfishing is prohibited within the boundaries of John Pennekamp Coral Reef State Park, and the salt waters in Monroe County from the Dade/ Monroe County line to and including Long Key. The DNR also has the power to establish restricted areas when safety hazards exist or when needs are determined by biological findings.

The National Park Service at the Everglades National Park, located at the tip of the South Florida Peninsula, has initiated proposed regulations which include restriction of recreational shellfishing and the elimination of commercial fishing within the waters of the Park by December 13, 1985. These proposed restrictions are highly controversial locally.

Biscayne National Park in the northernmost Florida Key is primarily an underwater park although it was designated by Congress, with rules slightly different from a National Park Service park. To establish Biscayne National Monument, the State of Florida and the Federal government agreed that fishing could continue, in accordance with State laws, unless it was determined to be detrimental to the purposes for which the "monument" was established. If so determined, it would be further regulated following consultation with the State.

Commercial fishing and lobster-trapping are legal, as is sport fishing, both by hook-and-line and by spear. Conch and lobster may also be taken by divers, provided they are caught by hand or by hand-held net when in season and provided legal limits are not exceeded. Tropical fish collection is not legal. No fish traps are permitted.

The Park management is also currently experimenting with the use of mooring buoys which mark an area for visitors and offer them an opportunity to tie up to a buoy rather than anchoring in an area which might damage the coral reef. The location of the moorings and educational material about certain unique reefs are discussed in a booklet prepared and distributed by the Biscayne Monument staff.

The National Park Service at Fort Jefferson National Monument, Dry Tortugas, off Key West, Florida, has prohibited the taking or disturbing of any species of coral, shells, shellfish, sponges, sea anemones or other forms of marine life, with the exception of the recreational catch of spiny lobster (*Panulirus argus*) and conch (*Strombus gigas*) which is limited to 2 per person. The use or possession of spears or gigs is prohibited at all times.

With regard to enforcement of these other protected areas varying arrangements exist. Through a joint management agreement with the State of Florida, NOAA and the USCG, the Key Largo Coral Reef Marine Sanctuary and John Pennekamp Coral Reef State Park are patrolled cooperatively by State Park Rangers, and the U.S. Coast Guard (see Appendix D-9). Persons found to be in violation of NOAA regulations are notified at the scene with the issuance of a Coast Guard Report of Boarding (CG Form 4100). Evidence is seized by USCG personnel and appropriate statements taken.

Coral or other materials or organisms mentioned above collected outside of John Pennekamp Coral Reef State Park and Key Largo Coral Reef Marine Sanctuary cannot be transported into these areas without danger of the possessor being fined. This is also true of the Key Biscayne National Park.

The effectiveness of enforcement arrangements at the Key Largo Coral Reef Marine Sanctuary is of particular interest to the Looe Key proposal. Although the Key Largo area is larger and immediately adjacent to an established State Marine Park, its ecological system and the human impacts occurring daily in the sanctuary are very similar to those at Looe Key.

Bahia Honda State Park is in the vicinity of the proposed Looe Key Sanctuary and managed by the Florida State DNR, Division of Recreation and Parks, and located on Bahia Honda Key. The Bahia Honda State Park personnel emphasize the protection of State resources by interpretation of the law to those who use the park rather than by enforcement. The park employs 17 staff and 14 rangers, most without law enforcement authority, whose responsibilities include search and rescue operations in State waters.

The National Key Deer Refuge, Key West National Wildlife Refuge, and Great White Heron National Wildlife Refuge are administered from the National Key Deer Refuge Headquarters by the U.S. Fish and Wildlife Service, located on Big Pine Key, in the vicinity of the Looe Key area. The U.S. Fish and Wildlife Service (FWS) has no jurisdiction in the State waters surrounding the refuges but must maintain boats in order to inspect and manage 90 percent of their lands. The FWS owns and maintains three boats; a 24'x9' workboat, a 26' aqua sport and a shallow water craft (17'). All resources, both personnel and budget, are fully committed to the purposes of the refuge and conversations with the refuge manager indicate that they would not be able to be actively involved in sanctuary management or enforcement.

V. LEGAL STATUS QUO

A. Summary and Analysis

Looe Key is located on the Continental Shelf seaward of the territorial sea and State jurisdiction. A variety of Federal Statutes and regulations apply to activities taking place in the area. Those that apply to activities posing significant threats to the resources at Looe Key identified in the Affected Environment Section are discussed in the present section. Each is examined in terms of its present effectiveness and potential capability in controlling impacts on these resources. In addition, the enforcement responsibility and capabilities of the relevant Federal agencies are examined including their permitting, surveillance and monitoring procedures and the enforcement arrangements among them and with State agencies.

Regulations for the most direct threats from man's activities to the coral reefs such as the taking of coral and anchoring do not presently exist. Until recently such activities were regulated by the Bureau of Land Management (BLM) under the Outer Continental Shelf Lands Act (OCSLA) but a recent decision of the Fifth Circuit held these regulations invalid except in connection with BLM's OCS leasing activities. In addition, currently there is no regulation of the collecting of tropical fish or invertebrates, and little regulation of commercial fishing.

Looe Key is located within the geographical jurisdiction of the South Atlantic Fishery Management Council (SAFMC). As described in this section, the SAFMC is in the process of preparing a Fishery Management Plan (FMP) for Snapper-Grouper Resources, and jointly with the Gulf of Mexico Fishery Management Council (GMFMC), FMPs for Coastal Pelagic Migratory Resources (Mackerel), Spiny Lobster and Coral and Coral Resources. Plans would impose various limitations on the fishing of these resources as detailed below. It is anticipated that the plans will be completed by late 1981.

As drafted, the Coral and Coral Reef Resources FMP will protect all coral within a 1 nm square HAPC (Habitat Area of Particular Concern encompassing the Looe Key Fore Reef) where proposed management measures would protect the resources against such direct threats as harvesting and anchoring and it would prohibit spearfishing in this area. Beyond the HAPC, the FMP proposes to prohibit the harvest of hard coral except under permit for scientific and educational purposes. A limited harvest of soft coral will be permitted.

The Spiny Lobster FMP would impose quite severe limitations on the fishing for this resource, as detailed below. Looe Key is located within the SAFMC's Snapper-Grouper Management Area III. South of Cape Canaveral (mid-depth and inshore) in which various management measures proposed to control these fisheries would apply, as described below. Under the draft Mackerel FMP, specific management measures are proposed for King and Spanish mackerel and cobia.

No FMP's are being prepared for other resources including numerous species of tropical fish with aesthetic but limited commercial value,

invertebrates, and other species which are interrelated in the ecosystem. In lieu of sufficient evidence to warrant preparation of a Tropical or "Ornamental" Reef Fish FMP, the SAFMC and the GMFMC are considering preparing a profile or description of the fishery and resource.

The effectiveness of the draft plans to mitigate the adverse physical and ecological impacts of commercial and recreational fishing on the Looe Key reef cannot be assessed at the present time. However, it should be noted that there are distinct differences between managing fisheries for optimum yield with special reference to food production and recreational opportunities, and managing an ecological system for the protection and maintenance of a coral reef with emphasis on enhancing public awareness and wise use of reef systems, public education, research and assessment. While the measures adopted for each purpose are likely to be complementary, they may not be identical in this situation.

In addition to these more direct threats, the disposal of sewage and trash, primarily by recreational boaters, could threaten the resources. These threats are not considered in any FMP and regulation under other laws is limited as detailed below. Finally the protection of a shipwreck, the HMS Looe, found in the area is desirable and not currently provided.

Pollution from dredging and dredge spoil disposal, ocean outfalls and other point source discharges and from any ocean dumping activities does not appear to pose a realistic threat at least at the present time. The Environmental Protection Agency and the Corps of Engineers have authority under the Clean Water Act and Ocean Dumping Act to address these activities on a case-by-case basis.

Surveillance and enforcement duties for the previously mentioned laws and implementing regulations have been assigned, for the most part, to three government agencies in the Florida region; the U.S. Coast Guard, the NMFS Division of Law Enforcement and the Florida Marine Patrol. This existing enforcement framework patrols the Fishery Conservation Zone, defined as those waters "Seaward of the 3 mile territorial sea boundary to 200 miles." Detailed information on these enforcement agencies is found in Section C--Enforcement (Dennis, 1979).

Eighty percent of Coast Guard missions in Florida deal with search and rescue. The Group Key West Coast Guard ranges along the entire coastline of the Florida Keys with their number one enforcement activity, at the present time, being drug interdiction. Distances between stations and the large territory to be covered makes their patrols for all missions intermittent and infrequent (Dennis, 1979).

The extent to which the Coast Guard, patrolling the Florida Keys, might be able to assist in the enforcement of the marine sanctuary at Looe Key can be judged by the number of personnel and the number and complexity of their present missions. From interviews with Commander Dave Russell, Coast Guard 7th District in Miami, and Lt. Commander Sam Dennis, Commander of Group Key West, it appears that the Coast Guard does not presently have adequate time or personnel to enforce effectively a marine sanctuary at Looe Key.

The enforcement responsibilities delegated by the Secretary of Commerce to NOAA/NMFS are currently administered and carried out by an Enforcement Division in the Office of Fisheries Management (a staff function) and by five separate and independent regional law enforcement organizations (line function) operating under the direction and control of the respective Regional Directors. The National Marine Fisheries Service administrative and enforcement resources are currently limited since available funds and personnel must be spread throughout the 200 mile fisheries conservation zone.

The Florida Keys are part of the Eastern Enforcement Area of the NOAA/NMFS Southeast Law Enforcement region, extending from North Carolina to Key West and including Florida Bay. NMFS primarily investigates and processes civil/criminal violations of the laws within NOAA jurisdiction. The Florida Marine Patrol and the U.S. Coast Guard patrol the waters under Cooperative Agreements entered into by the Regional Director of the NOAA/NMFS Law Enforcement Office in the Southeastern region. This arrangement alleviates the problem of the lack of ceiling points necessary to hire additional Agents for patrol work.

B. Survey of Authorities Relevant to the Protection of Looe Key Resources

1. Fishery Conservation and Management Act of 1976 (FCMA) 16 USC 1801 et seq.

Authority includes:

Managing the 200 mile fishery conservation zone with exclusive U.S. fishery management authority over all fish except highly migratory species.

Promoting domestic, commercial and recreational fishing under sound conservation and management principles.

Review, approval and implementation of fishery management plans (FMP's) to achieve and maintain optimum yield from each fishery.

The GMFMC (Texas, Louisiana, Mississippi, Alabama, and Florida) and the SAFMC (Florida, Georgia, North and South Carolina) will prepare and submit to the Secretary of Commerce, FMP's for each fishery within their geographical area of authority. The Council's FMP's will be implemented by Commerce, after a determination that the Plans are consistent with the FCMA's National Standards, other provisions of the FCMA and other applicable laws.

FMP's being prepared by the GMFMC either unilaterally or jointly with the SAFMC will affect species found and harvested commercially in the Looe Key reef area. These FMP's are:

a. <u>Spiny Lobster Resources Plan</u>:

The latest available draft was circulated August 1979. Key Points: While the spiny lobster management zone "encompasses the offshore areas

from North Carolina to Texas, in practice the commercial and recreational harvest of spiny lobster from U.S. waters is almost exclusively limited to waters off Southern Florida." (DEIS, 1979).

The plan strives to protect the spiny lobster population for future use while allowing harvesting at a rate which approaches the maximum sustainable yield and which provides the optimum economic and social contribution from the fishery. To accomplish this, strict management measures have been recommended including: "a size limit, a closed season, (including a special recreational season), certain gear restrictions, measures to protect 'shorts' and 'egg-bearing' females and prevent poaching, and a measure to encourage a mechanism to minimize conflicts. Limited mandatory statistical reporting will be required by user groups." (Summary Sheet DEIS). The species involved are spiny lobster (*Panulirus argus*) and associated incidental species as follows: smooth tail lobster (*Panulirus laevicauda*); and Spanish lobster (*Scyllarides aequinoctialis*, *Scyllarides nodifer*, *Scyllarus americanus*, and *Scyllarus chacei*).

Negligible economic, social or environmental changes are anticipated, according to the DEIS, due to the proposed action. Impacts of the plan are generally the same as those due to existing state regulatory efforts and current practices within the fishery, since the proposed regulations are almost identical to present State regulations. Enforcement duties for the Spiny Lobster Plan will also be turned over to the State in the event of Plan approval.

b. Draft FMP for Snapper-Grouper Resources

The latest version of this draft FMP (February 1980) reviews (1) the short- and long-range goals of the FMP; (2) the distribution, abundance and present condition, ecological relationships, estimate of maximum sustainable yield, and probable future condition of fisheries within the snapper---grouper complex; (3) the condition of natural and artificial habitats of the stocks and Federal and State habitat protection programs, laws and policies; (5) the history and present efforts of commercial and recreational user groups, vessels and fishing gear; (6) the economic characteristics of the fishery; (7) a description of the business, markets and organizations associated with the snapper-grouper fishery; and (8) a description of the social and cultural framework of domestic snapper-grouper fishermen. Decision Elements for the draft Snapper-Grouper FMP were approved by the Council (August 25, 1980), as follows:

° Management Subunits:

1. Black sea bass

2. North of Canaveral (mid-depth)

Gag grouper	Vermillion snapper
Scamp	Grunts
Red porgy	Speckled hind
Red snapper	Triggerfish

3. South of Canaveral (mid-depth and inshore) Looe Key Area

Mangrove snapper	Inshore groupers
Yellowtail snapper	Grunts
Mutton snapper	Porgies
Lane snapper	

4. Deep Water Complex (throughout range)

Snowy grouper	Golden tilefish
Yellowedge grouper	Black tilefish

° Estimates of the Current Catch by Sub-Unit

1.	Black sea bass	1,605,914 lbs)	to be
2.	North of Canaveral (mid-depth	4,126,116 lbs)	rounded
3.	South of Canaveral (mid-depth & inshore	8,933,199 lbs)	to nearest
4.	Deep water (throughout range)	1,184,770 lbs)	100,000 lbs
	Total catch	15,894,999 lbs.	

° Estimates of Maximum Sustainable Yield (MSY)

MSY is determined to be equal to the best available estimate of the current catch in management subunits 1, 2 and 3 and equal to optimum yield for subunit 4.

° Management Goals:

1. Long range goal: Maximize the economic and social value of the harvest consistent with preventing overfishing of the stocks.

Sub-goals:

° Establish an information system to monitor the status of the snapper-grouper fishery.

° Encourage continued research on the biology and fishery of significant species.

° Prevent further overfishing of those stocks which now may be overexploited.

° Restore, over time, to the optimum level those stocks which now may be overexploited.

° Encourage up to full exploitation those stocks not currently harvested at the optimum yield.

° Encourage protection of existing habitat and the development of new habitat by the construction of artificial reefs.

° Reduce gear and user conflicts.

° Give priority to specific gear in high use, nearshore waters where growth overfishing is demonstrated.

2. Short term goal: Because of the dearth of information about social and economic values of this fishery and the biological status of the stocks, the short term goal is to stablilize harvest while socio-economic and biological data are being obtained.

° Optimum Yield

Optimum yield (OY) in management subunit 1, 2 and 3 is specified as equal to the current (1979) catch OY for subunit 4 is specified as the amount of fish harvested which results in the average length of the catch being no less than the average length at which females mature averaged with the length at which males mature.

° Definition of overfishing

Harvest from any of the four management subunits in excess of the stated OY for that subunit is to be considered overfishing and as cause to restrain the fishery, with the following provisions.

1. The fishery is not to be restrained if the data used to determine OY was faulty.

2. The fishery is not to be restrained if up-to-date biological analysis indicates that the stock can safely sustain additional harvest.

3. The fishery is not to be restrained unless the social and economic benefits to be gained in subsequent years are greater than the social and economic costs which will be incurred in the year of restraint.

° Management measures

1. Special Management Zones

Zones in which special management measures are applicable may be designated. Such designations may be for a stipulated period of time or may be in force until changed by the Council.

The following is a broad spectrum of biological, socio-economic and environmental indicators which the Council will employ to identify zones that may require a special management regime. It should be noted that all of these indicators will be applicable in all situations. The indicators that are applicable in a particular area will be balanced against the objectives established for that fishery before the special management zone designation is made.

Biological

a. Yield per recruit is less than the maximum (the management goals for the fishery will determine the level that is unacceptable).

b. Recruitment is declining (the danger point cannot be precisely quantified).

c. Numerical decline in catch per unit of effort (the acceptable level of CPUE is a subjective economic-esthetic judgement).

d. A change in target species because of a scarcity of the original target.

Socio-Economic

a. Conflicts among user groups (may vary seasonally, during the week, etc.).

b. The real value of the fishery (i.e., adjusted for inflation) is declining.

c. Decline in the level of participation in the fishery (may vary with time of the week or season of the year).

d. Change in the proportion of the total harvest taken by various user groups.

e. Significant increases in participation which may signal impending overcapitalization.

f. Request for special management zones for artificial reefs.

Environmental

a. Physical degradation of the habitat.

b. Biological degradation of the habit (e.g., diseases, predators).

c. Chemical degradation of the habitat.

d. Decline in species diversity.

A. Zoning for Artificial Reefs or Fish Havens

Upon request from the permittee (i.e., holder of COE permit) for any artificial reef or other modification of habitat for the purpose of influencing fishing or fishes, the Council may, after due consideration and within the constraints of the National Standards of FCMA and this plan, designate the modified area and an appropriate surrounding area as a special management zone and recommend that the Secretary promulgate regulations which will further the purposes for which the permittee modified the habit.

B. Zoning for Fishing by Special Gear

In highly used nearshore waters when the fishing pressure placed upon the fish population become greater than the reproductive and/or growth potential the fish population is capable of meeting, the Council may designate a special management zone in which priority will be given to users of specific gear. Competition for the limited resources in areas of intense use will be reduced by giving precedence to use of specific gear and by restraining or prohibiting use of other kinds of fishing gear. Restraints on specific gear for fishing may also be imposed.

1. Catch Limitations

a. Total Allowable Level of Foreign Fishing (TALFF)

Specified as zero.

b. Prevention of Overfishing

The Secretary and the Council will evaluate the desirability of implementing measures to avoid overfishing when the catch from subunits 1, 2 or 3 reaches 60% of OY. In the case of the deep-water subunit, OY is defined on the basis of average length of sexual maturity, evaluation will occur when the average length in the catch of any of the four species is the length at sex reversal for that species.

If after such consultation and evaluation, it is determined that measures are necessary to avoid overfishing, one or more of the following actions may be taken (by plan amendment) to apply for an appropriate period of time.

1) Establish catch limits per vessel per time period.

2) Establish catch limits per fisherman per time period.

3) Designate Special Management Zones which will be closed to fishing for designated species in the management unit. A provision may be made for by-catch of prohibited species in fisheries directed at species not in the management unit.

4) Designate Special Management Zones in which certain designated types of fishing gear may be controlled or prohibited. One or more of the following actions may be taken:

a) Preference will be given to the kind of gear employed by the largest number of users.

b) Preference will be given to the most efficient kind of gear.

c) Preference will be given to recreational users in nearshore waters and to commercial users in offshore waters.

d) Preference will be given to traditional kinds of gear.

5) Establish size limits for designated species.

6) Other actions as may be deemed appropriate.

c. Fishing Year

The fishing year will be the calendar year.

d. Size Limits

Size limits may be implemented (by plan amendment) as a means of attaining the following objectives and may also be appropriate to other objectives.

1) To maximize yield per recruit.

2) To provide an adequate number of males in the population of those species in which individuals start life as females and at a later age change to males.

3) To maximize the dollar value, or some other specified value, of the fishery when value varies with size of fish.

The following procedure will be used to set an appropriate size limit, provided adequate information is available:

1) Estimate the number of undersized fish or the number of juveniles in the catch of the fishery both as it is now prosecuted and at the size which will attain the objective. If the objective is to maximize yield per recruit, the size which will attain the objective will be known in advance. However, the size that will attain the objective of maximizing the value usually will not be known in advance. In such a case a range of sizes that seems likely to attain the objective must be tested to determine the best fit.

2) Estimate the discounted (i.e., present value) flow of the future dollar yield, or other measure of value, from the undersized catch.

3) Choose the size of fish which the preceding analysis demonstrates will maximize the dollar yield or other value from the fishery, considering whether this will provide a desirable allocation among user groups.

2. Vessel, Gear and Enforcement Devices

a. The following measures shall apply throughout the management area:

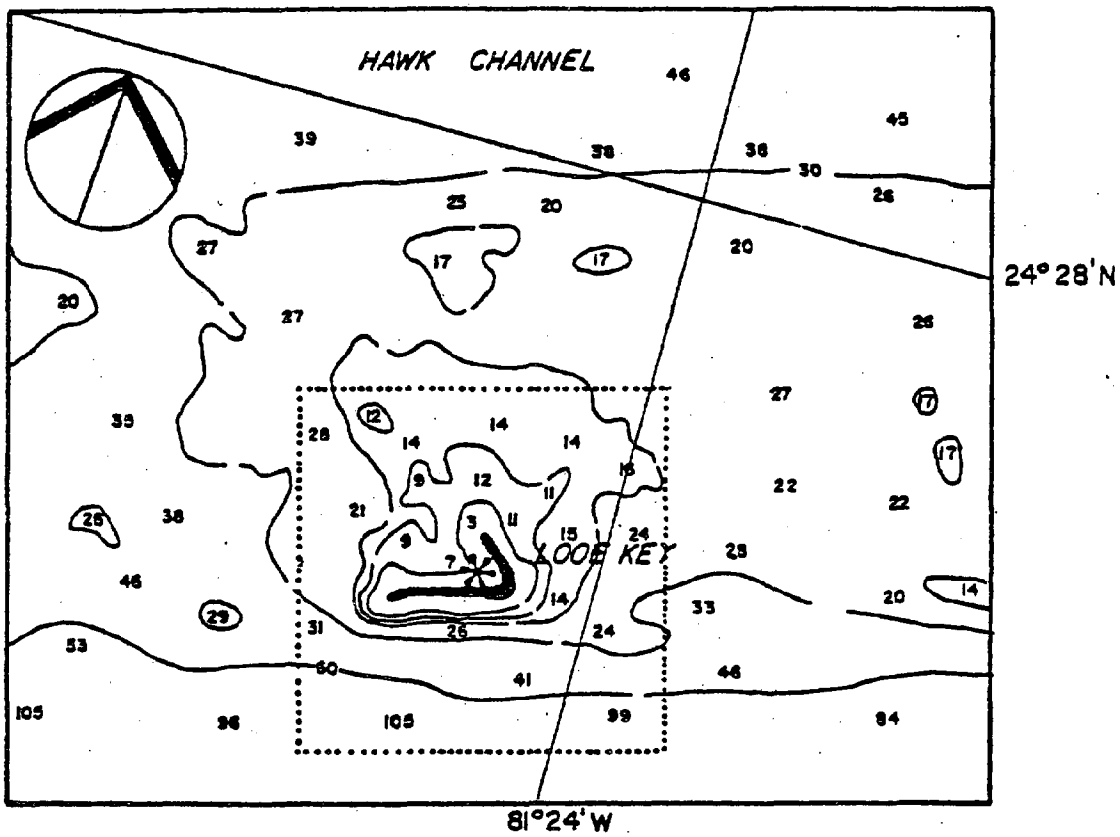
1) Fish traps shall have a degradable panel of appropriate size (at least as large as the entry ports) or degradable door fasteners.

2) Fish traps shall have a mesh size no smaller than 1x2 inches or 1.5 inch hexagonal one year after implementation of this plan.

FIGURE 6

LOOE KEY HABITAT AREA OF PARTICULAR CONCERN

SCALE: 1" = 3000' 1" = .49 nm 1" = .91km



. Location of the Looe Key HAPC, as measured onto the contours of NOAA National Ocean Survey Chart 11445. Square measures 1.852km (1 nm) on each side with a center at the asterisk.

3) An individual shall not fish traps other than his own without the written authorization of the owner.

4) Traps and trap buoys shall be identified with the boat or vessel fishing the traps.

b. The following measures shall apply south of Canaveral in waters shallower than 50 fathoms:

1) Pulling fish traps is prohibited between the period one hour after sunset and one hour before sunrise.

2) Fish traps shall not be larger than 54 cubic feet in volume.

3) The use of fish traps will be prohibited shoreward of the 100 ft. contour.

c. The use of poisons, explosives and powerheads for taking fishes of the snapper-grouper complex is prohibited throughout the management area.

c. Coral and Coral Reef Resources Plan

A Draft Fishery Management Plan for coral and coral reef resources (latest draft March 31, 1980) now under revision is being considered now by the Gulf and South Atlantic Fishery Management Councils.

The FMP concentrates on identifying participating user groups, research organizations, public aquaria owners, and recreational and commercial poachers (without permits), analyzing the resource and the human impacts on it and describing the economic and legal factors involved. The recommended specific management objectives are as follows:

Develop the scientific information necessary to determine the feasibility and advisability of harvest of the coral resource.

Minimize, as appropriate, adverse human impacts on coral and coral reef resources.

Provide for special management for coral habitat areas of particular concern (HAPC) one of which is identified as a one nmi square area which the plan believes "encompasses nearly all of the significant reef zones and spur and groove formations of Looe Key" as identified by Antonius et al (1978). See Figure 6.

Specific management measures now being proposed for the HAPC are:

- no coral collecting within the 1 nm sq;
- within a trapezoidal core no contact with coral or coral reef resources, no collecting of tropical fish, no fixed fishing gear, no spearfishing and no anchoring.

In addition, the draft Coral and Coral Reef Resources FMP proposes to accept the protective regulations already in place for designated areas such as Key Largo Marine Sanctuary, Biscayne National Monument and Ft. Jefferson National Monument. It is therefore possible that if the Looe Key marine sanctuary proposal adequately protects the resources the Councils could determine that additional management measures are unnecessary for the Looe Key HAPC.

In addition, the plan proposes to prohibit harvest of hard coral in the FCZ except by permit for scientific and educational purposes and to allow limited commercial harvest of soft coral.

d. Draft EIS and FMP for Coastal Pelagic Migratory Resources (Mackerel)

The SAFMC and GMFMC have developed and distributed for review and comment a Draft EIS and FMP for Coastal Pelagic and Migratory Resources (Mackerel) (February 1980).

Species within the management unit for which management regulations are proposed include the king mackerel, *Scomberomorus cavalla*, Spanish mackerel, *S. maculatus*, and cobia, *Rachycention canadum*. Species included in the management unit but for which regulations have not been proposed, include the cero mackerel, *S. regalis*, little tunny *Euthynns alletteratus*, dolphin *Coryphaena hippurus* and bluefish, *Pomatomus saltatrix*.

Recommended management objectives for king and Spanish mackerel are:

° Instigate management measures necessary to prevent exceeding maximum sustainable yield (MSY) ["the mathematical estimate for the pounds of resource which can be harvested annually without overfishing the resource" DEIS, 1980].

° Establish a mandatory statistical reporting system for monitoring catch.

° Minimize gear and user conflicts.

° (For Spanish mackerel only) promote the maximum use of the resource up to the optimum yield estimate (the MSY estimate modified by economic, sociological and ecological (biological) characteristics of the fishery and user groups (DEIS, 1980).

The recommended management objective for cobia is to instigate management measures necessary to increase yield per recruit and average size and to prevent overfishing.

Management measures proposed for public review and comment in the DEIS may be summarized as:

° If a conflict arises through expansion of a historical king Mackerel or Spanish mackerel fisheries in a traditional fishing area or region, the Secretary of Commerce (Secretary), after consultation with affected Council and States, may take action to:

(a) separate users or gear by area (fishing zone);

(b) separate users or gear by time (day or week);

(c) assign quotas; or

(d) allow unlimited usage of gear or device.

° If conflict arises through the introduction of king or Spanish mackerel gear or devices into new regions where they have not been historically fished, the Secretary, after consultation with affected Council and States, may take action to:

(a) prohibit use of the gear or device in that region;

(b) allow only limited use of the gear or device;

(c) limit number of units of gear or device; or

(d) allow unlimited gear usage.

° If king mackerel catch exceeds the 37 million pound annual allocation, the Secretary may take action to close the recreational or commercial fisheries, after considering all relevant data and consulting with affected Councils;

° Purchase, sale or processing king mackerel under 25 inches fork length will be illegal;

° All king mackerel nets shall have a 4 3/4 inch minimum mesh size;

° Use of purse seines shall be prohibited in the king mackerel fishery of the South Atlantic except in conjunction with research programs to determine their effect on the fishery;

° After consulting with affected Councils, bag and size limits for king mackerel taken by recreational or recreational-for-hire users or trip limits for commercial users will be instituted when supporting data becomes available;

° A 12-inch fork length minimum size limit will be set on Spanish mackerel in both commercial and recreational fisheries. Taking undersized fish cannot excel five per cent of total catch by weight;

° The Secretary is requested to develop a research program to determine the effect of purse seines on Spanish mackerel;

° Bag limits for Spanish mackerel taken by recreational or recreational-for-hire users and/or trip limit for commercial users will be set when supporting data become available;

° Possession of cobia less than 33 inches fork length shall be prohibited;

° The Councils will "require a reporting system for all user groups and processors based on statistical sampling whereby it would be mandatory for a selected respondant to provide answers to a sample questionnaire on a recurring basis that is not of great frequency;"

° For king mackerel the Councils will require a mandatory trip ticket system for all the for-hire charter and party boats; and

° For Spanish mackerel, the Councils will require a mandatory trip ticket system for a sample of the "for-hire" charter and party boats. (Draft EIS and FMP for Coastal Pelagic Migratory FMP, 1980).

E. Preliminary Management Plan (PMP) for Atlantic Billfishes and Sharks

The PMP for Atlantic Billfishes and Sharks currently prohibits the retention of billfishes and other non-target species taken incidental to directed foreign fisheries for tuna and shark within the FCZ. In the PMP, it is being proposed to extend the 1979 procedures to minimize the capture and subsequent mortality of non-target species in directed foreign shark fisheries by imposing area and gear limitations. This proposal is designed to limit the bycatch of incidental grouper and snapper and other prohibited species.

2. The Outer Continental Shelf Lands Act (OCSLA) 43 OSC 1331 et seq.

Authority: Comprehensively regulate oil and gas leasing, exploration and development activities. Expedite development while protecting the marine environment.

Oil and gas development does not appear to be a realistic possibility in the vicinity of Looe Key and, therefore, does not pose a threat to the resources. More importantly for Looe Key, the OCSLA does not appear to authorize general protection measures except in connection with such activities.

The Department of the Interior has promulgated regulations at 43 CFR 6224.1-1, prohibiting activities directly causing damage or injury to valuable coral communities unless a permit for the activity is first obtained. However, in a recent decision, United States v. Alexander, decided September 24, 1979, the U.S. Court of Appeals, Fifth Circuit, ruled that the authority of the OCSLA is confined to the promulgation of rules and regulations applicable to leasing operations on the OCS and

that, in the absence of a mineral lease operation in a given area, the Department of the Interior is unable to enforce any regulation issued pursuant to it.

The case involved attempts to salvage a sunken vessel (presumably scuttled while transporting narcotics) on the Looe Key coral formation. The salvager damaged coral and was convicted in the District Court. This appeal challenged the authority of the regulation cited above and, as indicated, the Fifth Circuit reversed the conviction, stating "The provision (Section 5(a)) is not, as the Government would have it, an independent source of regulatory authority."

This decision is controlling in the Fifth Circuit which, of course, includes Looe Key and the entire Gulf Coast, as well as the Atlantic Coast of Florida and Georgia. A rehearing has been denied and it appears that the Government will not seek review by the Supreme Court.

3. The Clean Water Act 33 U.S.C. 1251 et seq.

Authority: Restore and maintain water quality.

Section 301 prohibits the discharge of any pollutant into the waters of the contiguous zone or the ocean from any point source other than a vessel without a permit from EPA. The only such discharge likely to occur at Looe Key, however, is a vessel discharge.

Section 311 of the CWA does apply to vessels and prohibits the discharge of oil and hazardous substances in quantities which may be harmful as defined by EPA. The current list excludes, among other things, many items of trash and litter.

Section 1322 regulates the discharge from marine sanitation devices but does not apply beyond the territorial sea (see regulations effective June 1, 1980).

4. Marine Protection, Research and Sanctuaries Act of 1972, Title I, 33 U.S.C. 1411 et. seq. (The Ocean Dumping Act)

Authority: Prohibit the dumping of certain toxic materials into ocean waters and regulate the dumping of other materials into such waters.

Section 101 prohibits the transportation from the U.S. of any material for the purpose of dumping it into waters without a permit from EPA (or the Corps in the case of dredge spoil disposal).

EPA, under Section 1412(c) of this act, pre-selects sites or times at which certain materials may not be dumped and issues permits for the disposal of all materials, with the exception of dredge spoils, which consider the effects of the proposed dumping on marine ecosystems. At the present time, there are no pre-selected dump sites in or adjacent to the Looe Key area.

Permits for disposal of dredged materials are issued by COE, on the basis of EPA criteria for protection of human health and the marine environment. Permits have only been issued in Largo Sound and Key West.

While the disposal of trash and various materials from vessels is not subject to EPA and COE authority, the agencies can regulate disposal of other waste materials in the vicinity of Looe Key.

5. The Endangered Species Act of 1973, 16 U.S.C. 1531 et. seq. (ESA)

Authority: Prohibit the taking of listed endangered and threatened species and ensure that actions "authorized, funded or carried out by Federal agencies do not jeopardize species or critical habitat." The purposes of the act are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved and to provide a program for the conservation of such species.

Although no listed endangered/threatened species have been identified yet at Looe Key, the area contains a number of species considered endangered or threatened by Florida. Furthermore, the area has been identified by the U.S. Fish and Wildlife Service as suitable habitat for the following listed endangered species.

Atlantic Green Turtle----------Chelonia mydas mydas - All coastal and marine habitats.

Atlantic Hawksbill Turtle------Erethmochelys imbricata imbricata - Primary reef habitats.

Atlantic Ridley Turtle---------Lepidochelys kempi - All coastal and marine habitats.

6. The Antiquities Act, 16 U.S.C. 1431 et seq.

Under a recent court decision, the Antiquities Act, which provides that the Department of the Interior may designate and protect certain historically important sites, does not authorize such action in relation to antiquities located on the OCS. The Abandoned Property Act, 40 U.S.C. 310, is similarly limited. The National Historic Preservation Act, 16 U.S.C. 470 et seq., offers protection for marine artifacts once listed but only with respect to Federal or Federally supported activities. The historic shipwreck located at Looe Key is not listed and, even if listed, would not be fully protected from private activities.

C. Enforcement Agencies with Authority in the Federal Waters of the Looe Key Area

1. U.S. Coast Guard

The Coast Guard, as established in 1915, is a military service and a branch of the armed forces of the U S. Its overall authority, to enforce or assist in the enforcement of applicable Federal laws on and under the high seas and waters, comes from Title 14, USC 2.

Primary Duties:

"The Coast Guard shall enforce or assist in the enforcement of all applicable Federal laws on and under the high seas and waters subject to the jurisdiction of the United States; shall administer laws and promulgate and enforce regulations for the promotion of safety of life and property on and under the high seas and waters subject to the jurisdiction of the United States covering all matters not specifically delegated by law to some other executive department; shall develop, establish, maintain, and operate, with due regard to the requirements of national defense, aids to maritime navigation, icebreaking facilities, and rescue facilities for the promotion of safety on, under, and over the high seas and waters subject to the jurisdiction of the United States; shall, pursuant to international agreements, develop, establish, maintain, and operate icebreaking facilities on, under, and over waters other than the high seas and waters subject to the jurisdiction of the United States; shall engage in oceanographic research on the high seas and in waters subject to the jurisdiction of the United States; and shall maintain a state of readiness to function as a specialized service in the Navy in time of war."

The Florida Keys are part of the 7th U. S. Coast Guard District with headquarters in Miami, Florida. Group Key West, based in Key West, Florida, has the enforcement responsibility for the Florida Keys, including the Looe Key reef area.

The extent to which the Coast Guard can provide effective enforcement of marine laws on the high seas depends on the number of personnel, boats and other equipment at their disposal and the complexity of the missions assigned to them.

There are three Coast Guard Stations on the Keys; Key West, Marathon and Islamorada, with less than 75 personnel. Eighty percent of their missions deal with search and rescue operations. Their law enforcement resources are as follows:

Key West:	2 41' boats	- 21 personnel
Marathon:	2 40' boats	- 21 personnel
	several small boats	
Islamorada:	2 40' boats	- 28 personnel

In addition to search and rescue operations, their missions can include:

Enforcement of Customs laws with respect to smuggling (primarily drugs);

Enforcement of Immigration laws with respect to refugees;

Establishing and maintaining aids to navigation in navigable waters and on the high seas;

Environmental clean-up of toxic and hazardous substances in accordance with the Federal Water Pollution Control Act.

Without formal agreement and funding, the Coast Guard makes no scheduled patrols except for those undertaken as a part of their regular patrols. Distances between stations and the large territory to be covered makes these patrols intermittent and infrequent. (Lt. Cdr. Dennis, 1979) The Group Key West Coast Guard ranges along the entire coastline, with the number one enforcement activity, at the present time, being drug interdiction.

2. National Marine Fisheries Service, Division of Law Enforcement, Office of Fisheries Conservation and Management

The NOAA/NMFS enforcement function originated in 1958 under the old Bureau of Commercial Fisheries, evolving from loosely coordinated regional programs responsible for enforcing international conventions, agreements, Federal wildlife statutes and regulations pertaining to certain species of fish, whales and fur seals. This function expanded in the late 1960's to meet the growing demand to control increased foreign fishing effort off the U. S. coast, including enforcement of the newly established Contiguous Fishery Zone(Bartlett Act). As more treaties, agreements and laws with substantial national consequences were implemented, the NMFS law enforcement program necessarily became more essential. Enforcement responsibility substantially increased with the passage of the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973.

The enforcement responsibilities delegated by the Secretary of Commerce to NOAA/NMFS are currently administered and carried out by an Enforcement Division in the Office of Fisheries Management (a staff function) and by five, separate, and independent regional law enforcement organizations (line function) operating under the direction and control of the respective Regional Directors.

The headquarters enforcement organization in Washington, D.C. is responsible for establishing national enforcement policies and procedures but has no direct control over regional law enforcement organizations.

The Florida Keys are part of the Eastern Enforcement Area of the NOAA/NMFS Southeast Law Enforcement region, extending from North Carolina to Key West and including Florida Bay. The Eastern Enforcement Area employs a Senior Resident Agent and one Agent on a temporary appointment in Miami. Their responsibilities include the enforcement of the Fisheries Conservation Management Act, the Marine Mammal Protection Act, the Endangered Species Act, and the Lacey and Black Bass Acts, (prohibiting the transport of materials/products of fish and wildlife, illegally obtained under other laws in interstate commerce).

Their primary mission is to investigate and process civil/criminal violations of the laws mentioned above. The Florida Marine Patrol and the U.S. Coast Guard patrol the waters under Cooperative Agreements entered into by the Regional Director of the NOAA/NMFS Law Enforcement Office in the S.E. region. This alleviates the problem of the lack of ceiling points necessary to hire additional Agents for patrol work.

There is a Basic Agreement with the State of Florida, in effect since July 1, 1975, signed by the Department of Commerce/NOAA for Law Enforcement

Services under the Marine Mammal Protection Act of 1972. The State law enforcement officers are designated by the Regional Director, NMFS, to act as Federal law enforcement agents in the enforcement of the act within the State's jurisdiction or against its own citizens anywhere.

There is a new Cooperative Enforcement Agreement pending between the U.S. Department of Commerce, NOAA/NMFS, the U.S. Coast Guard and the State Department of Natural Resources Florida Marine Patrol for law enforcement services under the Fishery Conservation and Management Act, deputizing State Officers as Federal Enforcement Agents to enforce the act within the Fishery Conservation Zone adjacent to the State and within the boundaries of the State and providing U.S. Coast Guard assistance to the State, should it be available. In exchange, the Department of Commerce, for $78,000, is to provide the State with enhanced communication and data processing capabilities.

The effectiveness of this enforcement arm of the NMFS is limited by lack of staff necessary to patrol the ocean waters within the jurisdiction of the FCMA, Endangered Species Act and the Marine Mammal Protection Act and their forced reliance on other agencies (Florida Marine Patrol and U.S. Coast Guard).

The only law enforcement responsibility in NOAA outside of NMFS statutory responsibility is that of enforcing Marine Sanctuary regulations. However, the only two designated Marine Sanctuaries are enforced by agencies outside of Commerce under contract to NOAA/Commerce (Monitor and Key Largo), at the present time.

3. Florida Marine Patrol

The Florida Marine Patrol, law enforcement arm of the State Department of Natural Resources, has an office and staff (25) at Marathon in Monroe County. The Monroe County Marine Patrol has the responsibility for enforcing all State regulations in State waters on both sides of the Keys; NMFS regulations for marine mammals and NMFS/Fish and Wildlife regulations for endangered and threatened species in Florida Keys State waters; regulations for endangered and threatened species in Federal waters and regulations for the Marine Mammal Protection Act where its own citizens are involved anywhere. Florida Marine Patrol agents are also uniformed officers of the State of Florida and must enforce all State laws, both on land and in the water. The State waters of the Florida Keys include the 3 mile area on both sides of the Keys.

The USCG and the Patrol have verbal agreements to notify one another of possible State/Federal violations.

The extent of Florida Marine Patrol effectiveness in both its statutory and delegated responsibilities depends on adequate staffing and equipment. Informal cooperation between the State enforcement officers and the Coast Guard has increased the effectiveness of both agencies.

CHAPTER FOUR ENVIRONMENTAL CONSEQUENCES

I. INTRODUCTION

In order to discuss the potential environmental, social and economic consequences of various boundary and regulatory alternatives considered by NOAA, human activities were grouped, as follows:

Coral collecting

Commercial fishing

Tropical specimen collecting (tropical fish and invertebrates)

Spearfishing

Anchoring

Snorkeling, SCUBA diving

Removal of Historic and Cultural Resources

Discharges

Regulatory alternatives analyzed for each of these activities range from the legal status quo, i.e. no proposed sanctuary regulations to the banning of the activity within the sanctuary boundary recommended. The discussion of the status quo alternative for each activity contains a description of the existing environmental, economic, and social conditions.

Economic analysis of the regulatory alternatives centers on economic impacts associated with the 5 sq nm boundary alternative. Boundary Alternative #2 was selected for detailed analysis as the preferred alternative because it encompasses the five ecological elements at Looe Key and satisfies the Sanctuary Program objectives.

II. Boundary Alternatives (see Figure 7)

Boundary Alternative	Approx. Area	Ecological Zones (See Fig. 4)
#1	1 nm sq	Fore Reef, portions of the Reef Flat, Deep Reef, Patch Reef
#2 (preferred alternative)	5 sq nm	Fore Reef, Reef Flat, Deep Reef, Patch Reef, Deep Ridge
#3	10 sq nm	All 5 above zones plus additional Patch Reef areas east and west of the reef

A. Boundary Alternative #1 (1 nmi sq 3.5 sq km)

This one nautical mile square alternative corresponds to the Habitat Area of Particular Concern (HAPC) at Looe Key being proposed in the FMP for Coral and Coral Reef Resources by the Gulf of Mexico and South Atlantic Fishery Management Councils (for specific aspects of the plan see Chapter 3, Status Quo).

The coordinates for this boundary alternative are:

a. 24°, 33.4' North
81°, 25' West

b. 24°, 33.4' N
81°, 24' W

d. 24°, 32.2' N
81°, 25' W

c. 24°, 32.2' N
81°, 24' W

This one nautical mile square sanctuary with the center approximately in the middle of the Looe Key Reef Flat would encompass two reef zones of the Looe Key ecological system: the Reef Flat and the Fore Reef. At the southern margin it would contain a narrow band of the shallowest part of the Deep Reef and at the northern rim some very small reef outcrops belonging to the Patch Reef zone. These additions, however, are so limited in area as to be negligible.

Boundary alternative #1 would protect the best developed and unique coral formation of the entire Looe Key reef system from physical impact. The Fore Reef is a spur and groove system about 1500 X 350 meters wide, extending from the low tide mark down to a little over 9m depth (Antonius, 1980).

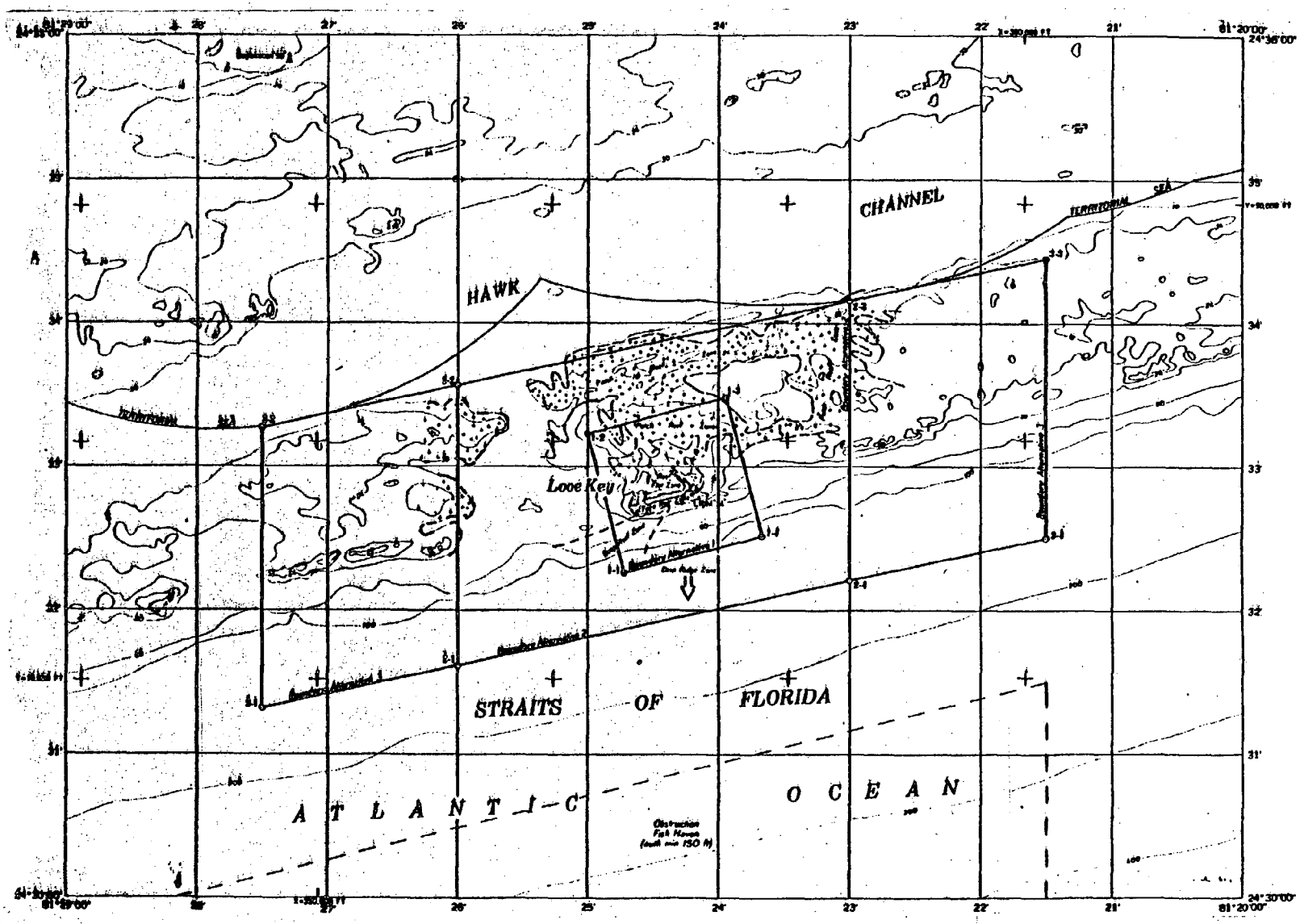


FIGURE 7

LEGEND

1-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 1
2-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 2
3-1 DIGITIZED POINT ON BOUNDARY ALTERNATIVE 3

TRANSVERSE MERCATOR PROJECTION
FLORIDA STATE PLANE COORDINATE SYSTEM - EAST ZONE
NORTH AMERICAN 1927 DATUM
SCALE 1:20,000

UNITED STATES - GULF COAST
FLORIDA
FLORIDA KEYS
LOOE KEY
PROPOSED MARINE SANCTUARY
BOUNDARY ALTERNATIVES

It contains shallow, as well as intermediate, water-depth coral communities but with the obvious lack of a number of species one might expect to occur here. While the shallow "reef-crest-part" of the Fore Reef shows extensive Millepora-Zoanthara fields, the deeper "reef-fingerpart" is a system of alternating sand valleys and several meter-high coral ridges of massive coral growth forms and is populated by the greatest numbers and species diversity of fish in the five zones.

The Reef Flat borders the Fore Reef to the north, a sand-seagrass area about one quarter of a square kilometer in size and an average of 1.5 m deep. It is also an important area offering a large recreational area of sandy reef top, for inexperienced swimmers or families with children. Although the Reef Flat provides little cover and has the lowest species diversity of all the zones, it is an important feeding area for fish of the Fore Reef zone, an integral part of the Looe Key Coral Reef system and very important to a segment of the recreational population.

The channels between the fingers of coral on the Fore Reef are very important to fish migrations from one zone to the other (Zieman & Roblee 1979), and provide essential access to the reef for pelagic species, such as mackerel. Although parts of the deeper sandy channels would be covered by the 1 sq nm alternative, the more distant parts of the channels would not be protected at all to the east and west of the Fore Reef, and Deep Reef Ridge would remain virtually unprotected.

Enforcement of 1 nm sq area would be unlikely as the area is too small for accurate boundary detection, considering the size boat that would be used (Russell, Coast Guard personal communication, 1979). Citing of violators in this alternative could also be difficult. Due to its limited boundaries, violators would have sufficient time to escape as law enforcement officers approach the sanctuary.

In addition there is a question of the wisdom of protecting part but not all of a unit or ecological system such as Looe Key. User activities beyond the 1 nm sq alternative, uncontrolled by the sanctuary manager, could undermine the careful management within the sanctuary. Finally, though the physical aspects of the spur and groove system could possibly be protected with this boundary, that is only one of the sanctuary program objectives.

B. Boundary Alternative #2 - Preferred Alternative

This alternative covers a 5 sq nm (17 sq km) area, the coordinates of which are:

a. 24°, 34' N 81°, 25.9' W	b. 24°, 34.2' N 81°, 23.3' W
c. 24°, 31.6' N 81°, 25.9' W	d. 24°, 32.3' N 81°, 23.3' W

The 5 sq nm alternative encompasses all five ecological zones: Patch Reef; Reef Flat; Fore Reef; Deep Reef and Deep Ridge. It also covers an extension of the Fore Reef to the east discovered only recently as part of the survey work for this EIS.

The Patch Reef zone is a relatively shallow flat bottom area, covered with extensive turtle grass manatee grass. Interspersed among the seagrass beds are numerous patch reefs with very little profile. The Patch Reefs within this zone are usually dominated by densely growing, large octocorals. The species diversity of octocorals on the Patch Reef is greater than that of the Fore Reef and certain octocorals exist only on the Patch Reef. The scattered stony corals reach only moderate size, but nevertheless give the Patch Reefs enough structure to provide shelter for fishes and invertebrates. In addition, the naturally rare pillar coral (Dendrogyra cylindrus) is more likely to be found in the Patch Reef area than at the Fore Reef.

The significance of the Patch Reef zone as a shelter for a variety of finfish and shellfish has been pointed out in a number of publications (e.g., Zieman & Roblee, 1979). Without the protection of the interspersed Patch Reefs, these animals would be unable to use the surrounding seagrass beds as feeding grounds. This zone, together with the even shallower Reef Flat, are Looe Key's nursery for juvenile fishes. In addition, the extensive seagrass beds of both zones constitute the feeding ground for many deepwater fishes migrating to these areas at night.

The Fore Reef provides the deep sheltered channels for these migrations from the Deep Reef to the shallow reef zones, while the much wider channels on either side of the Fore Reef provide access for pelagic species.

The Deep Reef today still harbors territorial fishes such as groupers which, given protection and time, may repopulate the apparently over-fished Fore Reef zone. This could also be the case for conspicuously missing corals which might, in time, repopulate the Fore Reef from the stock that live on the Deep Reef.

The main part of the Deep Reef exhibits a coral community of intermediate to deepwater species, with some coral species growing abundantly here that no longer occur on the Fore Reef. The Deep Reef, on the seaward side, is a slope of increasing steepness, ending in a small dropoff to about 25 to 35 m depth. Numerous surge channels with a profile of up to 1.5 m provide habitat for territorial reef animals such as grouper and lobster.

Since the 5 sq nm alternative contains portions of the Deep Ridge as well as the main four reef zones of Looe Key, it forms a representative "slice of the ecological pie" through the reef tract in this area.

Though Looe Key alone represents a small segment of the Florida reef tract, it is possible that by focusing intensive management on smaller discrete units such as Biscayne National Park, Key Largo National Marine Sanctuary, John Pennekamp State Park, Fort Jefferson National Park, and Looe Key, we can protect enough of the reef tract to achieve a measure of success in insuring long-term viability. In addition, these discrete protected areas are tied together by the broader conservation measures afforded

under the proposed joint Gulf and Coral Reef Resources Fishery Management Plan. All of these entities, together with heightened awareness of the need for close cooperative management strategies, should provide an increased level of protection.

The 5 sq nm boundary alternative would create a sanctuary containing representation components of each reef zone and establish a sanctuary that protects a reef tract system rather than one component. This approach is consistent with the goals and objectives for establishing a sanctuary at Looe Key.

A sanctuary with this boundary would include all of the reefal zones and be "systematic" in scope providing for the maintenance and enhancement of long-term productivity of an entire ecological unit. This boundary alternative would provide a geographic basis for achieving the sanctuary goals:

- To maintain, protect and enhance the quality of the natural, biological, aesthetic and cultural resources of Looe Key Reef system;
- To promote and stimulate marine research efforts directed towards identification and analysis of marine ecological interrelationships.
- To enhance public awareness of the functions of the Looe Key coral reef system.

C. Boundary Alternative #3 (10 sq nm 34 sq km)

This alternative includes an area of 10 sq nm (34 sq km) the coordinates of which are:

a. 24°, 33.3' N 81°, 27.5' W	b. 24°, 34.3' N 81°, 25.4' W	c. 24°, 34.2' N 81°, 23.3' W
d. 24°, 34.7' N 81°, 21.3' W	e. 24°, 31.3' N 81°, 27.5' W	f. 24°, 32.5' N 81°, 21.3' W

This area contains the entire 5 sq nm boundary alternative as well as considerable portions of territory to the east and west (Fig. 4). Information from actual field studies on the areas east and west of the Looe Key reef itself was not readily available. The northern part of these additional areas can generally be regarded as extensions of the Patch Reef Zone, a morphological feature that can be found along the entire chain of the Florida Keys in shallow water and at a certain distance offshore. The southern part of these additional areas, however, does not contain any significant reef. Instead it contains a slope that consists mainly of sand bottom. Whether the deepest parts include any type of coral community, such as the Deep Reef, is not known at present, but the probability seems low.

Enlarging the sanctuary area to 10 square nautical miles could increase the effectiveness of enforcement by making it more difficult for violators to escape undetected before being caught.

The Onsite Survey of Looe Key indicates that local fishermen depend on the 5 square nautical mile sanctuary proposal area for approximately one-third of their catch and the area beyond the 5 square nautical mile boundary for approximately two-thirds of their catch. Therefore posing restrictions on commercial fishing within a 10 sq nmi area would likely cause considerable economic hardship on local long-term commercial fishermen and yet not provide that great an increase in the degree of protection of the reef systems.

III. Environmental Consequences of Proposed Regulatory Alternatives

A. Alternatives Concerning Coral Collecting.

1. Status Quo: Unregulated taking of coral under all boundary alternatives.

The taking of coral in Looe Key is presently unregulated. State regulations do not apply in waters beyond the territorial sea. BLM/Interior regulations previously controlling the harvesting of corals are no longer enforceable in the Looe Key Reef area (see above). The FMP for Coral and Coral Reef Resources is still in the draft stage and the environmental impact statement has not yet been completed. The final plan will not likely be implemented before January, 1981 (GMFMC).

Direct observations (Davidson, 1979) indicate that souvenir coral collecting is an ongoing practice today, and probably the most serious drain of the reef's coral resources. The absence of certain species in areas of the reef that provide accessible, suitable habitat provides circumstantial evidence of the harvesting of these attractive growth forms. There is a strong probability that small finger-like growth forms, such as *Madracis*, *Porites* and *Oculina* species and especially the beautiful flower coral *Eusmilia fastigiata*, which occur on the Deep Reef but not on the more accessible Fore Reef, have been exterminated on the Fore Reef by collectors. A larger type of flower coral, *Mussa angulosa*, is also abundant on the Deep Reef, but rather rare on the Fore Reef. It does occur somewhat more frequently in the Patch Reef zone, which may reflect a difference in visitor-related collecting pressure. One naturally rare species, the pillar coral *Dendrogyra cylindrus*, has almost been exterminated by collectors in the entire Florida reef tract, including Looe Key. Without regulatory protection of existing coral assemblages, remaining populations of these scarce corals in the more accessible areas of the reef could be eliminated. Collecting pressures could then shift to other, less desirable species and to those populations which persist on the Deep Reef and less frequented Patch Reefs.

A significant degree of commercial collecting does not occur here any longer (Causey, personal communication, 1979). The long term consequences of depletion and removal of entire species populations has been insufficiently studied, but is considered by most scientists to be detrimental to the reef ecosystem. The current draft of the FMP for Coral and Coral Reef Resources proposes to approve for harvest by permit limited quantities of certain

soft coral species and to issue coral collecting permits for hard and soft coral for scientific and educational purposes. It proposes to prohibit all taking of corals within the suggested 1 sq nm Habitat Area of Particular Concern.

The perpetuation of the status quo would allow all coral collecting to continue unless and until the FMP is approved and implemented. This could result in adverse ecological consequences to the reef system and to those valuable commercial and recreational species depending on it for habitat.

2. Prohibit the collection or possession of all coral, living or dead within the sanctuary under all boundary alternatives but permit the collection of coral for scientific and educational purposes: PREFERRED ALTERNATIVE.

This alternative would protect present and future coral resources while permitting coral specimen collecting for educational and scientific purposes under permit from NOAA. Since the current level of commercial coral collecting is insignificant in the proposal area the economic impact of this alternative will be negligible. The proposed restriction is more stringent than that being considered in the Coral FMP in that the latter permits limited harvest of soft coral outside the 1 nm sq HAPC.

NOAA personnel would be needed to review the permits required by this alternative thereby increasing the staff workload and detracting from other duties. This alternative would also increase the responsibilities of enforcement personnel.

A regulation similar to this proposed for the sanctuary is presently in force in John Pennekamp State Park and in the Key Largo Marine Sanctuary. As discussed in Chapter Three, the inclusion of a provision prohibiting possession of coral, dead or alive, within the proposed boundaries has resulted in few enforcement difficulties within these two protected areas. On the other hand, Florida State law, applicable in the territorial sea, does not prohibit possession of cleaned or cured specimens of sea fans, hard and soft corals or fire coral and enforcement difficulty has arisen because these organisms can be quickly killed and bleached on board ship before enforcement agents can board for inspection (Tingley, personal communication, 1979).

Protecting the Looe Key coral reef system by prohibiting the taking of coral except for scientific and educational purposes will:

- maintain the coral as an important producer of sand, a renewable resource which comes from dead coral,
- maintain the high primary productivity which produces oxygen for the support of organisms living in the vicinity;
- maintain these reefs as gene pools for future colonization of adjacent coral areas;

- preserve a reef, which, if seriously degraded, might not recover since today's environmental conditions may be different from those existing at its inception;

- provide the structural foundations for future coral growth;

- pose limited enforcement difficulties;

- maintain the reef habitat thereby maximizing associated recreational benefits such as quality of diving, and fishing.

Since insignificant commercial collecting occurs within the boundaries of the sanctuary proposal, this regulation will not have an economic impact. OCZM will work closely with the Fishery Management Councils to insure as nearly as possible compatible non-duplicative permitting procedures. If Looe Key becomes a sanctuary and if NOAA consultation with the Council takes all its concerns into account, the sanctuary permit could be the only one required.

3. Prohibit the collection or possession within the sanctuary of all coral, living or dead, under all boundary alternatives.

This alternative would fully protect the coral reef system at Looe Key from coral collecting and would not place an additional administrative burden on the Sanctuary Programs Office (SPO) staff. However, one of the proposed sanctuary objectives is to promote research and study of the natural resources of Looe Key and a prohibition of this type might discourage valuable studies requiring the taking or study in the field of small numbers of specimens.

B. Alternatives Concerning Commercial Fishing

Environmental consequences of wire trapping, lobster trapping, net and hook and line fishing were analyzed to determine whether or not proposed restrictions were warranted. Available data do not support controls on net and hook and line fishing at this time (see Chapter 2, VI). The following specific alternatives were considered for wire trap usage and lobster trapping.

1. Regulatory Alternatives for Wire Trap Fishing

a. Status quo: Unrestricted use of wire traps within all boundary alternatives.

Recently wire trap fishing has become a highly controversial and emotional issue. Unfortunately very little documented evidence exists regarding actual or potential environmental, sociological and economic impacts of trap usage.

Both the draft FMP for snapper-grouper resources and the first quarterly report (November 1979 - January 1980) on the wire trap fishery conducted jointly by the Florida Department of Natural Resources (FDNR) and the National Marine Fisheries Service (NMFS) offer information relating to wire fish trapping in the Florida Keys. The latter report, the most recent information available, represents data from the first 3 months of the 12 month study.

At present, no regulations govern the use of wire fish traps in this area. However, several management measures on the use of traps are proposed in the draft FMP for snapper-grouper resources, including: (1) traps will have degradeable panels of appropriate size (at least as large as the entry ports) or degradeable door fasteners; (2) traps will have mesh no smaller than 1x2 inches or 1.5 inch hexagonal; (3) trap and buoys must be identified with the boat of the owner by a color code; (4) a person must not fish traps other than his own without written authorization of the owner; (5) pulling traps is prohibited between the period one hour after sunset and one hour before sunrise; (6) traps may not be larger than 54 cubic feet; and (7) the use of fish traps will be prohibited shoreward of the 100 foot contour. Measures 1, 2, 6 and 7 are conservation oriented. The purpose of the degradeable panel is to prevent lost or "ghost" traps from continuing to capture fish. Specification of a minimum mesh size is intended to provide for escapement of juvenile fish. The draft FMP includes that a reasonable limitation on the size of traps and on the areas where they can be deployed is warranted at this time to lessen user group conflicts and until the biological, social and economic impacts of the gear can be more fully evaluated. Measures 3, 4 and 5 are intended to discourage poaching and theft and will improve the enforceability of the other management measures pertaining to the trap fishery.

According to the first quarterly report, wire fish trapping in Monroe (and Collier) Counties is a popular fishing method. Although it has been used intermittently since the Depression, the use of wire traps for commercial fishing is relatively new. According to the Florida Sea Grant, their general acceptance in the Florida Keys started in 1976-77.

The traps are constructed of vinyl-covered welded wire mesh, usually with openings of 1"x2" or larger. The FDNR report and draft Reef Fish Plan indicate that traps typically have overall dimensions of 2'x3'x4' (FDNR, 1980) to 3'x6'x3' with a base of 18 square feet. On the other hand, the Marine Wilderness Society in Florida has reported that wire traps can cover from 25 square feet to as much as 40 square feet of bottom area. Fish traps commercially available in the South Florida area can be purchased with as much as 120 cubic feet in volume. The draft Reef Fish FMP proposes to restrict all fish traps fished within the FCZ to 54 cubic feet or less in volume.

The draft snapper-grouper FMP also indicates that traps are typically set at depths of less than 30 to 150 feet (9.14m-45.75m). The first quarterly report of the Florida DNR substantiates this and indicates baited traps are individually buoyed and normally placed 100'-150' apart in water from 25' to 150' deep. Some of the small, shallow water operators can visually select the area to place each trap. Deeper water fishermen rely on fathometers to locate "good bottom" and then deploy their traps in a line adjacent to the relief. Most fishermen in the Lower Keys and Tortugas fish in depths of 80' to 150'. Others report that the normal fishing depth is between five and 45 m (Sylvester and Dammann, 1972; Monro, 1974) in the shallow reef areas of Florida.

The FDNR report observes that the most desirable bottom for setting traps has various ledges with 2'-4' relief with live gorgonians, sponges, and heads of hard coral and which extend in any one direction for 100' or more. A habitat of this type is fished heavily for 2-3 days, and then the traps are moved to some other likely spot. If this ledge area was a good producer, the fishermen will return two weeks later and again fish it for 2-3 days. There are three areas in the Florida Keys that are supporting fish traps continuously, at least for the first quarter of this study. These areas are: the area immediately surrounding Sombrero Light off Boot Key (Middle Keys), the area adjacent to the whistle buoy south of Loggerhead Light (Dry Tortugas), and the area adjacent to the Big Pine shoals off Big Pine Key (Lower Keys).

Conclusive data on the number of fishermen in the area that use traps and the extent of the increasing use of traps is not available. During the first quarterly report period, FDNR reports that the wire trap fishery in Monroe County involves approximately 43 boats, with the crew consisting normally of a captain/owner and a single mate. Several small boat, nearshore operations were conducted by a captain only. Twenty-two of the 43 captain/owners are part-time trappers who also fish lobster or crab traps or engage in other types of fishing activity. Seven of these trappers engage in wire fish trapping only during the summer when the lobster and stone crab seasons are closed. These 43 fishermen utilized an estimated 998 traps (an average of 23/boat).

National Marine Fisheries Service (NMFS) estimates are greater than the figures obtained by FDNR. NMFS estimates that in Monroe County 8,000 traps maximum were used by fishermen in 1978 and that 300 to 350

vessels were involved. Data obtained during the Onsite Survey revealed that in 1978 nearly 35% of commercial fish landings in the 5 square nautical mile area were from wire traps (see Appendix C, Table 3).

According to Florida DNR, fishermen in the Florida Keys trap fishery operate vessels that range from 34 ft. wooden vessels constructed in Cuba of jubilla wood to a modern 75 ft. steel hull with freezers. Most vessels have hydraulic pot haulers, fathometers and either loran or radar, although several of the smaller vessels have neither pot haulers nor any positioning device.

Since fish traps are normally placed on or adjacent to the ledges of out croppings of 2'-4' relief, wire trap fishermen come in close contact with other users who are competing for this limited bottom area. For example, sport trollers' rigs become entangled in trap buoys, and bottom fishermen lose gear by becoming entangled with the traps. Physical damage to coral species has occurred when these traps have been dropped on corals, dragged across the bottom during retrieval and tossed about during rough weather (personal communication, Davidson, 1979).

Sport divers also report that traps on shallow reefs capture and kill excessive amounts of tropical reef fish and at the same time destroy living coral. Fish trappers on the other hand, have stated that their traps are not set on the tops of biologically productive reliefs, but adjacent to these formations. These fishermen also reported that the majority of reef tropicals and undersized groupers and snappers are returned to the water immediately with little detrimental effect.

Traps lost by separation of the buoy line from the trap either by vandals, propellors or storms are called ghost traps and continue fishing for unknown periods of time. The number of lost traps per fisherman per year ranges from 30% to as high as 200% of the total of traps being fished (FDNR, 1980).

One diver on Big Pine Key reports that on a recent dive around Big Pine shoals, several ghost traps were in his field of vision at any given time as he progressed down the reef in 50 feet of water. Further research needs to be done to determine the numbers of ghost traps, their life span, and their ability to catch and retain fish (FDNR, 1980).

The FDNR study, also observed that less than 10% of the total fish caught by wire traps were dead or injured. The most commonly found dead fish were barracudas and large jacks. The most common trap-caused injury was the abrasion of the snout followed by gas embolism which is caused by the rapid ascent through the water column. The report did not measure, however, how many and what species of smaller fish were caught and eaten during the period of captivity.

As part of this study captured species were categorized as target or non-target depending on whether or not the fish were landed for human consumption. Primary target species consisted of large (3.0 lb. whole) black, red, Nassau, yellowfin, scamp, gag and hind groupers; button,

yellowtail, lane, silk, dog and schoolmaster snappers that were larger than one pound gutted; hogfish larger than one pound; jolthead and knobby porgies larger than one pound; margate, black margate and sailor's choice grunts larger than one pound.

Small groupers and snappers were normally returned to the water during this period of observation. Non-target species were considered to be tangs, angels, butterflies, parrots, wrasses other than hogfish, triggers, files and trunk fish and were discarded by most fishermen.

During the three months of this project, the investigators observed the capture of 1568 target fishes of 29 species and 136 spiny lobster. These amount to 61.4% of the total number (2552) and 72.9% of the total weight (5164.6 lbs) of individuals of 48 species and accounted for 38.6% of the total number and 27.1% of the total weight of individuals sampled.

The 10 most abundant species (3 groupers, 1 snapper, 2 porgies, 2 grunts, 1 angel, 1 tang) accounted for 58.7% of the total number of all individuals and 61.02% of the total weight of all individuals. Groupers (358 individuals weighing 2958.23 lbs) account for 14.0% of total number of all individuals sampled and 57.3% of total weight of all individuals sampled.

The study by the Florida DNR and the NMFS hopes to help resolve the controversies surrounding wire trap use and facilitate management decisions on the fish trap industry. In the meantime often cited disadvantages include:

(1) financial success depends entirely upon unstable market demands, supply, and price;

(2) high level of trap efficiency can interfere with the catch per unit effort of recreational and commercial hook and line fishing;

(3) intense trapping efforts in isolated reef areas may radically change fish species composition and abundance;

(4) trap dimensions (mesh size, entrance funnel size, orientation and location, and trap volume) are not always species specific and are selective for a wide variety of reef fish, including juveniles, trash or forage species and non-food tropicals (the draft Reef Fish FMP, however states that "...evidence suggests that traps are generally selective and can be set so they are highly selective");

(5) Coral and coral reef resources can be physically damaged when traps are dragged across the reef surface during retrieval or when displaced by waves and currents;

(6) traps are easily lost due to theft, bad weather and vessel passage severing buoy lines; these traps, popularly known as "ghost" or "drowned" traps, continue fishing indefinitely unless retrieved by divers or destroyed by corrosion or large predators;

(7) unnecessary trap-related mortalities occur from cannibalism or starvation in side fished and "ghost" traps and from gas embolisms caused by rapid ascent from depths during retrieval;

(8) traps containing large numbers of stressed fish or in the case of "ghost" traps, mutiliated fish or skeletal remains, are unsightly and detract from a SCUBA diver's aesthetic experience.

Specific observations on the use of traps in tropical areas outside Florida include the following:

> "If the use of fish traps becomes a significant fishing method for harvesting reef fish in the Gulf of Mexico, there is a possibility of seriously overfishing stocks of reef fish, particularly in the nearshore waters unless effort by other gear is reduced" (Draft Reef Fish FMP); "In Jamaica, where the intensity of fishing on the nearshore reefs appears to be higher than any other island in the Caribbean, the abundance of fishes on the reef is remarkably low. We are working on the hypothesis that the low density of fishes is a direct consequence of exploitation with the small mesh traps" (Munro, Reeson & Graut, 1971).

By contrast, often cited advantages of wire trap use include observations that they:

(1) are inexpensive, easy to build and repair, and require little maintenance;

(2) require a minimum of effort once set, allowing fishermen to pursue other interests;

(3) can be used in areas where irregular bottom relief precludes the use of trawls or nets;

(4) are successful for fish not easily taken by other methods; and

(5) are an important and efficient research and resource assessment tool.

In summary, the continued use of wire fish traps within the sanctuary could, according to studies and observations in other areas, seriously deplete reef fish stocks through overfishing and incidental bycatch, thereby reducing species richness and fish populations in the Looe Key coral reef ecological system (Stevenson, 1977; Thompson and Munro, 1974). Furthermore, according to the SAFMC, snapper/grouper resources may be presently overfished unless regulation and management occur for these already stressed reef fish stocks. Unregulated use of wire fish traps within the sanctuary could impair recreational value, depriving visitors of the opportunity to enjoy an area of great species diversity. Underwater visitor sightings of wire traps on the sea floor containing large amounts of fish will also detract from the natural aesthetics of a sanctuary and may discourage visitor use. It will be several months before the snapper-grouper FMP becomes public, and changes in proposed management measures may occur as a result of public review. Close coordination will continue throughout the process between the SAFMC and OCZM.

b. Prohibit wire fish traps on the Fore Reef and Reef Flat (Boundary Alternative #1) but allow them in the Patch Reef, Deep Reef and Deep Ridge zones alternatives outside 1 sq nm (Boundary Alternatives #2 & #3)

This alternative would protect the Fore Reef spur and groove system from physical damage from traps and would maintain the Reef Flat as a suitable recreational area for snorkelers and inexperienced divers.

It would enhance the superior recreational value of the 1 sq nm boundary alternative by eliminating wire fish traps from the ocean floor. However, ecological damage to the reef system from overfishing and incidental bycatch of non-commercial species would not be prevented. Due to the constant movement, back and forth, of fish between the Deep Reef and Ridge through Fore Reef channels to the Patch Reefs to feed, a 1 sq nm ban of wire traps in the Fore Reef and Reef Flat would not effectively protect fish populations at Looe Key from depletion.

Similarly this alternative would not protect against damage from traps and anchoring to Deep Reef and Deep Ridge living coral assemblages which consist of a rich variety of stony coral, octocoral, sponges and types of coral no longer found on the Fore Reef.

Although the location of wire fish traps varies and largely depends on where the fish are running, local residents interviewed during the onsite survey stated that most trapping occurs seaward of the Fore Reef and outside of the 1 sq nm alternative. Fishermen avoid the spur and groove system of the Fore Reef and the shallowness of the Reef Flat to avoid hull damage. Therefore, this alternative is not likely to have a substantial adverse economic effect on Looe Key wire trap fishermen.

c. Prohibit wire fish traps within the 5 sq nm sanctuary (Boundary Alternative #2 and #3). PREFERRED ALTERNATIVE.

This alternative would prevent both physical and ecological damage from traps to the coral formations and resident fish species. Fishermen, although prohibited from laying traps within the 5 sq nm area, could continue to utilize the area seaward of the reef beyond approximately 140 feet and those areas beside Looe Key, along the outer reef tract. This proposed regulation is slightly more restrictive than that presently under consideration in the Draft Snapper-Grouper FMP which includes a proposed prohibition out to the 100 foot contour south of Cape Canaveral; the sanctuary prohibition would extend to the proposed boundary at approximately the 140 foot contour.

The prohibition would probably not substantially affect the catch of mackerel normally found in the "blue water" environment seaward of the reef. How much this restriction could reduce the catch of yellowtail, mangrove and mutton snapper, and grouper by Looe Key fishermen cannot be forecast. On the other hand, it can be stated that they would be denied the value of the catch currently taken from this area which amounts to about $109,000 or $3,900 per boat per year (Appendix C, Table 2).

The Looe Key Onsite Survey indicated there were other zones where wire fish traps are used by Looe Key fishermen. It is not definite that the loss of fishing grounds in the five sq nm alternative could not eventually be either partially or completely offset by setting more traps in adjacent areas or moving to other localities to fish. However, learning new areas takes time and there would be at least a temporary reduction in fish catch and an accompanying economic loss while fishermen located and became familiar with new fishing grounds.

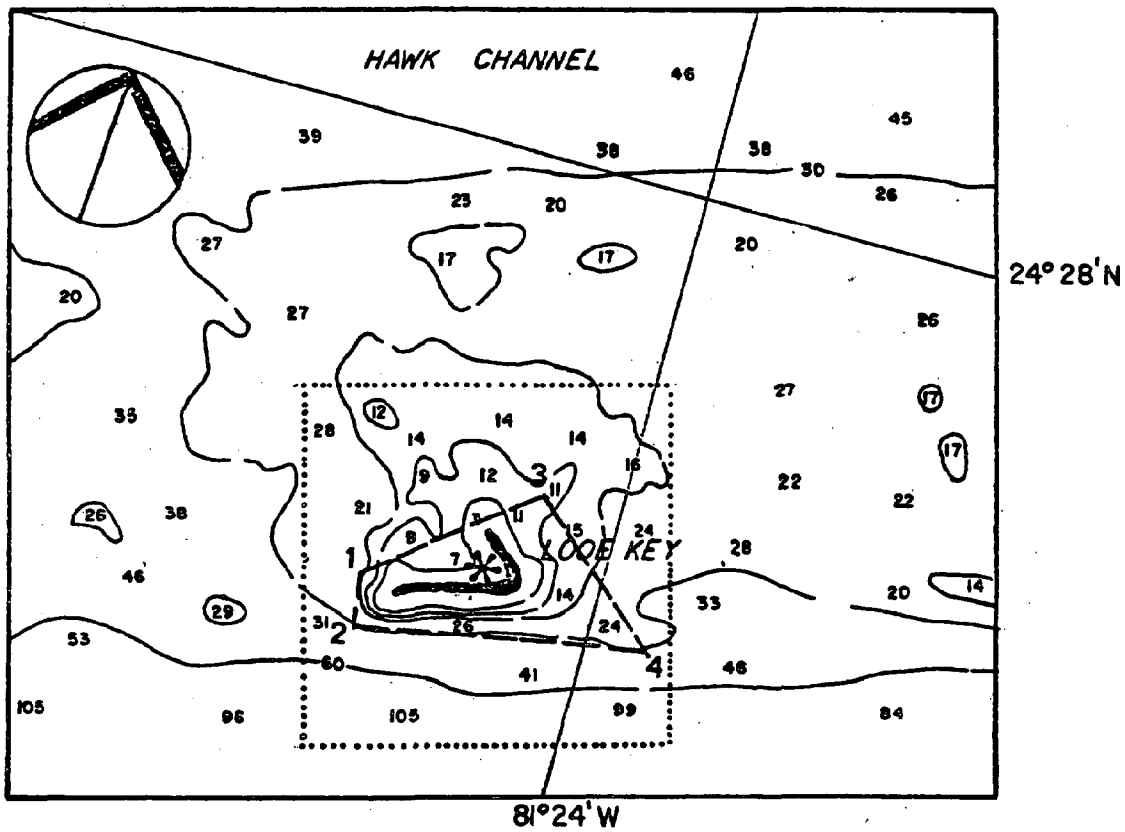
Use of wire fish traps is prohibited within the Key Largo Marine Sanctuary because they indiscriminately catch and kill large numbers of tropical fish species (personal communication, Gillen, 1979). Reducing the population of tropical fish by the use of wire fish traps can diminish its delicate balance, creating unnecessary additional stress to this fragile ecosystem (Stevenson, 1978).

Most visitors to the marine sanctuary depend on boundary market buoys and other landmarks to determine their position within the sanctuary. They do not visually carry sophisticated depth sounding equipment aboard their small pleasure boats and would have difficulty tracking several differing boundary restrictions. Therefore, for regulations to be realistic and understandable to the general public, they must be consistent throughout the sanctuary area and unchanging with respect to depth. Therefore, this alternative would extend the prohibition on wire trap use throughout the proposal area to the 140 foot depth and thus beyond the 100 foot depth proposed in the Snapper-Grouper FMP.

FIGURE 8

CORE TRAPEZOID AREA

SCALE: 1" = 3000' 1" = .49 nmi 1" = .91km



Location of the Looe Key HAPC, as measured onto the contours of NOAA National Ocean Survey Chart 11445. Square measures 1.852km (1 nmi) on each side with a center at the asterisk. The LORAN-C readings for the four points of the trapezoid are listed below.

1 NW 7980-W-13973.7, 7980-Y-43532.7
2 SW 7980-W-13973.4, 7980-Y-43532.4
3 NE 7980-W-13975.0, 7980-Y-43530.1
4 SE 7980-W-13975.4, 7980-Y-43527.7

2. Regulatory Alternatives Affecting Lobster Trapping.

a. Status quo: Unrestricted fishing for spiny lobster within all boundary alternatives.

The survey of fishing activity in Looe Key disclosed that approximately 58,000 lbs. of lobster were caught in the Looe Key 5 square nautical mile sanctuary boundary alternative by 25 fishermen in 1978 (see Appendix C, Table 4.) The catch was primarily in areas other than the Fore Reef.

Lobster traps are generally set along the Florida reef tract, according to the season. In early fall, at the beginning of the State allowable harvest season, pots are numerous in the patch reef areas close to shore. According to local fishermen, lobsters begin migrating in October and November to cooler, deeper water. Pots are then placed in and seaward of the reef tract (Armitt, 1979).

At the present time, there are no promulgated regulations to control the impacts of trapping spiny lobster in Federal waters. The GMFMC has a Spiny Lobster Plan under consideration because the fishery, both commercially and recreationally, is particularly active in Florida. The plan includes proposed management measures restricting, among other things, size, season and gear. Proposed restrictions are almost identical to State regulations (for details see Chapter Three). In addition the joint SAFMC and GMFMC Coral and Coral Reef Resources FMP now in preparation proposes to prohibit potting within the core trapezoidal area of the HAPC (see Chapter Three).

There is considerable disagreement among biologists, commercial fishermen and conservationists as to the behavior of the spiny lobster. National Park Service (NPS) scientists (managers of nearly 100,000 acres of coral reef adult lobster habitat) have found that (1) adult lobsters at Ft. Jefferson National Monument are primarily resident species (lobsters tagged and released did not move outside a 10 km area at Dry Tortugas in 104 weeks); (2) one single 8 months open season for recreational lobster fishing can deplete a large resident population of juvenile and adult lobster by up to 50%, even with an enforced harvest limit of 2 lobsters per person per day; (3) 1 year of complete prohibition of both recreational & commercial fishing can restore an area to approximately 78% of its pre-harvest level and increase the lair occupancy rate to 71% after 16 months of post harvest protection; and (4) there are inherent conflicts between fishery interests of promoting harvests and NPS management objectives that emphasize preservation of species diversity.

Marine biologist Gary Davis at Ft. Jefferson points out in "Fishery Harvest in an Underwater Park":

> "Community structure, and therefore species richness, is determined by species interactions as well as environmental conditions and will reflect alterations in the abundance of individual species, particularly abundant high-level predators. P. argus is such a predator. The pre-harvest, natural standing crop of P. argus was conservatively estimated from visual sightings at 58.3 kg per hectare of diurnal lobster habitat at Dry Tortugas. Mark and recapture efforts indicated that this figure may represent only 30 to 40 percent of the actual biomass in the massive coral reef complexes where there were numerous hidden caves and narrow crevasses in which lobsters were probably undetected during diver surveys. The total standing crop of coral reef carnivores at Eniwetok was estimated at 470 kg per hectare, and total reef fish standing crop from the Caribbean range from 273 to 1,590 kg per hectare. From this it can be seen that spiny lobsters are abundant and may represent over 10 percent of the predator biomass even in an extremely complex and diverse coral reef ecosystem. Furthermore, P. argus is a secondary predator, preferring other carnivores as food. Removal of a significant proportion of the spiny lobsters from a reef system could be expected to cause a shift toward simplicity, with a reduction in species richness."

Continued unrestricted lobster fishing in the Looe Key Sanctuary boundary areas could possibly deplete the resident population to a level that could disrupt the reef ecosystem by reducing the numbers of those important predators.

In addition to the significant changes in the lobster population which could eventually occur within the Looe Key system, lobster traps themselves, weighing about 80 pounds can physically damage coral. Careful setting and retrieving of pots in sandy bottom channels can prevent most damage; however, wave action from storms can drag pots into and over coral causing damage beyond the control of fishermen. Unrestricted lobster fishing will enable spiny lobster fishermen to continue to take a significant portion of their landings from the Looe Key area. The value of the 1978 catch was about $466,320 or about 62% of the total revenue from commercial fishing (see Table 2). Regulations under the Spiny Lobster and joint Coral and Coral Reef Resources FMPs will not likely be in place for at least 6 to 8 months and as plans are currently only proposed the ultimate level of protection is unpredictable.

b. Prohibit lobster trapping on Fore Reef only under all boundary alternatives. PREFFERRED ALTERNATIVE.

This option would prohibit the setting of traps in the Fore Reef consistent with the HAPC plan currently proposed by the South Atlantic and Gulf Fishery Management Councils (see Chapter Three). No lobster trapping would be allowed within the core trapezoid area (Loran "C" Readings,points 1, 2, 3, and 4, Appendix A). Lobster trapping would be allowed on the Reef Flat, Patch Reefs, the Deep Reef and Deep Ridge. This preferred alternative would protect the most spectacular coral assemblages from lobster trap damage and contribute to species richness by partially protecting the spiny lobster as a major predator in the reef system (Figure 8).

Studies on lobster populations in the Dry Tortugas have shown seasonal relocations between adjacent reef and grass flat areas and that individual lobsters return to the same general area each year. As a result, individuals of the Looe Key resident population may be trapped as they move between the Fore Reef, Reef Flat and the grass flats of the Patch Reefs to feed.

Studies in Ft. Jefferson National Monument (Dry Tortugas) have also demonstrated that in late summer and early fall an equal number of males/females concentrated in large lairs in the shallow patch reefs. If this is true of Looe Key, then large numbers of the Looe Key population could be taken at the start of the fishing season in the Patch Reef area, which lies outside the regulated area in Boundary Alternative #1. Finally, studies indicate that in late November and early December, as water temperatures cool, lobsters disperse to smaller scattered lairs on the deeper reefs at depths 12-30 m.

It appears that a prohibition against lobster trapping on the Fore Reef might help protect the renewable lobster resources at Looe Key for the time being. Completion of the spiny lobster FMP will also contribute to sustaining the lobster fishing industry over the long-term but the degree of protection cannot be determined at this time.

An estimated 232,000 lbs. of spiny lobster were caught in Boundary Option #2 in 1978. Personal communication with local residents and fishermen revealed that most of this catch was taken from outside the Fore Reef and Reef Flat zones. According to interviews with local people, lobster boats avoid shallow coral reef areas, preferring sites with greater maneuverability and more open sandy areas on which to place traps. This alternative would protect the Fore Reef from physical damage while resulting in minimal economic loss to the lobster fishermen and regional businesses in the area by allowing trapping in a major portion of the sanctuary.

NOAA's Office of Coastal Zone Management (OCZM) and the appropriate Fishery Management Council will continue to work cooperatively under Memoranda of Understanding in their efforts to protect and enhance the Looe Key coral reef habitat and the spiny lobster fishery. Continued monitoring of the area by the NMFS and the Councils would aid in maintaining the stock of a valuable renewable resource, both in the restricted area and in the area adjacent to the sanctuary.

c. Prohibit lobster trapping within the 5 sq nmi (Boundary Alternative #2, and #3).

This alternative would prohibit lobster fishing within the 5 sq nmi alternative but would permit trapping outside the five sq nm but within the 10 square nautical mile sanctuary proposal. This alternative would maintain a healthy, substantial spiny lobster population in the Looe Key the region as increased numbers of juveniles would migrate from the reef and be caught outside the boundaries. Coral damage from pots and incidental bycatch of tropical fish would also be significantly eliminated within the entire Looe Key system.

Banning traps from this five square mile area would be hardest on the fishermen in fall and early winter when they mainly depend on lobster fishing for revenue. The annual revenue from this area of Looe Key (Boundary Alternative #2) is estimated at $466,320, as recorded in Appendix C Table 2. This represents about 62 percent of all landings within Boundary Alternative #2.

Because of its convenient location and generally productive yield the denial of lobster fishing within Boundary Alternative #2 would impose a significant economic hardship on fishermen and local businessmen who support or rely on the industry.

3. Regulatory Alternatives Affecting Tropical Marine Specimen Collecting

a. Status quo: Unrestricted tropical specimen collecting(marine life fishing) within all boundary alternatives.

The GMFMC and the SAFMC are preliminarily determining the feasibility and desireability of preparing profile or description of the tropical reef fish fishery. The SAFMC and GMFMC are proposing to prohibit tropical specimen collecting within the 1 nautical mile square HAPC. At the present time, however, no current or other proposed Federal regulations limit tropical fish and invertebrate collection. The extent to which such activity can be controlled through HAPC regulations in the Coral and Coral Reef Resources FMP has not been determined judicially or administratively. Current indications are that the Councils' definition of Coral Reef Resources does not include invertebrates or reef fish but rather the dead reef structure only. Furthermore, the final outcome of the Coral FMP is unpredictable until the Plan has completed the NEPA process and becomes final.

Both commercial marine life fisheries and amateur tropical fish and invertebrate collecting occurs throughout the Looe Key area. Tropical fish collectors in general take a large variety of fish but concentrate primarily on a small number of the popular species. Collectors harvest mostly juvenile fish from shallow depths. Collected invertebrates include brightly colored and otherwise aesthetically appealing molluscs, small crustaceans, including several shrimp which participate in the "cleaning symbiosis" relationship, and a wide variety of other species for the home aquarist, biological specimen industry, curio trade and municipal aquaria.

The most commonly collected families of fishes (Hess and Stevely, 1979) are angelfishes and butterflyfishes, damselfishes, cardinalfishes, jawfishes, drums and croakers, blennies, wrasses and gobies. Neon gobies, small shrimp, juvenile bluehead wrasses, juvenile French angelfish, and juvenile porkfish to a lesser degree, are particularly known to set up and participate in cleaning stations for finfish which then have an overall beneficial effect on the ecological balance of the reef. Removal of these species in large numbers could adversely affect the reef system.

Most collectors work from small outboard motor boats. Collectors use small hand nets while diving underwater (snorkeling, SCUBA). Some collectors also use a mild anesthetic, quinaldine, to slow temporarily the fishes while collecting. A few collectors who do not approve the use of chemicals, use only skill to chase fishes into nets.

Quinaldine is a derivative of coal tar used in the manufacture of dyes and explosives and was never intended as a fish collecting anesthetic. Quinaldine is only slightly soluble in water and must be diluted before use. Diluting agents include ethyl alcohol and seawater,

with acetone added by some collectors to draw the fish from protective cover. Studies, however, have indicated that acetone can be harmful to gill membranes and liver. Quinaldine is absorbed primarily through the gills and concentrates initially in the brain (Brandenburger Brown et al, 1972)(Hess Steberg, 1979). Recovery usually occurs rapidly once the fish is removed from the drugged water (1-10 minutes).

Concern for possible adverse effects of the widespread use of quinaldine on the marine environment has led to its regulation by the Florida DNR (since 1973) and a few preliminary studies on its open water use. Jaap and Wheaton of FDNR stated in 1975 that "quinaldine treatment induced no long term damage to octocorals (soft corals) and only slight damage to two scleractinian specimens". The effects of quinaldine on larval fishes and invertebrates are still unknown. There are obvious advantages to the use of quinaldine in difficult terrain and deep water collecting but "collecting with drugs is also very efficient and contributes to the decline of marine tropicals on the reefs" (Moe, 1958). Collecting with drugs may also lower the quality/health of fish sold by collectors (personal communication, Bigford, 1980).

Bleaches, used also for collecting in the past are now prohibited in Florida waters. Although regulating the use of quinaldine should restrict its use to experienced collectors, some unskilled part time collectors use quinaldine improperly thereby resulting in unnecessary mortality to fishes and other marine organisms.

Although most of the marine specimens sold in today's U.S. aquarium industry come from the marine environment, tropical fish are successfully raised in captivity and sold commercially as well (Moe, 1980). Raising fish in aquaria for commercial sale although not now economically competitive with harvesting in the natural environment could eventually be a viable alternative to tropical fish collecting at Looe Key.

Unregulated tropical specimen collecting in the marine sanctuary would allow unlimited collecting of Looe Key reef species by commercial and amateur collectors as long as there is a market and fish and invertebrates to harvest. It appears that there is and continues to be considerable growth of the market for marine aquarium hobby products in recent years (Hess and Stevely, 1978). The economic take per year in Boundary Alternative #2 is estimated at $25,000 to $43,000 or $80,075 to $137,725 using regional multipliers. While this return is probably not great for any one collector, it does contribute limited economic benefit to the region. It is likely, however, that the harvest could be taken from adjacent areas with an equivalent minimal socio-economic impact.

b. Restrict tropical specimen collecting (marine life fishing) to those with NOAA permits within all boundary alternatives and to non-chemical techniques.

Restricting tropical specimen collecting to those individuals with permits will limit marine specimen collecting within the sanctuary to only those persons demonstrating a knowledge of tropical marine species and the most accepted and non-damaging techniques for harvesting tropical fishes and invertebrates. Requiring permits would not impose a significant

burden on those businesses now in the area, nor would it necessarily preclude others from becoming collectors. However, a permit and monitoring system will have to be established by OCZM that is suitable for processing and monitoring commercial permits.

It is not likely that administration and enforcement of such a permit system for effective regulation of tropical specimen collecting could be developed. It would require the undertaking of extensive monitoring of fish stocks to determine when sufficient populations of the species existed and at what point and to what degree taking would be appropriate. Commercial permitees could not be monitored given existing resources, to assure that their actions would be consistent with the conditions of the permit. A permit system of this nature would require elaborate surveillance of collectors and specified check points for ingress and egress at the sanctuary. As an example, it would be virtually impossible to determine whether a permitee took only x specimens over a period of y months.

The taking of important ecological species such as the neon goby and the depletion of naturally rare species so desirable to a marine sanctuary would continue although permitting the activity would allow monitoring of activity levels and control whenever necessary.

Prohibiting the use of chemicals would limit collecting activities to the more experienced collector. Since the long term effects of the commonly used quinaldine are not well documented this restriction will eliminate the potential for harm.

c. Prohibit tropical specimen collecting (marine life fishing) within all boundary alternatives except for scientific and educational purposes with NOAA permits. PREFERRED ALTERNATIVE.

This alternative would protect and enhance the tropical fish population at Looe Key, prevent the depletion of ecologically important species, add to the aesthetics of the sanctuary, and maintain and enhance the long term productivity of the Looe Key coral reef for future generations. The Key Largo Marine Sanctuary and the Biscayne National Monument do prohibit such taking thereby providing a precedent for such action.

A prohibition on collecting (marine life fishing) would not require the construction of an administratively burdensome permit and monitoring system for commercial collecting. Instead, it would utilize the already existing system designed for issuing a limited number of permits for scientific and educational purposes, that has been established for the Key Largo Marine Sanctuary.

It appears that there are many suitable areas for tropical specimen collectors to catch tropical fish and invertebrates in Florida; including shallow inshore areas, inshore coral heads, mid-channel reefs (in the middle of Hawk's Channel), and the entire outer reef. This alternative would cause limited economic loss to present commercial collectors.

The total economic loss of revenue per year as estimated in the socio-economic analysis for Boundary Alternative #2, would be $25,000 to $43,000 or $80,075 to $137,729 using regional multipliers. At least some of this loss could be made up by collecting elsewhere.

C. Regulatory Alternatives for Spearfishing

1. Status quo: Unregulated spearfishing under all boundary options.

Commercial spearfishing is no longer feasible because of diminished populations of large specimens, according to the Looe Key Reef Resource Inventory (1978). Individual spearfishing has continued by sport fishermen and local residents who prefer this method of catching edible fish. Although there are no public statistics on the number of spearfishermen at Looe Key, the Looe Key Inventory has stated that spearfishing activity is widespread in this area.

In Florida, the total catch of spearfishermen is much less than line fishermen due to environmental conditions (Davis, 1980). Spearfishing is more limited by depth, visibility and seasonal temperatures.

A study of recreational boating in Dade County (Austin et. al., 1977) has indicated that in Dade County the average daily catch of spearfishermen was not much different from line fishermen in the same areas. However, total spearfishing activity and grouper catch was much less than that of line fishermen in all areas during all seasons except on the south reef in summer.

Approximately 58.8 percent of the spearfishermen in the Dade County study used rubberpowered, trigger-activitated guns, 16.5% used Hawaiian slings and 24.7% used both. A small number used pneumatic or springpowered guns or pole guns. Sixty percent were free diving (snorkel only) and 28.4 % used SCUBA equipment when spearfishing. Of all spearfishing in Dade County, none was recorded deeper than 80 feet and 71.5 % was conducted between 11 and 30 feet.

Species sought were limited; groupers (35.8%), hogfish (32.4%) and snapper (8.9%). Preference for snapper was misleading; however, since many spearfishermen regard hogfish as snapper. It appears that spearfishing at Looe Key will, but not in comparison to commercial and recreational line fishing, reduce significantly large predators and other fish species important to the continued health of the reef system.

Spearfishing, however, quickly makes grouper and snapper very wary of divers, too wary in fact, to be observed by most nonspearfishermen who lack experienced observation skills (Davis, 1980, DEIS comments). The Looe Key Resource Inventory (1978) stated that "... the practice of spearfishing, even when not many fish are taken, creates wariness in the hunted species and effectively causes them to move out of the area." The authors contrast the current situation at Looe Key Reef, where larger groupers are quite rare and exhibit wariness of divers, to that in the Key Largo Marine Sanctuary, where these fish are relatively abundant and can be approached closely.

There are no existing spearfishing controls and the final scope of the Coral and Coral Reef Resources FMP special management measures are unpredictable. The plan has not been through the EIS public review process and will not likely be implemented until January 1981. The Plan proposes to prohibit spearfishing within the core trapezoid of the 1 nm sq HAPC.

2. Restrict spearfishing within the sanctuary to pole spears and Hawaiian slings under all boundary alternatives.

Restricting spearfishing to certain weapons would tend to restrict this type of fishing to the more experienced divers and snorkelers and eliminate the use of rubber-powered arbaletes, pneumatic and spring-loaded guns and other types of weapons often used by novice divers.

In addition, it would tend to reduce both the physical damage to the reefs caused by inexperienced spearfishermen and the chances of human injury. This would probably have minimal economic impact on dive and charter boat captains since only an estimated 15 percent of the Looe Key divers now spearfish (personal communication, Davidson, 1979).

This alternative would not eliminate the wariness and removal of certain species from the reef, nor would it prevent experienced spearfishermen from contributing to the reduction of stocks of important commercial fish species and key ecological species on the reef system. This option would be difficult to enforce.

3. Prohibit spearfishing and possession of spearfishing equipment within the 5 sq nmi (Boundary Alternative #2 and #3) PREFERRED ALTERNATIVE.

A primary impact for this alternative is to enhance the quality of resource recreational experiences by divers, snorkelers and observers. This prohibition will also benefit the ecological system by preventing the continued disturbance and removal of territorial reef predators and would promote the return of larger grouper, snapper and other predators to the reef or perhaps, in time, lead to fish becoming less wary. In addition, it would remove the human injury potential, the inadvertent killing of non-edible tropical reef fish species found within the sanctuary and physical damage to the coral from divers in pursuit of fish. All of the above would help ensure high quality recreational experiences by divers and snorklers.

Although local residents and visitors will no longer have the opportunity to spearfish in the Looe Key 5 mile area, there are many other areas suitable for spearfishing.

The oceanic side of the Florida Keys is a desirable area for spearfishing with a submarine bank that varies in width from more than three to nearly seven nautical miles along the length of the Keys. Most of this bank lies in water depths less than 30 feet. The shallow inshore area is not attractive to spearfishermen due to the small number of fish to be found there. However, the many patches of corals scattered along the seaward edge are favorite fishing grounds for spearfishermen (Murdock, 1957). It will not discriminate against novice spearfishermen and will conform with the more enforceable regulation at the Key Largo Marine Sanctuary which prohibits the use of spear guns, slings, harpoons or other kinds of weapons potentially harmful to human safety, fish and wildlife, and the reef structure.

D. Alternatives Regulating Tampering with, Damage to and Removal of Submerged Historical and Cultural Resources within the Sanctuary.

1. Status quo: Unrestricted activities regarding submerged historical and cultural resources in all boundary alternatives.

The Bureau of Land Management of the Department of the Interior is preparing a Submerged Cultural Resource Plan to identify shipwreck sites between Key West and Cape Hatteras out to 200 miles. A Looe Key American Shoals survey is being conducted by the Newfound Harbor Marine Institute. However, there are no Federal laws at the present time regulating salvage and recovery operations in the high seas. The status quo would allow the continued unregulated investigation and removal of submerged artifacts and could also lead to the tampering and removal of important historical and cultural resources within the sanctuary. These recovery operations can result in damage to those coral communities which have attached themselves to the submerged artifacts.

Under a recent court decision, the Antiquities Act which provides that the Department of the Interior may designate and protect certain historically important sites does not authorize such action in relation to antiquities located on the OCS. In addition, neither the Abandoned Property Act nor the National Historic Preservation Act offer protection for valuable marine artifacts. The marine sanctuary program is the only vehicle for designation and preservation of such resources.

2. Prohibit tampering with, damage to and removal of historical and cultural resources in all boundary alternatives except with a NOAA permit for scientific and educational purposes. PREFERRED ALTERNATIVE.

This alternative would prohibit tampering with, damage to and removal of historical and cultural resources and still allow continued exploration and investigation with minimal damage to coral reef resources. Shipwrecks of interest in and adjacent to the area could be explored and artifacts recovered under a NOAA permit which would be based on the educational and research value of the proposed actions. This alternative, however, would not completely preclude reef damage and other disruptions to the marine resources from salvage and recovery operations.

Under this alternative, NOAA could cooperate and assist the Bureau of Land Management in the preparation of the Submerged Cultural Resource Plan which includes the Looe Key Reef area. Historical resources could also eventually be placed on the National Register of the National Historic Preservation Act once the nomination has been made and the resource selected.

3. Prohibit tampering with, damage to and removal of historical and cultural resources within 5 sq nm (Boundary Alternatives #2 and #3).

This regulation would protect the HMS Looe and other submerged shipwrecks of cultural and historical significance from tampering and removal. It would completely protect coral reef assemblages from further damage from such operations.

It appears that there is little salvage and or other disturbing activity in the area at the present time. Therefore this regulation would not impact ongoing salvage and recovery operations, but it would prevent possible research and educational benefits.

E. Alternatives for Regulating Discharges

1. Status quo: Rely on existing authorities to control discharges in all boundary alternatives.

Federal regulation of sewage wastes from marine sanitation devices, effective January 31, 1980, does not extend beyond territorial (State) waters. The disposal of dredge materials and toxic and hazardous substances are regulated by the Clean Water Act (CWA) and Title II, Ocean Dumping of the Marine Protection Research and Sanctuaries Act; EPA has the authority to develop criteria for dredge disposal and the disposal of toxic and hazardous materials and for the selection of dump sites for dredge disposal in ocean waters. Therefore, vessels are allowed to discharge trash, litter, solid wastes, and sewage.

This alternative would not prevent the discharge from vessels of trash, litter, solid waste, or untreated sewage directly into the proposed sanctuary. The status quo would rely on the authority of the CWA, Title II and corresponding regulations.

2. Prohibit the discharge of all substances in all boundary alternatives.

This regulation would prohibit any discharge within the sanctuary. Discharge of litter, trash, solid waste and sewage from vessels would be prohibited. A prohibition on the discharging of vessel cooling waters would prevent motorized vessels from entering the sanctuary. Prohibiting the discharge of fish parts and chumming materials would inconvenience fishermen and curtail otherwise allowed fishing activities.

3. Prohibit the discharge of substances except cooling waters from vessels, fish or parts, chumming materials and discharges from marine sanitation devices (MSD) within 5 sq nm (Boundary alternatives #2 and #3). PREFERRED ALTERNATIVE.

This alternative would prohibit littering and discharge of solid waste from vessels. It would prohibit the discharge of raw, untreated sewage into the sanctuary. However, it would allow fishermen to discharge fish or parts and use chumming materials. By not restricting the discharge of cooling waters,this alternative would allow the use of motorized vessels.

The large number of people using Looe Key has lead to a high incidence of litter and trash being discharged overboard. The proposed regulation prohibiting discharging and littering will help maintain the area's overall recreational and aesthetic appeal. It would help to prevent floating or submerged waste debris such as plastic and metal objects discarded from users at Looe Key.

The proposed regulation would prevent the discharge of untreated sewage from vessels allowing discharges from a MSD only. This regulation is consistent with current Coast Guard regulation. The Coast Guard regulations prohibit the discharge of untreated wastes within the territorial sea for public health reasons - the presence of swimmers and relatively shallow water. Because the site of the proposed sanctuary is heavily used for water contact activities such as swimming and diving and portions have relatively shallow water depths, only the discharge from MSDs is allowed.

Impacts of the regulation will be minor. Sanctuary users will have to retain trash for disposal at proper facilities. Vessel operators will have to utilize their MSD or holding tanks and will be unable to empty the latter.

The Environmental Protection Agency, Marine Activities Office (responsible for developing the regulations), and the U.S. Coast Guard, Office of Marine Environment and Systems, Branch Enforcement (responsible for implementing the regulations), have informed NOAA that there are no existing studies on the effects of MSD chemicals on corals. These agencies believe that MSD discharges will not negatively impact the health of the reef. If the sanctuary is designated, NOAA will monitor closely the effects of the discharges.

F. Alternatives Regulating Anchoring

1. Status Quo: Unrestricted anchoring within the three boundary options.

At the present time, there are no Federal laws regulating the location or type of anchoring in the Looe Key area.

Branching coral growth forms such as elkhorn (*Acropora palmata*) and staghorn (*Acropora cervicornis*) in the Fore Reef system are especially susceptible to anchor damage. Fortunately, however, these species appear to have the greatest potential for regeneration. Recovery of other damaged coral, however, is slow since, as discussed in Chapter Three, growth rates of coral in the Florida Reef Tract are about one-half that of the Central Caribbean. The draft Coral and Coral Reef Resources FMP (CNA 1979) states, within this context, that: "coral growth rates are so slow in most species that recovery rates after harvest, human impact or natural stress are far slower than observed in most resources". Moreover, as has been pointed out by Antonius (1975 and 1977), even slight mechanical injury to large stony corals can initiate a series of events manifesting in widespread pathology or even death of an entire colony.

Evidence of anchor damage to stony corals and octocorals is widespread within surveyed areas of the proposed sanctuary boundaries. Broken pieces of elkhorn and staghorn coral are easily visible in the Fore Reef and Reef Flat zones where the water is shallow and the more spectacular coral is found. Entire octocorals can be observed lying on the bottom, obviously ripped from their substrate.

Much of this damage was fresh during observations in 1976 and 1977 and its occurrence and distribution is likely a result of a combination of anchor damage, wave damage and other natural factors. Numerous observations have been made of boat anchors lying in living coral and of anchor ropes and chains chafing corals. Comparable information on conditions in the Deep Ridge and Deep Reef zones is not available because the depth of water makes these areas less accessible. However, it can be reasonably assumed that the coral and benthic organisms have suffered some damage from boats anchoring in deeper water.

Recreational and commercial boat anchoring damage observed at the Looe Key coral reef has been found in other reefs. Damage to the benthos and living coral in the Flower Garden and 28 Fathom Banks has resulted from improper anchoring practices. Sand anchors, properly located in the rubble and sand grooves between the coral spurs, or in deeper sandy bottom seaward of the major coral formations, create the least disturbance.

Methods of anchoring in reef areas are discussed in the Draft Coral and Coral Reef Resources FMP. This report cites a number of specific anchoring problems which can cause damage to corals; anchor fluke span, length of chain relative to water depth, and anchor placement.

The Draft Coral and Coral Reef Resources FMP further states: "... that the amount of damage is proportional to the level of use in an area, the method of anchoring, the size of the anchor used, and the composition of the biotic community." The draft FMP goes on to cite accounts from several areas which emphasize the relationship of user levels to anchor damage. It would be reasonable to assume, for the Looe Key Reef, that, in the absence of anchoring regulations, this same relationship would hold. The number of boats presently anchoring in this small area is already quite high and the stress is apparent. Anchor impacts on the Looe Key Fore Reef coral community are projected to become more widespread in the absence of regulation.

Unregulated anchoring would give unlimited choice of anchor sites to recreational and commercial boats. Visitors could dive close by their boats. Physical damage to coral would continue unabated.

2. Prohibit anchoring on coral on Fore Reef (delineated as the core trapazoid in the Coral Reef FMP (Figure 8) and encourage anchoring in sand areas elsewhere. PREFERRED ALTERNATIVE.

This alternative would help protect the Fore Reef coral assemblages from snagging, breaking, or other anchor damage. Anchor abrasion of corals is common in the Fore Reef zone of Looe Key. It is here that anchor chains and lines, primarily from the smaller draft boats anchored in the sand bottom between the coral spurs, chafe the adjacent corals. Raising anchors snagged on the coral spurs also has resulted in significant damage. As the popularity of Looe Key and its accessibility becomes more widely known, anchor damage can be expected to occur more frequently. Indiscriminate anchoring with its potential for damage in a coral reef sanctuary, is incompatible with the purposes for which these areas are considered for designation.

The Fore Reef is frequented by divers because of the spectacular nature of the coral formations and the size and diversity of reef fish populations. In order to gain access to this area, most boats anchor directly in this zone, which is no deeper than nine meters or in the Reef Flat nearest the Fore Reef. By prohibiting anchoring on coral in this area and encouraging sand anchoring in adjacent areas, anchor damage to the Fore Reef can be substantially reduced.

The Reef Flat offers suitable protection from high waves because of its location behind the reef crest. The bottom consists primarily of sand, coral fragments, seagrass, macro-algae and occasional colonies of living coral. As a result, this area can withstand much greater anchoring pressure than the Fore Reef Zone with its well developed coral structure. Because of the substrate and protected location of the Reef Flat, small sand anchors, e.g. Danforth, are capable of holding all but the largest boats with a shallow enough draft to enter this zone. Divers and snorkelers entering the water can swim through this shallow (less than two meters) area and pass through one of the surge channels of the reef crest and dive on the Fore Reef. Only in rough weather is passage through the reef crest somewhat hazardous.

The area seaward of the Fore Reef is less protected but convenient to the Fore Reef and would also be suitable as an anchoring area. With adequate enforcement and management at the sanctuary site, boats can be directed to sandy areas, suitable for anchoring adjacent to the Fore Reef. This alternative might inconvenience recreational and commercial hook and line fishing in the area of the Fore Reef. Fishermen would have to spend additional effort to insure sand anchoring within this small core area.

Enforcement of this regulation will entail frequent site inspections and the development of an educational program to advise users on anchoring procedures.

This regulation would serve as an interim measure until information is gathered to allow evaluation of alternative measures. Research and assessment of the feasibility and possible design of or appropriate mooring system for Looe Key will provide a basis for management decisions which will better insure maximum opportunities for both public use and resource protection. If the sanctuary is designated, such a study will be designed as a part of the management plan.

3. Placement of a mooring buoy system or systems in strategic areas of the Fore Reef zone in all boundary options.

This would enable divers, particularly SCUBA divers, with heavy equipment, to dive safely near their boats and it would provide safe access to the Fore Reef for novice divers. Biscayne National Monument has an optional mooring buoy system which not only guides visitors to certain coral reef areas but offers them the opportunity to tie up to a buoy to prevent anchor damage.

A mooring system would have to be stable enough to secure large dive and charter boats in moderately rough seas and designed in a manner to prevent collisions between the moored vessels. This would result in destruction of portions of the sea floor but could reduce anchor damage substantially to the reef. Observations in Biscayne Monument have noted some concentrated damage to adjacent coral areas, as in the case of designated anchoring zones.

If the marine sanctuary is not adequately patrolled, this type of regulation could cause conflicts among users. Although not prohibitively expensive, mooring systems are costly and their purchase and installation would have to be budgeted by Sanctuary management. The relatively small Fore Reef area may not be large enough to place enough buoys to accommodate the number of potential boats and buoy placement itself could be damaging to the coral.

Periodic relocation of the anchoring zone of buoys to allow impacted areas to recover could also be used to minimize the concentration of damage in localized areas. This approach however has not been successful at the Buck Island National Monument in the Virgin Islands. Park Service officials indicate that rotating buoy location is not viable there. Coral growth is too slow to make reasonable rotating times feasible.

4. Require the use of sand-anchors under all options.

Grapple hooks and other non-sand-bearing anchors are particularly damaging to coral. Prohibition of grapple-type anchors is a consideration because of the damage from such anchors used by divers in the Looe Key area. A change to sand anchor would encourage anchoring in sand areas only but would not solve all anchor associated problems. There is also some doubt if this is a workable regulation due to the type of enforcement it would require.

LIST OF PREPARERS

Many persons participated in the preparation of this document. A major portion of the environmental analysis was performed under contract by Sager O Gardiner O Wilcox, 6723 Whittier Ave., McLean, Va. 22101.

Sager O Gardiner O Wilcox

Evelyn S. Wilcox	Project Manager
William P. Gardiner	Environmental Specialist
Dr. Martha Sager	Ecologist
Dr. Arnfried Antonius	Marine Biologist
Dr. Arthur Weiner	Marine Biologist
Richard N. Sharood	Attorney
James A. Cato	Fisheries Economist
Phillip Webre	Economist

Office of Coastal Zone Management

Dallas Miner	Director
Dr. Nancy Foster	Deputy Director
Edward Lindelof	Gulf and Caribbean Project Officer
Annie Hillary	Program Analyst
John Milholland	Attorney

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES OF THE LOOE KEY FEIS

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
Department of Commerce
Department of Defense
Department of Energy
Department of Health and Human Services
Department of Housing and Urban Development
Department of the Interior
Department of Justice
Department of Labor
Department of Transportation
Environmental Protection Agency
Federal Energy Regulatory Commission
General Services Administration
Marine Mammal Commission
Nuclear Regulatory Commission

State, Regional and Local Government

Florida Department of Environmental Regulation
Florida Department of Natural Resources
Florida Department of State
Florida Game and Fresh Water Fish Commission
Florida Office of the Governor
Gulf of Mexico Fishery Management Council
Monroe County Board of County Commissioners
South Atlantic Fishery Management Council

Elected Officials

Hon. Dante B. Fascell

National and Local Interest Groups

Active Divers Association
Broward County Audubon Society
Camp Wesumkee
Center for Environmental Education
Central Florida Pleasure Divers
Dade Marion Institute
Defenders of Wildlife
Environmental Law Society
Everglades Protection Association
Florida Audubon Society
Florida Keys Fishing Guides Association
Florida Reef Foundation

Foundation for Pride
Friends of the Lower St. Johns
Islamorada Charter Boat Association
Izaak Walton League, Mangrove Chapter
Izaak Walton League, Cypress Chapter
Key Biscayne Anglers
Lake Region Audubon Society
Layton Kiwanis Club
Marathon Guides Association
Marine Mammal Foundation
Marine Wilderness Society
Marine Wildlife Foundation
National Association of Retired Federal Employees
National Audubon Society
National Fisheries Institute
New York Zoological Society
Norine Rouse Scuba Club
Periwinkle Alliance
Royal Palm Audubon Society
Sarasota County Sportsmen's Club
Save the Bay
Sierra Club, Florida Chapter
Sierra Club, Miami
Tropical Anglers Club
Tropical Audubon Society
Underwater Society of America
Upper Keys Citizens Association
Volusia Flager Sierra Group

Individuals

Karen Achor
Mr. & Mrs. J.S. Baker
Mary Bruce
Walter S. Boardman
James A. Bohnsack
C.M. Buckman
Fiona R. Bruns
Charles A. Buckel
Josephine K. Carter
James M. Critaker
Paul P. Daley
Capt. Ed Davidson
J. Connor Davis
Alfred R. Dixon
William A. Dunson
Henry A. Feddern
Mr. & Mrs. Ron Galuba
Robert N. Ginsburg
Dorothy A. Harte
Lynn Houaman
Melvin P. House
Anita & Ferdinand Hurricks
Nan B. Keefer

Hand & Grace Kendall
Curtis R. Kruer
John R. Maiolo
Robert F. Merrick
William R. Meyers
Gary Milano
William T. Mills
John C. Noyes
J.L. Pinckney Jr.
Frank S. Potts
William Ruetel
Marcy Schiff
John J. Schoendorf
Susie Schultz
Larry Verdier
William M. Warner
Lee Wood

BIBLIOGRAPHY

General

Armitt, Al. 1979. Personal communication. State Vice Pres. Organized Fishermen of Florida (OFF).

Austin, C. Bruce, Robert Brugger, J. Conner Davis and Linda Seifert. March 1977. Recreational Boating in Dade County 1975-1976. Prepared for Sea Grant.

Ballard, W. R. 1979. Personal communication. Director Lower Keys Chapter of OFF.

Brown, Col., Assistant Chief, Florida Marine Patrol, Tallahassee. 1979. Personal communication.

Carr, Chuck 1979. Florida Audubon Society.

Causey, Bill, Feb. 1, 1980. Personal communication, Florida Marine

Davis, Gary E. 1977. Effects of recreational harvest on a spiny lobster, Panulirus argus population. Bulletin of Marine Science, Vol. 27 No. 2.

Davis, Gary E. 1976. National Park Service Spiny Lobster Fishery Research in Florida. Key West, Florida.

Davis, Gary E. 1977. Anchor Damage to a Coral Reef on the Coast of Florida.

Davis, J. Connor, 1980. Personal communication, Marine Biologist.

Dennis, Cdr. Sam. 1979. Personal communication. Commander Group U.S. Coast Guard Key West, Key West, Florida.

Feddern, Henry, February 8, 1980. Personal communication, Florida Marine Assoication.

Florida Administrative Code. 1979. Rules 17-3, 17-4 and 17-6.

Florida Conservation Foundation. 1978. ENFO Newsletter.

Florida Division of State Planning. 1974. Final report and recommendations for the proposed Florida Keys area of critical State concern. Florida Bureau of Land and Water Management, Tallahassee, Florida.

Florida Sea Grant College. 1978. Environmental Impact Statement and Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico.

Florida Department of Environmental Regulation. 1979. Coastal Management Issue Scoping Paper.

Florida Department of Environmental Regulation. 1978. Florida Coastal Management Program Appendix. Prepared for the 1978 Florida Legislature.

Florida Department of Natural Resources Coastal Coordinating Council. 1974. Florida Keys Coastal Zone Management Study.

Gillan, Jack. 1979. Personal Communication Superintendant Onsite Manager Key Largo Coral Reef Sanctuary.

Hess, Deb and John Stevely, 1979 The Aquarium Reef Fish Collecting Industry Monroe County, Florida Marine Resource Inventory Monroe County Marine Advisory Program. Florida Cooperative Extension Service.

John Pennekamp Coral Reef State Park. 1979. Marine Sanctuary Management Workshop.

Looe Key Reef. Public meeting concerning the proposed designation of the Looe Key Reef as a National Marine Sanctuary. Big Pine Key, Florida. January 17, 1978.

Memorandum from Terry Leitzell, Director of National Marine Fisheries Services to Marine Wilderness Society. Sept. 20, 1979. Request to have Pillar Coral listed as an Endangered Species.

Memorandum of Understanding, Gulf Fishery Management Council and Office of Coastal Zone Management. May 24, 1979.

Moe, Martin, February 8, 1980. Personal Communication. Florida Marine Life Association.

Monroe County Planning Department. 1978. Monroe County Coastal Zone Protection and Conservation Element.

Murdock, James. 1957. A Survey of Spearfishing in the Florida Keys. Proceedings of the Gulf and Caribbean Fisheries Institute Annual Meeting.

Murray, Thomas. 1979. Personal Communication, Florida Cooperative Extension Service.

National Marine Fisheries Service. 1980. Draft Environmental Impact Statement for the Spiny Lobster Fishery Management Plan. Prepared for the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council. St. Petersburg, Florida.

National Park Service. 1979. A Review of Fishery Management Options and Proposed Rules for Everglades National Park.

O'Kane, Lt. Kevin. 1979. Comparison between Looe Key Reef and Coral Reef State Park and Key Largo Coral Reef Marine Sanctuary.

Peterson M. L. 1955. The last cruise of the H.M.S. Looe Smithsonian Misc. Coll., 131 (2), 74 pp.

Russell, Lt. Cdr. Dave. 1979. Personal communications. Assistant Chief, Intelligence and Law Enforcement Branch, 7th Coast Guard District, Miami, Florida.

Samsome, Gerry. 1979. Personal communication. Executive Director, OFF

Shinn, Eugene A. 1979. Collecting Biologic and Geologic Specimens in South Florida. Atlantic Reef Committee. Information Circular.

Stevenson, David K. 1977. Proceedings Gulf and Caribbean Fishery Institute and Conference on small-scale fisheries in the Caribbean. pp. 95-112.

Stone, Alexander. 1979. Letter to Sanctuary Programs Office re wire mesh fish traps. President, Marine Wilderness Society.

Taylor, Ronald J. and McMichael, Robert B., " The first quarterly report on the wire trap fishery in the Florida Keys based on observations during November 1979 - January 1980". Florida Department of Natural Resources, February, 1980.

Thomas, Richard. 1979. Personal communication, commercial fisherman.

Tilmant, Jim. 1979 Personal communication, Research Biologist, Biscayne Monument.

Tingley, Ralph. 1979. Personal communication. Chief, Florida Marine Patrol, Florida Keys.

University of Florida Center for Governmental Responsibility, Holland Law Center. 1976. Prepared for Florida Department of Natural Resources, Division of Resource Management, Bureau of Coastal Zone Planning.

Scientific Literature

Antonius, A. 1972. Occurrence and distribution of stony corals (Anthozoa and Hydrozoa) in the vicinity of Santa Marta, Colombia. Mitt. Inst. Colombo-Aleman Invest. Cient., 6: 89-103.

Antonius, A. 1974. Final report of the coral reef group of the Florida Keys project for the project year 1973. Harbor Branch Foundation, Fort Pierce, Florida. 201 pp.

Antonius, A. and G. Griffin. 1974. Turbidity and coral reef health in waters of Pennekamp Park, upper Florida Keys. Florida Scientist, 37: 15.

Antonius, A. 1975. Health problems of the Florida coral reefs. Florida Scientists, 38: 21.

Antonius, A. 1977. Coral mortality in reefs: a problem for science and management. Proc. Third Internat. Coral Reef Symp., Univ. Miami, 2: 618-623.

Antonius et al. 1978. Looe Key Reef Resource Inventory

Bayer, F.M. 1961. The shallow-water Octocorallia of the West Indian region. Martinus Nijoff, The Hague, Netherlands, 101 fig., 28 pl., 373 pp.

Bohlke, J.E. and C.C.G. Chaplin. 1970. Fishes of the Bahamas and adjacent tropical waters. Livingston Publishing Comp., Wynnewood, Pennsylvania. 36 pl., xxiii + 771 pp.

Chaplin, C.C.G. 1972. Fishwatchers guide to West Atlantic coral reefs. Livingston Publishing Compl, Wynnewood, Pennsylvania. 23 pl., 64 pp.

Cottam, G. and J. T. Curtis. 1956. The use of distance measure in phytosociological sampling. Ecology, 37: 451-460.

deLaubenfels, M.W. 1953. A guide to the sponges of Eastern North America. Publ. Mar. Lab. Univ. Miami, Univ. Miami Press. 32 pp.

Florida Coastal Coordinating Council. 1974. Florida Keys Coastal Zone Management Study. Florida Department of Natural Resources, Tallahassee, Florida.

Geister, J. 1977. The influence of wave exposure on the ecological zonation of Caribbean coral reefs. Proc. Third Internat. Coral Reef Symp., Univ. Miami, 1: 23-29.

Ginsburg, Robert N. 1974. Florida Reef Types. Proceeding Florida Keys Coral Reef Workshop. U. of Miami

Ginsburg, R. N. and E. A. Shinn. 1964. Distribution of the reef-building community in Florida and the Bahamas. Bull, Am. Assoc. Petrol. Geol., 66: 310-318.

Glynn, P.W. 1977. Coral growth in upwelling and non-upwelling areas off the Pacific coast of Panama. Journ. of Marine Research, 35: 567-585.

Goodson, G. 1976. Fishes of the Atlantic coast. Marquest Color-guide Books, Palos Verdes Estates, California. v + 203 pp.

Goreau, T.F. 1959. The coral reefs of Jamaca: I. Species composition and zonation. Ecology, 40: 67-90.

Goreau, T. F. and J. W. Wells. 1967. The shallow water Scleractinia of Jamaica: revised list of species and their vertical distribution range. Bull. Mar. Sci., 17: 442-453.

Greenberg, I. 1977. Guide to corals and fishes of Florida, the Bahamas, and the Caribbean. Seahawk Press, Miami, Florida. 64 pp.

Hoffmeister, J. E. 1974. Land from the Sea. Univ. Miami Press, Coral Gables, Florida. 143 pp.

Hoffmeister, J. E., J. I. Jones, D. R. Moore, and H. G. Multer. 1964. Living and fossil reef types of southern Florida. Geol. Soc. Am. Conv., Nov. 1964. 2 pl., 28 pp.

Hoffmeister, J. E. and H. G. Multer. 1968. Geology and origin of the Florida Keys. Geol. Soc. America Bull., 79: 845-852.

Jones, J. A. 1977. Morphology and development of Southern Florida partch reefs. Proc. Third Internat. Coral Reef Symp., Univ. Miami, 2: 231-235.

Kaufmann, L. 1977. The three spot damselfish: effects on benthic biota of Caribbean coral reefs. Proc. Third Internat. Coral Reef Symp., Univ. Miami, 1: 559-564.

Kissling, D. L. 1975. Coral reefs in the lower Florida Keys: a preliminary report. In: Carbonate Rock Environments, ed. H. G. Multer, Farleigh Dickinson Univ., Madison New Jersy. pp. 102 E-K.

Longley, W. H. and S. F. Hildebrand. 1941. Systematic catalogye of the fishes of Tortugas, Florida. Pap. Tort. Lab., Carnegie Inst. Wash., 34, 34 pl., 331 pp.

Loya, Y. 1972. Community structure and species diversity of hermatypic coral at Eilat, Red Sea. Mar. Biol., 13: 100-12

Loya, Y. and L. B. Slobodkin. 1971. The coral reef of Eilat (Gulf of Eilat, Red Sea). Symp. Zool. Soc. Lond., 28: 117-139.

Macintyre, G. I.I and O. H. Pilkey. 1969. Tropical coral reefs: tolerance of low temperatures on the North Carolina continental shelf. Science, 166" 374-375.

Marszalek, D.S., G. Babashoff, M.R. Noel, and D.R. Worley. 1977. Reef distribution in South Florida. Proc. Third. Internat. Coral Reef Symp., Univ. Miami, 2: 223-229.

Mayor, A. G. 1914. The effects of temperature upon tropical marine animals. Publ. Carnegie Inst. Wash., 183: 1-24.

Mayor, A. G. 1916. The lower temperatures at which reef-corals loose their ability to capture food. Carnegie Inst. Wash., Year-Book, 14, 212.

National Park Service. 1977. Draft master plan. Draft environmental statement. U. S. Department of the Interior, Washington, D. C.

Odum, Eugene P. Fundamentals of Ecology Third Edition. p. 51.

Ogden, J. C. and J. C. Zieman. 1977. Ecological aspects of coral reef - seagrass beds contacts in the Caribbean. Proc. Third Internat. Coral Reef Symp., Univ. Miami, 1: 377-382.

Pielou, E. C. 1966. The measurement of species diversity in different types of biological collections. J. Theor. Biol., 13: 145-163

Porter, J. W. 1972. Ecology and species diversity of coral reefs on opposite sides of the Isthmus of Panama. Bull, Biol. Soc. Wash., 2: 89-116.

Randall, J. E. 1968. Caribbean reef fishes. T.F.H. Publications,. Hong Kong. 324 fig., 318 pp.

Shinn, E.A. 1963. Spur and groove formation on the Florida Reef Tract. Jour. Sed. Pet., 33 (2): 291-303.

Shinn, E.A. 1966. Coral growth-rate, an environmental indicator. Jour. Paleo., 40 (2): 233-240.

Stark, W.A. 1968. A list of the fishes of Alligator Reef, Florida, with comments on the nature of the Florida reef fish fauna. Univ. Miami, Inst. Mar. Sci., 890, 28 pp.

Stark, W.A. and W.P. Davis. 1967. Night habits of fishes of Alligator Reef, Florida. Ichthyologica, 38 (4): 313-356, 25 fig.

Stoddart, D.R. 1963. Effects of hurricane Hattie on the British Honduras reefs and cays, October 30-31, 1961. Atoll Res. Bull., 95: 1-142.

Stoddart, D.R. 1969. Distribution of corals in reefs. Proc. Symp. Corals and Coral Reefs, Mandapan, India. pp. 71-80.

Vaughan, T.W. 1918. The temperature of the Florida Reef Tract. Pap. Tort. Lab., Carnegie Inst. Wash., 9: 319-339.

Vaughan, T.W. and J.W. Wells. 1943. Revision of the suborders, families, and genera of the Scleractinia. Spec. Papers Geol. Soc. Amer., New York, 44: 1-363.

Voss, G.L. 1973. Sickness and death in Florida's coral reefs. Nat. Hist., 82 (7): 40-47.

Wells, J.W. 1973. New and old scleractinian corals from Jamaica. Bull. Mar. Sco., 23(1): 16-58.

Wiedenmayer, F. 1977. Shallow water sponges of the western Bahamas. Birkenhauser Verlag, Basel and Struttgart. 180 fig., 43 pl., 336 pp.

Economic Analysis

Bell, Frederick W. 1979. Recreational versus commercial fishing in Florida: An economic impact analysis.

Black, Crow and Eidsness, Inc. 1976. Engineering and Financial Report for the Florida Keys Aqueduct Authority. Black, Crow and Eidsness, Inc., Gainesville, Florida.

Cato, James C. 1979. Economic impact estimates concerning commercial fishing in Florida. Florida Cooperative Extension Service, Marine Advisory Program, Cooperative Extension Service, Marine Advisory Program, Gainesville, Florida.

Cato, James C., R. Allan Morris and Fred J. Prochaska. 1978. Production costs and earnings by boat size: Florida Spanish Mackerel Fishery. Florida Cooperative Extension Service, Marine Advisory Program, Gainesville, Florida.

Cato, James C. and Fred Prochaska. 1978. Socio-economic assessment of fishery management in Everglades National Park. U.S. National Park Service, South florida Research Center, Everglades National Park.

Center for Natural Areas. 1979. Fishery Management Plan for Coral and Coral Reef Resources. center for Natural Areas, Washington, D.C.

Florida Department of Administraton. 1979. Analysis of Florida Keys Economic Sectors with Regard to Areas of Critical State Concern Designation. Florida Bureau of Land and Water Management.

Florida Department of Commerce. 1977. Monroe County Economic Data. Bureau of Economic Analysis.

Florida Department of Natural Resources. 1978. Tabulation of Daily Visitors. Bahia Honda Recreation Area.

Florida Statistical Abstract. 1978. University of Florida Press, Gainesville, Florida.

Goreau, Thomas F., Nora I. Goreau and Thomas T. Goreau. 1979. Corals and Coral Reefs. Scientific American, Vol. 24, No.2.

Korin, Basil P. 1975. Statistical Concepts for the Social Sciences. Winthrop Publishers, Cambridge, Md.

Krutilla, John V. and A.C. Fisher. 1975. The Economics of Natural Environments: Studies in the Valuation of Commodity and Amenity Resources. Johns Hopkins University Press, Baltimore, Md.

Mathis, Kary, James C. Cato, Robert L. Degner, Paul D. Landrum and Fred J. Prochaska. 1979. Commercial Fishing activity and Facility Needs in Florida: Dade and Monroe Counties. Florida Agricultural Market Market Research Center, University of Florida, Gainesville, Florida.

Monroe County Statistics. June, 1979. Monroe County Planning Department, Key West, Florida.

Morris, R. Allan, Fred J. Prochaska, and James C. Cato. 1977. An Economic Analysis of King Mackerel Production by Hook and Line on the Florida Atlantic Coast. Florida Cooperative Extension Service, Marine Advisory Program, Gainesville, Florida.

Morris, R. Allan and Fred Prochaska. 1979. Economic Impact of the Processing and Marketing of Commercial Florida Marine Landings. Marine Advisory Program, Gainesville, Florida.

Prochaska, Fred J. 1978. Theoretical and Empirical Consideration for Estimating Capacity and capacity Utilization in Commercial Fisheries. American Journal of Agricultural Economics.

Prochaska, Fred J. and J.R. Baarda. 1975. Florida Fisheries Management Programs: Their development, administration, and current status. University of Florida, Gainesville, Florida.

Prochaska, Fred J. and Joel S. Williams. 1978. An Economic Analysis of Spiny Lobster Production by Individual Firms at Optimum Stock Levels. Southern Journal of Economics.

Prochaska, Fred J. and Joel S. Williams. 1976. Economic Analysis of Cost and Returns in the Spiny Lobster Fishery by Boat and Vessel Size. Florida Cooperative Extension Service, Marine Advisory Program, Gainesville, Florida.

Prochaska, Fred J. and R. Allan Morris. 1978. Primary Economic Impact of the Florida Commercial Fishing Sector. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, Florida.

Skin Diver Magazine. 1979. 1979 Reader Survey. Petersen Publishing Co., Los Angeles, California.

Snell, Ernie. 1979. Personal communication. National Marine Fisheries, Miami, Florida.

Tilmant, James, Danny Peters and Renate Skinner. 1979. Biscayne National Monument Fisheries Monitoring Program. Second Quarter Report. U.S. National Park Service, Biscayne National Monument, Homestead, Florida.

U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysic Division. 1977. Industry - Specific Gross Output Multiplier for BEA Economic Areas. Government Printing Office, Washington, D. C.

U.S. National Park Service, Biscayne National Monument. 1979. Average number of people per boat for each recreational activity for the whole period of record. Homestead, Florida.

Williams, Joel S. and Fred J. Prochaska. 1976. The Florida Spiny Lobster Fishery: Landings, Prices and Resource Productivity. Florida Sea Grant Program, Gainesville, Florida.

APPENDIX A DRAFT DESIGNATION DOCUMENT
DESIGNATION OF THE LOOE KEY MARINE SANCTUARY

APPENDIX A

DRAFT DESIGNATION DOCUMENT
DESIGNATION OF THE LOOE KEY MARINE SANCTUARY

Preamble

Under the authority of the Marine Protection, Research and Sanctuaries Act of 1972, P.L. 92-532, (the Act) the waters at Looe Key are hereby designated a Marine Sanctuary for the purposes of preserving and protecting this valuable and fragile ecological and recreational resource and of stimulating research activities and public awareness of its value and vulnerability.

Article 1. Effect of Designation

Within the area designated as the Looe Key Marine Sanctuary (the Sanctuary), described in Article 2, the Act authorizes the promulgation of such regulations as are reasonable and necessary to protect the values of the Sanctuary. Article 4 of the Designation lists those activities which may require regulation but the listing of any activity does not by itself prohibit or restrict it. Restrictions or prohibitions may be accomplished only through regulation and additional activities may be regulated only by amending Article 4.

Article 2. Description of the Area

The Sanctuary consists of a 5.32 square nautical mile (sq nm) area of the waters located off the coast of Florida 6.7 nm (12.5 km) southwest of Big Pine Key in the lower Florida Keys. The precise boundaries are as follows:

Latitude and Longitude are furnished to .001 of a second.

	LATITUDE			LONGITUDE		
PT NO	0	/	//	0	/	//
2-1	24	31	37	81	26	00
2-2	24	33	34	81	26	00
2-3	24	34	09	81	23	00
2-4	24	32	12	81	23	00

Article 3. Characteristics of the Area that Give it Particular Value

The sanctuary area is a valuable diverse and biologically productive living coral reef community in the Florida Reef Tract, including an array of tropical fish species and a well defined classic "spur and groove" reef system. The site also provides feeding, spawning, and nursery areas valuable for commercial fisheries. The Sanctuary will provide recreational experiences,

scientific research opportunities and generally will have special value as an ecological, recreational, esthetic and educational resource.

Article 4. Scope of Regulation

Section 1. Activities Subject to Regulation. In order to protect the distinctive values of the sanctuary, the following activities may be regulated within the Sanctuary to the extent necessary to ensure the protection and preservation of its marine features and the ecological, recreational, and esthetic value of the area:

a. Collecting and damaging coral
b. Tropical specimen collecting
c. Vessel operations
d. Spearfishing
e. Wire fish trap fishing
f. Lobster potting
g. Bottom trawling and specimen dredging
h. Discharging or depositing any substance or object
i. Dredging or alteration of or construction on the seabed
j. Removing or otherwise harming cultural or historic resources

Section 2. Consistency with International Law. The regulations governing the activities listed in Section 1 of this Article will apply to foreign flag vessels and persons not citizens of the United States only to the extent consistent with recognized principles of international law including treaties and international agreements to which the United States is a party.

Section 3. Emergency Regulations. Where essential to prevent immediate, serious and irreversible damage to the ecosystem of the area, activities other than those listed in Section 1 may be regulated within the limits of the Act on an emergency basis for an interim period not to exceed 120 days, during which an appropriate amendment of this Article would be proposed in accordance with the procedures specified in Article 6.

Article 5. Relation to Other Regulatory Programs

Section 1. Fishing. The regulation of fishing is not authorized under Article 4 except with respect to the removal or damage of coral (paragraph (a)), the removal of tropical fish and invertebrates, (paragraph (b), and the use of certain techniques including paragraphs #(d)-(g). In addition, fishing vessels may be regulated with respect to discharges (paragraph (h)) and anchoring (paragraph (c)). All regulatory programs pertaining to fishing, including particularly Fishery Management Plans promulgated under the Fishery Conservation and Management Act of 1976, 16 U.S.C 1801 et. seq. shall remain in effect and all permits, licenses and other authorizations issued pursuant thereto shall be valid within the Sanctuary unless authorizing any activity prohibited by regulation implementing Article 4.

Section 2. Defense Activities. The regulation of those activities listed in Article 4 shall not prohibit any activity conducted by the Department of Defense that is essential for national defense or because of emergency. Such activities shall be conducted consistently with all regulations to the maximum extent practicable.

Section 3. Other Programs. All applicable regulatory programs shall remain in effect and all permits, licenses and other authorizations issued pursuant thereto shall be valid within the Sanctuary unless authorizing any activity prohibited by any regulation implementing Article 4. The Sanctuary regulations shall set forth any necessary certification procedures.

Article 6. Alterations to this Designation

This Designation can be altered only in accordance with the same procedures by which it has been made, including public hearings, consultation with interested Federal and State agencies and the appropriate Regional Fishery Management Councils and approval by the President of the United States.

DRAFT REGULATIONS

PART 937 - THE LOOE KEY MARINE SANCTUARY REGULATIONS

937.1 Authority
937.2 Purpose
937.3 Boundaries
937.4 Definitions
937.5 Allowed Activities
937.6 Prohibited Activities
937.7 Penalties for Commission of Prohibited Acts
937.8 Certification of Other Permits
937.9 Appeals of Administrative Action

937.1 Authority

The sanctuary has been designated by the Secretary of Commerce pursuant to the authority of section 302(a) of Title III of the Marine Protection, Research and Sanctuaries Act of 1972, 16 U.S.C. 1431-1434 (the Act). The following regulations are issued pursuant to the authorities of sections 302(f), 302(g) and 303 of the Act.

937.2 Purpose

The purpose of designating the Sanctuary is to protect and preserve the coral reef ecosystem and other natural resources of the waters at Looe Key and to ensure the continued availability of the area for public educational purposes and as a commercial, ecological, research and recreational resource. This area supports a particularly rich and diverse marine biota. The area is easily accessible to the lower Florida Keys and is widely used by boaters, charter boat operators, dive boats, recreational divers and fishermen. Consequently, both present and potential levels of use may result in harm to Looe Key in the absence of long term planning, research, monitoring and adequate protection.

937.3 Boundaries

The Sanctuary consists of an area of 5.32 square nautical miles of high sea waters off the coast of lower Florida Keys, 6.7 nautical miles (12.5 km) southwest of Big Pine Key. The area includes the waters overlaying a section of the submerged Florida Reef tract at Looe Key. The precise boundaries are:

Latitude and Longitude are furnished to .001 of a second.

	LATITUDE			LONGITUDE		
PT NO	0	/	//	0	/	//
2-1	24	31	37	81	26	00
2-2	24	33	34	81	26	00
2-3	24	34	09	81	23	00
2-4	24	32	12	81	23	00

937.4 Definitions

a. "Administrator" means the Administrator of the National Oceanic and Atmospheric Administration.

b. "Assistant Administrator" means the Assistant Administrator for Coastal Zone Management, National Oceanic and Atmospheric Administration.

c. "Person" means any private individual, partnership, corporation, or other entity; or any officer, employee, agent, department, agency or instrumentality of the Federal government, or any State or local unit of the government.

d. "Tropical fish" means fish and invertebrates of minimal sport and food value, usually brightly colored, often used for aquaria purposes and which live in a close interrelationship with the coral.

e. "The Reef" means the area of the well defined "spur and groove" coral reef as delineated by Loran readings 1, 2, 3, 4 as follows:

1. NW 7980-W-13973.7, 7980-Y-43532.7
2. SW 7980-W-13975.4, 7980-Y-43532.4
3. NE 7980-W-13975.0, 7980-Y-43530.1
4. SE 7980-W-13975.4, 7980-Y-43527.7

937.5 Allowed Activities

All activities except those specifically prohibited by section 937.6 may be carried on in the Sanctuary subject to all prohibitions, restrictions and conditions imposed by any other authority.

937.6 Activities Prohibited Without a Permit

a. Unless permitted by the Assistant Administrator in accordance with section 937.8, or as may be necessary for the national defense, in accordance with Article 5, section 2 of the Designation, or to respond to an emergency threatening life, property or the environment, the following activities are prohibited within the Sanctuary. All prohibitions must be applied consistently with international law.

(1) Removing or damaging distinctive natural features

(a) No person shall break, cut or similarly damage or take any coral or marine invertebrate except as a result of anchoring outside the Fore Reef as allowed under subsection 2(a) of this section. Divers are prohibited from handling coral or standing on coral formations.

(b) No person shall take except incidentally to allowed fishing activities, any tropical fish or marine invertebrate.

(c) There shall be a rebuttable presumption that any items listed in this paragraph found in the possession of a person within the Sanctuary have been collected or removed from within the Sanctuary.

(2) Operation of watercraft

All watercraft shall be operated in accordance with Federal rules and regulations that would apply if there were no sanctuary. The following constraints also shall be imposed.

(a) No person shall place any anchor on coral within the Fore Reef of the Sanctuary nor allow any chain or rope to enter the Fore Reef in a way that injures any coral. When anchoring dive boats, the first diver down shall inspect the anchor to ensure that it is placed off the corals and will not shift in such a way as to damage corals. No further diving is permitted until the anchor is placed in accordance with these requirements.

(b) Watercraft must use mooring buoys, stations or anchoring areas when such facilities and areas have been designated and are available.

(c) Watercraft shall not be operated in such a manner as to strike or otherwise cause damage to the natural features of the Sanctuary.

(d) All watercraft from which diving operations are being conducted shall fly in a conspicuous manner, the red and white "divers down" flag.

(3) Using Harmful Fishing Methods

(a) No person shall use or place wire fish traps within the sanctuary.

(b) No person shall place lobster traps within the Fore Reef area of the sanctuary.

(c) No person shall use pole spears, Hawaiian slings, rubber-powered arbalets, pneumatic and spring loaded guns or similar devices known as spearguns within the sanctuary.

(4) Removing or damaging distinctive historical or cultural resources

No person shall remove, damage or tamper with any historical or cultural resource, including cargo, pertaining to submerged wrecks.

(5) Discharges

No person shall deposit or discharge any materials or substances of any kind except:

(a) Fish or parts and chumming materials

(b) Cooling water from vessels

(c) Effluents from marine sanitation devices

(6) Markers

(a) No person shall mark, deface or damage in any way or displace, remove or tamper with any signs, notices, or placards, whether temporary or permanent, or with any monuments, stakes, posts or other boundary markers installed by the managers or markers placed for the purpose of lobster pot fishing.

(b) All activities currently carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to these prohibitions. The exemption of additional activities having significant impacts shall be determined in consultation between the Assistant Administrator and the Department of Defense.

(c) The prohibitions in this section are not based on any claim of territoriality and will be applied to foreign persons and vessels only in accordance with principles of international law, including treaties, conventions and other international agreements to which the United States is signatory.

937.7 Penalties for Commission of Prohibited Acts

Section 303 of the Act authorizes the assessment of a civil penalty of not more than $50,000 against any person subject to the jurisdiction of the United States for each violation of any regulation issued pursuant to the Act, and further authorizes a proceeding in rem against any vessel used in violation of any such regulation. Procedures are outlined in Subpart D of Part 922 (15 CFR Part 922) of this chapter. Subpart D is applicable to any instance of a violation of these regulations.

937.8 Permit Procedures and Criteria

(a) Any person in possession of a valid permit issued by the Assistant Administrator in accordance with this section may conduct any activity in the sanctuary specifically prohibited under section 937.6 provided that any permit allowing the damaging, taking or removal of coral, tropical marine specimen collecting (marine life fishing), or historical or cultural resources shall be granted only if the activity involved furthers educational or scientific purposes or is related to salvage or recovery operations.

(b) Permit applications shall be addressed to the Assistant Administrator for Coastal Zone Management, ATTN: Sanctuary Programs Office, National Oceanic and Atmospheric Administration, 3300 Whitehaven Street, N.W., Washington, D.C. C. 20235. An application shall include a description of all activities

proposed, the equipment, methods, and personnel (particularly describing relevant experience) involved, and a timetable for completion of the proposed activity. Copies of all other required licenses or permits shall be attached.

(c) In considering whether to grant a permit the Assistant Administrator shall evaluate such matters as (1) the general professional and financial responsibility of the applicant; (2) the appropriateness of the methods envisioned to the purpose(s) of the activity; (3) the extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, educational or scientific information; (4) the end value of the activity and (5) such other matters as deemed appropriate.

(d) In considering any application submitted pursuant to this Section, the Assistant Administrator shall seek the view of the Fishery Management Councils and may seek and consider the views of any person or entity, within or outside of the Federal Government, and may hold a public hearing, as deemed appropriate.

(e) The Assistant Administrator, may, in his or her discretion grant a permit which has been applied for pursuant to this Section, in whole or in part, and subject to such condition(s) as deemed appropriate. The Assistant Administrator or a designated representative may observe any permitted activity and/or require the submission of one or more reports of the status or progress of such activity. Any information obtained shall be made available to the public.

(f) The permit granted under paragraph (e) may not be transferred.

(g) The Assistant Administrator may amend, suspend or revoke a permit granted pursuant to this Section, in whole or in part, temporarily or indefinitely, if the permit holder (the Holder) has acted in violation of the terms of the permit or of the applicable regulations. Any such action shall be set forth in writing to the Holder, and shall set forth the reason(s) for the action taken. The Holder may appeal the action as provided for in 937.10.

937.9. Certifiction of Other Permits

All permits, licenses and other authorizations issued pursuant to any other authority are hereby certified and shall remain valid if they do not authorize any activity prohibited by section 937.6. Any interested person may request that the Assistant Administrator offer an opinion on whether an activity is prohibited by these regulations.

935.10. Appeals for Administrative Action

(a) Any interested person (the Appellant) may appeal the granting, denial, or conditioning of any permit under section 937.8 to the Administrator of NOAA. In order to be considered by the Administrator, such appeal shall be in writing, shall state the action(s) appealed and the reason(s) therefore and must be submitted within 30 days of the action(s) by the Assistant Administrator. The Appellant may request an informal hearing on the appeal.

(b) Upon receipt of an appeal authorized by this Section, the Administrator shall notify the permit applicant, if other than the Appellant, and may request such additional information and in such form as will allow action upon the appeal. Upon receipt of sufficient information, the Administrator shall decide the appeal

in accordance with the criteria set in 937.8(c) as appropriate, based upon information relative to the application on file at OCZM and any additional information, the summary record kept of any hearing and the Hearing Officer's recommended decision, if any, as provided in paragraph (c) and such other considerations as deemed appropriate. The Administrator shall notify all interested persons of the decision, and the reason(s) therefore, in writing, normally within 30 days of the receipt of sufficient information, unless additional time is needed for hearing.

(c) If a hearing is requested or if the Administrator determines one is appropriate, the Administrator may grant an informal hearing before a Hearing Officer designated for that purpose after first giving notice of the time, place, and subject matter of the hearing in the Federal Register. Such hearing shall normally be held no later than 30 days following publication of the notice in the Federal Register unless the Hearing Officer extends the time for reasons deemed equitable. The Appellant, the Applicant (if different) and, at the discretion of the Hearing Officer, other interested persons, may appear personally or by counsel at the hearing and submit such material and present such arguments as determined appropriate by the Hearing Officer. Within 30 days of the last day of the hearing, the Hearing Officer shall recommend in writing a decision to the Administrator.

(d) The Administrator may adopt the Hearing Officer's recommended decision, in whole or in part, or may reject or modify it. In any event, the Administrator shall notify interested persons of the decision, and reason(s) therefore in writing within 30 days of receipt of the recommended decision of the Hearing Officer. The Administrator's action shall constitute final action for the Agency for the purposes of the Administrative Procedure Act.

(e) Any time limit prescribed in this Section may be extended for a period not to exceed 30 days by the Administrator for good cause, either upon his or her own motion or upon written request from the Appellant or Applicant stating the reason(s) therefore.

SCALE: 1" = 3000' 1" = .49 nmi 1" = .91km

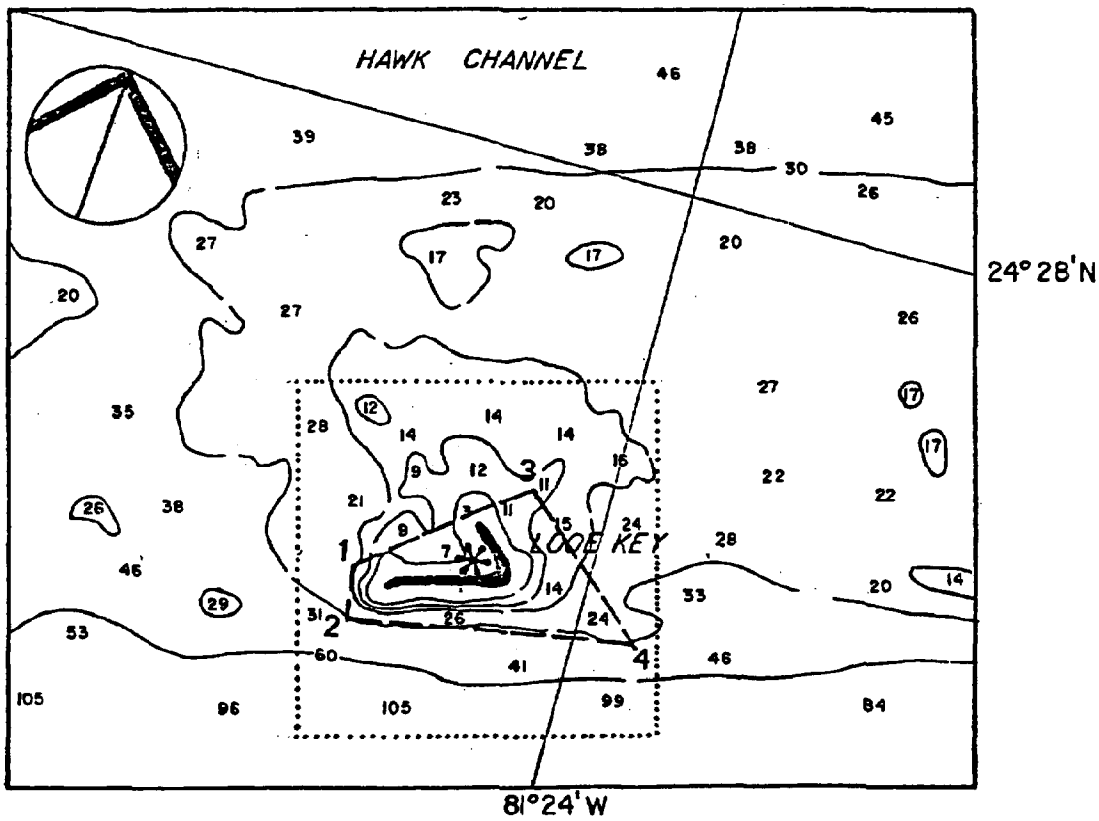


FIGURE 6-7. Location of the Looe Key HAPC, as measured onto the contours of NOAA National Ocean Survey Chart 11445. Square measures 1.852km (1 nmi) on each side with a center at the asterisk. The LORAN-C readings for the four points of the trapezoid are listed below.

1 NW 7980-W-13973.7, 7980-Y-43532.7
2 SW 7980-W-13973.4, 7980-Y-43532.4
3 NE 7980-W-13975.0, 7980-Y-43530.1
4 SE 7980-W-13975.4, 7980-Y-43527.7

APPENDIX B SITE ANALYSIS RESEARCH METHODS

APPENDIX B

SITE ANALYSIS RESEARCH METHODS

Next to the ecological complexity of a coral reef, its size poses the most difficult problem for research. Since coral reefs are usually much too large to be quantitatively assessed as a whole, a statistically significant number of samples has to be selected for analysis. This number has to be high enough to be truly representative for the entire reef, but small enough to remain manageable. In order to achieve this goal, a variety of field methods have been developed by the scientific community. Diverse as they are, they can easily be divided into two groups, one working with sample-plots, the other with plotless lines.

The latest synopsis of sample-plot techniques (Stoddart, 1969) lists over a dozen different methods. They all have in common the establishment of fixed-area, permanent sample plots, inside of which all components can be measured, mapped, photographed, etc., and the life-history of their sessile organisms monitored over long periods of time. Dating back to the beginning of this century, these methods have proved useful scientifically, but also extremely time-consuming in terms of fieldwork man-hours. In terrestrial phytosociology, it was finally discovered (Cottam and Curtis, 1956) that sampling along plotless transect lines yields no less valuable data, but saves up to 90% of working time. This discovery was later adopted by some coral reef ecologists, working on similar problems, but constantly hampered by the inherent expense of underwater work. Plotless line techniques have been used successfully for purely scientific purposes by several authors (e.g. Loya and Slobodkin, 1971; Loya, 1972; Porter, 1972).

For the somewhat different goals of coral reef resource management, plotless line techniques were recently adapted by Antonius (Antonius, 1974). Using these modified plotless line techniques, sample points are recorded in evenly spaced intervals technique), as opposed to measuring continuously under the transect line. Because of underwater operating constraints, and the need to analyze large reef areas with transects in the order of magnitude of kilometers, sample point intervals of one meter were chosen for the Looe Key Reef Resource Inventory (Florida Reef Foundation, 1978), the baseline study used in the Looe Key Affected Environment site analysis.

The Looe Key Resource Inventory, used in the EIA, was directed towards identifying the main components of the reef ecosystem in terms of biomass, area coverage, and importance. In the field, this strategy was manifested in an attempt to accurately sight-identify dominant reef components.

Snorkeling and SCUBA diving techniques were used to visually assess fish populations at Looe Key. Dives were aimed at covering all four reef zones as thoroughly as possible without creating any disturbance. All species were recorded and their relative abundance noted by direct observation. At the onset of this study, it was decided that fish-collecting techniques in any form would not be used to establish the check list or to confirm the identities of any questionable species. For the scope of this study, the possible deleterious effects of rotenone use (i.e. poisoning the fish in a given area for collection and identification) outweighed the advantages of positive identification of questionable species. Only direct observations or photodocumentation were used to identify the fish. Spawning activity was noted by actual observed spawning or by the presence of demersal egg nests. Coral - fish interactions were photographed and routinely monitored with particular emphasis placed on the damselfishes (family Pomacentridae) and their selected coral species habitat. The different reef zones were analyzed as to the important species present and comparisons made with similar reefs in the Key Largo Marine Sanctuary. Night dives were conducted to account for the cryptic nocturnal species that may not be seen during the day.

Collecting and laboratory identifying techniques for all species were minimized, thereby curtailing negative impacts on the reef system and allowing the project to proceed within its specific time and funding constraints. Thus, species identifications of some algae, infrequently observed sponges, octocorals difficult to identify in the field (e.g. genus Eunicia), rare scleractinians (e.g. genus Agaricia), a number of small molluscs, as well as some difficult to observe fishes, have to be considered preliminary at the present stage.

More extensive collecting and laboratory work in the future would be highly desirable from a scientific point of view. However, since all the species in question probably comprise less than one percent of Looe Key Reef in terms of biomass and organic cover, they should not be considered especially important for purposes of resource management.

Appendix B

SYSTEMATIC LIST OF SPECIES

Thallophyta

Chlorophyta (Green Algae)

Bryopsis pennata v. *leprieurii*
Caulerpa racemosa v. *macrophysa*
Caulerpa vickersia
Caulerpa cupressoides
Caulerpa sertularoides f. *farlowii*
Halimeda opuntia
Halimeda opuntia f. minor
Halimeda incrassata
Halimeda monile
Halimeda tuna
Halimeda discoides
Penicillus capitatus
Penicillus lamourouxii
Rhipocephalus oblongus
Rhipocephalus phoenix f. *brevifolius*
Udotea flabellum
Udotea sublittoralis
Udotea conglutinata
Cladophora fuliginosa
Anadyomene stellata
Valonia ventricosa
Valonia macrophysa
Acetabularia crenulata
Dasycladus vermicularis
Cladophoropsis macromeres
Cladophoropsis membranacea
Batophora oerstedii
Neomersis annulata
Dictyosphaeria cavernosa

Phaeophyta (Brown Algae)

Stypopodium zonale
Dictyota dichotoma

Dictyota bartay resii
Dictyota divaricata
Padina sanctae-crucis
Sargassum polyceratium

Rhodophyta (Red Algae)

Liagora ceranoides
Liagora pedicellata
Peysonellia spp.
Melobesia membranaces
Goniolithon spp.
Lithothamnium incertum
Lithothamnium spp.
Amphiroa fragilissima
Amphiroa rigida v. antillana
Ceramium spp.
Spyridia filamentosa
Spyridia aculeata v. hypneoides
Chondria cnicophylla
Digenia simplex
Lithophyllum spp.
Laurencia intricata
Laurencia obtusa
Laurencia corallopsis
Laurencia papillosa
Wrangelia sp.
Polysiphonia spp.

Spermatophyta

Angiospermae - Halophyta (Sea Grasses)

Syringodium filiforme (Manatee Grass)
Thalassia testudinum (Turtle Grass)

Porifera (Sponges)

Calcisponges

Leucetta floridana

Demosponges - Keratosa

Oligoceras hemorrhages
Ianthella ardis
Ircinia fascicularis (Stjnker Sponge)
Ircinia campana (Vase Sponge)
Ircinia strobilina (Cake Sponge)
Dysidea etheria (Heavenly Sponge)
Aplysilla sulfurea
Verongia fistularis (Candle Sponge)
Verongia longissima (Branching Candle Sponge)
Hippospongia lachne (Sheepswool Sponge)
Spongia obliqua (Cuban Reef Sponge)

Haplosclerina

Dasychalina cyathina (Vase Sponge)
Neopetrosia longleyi (Sprawling Sponge)
Xestospongia muta (Barrel Sponge)
Haliclona rubens (Red Sponge)
Haliclona viridis (Green Sponge)
Haliclona variabilis
Haliclona permollis
Haliclona subtriangularis
Callyspongia vanalis (Tube Sponge)
Callyspongia plicifera (Tube Sponge)
Iotrochota birotulata (Purple Bleeding Sponge)
Fibulia nolitangere (Do-not-touch-me Sponge)

Poecilosclerina

Halichondria melandocia
Adocia neens
Tedania ignis (Fire Sponge)
Lissodendoryx isodictyalis
Xytopsues griseus
Agelas sparsus

Aulospongus schoenus
Mycale angulosa
Homaxinella rudis
Higginsia strigilata

Hadromerina

Cliona caribboea
Cliona lampa (Boring Sponge)
Spheciospongia vesparia (Loggerhead Sponge)

Epipolasida

Tethya diploderma (Golf Ball Sponge)

Choristida

Cinachyra cavernosa
Geodia gibberosa (White Sponge)

Carnosa

Chondrilla nucula (Chicken Liver Sponge)

Coelenterata

Hydrozoa - Athecata - Milleporina (Hydrocorals)

Millepora alcicornis)
Millepora complanata) (Fire Coral)
Millepora squarrosa)

Anthozoa - Hexacorallia

Actiniaria (Sea Anemones)

Actinia bermudensis
Condylactis gigantea
Bunodosoma cavernata
Phymantis crucifer
Lebrunia danae
Bartholomea annulata
Calliactis tricolor
Stoichactis helianthus

Zoantharia (Mat Anemones)

Zoanthus sociatus
Zoanthus pulchellus
Palythoa mammillosa

Corallimorpharia (False Corals)

Ricordia florida
Rhodactis sanctithomae

Scleractinia (Reef Corals)

Stephanocenia intersepta (Blushing Star Coral)
Madracis decactis (Cactus Coral)
Madracis mirabilis) (Pencil Corals)
Madracis asperula)
Acropora palmata (Elkhorn Coral)
Acropora cervicornis (Staghorn Coral)
Acropora prolifera (Fused Staghorn Coral)
Agaricia agaricites
f. agaricites
f. danai
f. carinata (Leaf Corals)
f. purpurea
f. humilis

Agaricia tenuifolia	
Agaricia undata	
Agaricia lamarcki	(Leaf Corals)
Agaricia grahamae	
Agaricia fragilis	
Helioseris cucullata	(Sancer Corals)
Siderastrea siderea	
Siderastrea radians	(Star Corals)
Porites astreoides	(Mustard Hill oral)
Porites porites	
Porites divaricata	(Finger Corals)
Porites furcata	
Favia fragum	(Golfball Coral)
Diploria clivosa	
Diploria labyrinthiformis	(Brain Corals)
Diploria strigosa	
Manicina areolata	(Rose Coral)
Colpophyllia natans	(Brain Coral)
Montastraea annularis	
Montastraea cavernosa	
Solenastrea hyades	(Star Corals)
Solenastrea bournoni	
Oculina diffusa	
Oculina varicosa	(Ivory Bush Corals)
Meandrina meandrites	(Brain Coral)
Dichocoenia stokesi	
Dichocoenia stellaris	(Star Corals)
Dendrogyra cylindrus	(Pillar Coral)
Mussa angulosa	(Flower Coral)
Scolymia lacera	(Disc Coral)
Isophyllia sinuosa	(Cactus Coral)
Isophyllastrea rigida	(Rough Star Coral)
Mycetophyllia lamarckiana	
Mycetophyllia danaana	
Mycetophyllia ferox	(Fungus Corals)
Mycetophyllia aliciae	

Eusmilia fastigiata
Sphenotrochus auritus (Flower Coral)
Tubastrea aurea

Octocorallia

Scleraxonia (Octocorals)

Briareum asbestinum (Corky Sea Fingers)
Iciligorgia schrammi (Deepwater Sea Fan)
Erythropodium caribaeorum

Holaxonia

Plexaura homomalla
Plexaura flexuosa
Plexaura wagenaari
Eunicea asperula
Eunicea fusca
Eunicea mammosa
Eunicea succinea
Eunicea laciniata
Eunicea tourneforti (Sea Whips)
Eunicea calyculata
Muriceopsis flavida
Plexaurella dichotoma
Plexaurella nutans
Plexaurella grisea
Plexaurella fusifera
Muricea muricata
Muricea atlantica
Muricea elongata

Pseudopterogorgia bipinnata
Pseudopterogorgia acerosa (Sea Feathers)
Pseudopterogorgia americana
Gorgonia ventalina (Sea Fan)
Pterogorgia citrina
Pterogorgia anceps (Triangular Sea Band)
Pterogorgia guadelupensis (Flat Sea Band)
Ellisella barbadensis (Sea Wire)

Annelida

Polychaeta

Amphinomidae

Hermodice carunculata (Fire or Bristleworm)
Sabellidae

Sabella melanostigma (Banded Feather Duster)

Serpulidae

Spirobranchus giganteus (Horned Feather Worm)

Pomatostegus stellatus (Star Feather Worm)

Arthropoda

Crustacea - Decapoda

Stenopodidea

Stenopus hispidus (Banded Coral Shrimp)

Caridea

Periclimenes petersoni
Periclimenes yucatanicus (Cleaning Shrimp)

Astacidea

Palinurus argus (Spiny Lobster)
Palinurus guttatus (Spotted Crawfish)

Anomura

Ranilia muricata

Brachyura (Crabs)

Callapa gallus (Yellow Box Crab)
Portunus spinimanus (Spiny-Handed Portunus)
Carpilius corallinus (Coral Crab)
Gyptoxanthus erosus (Eroded Reef Crab)
Leptodius floridanus (Florida Leptodius)
Percnon gibbesi (Spray Crab)
Stenorhynchus seticornis (Arrow Crab)
Mithrax verrucosus (Granulated Spider Crab)

Mithrax hispidus
Mithrax sculptus (Spider Crab)

Pitho anisodan

Macrocoeloma trispinosum

Stomatopoda

Squillidae

Pseudosquilla ciliata (False Mantis Shrimp)

Mollusca

Amphineura - Chitonida

Chaetopleura apiculata (Bee Chiton)
Isnochiton floridanus (Slender Chiton)

Gastropoda - Prosobranchia - Archaeogastropoda (Sea Snails)

Hemitoma octoradiata (Eight-Ribbed Limpet)
Diodora listeri
Diodora cayenensis
Diodora dysoni (Keyhole Limpets)
Diodora minuta
Diodora jaumei

Lucapinella limatula
Lucapina suffusa
Lucapina sowerbii
Lucapina philippiana
Lucapina aegis (Keyhold Limpets)
Limula frenulata
Limula pycnonema
Fissurella barbadensis
Fissurella angustata

Acmaea pustulata (Spotted Limpet)

Tegula lividomaculata
Tegula hotessieriana (Top Shells)
Calliostoma javanicum
Calliostoma jubibum

Turbo canaliculatus (Channeled Turban)

Astraea caelata
Astraea tuber (Star Shells)

Astrae phoebia
Astrae tecta

Rissoina bryerea
Rissoina cancellata (Risso Shells)

Caecum floridanum
Caecum pulchellum (Caecum Shells)

Cerithium biminiense
Cerithium guinaicum (Horn Shells)
Seila adamsi (Screw Shell)
Triphora turris-thomae

Triphora nigrocincta
Triphora pulchella (Triphora Shells)

Triphora decorata
Epitonium lamellosum (Wentletrap)
Cheilea equestris (False Limpet)
Crepidula plana (Slipper Shell)
Strombus gigas (Queen Conch)
Strombus pugilis (Fighting Conch)
Strombus raninus (Hawk Wing Conch)
Erata maugeriae (Erata Shell)

Trivia pediculus
Trivia quadripunctata (Trivia Shells)

Trivia suffusa

Cyprea zebra
Cyprea cinerea
Cyprea spurca (Cowries)
Cyprea cervus

Cyphoma gibbosum
Cyphoma macgintyi (Flamingo Tongue)

Polyneces lacteus (Moon Shell)
Morum oniscus (Wood Louse)
Phalium granulatum (Scotch Bonnet)
Cassis madagascariensis (Helmit Shell)
Cypraecassis testiculus (Baby Bonnet)
Charonia variegata (Trumpet Shell)

Cymatium nicobaricum
Cymatium pileare (Triton)
Cymatium vespaceum

Bursa thomae (Frog Shell)
Tonna maculosa (Tun Shell)

Neogastropoda

Morula nodulosa
Favartia cellulosa
Favartia alveata
Thais deltoidea (Rock Shell)
Coralliophila abbreviata
Coralliophila caribaea (Coral Snail)
Columbella mercatoria
Columbella rusticoides (Dove Shells)
Nassarinar monilifera
Bailya pava
Bailya intricata (Baily Shells)
Engina turbinella
Pisania pusio
Pisania auritula (Pisa Shells)
Pisania tincta
Latirus infundibulum
Leucozonia nassa (Latirus Shells)
Vasum muricatum (Vase Shell)
Jaspidella jaspidea (Dwarf Olive)
Mitra nodulosa (Miter Shells)
Mitra albocincta
Pusia gemmata
Marginella aureacincta
Marginella lavalleeana (Marginella)
Conus regius
Conus mus
Conus jaspideus (Cone Shells)
Conus juliae
Daphnella lymeiformis (Turret Shell)

Opisthobranchia

Tectibranchia

Acteocina candei
Pleurobranchus aerolatus (Sea Slug)

Sacoglossa

Tridachia crispata (Sea Slug)

Pelecypoda

Filibranchia (Sea Shells)

Arca imbricata
Barbatia candida

Barbatia cancellaria (Ark Shells)
Acropsis adamsi
Anadara notabilis
Modiolus americanus
Brachiodontes exustus
Lioberus castaneus nigra (Mussels)
Lithophaga bisulcata
Lithophaga aristata
Isogonomon radiatus
Pinctada radiata (Oysters)
Atrina rigida (Pen Shell)
Chlamys sentis
Chlamys imbricata (Scallops)
Plicatula spondyloidea (Cat's Paw)
Lima scabra
Lima pellucida (File Shells)

Eulamellibranchia

Lucina pectinatus (Jamaica Lucine)
Codakia orbicularis (White Lucine)

Chama congregata
Chama sinosa (Jewel Box Shells)
Chama florida
Pseudochama radians
Trachycardium isocardia (Prickly Cockle)
Chione intapurpurea (Mottled Chione)
Tellina laevigata
Arcopagia fausta (Tellin Shells)
Corbula swiftiana (Basket Clam)

Cephalopoda

Octopoda

Octopus briareus (Common Reef Octopus)
Octopus vulgaris (Common Octupus)

Teuthoidea

Sepioteuthis sepioidea (Reef Squid)

Echinodermata

Echinoidea (Sea Urchins)

Eucidaris tribuloides (Slate-pencil Urchin)
Diadema antillarum (Long-spined Urchin)
Lytechinus variegatus (Variegated Urchin)
Tripneustes ventricosus (Sea Egg)
Echinometra lucunter (Rock-boring Urchin)
Echinometra viridis (Green Rock-boring Urchin)
Clypeaster rosaceus (Brown Sea Biscuit)

Clypeaster subdepressus (Sand Dollar)
Encope michelini (Notched Sand Dollar)
Echinoneus cyclostomus (Reef Echinonens)

Meoma ventricosa (West Indian Sea Biscuit)
Plagiobrissus grandis (Long-spined Sea Biscuit)

Asteroidea (Starfish)

Oreaster reticularis (Cushion Star)
Ophidiaster guildingi (Guilding's Star)
Echinaster sentus (Thorny Starfish)

Ophiuroidea (Brittle Stars)

Ophiomyxa flaccida (Slimy Brittle Star)
Astrophyton muricatum (Basket Starfish)
Ophiothrix oerstedii (Oersted's Brittle Star)
Ophiocoma echinata (Spiny Ophiocoma)
Ophiocoma riisei (Common Ophiocoma)
Ophiocoma wendti (Red Brittle Star)
Ophioderma appressum (Harlequin

Brittle Star)
Ophioderma brevispinum (Short-spined Brittle Star)
Ophiolepis elegans (Elegant Brittle Star)

Holothuroidea (Sea Cucumbers)

Holothuria floridana (Florida Sea Cucumber)
Actinopyga agassizi (Agassiz' Sea Cucumber)
Euapta lappa (Sticky-skinned Sea Cucumber)

Chordata

Tunicata - Ascidiacea

Didemnumcandium (White Sponge Tunicate)
Clavelina picta (Painted Tunicate)
Ascidia nigra (Black Tunicate)
Bothryllus planus (Flat Tunicate)
Amaroucium stellatum (Starred Tunicate)
Polycarpa obtecta (Incrusted Tunicate)

Vertebrata

Pisces

Chondrichthyes

Ginglymostoma cirratum
Carcharhinus leucas
Carcharhinus obscurus
Sphyrna makarran (Great Hammerhead)
Dasyatis americana (Southern Stingray)
Urolophus jamaicensis (Yellow-Spotted Stingray)
Aeobatus narinari

Osteichthyes

Megalops atlantica (Tarpon)
Harengula humeralis (Red-Ear Sardine)
Harengula pensacolae
Sardinella anchovia
Synodus foetens
Synodus intermedius (Sand Diver)
Enchelycore nigricans (Viper Moray)

Enchelycore sp.
Gymnothorax funebris (Green Moray)
Gymnothorax moringa (Spotted Moray)
Gymnothorax vicinus (Purplemouth Moray)
Muraena miliaris (Goldentail Moray)
Stronglure notata
Tylosurus crocodilus (Houndfish)
Hemiramphus balaa
Hemiramphus brasiliensis (Ballyhoo)
Hyperhamphus unifasciatus
Aulostomus maculatus (Trumpetfish)
Fistularia tabacaria (Cornetfish)
Micrognathus crinigerus
Micrognathus crinitus
Adioryx vexillarius (Dusky Squirrelfish)
Holocentrus ascensionis
Holocentrus rufus (Squirrelfish)
Myripristis jacobus (Blackbar Soldierfish)
Centropomus unidecimalis (Snook)
Cephalopholis fulva (Coney)
Diplectrum formosum
Epinephelus adscensionis (Rock Hind)

Epinephelus guttatus (Red Hind)
Epinephelus morio (Red Grouper)
Epinephelus striatus (Nassau Grouper)
Hypoplectrus gemma
Hypoplectrus puella (Barred Helmet)
Hypoplectrus unicolor (Butter Helmet)
Mycteroperca bonaci (Black Grouper)
Mycteroperca microlepsis (Gag)
Mycteroperca phenax (Scamp)
Mycteroperca tigris
Mycteroperca venenosa (Yellowfin)
Petrometopon cruentatum (Graysby)
Serranus tabacarius (Tobacco Fish)

Serranus tigrinus (Harlequin Bass)
Rypticus saponaceus (Soapfish[
Rypticus subbifrenatus
Ambiycirrhitus pinos (Red Spotted Hawkfish)
Lutjanus analis (Mutton Snapper)
Lutjanus apodus (Schoolmaster)
Lutjanus griseus (Gray Snapper)
Lutjanus jocu (Dog Snapper)
Lutjanus mahogoni (Mahogany)
Lutjanus synagris (Lane)
Ocyurus chrysurus (Yellowfish Snapper)
Priacanthus cruentatus (Glasseye)
Apogon binotatus (Barred Cardinalfish)
Apogon maculatus (Flamefish)
Apogon planifrons
Apogon townsendi
Astrapogon punticulatus
Malacanthus plumieri (Sand Tilefish)
Cranax bartholomaei
Cranax fusus
Cranax hippos
Cranax latus
Cranax ruber
Elagatis bipinnulatus
Seriola dumerili (Greater Amberjack)
Trachinotus falcatus (Permit)
Eucinostomus argenteus
Gerres cinereus (Yellowfish Mojarra)
Anisotremus surinamensis (Black Margate)
Anisotrems virginicus (Porkfish)
Haemulon album (Margate)
Haemulon aurolineatum (Tomtate)
Haemulon carbonarium (Caesar Grunt)
Haemulon chrysargyreum
Haemulon flavolineatum (French Grunt)

Haemulon macrostomum (Spanish Grunt)
Haemulon melanurum (Cottonwick)
Haemulon parrai
Haemulon plumieri (White Grunt)
Haemulon sclurus (Bluestriped Grunt)
Haemulon striatum
Equetus acuminatus (Cubbyu)
Equetus punctatus (Spotted Drum)

Odontoscion dentex (Reef Croaker)
Mulloidichthys martinicus (Yellow Goatfish)

Pseudupeneus maculatus (Spotted Goatfish)
Calamus bajonada (Jolthead Porgy)
Calamus calamus (Saucereye Porgy)
Calamus nodosus (Knobbed Porgy)
Calamus proridens (Littlehead)
Pempheris schomburgki (Copper Sweeper)
Kyphosis incisor (Yellow Chub)
Kyphosis sectatrix (Bermuda Chub)
Chaetodipterus faber (Spadefish)
Chaetodon capistratus (Foureye Butterflyfish)
Chaetodon ocellatus (Spotfin Butterflyfish)
Chaetodon sedentatius (Reef Butterflyfish)
Chaetodon striatus (Banded Butterflyfish)
Holocanthus ciliaris (Queen Angelfish)
Holocanthus isabelita (Blue Angelfish)
Holocanthus tricolor (Rock Beauty)
Pomacanthus arcuatus (Gray Angelfish)
Pomacanthus paru (French Angelfish)
Abudefduf saxatilis (Sergeant Major)
Chromis cyanea (Blue Chromis)
Chromis insolatus
Chromis multilineata (Yellow-Edge Chromis)
Chromis scotti
Eupomacentrus fuscus (Dusky Damselfish)
Eupomacentrus leucostictus (Beau Gregory
Eupomacentrus mellis
Eupomacentrus partitus (Bicolor Damselfish)
Eupomacentrus planifrons (Yellow Damselfish)
Eupomacentrus variabilis (Cocoa Damselfish)
Microspathodon chrysurus (Yellowtail Damselfish)

Bodianus pulchellus (Spotfin Hogfish)
Bodianus rufus (Spanish Hogfish)

Clepticus parrai (Creole Wrasse)
Doratonotus megalepis
Halicoeres bivittatus (Slippery Dick)
Halichoeres cyanocephalus
Halichoeres garnoti (Yellowhead Wrasse)
Halichoeres maculipinna (Clown Wrasse)
Halichoeres pictus
Halichoeres radiatus (Pudding Wife)
Hemipteronotus martinicensis
Hemipteronotus novacula
Hemipteronotus splendens (Green Razorfish)
Lachnolaimus maximum (Hogfish)
Thalassoma bifasciatum (Bluehead)
Nicholsina usta
Scarus coelestinus (Midnight Parrotfish)
Scarus coeruleus (Blue Parrotfish)
Scarus croicensis
Scarus guacamaia
Scarus taeniopterus (Princess Parrotfish)
Scarus vetula (Queen Parrotfish)
Sparisoma aurofrenatum (Redband Parrotfish)
Sparisoma chrysopterum (Redtail Parrotfish)
Sparisoma radians
Sparisoma viride (Stoplight Parrotfish)
Acanthurus bahianus (Ocean Surgeon)
Acanthurus chirurgus (Doctorfish)
Acanthurus coeruleus (Blue Tang)
Scomberomorus cavalla
Scomberomorus maculatus
Scomberomorus regalis (Cero Mackerel)
Barbulifer ceuthoecus
Coryphopterus eldolon
Coryphoterus glaucofraenum
Coryphopterus lipernes
Coryphopterus personatus
Coryphoterus punctipectorphorus
Elactinus oceanops

Gramannia macrodon
Lythrypnus phorellus
Lythrypnus spilus
Scorpaena plumieri
Opistognathus aurifrons (Yellowhead Jawfish)
Opistognathus whitehursti
Acanthemblemaria aspera
Enneanectes pectoralis
Labrisomus kalisherae
Malacoctenus macropus
Paraclinus fasciatus
Entomacrodus textilus
Ophioblennius atlanticus (Redlip Blenny)
Sphyraena barracuda (Great Barracuda)
Echeneis naucrates
Alutera schoepfi (Orange Filefish)
Alutera scripta (Scrawled Filefish)
Balistes capriscus (Gray Triggerfish)
Cantherines pullus
Canthidermis sufflamen (Ocean Triggerfish)
Acanthostracion quadricornis (Scrawled Cowfish)
Lactophrys bicaudalis (Spotted Trunkfish)
Lactophrys triqueter (Smooth Trunkfish)
Canthigaster rostata (Sharpnose Puffer)
Diodon holocanthus (Spiny Puffer)
Diodon hystrix (Porcupinefish)

APPENDIX C LOOE KEY ONSITE SURVEY

APPENDIX C

LOOE KEY ONSITE SURVEY

A. Methodology

In order to assess the costs and benefits of the various regulatory and boundary alternatives considered in the DEIS to the major user groups at Looe Key, the following steps were taken to: (1) identify the major user groups, including commercial fishermen, commercial recreational businesses, tropical fish collectors and individual recreational snorkelers, divers, fishermen and others who use the Looe Key coral reef area, (2) review the literature to determine the characteristics of these groups and the likely extent of their activity at Looe Key, (3) measure the annual income directly generated by the users of Looe Key through the use of onsite surveys, (4) measure the indirect effects of the income generated by activity through regional multipliers, (5) examine the existing and predicted socio-economic circumstances of the Lower Keys, and (6) evaluate the results of the surveys and the onsite information in an overall economic and demographic context.

All income and catch information from commercial fishermen and income from commercial recreational businesses of Looe Key were only available at the County or Standard Metropolitan Statistical Area level. To obtain a more accurate socio-economic picture of the Looe Key area, it was necessary to go beyond published sources and conduct on onsite survey.

Using published literature on the user groups and the expertise of Fisheries Economists from the University of Florida, interview schedules were designed for each of the major user groups, with the exception of the individual recreational users who were too numerous and scattered to interview and count.

Local organizations and key individuals were contacted in an effort to locate as many of the actual users as possible.

Finally, to get a broad picture of the stream of expenditures of such diverse, and diffuse user groups, regional multipliers were used, in accordance with the U.S. Department of Commerce, Bureau of Economic Analysis methodology.

The recreational value of the reef was determined by estimating the volume (people) of reef use from information provided by the Survey, and the fair market cost of such activity. These estimates were checked against other data sources and found to be consistent. Although not often used, this method of valuation of recreational activities is well established (Krutilla, 1975).

Personal interviews were conducted in mid-October with users most likely to be affected by the designation of Looe Key as a marine sanctuary.

The survey interview schedules were distributed to commercial fishermen, commercial and recreational enterprises, fish houses and tropical specimen collectors who could be expected, judging from other studies and surveys, to depend on Looe Key for part of their livelihood. Commercial fishermen and businesses which provide recreational services, such as dive boat shops and marinas, were the main businesses surveyed.

Twenty-five interview schedules dealing with their 1978 catch, were completed by commercial fishing businesses. This number represents 2.6 percent of fishermen/ boats in Monroe County estimated to be commercially active in 1977-1978 (see Mathis et al, 1979 p. 15), and represented an important portion of those active in the area under consideration. One major tropical specimen collector and one fish house responded, as well as two out of six dive shops and charter boats, one marina and a boat rental and camping gear business.

The interview schedules were designed to obtain (1) a representative sample from which to derive information on the total population user group in the Looe Key area, (2) information on businesses' total income generated by the Looe Key area, (3) information on other potential sources of income to users, such as fishing or recreational diving areas other than the area directly around Looe Key reef. The sample was derived from meetings arranged with fishing representatives (members of the Organized Fishermen of Florida and marine agents), interviews with members of the community, and the assistance of a local citizen with research and academic experience who was familiar with the fishing industry.

The Looe Key reef itself was part of a 5.32 square mile area in the survey that contained representative zones of the Looe Key ecological system and coincided with the intermediate size boundary option for the proposed sanctuary (Boundary Option #2).

While proposed sanctuary boundary alternatives range from 1 square mile (#1) to 10 square miles (#3), this intermediate size provided a good basis for analysis.

The year 1978 was selected as the sample year. Although new fishermen and dive shops have entered the area since then, county and State data are only available for 1978. Thus, to provide a statistical check, 1978 was used.

B. Looe Key Reef Area Sample Survey Results

1. Commercial Fishermen.

Twenty-five commercial fishermen (boats) in the vicinity of Looe Key were surveyed, living between SevenMile Bridge in the north and Saddlebunch Keys in the south. The major keys included in the survey were Bahia Honda Key, Big Pine Key Summerland Key, Cudjoe and Ramrod Keys.

A previous survey by the University of Florida in 1978 indicated that 48 percent of Monroe County fishermen lived within one mile of their fishing ports and roughly 64 percent lived within three miles. (Boat and fisherman travel information, Mathis et al, 1978, p. 19).

It was expected that the most active fishermen in Looe Key were those closest to it. Using average marine travel data (Mathis et al, 1979) as a base, it was decided that an area with a 15 mile radius would be adequate to obtain an statistical sample for measuring total commercial fish catch value at Looe Key. In the course of the survey, the choice of the sample survey area seemed validated. At the fringes of the area, some commercial fishermen, dive shops and others reported little or no activity connected with Looe Key.

The twenty-five fishermen in the sample survey all owned their own boats, averaging 33 feet in length. The average fisherman had spent 10.32 years in the business and had been fishing in the Looe Key 5 nmi zone for 7.6 years. They employed a total of 36 crew (34 non-family). The average weekly wage for these crewmen was $195.95 per week and they worked an average of 41.5 weeks per year. Total yearly payroll, not including family members, was $276,499,56 or $8,132,34 per employee, which was lower than the county average for private non-farm wage earners.

Fish catches vary seasonally in the Looe Key area. From February to late July, before the start of the lobster season, the fishermen depended mostly on yellowtail, mangrove and mutton snapper, and grouper. In the fall and early winter, they caught mainly lobster with little reported snapper or mackerel. Spanish, cero and king mackerel began to plan a major role in the catch in December and continued to March.

The most productive fishing areas reported were those between and including Looe Key Reef and Big Pine Shoal, the area surrounding American Shoal areas in Hawk Channel off Sugar Loaf Key and Cudjoe Key.

Most of the boats fished for more than one species, using a combination of methods, such as hook and line part of the year and trapping during the lobster season. Trapping for lobster, crab and fish amounted to 57.7 percent, 24.9 percent used hook and line, and 17.4 used nets. (Table 2) Based on survey tabulations, commercial fishermen did not all depend on Boundary Option #2 exclusively. Of the 597,356 lbs. caught in the total area in and around Looe Key, 167,970 lbs. were landed in the 5 mile area encompassing Looe Key. Most boats seem to fish the Looe Key 5 nmi zone only part of the time, since the desired species migrate both seasonally in and adjacent to Looe Key and throughout the entire reef tract. (Table 1)

This sample of 25 boats is roughly one-fourth of the estimated boats (100) that could be affected by the Looe Key Sanctuary proposal, according to the consensus of leading fishermen in the area. In order to obtain the total estimated catch value of the Looe Key area, it was necessary to get an average income per boat from the sample survey and multiply it by the total estimated 100 commercial fishing boats.

APPENDIX C - TABLE 1

Total Area Landings Analysis (Survey Data - Pounds)		Boundary Option #2 Landings Analysis (Survey Data - Pounds)		Outside Boundary Option #2 Landings Analysis (Survey Data -Pounds)	
Species	Total	Species	Total	Species	Total
Lobster	335,526	Lobster	58,000	Lobster	277,526
Crab	9,400	Crab	950	Crab	8,450
Yellowtail Snapper	35,285	Yellowtail Snapper	19,380	Yellowtail Snapper	15,905
Mangrove & Gray Snapper	32,265	Mangrove & Gray Snapper	18,080	Mangrove & Gray Snapper	14,185
Mutton Snapper	33,790	Mutton Snapper	15,550	Mutton Snapper	18,240
Grouper	60,700	Grouper	26,120	Grouper	34,580
Mackerel	83,540	Mackerel	28,690	Mackerel	54,850
Other	6,850	Other	1,200	Other	5,650
TOTAL	597,356	TOTAL	167,970	TOTAL	429,386

Thus, using average 1978 Monroe County dockside prices, computed by the National Marine Fihseries Service, the reported 1978 catch in Boundary Option #2 was 28% and worth $755,690 or $7,556.90 or $7,556.90/ per boat/per year. Based on information on total landings (100%) in the area, boats could be expected to earn approximately $27,000, average annual income. (Table 2) (Table 3)

Of the $755,690 earned in Boundary Option #2, 61.7 percent came from lobster trapping, 14.5 percent from wire fish trapping, 17.7 percent from hook and line fishing, 5.6 percent from netting and 5 percent from trapping stone crab.

These fishermen, however, do more than just sell fish. They buy food, gasoline, supplies for their boats. Their activities generate other activities. The income generation process is usually called the multiplier process. Each initial increase in income (in this case, sales of fish) will magnify itself throughout the economy and the final increase will be a number of times greater than the initial increase. The gross output regional multiplier for forestry and fish products in the Miami Economic Area of the Bureau of Economic Analysis is 1.914. (BEA, Regional Economic Analysis Division, USDC, 1977). No forestry occurs in this region so this multiplier should be fairly accurate for fishing. This regional multiplier indicates the "regional" impact of the sales of fish. The impact after the fish have been moved from the area for distribution, etc., is not counted. The total economic impact of the fish at final sale will be greater than 1.914. However, not all this impact is felt in the area of catch, thus the regional multiplier should be appropriate. Using the economic value of the commercial fishing in Boundary Option #2, the economic effect of the fishing effort there, using the regional multiplier is $1,445,390.

b. Commercial Recreational and Educational Businesses

The interview schedules to gather information about this group went largely unanswered because of the low response rate, only revenue from the commercial dive boat operations in the commercial business catagory were calculated in the economic study.

Revenue from dive charter boats was estimated from the onsite survey to be $250,000 and appears to be the major income, outside of commercial fishing in the Looe Key area. Other income producing businesses were not accounted for in the Survey, such as marinas and fishing lodges rent boats and equipment.

ESTIMATED VALUE OF LANDINGS
BOUNDARY OPTION 2
(1978 Dollars)

Species	Method: Trap	Hook & Line	Netting	Total Value (Percent of Total)
Spiny Lobster ($2.01/lb.)[a]	466,320	NONE	NONE	$466,320 (61.7)
Yellowtail Snapper ($1.02/lb.)[a]	19,180	57,590	2,300	79,070 (10.5)
Mangrove Snapper ($.73/lb.)[a]	730	39,170	6,320	46,220 (6.1)
Mutton Snapper ($.82/lb.)[a]	36,410	14,600	NONE	51,010 (6.8)
Grouper ($.68/lb.)[a]	52,800	18,250	NONE	71,050 (9.4)
Mackerel (all types)[b]	NONE	3,440	33,280	36,720 (4.8)
Stone Crab ($1.08/lb.)[a]	4,100	NONE	NONE	4,100 (0.5)
Other ($.25/lb.)[a]	300	400	500	1,200 (0.2)
TOTAL	579,840	133,450	42,400	$755,690
Lobster & Crab Trapping	470,420			
Fish Wire Trapping	109,420			
PERCENT	76.7	17.7	5.6	100
Lobster & Crab	62.2			
Fish	14.5			

a: All prices are the 1978 weighted dockside prices for Monroe Co. Provided by Natonal Marine Fisheries Service, Miami.

b: Mackerel species aggregated to protect confidentiality. Prices are King, ($.41/lb.) and Spanish, ($.22/lb.)

Appendix C Table 2

average of seasonal averages compiled from the survey since each season has a different visitation rate.) If these estimates are correct and, assuming 300 days of clear weather, then there were somewhere between 3,564 and 7,008 private boats visits to the Looe Key reef last year.

A recent Key Biscayne National Park survey indicates that for all boat use there was an average of 3.8 persons per boat. The Bahia Honda State Recreational Area tabulation of daily visitors for FY 1978-79 showed that over 11,000 visitors arrived by boat to that facility in that period. The Bahia Honda 11,063 visitors should, based on 3.8 per boat have arrived in 2,911 boats. If only half of these went to Looe Key Boundary Option #2, then 40 percent of the lower estimated boat traffic (3,564) could be attributed to Bahia Honda alone. There are also, of course, many other places from which boats to Looe Key can be launched. Thus, the Looe Key boat visit estimates seem consistent with other evidence.

It was assumed, based on personal interviews and published data that one-third of these boats were used for recreational fishing and sightseeing, and two-thirds of the boats were used by skin and SCUBA divers, of whom two-thirds again were assumbed to be skin divers, not SCUBA divers.

The survey at the Biscayne National Park of the average number of people per boat for different recreational activities indicated that between 3.7 and 4 .3 persons ride when engaging in diving activities. The weighted average was 4.08 persons per private diving boat. Using the Biscayne National Monument and multiplying by the number of boats estimated to be carrying divers to Looe Key. It was estimated that the 2,376 to 4,672 boats which was assumed carried divers to Looe Key had 9,694 to 19,061 divers on board.

These estimates appear to be consistent with other available sources. Bahia Honda had 351,700 visitors in FY 1978-79. A Florida Department of Natural Resources survey of park visitors indicated that 4 percent of visitors in southern Florida parks go SCUBA diving. Thus, at least 14,068 visitors to Bahia Honda could be expected to go SCUBA diving; probably more, since 4 percent is an average and Bahia Honda is probably above average with regard to its orientation towards water. In addition, of course, there are non-Bahia Honda divers at Looe Key. The yearly estimates of 9,694 to 19,061 private divers in Boundary Option #2 thus seems conservative but consistent with the Bahia Honda data.
An accepted method of imputing value to non-quantifiable activity is to use the cost of the same or similar activity is paid to a commercial business to arrive at an economic value.

The average cost of a private SCUBA dive trip to the Looe Key Reef ranges from $17 to $25, according to survey responses. Using $12 as the value of a snorkeling trip, based on the survey and information from the National Dive Center Washington, D. C., the combined value of a dive trip was estimated to be $16.50.

ESTIMATED BOUNDARY OPTION 2 LANDINGS

(Pounds)

Species	Hook & Line	Trap	Hook/Net	Netting	Total Pounds (Percent of Total)
	Method				
Spiny Lobster	NONE	232,000	NONE	NONE	232,000 (34.5)
Crab	NONE	3,800	NONE	NONE	3,800 (0.6)
Yellowtail Snapper	56,460	18,800	NONE	2,260	77,520 (11.5)
Mangrove Snapper	53,660	1,000	NONE	8,660	72,320 (10.8)
Mutton Snapper	17,800	44,400	NONE	NONE	62,200 (9.3)
Grouper	26,840	77,640	NONE	NONE	104,120 (15.5)
Mackerel	10,760	NONE	NONE	104,000	114,760 (17.1)
Other	1,600	1,200	NONE	2,000	4,800 (0.7)
TOTAL	167,120	387,840	NONE	116,920	671,880
PERCENT	(24.9)	(57.7)		(17.4)	(100)
PERCENT OF TOTAL LANDINGS	7.0	34.9 Fish 16.3		4.9	28.2

Appendix C Table 3

COMPARISON OF ANNUAL COMMERCIAL FISH LANDINGS
LOOE KEY BOUNDARY OPTION 2 AND MONROE COUNTY, FLORIDA

	Survey Results (25 Boats) Estimated Landings in Boundary Option 2	Estimated Total Fishing Boat[1] Landings in Boundary Option 2		Average Landings Reported for[2] Monroe County 1974 - 1976	
Species	Total Pounds	Total Pounds	Average lbs/boat	Total lbs.	Ave. lbs/boat
Spiny Lobster	58,000	232,000	2,320	1,607,312	1,692
Yellowtail Snapper	16,080	64,320	643	620,664	653
Mangrove Snapper	19,280	77,120	771	187,615	197
Mutton Snapper	15,950	63,800	638	145,296	153
Grouper	23,610	94,440	944	824,297	868
Mackerel	29,895	119,580	1,196	8,785,758	9,248
Crab	950	3,800	38	812,967	856
Other	1,400	5,600	56	157,454	166
TOTAL	165,165	660,660	6,606	13,141,363	13,833

1) See Text, page

2) Source: Commercial fishing activity and facility needs in Florida, p.31 and Appendix Table 3. Mathis et al

Appendix C Table 4

Analysis of Fishing Methods in the Looe Key Area

Based on Sample Survey

	Number	%
Number of fishing boats	25	100
Fish for lobsters only	4	16
Fish for lobsters & crabs	23	92
Fish for crabs	10	40
Fish only	2	8
Fishermen using hook & line	16	64
Fishermen using wire traps	7	28
Fishermen using nets	3	12
Fish for both lobster & fish	18	72
Fishermen who use only nets	0	0

Appendix C

Table 5

The divers chartering boats also stay in hotels, motels, visit restaurants, and purchase air and other equipment. These economic multiplier effects were counted by using a regional service sector multiplier. The multiplier selected for these commercial dive boats was 3.203 (BEA 1977, p. 44). Thus, their total economic value for purposes of analysis was estimated at $800,750. Almost all of this income is derived from the 5 square mile or Boundary Option #2.

The Newfound Harbor Marine Institute on Big Pine Key, a non-profit organization offering one of the most comprehensive marine education opportunities in the Florida Keys, focuses upon the nearby Looe Key coral reef and other coral assemblages in the general vicinity, for year round teaching. Seacamp, a part of the Institute, offers a variety of educational programs to students in the 4th grade through graduate school in college. Between 5,000 and 6,000 persons participate in the 3 to 30 day programs each year.

The analysis did not attempt to count income generated to the area from marinas, fishing lodges or educational organizations due to the lack of sufficient information.

c. Tropical Specimen Collectors

Tropical fish collectors who catch and sell the brightly colored reef fishes of the coral reef for home aquaria and research purposes are one small user group at Looe Key. While areas of extensive coral growth, such as Looe Key, are not generally suitable as collecting areas because of the many hiding places afforded by the reef, interview schedules and information provided by persons familiar with the tropical fish industry indicated that there was a limited amount of collecting occurring at Looe Key.

Estimates, based on these sources, of the total value of tropical fish collected yearly in the area, ranges from $200,000 to 250,000. Of these figures, roughly $25,400 to $31,750 worth is collected in Boundary Option #2. The regional multiplier effect would increase these estimates to between $582,000 and $782,500 in the entire area. The Boundary Option #2 generated income would lie between $74,000 and $92,500.

d. Private Recreational Users

Most sources interviewed agreed that the largest user group of the reef combines skin and SCUBA divers and recreational fishermen. It is in the measurement of this group's contributed economic value to the reef that the greatest number of assumptions have to be made and the most qualifiers have to be placed on any figure.

Commercial recreational questionnaires estimated that average daily private boat visits to the proposed Looe Key 4.9 nmi sanctuary ranged between a low of 11 and a high of 23. (Each of these is a weighted

The activity of the 9,694 to 19,061 divers in Boundary Option #2 was worth between $159,951 and $314,506 in 1978.

These divers, however, do not merely dive, they stay in hotels and motels, rent boats, buy air and other equipment. The multiplier of the relevant sector selected this region was 2.203 (see BEA, 1977, p.44). The private recreational diving activity in Looe Key was thus considered to be generating between $352,371 and $692,856 for the region in 1978.

It was assumed from personal interviews and Survey information that the recreational fishermen and others would occupy one-third of the boats. This means that 1,188 to 2,336 boats would be visiting Looe Key, carrying recreational fishermen, sightseers and others. The figure of $40 per boat, the average rental price, was selected to place a value on the non-quantifiable activity of recreational fishing, sightseeing, and other related activities. Recreational non-diving at Looe Key, therefore, was estimated to be between $47,520 and $93,440. The multiplier effect of this activity would raise the total value of the activity to (BEA, 1977, p.44) the region to between 104,686 and 205,848.

The estimated value to the community and region of the private recreational uses of Looe Key lies thus between $457,057 and $898,704.

Combining the 7,500 commercially transported divers with an average of 15,000 divers using their own transportation and adding an estimated 5,500 students from Newfound Harbor Institute, the total drive/snorkler load for 1978 would have been 28,000 individuals.

APPENDIX D FLORIDA STATE LAWS AND EXISTING STATE AND FEDERAL MARINE RESERVES, PARKS AND SANCTUARIES

Appendix D

FLORIDA STATE LAWS AND EXISTING STATE AND FEDERAL MARINE RESERVES, PARKS AND SANCTUARIES

A. Florida State Laws

Florida State laws which regulates human activities similar to activities found in Looe Key Waters. Legal Authority: Chapter 370, Florida State Code Enforcement Authority: DNR Division of Law Enforcement (Table D1) Chapter 370. Saltwater Fisheries and Conservation. 370.114 Taking of marine corals and sea fans regulated; penalties.

1. It is unlawful for any person, as defined in s. 1.01:

   a. To take, attempt to take, or otherwise destroy, or to sell or attempt to sell, any sea fan of the species Gorgonia flabellum or of the species Gorgonia ventalina or any hard or stony coral (Scleractinia) or any fire coral (Millepora); or

   b. To possess any fresh, uncleaned, or uncured sea fan of the species Gorgonia flabellum or of the species Gorgonia ventalina or any fresh, uncleaned, or uncured hard or stony coral (Scleractinia) or any fresh, uncleaned, or uncured fire coral (Millepora).

   unless it can be probed by certified invoice that the sea fan or coral was imported from a foreign country or unless it can be proven that the sea fan or coral was lawfully taken before July 1, 1976.

2. This section shall not apply to any sea fan or coral taken for scientific or educational purposes when the taking is approved and permitted by the department.

3. It is unlawful to take coral from, or possess it in the John Pennekamp Coral Reef State Park. The provisions of s. 592.17 shall be in addition to the provisions of this subsection.

4. A person who violates any provision of this section is guilty of a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083.

The U. S. Coast Guard and the Florida Marine Patrol have verbal agreements to notify one another of possible State/Federal violations of the taking of coral in State/Federal waters.

The State law, outside of the John Pennekamp Park, is considered by some law enforcement personnel and administrators as largely unenforceable because "fresh, uncleaned, or uncured sea fan, hard or stony coral

Florida Department of Natural Resources
(Authorized to Establish Aquatic Preserves)

Division of Administrative Services	Division of Marine Resources	Division of Recreation and Parks	Division of Resource Management	Division of Law Enforcement
Licensing and boat registrations. Issuance of sponge licenses, non-resident fish and boating licenses.	Preservation, management, protection and regulation of uses of marine resources to provide basic scientific research information for managers. Bureau of Marine Science and Technology (fisheries resource management - issuance of licenses).	Preservation and management of all parks and recreation areas held by the State. Development and execution of a comprehensive multi-purpose recreation and conservation program.	Bureau of Coastal and Land Boundaries. Definition of state owned submerged lands and uplands works with NOS. Responsible for lands other than parks & recreation areas, wilderness areas held by the State. Develop State plan for CZM.	Enforcement of State law relating to protection of natural resource (fisheries). Education of the public regarding these laws.

Table D 1

or fire coral" can be quickly killed and bleached on board a boat, with the use of a bleaching agent, before a patrolman can inspect the boat. The regulation for the John Pennekamp Coral Reef State Park, however, which simply states "It is unlawful to take coral from, or possess it", appears the most effective for enforcement purposes.

Penalty: Criminal

Fine: $35.65

The fine of $35.65, set at the present time by a Circuit Court Judge in the Florida Keys, for a misdemeanor of the second degree (prescribed in the statute), is considered by most as little deterrent in the taking of coral from State waters.

Regulations: The Division of Law Enforcement of the Florida DNR has not, as yet, adopted any regulations to accompany the statute, 370.114, on the taking of marine corals and sea fans.

Other applicable state regulations:

370.071	Fishermen and equipment; regulation
370.10	Crustacea, marine animals, fish regulations; general provisions
370.101	Saltwater fish; regulations
370.11	Fish; regulation
370.113	Queen conchs of the species Stombus gigas; regulation
370.12	Marine Animals
370.13	Stone crabs
370.14	Crawfish
370.17	Sponges; regulation
370.172	Spearfishing definition; limitations Penalty

Spearfishing is prohibited within the boundaries of John Pennekamp Coral Reef State Park, and the salt waters in Monroe County known as the Upper Keys from the Dade/Monroe County line to and including Long Key. The DNR also has the power to establish restricted areas when safety hazards exist or when needs are determined by biological findings.

370.072 State Endangered and threatened species

Threatened and endangered species and their habitat, Monroe County, from inventory of rare & endangered biota of Florida, Florida Audubon & Florida Defenders of the Environment.

Endangered Species as defined by the Florida Audubon Society and the Florida Defenders of the Environment

Invertebrates found within the proposed sanctuary:

Elkhorn Coral	Acropora palmata	Outer Reef Environment
Staghorn Coral	A. Cervicornis	Reef Environment
Staghorn Coral	A. prolifera	Reef Environment
Pillar Coral	Dendrogyra cylindrus	Reef Environment
Large Flower Coral	Mussa angulosa	Reef Environment
Lettuce Coral	Agaricia agaricites	Reef Environment
Flower Coral	Eusmilia fastigiata	Reef Environment
Starlet Coral	Siderastrea siderea	Reef Environment
Brain Coral	Diploria clivosa	Reef Environment
Brain Coral	D. labryinthiformis	Reef Environment
Small Star Coral	Montastraea annularis	Reef Environment
Large Star Coral	M. cavernosa	Reef Environment
Brain Coral	Meandrina meandrites	Reef Environment
Atlantic Green Turtle	Chelonia Mydas mydas	All habitats

Species whose habitat are found within the proposed sanctuary:

Atlantic Green Turtle	Chelonia Mydas mydas	All habitats
Atlantic Hawksbill Turtle	Eretmochelys imbricata imbricata	Primary reef habitats
Atlantic Ridley Turtle	Lepidocheyls kempi	All habitats

All violations of the above State laws, with the exception of 370.12 Marine Animals (a first degree offense) are criminal offenses; misdemeanors of the second degree, with punishment prescribed by a Circuit Judge in Monroe County.

Enforcement Agency: Florida Marine Patrol

Chapter 258. State Parks and Preserves.

258.41 This provision permits the setting aside of State-owned submerged lands of exceptional biological, aesthetic and scientific value as aquatic preserves. Two of the thirty-one State aquatic preserves were established in Monroe County. One of these, the Coupon Bight Aquatic Preserve is located directly adjacent to the sanctuary off Big Pine Key. This Preserve, included in the State Coastal Management Program as a Geographic Area of Particular Concern, is a shallow semi-enclosed bay of unique biologic and scientific valued.

B. Existing Federal and State Marine Parks and the Key Largo Marine Sanctuary in the Florida Keys and Their Existing Regulations

1. Everglades National Park at the tip of the Sourth Florida Peninsula (Department of Interior's National Park Service)

Everglades National Park includes a part of Florida Bay. Five regulations have been proposed in 1979 to:

Close additional areas of Florida Bay to all public entry to protect crocodile nesting critical habitat.

Restrict recreational shellfish harvest (blue crab traps, stone crab traps and spiny lobster).

Establish bag limits for fish species.

Assimilate State of Florida statutes for commercial stone crabbing.

Eliminate commercial fishing by December 31, 1985, within the waters of the park.

Permits for all activities except hook-and-line fishing in the Everglades National Park are required and reviewed by the South Florida Research Center, NPS, Homestead, Florida, who also review permits for the Fort Jefferson National Monument, Dry Tortugas.

2. Fort Jefferson National Monument, Dry Tortugas (Department of the Interior's National Park Service)

Located 110 km (65 miles) west of Key West, Florida, Fort Jefferson National Monument which was established to protect Ft. Jefferson but also manages 100,000 acres of coral reefs within park boundaries. The taking or disturbing of any species of coral, shells, shellfish, sponges, sea anemones or other forms of marine life is prohibited with the exception of the recreational catch of spiny lobster (*Panulirus argus*) and conch (*Strombus gigas*) which is limited to 2/person/day. Commercial fishing is limited to 40 percent of the monument. The use or possession of spears, gigs, or other forms of spearfishing is prohibited at all times.

3. Biscayne National Park in the Northernmost Florida Keys (Department of the Interior's National Park Service)

Biscayne National Park is primarily an underwater park. The "park" is actually a monument, as designated by Congress, with rules slightly

different from a National Park Service park. To establish Biscayne National Monument, the State of Florida and the Federal government agreed that fishing be allowed to continue in accordance with State laws unless it was determined to be detrimental to the purposes for which the "park" was established. If so determined, it should be further regulated following consultation with the State.

The enabling legislation reads, as follows:

Sec. 4 "The Secretary of the Interior shall preserve and administer the Biscayne National Monument in accordance with the provisions of the Act of August 25, 1916 (39 Stat.535;16 U.S.C. 1-4), as amended and supplemented. The waters within the Biscayne National Monument shall continue to be open to fishing in conformity with the laws of the State of Florida except as the Secretary, after consultation with appropriate officials of said State, designates species for which, areas and times within which, and methods by which fishing is prohibited, limited or otherwise regulated in the interest of sound conservation or in order to achieve the purposes for which the national monument is established."

Commercial fishing and lobster-trapping are legal, as is sports fishing, both by hook and line and by spear. Conch and lobster may also be taken by divers, provided they are caught by hand or by hand-held net when in season and provided legal limits are not exceeded. Tropical fish collection is not legal.

Under the laws and regulations of the Park, identical to State laws, the Superintendent of the Park grants permits. Four patrol boats survey the area (20' - 28') manned by four Park Rangers with law enforcement authority. The Florida Marine Patrol enforces in State waters. Total park acreage is 104,000.

At the present time, the Park management is conducting an extensive fisheries management information program. Fishermen are interviewed in the field out to the 60 ft. contour. Major species caught by commercial fishermen are snapper, grouper, hogfish, grunts, dolphin and sailfish. No fish traps are permitted. Some permits are granted for stone crab and crawfish fishing. Aliens and non-residents must have fishing licenses. Sportfishing must only be for edible fish.
The Park management is also currently experimenting with the use of mooring buoys which mark an area for visitors and offer them an opportunity to tie up to a buoy rather than anchoring in an area

which might damage the coral reef. The location of the moorings and educational material about certain unique reefs are discussed in a booklet prepared and distributed by the Biscayne Park staff.

The Biscayne National Park is adjacent to a spiny lobster sanctuary.

4. Bahia Honda State Park in the lower Florida Keys

The Bahia Honda State Park, managed by the Florida State DNR, Division of Recreation and Parks, is located on Bahia Honda Key adjacent to the proposed Looe Key Sanctuary. The park offers overnight camping facilities; two marinas; one for campers and one leased by a concessionaire; and swimming, picnicking facilities. The marinas are approximately 30 minutes running time by boat from the Looe Key Reef area. Staff for the park includes 17 staff and 14 rangers, most without law enforcement authority whose responsibilities include search and rescue operations in waters immediately adjacent to the park.

The Bahia Honda State Park personnel emphasize the protection of State resources by interpretation of the law to those who use the park rather than by enforcement.

5. John Pennekamp Coral Reef State Park and U.S. Key Largo Coral Reef Marine Sanctuary in the upper Florida Keys (State Department of Natural Resources' Division of Recreation and Parks and Department of Commerce's Office of Coastal Zone Management under NOAA)

The John Pennekamp Coral Reef State Park and U. S. Key Largo Coral Reef Marine Sanctuary are actually two preserves, consisting of an area extending out three miles from shore and administered by the State of Florida (Department of Natural Resources, Division of Recreaton and Parks) and a Federally operated sanctuary beginning at the end of State jurisdiction and extending seaward, also administered by the DNR, Division of Recreation and Parks.

Named after the late John Pennekamp, the combined area of both parks was originally a State Park. The John Pennekamp Park was created in 1961 to protect coral and to prevent spearfishing and tropical fish collection. The State did not limit commercial fishing and lobstering in the State Park. In 1975, when the Supreme Court ruled State jusisdiction could only extend three miles, the most luxuriant reefs, which lie between four and six miles offshore, were without State protection. At

that time, the State of Florida nominated the offshore waters for Marine Sanctuary status to insure continued protection of the resources. The Key Largo Coral Reef Marine Sanctuary was designated by NOAA in December, 1975, as prescribed in the Marine Protection, Research and Sanctuaries Act of 1972. At the time, the existing State regulations were adopted for the Federal waters seaward of the John Pennekamp Coral Reef State Park and are still in force today.

Through a joint management agreement with the State of Florida and managed by the State, the U.S. Key Largo Coral Reef Marine Sanctuary is patrolled by State and Park Rangers and the U.S. Coast Guard. Collection or possession of coral, dead or alive, and sand or any other organism, dead or alive, (other than fish or lobster), can cost up to $5,000. If coral or other materials or organisms mentioned above are collected outside of John Pennekamp Coral Reef State Park and U.S. Key Largo Coral Reef Marine Sanctuary, they cannot be transported into these areas without danger of the person possessing them being fined. This is also true of Biscayne National Monument.

The management and enforcement of the Key Largo Coral Reef Marine Sanctuary, is of particular interest to the Looe Key proposal. Although the area is larger, in the upper Keys, and immediately adjacent to an established State marine park, its ecologinal system and the human impacts occurring daily in the sanctuary are very similiar to the area known as Looe Key.

a. Memorandum of Agreement

At present, there is a memorandum of agreement between NOAA/OCZM and the State DNR, Division of Recreation and Parks, which provides:

- State on-site management in accordance with the rules and regulations promulgated by OCZM.
- State administered regulation. Proposed regulations revising existing interim - final regulations are being considered at the present time.
- At question appears to be how much should the regulations resemble State regulations in the interest of consistency and how much should they be a reflection of the objectives of the Marine Protection Research Sanctuaries Act.
- State evaluation of all permits.

- State enforcement of the Sanctuary regulations through a cooperative effort with the U. S. Coast Guard. The State reviews all citations issued by the USCG and sends a report of the violation and recommendations to the NOAA/General Counsel, St. Petersburg, Florida.

- State submissions of semi-annual reports to NOAA and submission of recommendatons for more effective management.

b. U.S. Coast Guard Enforcement Agreement

Patrol of the sanctuary is accomplished jointly by the Florida Marine Patrol and U.S. Coast Guard personnel. Enforcement authority for State Park rangers is limited to John Pennekamp Coral Reef State Park and does not include Key Largo Coral Reef Marine Sanctuary. Persons found to be in violation of NOAA regulations are notified at the scene by the issuance of a Coast Guard Report of Boarding (CG Form 4100). Evidence is seized by USCG personnel and appropriate statements taken. NOAA paid the salaries of two Coast Guard personnel assigned to Key Largo in 1978. In 1979, the Coast Guard continued its allotment of personnel to the sanctuary but refused payment, since enforcement was part of their ongoing responsibility.

c. Law Enforcement Procedures

Once all officials and the violator have been notified and the State park service has evaluated the information, the NOAA General Counsel draws a Notice of Violation, specifying the precise violation involved, and the proposed penalty (which may be negotiated).

The BLM coral regulations have rarely been used since these regulations provide for criminal penalties involving arrest and appearance before a Federal Magistrate.

d. Enforcement Results in Key Largo

There were six Notices of Violation issued in 1977, fifty-nine in 1978 and twenty-three in 1979. The average proposed penalty for the three year period was $86.73, the average compromise penalty agreed upon by the violators was $60.92.

APPENDIX E

NOAA RESPONSES TO COMMENTS RECEIVED ON THE PROPOSED LOOE KEY MARINE SANCTUARY DEIS

GENERIC RESPONSE #1 - SUPPORT FOR THE LOOE KEY PROPOSAL

Thank you for your comments. NOAA concurs with the view that Looe Key is a valuable and important resource and that Looe Key is a national resource of high ecological value. NOAA also concurs that marine sanctuary designation offers an effective mechanism to protect and conserve this portion of the Florida reef system for the benefit of future generations.

GENERIC RESPONSE #2

Several reviewers voiced the opinion that adequate protection will be afforded Looe Key by the Fishery Management Council pursuant to the Fishery Conservation and Management Act (FCMA) and that sanctuary designation would, therefore, be duplicative and unneccesary. Although the FCMA provides environmental protection, its principal focus is the management of selected commercial and recreational fisheries. Conservation efforts under this statute are by necessity directed toward individual species rather than ecosystems. Accordingly, both in general and in the case of Looe Key the two programs are complementary, not duplicative.

In accordance with the FCMA, the Regional Fishery Management Councils (FMC) develop Fishery Management Plans (FMP), that are implemented by the Department of Commerce. These FMP's provide for protection of selected fishery resources but in general do not focus on site-specific ecosystem management. FMP's do not necessarily consider elements of the ecosystem which are not harvested nor do they address the entire range of threats to which an area like Looe Key can be subject. Title III of the Marine Protection Research and Sanctuaries Act, on the other hand, authorizes conservation of special or threatened ecosystems per se. Because of the differing focuses of the two statutes the efforts of the FMP's and the Marine Sanctuaries Program should, through cooperative efforts, complement each other.

In particular, major differences between the Councils' joint Coral and Coral Reef Resources FMP and the NOAA Looe Key marine sanctuary proposal include: (a) the size of the specific area to be protected; (b) the range of organisms toward which management attention is directed; and (c) the emphasis on comprehensive management planning, including interpretive programs and design and implementation of long-term site specific research.

First, with regard to size, the Habitat Area of Particular Concern (HAPC) proposed in the draft Coral and Coral Reef Resources FMP includes a one sq nm area which will allow the protection of the actual spur and groove system from physical damage. However, the long-term biological productivity of a system is by no means assured by such protection efforts and NOAA believes that the FMP proposed protection of a 1 sq nm area will not provide that assurance. Comprehensive management emphasis on monitoring, visitor uses, research and public education aimed at assessing the effectiveness of protective measures and health of the total system will form the basis for ensuring future viability of this section of the reef tract. For a discussion of the rationale for the proposed sanctuary 5 sq nm boundary, please see Generic Response #3 and Chapter IV (Environmental Consequences of the Proposed Action).

It should, however, be noted that knowledgable scientists have questioned the likelihood that even the sanctuary program with its emphasis on the latter facets of management can effectively protect this section of the reef tract (Generic Response #2). The basis for this concern is the small size of the proposed sanctuary. In the marine environment adequate

buffer zones replace the fences used in traditional land management techniques. This approach requires a greater area to protect a given resource than would normally be necessary on land. NOAA believes, however, that after analyses of potential impacts on the total human environment, 5 sq nm represents a reasonable buffer beyond that provided through the HAPC. This in combination with the management oriented facets of the sanctuary program will complement the efforts of the Councils to protect coral species in the fishery conservation zone.

Second, the Council's FMP limits the definition of coral reef resources to the actual coral structure. This leaves the majority of invertebrates and lower vertebrates without specific protection. The productivity of coral reefs, equalled only by that of tropical rain forests, is a result of the organisms forming the reef structure (algal biomass may be three times greater than that of the corals); and light, oxygen and efficient nutrient recycling as a result of the innumerable non-coral reef organisms. It is this entire specialized ecosystem that is the focus of sanctuary integrated research, education and regulation over the long-term.

In conclusion, the major differences between the proposed management measures for the HAPC and the final proposed marine sanctuary regulations are focused on the emphasis placed on comprehensive management, monitoring, research and public education by the sanctuary program which is lacking in the HAPC proposal and which complements the Councils' FMP efforts. A comparison of the two programs was forwarded by the GMFMC and an updated version is presented below.

LOOE KEY PROPOSALS

Marine Sanctuary	Coral FMP
General Area: Five square nautical miles includes portions of the Patch Reefs, a Reef Flat, Fore Reef, Deep Reef, and Deep Ridge.	General Area: One nautical mile square. Contains Fore Reef and Reef Flat.
"Special Management Area": Trapezoid.	"Special Management Area": Trapezoid.
Coral Collection: None permitted in general area; regulations also prohibit damage to coral which would include standing, breaking, etc.	Coral Collection: None permitted in the general area and no contact with coral permitted in trapezoid area.
Tropical Marine Specimens: Collection of all tropical specimens, including invertebrates, prohibited throughout area, except by permit for scientific and educational purposes.	Tropical Marine Specimens: Collection of marine tropical fishes prohibited in trapezoid area.
Spearfishing: Prohibited in general area.	Spearfishing: Prohibited in trapezoid area.
Fixed Gear: General area: prohibit wire fish traps. Trapezoid area: prohibit wire fish traps and lobster traps.	Fixed Gear: General area: prohibit fish traps within 100-foot contour (Reef Fish FMP). Trapezoid area: fixed fishing gear prohibited.
Anchoring: Prohibited on coral in trapezoid.	Anchoring: Prohibited in trapezoid.
Historical and Cultural Resources: Removal, damaging, tampering prohibited.	Historical and Cultural Resources: Not applicable.
Toxic Materials: Prohibits all discharges except vessel cooling water, fish parts, chumming materials and effluents from marine sanitation devices.	Toxic Materials: Prohibits toxic chemicals in taking fish and other marine organisms in coral areas; other discharges not addressed.
Explosives: Not specifically addressed; however, this would be included under the prohibition of damage to coral.	Explosives: Prohibited over live coral bottoms when causing coral damage.

GENERIC RESPONSE #3

During review of the DEIS and at the public hearings two issues were raised focused on 1) the basis for selection of Looe Key as a sanctuary proposal and 2) the size of the proposal area. With regard to the first issue, certain reviewers stated that in their opinion Looe Key is not a unique area and therefore sanctuary designation is not justified. The uniqueness of the Looe Key area is indeed not measured in terms of new and different species assemblages. It is true that the species found on Looe Key are also found all along the Florida Reef tract. The special nature of Looe Key is measured, instead, in terms of the spectacular beauty of the spur and groove system, the value of this small area to local biological productivity (see commercial fishing statistics) and the ease of accessibility to the user public. Looe Key is located only 6.7 nm offshore and can be easily located in a relatively short period of time. The shallow water portions of the reef in combination with the deeper areas make it attractive to both novice and highly experienced swimmers, snorklers and divers. Public charter boat operations, dive boats, recreational divers and fishermen, a major non-profit organization (the Newfound Harbor Marine Institute) and established commercial fishermen utilize the reef. The area is currently experiencing intensive public use which based on population and tourist projections is expected to increase. All of these factors taken together contribute to the special nature of Looe Key. While it is true that it is not the only beautiful section of the reef tract and that it is but one of the several shelf margin reefs in the lower keys, NOAA believes that, without question, the combination of factors discussed above qualify Looe Key for sanctuary status and that given user pressures, this small section of the reef tract must be comprehensively managed if its long-term viability is to be assured.

The proposed 5 sq nm boundary was criticized during the review both as being too large and as being much too small. It was felt by several commentors that the proposed 1 sq nm HAPC presents an appropriate size for a sanctuary. Protection of an area of this size will provide for prohibitions of physical damage to the Fore Reef and associated organisms. It will not likely provide an adequate area for assuring biological integrity of the system. In the marine environment protection of any core area (Fore Reef) requires identification and protection of even large areas (buffers) where essential processes for the stability of the core take place. NOAA does not believe that 1 sq nm offers a reasonable buffer to assure long-term productivity of the Looe Key reef system.

The 5 sq nm sanctuary proposal has also been criticized as being too small and vulnerable to outside harmful activities to warrant designation. It is true that marine systems cannot be managed by reliance upon traditional land management techniques. Essential differences between marine and terrestrial environments include the size of the ecosystems, the mobility of marine organisms and the three dimensional nature of the hydrosphere, sink, and downstream affects. Because of these characteristics, setting aside limited marine areas such as Looe Key contributes to protection of the large system. Locating these small candidates for protection involves consideration of their location, number, size and linkages. Ideally, management would be able to identify the linkages, protect them and thereby protect the region as a whole while we continue to use and enjoy it.

Though Looe Key alone represents a small segment of the reef system, it is possible that by focusing intensive management on smaller discrete units such as Biscayne Bay National Park, Key Largo National Marine Sanctuary, John Pennekamp State Park, Fort Jefferson National Park, and Looe Key we can protect enough of the reef tract linkages to insure protection of the entire system.

In addition, these discrete protected areas are tied together by the broader conservation measures afforded under the Management Councils' Coral and Coral Reef Resources Fishery Management Plan. In the near future other FMP's will be implemented for fisheries under the jurisdiction of the South Atlantic Council. All of these entities, together with heightened awareness of the need for close cooperative management strategies, should provide an increased level of protection.

In conclusion, after assessing the potential impacts of larger Looe Key sanctuary boundaries, NOAA continues to propose the 5 sq nm alternative. In a purely biological sense, a sanctuary covering the whole of the Florida Keys might be more desirable; however, the Looe Key proposal offers a workable proposal which will contribute to protection of the integrity of the entire reef tract and at the same time minimize economic impacts to area residents.

GENERIC RESPONSE #4

The preferred alternative (Alternative b) proposed in the DEIS would have required that NOAA establish a permitting system and develop criteria specifying under what conditions commercial collecting permits would be granted. It would also have required the undertaking of extensive monitoring of fish stocks to determine when adequate population levels of target species existed and at what point and to what degree taking would be appropriate. A number of reviewers opposed collection on ecological or philosophical grounds. In response to concerns and arguments presented in the DEIS review, NOAA has reconsidered the preferred alternative for tropical specimen collecting and now proposes instead to prohibit collection of such specimens except by permit for scientific and educational purposes.

Several reviewers felt that administration and enforcement of a permit system for effective regulation of commercial tropical specimen collecting could not be developed. Subsequent consultations with existing commercial permitting authorities emphasized the difficulties involved. It is not likely that permittees could be monitored to assure that their actions would be consistent with the conditions of the permit without an elaborate surveillance system with specified check points for ingress and egress at the sanctuary boundaries. As an example, it would be virtually impossible to determine whether a permittee took only 100 neon gobies over the period of two months.

Establishment of a limited permitting system to allow taking of tropical specimens for research and scientific purposes could be accomplished without administrative and enforcement difficulties. It is anticipated that most research within the sanctuary would be non-consumptive (i.e., observational) and would not require a permit. Limiting the taking of specimens to research and educational purposes only will result in significantly fewer permits than would a system which included commercial taking. Furthermore, the Office of Coastal Zone Management has already developed an administrative process currently employed for the Key Largo Marine Sanctuary that is designed to handle limited permits for these purposes.

There are many available easily accessible and suitable areas for tropical specimen collectors to capture tropical fish and invertebrates in south Florida; including shallow inshore areas, inshore coral heads, mid-channel reefs (in the middle of Hawk's Channel), and the entire outer reef. Prohibiting collecting in the Looe Key area would cause limited economic loss to present commercial collectors. When the accessibility of alternative sites, the small size of the proposed sanctuary, and the minimal economic impact, however, are weighed against the administrative cost and burden of establishing a commercial permitting system, commercial permitting does not appear justifiable. From a conservation standpoint, a sanctuary prohibition would protect and enhance the tropical specimen populations at Looe Key, help prevent the depletion of ecologically important species, add to the aesthetics of the sanctuary, and help maintain and enhance the long term

productivity of the Looe Key coral reef for future generations. In addition, the majority of those reviewers who commented on this issue did not support the permitting system for commercial collecting. For these reasons NOAA proposes to prohibit all tropical specimen collecting except by permit for scientific and educational purposes.

The proposed regulation, however, does not necessarily exclude all commercial collection. For example, permits could be given for collecting for sale to public aquaria. It is unlikely however that there will be as many applications for this type of permit as there would be for full scale commercial collecting. Section 938.8 of the proposed regulations details the criteria the Assistant Administrator must consider in granting a permit; (1) the general professional and financial responsibility of the applicant, (2) the appropriateness of the methods envisioned to the purpose(s) of the activity, (3) the extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary, (4) the end value of the activity (i.e., if the intended activity is (a) for research related to the resources of the Sanctuary, or (b) to further the educational value of the Sanctuary), and (5) other matters as deemed appropriate. Each permit application will be judged on individual merit.

In conclusion, NOAA believes that this regulation will protect the resource, and allow collecting that is consistent with sanctuary goals and limited enough in scope that monitoring and enforcement can be conducted adequately.

PUBLIC HEARINGS COMMENTS

Miami, Florida - June 16, 1980

E. A. Shinn, speaking as a private citizen

1. Is marine sanctuary designation the proper way to achieve coral reef conservation?

2. How cost effective is the sanctuary program?

3. When the mandate providing NOAA with authority to regulate the coral reefs on the continental shelf goes into effect, what additional protection will a sanctuary provide if one is designated at Looe Key?

PUBLIC HEARING RESPONSES TO COMMENTS

Looe Key -- Miami, Florida

Shinn

1. Response: The marine sanctuary program is specifically designed to give maximum attention to relatively small, high quality areas such as Looe Key, which are worthy of conservation. Looe Key reef, as a marine sanctuary, will receive special management and enforcement attention beyond that possible in a general management structure such as that provided, for example, in Fishery Management Plans. The Fishery Management Plans base their jurisdictional boundaries on the territorial range of fish and coral species, thus covering wide areas such as the entire outer reef tract of the Florida Keys. There is little opportunity or necessity under their mandate to provide management and protection or enforcement of any one area such as the Looe Key reef. Also please see Generic Response #2.

2. Title III of the Marine, Protection, Research and Sanctuaries Act receives funding on a yearly basis. Funding for fiscal 1980 was 1.75 million dollars for the entire marine sanctuaries program. This money is used for administrative costs, costs related to the designation process and management, enforcement, research and monitoring of existing sites. Looe Key is one of seven sites now under active consideration.

Projected management costs per site average $90,000/year. In some cases enforcement costs must also be funded and the average planning figure is $60,000/year. Research and Monitoring costs per site will vary from 0 - 100,000/year depending upon management needs and the existing data base. The actual budget needs for any given site will be derived after formulation of the Management Plan.

3. Please see Generic Response #2.

Richard Neilson, Commercial Fisherman from Ft. Lauderdale

1. Opposed to the proposed Marine Sanctuary because business will be taken away from fishermen. NOAA and the State of Florida have banned fish traps without biological or scientific data. This is unfair. NOAA needs up-to-date NMFS - State data on wire-fish traps.

Robert Ginsberg, resident of Coral Gables, Professor University of Miami

1. Supports the Marine Sanctuary Program.

2. A sanctuary must be large enough to control surroundings. A five square mile boundary is small and subject to natural disasters.

3. There are two areas of potential uniqueness to be protected:

1) the coral reef itself, the organisms, animals and esthetic qualities; and

2) historical and cultural resources.

What makes this coral reef different from all other coral reefs?

4. The historical value includes the remains of a shipwreck of the HMS LODE and THE SNOW, yet these ship remains are almost totally deteriorated and the only way to gain knowledge about the wreck is to fan the sand. This is prohibited in the rules and regulations.

5. Coral collecting by tourists will already be prohibited by the 1981 mandate and a sanctuary would be a duplication of work.

6. More consideration should be taken in investigating other possible sanctuary sites in the Lower Keys.

Alexander Stone, President, Marine Wilderness Society

1. Supports the proposed Marine Sanctuary. The sanctuary should be established as soon as possible.

2. Wants NOAA to include all information sent by Marine Wilderness Society in the Final Environmental Impact Statement.

3. Endorses the five square mile marine sanctuary. The five square mile sanctuary proposed is important to preserve long-term protection for conservation, recreation, ecological, educational and esthetic values.

4. The sanctuary must include adequate portions of Patch Reef, Reef Flat, Fore Reef, Deep Reef, and Deep Ridge, and it must have a reasonable buffer zone to protect tropical fish and other marine organisms.

5. Publicity could destroy the coral reef.

6. Boaters must be careful when and where they anchor.

7. Scientists should be required to obtain permits for collection of specimens.

8. Divers should "take only memories and leave only bubbles."

9. Spearfishermen will not be able to fish if the sanctuary is designated.

Neilson

1. Response: References, in the text, to wire fish trapping, have been changed to utilize the latest wire fish trap data from the State DNR-NMFS study. The final sanctuary proposal represents NOAA's best effort to manage effectively a viable section of the reef tract with minimal economic impact on commercial fishing. When the NMFS - State study is completed NOAA will re-evaluate the prohibition on wire fish traps in light of the final data.

Ginsburg

1. Response: Please see written comments of Robert Ginsburg.

Stone

1. Response: Please see written comments of Alex Stone, Marine Wilderness Society.

10. There should be a comprehensive management plan.

11. The Sanctuaries Program protects the area by preventing damage, all other Federal regulations call for clean-up after the damage has been done.

12. Wire fish trapping should be prohibited within the sanctuary. Only 20 percent of the fish caught in wire fish traps are marketable; and 35 percent of the fish caught in wire fish traps are grunts.

13. Regulations on tropical fish catching are too open ended.

14. The "anchor down" provision should be made as basic as possible to allow maximum non-damaging use of the sanctuary while protecting the coral reef.

15. A problem with the mooring buoy system is that it can not possibly provide enough buoys in the area.

Rosemary Roth, Member, Board of Directors, Tropical Audubon Society
(speaking on behalf of Bob Kelly, President, Tropical Audubon Society)

1. The Audubon Society supports the proposed Marine Sanctuary.

2. Figures on commercial fishing are overestimated and the figures on tourism are underestimated. Tourism is more important to the economy than commercial fishing.

Mary Terese Delate, Chairperson of Miami Sierra Club

1. The Miami Club supports the proposed Marine Sanctuary.

2. The fishery management program provides stable, uninterrupted income for area fishermen. Protection of the coral reef would provide habitat for a number of marine species.

3. The five square mile boundary is the best alternative.

4. Shell collecting should be prohibited except for educational or scientific research by permit only. This would protect hermit crabs.

Alice Wainwright, National Audubon Society,
also speaking on behalf of the Florida Audubon Society.

1. They support the proposed Marine Sanctuary. In the past not enough emphasis has been placed on the recreational value of Looe Key. Looe Key has suffered from degradation. The educational objectives are adequate and the preferred regulations proposed by NOAA are adequate.

2. The boundary is satisfactory, but it could be larger.

3. Enforcement of anchoring only on the sand is vital to coral reef protection.

Roth

1. Response: Please see written comments of Robert L. Kelly, Tropical Audubon Society.

Delate

1. Response: Please see Generic Response #1.

2. Response: Please see Generic Response #2.

3. Response: Please see Generic Response #3.

4. Response: Please see Generic Response #4 for a discussion of the tropical specimen collecting.

Wainwright

1. Response: Please see Generic Response #1.

2. Response: Please see Generic Response #3.

3. Response: In the FEIS, NOAA proposes to prohibit anchoring on coral on the Fore Reef and to encourage sand anchoring elsewhere. Please see Chapters Two, Preferred Alternative, Four, Environmental Consequences, and Appendix A.

John C. Noyes, Executive Secretary, Florida Marine Life Association

1. Opposed to the proposed Marine Sanctuary.

2. Corrections to be made in the EIS:

In general, the DEIS is "stretching the point" to justify the sanctuary.

Page 4, paragraph 1: Looe Key is not the only "living" coral reef left.

Goal 1: Why must this be protected when it is already being protected by Gulf Council and South Atlantic Council?

Goal 2: A marine sanctuary is not necessary to achieve this goal.

Goal 3: Remove the term "Looe Key"

Page 14, paragraph 5: No major hurricane has touched down on the Lower Keys in a long time. The storm surges severely damage coral reefs; and anchoring damage is insignificant.

Page 15, paragraph 1: Queen Angel fish and neon goby are of no economic value for commercial fishermen. Commercial fishing in the area is insignificant to renewable resources.

Page 15, paragraph 2: No marine predator eats sea urchins except possibly the hog snapper and giant spotted burfish which are not reef predators. Sea urchins are migratory.

There are identical paragraphs on pages 25 and 89 that imply that groupers have inhabited the Fore Reef zone. There might be a "natural" reason why groupers do not inhabit the Fore Reef zone. Butterfly fish inhabit the Fore Reef zone and Deep Reef area.

Hamlets, Blue chromis and creole wrasses range in 35-75 foot depths. Purple reef fish, sunshine fish, spot fish normally inhabit 80-100 foot depths.

Page 56, paragraph 4: The distribution of fish in these depths is normal.

Page 58, paragraph 3: Pillar coral is not an endangered species.

Page 100, paragraph 2: Lobsters do not need emergency protection, and coral will grow back.

3. The DEIS is a biased document to sway one to believe humans have caused the ecosystem damage at Looe Key.

W. R. Ballard, Director, Lower Keys Chapter of OFF

1. Opposed to the proposed Marine Sanctuary.

2. They are afraid of future rule changes without public knowledge.

3. No businessman in the area of the proposed sanctuary is in favor of its designation.

4. Page 6: Hook and line fishing, net fishing, snorkling and SCUBA diving are not regulated under current designation, yet in Appendix A (page 85) there is mention of regulating the use of rope, chain, and anchor in order to protect the coral. This is paradoxical, for there is no possible way for a fisherman to line a fish if he can not anchor anywhere within the sanctuary.

Noyes

1. Response: See written comments of John Noyes.

Ballard

1. Response: No response necessary.

2. Response: It is true that one of the major concerns of opponents of the proposed sanctuary is the belief that NOAA will use what is perceived as unilateral discretion to enlarge the boundaries of the sanctuary and modify the operating regulations. However, the constraints posed by the Marine Sanctuaries Program Regulations (CFR vol. 44 no. 148, 7/31/79) ensure that modification of either the Designation Document or regulations of individual sanctuaries is a lengthy process involving numerous opportunities for public notice and involvement. Management measures will be periodically reviewed for need and effectiveness in light of current information. Such a review will involve public participation. Should the currently proposed regulations prove unnecessary, appropriate changes will be proposed and will move through extensive public review and comment.

3. Response: Most of the written responses (over 100 letters) to the Looe Key DEIS were in support of the proposed Marine Sanctuary at Looe Key; however, it is true that the majority of the commercial fishing industry representatives oppose designation.

4. Response: The text has been clarified (Introduction and Summary Section III). Sand anchoring will be requirred only on the Fore Reef (Core area).

Richard Thomas, commercial fisherman

1. Opposed to the proposed Marine Sanctuary.

2. There is a duplication of effort, for the items regulated, are already regulated by another governmental agency.

3. There is no mention of the cost of management of the sanctuary or proposed cost of year-to-year maintenance. The public has the right to know how much has been spent so far and how much it will cost.

4. The boundaries are not defined in the document, only a vague reference to a 5.3 square mile boundary. Rules and regulations can be changed within 60-90 days. Exact boundaries should be included in the Designation Document.

5. If NOAA does not want to restrict trapping except in the Fore Reef zone, the regulations should be put in the Designation Document.

6. Boats running into reef are a larger problem than anchoring. This should be mentioned in the draft.

7. Restriction of commercial line fishing through anchoring restrictions over the total five square miles, hampers commercial and recreational hook and line fishermen. Restriction of Fore Reef area (hard coral), i.e., protecting it from anchoring should be placed in the Designation document. It would be very difficult to fish without anchoring.

8. Appendix D-9: The monetary fine structure of Key Largo is a model for what NOAA will do for Looe Key. The average fine for three years was $86.73. Penalty agreed upon is $60.92 and the total penalty for evidence collected is $2,315,000.

Thomas

1. Response: No response necessary.

2. Response: Please see Generic Response #2.

3. Response: Title III of the Marine, Protection, Research and Sanctuaries Act receives funding on a yearly basis. Funding for fiscal 1980 was 1.75 million dollars for the entire marine sanctuaries program. This money is used for administrative cost, costs related to the designation process and management, enforcement, research and monitoring of existing sites. Looe Key is one of seven sites now under active consideration.

Projected management costs per site average $90,000 per/year. In some cases enforcement costs must also be funded and the average planning figure is $60,000/year. Research and Monitoring costs per site will vary from 0 - $100,000/year depending upon management needs and the existing data base. The actual budget needs for any given site will be derived after formulation of the Management Plan.

4. Response: Exact boundaries have been placed in the Designation Document. Please see Response #2 for Mr. Ballard.

5. Response: The Designation Document serves as a Charter for the sanctuary. It provides a broader picture of the management framework with the details supplied later in the management plan which includes the regulations. Any future changes in regulations would not be made without extensive public notice, involvement, review and comment. If found desirable by the public, advisory committees composed of user group representatives will be established as a part of the management structure. This will insure public awareness and input into all phases of management of a Looe Key sanctuary.

6. Response: Reliable information on boats running into the reef is not now available. Following sanctuary designation, a visitor use survey will be initiated to determine the extent of boat damage to the reef. Also having the sanctuary added to NOAA nautical charts should help alleviate this problem.

7. Response: Please see anchoring regulation changes in the FEIS (Chapter 2 and 4) in the Designation Document. Under the final proposal anchoring will be restricted only on the Fore Reef where sand anchoring will be required.

8. Response: $60.92 is the average penalty, but will not necessarily be the exact amount for each of the 90 violations. The entire reference to $2,315,000 has been removed from the Appendix as it was misleading.

Jerry Samsone, Executive Director of OFF

1. Commercial fishing is compatible with a marine sanctuary if it is properly regulated. The Preamble and basic articles of the designation document are not too comforting to commercial fishermen.

2. Article 3: The marine sanctuary will provide recreational and scientific opportunities. 200,000 pounds of spiny lobster taken from the five square mile area has a significant impact. Include the compatability of commercial fishing and the intent of the marine sanctuary in the Designation Document.

3. Page 74 & 88: Since p. 74 states that enforcement will be turned over to the State, why does it matter what size vessels the Coast Guard will be using?

4. Page 94: Update information pertaining to Florida's reefs and fish trapping in final document and current state of the art on fish trapping as done by National Marine Fishery Services and Florida DNR.

5. Page 98: The current value of the fish taken from the five mile area in fish trapping is $109,000 ($109 per boat). This must be a typographical error. Only 28 percent of all boats use fish traps, so the figure per vessel should be $3,900 not $109.

6. If the thrust of your proposal is to protect the Fore Reef how can you do it by encouraging visitation? If the Fore Reef is really unique why not make the core trapezoidal area a "no touch" zone.

Sansome

1. Response: The Preamble and basic articles have been changed to include recognition of the commercial value of the area, recognition of commercial uses along with recreational, research, etc.

2. Response: Article 3 has been changed to acknowledge fishing productivity as one of the characteristics which give Looe Key a particular value.

3. Response: The delegation of enforcement authority mentioned on p. 74 refers to the current plan of NMFS with regard to the FMP. NOAA proposes that enforcement at a Looe Key Marine Sanctuary be carried out by the Coast Guard under special arrangements for an onsite presence.

4. Response: All references to wire fish trapping in the final document have been updated to include the newest information on fish trapping from the Florida DNR and NMFS Study.

5. Response: The text has been corrected (Chapter 4, Section III).

6. Response: NOAA recognizes the potential adverse impacts of large numbers of people on small areas such as Looe Key. Because of its small size, the management at Looe Key will stress education and enforcement measures to protect the reef and will de-emphasize management techniques which encourage visitation. However, without sanctuary designation it is anticipated that the Looe Key Reef area will receive an ever increasing number of visitors as the population of the nearby Keys continues to grow along with levels of tourism. A sanctuary management framework will provide for monitoring and control of these increasing uses.

The revised proposed anchoring regulation prohibits anchoring on coral on the Fore Reef within the core trapezoidal area. This in combination with other marine sanctuary proposed restrictions and those proposed for the HAPC in the Coral and Coral Reef Resources FMP relieve considerable pressure from the spur and groove system itself.

Jack Gill, fisherman

1. Opposed to the proposed Marine Sanctuary and feel the Fishery Management Councils can control any problems.

2. Tourists will destroy these nonrenewable resources.

3. Only a handful of people are interested in the sanctuary.

4. Opposed to Federal government involvement, feel it will destroy commercial fishing.

Dr. James Bohnsack, Department of Biology, University of Miami

1. Chemicals for collecting should be allowed with a permit from NOAA for research and educational purposes.

2. Why is hook and line fishing permitted and spearfishing banned?

3. The nomination procedure has been marred by local politics and pressure groups.

4. To minimize further friction, the Sanctuary Manager should be a person totally outside of the region and who has had no previous involvement with the nomination process, to avoid a conflict of interest.

5. NOAA funds should not be used to widely advertise the sanctuary because it can not handle too many people. Public funds should be used to teach people how to anchor properly in sand. Use funds to advertise regulations and educate the public.

6. Five years after sanctuary designation, the rules should be reviewed and possibly revised. There was no mention of monitoring, management, or enforcement.

7. NOAA should make certain that funds are available for research studies.

Gill

1. Response: Please see Generic Response #2.

2. Response: NOAA believes that the Marine Sanctuary Program will offer long-term protection to Looe Key nonrenewable resources by managing and regulating, to the extent necessary, the ever increasing use of the area by tourists and other users. Please see response #6, Jerry Sansome above.

3. Response: NOAA has received over 100 letters in response to the Looe Key proposal. Over 80 percent were favorable to the sanctuary designation.

4. Response: The proposed Looe Key 5 sq nm sanctuary area accounts for approximately one-third of the catch of commercial fishermen at Looe Key. Of that one-third; lobster trapping will still be allowed outside the Fore Reef along with trawling and hook and line fishing.

Bohnsack

1. Response: Please see written comments of James Bohnsack.

Key West Hearing - June 17, 1980

Harold Hudson, U. S. Geological Survey

1. Regulations for the sanctuary have a double standard because spearfishing is prohibited yet line fishing is permitted. If spearfishing is killing all the predators, then line fishing must not be catching any as line fishing helps deplete the predators too. Barracudas are also caught by hook and line fishermen. Eliminate any fishing that will take the predators from the reef.

W. R. Ballard, Director, OFF

1. Opposed to the proposed Marine Sanctuary, because of the unfavorable economic impacts on commercial fishing and business in the Lower Keys.

2. Page 3, paragraph 2: Regulations will be altered or changed regardless of public opinions. One public hearing is not enough to bring forth comments on regulations and restrictions. Comments received at the first hearing should be evaluated and followed with additional public hearings. Most line fishermen avoid the coral reef area because of the lack of fish in the area. Anchoring restrictions will decrease the amount of commercial and recreational bottom fishing boats.

3. Page 12, paragraph 2: Anchoring in sand, snorkeling and SCUBA diving are permitted, not to inconvenience hook and line fishermen. According to page 85, paragraph 6, hook and line fishing, and net fishing are not regulated and yet anchor regulations do regulate hook and line fishing.

4. Page 14, paragraph 5: Any lobster traps dropped on coral are a mistake. Trawl fish traps are not dragged along bottom coral. Fishermen do not anchor while setting wire fish traps.

James E. Sharpe, OFF

1. Opposed to the proposed Marine Sanctuary. Looe Key is a very productive fishing area (50% of his income) particularly for yellow tail snapper.

2. Everglades National Park now has an unfavorable economic impact on commercial fishing and business of the Keys. Commercial fishermen can not earn a living there.

Mr. Sharpe presented a map showing large areas in Monroe County under protective regulation.

Key West Hearing - June 17, 1980

Hudson

1. Response: Please see the revised sections on spearfishing and hook and line fishing. Monitoring after designation will continue to examine the effects of hook and line fishing on the reef system.

Ballard

1. Response: Please see response #4 of Mr. Gill, Miami hearing. The proposal presented in the FEIS represents NOAA's best effort to manage effectively the Looe Key area with minimal adverse economic impact. User groups participation in sanctuary management will further insure continuous consideration of this issue.

2. Response: Following public workshops, public hearings and the opportunity for written comments on the DEIS and after sanctuary designation, there will be further opportunities for citizen participation during the management phase of Looe Key. Please see response #2 to your comments at the Miami hearing.

3. Response: The text has been revised to reflect your comments (Introduction and Summary Section V). Also please see responses to the J. Connor Davis letter. Anchoring on coral is prohibited only on the Fore Reef.

4. The text has been corrected to reflect your comments (Introduction and Summary, Section VI).

Sharpe

1. Response: Please see Generic Response #2.

2. Response: The exact percentage of Monroe County actually designated as a park or preserve is unknown. It has been stated, however, that some 80% is under one type of management or another. The amount of area in protective status is not believed to be a legitimate rationale for determining whether or not the proposed Looe Key site is worthy of marine sanctuary status. NOAA believes that the determination should be made on the merits of the resource values of Looe Key.

Richard Thomas, commercial fisherman

1. Opposed to the Marine Sanctuary Program as a whole. The restrictions are too flexible and too easy to change; similar to the Everglades National Park, with open ended rules and regulations. Anchoring should just be prohibited in the trapezoidal area. Boundaries should be set forth in the Designation document. Regulations should be more specific. Costs of the program should be spelled out.

Duncan Matthieson, Newfound Harbor Marine Institute

1. The Institute supports a proposed Sanctuary at Looe Key.

2. The DEIS should look more closely into management, and enhancement as well as using the shipwreck for teaching resources. The sanctuary should preserve cultural and natural resources.

3. There should be no salvage operations in the 5 mile area since there are problems with treasure hunters.

4. Looe Key provides an interesting laboratory. Newfound Harbor Institute is developing a research/development program for its students in the Looe Key area.

William H. Westray, resident of Key West for 35 years

1. Supports the proposed Marine Sanctuary. Looe Key is important nationally. If the area is destroyed, it can not be restored, feel that Looe Key is the "jewel" of the 130 miles of reef. Therefore, Florida needs to utilize the Marine Sanctuary Program.

Al Armitt, OFF and local resident for many years

1. OFF is opposed to the proposed Marine Sanctuary.

2. The DEIS should have indicated the number of people that attended the workshop and had more information about the opposition to the proposed sanctuary in the Designation document.

3. Fishermen of OFF are not against conservation; everyone wants to preserve the fishery.

Dennis Keniste

1. Supports the proposed Marine Sanctuary.

2. Anchoring regulations and the mooring system are a good idea.

3. The overturning of the Alexander conviction in the case of injury to coral from salvaging operations heightens concern for the Looe Key reef.

Ed Little, former Marine Biologist

1. Supports the proposed Marine Sanctuary.

2. It is important to preserve unique habitat areas and fisheries.

Thomas

1. Response: Please see Response #2 above for Mr. Ballard. In the final proposal anchoring on the coral is be prohibited only in the trapezoidal area and exact sanctuary boundaries are presented in the Designation Document. Please see Response #3, Mr. Thomas, Miami hearing, with regard to program costs.

Matthieson

1. Response: Please see Generic Response #1.

2. Response: Following designation, the Looe Key Management Plan will include management and enhancement measures for the historic, cultural resources at Looe Key.

3. Response: Such operations are prohibited in the final proposal without a valid sanctuary permit (Sec 937.8 (a) of Appendix A).

4. Response: No response necessary.

Westray

1. Response: Please see Generic Responses #1 and #2.

Armitt

1. Response: No response necessary.

2. Response: The text has been expanded to reflect your concerns (Introduction and Summary, Section I).

3. Response: The marine sanctuary management, after designation, will work with the Fishery Management Councils, organized fisheries groups and individual fishermen, to develop and strengthen measures for the conservation of the resources. Citizen participation in sanctuary management advisory groups would ensure continued attention to this issue.

Keniste

1. Response: Please see Generic Response #1.

2. Response: No response necessary.

3. Response: Please see Generic Response #2.

Little

1. Response: Please see Generic Response #1.

2. Response: No response necessary.

Looe Key -- Big Pine Key, Florida

Shawn Ray

1. Opposed to the proposed Marine Sanctuary which will put him out of a job. The sanctuary will have an adverse effect on commercial fishing, especially trapping.

James Moore, lobsterman

1. Opposed to the Sanctuary; fishes with 500 traps. Fears enlargement of boundaries.

James Sharpe, member of OFF

1. Opposed to the proposed Marine Sanctuary.

2. Fears that the boundaries for the Looe Key sanctuary will gradually increase. Eighty percent of Monroe County, now regulates and severely restricts commercial fishermen, Key Largo alone, is 150 square miles.

Newell, Commercial Fisherman

1. Opposed to the proposed Marine Sanctuary claiming that there was no public hearing on Key Largo before it was created. Also object to Looe Key hearings being held in Miami and at 1:00 p.m. at Key West.

Stanley Wade, Lower Keys Chambers of Commerce

1. Believe the sanctuary will have a beneficial economic impact and endorse Boundary Alternative #1 (1 mile area).

The sanctuary should prohibit:

- coral collecting,
- hook and line fishing,
- fish and lobster traps,
- specimen collecting,
- harming or removing cultural or historic resources,
- anchoring on coral, and
- spearfishing

2. NOAA needs to have a good enforcement plan in that 1 mile area.

Big Pine Key Public Hearing - June 18, 1980

Ray

1. Response: Please see Response #1 for W.R. Ballard, Key West hearing.

Moore

1. Response: In the FEIS the exact boundary coordinates are included in the Designation Document.

Sharpe

1. Response: No response necessary.

2. Response: See Response #2, of your testimony, Miami Public Hearing.

Newell

1. Response: The Looe Key Sanctuary proposal has benefited by public input at workshops, hearings, and through the opportunity for written comments on the DEIS. Comments will also be accepted after release of the FEIS. If designation takes place there will be an emphasis on public involvement throughout the management phase.

Public hearings were held in Miami, Key West and Big Pine Key in order to afford all interested parties in the Keys an opportunity to comment. Interest in Looe Key, a national resource, extends beyond the boundaries of Big Pine Key.

Wade

1. Response: Please see Generic Response #3 for a discussion of the boundary issue.

2. Response: NOAA proposes that the U.S. Coast Guard be the enforcement agent for the proposed sanctuary if special arrangements can be made for an onsite presence. Adequate enforcement levels cannot be achieved as an add on to existing patrols. Site specific arrangements will be required.

Herbert Simons, member of OFF

1. Opposed to the proposed Marine Sanctuary

Robert S. Officer

1. Opposed to the proposed Marine Sanctuary. Looe Key reef has survived without controls.

2. Does not favor the Federal government's involvement because they have lied about rules and regulations with the National Park Service.

3. Commercial fishermen are one of the few food producers which is not Federally subsidized.

Billy D. Causey, Florida Marine Life Association

1. Opposed to the proposed Marine Sanctuary.

2. Looe Key is more protected by the Coral Reef FMP as a Habitat Area of Particular Concern. Looe Key is protected under the Gulf of Mexico Fishery Management Council and South Atlantic Fishery Council. No need to have two government agencies (i.e., NOAA and Fishery Management Councils) protecting the same resource.

Bill Becker, Seacamp and Newfound Harbor Marine Institute

1. The Institute supports the proposed one square mile sanctuary boundary as an area with local support and a reasonable buffer zone, recognizing the need to preserve Looe Key.

The one square mile boundary is sufficient to protect the heavily visited shallow reef. Areas surrounding the one nautical mile are no more or less unique.

If the five mile area is designated, the Designation document should include a statement that the entire reef top cannot be closed to the public at any one time. The five mile designation could cause over-spending and legal objections. Educational purposes can be met as easily in the one square mile as in the five square mile.

2. Exempting the Department of Defense from regulations should only be in times of declared war.

3. An onsite manager should be someone from outside the area.

4. In the one square mile zone regulations should prohibit the following:

- coral collecting,
- fish and lobster traps,
- tropical specimen collecting,
- spearfishing, although provisions should be made for spearfishing equipment found on boats within the Sanctuary, and
- disturbance or removal of cultural or historical resources

Simons

1. Response: No response necessary.

Officer

1. Response: No response necessary.

2. Response: Please see Response #2, for Mr. Ballard, Miami hearing.

3. Response: No response necessary.

Causey

1. Response: No response necessary.

2. Response: Please see Generic Response #2, for a discussion of the HAPC and the sanctuary proposal.

Becker

1. Response: Please see Generic Response #3 for a discussion of the boundary issue. There is no provision in the Looe Key proposed Designation Document or regulations for closure of any or all of the sanctuary.

2. Response: It is standard procedure that Federal regulations not prohibit activities necessary for national defense or because of an emergency. NOAA retains this language in Article 5, Section 2 of the Designation Document. The Department of Defense will in all other instances abide by sanctuary regulations.

3. Response: Sanctuary management will be comprised of trained personnel, thoroughly versed in special area management in the marine environment.

4. Response: Please see Generic Response #4 on tropical specimen collecting. The FEIS proposes to prohibit all collecting except by permit for scientific and educational purposes. Allowing spearfishing equipment on board boats within the sanctuary will weaken the effectiveness of enforcement of the spearfishing regulation. The final proposal allows lobster trapping outside the Fore Reef core area. Please see Chapter Four for the rationale.

5. Salvaging a shipwreck should only be permitted when leaving the wreck there would harm the coral reef more than it would to remove it. This salvaging should be carefully monitored.

6. Since the intent of the marine sanctuary is the protection of all organisms, regulations must include hook and line fishing and net fishing.

7. The Gulf of Mexico Fishery Management Council prevents tourists from taking coral reef pieces.

8. Public hearings should be held prior to the issuance of new or revised rules and regulations.

9. There must be cooperation between the fishery management councils and the Sanctuary Programs Office regarding all management.

10. The public should be able to request information from the U. S. Coast Guard and the Florida State Officials about the management process prior to the final EIS.

5. Response: Your suggestions on the regulating of salvaging of shipwrecks will be considered in the development of criteria for permits.

6. Response: NOAA believes that the protection of the ecological system does not necessarily mean regulations which deny all consumptive use of the resources. Please see Chapter Four for a discussion of these activities. Also please see the responses to the J. Connor Davis letter.

7. Response: The Council does not yet have the authority to regulate the taking of coral. This can only be accomplished after the Coral and Coral Reef Resources Plan is promulgated and regulations are in place. The enforcement level at Looe Key with an onsite presence will be enhanced under sanctuary management.

8. Response: The policy of the Marine Sanctuary Program is to hold public hearings prior to the issuance of new or revised rules and regulations and to consult with interested parties prior to even proposing such changes.

9. Response: NOAA intends to consult with the Fishery Management Councils in all matters within their joint jurisdiction.

10. Response: Detailed management plans will be developed following designation. At the present time, there are no definite arrangements with either the Coast Guard or the State of Florida. NOAA is proposing that the Coast Guard enforce sanctuary regulations and that the State of Florida through a cooperative agreement oversee day-to-day management responsibilities. No final arrangements have been made. The public will be involved during formulation of the Management Plan.

Please see Chapter Two, the Preferred Alternative for further discussion.

11. Duties should be established for the onsite manager regarding enforcement and education.

12. The public should have recourse and be able to speak out if they are dissatisfied with the final rule making.

13. Please document the actions Congress will take for the year-to-year financial support for management, enforcement, research, and education.

14. There must be strong enforcement, and a comprehensive education program.

15. Poor management and wide publicity are worse than no sanctuary at all. Do not use funds to advertise the sanctuary.

16. There should be regulations regarding oil and gas activities within the sanctuary.

11. Response: Duties of the onsite manager will be developed as a part of the Management Plan.

12. Response: NOAA is encouraging public participation in management if the Looe Key sanctuary is designated. The greater the level of public involvement the more likely it is that sanctuary management measures will reflect issues of general concern. NOAA advises that the user groups seek to serve on advisory committees as one avenue of input. Periodically NOAA will reevaluate the effectiveness of management strategies, and such evaluations will emphasize public review and suggestions.

13. Response: Title III of the Marine, Protection, Research and Sanctuaries Act reviews funding on a yearly basis. Funding for fiscal 1980 was 1.75 million dollars for the entire marine sanctuaries program. This money is used for administrative costs, costs related to the designation process and management, enforcement, research and monitoring of existing sites. Looe Key is one of seven sites now under active consideration.

Projected management costs per site average $90,000/year. In some cases enforcement costs must also be funded and the average planning figure is $60,000/year. Research and Monitoring costs per site will vary from 0 - 100,000/year depending upon management needs and the existing data base. The actual budget needs for any given site will be derived after formulation of the Management Plan.

14. Response: Since the release of the DEIS, NOAA has initiated consultation at the headquarters level with the U. S. Coast Guard for arrangements to insure special attention to the Looe Key area should it be desingated as a sanctuary. NOAA believes that adequate Looe Key enforcement and surveillance cannot be achieved as an add-on to existing patrols. An onsite presence will be required and arrangements will be made to that effect. Further, a comprehensive education program will be part of the Sanctuary management.

15. Response: Please see Response #6 for J. Sansome, Miami hearing.

16. Response: Oil and gas exploration at the Looe Key site is highly unlikely. In the event that it does become an issue, NOAA can seek to control the impacts by proposing restrictions on alteration of the seabed.

Richard Paul, National Audubon Society, (speaking for Alexander Scrum, member of Citizens Advisory Committee John Pennekamp Coral Reef State Park)

1. Support the proposed Marine Sanctuary.

2. NOAA should designate unregulated portions of the sanctuary for lobster trapping.

3. Oppose a boundary expansion to ten square miles; 5 mile area is better; one mile option too small.

Don Schumacher, President, Lower Keys Property Owners Association

1. Support the one square mile sanctuary boundary. Nothing should be taken from the one square mile area.

Jim Young, Commercial fisherman

1. Opposed to the proposed Marine Sanctuary.

2. The proposal is unconstitutional and a threat to the constitutional rights of all Americans. The government is taking away areas used for trawl fishing, which are very important to commercial fishing. Commercial fishermen have lost their rights. Fishing and diving should not be taken away at any time.

3. Opposed to Federal government control.

Don Young

1. He questions the constitutionality of taking away fishing rights.

Dr. Marie Landry, Big Pine Key Civic Association

1. Support the proposed one mile sanctuary boundary. Rules and regulations should prohibit:

- coral collecting,
- fish and lobster trapping,
- tropical fish collecting,
- spear fishing, although provisions should be made for spear-fishing equipment found on boats within the Sanctuary.
- removal of submerged cultural and historical resources,
- discharges of any kind, except those of cooling waters and from vessels and marine sanitation devices, and
- anchoring on living coral.

Additional public hearings should be held if new regulations are adopted or proposed.

Paul

1. Response: Please see Generic Response #1.

2. Response: NOAA is allowing lobster trapping outside of the core trapezoidal area of the Fore Reef. Fishermen have indicated that this is the area of significant take as opposed to the spur and groove system itself.

3. Response: Please see Generic Response #3.

Schumacher

1. Response: Please see Generic Response #3.

Young, Jim

1. Response: No response necessary.

2. Response: NOAA does not propose regulating trawling within any portion of the sanctuary at this time. Emphasis will be placed on public involvement in management of the Looe Key sanctuary should designation occur. This emphasis on public participation should ensure full consideration of all issues of concern to local citizens and at the same time provide protective management to a national resource of interest to all Americans.

Young, Don

1. Response: Please see Response #2 for Mr. Jim Young, Big Pine Key hearing.

Landry

1. Response: Please see responses to Mr. Becker, Big Pine Key hearing.

Henry Feddern, Executive Director, Florida Marine Life Association

1. Opposed to the proposed marine sanctuary.

2. The DEIS does not discuss the consequences of not designating a sanctuary.

3. There are reefs in other places in Florida that could be protected instead of Looe Key, namely Biscayne Bay.

4. How can OCZM control the bending of rules by user groups?

5. What would stop OCZM from extending the boundaries if they feel it is too small after it is designated and approved?

6. There is a duplication of work, for these regulations are already being enforced by other Federal regulatory agencies.

7. How much money has been spent on present enforcement? Future enforcement?

8. It would be difficult to have an onsite manager 24 hours a day without having a structure built on the seabed which would destroy part of the sanctuary.

9. The public should be able to view the comprehensive management proposal.

10. Why does this marine sanctuary need to be established with regulations that are dissimilar to national parks?

Captain Ed Davidson, President - Florida Keys Audubon Society, Chairperson-Citizens Coalition, President - Middle Keys Citizen's Association

1. Supports the proposed Marine Sanctuary.

2. If the sanctuary boundary is only one square mile, it will ruin the surrounding area.

3. There is no intention to create a disadvantage to the commercial fishermen.

4. The sanctuary should provide onsite protection.

5. Those who are going to lose out are the recreational divers, spearfishermen, and specimen collectors.

Mike Laudicina, commercial fisherman

1. Opposed to the proposed Marine Sanctuary because it would put commercial fishermen out of business.

2. Coral will regrow after it is broken.

3. The idea of establishing a Looe Key Marine Sanctuary would attract tourists who would take pieces of coral, and anchor on the coral reef.

4. The Federal government will expand the marine sanctuary.

5. There will be fish shortages if the sanctuary is established.

L. B. McClusky

1. Opposed to the proposed Marine Sanctuary. Commercial fishermen are always at a disadvantage.

2. There are unlimited funds for parks, yet the government has to trim the budget and cannot afford to fund other programs. This does not make sense. Biscayne Monument is now being expanded to Dade County. This is proof of continued expansion.

Feddern

1. Response: Please see responses to written comments from Henry Feddern.

Davidson

1. Response: Please see written comments for Ed Davidson.

Laudicina

1. Response: Please see Response #4 for Mr. Gill, Miami hearing.

2. Response: Coral has some ability to regenerate after it has been damaged, but repeated damage to coral reefs from heavy use of the area has an irreversible effect on coral reefs as evidenced by numerous scientific studies and personal observations of reef damage in populated areas.

3. Response: See Response #6 for Mr. Sansome, Miami hearing.

4. Response: See Response #2 for Mr. Ballard, Miami hearing. The exact boundary coordinates have been placed in the Designation Document, making it impossible for NOAA to change the boundary without Presidential approval.

5. Response: Research relating to the environmental impact analysis of Looe Key did not uncover any information which would indicate fish shortages as a result of the present proposed regulations. In fact according to some biologists protection of the Looe Key area should enhance fish populations.

McClusky

1. Response: No response necessary.

2. Response: NOAA cannot speak for the National Park Service nor comment on its budget and programs for Parks such as Biscayne National Park. However, funding for Title III of the Marine, Protection Research and Sanctuaries Act is definitely not unlimited. Please see response #13 to Mr. Beckers testimony, Big Pine Key hearings.

W. R. Ballard, Director - OFF

1. The DEIS doesn't state the number of people at the public workshop in opposition to the sanctuary. Asked for a hand count of those opposed to the current proposal. A show of hands, supporting and opposing the proposed sanctuary showed only 20 percent out of about 100 in support of the sanctuary at the Big Pine Key Hearing.

William H. Westray, resident of Key West

1. Supports the proposed Marine Sanctuary because it will be of benefit nationally for all U. S. citizens. NOAA is not going to take over Looe Key, the citizens requested sanctuary status for Looe Key.

2. The Looe Key coral reef is being destroyed. Sanctuary designation will help to protect and replenish the resources. Experts should select the best boundary option. However, by designating Alternative #1, the use pressures will simply move beyond the one mile boundaries.

Al Armitt, OFF

1. Opposed to the proposed Marine Sanctuary.

2. There is already a public law which protects marine resources, P.L. 94-265. The South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council already protect the area. (Listed the seven standards that the fishery councils work under that protect the fisheries.)

3. In the DEIS, there is little mention of the opposition to the Marine Sanctuary.

4. In the Designation Document, the anchor must be landed in sand, yet fishermen cannot anchor in sand. Please clarify this.

5. The mooring buoy system is ineffective because there may be a shortage of bouys resulting in competition among the users in the sanctuary.

6. OCZM should re-evaluate the proposed 5 mph speed limit.

7. In the Designation Document, there are no boundaries set for the sanctuary.

Ballard

1. Response: NOAA has reviewed the original public workshop testimony and the Introduction/Summary, Section I has been changed to reflect your concerns.

Westray

1. Response: Please see Generic Response #1.

2. Response: Please see Generic Response #3.

Armitt

1. Response: No response necessary.

2. Response: Please see Generic Response #2.

3. Response: Opposition to the Sanctuary has been included in the FEIS, wherever applicable. Please see Chapter One - Introduction and Summary.

4. Response: It is NOAA's understanding that there are sand anchors used in areas other than coral reefs, which anchor effectively and can be safely used by fishermen and other boaters at Looe Key. However, you will note that the final proposal does not require sand anchoring outside of the Fore Reef area. The proposed regulation now prohibits anchoring on coral in the core trapezoidal area on the Fore Reef and encourages sand anchoring elsewhere within the sanctuary.

5. Response: The feasibility and desirability of a mooring buoy system will be evaluated for the Looe Key area, following designation. If study results demonstrate the ineffectiveness of a mooring system in this area then such a system will not be used.

6. Response: The draft regulation 937.6 2(d) regulating speed and wake size has been deleted and is not included in the final proposal.

7. Response: In response to your suggestion the exact boundaries for the proposed Sanctuary have been presented in the Designation Document.

Jerry Sansom, Executive Director - OFF

1. Opposed to the proposed Marine Sanctuary.

2. Promises made by the Federal government in the past have not been kept.

3. Plans from the Fishery Management Councils are sufficient. Sanctuary designation is a duplication of effort. It seems that the majority of the people who live in the affected area support the one mile Sanctuary or none at all.

W. R. Moore, commercial fisherman, landowner on Big Pine Key

1. Opposed to the proposed Marine Sanctuary.

2. Few commercial fishermen use the Fore Reef.

3. There is no guarantee that the sanctuary boundaries will not be extended.

4. Favor Fishery Management Council regulation.

Joe Letson, OFF

1. Opposed to the proposed Marine Sanctuary. He presented a list of 530 residents of the Florida Keys who are opposed to the proposed Marine Sanctuary.

William Lemmon, Sea Center

1. The Center is neutral in the subject of proposed Marine Sanctuary.

2. There should be clarification of speed limits and anchoring. One can't anchor in sand without the anchor drifting onto coral.

3. The information in the Designation Document should be more detailed.

Carl Aufrecht, Manager Sea Center

1. He is also uncertain on the subject of the proposed Marine Sanctuary. He can't say that he is for the sanctuary. There are too many unanswered questions.

Brad Bokhoven, OFF

1. Opposed to the proposed Marine Sanctuary.

2. The fishermen will not be able to make a living.

Sansome

1. Response: No response necessary.

2. Response: Please see Response #2, for Mr. Ballard, Miami hearing. If a sanctuary is designated every effort will be made by NOAA to ensure user group participation in management.

3. Response: Please see Generic Response #2, and #3.

Moore

1. Response: No response necessary.

2. Response: The FEIS now points out that few fishermen use the Fore Reef.

3. Response: Please see Response #2 for Mr. Ballard, Miami public hearing.

4. Response: Please see Generic Response #2.

Letson

1. Response: The FEIS has made note of the petitioners against the Sanctuary.

Lemmon

1. Response: No response necessary.

2. Response: Please see Responses #4 and #6, for Mr. Armitt, Big Pine Key public hearing.

3. Response: The Designation Document serves as a charter for the proposed sanctuary. It provides a broad guiding framework under which management details are structured. The Designation lists those activities subject to regulation and describes the exact boundary for a proposed Looe Key marine sanctuary.

Aufrecht

1. Response: No response necessary.

Bockhoven

1. Response: No response necessary.

2. Response: Please see Response #4 for Mr. Gill, Miami hearing.

Unknown Commenter - lobster fisherman

1. Opposed to the proposed marine sanctuary because he will be out of a job. Fishermen can't catch anything in the mud. They need to be near the coral reefs.

Zeke Burke, resident of Big Pine Key - fisherman

1. Opposed to the proposed Marine Sanctuary.

2. Fish traps are not placed on the coral reef. If they are, they will be torn up by the coral.

William Niles, commercial fisherman

1. Opposed to the proposed marine sanctuary and against the government putting in another park.

2. He and his family will not be able to visit the coral reef because there is a commercial fishing sticker on his boat.

Unknown Commentor - fisherman

1. Opposed to the proposed Marine Sanctuary.

2. Looe Key does not need to be preserved for the coral reef. If Looe Key is preserved, then a trend might start and people would want to preserve all other diving sites. No one would be able to fish there.

Lobster fisherman

1. Response: Please see Response #4 for Mr. Gill, Miami hearing.

Burke

1. Response: No comment necessary.

2. Response: Please see Chapter 4, Section III for an updated discussion of wire fish trapping.

Niles

1. Response: No comment necessary.

2. Response: NOAA in no way proposes to exclude commercial fishermen from any designated sanctuary. Restrictions are proposed for certain types of activities only. Please see Chapter One, Introduction and Summary or Chapter Two, the Preferred Alternative, for a description of the proposal.

Fisherman

1. Response: No comment necessary.

2. Response: Please see Response #6 for Mr. Sansome, Miami public hearing.

Advisory Council On Historic Preservation

1522 K Street, NW
Washington, DC 20005

June 2, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street NW,
Washington, D.C. 20235

Dear Sir:

E-27

1 We have reviewed your draft environmental impact statement for the proposed Looe Key Marine Sanctuary, Florida Keys, and have the following comments for your consideration.

It appears that the long-term effects of sanctuary designation would generally be beneficial to the historic, archeological, and other cultural resources in the Looe Key area, particularly the remains of the HMS Looe. However, we wish to remind NOAA of its responsibilities under Executive Order 11593, "Protection and Enhancement of the Cultural Environment," and the National Historic Preservation Act (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) to more completely identify, evaluate, and protect the resources under its management and control if the Looe Key National Marine Sanctuary is approved and designated. As noted on pages 67 and 109, NOAA should work in close cooperation with the Bureau of Land Management, as well as consult with the Florida State Historic Preservation Officer (SHPO), in identifying and evaluating properties within the proposed sanctuary boundaries which may be eligible for inclusion in the National Register of Historic Places. Any results available from the Looe Key/American Shoals cultural resource survey being conducted by the Newfound Harbor Marine Institute (p. 108) should be included in the final environmental statement. If properties identified as a result of this or other surveys are determined eligible for the National Register, NOAA, in accordance with the Council's regulations (36 CFR Part 800), should make determinations of effect in consultation with the Florida SHPO and request the Council's comments, as appropriate.

We would be happy to assist NOAA in reviewing any future cultural resource management plans for Looe Key in conjunction with our responsibilities for review and comment under Section 106 of the National Historic Preservation Act. Please contact Ronald Anzalone or Don Klima of our staff at FTS 254-3495 if you have any questions or need assistance.

Sincerely,

Jordan E. Tannenbaum

Jordan E. Tannenbaum
Chief, Eastern Division of
Project Review

Response #1

The text has been expanded to set forth NOAA responsibilities under Executive Order 11593 and the National Historic Preservation Act. Please see Chapter Four, the Preferred Alternative under .5, Alternatives Regulating Tampering With, Damage To, and Removal Of Submerged Historical and Cultural Resources.

DEPARTMENT OF THE AIR FORCE
REGIONAL CIVIL ENGINEER, EASTERN REGION (HQ/AFESC)
556 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30303

1980 JUL 15 AM 5:55

8 July 1980

REPLY TO ATTN OF: ROV2

SUBJECT: Review of Draft Environmental Impact Statement (DEIS) for the Proposed Looe Key National Marine Sanctuary

TO: Director of Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N. W.
Washington, DC 20235

1. We have reviewed subject DEIS and are satisfied that the "Draft Designation Document", Appendix A, provides for Air Force operations in the proposed sanctuary area. Thus, we have no objection to the proposed marine sanctuary.

2. Thank you for the opportunity to review this DEIS.

ROBERT L. WONG
Chief
Environmental Planning Division

Cy to: USDC/Mr. Barrett
USAF/LEEV
TAC/DEEV
31 CSG/DEEV

No response necessary

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32201

SAJEN-EE

10 June 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Sir:

The Draft Environmental Impact Statement concerning the proposed Looe Key National Marine Sanctuary has been reviewed in this office. The proposed action would not affect existing federal projects, nor permitting considerations under Corps of Engineers jurisdiction.

No response necessary

Thank you for the opportunity to review and comment on the draft statement.

Sincerely,

J. A. Barbt, Jr.
for JAMES L. GARLAND
Chief, Engineering Division

DANTE B. FASCELL
10th District, Florida

COMMITTEES:
FOREIGN AFFAIRS
CHAIRMAN: INTERNATIONAL OPERATIONS SUBCOMMITTEE
SUBCOMM. INTER-AMERICAN AFFAIRS SUBCOMMITTEE

GOVERNMENT OPERATIONS
MEMBER: LEGISLATION AND NATIONAL SECURITY SUBCOMMITTEE

COMMISSION ON SECURITY AND COOPERATION IN EUROPE
CHAIRMAN

CANADIAN-UNITED STATES INTERPARLIAMENTARY GROUP
CHAIRMAN, U.S. DELEGATION

CHARLES R. O'REGAN
ADMINISTRATIVE ASSISTANT

Congress of the United States
House of Representatives
Washington, D.C. 20515

June 25, 1980

The Honorable Robert W. Knecht
Assistant Administrator for
Coastal Zone Management
National Oceanic and Atmospheric Administration
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Mr. Knecht:

Enclosed, for your information and consideration, is a letter I have received from one of my constituents, Mrs. Jerome S. Baker, of Big Pine Key, Florida. Mrs. Baker is opposed to the designation of Looe Key as a National Marine Sanctuary.

I would appreciate your including Mrs. Baker's remarks in the official hearing record and giving them every possible consideration prior to making a final determination as to Sanctuary status.

Sincerely,

Dante Fascell

DANTE B. FASCELL
Member of Congress

DBF:BB
Enclosure

The letter has been included in the record. Please see the letter of Mrs. Jerome S. Baker, below.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 15 1980

OFFICE OF THE ADMINISTRATOR

Dr. Nancy Foster
Deputy Director
Sanctuary Programs Office
Office of Coastal Zone Management
NOAA
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Dr. Foster:

1 The Environmental Protection Agency (EPA), in accordance with its responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, has reviewed the National Oceanic and Atmospheric Administration (NOAA) Office of Coastal Zone Management's (OCZM) draft Environmental Impact Statement for the Proposed Looe Key National Marine Sanctuary and offers the following comments.

2 EPA supports OCZM's proposal to designate a marine sanctuary in the waters off the middle Florida Keys. We believe the Looe Key Reef area, which is one of the few living reef areas in the Florida reef tract and which is being threatened by current and increasing pressures from human uses, needs the protection that can be gained through sanctuary designation.

3 In general, we believe the alternatives for regulating the sanctuary have been adequately discussed in the DEIS. There are, however, several areas in the DEIS which we believe need further discussion. In particular, the discussions of the impacts of the various regulatory alternatives for the boundary selection and the analysis of alternatives related to marine discharges, lobster trapping, and marine specimen collecting were not dealt with in sufficient detail to justify the alternatives chosen. Our suggested changes related to these issues are given below.

4 We suggest that the FEIS expand the discussion of the impacts for each boundary alternative. The maps and graphics in the FEIS should provide more information detailing the extent of the biological zones encompassed by each boundary option. There should also be an expanded discussion on how and to what degree the preferred boundary will achieve the goals of the sanctuary.

Response #1

No response necessary.

Response #2

Please see Generic Response #1.

Response #3

No response necessary.

Response #4

NOAA believes the discussion of the impacts of Boundary Alternatives #1 and 2 to be adequate for the purposes of this document. However, Generic Response #3 provides additional discussion. FEIS maps and graphics have been revised in a way that clarifies the extent to which each of the biological zones is included in each boundary option. The discussion of boundary alternative #3 and the preferred alternative have been expanded to satisfy your comments. (Chapter Four, Environmental Consequences and Chapter Two, Preferred Alternative).

The discussion on discharges within the sanctuary boundaries should be expanded in the FEIS. Given the continuing and increasing use of the area for commercial and recreational activities, allowing the discharge of fish parts, chumming materials, and effluents from marine sanitation devices (MSD) may not adequately protect water quality or maintain and enhance the resources of the Looe Key system. The FEIS should provide estimates of current and projected quantities of fish parts, chumming materials and MSD effluent to be discharged in the sanctuary, and prevailing and worst case oceanographic conditions, so that the magnitude of these impacts can be more fully evaluated. 5

It was noted in the DEIS that lobsters are extremely important faunal components in reefal ecosystems. Yet, the preferred alternative would allow lobster trapping in all but the Fore Reef. In addition to removing lobsters from the ecosystem, lobster traps also take fish incidentally and their presence provides the potential for physical damage to the reef. Since the DEIS also notes that fishery and marine sanctuary management plans may have different goals, we believe the discussion of alternative regulations concerning lobster trapping needs to be expanded. As written, it does not provide an adequate rationale for the selection of the preferred alternative as being consistent with the purposes of the sanctuary. 6

Finally, although the preferred alternative would restrict tropical specimen collecting to collectors with NOAA permits and to non-chemical techniques, the more experienced collectors would continue to take important marine species from the sanctuary. Such "takings" could be significant, thereby limiting the research opportunities for understanding the complex functioning of this marine ecosystem. Since there are regulations prohibiting specimen collecting in the Key Largo Marine Sanctuary and Biscayne National Monument, we recommend that additional information be developed in the FEIS to explain the selection of the preferred alternative. 7

In view of the comments and concerns discussed above we have assigned the DEIS a Category EO-2, lack of objections, insufficient information. We look forward to continued cooperation with you as you proceed with the designation for the Proposed Looe Key Marine Sanctuary. Thank you for the opportunity to comment on this draft statement. 8

Sincerely yours,

William N. Sedeman, Jr.
Director
Office of Environmental Review (A-104)

Response #5

Visitor use studies which address user-related impacts will be instituted following designation. At regular intervals management measures will be reviewed with regard to their effectiveness in accomplishing sanctuary goals and objectives. Among other research and monitoring studies, visitor use data will provide a basis for such a review. Public input will also be solicited.

Response #6

Please refer to Dr.E.Gissendanner, Florida Department of Natural Resource let Response #2.

Response #7

The final proposal prohibits tropical specimen collecting except by permit for scientific and educational purposes and the text has been revised to reflect this change.

Response # 8

No response necessary.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

IN REPLY REFER TO:

June 25, 1980

Mr. Michael Glazer
Assistant Administrator for
Coastal Zone Management
National Oceanic and Atmospheric
Administration
3300 Whitehaven Street, N. W.
Washington, D. C. 20235

Dear Mr. Glazer:

The proposed Looe Key National Marine Sanctuary/Draft Environmental Impact Statement (Florida) has been reviewed by the staff of the Federal Energy Regulatory Commission.

No response necessary

A study of available maps shows that there are no natural gas pipelines within the 5 square miles of the proposed marine sanctuary. Examination of information available as of August 1979 reveals no recent oil or gas production within the proposed sanctuary. Additionally, there is no indication of any current exploratory or developmental drilling within the area.

Thank you for the opportunity to review and comment on the proposed Looe Key National Marine Sanctuary/Draft Environmental Impact Statement.

Sincerely,

Carl N. Shuster

Carl N. Shuster, Jr. - Ph.D.
Coordinator, Coastal Zone
Affairs

cc: Mr. Bruce Barrett

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

OFFICE OF THE ASSISTANT SECRETARY
FOR COMMUNITY PLANNING AND DEVELOPMENT

IN REPLY REFER TO:

JUN 26 1980

Mr. Dallas Miner
Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Mr. Miner:

As required under the Coastal Zone Management Act, we have reviewed the proposals for both Gray's Reef and Loe Key Marine Sanctuaries. Our Central, Regional and Area Office review indicates no areas of HUD concern.

In view of the lack of effect upon HUD programs, we have no objection to the proposed sanctuary plans.

Sincerely,

Trudy McFall
Office of Planning
and Program Coordination

No response necessary

United States Department of the Interior
FISH AND WILDLIFE SERVICE
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

June 6, 1980

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office
Office of Coastal Zone Management, NOAA
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Dr. Foster:

1 Thank you for the Draft Environmental Impact Statement of the proposed Looe Key National Marine Sanctuary.

As you know, I have represented the U.S. Fish and Wildlife Service on the South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council the past year and have been exposed to much debate in the two Councils on the subject of Marine Sanctuaries, and, more recently, Looe Key specifically. In addition, I am a member of the joint Coral Management Committee of the two Councils which is developing the Fishery Management Plan for Coral. In the Coral Management Plan, Looe Key is addressed (a Habitat of Particular Concern - HAPC).

My comments will be from the point of view of my assignment with the Fishery Management Councils and my position as the Assistant Regional Director--Fisheries for the Fish and Wildlife Service for the Atlanta Region. Formal comment of the Fish and Wildlife Service is being prepared and will be sent to you through normal channels of Service procedure.

2 I concur with the proposal for this action and the goals and objectives. However, I believe Alternative #3 of your Boundary Alternatives would give a more desired management regime both for protection and management of the Sanctuary. Regarding regulatory alternatives, I concur with all preferred alternatives except (1) lobster trapping (I recommend alternative 3), and (2) tropical marine specimen collecting (I recommend alternative 3). It is difficult for me to believe that an estimated
3 232,000 lbs. of lobster were caught in Boundary Option #2 area in 1978 (page 101); since in 1975, a total of 2,319,000 was landed in all of Florida in the South Atlantic (Fishery Statistics of the U.S., 1975 - Department of Commerce publication).

2

4 In general, I concur with your analyses. You and those responsible are to be complimented for your Draft Environmental Impact Statement.

Sincerely yours,

Frank R. Richardson

Frank R. Richardson
Assistant Regional Director
Fisheries

Response #1

No response necessary.

Response #2

Please see Generic Response #3

Response #3

(a) Alternative #2 on lobster trapping was selected by NOAA to protect the Fore Reef from physical damage, offer protection to the spiny lobster species within the major reef system, as well as to avoid undue economic impact to the local fishermen. Although the catch value reported in the Onsite Survey certainly appears to be high in light of your data and Monroe County statistics, the results were within the range of probability and appropriate for general economic analysis. For this reason they were used in the DEIS analysis as reported by the fishermen.

(b) Tropical Specimen Collection, Alternative #3, is now the preferred alternative based on new information and subsequent public comment. Please see Generic Response #4.

Response #4

No response necessary.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 80/465

July 18, 1980

Dr. Nancy Foster
Deputy Director, Sanctuary Programs Office
Office of Coastal Zone Management - NOAA
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Dr. Foster:

1 We have received and reviewed the Draft Environmental Impact Statement for the Proposed Looe Key National Marine Sanctuary, and wish to offer several comments. We support designation of the area as a National Marine Sanctuary, although we have some concerns with discussion provided in the Draft Environmental Impact Statement.

General Comments

While supporting the Sanctuary, we are concerned about the manner in which the particular location and size of the proposed sanctuary was chosen, and what, if any, precedent the designation would set. We do not believe that adequate explanation was given in this DEIS for selecting the proposed boundaries. Looe Key is one segment of the Florida Keys/Reef system; we recommend that the boundaries should be chosen in the context of that total resource. For example, the lower Keys, as a whole ecosystem, should be reviewed for consideration of management needs, and the proposal should consider the relationship of Looe Key within the lower Keys system. Otherwise, it may be difficult to justify appropriate management, education, and enforcement funds for a sanctuary of this small size.

2 Further, by directing sanctuary management activities into such a confined space, its benefits may be diminished because of overuse or competiton among users. We therefore would support boundary option 3 (10.5 square nautical miles).

The DEIS seems to focus more on the causes for designation than on the effects of designation. It would be useful to identify the specific effects which would result if the goals and objectives of the proposed sanctuary were all met. We believe this would lead to a clearer identification of the benefit which would result from the sanctuary. In addition, however, it is not clear from the DEIS whether all of the objectives can be met equally, or whether actions necessary for some will conflict with others. For example, to what extent can recreational use be promoted before it exceeds the carrying capacity of the resource and conflicts with objectives for resource protection and scientific research? What will be the impact of the sanctuary visitor center, physically (i.e., in terms of resources displaced during construction) and indirectly (e.g., in terms of increased visitor usage)? Does NOAA have any data on the environmental impacts --adverse or positive-- resulting from the designation of the Key Largo Coral Reef Marine Sanctuary?

Response # 1

Thank you for your letter. No response necessary.

Response # 2

Please see Generic Response # 3.

Although the sanctuary is being proposed for a variety of objectives, it is not clear why this area was selected. The Looe Key Reef is evidently a unique resource offering significant opportunity for preservation of coral and reef ecosystems associated with major research opportunity. Only the briefest attention to these points is provided by the EIS. Was Looe Key chosen for rare, exceptional, or unique quantities, or because of its
2 representativeness? Because of habitat, productivity, public interest, recreational, or scientific and educational value? We suggest the sanctuary could be made more understandable and significant to the public by explaining these issues more fully and pointedly.

The document does not describe the scoping of the statement, the issues and alternatives raised during that process, and the conclusions arrived at by OCZM about the significant alternatives and issues deemed worthy of evaluation.
3 To understand the design of the EIS (i.e., the issues and alternatives selected), some relationship to the pre-EIS scoping dialogue should be provided. The alternatives identified as justifying presentation in the EIS should each be evaluated for those impacts identified during scoping as the important impact issues. The analysis in Chapter Four does not do this and is not related to the scoping which was performed.

There seems to be no usefulness to the section on the Legal Status Quo (chapter 2, section V) except to provide a lodging place for anticipated legal arguments about
4 the EIS. In keeping with the direct intent of the CEQ regulations to cut down on unnecessary material in EIS's, we suggest this section might be usefully trimmed or eliminated. If it is intended to merely portray the existing managerial pattern in the Reef area, it could be reduced to those essentials and included in Chapter Three as a part of the description of the affected environment.

The discussions in chapter 4 omit consideration of three topics specifically
5 identified by Section 102(2)(C) of NEPA as essential to an environmental statement: (ii) any adverse effects which cannot be avoided, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irretrievable and irreversible commitments of resources.

The analysis of impact, particularly for the preferred alternative, does not get down to evaluating what will happen to any environmental component such as water quality, coral, fish, etc. For example, the preferred
6 alternative relative to prohibiting discharges (p.110) covers its analysis in one brief paragraph that is entirely conclusary and does not discuss effects at all. It merely tells what different regulatory activities will take place. This is a discussion that provides little useful understanding of the environmental consequences of the action.

Specific Comments

7 1. Figures (maps) on pages 8, 23, 50, and 87 do not include scales that permit the reader to determine distances. These should be added. Keys should be provided for the contours; are these feet, meters, or fathoms? One map should be provided which shows Looe Key to scale.

Response # 3

A discussion of the scoping process has been included in the Introduction and Summary section of the FEIS.

Response # 4

The only description of the Legal Status Quo in Chapter Two of the DEIS is a summary of the no action alternative. Analysis of this alternative is required by CEQ regulations. The Legal Status Quo per se is described in Chapter Three of the DEIS as a part of the affected environment.

Response # 5

NOAA believes that Chapter Four adequately incorporates the consideration of Section 102(2)(c) concerns into the discussion of the analysis of impacts. The discussion of economic impacts compares the short term gain resulting from commercial exploitation of the fishery resources versus long term gains from resource conservation. The unavoidable economic and environmental impacts of certain regulatory alternatives such as lobster trapping, specimen collecting and achoring, and the discussion of irretrievable and irreversible commitment of resources is included and integrated into the body of Chapter Four. It is our understanding that this approach is consistent with the CEQ regulations.

Response # 6

The analysis of impact evaluates the consequences of activities on the resources of the Looe Key Area. For example, the discussion regarding anchoring, evaluates the degree of damage to corals from various alternatives. The discussion on tropical specimen collecting and other fishing activities are evaluated in qualitive terms of stock depletion, damage to reef habitat and even the aesthetic component of the dive experience.

Response # 7

Figures (maps) have been revised in the FEIS to reflect your comment.

8 2. Consideration should be given to regulating the length on line allowed for lobster trapping, if lobstering is permitted within the sanctuary (page 7).

9 3. Some benefits that will be derived from prohibiting spearfishing include better conditions for observing and studying fish and better conditions for photographing fish (page 13).

10 4. Among the concerns that should be listed for the "no action" alternative should be the problem of shipwrecks. If the area is not designated as a marine sanctuary, the area will not be marked properly and the incidents of shipwrecks will continue. Florida's Department of Natural Resources has documented the shipwrecks but has not published any listings (pages 13 and 14).

11 5. Limited permitting of tropical marine specimen collecting will probably "reduce" rather than "prevent" economic impact on this user group (page 13).

12 6. Oil and gas exploration and related activities should be included among the activities listed for which regulations are not currently proposed under the condition "alteration or construction of the sea bed" (page 16).

13 7. The statement: "In addition, the naturally rare pillar coral (Dendrogyra cylindrus) is more likely to be found in the Patch Reef area than at the Fore Reef" needs a reference (page 25).

14 8. What is the ecological environment that is listed in the last paragraph on page 40?

9. Section IV entitled "State and other Federal resource management provisions in adjacent and nearby areas" fails to discuss enforcement of migratory bird laws (page 67-69).

16 10. Table 7 should list coastal and marine birds (page 71).

17 11. Should the list of endangered species (pages 80 and D-4) include the loggerhead sea turtle (Caretta caretta)?

18 12. We found the division of references into three parts confusing, and suggest they be merged into one. In addition, it would be helpful to list the affiliation or address for individuals, and to distinguish between references cited and those used as general background.

19 13. Note typographic errors re Krutilla and Fisher, 1975, not 1979 (p. 126).

20 14. "Evenly spaced intervals" are not "random samples." (p. B-1).

21 15. There appears to be an arithmetic error on p. c-11: 11 to 23 boats per day x 300 clear days does not equal 3564-7008.

22 16. We are concerned about the validity of the assumption that the forestry/fishing multiplier represents the fishery in the area. Cartwright (B E A, pers. comm.) suggests that a more appropriate multiplier would be one for processing.

Response # 8

NOAA prefers that the authority for regulation of fishing gear rest with the Fishery Management Councils and the NMFS. NMFS has the experience and expertise regarding gear design.

Response # 9

The text has been revised to incorporate your comments.

Response # 10

The concern over shipwrecks has been incorporated into the status quo alternative. The impacts of sanctuary designation are reflected in Chapter Four.

Response # 11

The tropical specimen collecting regulation has been revised in the FEIS to propose prohibiting except by permit for scientific and educational purposes. Please see Generic Response #4.

Response # 12

NOAA believes that the unlikelihood of oil and gas exploration and exploitation in the Looe Key area and the small size of the proposed sanctuary make the listing of oil and gas as activities subject to regulation unnecessary. In the event this threat should materialize, NOAA could promulgate protective regulations because the activity would undoubtedly result in alteration of the seabed. (See Appendix A, Article 4(1)(i).

Response # 13

A reference has been added to the text as you suggested.

Response # 14

The text has been clarified at your suggestion. The ecological environment is the Looe Key ecological system.

Response # 15

The Looe Key reef area is entirely submerged and not a known habitat area for migratory birds, therefore NOAA has not included a discussion on enforcement of migratory bird laws.

Response # 16

According to Dr. Archie Carr, formerly of the Florida Audubon Society, the Looe Key area is not a coastal and marine bird foraging or habitat area.

23 17. What is the time period for the revenue data presented in Appendix C? Are these annual or monthly figures?

24 18. References to Biscayne Bay National Monument should all be changed to Biscayne Bay National Park.

25 19. There is an apparent arithmetic error in the report of enforcement violations: 90 violations x $60.92 (average penalty) does not equal $2,315,000.

Thank you for the opportunity to review and support the proposed Looe Key Sanctuary.

Sincerely,

JAMES D. WEBB
Deputy Assistant Secretary
for Fish and Wildlife and Parks

Response # 17

Section 7 Consultations in accordance with the Endangered Species Act, indicate that this is not habitat for the loggerhead sea turtle (Caretta caretta).

Response # 18

The division of references as a method of presenting the bibliography was selected because it was believed to be helpful. The affiliation of individuals has been indicated in the FEIS in response to your suggestion.

Response # 19

The typographical errors have been corrected.

Response # 20

The text has been changed at your suggestion.

Response # 21

Appendix C has been corrected.

Response # 22

The regional multiplier was selected for NOAA by fisheries economists, Drs. James Cato and Fred Prochaska of the University of Florida. See complete explanation in Appendix C-5.

Response # 23

The text has been changed to incorporate your comments (Appendic C Page C-1).

Response # 24

References to Biscayne National Mounment have been changed accordingly.

Response # 25

$60.92 is the average penalty but not necessarily the exact penalty for each of the 90 violations mentioned. The entire refernce to the $2,315.00 has been removed from the Appendix as misleading or incorrect.

MARINE MAMMAL COMMISSION
1625 EYE STREET, N. W.
WASHINGTON, DC 20006

20 May 1980

Dr. Nancy Foster
Marine Sanctuaries Program
Office of Coastal Zone Management
2300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Nancy:

Thank you for sending the Commission a copy of the Looe Key National Marine Sanctuary DEIS. Since the proposed action does not appear to involve any marine mammal issues, we will not be commenting upon the document.

Thank you for your consideration in this matter.

Sincerely,

David W. Laist
Special Assistant to
the Executive Director

No response necessary

DEPARTMENT OF TRANSPORTATION
REGIONAL REPRESENTATIVE OF THE SECRETARY
1720 PEACHTREE ROAD, NORTHWEST
SUITE 515
ATLANTA, GEORGIA 30309

July 15, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., NW
Washington, D.C. 20235

Dear Sir:

In response to your letter of May 8, 1980, subject: Looe Key National Marine Sanctuary Draft Environmental Impact Statement, enclosed is a copy of our Coast Guard response.

No response necessary

Sincerely,

J.R. McDaniel

J.R. McDaniel
Assistant Regional Representative

Enclosure

Copy to: Bruce Barrett, Acting Director
Office of Environmental Affairs
U.S. Dept. of Commerce
Washington, D.C. 20230

OST, P-20

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDER (dpl)
Seventh Coast Guard District
51 S.W. 1st Avenue
Miami, Fla. 33130
Phone: (305) 350-5502

16475
JUL 08 1980

Regional Representative of the Secretary
U. S. Department of the Transportation
Region IV
1720 Peachtree Road NW
Atlanta, GA 30309

Dear Sir:

In response to your memorandum of 3 June 1980, the Draft Environmental Impact Statement, Proposed Looe Key National Marine Sanctuary was reviewed. The following comments are provided:

1 a. Page 5, Section III, Proposed Management, paragraph 6. The statement, "Enforcement and surveillance will be an integral part of the management and protection of the Looe Key Sanctuary," is the key to effective management of the resource. The statement fails to identify and discuss the specific responsibilities and authority in "cooperative management" of the proposed sanctuary. The Coast Guard is responsible for law enforcement, safety of life and property at sea, aids to navigation, search and rescue, etc. These responsibilities directly apply to the proposed marine sanctuary since it is located in federal waters. It is suggested that the National Oceanic and Atmospheric Administration (NOAA) develop a Memorandum of Understanding (MOU) with the Coast Guard setting fourth the specific responsibilities and reimbursement for costs of each party for management of the marine sanctuaries program. Coodination in developing the (MOU) should be conducted at the headquarters level.

2 b. Page 11, Section VI, Boundry. The statement, "The 5 sq nmi sanctuary will also allow for adequate enforcement of sanctuary regulations," fails to identify and discuss how the boundry will be identified. Will the Coast Guard, as part of its aids to navigation responsibility, be required to place and maintain buoys to mark both the 5 sq nmi sanctuary and 1 sq nmi core area boundaries? This responsibility should be identified and discussed in the (MOU) suggested in paragraph (a), above.

3 c. Page 12, Section IV, Anchoring. The statement, "The proposed regulation would allow anchoring only in the sand channels between the spur system of the Fore Reef, and seaward of the Fore Reef on the sand bottom," fails to discuss how the navigational position of vessels will be determined to insure anchoring occurs in designated areas. Will the Coast Guard be required to place and maintain buoys used to identify designated anchoring areas? This responsibility should be identified and discussed in the (MOU) suggested in paragraph (a), above.

J.R. McDaniel
Assistant Regional Representative
Department of Transportation

Response #1

NOAA has initiated consultation at the headquarters level with the U.S. Coast Guard for arrangements to insure special attention to the Looe Key area should it be designated as a sanctuary. NOAA agrees that adequate Looe Key enforcement and surveillance cannot be achieved as an add-on to existing patrols. An onsite presence will be required and arrangements will be made to that effect.

Response #2

After consultations with the Coast Guard at the headquarters levels, NOAA has determined that the use of marker buoys is not feasible at the present time. During development of the Management Plan, the feasibility and desirability of marking boundaries, with buoys or by other means, will be explored with the Coast Guard.

Response # 3

The anchoring regulation has been changed in the final proposal to prohibit anchoring on the coral on the Fore Reef and to encourage sand anchoring elsewhe in the sanctuary. If the sanctuary is designated NOAA will initiate a study of alternative solutions to anchoring questions.

4 d. Page 13, Section IV, Discharges. The statement, "... although they will be required to retain their trash for proper disposal elsewhere," should be changed to provide for disposal of trash in an approved sanitary landfill onshore, not in the marine environment.

5 e. Page 22, Section II, paragraph B, Onsite Manager. The statement, "A State-Federal cooperative enforcement system is planned utilizing an onsite manager," fails to identify and discuss the lack of authority for state enforcement in federal waters. The Coast Guard is responsible for law enforcement in the area proposed for the marine sanctuary since it is in federal waters. The paragraph further discusses, "enforcement analysis," which is a Coast Guard responsibility. This responsibility should be identified and discussed in the (MOU) suggested in paragraph (a), above.

The concept of an onsite manager is necessary; however, since this proposed sanctuary is entirely within federal waters the manager should be a federal officer. It is suggested that NOAA establish a "Marine Sanctuary Ranger" program similar to that used by the National Park Service for effective management of the resources.

6 f. Page 24, Section II, paragraph B, Anchoring Study. The proposed study of a mooring buoy system should be expanded to discuss the effects of the placement and maintenance of buoys for boundary and designated anchoring area identification on marine sanctuary resources. Buoys and associated anchoring systems moving with the tides and currents may damage or destroy marine sanctuary resources.

7 g. Page 32, Section II, paragraph D.7, Discharges. The paragraph, "The Coast Guard regulations prohibit the discharge of untreated wastes within the territorial sea..." should be expanded. Discharges from marine sanitation devices are regulated in state waters. The term, "territorial sea" should be changed to state waters.

8 h. Page 39, Section IV, paragraph 1. The statement, "Looe Key is located on the high seas adjacent to the United States and therefore is subject only to Federal jurisdiction," should be expanded. The term, "high seas" in the strict sense is international waters. Federal jurisdiction is limited. The exact location of the proposed marine sanctuary in relation to federal, state and international waters should be provided.

9 i. Page 40, Section IV, paragraph 3. The paragraph, "Regulation to prevent pollution of marine systems from the shipboard wastes other then sewage and oil wastes does not presently exist..." should be expanded. The term, "marine systems" should be changed to marine waters. Regulations of marine pollution includes: oil and hazardous chemicals, marine sanitation devices, ocean dumping, and dredging. The term, "territorial waters" should be changed to state waters.

10 j. Page 69, Section IV, paragraph 1. The paragraph, "With regard to enforcement of these other protected areas varying arrangements exist..." is unclear. The responsibilities identified in the joint management agreement should be defined for each agency. Enforcement authority for State Park Rangers is limted to John Pennekamp Coral Reef State Park and does not include Key Largo Coral Reef Marine Sanctuary. The statement, "This is also true of Biscayne National Monument," is unclear. The joint

Response #4

NOAA appreciates your concern, but does not have the authority to regulate disposal of trash outside of the sanctuary.

Response #5

Please see Response #1 above.

Response #6

Please see Response #3 above. Assessment of the feasibility of mooring buoys will address the concerns expressed in this comment.

Response #7

An expanded discussion of discharges is found in Chapter Four of the FEIS. The text has been changed as you suggested. The term "territorial sea" has not been changed to State waters. Most statutes relevant to activities and marine resources delimits jurisdiction in terms of the territorial sea e.g., Clean Water Act and Ocean Dumping Act.

Response #8

The text has been revised to incorporate your comment. The FEIS indicates that Looe Key is not subject to State jurisdiction.

Response #9

Please see Chapter Three IV. Legal Status Quo of the FEIS for an expanded discussion of these points. The term "territorial waters" has not been changed. See Response #8.

Response #10

We have clarified the document to reflect the fact that State Park Rangers do not have enforcement authority in the Key Largo Coral Reef Marine Sanctuary. The text has been altered to alleviate the confusion.

management agreement does not apply. The statment, "Persons found to be in violation of NOAA regulations...," applies only to the marine sanctuary, not the state park.

11 k. Page 71, Table 7. The table is intended to summarize the authority of federal agencies on the "high seas" but fails to identify the responsibility of the Coast Guard. The term "high seas" should be changed to internacional waters.

12 l. Page 72, Section IV, paragraph A.9. The paragraph, "Surveillance and enforcement duties...," is unclear. The Florida Marine Patrol does not patrol the Fishery Conservation Zone. This is a Coast Guard responsibility.

13 m. Page 72, Section IV, paragraph A.10. The paragraph, "Eighty percent of Coast Guard missions...," is unclear. In FY-78, Seventh Coast Guard District, Group Key West responded to 1,509 search and rescue calls. Coast Guard Search and Rescue Stations are located at Islamorada, Marathon, and Key West in this Group's area of responsibility (Encl. 1). The statement, "Distances between stations and the large territory to be covered makes their patrols intermittent and infrequent," is unclear. Does this apply to drug interdiction or marine sanctuary enforcement?

14 n. Page 72, Section IV, paragraph A.11. The statement, "The extent to which the Coast Guard, patrolling the Florida Keys, might be able to assist in the enforcement of thr marine sanctuary at Looe Key...," is unclear. The Coast Guard is responsible for federal law enforcement in U. S. waters directly applicable to the proposed marine sanctuary. It is suggested that (NOAA) develop a (MOU) with the Coast Guard as identified in paragraph (a), above, to identify enforcement responsibilities.

15 o. Page 73, Section IV, paragraph A.13. The statement, "The Florida Marine Patrol and the U. S. Coast Guard patrol the waters..." is incorrect. The Florida Marine Patrol does not patrol federal waters. It's enforcement authority is limited.

16 p. Page 80, Section IV, paragraph C.1. U. S. Coast Guard. The statement, "The Coast Guard, as established in 1915, is a military service and a branch of the Armed Forces of the U. S." should be expanded. On January 28, 1915 President Wilson signed the Act establishing the modern Coast Guard; however, President Washington signed the Revenue Act of 1789 on August 4, 1790 establishing a "system of Revenue Cutters." On March 21, 1791, the President signed the commissions of the first thirteen officers in this military service.

17 q. Page 81, Section IV, paragraph C.1. U. S. Coast Guard. The statement, "There are three Coast Guard Stations on the Keys; Key West, Marathon and Islamorada, with less than 75 employees." The term "employees" is incorrect. Members of the Armed Forces are not employees in the strict sense of the term, but military members.

18 r. Page 82, Section IV, paragraph C.1. U. S. Coast Guard. The paragraph, "Without formal agreement and funding, the Coast Guard makes no scheduled patrols except for those undertaken as a part of their regular activities," is unclear. Law enforcement is a "regular activity" of the Coast Guard

Response #11

NOAA recognizes the enforcement authority of the Coast Guard. After considering your comment, NOAA believes that the Table in question is confusing and does not serve to enhance the understanding of the text in Chapter Three. Accordingly, the Table does not appear in the FEIS.

Response #12

Please see Chapter Three, Section C.2, for a discussion of existing and pending agreements between the State of Florida and the Department of Commerce/NMFS which provide for some degree of State enforcement of Federal regulations in the Fishery Conservation Zone.

Response #13

The text has been clarified to satisfy your comment.

Response #14

Please see Response #1 of this letter.

Response #15

Please see Response #12 above.

Response #16

Thank you for the additional historical information. However, the description in the DEIS appears adequate for the analysis required in the final document.

Response #17

The text has been changed to incorporate your comment.

Response #18

The text has been changed to incorporate your comment. Also please see Response #1 of this letter.

and patrols are scheduled for those missions. The MOU suggested in paragraph (a), above would provide effective enforcement for the proposed marine sanctuary program.

19 s. Page 82, Section IV, paragraph C.2. National Marine Fisheries Service. The statement, "The Florida Marine Patrol and the U. S. Coast Guard patrol the waters..." is incorrect. The Florida Marine Patrol does not patrol the Fishery Conservation Zone.

20 t. Page D-8, Appendix D, paragraph B.5. The statement, "Through a joint management agreement with the State of Florida and managed by the State, the U. S. Key Largo Coral Reef Marine Sanctuary is patrolled by State and Park Rangers and the U. S. Coast Guard," should be expanded. Enforcement action within the sanctuary is limited to the U. S. Coast Guard. The State of Florida has no jurisdiction in federal waters.

21 u. Page D-9, Appendix D, paragraph B.5. U. S. Coast Guard Enforcement Agreement. The statement, "Patrol of the sanctuary is accomplished jointly by the Florida Marine Patrol and U. S. Coast Guard personnel," should be expanded. Enforcement action with the sanctuary is limited to the U. S. Coast Guard. The State of Florida has no jurisdiction in federal waters.

Thank you for the opportunity to comment on this proposed sanctuary. Please provide this office with a copy of the FEIS. Any coordination required in developing this proposed sanctuary should be directed to this office for consolidated district response.

M. G. BARBOUR
By direction

Encl: (1) 7CGD Operational Unit Map

Copy: Group Key West
COMDT (G-WS-1)

Response #19

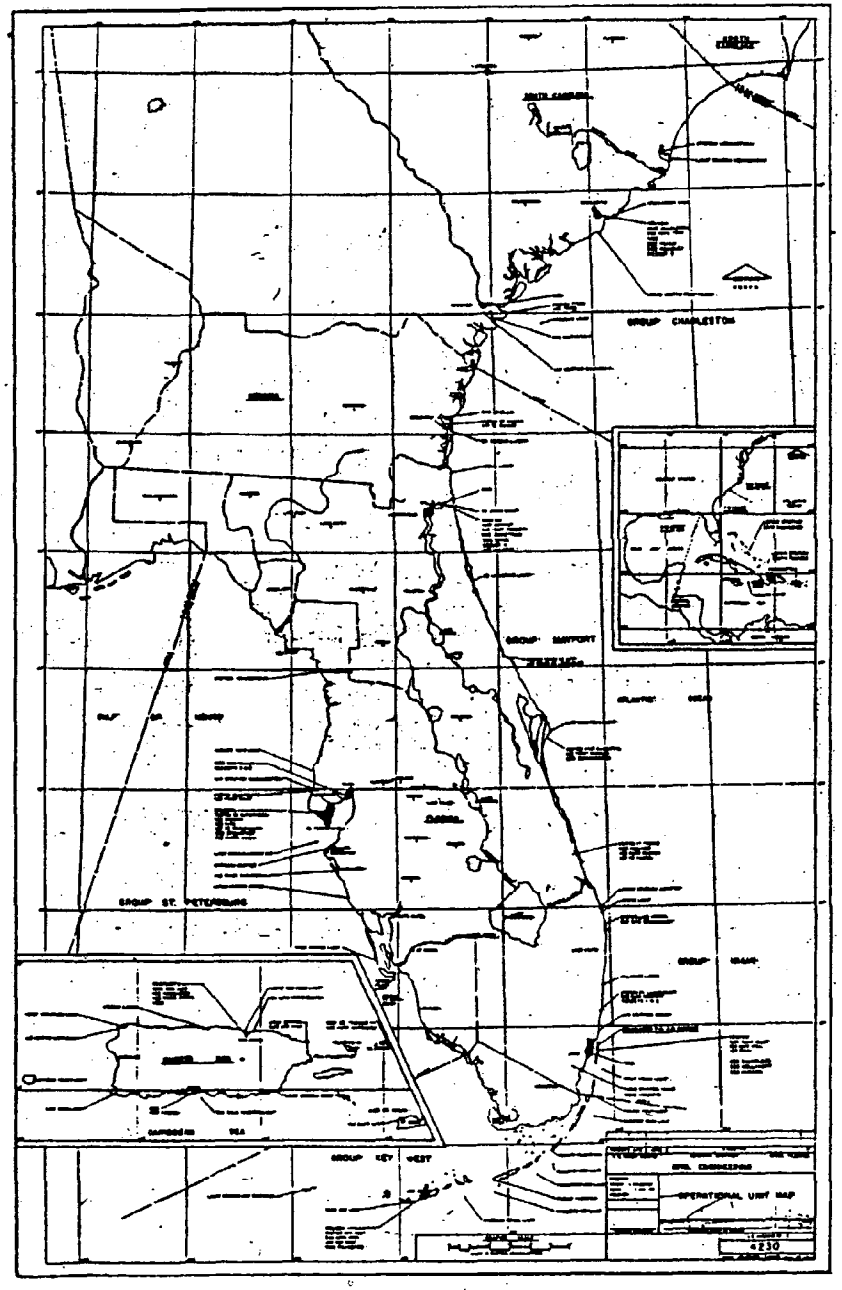
Please see Response #12 of this letter.

Response #20

The Key Largo Coral Reef Marine Sanctuary is patrolled by both State and Park Rangers. Key Largo Marine Sanctuary regulations are enforced by the Coast Guard, and John Pennekamp State Park regulations by the Florida Marine Patrol. This is discussed in Appendix D of the EIS.

Response #21

Please see Responses #12 and #20 of this letter.



No response necessary

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

JUL 28 1980
RECEIVED

July 25, 1980

Mr. Walt Kolb
Intergovernmental Coordination
State Planning and Development
Clearinghouse
A-95
Office of the Governor
The Capitol
Tallahassee, Florida 32301

Dear Walt:

Re: Draft Environmental Impact Statement,
Proposed Looe Key National Marine
Sanctuary, SAI No. 80-2106

1 The Department of Environmental Regulation, Division of Environmental Permitting has reviewed the referenced document and offers the following comments. The proposed designation is strongly supported since it is expected to afford substantial protection to a unique and valuable national marine resource.

2 Our only concern relates to the omission of proposed sanctuary regulations for seabed alteration, bottom trawling and specimen dredging. Although these activities might not threaten the resources of Looe Key, the omission of even conceptual controlling guidelines would seem to be inconsistent with the rather firm stance assumed for the other activities. Realistically, it is difficult to contemplate permissibility of these activities, considering their high probability for environmental damage. Therefore, it would seem appropriate to obviate the fostering of any potential interest in conducting such operations in the sanctuary. The suggestion that commercial bottom trawling may be considered economically feasible at some time in the future seems to have overlooked the stated purposes of the National Marine Sanctuary Program. Economic development is not a goal encompassed by these purposes.

Response #1

Please see Generic Response #1

Response #2

While dredging or alternation of the seabed could lead to damage and destruction of the coral reefs and other habitat within the sanctuary, the likelihood of such activities does not pose a realistic threat to the resources at this time. Variou: impacts on the environment are also associated with bottom-trawling and specimen dredging. These include suspension of sediments dislodging and breaking coral and generally degrading the physical benthic environment. As with alteration or construction on the seabed, the likelihood of bottom trawling and specimen collecting does not pose a realistic threat at this time.

By listing these activities in the Designation Document, NOAA does however, retain the right to promulgate regulations concerning alteration of the seabed and bottom-trawling and specimen collecting, should the need arise.

original typed on 100% recycled paper

2 We appreciate the opportunity to comment on this draft document. We would like to review the final environmental impact statement when it is prepared.

Cordially,

for John B. Rutherford

Lynn F. Griffin
Environmental Specialist
Intergovernmental Programs
Review Section

LFG/sb

cc: Glen Boe, DER, Marathon

State of Florida

DEPARTMENT OF NATURAL RESOURCES

DR. ELTON J. GISSENDANNER
Executive Director

3900 COMMONWEALTH BOULEVARD / TALLAHASSEE 32303

BOB GRAHAM
Governor
GEORGE FIRESTONE
Secretary of State
JIM SMITH
Attorney General
GERALD A. LEWIS
Comptroller
BILL GUNTER
Treasurer
DOYLE CONNER
Commissioner of Agriculture
RALPH D. TURLINGTON
Commissioner of Education

GOVERNOR'S OFFICE
Planning and Budgeting
Intergovernmental Coordination
JUL 10 1980
RECEIVED

July 8, 1980

Mr. Ron Fahs
State Planning and Development
Clearinghouse
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32303

Re: SAI 80-2106; Looe Key National Marine Sanctuary

Dear Mr. Fahs:

1 The department endorses the designation of Looe Key as a National Marine Sanctuary.

We would like to recommend a change to the preferred alternative that lobster trapping be prohibited in the fore reef area only.

2 Our recommendation is that the taking of lobsters by any means (not limited to only a prohibition of taking by trap) be prohibited in the entire sanctuary.

At present there is no area in the Florida Keys reef tract from which baseline data on lobsters can be obtained, since no area is completely protected from the taking of lobsters.

Sincerely,

William H. Harper
Administrative Assistant
to the Executive Director

WHH:js

Response #1

Please see Generic Response #1

Response #2

Alternative 2 for lobster trapping was selected by the NOAA: (1) to protect the Fore Reef from physical damage caused by lobster traps; (2) to contribute to species richness and ecological diversity by affording protection to the spiny lobster within the major reef system; and (3) to avoid major economic impact to the local fishermen and businesses. The Sanctuary management will work closely with the Fishery Management Council to protect the spiny lobster stocks. NEPA requires consideration of the human environment which includes the socio-economic as well as environmental impacts of the proposed action. Therefore, NOAA believes the present preferred alternative represents the most balanced approach.

State of Florida

DEPARTMENT OF NATURAL RESOURCES

DR. ELTON J. GISSENDANNER
Executive Director

3900 COMMONWEALTH BOULEVARD / TALLAHASSEE 32303

BOB GRAHAM
Governor
GEORGE FIRESTONE
Secretary of State
JIM SMITH
Attorney General
GERALD A. LEWIS
Comptroller
BILL GUNTER
Treasurer
DOYLE CONNER
Commissioner of Agriculture
RALPH D. TURLINGTON
Commissioner of Education

July 15, 1980

Dr. Nancy Foster
Office of Coastal Zone
Management
3300 Whitehaven Street
Washington, D.C. 20235

1980 JUL 21 AM
MAIL ROOM
CZM
REC'D.

Dear Dr. Foster:

1 The Florida Department of Natural Resources has reviewed the Draft Environmental Impact Statement concerning the proposed Looe Key National Marine Sanctuary. The Department supports the designation of Looe Key as a Marine Sanctuary, and we feel that the five-square nautical mile preferred size alternative is reasonable and necessary for the protection of a cross section of coral reef habitats.

2 The Department also supports the preferred management regulations as listed in the draft EIS, with one exception. The preferred management alternative regarding spiny lobsters would ban the use of lobster traps within a core area on the fore reef and does not propose to regulate the taking of spiny lobster by hand. The Department would prefer the prohibition of lobster fishing entirely within the five-square nautical mile boundary - your alternate number three (3). In support of our position, I am enclosing a copy of the review comments of your document prepared by W. G. Lyons of my staff. If alternative three were to be adopted, the Looe Key area would then be the only area within the Florida Reef Tract on which the taking of lobster was absolutely prohibited. This would provide a small, but vital, area for baseline research on this important species.

DIVISIONS / ADMINISTRATION • LAW ENFORCEMENT • MARINE RESOURCES
RECREATION AND PARKS • RESOURCE MANAGEMENT • STATE LANDS

Response # 1

Please see Generic Response #1.

Response # 2

Alternative 2 for lobster trapping was selected by the NOAA: (1) to protect the Fore Reef from physical damage caused by lobster traps; (2) to contribute to species richness and ecological diversity by affording protection to the spiny lobster within the major reef system; and (3) to avoid major economic impact to the local fishermen and businesses. The Sanctuary management will work closely with the Fishery Managmement Council to protect the spiny lobster stocks. NEPA requires consideration of the human environment which includes the socio-economic as well as environmental impacts of the proposed action. Therefore, NOAA believes the present preferred alternative represents the most balanced approach.

Mr. Lyons' comments also include some suggestions related to your list of species attached in Appendix B in the EIS. Thank you for this opportunity to comment on the proposal to designate Looe Key as a National Marine Sanctuary. I look forward to continuing work on this project with you and your staff.

Sincerely,

Elton J. Gissendanner
Executive Director

EJG/cgc

Casey Gluckman

State of Florida

Department of Natural Resources Interoffice Memorandum

DATE: 28 May 1980

TO: Karen Steidinger
George Henderson

THRU: Bill Lyons

FROM: Walt Judge

SUBJECT: Review of the Looe Key National Marine Sanctuary, Draft Environmental Impact Statement

The concept of a marine sanctuary at Looe Key Reef appears sound. The document is very poorly organized, with great redundancy and repetition of the same information. The 5.32 square nautical miles boundary option seems to be the best option presented; however, an alternative of lesser area, deleting the "deep ridge" might be a better alternative. The deep ridge is separated by a wide expanse of sediments from the other reef zones. One possibility is to set the outer boundary at 100' (30.5 m). I don't think many sport divers will examine and enjoy the "deep ridge"; in any case, fishing interests should be allowed access to this area. 3

The concept of resource exploitation as presented is not equitable. The proposal will allow hook and line, net, and some lobstering, but will ban spearfishing on the basis of safety and that spearfishing overharvests larger predators. The safety aspect is not well substantiated. Spearfishing is allowed in Biscayne National Monument and there have been no accidents to my knowledge. In reference to reef damage, I have seen lesions caused from fish hooks and wire leaders that appear to be a more frequent occurrence than damage caused by spears. Dive any reef in the Florida Keys and you will find lost tackle embedded in the reef. If we are serious about sanctuary, we should consider removing all forms of fishing within all or part of the sanctuary. The result will be a refuge, haven and oasis where heavily exploited stocks can recover and form the basis of recruitment for adjacent, heavily fished areas. I think denying one user group is not justified. Hook and line and net fishing harvest just as many predators and non-edible fish as does spearfishing. 4

Throughout the plan there is the statement that growth rate of corals in Florida are significantly less than rates reported for the "Central Caribbean." This cannot be confidently documented. For example, the following tables for the two most studied stony corals imply the rate is very similar for Florida and other Western Atlantic areas. 5

Response # 3

The DEIS is organized in accordance with the Council on Environmental Quality regulations for implementation of the National Environmental Policy Act. Sanctuary boundaries were drawn to encompass at least part of the Deep Ridge so that the Sanctuary might contain all representative zones of the Looe Key Reef area. Also, please see Generic Response #3.

Response # 4

The anchoring regulation has been changed to prohibit all anchoring on coral on the Fore Reef, including anchoring by vessels engaged in commercial and recreational hook and line fishing. This will likely result in a somewhat limited access to the reef and consequently the "take" of important reef species by hook and line fishermen in that area (except by drift fishing). Although insufficient information exists at the present time to regulate hook and line fishing beyond this, every attempt will be made to work closely with the Gulf of Mexico Fishery Management Council to find cooperative means of controlling the impacts of hook and line fishing in the event that it becomes a necessity. The discussion of spearfishing has been significantly revised in the FEIS. The final analysis reflects your comments and addresses the concerns outlined in your letter (please see Chapter Four, Regulatory Alternatives for Spearfishing).

Response #5

These sections of the text have been rewritten to be less definitive. Please see Chapter Three, Affected Environment, Marine Environment).

Acropora cervicornis (staghorn coral)

Locality	Annual Growth Rate(mm)	Authority
Key Largo Dry Rocks	109-110	Shinn, 1966
Eastern Sambo, near Key West	115	Jaap, unpublished
Buck Island, Virgin Islands	71	Gladfelder *et al.*, 1978
Barbados	146*	Lewis *et al.*, 1968
Jamaica	266*	" " " "

*Values are suspect, have not been duplicated or accepted by many reef workers.

Montastraea annularis (star coral)

Locality	Annual Growth Rate(mm)	Authority
Carysfort Reef	8.4	Shinn, 1976
" "	10.7	Hoffmeister and Multer, 1974
off Key West	9.0	Agassiz, 1890
Dry Tortugas	7.0	Vaughan, 1914
Eastern Sambo	7.0	Jaap unpublished
Florida mean	8.4 ± 1.6 mm	
Buck Island, Virgin Islands	6.6-8.9	Gladfelder *et al.*, 1978
Curacao	8.0	Bak, 1976
Jamaica	6.7	Dustan, 1975
Jamaica	25.0*	Lewis *et al.*, 1968
St. Croix, Virgin Islands	9.2-10.4	Baker and Webster, 1975
Jamaica	6.2-8.8	Aller and Dodge, 1974
Belize	6.6-8.7	MacIntyre and Smith, 1974
non-Florida mean growth	8.0 ± 1.4	

T-test implies the means are not equal (α=.05), however, the data is not sufficiently large to reject the hypothesis that growth rates of *M. annularis* are similar throughout Florida and the Caribbean.

Florida populations of reef coral are adapted to their environment, with exception of an extreme environmental insult. Growth rates are not documented to be significantly different.

6 The problem of enforcement is unresolved. The document accurately states that existing enforcement agencies are unable to enforce management statutes due to manpower shortages or other reasons. The basic problem of who will enforce the regulations is not detailed.

Specific errors or comments are as follows:

7 Page 4, line 1: Looe Key is not one of the few remaining reefs in the Florida

Response # 6

Since release of the DEIS NOAA has initiated consultation at the headquarters level with the U.S. Coast Guard for arrangements to insure special attention to the Looe Key area should it be designated a sanctuary. NOAA agrees that adequate Looe Key enforcement and surveillance cannot be achieved as an add-on to existing patrols. An onsite presence will be required and arrangements will be made to that affect.

Response # 7

The text has been revised to clarify the discussion of living sections of the Florida reef tract.

Page 3

Keys. There are numerous other reefs that could qualify for sanctuary status for similar reasons, i.e., Sombrero, Eastern and Middle Sambo, and Sand Key reefs.

8 Page 10, line 14: Montastraea (spelling) [throughout the document the genus is misspelled].

9 Page 12, coral collecting: This regulation will not protect coral from stress and damage, it eliminates collecting. Storm damage, climatic and astronomical phenomenon, vessel accidents can't be mitigated by this regulation.

10 Page 12, line 6: The most recent Coral-Coral Reef FMP has one special management measure, "prohibit all human directed or induced activities that contact coral... in the Looe Key HAPC."

11 Page 15, starting at line 13: The scenario that removal of grouper, snapper and hogfish by spearfishing has caused increase in Diadema populations which coincidentally have eliminated algae is not documented such that it should appear here. Randall et al. (1964) and Randall (1967) reported that remains of Diadema were found in triggerfish, wrasses, jacks, porcupine fish, puddingwives, trunkfish, margates, grunts, porgies, slippery dicks, and butterflyfish; wrasses were suspected of feeding on Diadema after other fish opened the tests. It appears a diverse number of fish actively feed on Diadema, but many are not culturally acceptable as food; hence, the removal of grouper and snapper (not reported to feed on Diadema), and hogfish probably does not cause increase in Diadema populations.

12 Page 16, line 19: The Gulf of Mexico Fishery Management Council is initiating an FMP for tropical aquarium species (fish and invertebrates).

13 Page 25, lines 29, 30: What are the conspicuously missing corals?

14 Page 27, lines 8-11: Although I respect Capt. Tingley's criticism of Florida's current coral statute, I seriously doubt that there are large scale operations of bleaching coral at sea.

15 Table 1, economic loss: Status quo; if you don't change anything, it would not cause a change in economics. Also, the values are relative to the user, in that if a user's sole livelihood is prohibited, the hardship would be severe.

16 Page 45, line 20: Change normal salinity to oceanic salinity.

17 Page 46, line 13: All the information on the Loop Current was from George Maul; hence, cite Maul.

18 Page 46, line 26: Mayer (spelling).

19 Page 46, lines 36, 37: As noted, the contention that coral growth rate in Florida is half that of the "Central Caribbean" is not documented and should be deleted.

Response # 8

The text has been corrected wherever Montastraea is mispelled.

Response # 9

Even though it is true that protection programs cannot control impacts of natural disasters, regulations can minimize the effects of human activities. However, continuous and repeated damage to coral reefs from anchoring, fish traps, lobster traps, divers, coral collecting and other human physical impacts does not give coral reefs sufficient time to recover as is the case with infrequent major hurricanes, judging from studies of heavily visited coral reef areas such as Buck Island in the U.S. Virgin Islands.

Response # 10

No response necessary. There is no correlation between your comment and line 6, page 12, of the DEIS. Please see Generic Response #2 for a discussion of the relationship between the HAPC and the proposed sanctuary.

Response # 11

The text has been revised to reflect additional analyses of this predator-prey relationship (Chapter 4, Regulatory Alternatives for Spearfishing).

Response # 12

The text has been changed to incorporate your comment.

Response # 13

To alleviate confusion, the sentence in question has been removed from the FEIS. However, likely habitat for certain species of coral (Chapter Two, C. Preferred Boundary) is now found only on the deeper reefs.

Response # 14

No response necessary.

Response # 15

Tables 1 through 5 are intended to summarize very generally the impacts of each alternative on the marine resources and on the human users at Looe Key and are not meant to represent a detailed analysis.

Response # 16

Normal salinity is considered acceptable terminology since the entire document deals with oceanic areas only. Brackish water areas are not discussed.

Response # 17

The information in question was obtained from Marszalek from the Proceedings of the Third International Coral Reef Symposium in 1977.

Response # 18

The text has been corrected to incorporate your comment.

Response # 19

The text has been clarified to meet your objections.

Page 4

20 Page 51, line 33: mammillosum (spelling).

21 Page 54, line 14: mammillosum (spelling).

22 Page 72, paragraph 2: The common element in fishery management plans and marine sanctuaries is that both are dependent on other Federal agencies for enforcement of regulations. I see this as a problem from an efficiency standpoint.

23 Page 76, C: The most recent Coral-Coral Reef Resources FMP is dated 31 March 1980.

24 Page 78, line 25: The most recent draft allows collection of 9 species of soft coral, not to exceed 5845 colonies. Collectors claim 75% of the soft corals they collect come from state waters.

25 Page 105, last line: The Okane reference is nebulous; is this a document or personal communication? I am unaware of any DNR publication dealing with Looe Key, Key Largo reefs comparison.

26 Page 113, paragraph 2: Few boats can safely navigate and anchor on the reef flat. It is reckless to advocate the reef flat as an anchorage.

27 Page 114, lines 16, 17: As noted earlier, coral growth in the Caribbean does not exhibit a two-fold growth rate increase when compared to Florida.

28 Appendix B, paragraph 2: In reference to Antonius's methodology and rationale. There is significant difference between Loya's and Porter's plotless line transect technique and that used by Antonius. Antonius censuses one data point per meter while Loya and Porter sampled a continuous 10 m strip. The advantage in the latter method is the ability to substantiate adequate sampling and utilize statistical analyses (linear density, size frequency, etc.). One sample point per meter as utilized by Antonius is insufficient and can't be used to quantitatively compare various reef zones. Each zone should be sampled with a number of continuous transects to be certain of data repeatability and sampling adequacy.

While plotless transects are quick and an excellent way to gather information, they are very difficult to resample for comparison. Even with good reference markers it is literally impossible to re-establish the transect in the same location twice. This is significant if one is interested in temporal comparison.

At Biscayne National Monument, Jaap and Wheaton (in progress) used 2x2 meter grids with locator stakes for temporal comparison of population dynamics; photography and ground truth are used in sampling. The data are more reliable than that acquired from 25 m transects. If your goal is temporal comparison, plotless transects are a poor method.

29 Appendix B, Systematic list of species, Hexacorallia: Hexacorallia is an antiquated systematic term. Subclass Zoantharia is the accepted taxon.

Responses # 20 and 21

The text has been changed to incorporate your comment.

Response # 22

Please see response #6.

Response # 23

The text has changed to incorporate your comment.

Response # 24

As you note, the text of the DEIS states the Plan proposes to allow "... limited commercial harvest of soft coral."

Response # 25

The O'Kane reference has been removed from the FEIS.

Response # 26

The only part of Looe Key unsafe for navigating and anchoring is the reef crest. As noted in the text (Chapter Three, Affected Environment, E. Looe Key Area), the reef crest is considered part of the Fore Reef, not the Reef Flat.

Response # 27

The text has been changed to incorporate your comment.

Response # 28

The technique used by Antonius in the "Looe Key Reef Inventory" did not attempt to quantitatively compare the various reef zones but rather to identify the dominant species in each zone. Further, limited by the scope of the study, the plotless transects as a technique for field research was selected to identify the main components of the reef system in terms of biomass area coverage and importance without the intention of using the information for temporal comparison.

Response # 29

The text has been corrected.

30 Stephanocoenia intersepta is not correct. Esper's Madrepora intersepta is an Indo-Pacific Porites, specimen extant, Senkenberg Museum, Frankfurt, West Germany.

31 Madracis asperula; I question the presence of this species.

I also question reporting Agaricia tenuifolia and Mycetophyllia danaana.

32 Mustard Hill coral (spelling), Montastraea (spelling), and stokesii (spelling).

33 Appendix D-4, Endangered Species: The list of 13 common scleractinian reef corals is lacking any support from USF & W, the Federal agency charged with enforcing this act. An invertebrate species must be endangered throughout a significant part of its geographic range to qualify as an endangered species. None of these corals qualify under this criteria. They should be deleted as it is false information.

WCJ:dg

Response # 30

The text has been changed. The species have been deleted from the list.

Response #31

Please refer to the last two paragraphs of Site Analysis Research Methods (Appendix B 2).

Response # 32

The changes in the text have been made.

Response # 33

Appendix D-4 Endangered Species is a list drafted by the Florida Audubon and Florida Defenders of the Environment as stated in the text 370.72 and listed as State endangered species under Appendix D Florida State Laws and Existing State and Federal Marine Reserves, Parks, and Sanctuaries.

FLORIDA DEPARTMENT OF STATE
George Firestone
Secretary of State
Ron Levitt
Assistant Secretary of State

GOVERNOR'S OFFICE
Planning and Budgeting
Intergovernmental Coordination
JUN 17 1980
RECEIVED

June 13, 1980

In reply refer to:

Mr. Louis Tesar
Historic Sites Specialist
(904) 487-2333

Mr. Ron Fahs, Director
Intergovernmental Coordination
State Planning and Development Clearinghouse
530 Carlton Building
Tallahassee, Florida 32301

Re: SAI 80-2106
Cultural Resource Assessment Request
Draft EIS, Proposed Looe Key National Marine Sanctuary
Monroe County, Florida

Dear Sir:

1 In accordance with the procedures contained in 36 C.F.R., Part 800 ("Procedures for the Protection of Historic and Cultural Properties"), we have reviewed the above referenced project for possible impact to archaeological and historical sites or properties listed, or eligible for listing, in the National Register of Historic Places. The authorities for these procedures are the National Historic Preservation Act of 1966 (Public Law 89-665) as amended by P.L. 91-243, P.L. 93-54, P.L. 94-422, and P.L. 94-458, and Presidential Executive Order 11593 ("Protection and Enhancement of the Cultural Environment").

We concur with and fully support the measures which the Office of Coastal Zone Management has proposed to manage and protect the cultural resources within the proposed Looe Key Marine Sanctuary, Florida Keys. It is our opinion that implementation of the proposed measures will serve to protect and preserve the National Register eligible resources within the subject tract.

2 If you have any questions about our comments, or about federal historic preservation regulations, please feel free to contact us.

Response #1

Please see Generic Response #1

Response #2

No response neccessary.

FLORIDA-State of the Arts
The Capitol • Tallahassee, Florida 32301 • (904) 488-3680

2 On behalf of the Secretary of State, George Firestone, and the staff of the Bureau of Historic Sites and Properties, I would like to thank you for your interest and cooperation in the preservation of Florida's historic resources.

Sincerely,

L. Ross Morrell,
State Historic Preservation Officer

LRM:Teh

cc: Director, Sanctuaries Program

FLORIDA GAME AND FRESH WATER FISH COMMISSION

R. BERNARD PARRISH JR.
Chairman, Tallahassee

GEORGE G. MATTHEWS
Vice Chairman, Palm Beach

DONALD G. RHODES, D.D.S.
West Eau Gallie

NELSON A. ITALIANO
Tampa

CECIL C. BAILEY
Jacksonville

ROBERT M. BRANTLY, Executive Director
H. E. WALLACE, Assistant Executive Director

June 25, 1980

JUN 27 1980

Mr. Ron Fahs, Director
Intergovernmental Coordination
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32301

Re: SAI 80-2106, Monroe County
Draft EIS, Looe Key Marine
Sanctuary

Dear Mr. Fahs:

1 The Office of Environmental Services of the Florida Game and Fresh Water Fish Commission has reviewed the referenced draft environmental impact statement and fully supports the designation of Looe Key as a marine sanctuary. This designation would serve to preserve a valuable and irreplaceable natural resource.

Please call me if we can be of further assistance.

Sincerely,

H. E. Wallace
Assistant Executive Director

249/rs5/1
AG

Response #1

Please see Generic Response 1.

STATE OF FLORIDA

Office of the Governor

THE CAPITOL

TALLAHASSEE 32301

BOB GRAHAM
GOVERNOR

August 5, 1980

Dr. Nancy Foster, Deputy Director
Sanctuary Program Office
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Dr. Foster:

1 This Office, functioning as the State planning and development clearinghouse, in accordance with the U.S. Office of Management and Budget Circular A-95 and the National Environmental Policy Act of 1969, has coordinated a review of your Draft Environmental Impact Statement on the Proposed Looe Key National Marine Sanctuary. As part of our review process, we circulated copies of the Draft Environmental Impact Statement to the following agencies: Departments of Agriculture and Consumer Services, Commerce, Environmental Regulation, Natural Resources, State, Transportation, and the Game and Fresh Water Fish Commission. These agencies were requested to review the statement and comment on possible effects the contemplated actions could have on matters of their concern.

Our review of this document and State agency comments concludes that the State of Florida, in general, supports the establishment of a marine sanctuary at Looe Key, as it would provide a means for protecting a sensitive environmental resource. However, a number of comments have been made which we feel merit your observation and consideration.

2 The suggested boundary of five nautical square miles as the recommended alternative may be the minimum practical size for a sanctuary. However, we believe that consideration should be given to examining the area's circulation patterns before determining the final boundaries. Your examination may result in a finding that the boundaries should be changed for the purpose of ensuring the future viability of the reefs.

This Office is also concerned that the proposal does not suggest a comprehensive study or management plan for the Florida reefs. Such an overall effort is important if we are to ensure adequate management and protection of these unique resources.

3 We concur with the attached comments from the Department of Environmental Regulation regarding the need for sanctuary regulations for seabed alteration, bottom trawling and specimen dredging. We also recommend an early promulgation of appropriate rules and regulations. In addition, the Department of Natural Resources suggests that the taking of lobsters be prohibited in

An Affirmative Action/Equal Opportunity Employer

Response #1

Please see Generic Response #1.

Response #2

Please Generic Response #2.

Response #3

Please see response #2 of the letter from Lynn F. Griffin, Florida Department of Environmental Regulation and response #2 of the letter from William H. Harper, Florida Department of Natural Resources.

3 the entire sanctuary. There is a need to acquire baseline data on the lobster population of the Florida Keys area, which can best be obtained from an area in which no lobstering is allowed. As one of the sanctuary program's goals is marine research, this suggestion should be given serious consideration.

4 The Impact Statement, unfortunately, fails to address the adverse environmental impacts and irreversible and irretrievable commitment of resources associated with the project, as required by the NEPA regulations. These should be discussed in the final document. Specific concerns which also should be addressed include increased recreational use of Looe Key after it becomes a sanctuary and appropriate rules reglating boats and divers.

5 In accordance with the Council on Environmental Quality guidelines and as required by the National Environmental Policy Act of 1969, this letter and the attachments should be responded to and appended to the final statement prepared for this project.

Thank you for your consideration of these comments. We request that you send us copies of the final environmental impact statement prepared for this project.

Sincerely,

Walter O. Kolb

Walter O. Kolb
Office of Planning and Budgeting

cc: Harry Harper
John Outland
J. Ross Morrell
H. E. Wallace
Ed McNealy
Ken Woodburn
Casey Gluckman

Response #4

NOAA believes that Chapter Four adequately incorporates the consideration of Section 102(2)(c) concerns into the discussion of the analysis of impacts. The discussion of economic impacts compares the short term gain resulting from resource conservation. The unavoidable economic and environmental impacts of certain regulatory alternatives such as lobster trapping, specimen collecting and anchoring, and the discussion of irretrievable and irreversible commitment of resources is included and intergrated into the body of Chapter Four. It is our understanding that this approach is consistent with the CEQ regulations.

In addition the analysis of impact evaluates the consequences of activities on the resources of the Looe Key area. For example, the discussion regarding anchoring, evaluates the degree of damage to corals from various alternatives. The discussion on tropical specimen collecting and other fishing activities are evaluated in qualitative terms of stock depletion, damage to reef habitat and even the aesthetic component of the dive experience.

Response #5

These letters have been included in the FEIS.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL
Lincoln Center, Suite 881 • 5401 W. Kennedy Blvd.
Tampa, Florida 33609 • Phone: 813/228-2815

CEQ
RECD.
1980 JUL 22 PM 11:32
MAIL ROOM

00.JUL.80★001195

July 14, 1980

Mr. Dallas Miner
Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Mr. Miner:

This Council has reviewed the Draft Environmental Impact Statement for the Proposed Looe Key National Marine Sanctuary. The following comments are herein submitted as a result of its review and consideration.

The Gulf of Mexico and the South Atlantic Fishery Management Councils, as you know, are completing a draft fishery management plan for corals. In it the Councils identify Looe Key as a habitat area of particular concern and specific management measures are recommended. These measures are:

1 "Looe Key Reef (nominated marine sanctuary). The designated HAPC to be one nautical mile square. No collection of coral to be permitted in this area. In a core trapezoid area within points 1, 2, 3 and 4, (see map) no contact with coral or coral reef resources, no collecting of marine tropical fishes, no use of fixed fishing gear, no spearfishing and no anchoring to be permitted.

"These management measures are intended to protect coral and bottom assemblages in the core area from all human directed or induced harm."

The trapezoid area described above is shown on attachment A.

Attachment B shows differences between the management proposed for Looe Key as a National Marine Sanctuary and as a habitat area of particular concern in our Fishery Management Plan for Corals and Coral Reef Resources.

A council authorized by Public Law 94-265, the Fishery Conservation & Management Act of 1976

Response #1

The Coral and Coral Reef Resources FMP HAPC proposal for Looe Key is discussed in Chapter Three, IV Legal Status Quo, and Chapter Four, Environmental Consequences, of the FEIS. NOAA has attempted whenever possible to be consistent with the FMP proposed management measures. If the Looe Key sanctuary proposal moves forward, NOAA will coordinate closely with the Councils to insure efficient management and enforcement of this area.

We feel that the measures proposed for our HAPC should also be adopted for the sanctuary.

Your office has a copy of our current draft of the Coral Fishery Management Plan should you need additional information supporting our position.

Thank you for the opportunity to review and comment on your document.

Sincerely yours,

Bob Jones by

Robert P. Jones
Chairman

RPJ:TRL:smp

Attachment

cc: Gulf Council
Roberto Moreno
Sandie Lamer
Jack Brawner
Staff

Response #2

Your comparison between the Marine Sanctuary and Coral FMP proposal for Looe Key clearly defines the similarities of the two sets of proposed regulatory measures. However, it fails to illustrate the difference between the two proposals with regards to comprehensive management focus and the emphasis in education and research.

In the FEIS NOAA has revised the proposed regulations as originally presented in the DEIS. We now propose to prohibit anchoring on the coral within the Fore Reef as defined by the core trapezoid area, and to prohibit the collection of tropical specimens (marine life fishing) within the proposed sanctuary (see Generic Response #4). In additon "damage" to coral is prohibited (except from anchoring where allowed) by regulation. These revision bring the sanctuary regulations even more in line with those proposed by the Councils. For a discussion of the size of the proposed sanctuary area, please see Generic Response #3 and for a discussion of the relationship between management as an HAPC and management as a sanctuary please see Generic Response #2.

SCALE: 1" = 3000' 1" = .49 nmi 1" = .91km

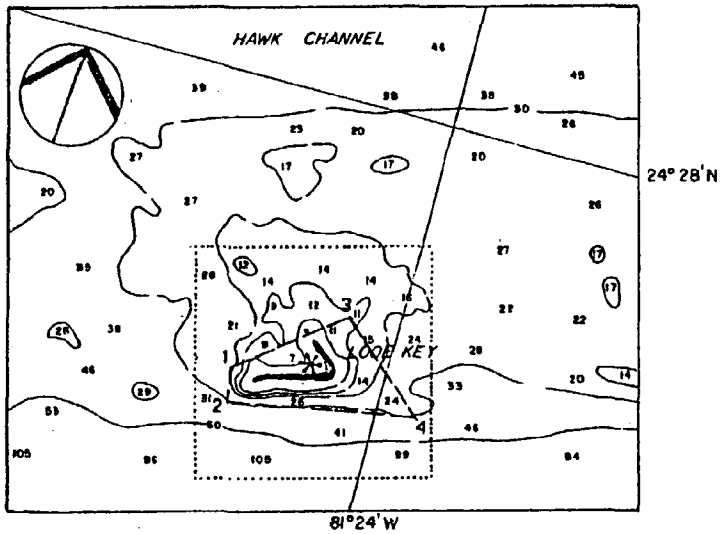


FIGURE 6-7. Location of the Looe Key HAPC, as measured onto the contours of NOAA National Ocean Survey Chart 11445. Square measures 1.852km (1 nmi) on each side with a center at the asterisk. The LORAN-C readings for the four points of the trapezoid are listed below.

1 NW 7980-W-13973.7, 7980-Y-43532.7
2 SW 7980-W-13973.4, 7980-Y-43532.4
3 NE 7980-W-13975.0, 7980-Y-43530.1
4 SE 7980-W-13975.4, 7980-Y-43527.7

LOOE KEY PROPOSALS

Marine Sanctuary	Coral FMP
General Area: Five square nautical miles includes portions of patch reefs, a reef flat, fore reef, deep reef, and deep ridge. (If charting shows a smaller area will include adequate portions of the five zones the area will be reduced.)	General Area: One nautical mile square. Contains fore reef and flat reef.
"Special Management Area": trapezoid.	"Special Management Area": trapezoid. (same)
Coral Collection: None permitted in general area.	Coral Collection: same, but no contact with coral permitted in trapezoid area.
Tropical Marine Specimens: Collecting allowed throughout area by permit.	Tropical Marine Specimens: Collecting of marine tropical fishes prohibited in trapezoid area.
Spearfishing: Prohibited in general area.	Spearfishing: Prohibited in trapezoid area.
Fixed Gear: General area: prohibit wire fish traps. Trapezoid area: prohibit wire fish traps and lobster traps.	Fixed Gear: General area: prohibit fish traps within 100-foot contour (Reef Fish FMP). Trapezoid area: fixed fishing gear prohibited.
Anchoring: Restricted to sand flats.	Anchoring: Prohibited in trapezoid.
Historical and Cultural Resources: Removal, damaging, tampering prohibited.	Historical and Cultural Resources: Not specifically addressed.
Toxic Materials: Prohibits all discharges except vessel cooling water, fish parts, chumming materials and effluents from marine sanitation devices.	Toxic Materials: Prohibits toxic chemicals in taking fish and other marine organisms in coral areas.
Explosives: not addressed.	Explosives: Prohibited over live coral bottoms when causing coral damage.

Ralph W. White

BRANCH OFFICE
3117 OVERSEAS HIGHWAY
MARATHON, FLORIDA 33050
TEL. (305) 743-9036

RECORDER
COLLECTOR OF DELINQUENT TAXES

CLERK OF THE CIRCUIT COURT
16TH JUDICIAL CIRCUIT
MONROE COUNTY
500 WHITEHEAD STREET
KEY WEST, FLORIDA 33040
TEL. (305) 294-4641

BRANCH OFFI
P.O. BOX
PLANTATION KEY, FLORIDA 330
TEL. (305) 852-92

COUNTY CLEI
COUNTY AUDITC

July 11, 1980

U. S. Department of Commerce
National Oceanic and Atmospheric Admin.
Rockville, Maryland 20852

Attention: Mr. Richard A. Frank, Administrator

Dear Sir:

1 The Board of County Commissioners of Monroe County, Florida at a regular meeting in formal session on July 1, 1980 adopted Resolutions No. 152-1980, 153-1980 and 154-1980 opposing the proposed Looe Key National Marine Sanctuary, supporting the Fishery Management Councils Coral Management Plan and requesting the appointment of a resident of Monroe County to the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council.

Enclosed for your information are copies of said resolutions.

Very truly yours,

Ralph W. White
Clerk of Circuit Court
and ex officio Clerk
Board of County Commissioners

RWW/vp

cc: file
Enclosures

1. No response necessary.

RESOLUTION NO. 153 - 1980

RESOLUTION SUPPORTING THE FISHERY MANAGEMENT COUNCILS CORAL MANAGEMENT PLAN/PROGRAM PROVIDING FOR THE PROTECTION OF THE CORAL REEFS.

WHEREAS, Monroe County, Florida, is directly affected by the activities which occur in and around it's waters; the Gulf of Mexico, the Florida Bay, and the Atlantic Ocean, and,

WHEREAS, the Gulf of Mexico Fishery Managment Council and the South Atlantic Fishery Management Council have jurisdiction over the Federal waters in and around Monroe County, State of Florida, and,

WHEREAS, said Councils are establishing a Coral Management Plan/Program which would provide for the protection of the coral reefs in and around Monroe County, Florida, now, therefore,

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MONROE COUNTY, FLORIDA, as follows:

2 I. That the Board of County Commissioners of Monroe County, Florida, does hereby support the concept that the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council proceed to establish and implement a Coral Management Plan/Program in order to provide for the protection of the coral reefs in and around Monroe County, Florida.

II. That the Clerk of the Board of County Commissioners is hereby directed to forward a copy of this resolution to the Governor of the State of Florida, the United States Department of Commerce, and such other agencies and officials as is appropriate.

Passed and adopted by the Board of County Commissioners of Monroe County, Florida, at a regular meeting held on the 1st day of July, 1980.

BOARD OF COUNTY COMMISSIONERS
OF MONROE COUNTY, FLORIDA

By _____
Chairman

(Seal)

Attest:

_____
Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY.
BY _____
Attorney's Office

2. No response necessary.

RESOLUTION NO. 154 1980

RESOLUTION REQUESTING THE APPOINTMENT OF A RESIDENT OF MONROE COUNTY, FLORIDA, TO THE GULF OF MEXICO FISHERY MANAGEMENT COUNCIL AND THE SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL.

WHEREAS, Monroe County is directly affected by the activities which occur in and around it's waters: the Gulf of Mexico, the Florida Bay, and the Atlantic Ocean, and,

WHEREAS, the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council have jurisdiction over the Federal waters in and around Monroe County, State of Florida, and

WHEREAS, appointments to said councils are made through designations by the Governor of the State of Florida and other appropriate agencies, now therefore,

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MONROE COUNTY, FLORIDA, as follows:

3 1. That the Board of County Commissioners does hereby request the Governor of the State of Florida to take such actions as is necessary in order to provide for the appointment of a resident of Monroe County, Florida, to the Gulf of Mexico Fishery Management Council and/or the South Atlantic Fishery Management Council in order to provide for direct input to said Council from the area directly affected by said Council activities.

2. That the Clerk of the Board of County Commissioners of Monroe County, Florida, is hereby directed to forward a copy of this Resolution to the Governor of the State of Florida, the United States Department of Commerce, and such other agencies and officials as is appropriate.

Passed and adopted by the Board of County Commissioners of Monroe County, Florida, at a regular meeting held on the 1st day of July, 1980.

BOARD OF COUNTY COMMISSIONERS
OF MONROE COUNTY, FLORIDA

By _____
Chairman

Attest: _____

APPROVED AS TO FORM AND LEGAL SUFFICIENCY.

E-88

3. No response necessary.

RESOLUTION NO. 152 - 1980

RESOLUTION OPPOSING PROPOSED LOOE KEY NATIONAL MARINE SANCTUARY AS SET FORTH IN ENVIRONMENTAL IMPACT STATEMENT DATED JANUARY, 1980.

WHEREAS, the Board of County Commissioners of Monroe County, Florida, has received the Draft Environmental Impact Statement dated April, 1980 regarding the proposed Looe Key National Marine Sanctuary, and,

WHEREAS, the Board of County Commissioners of Monroe County, Florida, at it's public meeting held on July 1, 1980, did receive comments in regards thereto, and,

WHEREAS, the establishment of a five (5) mile area is not necessary to protect the Looe Key Reef, now, therefore,

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MONROE COUNTY, FLORIDA, as follows:

1. That the Board of County Commissioners of Monroe County Florida, does hereby note it's opposition to the proposed Looe Key National Marine Sanctuary, the designation consisting of a five (5) mile boundary area, and further, that the Board of County Commissioners of Monroe County, Florida, does hereby request that the appropriate public hearings be held such that the proposed Looe Key National Marine Sanctuary area can be more reasonably established should the public input support same.

Passed and adopted by the Board of County Commissioners of Monroe County, Florida, at a regular meeting held on the 1st day of July, 1980

BOARD OF COUNTY COMMISSIONERS
OF MONROE COUNTY, FLORIDA

By _____
Chairman

Attest:

_____
Clerk

(Seal)

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY.

BY _____
Attorney's Office

4

4. Please see Generic Response #2.

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

1 SOUTHPARK CIRCLE, SUITE 306 CHARLESTON, S.C. 29407

TELEPHONE (803) 571-4366

DAVID H.G. GOULD, CHAIRMAN
PEGGY A. STAMEY, VICE CHAIRWOMAN

ERNEST D. PREMETZ, EXECUTIVE DIRECTOR

July 2, 1980

1980 JUL -7 AM 11:38
MAIL ROOM

Dr. Nancy Foster
Deputy Director
Sanctuary Programs Officer
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Nancy:

1 The South Atlantic Council, in its meeting last week, again reviewed the Looe Key sanctuary DEIS. The Council voted to support a one square mile sanctuary boundary identical to the HAPC for Looe Key as proposed in the Coral FMP. With this one change, the Council endorses the Looe Key sanctuary proposal. The Council does, however, recommend that certain corrections be made in the final document.

2 It was noted that the data on fish traps used in the DEIS is not the most current data available. The Council recommends that the final document utilize updated information available from the Florida DNR and NMFS' Southeast Fisheries Center.

3 Another recommendation from the Council concerns the use of the word "recreational" in the Preamble and Article III of the Draft Designation Document appearing in Appendix A. The reference to recreational without a like reference to commercial was considered inappropriate. It is suggested that either commercial be added wherever recreational is used or that recreational be deleted entirely.

With my best regards.

Sincerely,

David H. G. Gould
Chairman

DHGG:lg

cc: Members, South Atlantic Fishery Management Council

A COUNCIL AUTHORIZED BY THE FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976 (PL94-265)

Response # 1

Thank you for your letter. Please see Generic Response #3 for a discussion of the boundary issue.

Reponse # 2

NOAA has included the data from the FDNR/NMFS wire fish trap study. This new information has been incorporated into Chapter Four, Environmental Consequences, I. Regulatory Alternatives for Wire Trap Fishing.

Response # 3

The word "commercial" has been inserted in Article 3 of the Designation Document, acknowledging the value of Looe Key as an area important for commercial fisheries. However, the language in the Preamble of the Designation Document is derived from the statutory language of Title III of the Marine Protection, Research and Sanctuaries Act. The purpose of the Act specifies preserving "recreational values" as a rational for designation of an area as marine sanctuary but does not similarly specify commercial values. Accordingly it would be inappropriate for NOAA to insert the term "commercial" in the Preamble.

ACTIVE DIVERS ASSOCIATION
8934 S.W. 114 PLACE MIAMI, FLORIDA 33173

June 24, 1980

Please see Generic Response # 1.

Director Sancturries Program
Office of Coastal Zone Management
3300 Whitehaven St. N.W.
Washington, D.C. 20235

Director:

We are an organization numbering in excess of three hundred (300) Sport Divers and we totally support the five (5) Square Mile Looe Key Sancturies Proposal.

Very truly yours,

ACTIVE DIVERS ASSOCIATION

H.A.V. Parker III
Executive Council/Safety Officer

HAVP:js

Member
NATIONAL AUDUBON SOCIETY

BROWARD COUNTY AUDUBON SOCIETY

Member
FLORIDA AUDUBON SOCIETY

Karsten A. Rist
341 East Tropical Way
Plantation, Florida 33317
June 12, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N. W.
Washington, D. C. 20235

Dear Sir:

The Broward County Audubon Society represents more than 1600 individual and family memberships in Broward County, Florida. The interests of this membership are focussed on the preservation of our natural heritage, specificly on the preservation of unique habitats such as Looe Key and its plant and animal life.

The Broward County Audubon Society would like to express its strong support for the preservation of Looe Key and the establishment of Looe Key Marine Sanctuary.

With the number of visitors which have been recorded for Looe Key it is important that protective management rules be established and enforced. No Doubt the economic value of the tourist days spent in the Florida Keys because of Looe Key will have a much greater economic value than the loss to commercial fishing activities which the establishment of the sanctuary will entail.

Sincerely,

Karsten A. Rist

Karsten A. Rist
Conservation Chairman

Please See Generic Response #1

Center for Environmental Education

1925 K Street, N.W. • Washington, D.C. 20006 • 202/466-4996

July 15, 1980

Director, Marine Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., NW
Washington, D.C. 20235

OZM
REC'D.
1980 JUL 19 AM 12:43
MAIL ROOM

Dear Director:

We are here commenting upon the Draft Environmental Impact Statement on the marine sanctuary proposal for Looe Key.

1 General Comments: As the DEIS makes clear, the resources of primary concern within the study area are the coral reefs. The reefs serve as a focus for recreational use and as the habitat for other species of recreational and commercial value, e.g., tropical fish, spiny lobster. It is also clear from a reading of the Looe Key Reef Resource Inventory (henceforth, Inventory), prepared by the Florida Reef Foundation in 1978, that this area has already suffered tremendously from human activities (see especially page 31). It is also clear that the ecosystem of a coral reef community is complex and very sensitive to perturbation. Thus, while we agree that the coral reef is the resource of greatest importance in the area, we also believe that the regulations must not focus solely on the coral itself.

Indications are that the whole Florida Reef Tract may be undergoing a general deterioration (Inventory, p. 42). Looe Key provides an opportunity for protecting a unique segment of the Florida Reef Tract from further degradation and for focusing research into the status of the Florida Reef Tract as a whole. Visitor pressure on the reefs of the lower Keys in general, and on Looe Key in particular, will only increase in the coming years (DEIS, p. 59). In light of this, we believe that the sanctuary regulations should reflect the sensitivity of the reef system and the increasing impacts of human activities.

2 Boundaries: The preferred alternative boundaries provide a minimum of protection for the area. However, we find it difficult to evaluate the adequacy of this, or the other, boundary options because so little information is presented for the area outside the preferred boundary area. In particular, the map on Figure 2 of the DEIS does not depict biological zones outside the proposed five-square nautical mile boundary, much less zones which would be included under Alternative 3. Of particular concern is the exclusion of the deep ridge area, mentioned in the Inventory on pages 7 and 14. We believe that this area should be included in the sanctuary because it is part of the reef system and, to quote the inventory, "has the potential for elucidating the geological past of the area." (p. 14)

This is recycled paper.

E-73

Response #1

Please see Generic Response #1.

Response #2

Please refer to Response #3 of the letter from Sherrard Coleman of the Defenders of Wildlife, and the new FEIS maps of the biological zones and boundary alternatives. Also please see Generic Response #3.

One rationale presented for preferring the five-square nautical mile boundary is that such an area would represent an "ecological slice of the pie." (DEIS, pp. 25-26). The slice preferred is arbitrary because it excludes portions of the patch reef, deep reef, and deep ridge zones. No positve reasoning is presented for excluding these areas. It seems that these areas are excluded because there is little information on their biology. This lack of information is not sufficient reason for exclusion.

3 Coral Collecting: We strongly support the preferred regulations on coral collecting within the sanctuary area. The Inventory (pp. 37-38) states that four species of coral have already been exterminated due to collecting. This paper also states that "souvenir coral collecting is an ongoing practice." (p. 31) Not only do such activities reduce the esthetic and recreational value of the area but also threaten the ecological base of the area. To quote the Inventory (p. 31):

> "Habitat destruction resulting from coral harvesting and anchor damage has a pronounced deleterious effect on the reef and its resources. Adverse ecological effects of this nature not only disrupt functional interrelationships but negatively impact the commercially valuable resource base."

We believe that permits for scientific and educational coral collecting should stipulate the amount and location of coral to be taken.

4 Wire Trap Fishing: We agree that wire fish traps should not be allowed within the proposed sanctuary. The impact on coral and non-target fish species is of particular concern to us.

5 Lobster Trapping: We support the preferred alternative of prohibiting lobster trapping on the Fore Reef. However, we would like to see an assessment of the economic impact of allowing the setting of pots only in sandy areas outside the Fore Reef. We urge OCZM to pursue cooperation with the Fishery Management Councils in developing a workable plan for the protection of spiny lobster from overfishing. In particular, we wish to avoid the extirpation of this species, since this would have long-term effects on the reef community as a whole.

6 Tropical Marine Specimen Collecting: We strongly support Alternative C which would prohibit tropical specimen collecting within the sanctuary except for scientific and educational purposes with NOAA permits. We note that the DEIS (pp. 102-103) itself recognizes that tropical specimens can be raised successfully in capitivity and that areas outside the proposed sanctuary are likely to afford collectors opportunities for collecting such specimens. In addition, the DEIS discussion of this alternative recognizes the considerable advantages of this alternative.

Response #3

Please refer to Response #5 of the letter from Sherrard Coleman, the Defenders of Wildlife.

Response #4

No response necessary.

Response #5

All sanctuary management measures will be periodically reevaluated based on monitoring of uses and resources and additional research data. The regulation governing lobster trapping will be included in these reevaluation and monitoring efforts. Furthermore, every attempt will be made to work closely with the Fishery Management Councils to insure adequate protection of the spiny lobster.

Response #6

Please refer to Generic Response #4. The final proposal includes a prohibition on tropical specimen collecting within the sanctuary except by permit for scientific and educational purposes.

7 Spearfishing: As the DEIS notes (p. 105), spearfishing seems to have created a wariness in the fish of the Looe Key area which has diminished the opportunities for viewing these fish. In addition, as the DEIS notes, the elimination of reef predators by spearfishing appears to have spurred an increase in the urchin population, which, in turn, may be reducing seagrasses and algae in the area upon which herbivorous fish feed. The need for a prohibition on spearfishing within the sanctuary is clear. In order to implement such a prohibition, we believe it necessary to prohibit the possession of spearfishing equipment within the sanctuary. Otherwise, the prohibition on spearfishing will be all too easily circumvented.

8 Submerged Historical and Cultural Resources: We suppor the preffered alternative.

9 Discharges: We support the preffered alternative. We would urge, however, that the sanctuary manager monitor the expansion of shore-based sewage facilities in the are and inform permitting agencies of the sensitivity of the Looe Key area.

E-75

10 Anchoring: Both the DEIS (pp. 111-112) and the Inventory (p. 31) cite the sever impact which anchoring has had on the coral reef areas of the proposed sanctuary. Projected growth in the use of the study area threatens to further stress the coral of the Key. The Fore Reef and Reef Flat zones are already subject to widespread damage due to anchoring. At the very least, therefore, anchoring should be prohibited in the Fore Reef zone; elsewhere, it should be allowed only in sandy areas. We do not believe that this will prove impractical in the short term as far as recreational users are concerned. At the same time, we do not believe that recreational use of the area for the time being warrants the adverse impacts associated with anchoring. We wish to avoid, so to speak, "loving the reef to death". A temporary moratorium on anchoring in the above areas will allow OCZM with the cooperation of the Fishery Management Councils to develop long-range means of protecting coral resources from the effects of anchoring.

11 Sanctuary Management: We strongly ugre that the sanctuary manager convene an Advisory Committee which both represents community interest groups and can provide scientific advice on activities within the sanctuary. A vigorous public education campaign should be pursued to insure that users of sanctuary waters understand the substance and reason for regulations.

12 Other Issues: We suggest that instead of listing harmful fishing methods in the regulations at 937.6(3), permitted fishing methods be listed. Such methods should be easy to identify. The positive, rather than negative, tone of such regulations may be more palatable, and better observed, by users of the sanctuary waters.

Response #7

The text has been revised to clarify the relationship between reef predators and urchins. Please see Chapter Four, Regulatory Alternatives for Spearfishing.

Response #8

No response necessary.

Response #9

The sanctuary management will make every effort to work closely with other permitting agencies to insure understanding of the sensitivities of the Looe Key area and sanctuary management concerns.

Response #10

The preferred alternative for anchoring has been changed in the FEIS. NOAA is proposing to prohibit anchoring on coral on the Fore Reef and to encourage sand anchoring elsewhere within the sanctuary.

Response #11

Sanctuary management will emphasize continuing public participation and education. The latter is evidenced in the proposed sanctuary goals and objectives. Specific mechanisms for public involvement in management will be developed during formulation of the Management Plan. During that process, the public will be asked to review and recommend suggested management strategies. Advisory committees will be established if the public feels it desirable.

Response #12

This approach was used in the regulatory structure for the Key Largo Marine Sanctuary, and objections were raised by the Executive Director of the Organized Fishermen of Florida. NOAA concurs with their argument that this type of regulation results in much more confusion than a straightforward listing of prohibitions and restrictions.

Finally, we believe that those carrying on research in the sanctuary be required to supply reports to the sanctuary manager which summarize activities and results. In addition, the sanctuary manager should encourage by funding and other means research into the ecosystem and human impacts within the sanctuary.

We appreciate the opportunity to comment upon this proposal and look forward to the Final Environmental Impact Statement.

Sincerely,

Michael Weber

Michael Weber
Marine Habitat Coordinator

MW:mw
cc: Mr. Bruce Barrett

July 11, 1980

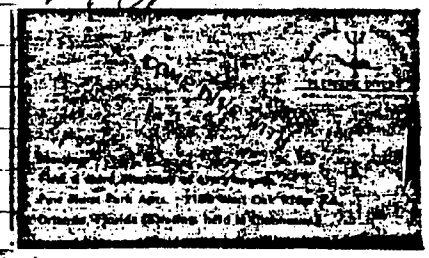
Director, Sanctuaries Program
Office of ~~Coastal~~ Coastal Zone Management
3300 Whitehaven Street N.W.
Washington, D.C. 20235

We the undersigned members of The Central Florida Pleasure Divers scuba club have dived Love Key and we support the effort of making Love Key reef National Marine Sanctuary status.

Sincerely,
Central Florida Pleasure Divers
Orlando, Florida

Debbie Howard
Gerald Gordon
Martin Wolff
Carol Cochran
Dale Johnson
Mark E. Schmidtke
Michelle Hero
Castle Bluge
Denn L. Bluge
Fred Robbins
Ken Korte
Rod C. Haggard
Dell Crainston
Raymond J. Rhuman

Nancy Schiff
Raymond Tentoni
Bruce A. Rauch
Isabel W. Tentoni
Margaret E. Cool
[illegible]
Patrick H. Matheson
Jim Burnsfield
Gayle Kleps
[illegible]



Please see Generic Response # 1.

Defenders OF WILDLIFE

July 14, 1980

Director, Marine Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Sir/Madam:

1 Defenders of Wildlife submits the following comments with respect to the Draft Environmental Impact Statement (DEIS) on the proposed Looe Key National Marine Sanctuary.

Defenders of Wildlife ("Defenders") is a national, non-profit, tax exempt organization with a membership of approximately 50,000 citizens nationwide, and is dedicated to the protection, conservation and enhancement of the nation's wildlife and wildlands.

Looe Key is the first proposed "national" marine sanctuary, a title which we find appropriate and in keeping with the scope and focus of the Marine Protection, Research and Sanctuaries Act of 1972. All marine sanctuaries designated pursuant to this program should be so titled to reflect the national interest in marine resource and habitat protection.

General Comments

2 Defenders is strongly supportive of the stated goals of sanctuary designation for Looe Key, Florida. As discussed in the introductory section of the DEIS, Looe Key is truly unique in its variety of marine organisms, supported by the continuing vitality of the complex, yet extremely fragile,

Sherrard Coleman

Response #1

The goal of the Marine Sanctuary Program is to establish and maintain a National system of marine sanctuaries for the purpose of preserving or restoring special marine areas for their conservation, recreational, ecological or esthetic values. The program focuses attention on sites of national interest and concern.

Response #2

Please refer to Generic Response 1.

1244 NINETEENTH STREET, NW • WASHINGTON, DC 20036 • (202) 659-9510

coral reef ecosystem. The coral formations are themselves irreplaceable, in addition to forming the foundation of this environment.

There has been longstanding and widespread local interest in protection of these resources -- as evidenced in particular by the number of organizations participating in NOAA's 1978 workshop in Big Pine Key. One of the primary concerns is the rapidly increasing recreational and commercial use of the area. As Looe Key is located outside state
2 territorial waters, state jurisdiction is not applicable. And, there is at present no regulation of the two most direct threats to the coral reef system: anchoring of boats and coral collecting activities. Increasing damage from these activities indicates that the majority of persons utilizing this area are not aware of the extreme fragility of the coral reef system. The disruption of one element precipitates a cause-and-effect reaction resulting in the imbalance and eventual decline of the entire system.

All of these factors underline the urgency of prompt designation of Looe Key as a sanctuary. One of the important benefits

of such designation would be coordinated efforts to "enhance public awareness of the functioning of the Looe Key coral reef system." (DEIS, p. 5) Defenders believes that all
2 interests involved in the use of Looe Key's resources can be adequately served, while still preserving -- through reasonable management -- an unparalleled ecosystem in a relatively undisturbed state.

Sanctuary Boundaries

The preferred alternative (#2) discussed in the DEIS would encompass portions of the Patch Reef, all of the Reef Flat, Fore Reef and portions of the Deep Reef and Deep Ridge zones -- approximately 5 square nautical miles in area. As later outlined at pp. 90-91, Boundary Alternative #3 would include all of Alternative #2's territory, plus portions of territory on the east and west borders of
3 Alternative #2. Defenders is perplexed, however, by OCZM's statement (pp. 90-91) that "this additional area does not contain the same highly developed coral system" found within the parameters of Boundary Alternative #2. Does this statement mean that the unique coral systems of Looe Key are round only within the approximate square of Boundary Alternative #2, and not along the same reef areas to the immediate east and west of that Alternative? This is apparently the case, although the DEIS does not directly say so, nor does it present

Response #3

The "highly developed coral system" referred to in the text on pp. 90-91 is the spur and groove system of the Fore Reef. According to sources interviewed at the site there is no comparable coral reef to the immediate east and west of the preferred alternative. Detailed biological investigations of the area beyond the five mile area were not available for the DEIS. The biological information in the DEIS was taken from data in the Looe Key Reef Resource Inventory in which the scope of work was limited to the biological zones associated with Looe Key reef. It would be difficult at this time to delineate an area encompassing the entire Deep Reef and Deep Ridge (north-south extension). Field investigations of this outer area are either non-existant or very preliminary. Also please see Generic Response #3 for additional discussion of the boundary issue.

On the other hand, the Looe Key area is a highly productive fishing area. Enlarging the 5 mile area to a 10 nm sanctuary could, if fishing regulations were imposed, restrict local, long-term commercial fishermen and interfere with as much as two-thirds of their catch. Enlarging the 5 mile area to 10 miles, although desirable, was not believed essential to meeting the objectives of the sanctuary.

evidence to that effect. In fact, other statements in the DEIS indicate that the necessary detailed investigation of the entire reef has not been accomplished.*

Rather, as the DEIS's introductory section makes clear, the preferred alternative has been selected without further resource investigation by OCZM because it:

> ...will provide a reasonable slice of the reef tract which will permit management to achieve the sanctuary objectives... (p. 4) (Emphasis added.)

and

> ...will provide long-term protection for a representative section of the Florida reef tract from Patch Reefs out to the Deep Ridge." (p. 11) (Emphasis added.)

3 and

> ...will help insure accomplishment of all sanctuary goals by encompassing a 'slice of the ecological pie'....." (p. 12) (Emphasis added.)

Such statements clearly indicate an arbitrary decision-making process which has resulted in proposed boundaries that will not, contrary to DEIS proclamations, meet the primary sanctuary objective of maintaining, protecting and enhancing the quality of the natural, biological, aesthetic and cultural resources of the Looe Key reef system. This objective is not founded in terms such as "reasonable slice, or representative section." The proposed boundaries would only accomplish partial protection for a small, selected portion of that system.

---

* DEIS, p. 90.

It is also apparent from additional statements on page 91 that the OCZM chose the particular boundaries of Alternative #2 in deference to local commercial fishing interests:

> "...local fishermen depend on the 5 square nautical mile sanctuary proposal area for approximately one-third of their catch and the area beyond the 5 square nautical mile boundary for approximately two-thirds of their catch. Therefore posing restrictions on commercial fishing within a 10 square mile area would likely cause considerable economic hardship on local long-term commercial fishermen....."

It should be noted that NOAA's own on-site survey of Looe Key* indicates that commercial fishing activities primarily involve spiny lobster, mackerel, and yellowtail snapper. Lobster traps are, for the most part, set within the Patch Reef zone, with a few occasionally set within the Deep Reef zone. Although both Ocyurus chrysurus (yellowtail snapper and Scomberomorus regalis (mackerel) occur in relative abundance throughout most of the reef zones,** commercial fishing line activities apparently are located in large part seaward of the reef and, less frequently, within Hawk Channel but north of Looe Key.***

---

* Looe Key Reef Resource Inventory, prepared for Office of Ocean Management, NOAA, by the Florida Reef Foundation, Homestead, Florida. February 28, 1978. Authors: Arnfried, Antonius, Arthur H. Weiner, John C. Halas, and Ed Davidson. (Hereinafter cited as "Onsite Survey".)

** The yellowtail snapper occurs less frequently in the Reef Flat and Deep Reef zones. Onsite Survey, p. 28.

***Onsite Survey, p. 30.

The Lower Keys Chapter of the Organized Fishermen of Florida has testified in opposition to any restriction on fishing activities which would reduce income to that industry. Defenders certainly does not wish to see unreasonably restrictive boundaries imposed to the "considerable economic hardship" of commercial fishing interests. Defenders does believe, however, that in the interest of presenting a comprehensive analysis, the OCZM must detail further both the area's resources beyond the borders of Alternative #2, and the current and anticipated levels of all activities impacting the Looe Key reef system. The inclusion of this sort of information is really prerequisite to a decision on boundaries which can be supported by all interests.

If such further investigations as requested above indicate that commercial fishing can be conducted outside sanctuary boundaries: 1) without undue economic hardship, and 2) without adverse impact upon adjacent coral reefs, then there can be no good reason for providing less-than-complete protection within sanctuary parameters -- whatever those finally established parameters may be.

In summary, the current DEIS discussion does not present a compelling argument for the adoption of Boundary Alternative #2. The fact that the Fore Reef zone has more spectacular corals than the Patch Reef zone must not

eliminate the Patch Reef zone from being considered an integral, vital component of the reef system. NOAA's Onsite Survey states, for example, that the Patch Reef zone provides the two "most important requirements for the mobile, herbivorous reef fauna: shelter from predators and an unlimited supply of food."* The Patch Reef and Reef Flat zones in combination thus comprise the nursery area for juvenile fish species. The OCZM should be proposing protection for all of both zones, instead of protection for all the Reef Flat zone and only parts of the Patch Reef zone. Likewise, Defenders believes that OCZM has not made the case for less-than-total protection for the Deep Reef zone and the Deep Ridge zone. As with portions of the closer-in zones, the Deep Reef and Deep Ridge zones contain a wide variety of octocorals, and stony corals, in addition to sponges. The Onsite Survey notes in particular the significance of the Deep Ridge zone as a potential source for discovering the area's geological past.**

3

The stated goals of sanctuary designation can only be achieved by protection of an entire system -- not by arbitrary selection and piecemeal protection of areas containing "more valuable" resources than those of adjacent areas within that system. Defenders also realizes, however, that designation of the entire Florida reef tract is both

---

* Onsite Survey, p. 37.

** Onsite Survey, p. 14.

impractical for management and unduly restrictive to human utilization.

In light of the foregoing discussion, and with awareness of the increasing commercial and recreational demands being placed on Looe Key's resources, Defenders proposes, therefore, that OCZM designate an area which encompasses the entirety of all five reef zones. This slight expansion of Boundary Alternative #3 would be north-south in direction; the east-west boundaries would remain as depicted in the DEIS (p. 23). Thus, the northern boundary of the sanctuary would extend from Hawk Channel southward to the margin of the continental shelf. The protective effect of such designation would be that of preserving, as a unit, all reef zones contained within a significant area of the reef tract system. Such an area would allow a "living laboratory" approach to needed understanding of the remaining reef system's interrelationships. Further, as stated in the DEIS (p. 91), such an expanded area would not be likely to require additional enforcement capability, as the same number of personnel could effectively patrol the larger area. Defenders believes that the incorporation of these extended boundaries can be accomplished without undue restrictions to the local commercial fishing industry. The larger area, albeit still a compromise and still a portion of the larger ecosystem, nevertheless encompasses the whole of all reefal zones, while allowing a reasonable level of human activity to continue. For these reasons, Defenders strongly urges its adoption.

Regulated Activities

4 Implementation of Looe Key National Marine Sanctuary should be primarily protective in its scope and effect. Hence, any human activities to be allowed within its boundaries must be carefully controlled and monitored to ensure the continuing health and viability of the area's living resources. With respect to specific activities, Defenders supports OCZM's assessment that coral collecting and anchoring of boats are primary detriments to the reef system.

5 1. Coral Collecting. Defenders is strongly supportive of OCZM's proposed regulation, which would prohibit collection or possession of all coral within the sanctuary (with the exception of those specimens collected under permit for scientific or educational purposes). It is very apparent that uncontrolled specimen collecting has resulted in the near depletion of several species from the easily-accessible Fore Reef zone. Defenders urges the OCZM to initiate a permit system which can exercise discretion in the review of "scientific" or "educational" applications for coral collecting. In this regard, specific provision should be made in permit applications for quantities, as well as species, of coral to be taken. Although the DEIS states (pp. 92-93) that commercial coral harvesting is "insignificant," the Onsite Survey mentions, at least, numerous reports indicating this activity to have been "common practice in the recent past."* The vast amounts of coral

* Onsite Survey, p. 31.

Response #4

Immediately after designation, a Visitor Use Study will be initiated. Monitoring these uses and evaluation of reef health and user impacts will allow management to assess the effectiveness of the sanctuary management measures in achieving sanctuary goals and objectives.

Response #5

"Scientific" and "educational" applications for the collection of coral will be carefully scrutinized. Specific provisions will be made in permit applications to specify quantities as well as the species of coral to be taken. Only those collectors meeting the criteria specified in 937.7 of the proposed regulations will be considered for permits.

imported into this country, from the Philippines in particular,* to be sold in countless curio and jewelry shops indicate a continuing demand for this resource. Defenders thus believes the OCZM should pay special attention to its regulations allowing a very limited take of coral specimens from the sanctuary. Those regulations (and their enforcement) must not allow loopholes for commercial interests.

5 In addition, the DEIS makes specific reference (p. 92) to the increased responsibilities enforcing this regulation will entail. Defenders does not believe that NOAA should regard permit review as "detracting" from other duties. Meaningful protection of the coral reefs is basic to the objectives of this designation: the careful review of permit applications is a vital element in that protection.

2. Commercial Fishing.

A. Wire Trap Fishing. Defenders believes that wire trap fishing should not be permitted in any portion of the sanctuary at this time. The regulations covering this activity may be amended to permit limited use of wire

6 traps when: 1) there are documented data available concerning the environmental, sociological and economic impacts of traps; and 2) there are conclusive data available on the number of area fishermen currently using wire traps as well as the expected increase in this usage. Given the stated

* "International Center for Living Aquatic Resources Management Newsletter," January, 1980, pp. 18-20.

Response #6

The draft regulations as proposed by NOAA in the DEIS prohibit wire trap fishing within the sanctuary.

disadvantages connected with wire trap usage (pp. 95-96), not the least of which is the potential to seriously deplete reef fish stocks, Defenders does not believe the cost- and efficiency-related advantages (p. 96) argue compellingly for their permitted usage.

6 Therefore, Defenders strongly urges OCZM to prohibit <u>any</u> wire trap usage within the sanctuary until such time as these data can be assessed and a final decision made to either permit limited usage or to prohibit usage completely within the sanctuary.

B. <u>Lobster Trapping</u>. Defenders is generally supportive of OCZM's intention to prohibit lobster trapping in the Fore Reef zone within the sanctuary, as such prohibition would offer partial protection to the species. The Onsite Survey indicates (p. 30) that most lobster traps are set within the Patch Reef zone in any

7 event, so this regulation is not anticipated to have a substantial economic impact on local lobster fishing interests. As is the case with wire trap fishing, there are considerable gaps in knowledge relating to lobster population dynamics. Defenders is pleased to note that OCZM plans close cooperation with Fishery Management Councils in their efforts to protect and enhance spiny lobster stocks both within the sanctuary and throughout adjacent areas.

Response #7

No response necessary.

3. Tropical Marine Specimen Collecting. It is somewhat unclear why OCZM proposes to allow tropical marine specimen collecting within sanctuary boundaries when its own discussion of this activity (pp. 103-104) indicates two pertinent factors which seem to argue against it: 1) tropical fish can and are successfully raised in captivity and sold commercially; and 2) tropical fish collecting can be conducted from adjacent areas with a minimal socioeconomic impact. It appears that OCZM has endorsed alternative "b," (restrict tropical specimen collectors to collectors with NOAA permits within all boundary alternatives and to non-chemical techniques) in deference to local commercial collectors, without being able to support that alternative on resource protective grounds. Defenders believes alternative "c" (limiting tropical specimen collectors within all boundaries to those with NOAA scientific and educational permits) is more rational. Indeed, the DEIS discussion of this alternative's effects (p. 104) argue strongly in its favor:

8

> "This alternative would protect and enhance the tropical fish population at Looe Key, prevent the depletion of ecologically important species, add to the aesthetics of the sanctuary, and maintain and enhance the long-term productivity of the Looe Key coral reef for future generations....."

Response #8

Please see Generic Response #4. The FEIS proposes to prohibit tropical specimen collecting except with a permit for scientific and educational purposes only.

8 "It appears that there are many suitable areas for tropical specimen collectors to catch tropical fish and invertebrates...including shallow inshore areas, inshore coral heads, mid-channel reefs...and the entire outer reef. This alternative would cause limited economic loss to present commercial collectors."

Defenders urges OCZM to adopt alternative "c", as it will provide species protection, reduce administrative review and monitoring functions, and not result in undue economic impact to commercial collectors.

9 4. Spearfishing. Defenders fully supports OCZM's proposed prohibition on all spearfishing (and possession of spearfishing equipment) within sanctuary boundaries.

10 5. Submerged Historical and Cultural Resources. Defenders agrees with the OCZM that continued exploration and investigations into submerged historical and cultural resources, such as the HMS Looe, are important, and should be allowed to go forward through the institution of a NOAA permit system.

11 6. Discharges. Defenders supports OCZM's preferred alternative, i.e., prohibiting the discharge of substances except non-polluted cooling waters from vessels, fish or parts and chumming materials and discharges from marine sanitation devices within the sanctuary.

12 7. Anchoring. The increasing number of recreational and commercial boats utilizing the Looe Key area underscores the importance of regulating locations and methods for anchoring as this activity is widely acknowledged to be

Response #9

No response necessary.

Response #10

No response necessary.

Response #11

No response necessary.

Response #12

NOAA has modified the proposed anchoring regulation to prohibit anchoring on coral the Fore Reef and to encourage sand anchoring elsewhere within the sanctuary (Please refer to Chapter Four, Environmental Consequences, 7. Alternatives Regulating Anchoring.)

This suggestion will be considered in the Response #4 study to be initiated if designation occurs.

extremely damaging in nature to coral reef systems. As both the DEIS and the Onsite Survey indicate, there is already widespread evidence of anchor-related damage to coral formations, particularly within the Fore Reef and Reef Flat zones. If allowed to continue unabated, this activity will certainly lead to the eventual demise of the entire reef system.

With respect to allowable anchoring locations, Defenders is generally supportive of OCZM's efforts to limit anchoring to less sensitive areas of the Looe Key system. However, those efforts do not go far enough in providing the needed protection for coral formations. As the DEIS indicates, the number and diversity of coral formations within the Fore Reef zone render that area the most popular to divers, but also render it the area most in need of protection from careless anchoring.

12

Further discussion in the DEIS (pp. 112-113) reveals that the Reef Flat zone and areas seaward of the Fore Reef offer less vulnerable anchoring sites. In light of this discussion, Defenders believes anchoring should be limited to designated areas within: 1) the Reef Flat zone, and 2) waters seaward of the Fore Reef zone. With respect to #2, above, designated anchoring sites should be restricted to waters in front of the eastern half of the Fore Reef, where an uninterrupted sand flat exists.*

---

* DEIS, pp. 10, 55.

12 Such modification of OCZM's preferred alternative would provide complete protection to the Fore Reef zone, and increased protection to both the Reef Flat and the Deep Reef zones. This is particularly desirable for the Deep Reef zone, where there is little information currently available on resources or their condition. Defenders does not believe the imposition of this prohibition would inflict undue hardship on recreational snorkelers and divers, since anchoring in designated areas of the Reef Flat zone offers: 1) a greater degree of protection from high waves beyond the reef crest, and 2) easy access to the Fore Reef zone by swimming through a relatively short expanse of shallow water.

13 Concerning methods of anchoring, Defenders supports OCZM's intention to institute research on the use of a mooring system in the Fore Reef zone. In addition to this research, OCZM should also investigate the use of such a system in the eastern half of the Deep Reef zone seaward of the Fore Reef zone. This portion of the Deep Reef zone is relatively shallow in depth (9-11 meters), and provides a very gradual downward slope* over a sandy bottom. It thus seems reasonable to believe this portion may well provide a suitable mooring area, allowing easy access to the Fore Reef area for divers. The concept of establishing permanent moorings has been advocated in the past for areas similar to Looe Key, such as Key Largo.**

Response #13

No response necessary.

---

* DEIS, p. 55.

** Phillip Dustan, "Beseiged Reefs of Florida's Keys," Natural History, Vol. 86:4, 1977, pp. 73-76.

Other Activities

Defenders disagrees with OCZM's stated intention not to promulgate regulations pertaining to: 1) alteration of or construction on the seabed; and 2) bottom trawling and specimen dredging. As revealed on page 41, the only reason offered for this intention is that these activities do not "pose a realistic threat to the resources at this time." This statement is misleading in two respects: 1) both activities, by DEIS admission, would be damaging in nature to coral resources and the benthic community as a whole; and 2) to say that resources are not threatened "at this time" indicates at least the possibility they will
14 be threatened in the future. (In fact, it is not entirely clear, with respect to bottom trawling and specimen dredging, that this activity isn't already planned, if not occurring.*)

In the interest of the Marine Sanctuary Program's stated goal of coordinated management, and of consistently thorough regulations, Defenders believes OCZM should promulgate regulations for these activities. It makes little sense to identify an activity as threatening in nature, and then not regulate it simply because it is not anticipated to occur in the near future.

---

* See DEIS discussion of exploratory trawling for reef fish on live bottoms in South Atlantic areas, p. 16.

Response #14

Bottom trawling and specimen dredging are listed in the Designation Document and are therefore subject to potential sanctuary regulations (Appendix A). Regulations will be considered with full public involvement should activities such as these, become a factor within sanctuary area.

15 In addition to these activities, Defenders believes that OCZM should also, at a minimum, list hydrocarbon operations as a regulated activity within the sanctuary. Although the DEIS states (p. 78) that "oil and gas development does not appear to be a realistic possibility in the vicinity," this belief is no guarantee against a change of mind in the future. OCZM certainly has nothing to lose by recognizing oil and gas operations as a potential threat to Looe Key's resources. Listing hydrocarbon operations as a regulated activity in the designation itself will enable OCZM to issue specific regulations should that activity be proposed for the area in the future. Failure to list hydrocarbon operations in the designation document as a regulated activity will require repetition of the entire designation process should oil and gas development become a proposed reality in the future.*

Sanctuary Management

16 Effective management is, of course, critical to a successful sanctuary program. With this desired result in mind, Defenders proposes that researchers conducting activities in the sanctuary under NOAA permits be required to submit to the Sanctuary Information Center reports on the results of those activities and that such reports be made available for public review and comment. This data base will

* DEIS, p. 5.

Response #15

The likelihood of oil and gas exploration and exploitation at Looe Key is remote. However, alteration of the seabed is listed in Appendix A, Article 4, Section 1(i) as an activity subject to regulation. In the event that gas and oil activity becomes an issue within the sanctuary, it would undoubtedly result in an alteration of the seabed and NOAA could promulgate protective regulations.

Response #16

This issue will be a part of the Management Plan which will be prepared if the sanctuary is designated. It is possible that NOAA permits for scientific and educational purposes will require reports on the results of research activities which will be available for public information. NOAA concurs that this requirement would better enable sanctuary management and the public to accurately assess both the resources at Looe Key and the cumulative impacts of human activities in the area.

16 better enable sanctuary management and the public to accurately assess both the quantities of resources and the cumulative impacts of human activities upon them.

17 Finally, provision should be made in the regulations for an advisory committee which would play a direct role in review of sanctuary permit applications and in monitoring of sanctuary issues in general. The advisory committee should be comprised of individuals representing the wide variety of interests utilizing Looe Key's resources.

Defenders appreciates very much the opportunity to provide comment upon this sanctuary proposal.

Sincerely yours,

Sherrard Coleman

Sherrard Coleman
Marine Issues Specialist

cc: Mr. Bruce Barrett

Response #17

Sanctuary management will be comprised of objective personnel thoroughly versed in special area management in the marine environment. In addition, management will seek continuing advice from outside expertise and from members of the various user groups. During development of the Management Plan, the public will be asked to review alternative mechanisms for ensuring continued involvement in sanctuary management. If formal advisory panels are found desirable by the public they will be established as a part of the final management framework. This arrangement has been suggested for other potential sanctuaries and can serve a very useful function.

Please see Chapter II for a more detailed discussion of proposed management.

SINCE NINETEEN HUNDRED "THE VOICE OF CONSERVATION"

July 11, 1980

Director, Sanctuaries Program
Office of Coastal Zone Mgm.
3300 Whitehaven St., NW
Washington, D.C. 20235

Re: Proposed Loo Key Marine Sanctuary

Dear Sir:

1 The Florida Audubon Society hereby comments upon the proposed Loo Key National Marine Sanctuary, and the draft Environmental Impact Statement prepared for this proposal. Florida Audubon, along with the National Audubon Society and the five Southeastern Florida chapters of the Society, strongly supports the proposed creation of the Loo Key National Marine Sanctuary. We represent collectively over 35,000 members in Florida, many of whom utilize the resources of the area proposed for inclusion in the sanctuary for recreation, including fishing, skin diving and nature study.

General Comments

The draft Environmental Impact Statement appears to underemphasize the economic impact of sport and recreational uses of the proposed sanctuary area, and overemphasizes the use of the area by commercial fishing interests. For example, the statement indicates on page 63 that "the onsite survey estimated revenue from dive boat trips to be between $150,000 and 250,000 in 1978."

2 From our experience, this figure appears almost absurdly low. We know of one dive boat operation alone which grosses more than $100,000 per year in this area. In addition, the man-day expenditures which are derived from the figures provided in the Environmental Impact Statement indicate that dive boat trips generate only 20-33 dollars per diver in "income." From our experience, these figures again seem low, and do not appear to be adequately justified in the text of the statement.

Conversely, the text of the statement itself suggests that the value of the commercial fishery at Loo Key is overestimated, due to the overestimate of the number of fishermen using the area, or by inflated catch value estimates

FLORIDA AUDUBON SOCIETY
921 Lake Sybelia Drive • P. O. Drawer 7 • Maitland, Florida 32751
(305) 647-2615

Response #1

Please See Generic Response #1.

Response #2

Most of the commercial recreational questionnaires distributed for the Looe Key onsite survey were unanswered. Because of the low response, only revenues form the commercial dive boat operations were calculated in the economic study (Appendix C-5) However, a regional service sector multiplier was used which brought the total estimated economic value of dive boat operations to between $480,450 and $800,750. In the absence of more detailed information, the EIS must rely upon the data collected during the survey. Conclusions drawn from such limited information must be used cautiously.

3 in survey questionnaires (p. 62). While this revelation is duly noted in the statements detailed text, it somehow escapes mention in the summary, and apparently no adjustments have been made in the considered economic impact of commercial fishing operations cited in the report because of this factor. Thus, commercial fishing seems to be of significantly overstated economic value in the proposed sanctuary area.

If the above cited factors were corrected for, an even more compelling case for designation of the sanctuary would exist, and it is unfortunate that these obvious inaccuracies were perpetuated to this stage of the Environmental Impact Statement process.

The Florida Audubon Society supports the preferred alternatives as indicated in the draft impact statement in the following regulatory areas:

4
- coral collecting
- fish traps
- lobster trapping
- spearfishing
- historic and cultural resources
- discharges
- anchoring

Florida Audubon urges the adoption of a different alternative than that selected as "preferred" in the draft Environmental Impact Statement in the case of tropical marine specimen collecting.

The "preferred" alternative selected in the draft Environmental Impact Statement would allow commercial tropical fish collecting to proceed within the sanctuary so long as those proposing to collect obtained a permit. The philosophy apparently operative here is to limit collecting to "experienced collectors," and those exhibiting "knowledge" of tropical marine species and "non-damaging techniques for harvesting tropical fishes and invertebrates." 5 The draft designation document contained in the draft E.I.S. as Appendix A, however, does not provide explicit criteria for the "knowledge" requirements of collectors, or the description or definition of "non-damaging techniques." As such, the provisions of the suggested permitting program seem loose and unenforceable toward any particular end.

In the case of tropical marine specimen collecting, we urge the Office of Coastal Zone Management to implement alternative 3, which would prohibit tropical specimen collecting except by permit for scientific and educational purposes. We further suggest that scientific and educational collecting be limited to those individuals directly associated with bonafide research or educational programs of accredited universities, institutions or state and federal government agencies, and that the requirements for issuance of a permit require submission of documentation of the nature and scope of the educational or research programs for which specimens are sought.

Response #3

While the commercial fishing survey catch value results also obtained from the onsite survey appeared higher than normal, (as compared with Monroe County data and information from other sources) the results were well within the range of probability and appropriate for general economic analysis. For this reason they were used in the DEIS analysis as reported by the fisherman.

Response #4

No response necessary.

Response #5

Please See Generic Response #4.

5 We can find no justification in the public interest for perpetuating commercial tropical fish harvesting for the pet trade within the limited 5 square mile area of this sanctuary. There are literally thousands of square miles of reef habitat in the Florida Keys area where such collecting can go on freely, and to suggest that closing this small segment to commercial harvesting will pose any kind of hardship upon the collecting industry simply does not stand reasoned scrutiny.

In conclusion, we urge that the designation of the sanctuary be made promptly, and that tropical specimen collection be restricted by permit to bonafide scientific and educational purposes.

Sincerely,

Charles Lee
Vice President - Conservation

cc: Senator Lawton Chiles
Senator Richard Stone
Congressman Dante Fascell
Bruce Barrett

June 17, 1980

Comments of The Marine Wilderness Society
on the
Draft Environmental Impact Statement
and
Proposed Regulations
for
Looe Key National Marine Sanctuary

I am Alexander Stone, President of The Marine Wilderness Society. The Society is pleased to have this opportunity to comment on the Draft Environmental Impact Statement for a proposed Looe Key National Marine Sanctuary, and to strongly support its designation.

Response #1
Please see Generic Response 1

1 The Marine Wilderness Society is a national marine conservation organization with an established record of active interest in the development of sound ocean policies that provide for the effective protection and preservation of certain important ocean areas of the coastal zone. On the issue of a Looe Key National Marine Sanctuary, the Society's vigorous position of support for the establishment of this sanctuary is a matter of record. It pleases me today to be able to endorse the establishment of a 5 square mile Looe Key National Marine Sanctuary not only on behalf of The Marine Wilderness Society, but also on behalf of the following organizations:

The Sierra Club Florida Chapter
The Marine Mammal Foundation
The Florida Reef Foundation
The Underwater Society of America

The Marine Wilderness Society
P O Box 943 / Miami Florida 33165

1 The Periwinkle Alliance
The Key Biscayne Anglers
The National Association of Retired Federal Employees - Homestead Chapter
The Norine Rouse Scuba Club
and the Sierra Club Miami Group, Volusia-Flagler Group, and Calusa Group.

Attached to these comments are the Resolutions of Support adopted by these organizations for the designation of a National Looe Key Marine Sanctuary of five square miles, so that it shall " include representational sections of all reef zones and provide an essential buffer zone between the main reef sector and the unregulated-activity areas outside the sanctuary."

Adoption of the 5-square-mile boundary alternative for the sanctuary is absolutely crucial to the purposes of the sanctuary, in the view of The Marine Wilderness Society and all the other organizations which we have just named. If the sanctuary designation is to achieve the stated purpose of providing long-term protection to this special marine area for its unique conservation, recreational, ecological and aesthetic values, an adequate area must be set aside.

Response #2
Please see Generic Response 3

2 To be representational of the integrated Florida Reef Tract ecosystem, the Looe Key National Marine Sanctuary must include adequate portions of the patch reef, reef flat, fore reef, deep reef and reef ridge, all of which are distinct transitional zones of the reef system. Anything less than a five-square mile area would fail to include these zones adequately enough to set off a viable system.

To properly protect the values and assets of Looe Key Reef which have brought about its consideration for marine sanctuary status, a reasonable "buffer zone" must be incorporated into the sanctuary. This is necessary to effectively shield the primary reef features

and its populations of tropical fish and other marine organisms from the much higher impact level and activity level which will be found outside the sanctuary's boundaries. To reduce the area of the sanctuary below the preferred alternative of five square miles will bring unrestricted activities and their attendant impacts so close to the sanctuary's major reef features and fish populations that the aforementioned activities and impacts will be reflected within the sanctuary itself.

At this juncture, I must point out that this is not only the judgment of strict marine conservationists. Among the over twelve thousand Floridians represented in the organizations which I mentioned earlier, we can count marine scientists, sport anglers,
2 divers and spear fishermen. Particularly noteworthy is the resolution of support for the five-squre mile sanctuary boundaries of the Underwater Society of America, this country's official spearfishing organization and national representative in all international spearfishing competitions.

E-101

All these people endorse the establishment of a five-square mile Looe Key National Marine Sanctuary, even if it means restrictions on their own activities. The anglers and boaters will have to exercise utmost care in their anchoring procedures. The scientists will have to obtain permits for their collection of specimens. The divers will have to "take only memories and leave only bubbles" on Looe Key Reef. And the spearfishermen will have to look elsewhere for their quarry. But they all agree: Looe Key Reef and its fish populations must be protected "to maintain and restore an essentially natural ecological condition and balance." And only the designation of a five-square mile Looe Key National Marine Sanctuary can achieve this.

That only a marine sanctuary designation can protect Looe Key Reef
3 and its natural values is acknowledged even by the Congressional

Research Service. Keep in mind that what is necessary at Looe Key Reef, what the objective of these proceedings is, is to provide this uniquely situated reef and its marine inhabitants with a comprehensive management system which will treat the reef system and impacts upon it in a holistic manner within a specific geographic area. In these respects, only the marine sanctuaries program can provide Looe Key Reef with the intended management.

I am sure you are aware of the narrow commercial interests which have been seeking to halt, undermine or limit the designation of a Looe Key National Marine Sanctuary, alleging that such a designation is superfluous in view of other available statutory authority, such as the Fishery Conservation and Management Act or the Outer Continental Shelf Lands Act. These arguments are deceptive and erroneous.

3

The Congressional Research Service, in its December 5 1979 report, has found that the Marine Sanctuaries Program embodies "...several respects in which the marine sanctuaries authority is unique. These unique benefits divide into (a) coverage of specific environmental impacts not directly regulable under other authority, and (b) other benefits." (CRS, p. 27).

This same study concludes that " The Marine Sanctuaries Authority of MPRSA Title III permits a holistic approach to management of defined marine areas that is not readily atainable through resort to statutes focusing on specific environmental impacts...Research reveals a variety of respects in which the marine sanctuaries act appears to offer environmental protection benefits not directly achievable through other Federal statutory authorities." (CRS, p. 34).

A second Congressional Research Service report, dated February 14, 1980, finds through its Natural Resource Policy Division that " the

Response #3

No response necessary

marine sanctuaries provision is an environmental protection law that offers a positive approach to the protection of marine areas of recognized importance. It is a multiple-use provision that was designed to protect a site, rather than stop certain activities
3 or eliminate adverse impacts. As demands on the marine environment increase, the need to protect highly valued sites will also increase...Without the sanctuary provision, sites could only be protected indirectly (and probably less completely) through a maze of federal programs...one could easily conclude that the long-term protection or restoration of marine sites for conservation, recreational, ecological or aesthetic values without the direct approach of a sanctuary program is likely to be more difficult." (p. 12-13)

Looe Key Reef needs and must have that direct approach because it is indeed a unique and highly valued marine site.

E-104

There are fears of uninformed people, misled by certain groups, that a marine sanctuary designation at Looe Key now will lead to stroke-of-the-pen expansion of boundaries and restrictions later. This is nothing more than nonsense, as anyone knows who has bothered
4 to read the Marine Sanctuaries Act and the federal regulations promulgated for its implementation. We trust that the Sanctuary Programs Office will give any future arguments of this sort the discounting they so richly deserve. In the hopes of reclarifying this situation, we are submitting as part of our comments a letter from the Director of Sanctuary Programs delineating the time-consuming and involved process which must precede the slightest change in the Looe Key National Marine Sanctuary document.

Time limitations now make it necessary for The Marine Wilderness
5 Society to defer from commenting extensively on the individual sanctuary regulations proposed until a later time. At this time, we would like simply to endorse NOAA's preferred alternative regu-

Response #4

No response necessary

Response #5

The tropical specimen collecting regulation has been changed in the final proposal to prohibit such collecting within the proposed sanctuary except by permit for scientific and educational purposes. Please see Generic Response #4. The anchoring regulation as proposed in the DEIS has been changed to prohibit all anchoring on the fore reef and to encourage sand anchoring elsewhere in the sanctuary.

lations with the following observations:

5 (a) Florida state law now prohibits the use and transportation of wire mesh fish traps. Under no circumstances should these traps be permitted anywhere in the sanctuary.

(b) The proposed regulations on tropical fish collecting are too permissive.

(c) The anchor damage provision should be made as simple as possible to allow maximum non-damaging use of the sanctuary while protecting its coral formations from impacts.

E-105

Fuller comments will follow within the comment period.

6 In conclusion, we wish to reiterate our solid position for the designation of a Looe Key National Marine Sanctuary, with the least delay possible and the boundaries to afford adequate protection for a sufficient reef area to include all its representational reef zones.

Response #6

No response necessary

Respectfully submitted,

Alexander Stone

ALEXANDER STONE
President
The Marine Wilderness Society

AS/bh
enc.

July 5, 1980

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office - OCZM
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

ref: Looe Key DEIS

Dear Dr. Foster:

1 Through this letter we would like to reaffirm our endorsement of the designation of a 5-square-mile Looe Key National Marine Sanctuary, based on that particular reef's unique and/or outstanding characteristics in terms of its ecology and in terms of the opportunities it offers under the esthetic, recreational and educational and research programatic objectives of the Marine Sanctuaries Program.

E-106

2 Looe Key Reef is unique among the lower Florida Reef Tract reefs in that it lies opposite Big Pine Key, an unusually large body of land for the Middle and Lower Florida Keys. This large land mass has a positive effect on coral species distribution on Looe Key Reef because it diverts direct passage of colder and less saline Florida Bay water over Looe Key Reef. Thus, Looe Key is uniquely benefitted in that it enjoys a more stable water temperature range than all other live coral reefs in the Lower and Middle Keys. This becomes particularly significant because as it is, the entire Florida Reef Tract is situated at the extreme lower temperature limit for reef building corals. Looe Key, even with the damage it is now sustaining due to a lack of protection, offers a uniquely rich coral species diversity and morphology which clearly qualify it for marine sanctuary status.

3 NOAA's own Looe Key Reef Resource Inventory states that, with regards to coral species diversity, Looe Key's "...list of 47 species to the best of our knowledge, (is) the most complete published so far for any Floridian reef...Remarkably, Looe Key's scleractinian species diversity compares very favorably...even with central Caribbean reefs." A comparison of Looe Key's identified reef building corals with the identified corals obtained during an intense 20-year study in Jamaica found that Looe Key's list of reef-building corals "...falls only five short of the Jamaican species list. This is quite remarkable for a reef that exists at

The Marine Wilderness Society
P O Box 943 / Miami Florida 33165

Response # 1

Please see Generic Response # 1.

Response # 2

The FEIS notes that reefs occur mainly opposite land where they are less exposed to Florida Bay Water (Ginsburg and Shinn, 1964) and therefore reefs are not as well developed in the more widely spaced Middle Keys as in the Upper Keys.

Response # 3

This information was provided by the " Looe Key Reef Resource Inventory" (Antonius et. al. 1978) and used in both the draft and final EIS. The Inventory serves as one of the major source documents.

the very boundary of coral reef development and has been studied only for a short period of time." (quotes from page 37 and 38).

3 This unique richness of coral species is made irrefutably significant in terms of human opportunity for study, research, recreation and esthetic enjoyment when we consider the unmatched depth availability of Looe Key's coral species and major reef features.

Looe Key Reef's spectacular spur and groove coral formations, found on its fore reef zone, are one of the major features which bring visitors to Looe Key Reef. The positioning of these formations at the edge of a very shallow reef flat zone make it uniquely accessible not only to experienced scuba divers and
4 marine biologists, but also to school-age children, first-time snorkelers, and just about any American citizen who can avail himself of a shallow-draft skiff and a glass-bottom bucket. Availability and potential opportunities for the sanctuary program's objectives under the categories of research, education and recreation make Looe Key Reef eminently qualified for marine sanctuary status.

E-107

Referring again to your own Looe Key Reef Resource Inventory, you will find that Looe Key Reef's reef flat "...exhibits a largely sandy reef top which is so shallow that it represents an ideal recreational area for unexperienced swimmers or families with children." (p. 3). Continuing, you will find that " The Fore Reef zone of Looe Key is a well developed and especially spectacular formation. Its main portion is a high profile spur and groove system, bordering the Reef Flat in very shallow water and sloping
5 down to a sand bottom in 9-11 m of depth...Following the spurs seaward, in a depth increasing from 3 to 8 m, one finds a zone which may well be the most important, certainly the most spectacular part of the Looe Key Reef. Some of the spurs show a profile here of up to 7 m high, caused mainly by the vigorous construction activity of the 'mountainous' star coral Montastrea annularis." (pgs. 11-12). Finally, as you move to the Deep Reef zone, you find "...a number of scleractinians with branching and flower-like growth forms...which are either not present or very rare in more accessible areas of Looe Key...Disklike growth forms of striking shape are found among many species of Agariciidae and Mussidae, which only at this depth occur in appreciable numbers...and two deep water species occur only here (including) the rare, monofilament Ellisella barbadensis..." (p. 13).

Is Looe Key Reef unique in the Florida Reef Tract in terms of coral species distribution and in fulfillment of the MSA's programmatic objectives? Categorically, the answer must be yes. And so must the decision be to declare a Looe Key Reef National Marine Sanctuary.

Respectfully,

Alexander Stone

ALEXANDER STONE
President

AS/ld

Response # 4

NOAA agrees that the existence of the shallow reef flat zone, its accessibility to the public and its utility for inexperienced swimmers, snorkler, and others, makes Looe Key a unique and extremely valuable marine recreation area. This feature is one of the most distinguishing aspects of the reef area and was a major factor considered in evaluating the site for proposed designation.

Response # 5

No response necessary.

MARINE WILDLIFE

July 12, 1980

Dr. Nancy Foster, Deputy Dir.
Sanctuary Programs Office - OCZM
3300 Whitehaven St., NW
Washington, D.C. 20235

Dear Dr. Foster:

We are submitting this letter in response to the Looe Key National Marine Sanctuary Draft Environmental Impact Statement published in April of 1980.

1 The Marine Wildlife Foundation is a corporation-not-for-profit chartered under the laws of the State of Florida for educational, research and marine resource management purposes and objectives. As such, the Foundation would like to register its support for the designation of a Looe Key National Marine Sanctuary. Our review of the DEIS for this project, and our own experience with the reef in question, clearly lead us to believe that Looe Key offers unique potentials for research, public education and recreation in the area of coral reefs, and that a marine sanctuary designation for 5 square miles of the reef is absolutely necessary in order to safeguard the reef's resources and the above mentioned potentials.

We've noted misleading opposing comments from some quarters with regards to the sanctuary nomination. These commentators are referring to the Looe Key nomination as an initiative which "picks on commercial fishermen" and which may in the future be broadened to drive the commercial fishermen from fishing grounds not covered in the original sanctuary designation document.

2 From a study of the marine sanctuary legislation and rules promulgated for its implementation in the Federal Register, we find the above objections to be totally unfounded in fact, and we feel it is necessary for the sake of clarity and truth in the record to spell out what we realize is already obvious to your office.

The Looe Key marine sanctuary nomination does not pick on commercial fishermen, or anybody else. NOAA's Preferred Alternative for the sanctuary's management itemizes eight specific activity areas to be regulated: coral collecting, wire trap fishing, tropical specimen collecting, spearfishing, lobster trapping, tampering with historic and cultural resources, vessel discharges, and anchoring.

Response # 1

Please see Generic Response # 1.

Response # 2

It has never been NOAA's intent to single out any particular group and unreasonably restrict their use of the Looe Key area. As you point out, six of the activities affect all user groups equally. NOAA has based its selection of both the preferred boundary and regulatory alternatives on the need to protect and conserve the Looe Key resources for maximum public benefit and to develop a sanctuary that is representative of the biological zones.

Of these eight activity areas, only two deal specifically with any commercial fishing activities. These are the regulations dealing with wire trap fishing and lobster trapping. With regard to wire trap fishing, even the Executive Director of the Organized Fishermen of Florida, Mr. Jerry Sansom, testified at the Miami public hearing on the Looe Key nomination that his organization (which officially represents commercial fishing interests in Florida) had "no problems with a fish trap ban on Looe Key..." He also did not lodge any objections to the proposed prohibition on lobster trapping on the Fore Reef zone.

2 The other ~~eight~~ 9/2 activity areas itemized in NOAA's Preferred Alternative for the sanctuary's management either affect all user groups alike (discharging, anchoring) or affect sport divers (tropical specimen collecting, spearfishing) or deal with destructive, vandal-type activities (coral collecting, tampering with historic and cultural resources). The contention that commercial fishermen are somehow a "target" of the Looe Key marine sanctuary nomination is fueled not by the facts within the Looe Key DEIS, but rather by the imaginary fears within the minds of some misinformed commercial fishermen.

E-109

These fears center around the belief that designating a Looe Key National Marine Sanctuary now would somehow lead to arbitrary, bureaucrat-initiated expansion of sanctuary boundaries and regulated areas sometime in the future, without the need for public process and to the specific detriment and loss of commercial fishermen.

We submit that the terms of the law and specified federal regulations make the above scenario impossible. According to the rules promulgated in the Federal Register on July 31, 1979, Section 922.26:

"(b) The Designation shall specify by its terms the geographic coordinates of the Sanctuary area, its distinctive features that
3 require protection, and the types of activities that may be subject to regulation. The terms of the Designation may be modified only by the same procedures through which the original designation was made.

(c) The regulations shall be consistent with and implement the terms of the Designation and shall set forth the limits of human activities within the sanctuary and procedures for the review and certification of permits, licenses or other authorizations pursuant to other authorities. All amendments to these regulations must remain consistent with the Designation."

This means that the sanctuary boundaries cannot be changed after Designation, except by the same laborious process of nomination, public input, Environmental Impact Statement publication, hearings, Secretary of Commerce approval and Presidential approval. The same

Response # 3

It is true that one of the major concerns of opponents of the proposed sanctuary is the belief that NOAA will use what is perceived as unilateral discretion to enlarge the boundaries of the sanctuary and modify the operating regulations. However, the constraints posed by the Marine Sanctuaries Program Regulations (CFR vol 44, no. 146, 7/31/79) insure that modification of either the Designation Document or regulations of individual sanctuaries is a lengthy process involving numerous opportunities for public notice and involvement.

3 is true for types of activities regulated: they cannot be changed without going through the same laborious process as the original nomination. For Looe Key Reef, that original process has now taken almost four years dating from the original nomination. It is clear that no federal bureaucrat can "spring" new restrictions or a sanctuary area expansion on any user group of Looe Key, except on an emergency basis for no more than 120 days and only if this action is found "...essential to prevent immediate, serious and irreversible damage to the resources of a sanctuary." (Federal Register, July 31, 1979, Section 922.76(d).

We know and expect that the Sanctuary Programs Office and NOAA, in its decision-making process regarding the designation of a Looe Key National Marine Sanctuary will consider facts and points of law as presented above, and disregard unfounded contentions based on emotionalism and ignorance. That is NOAA's binding responsibility under the Marine Sanctuaries Act, and we are confident of its proper execution.

Sincerely,

Ann Ramus(4)

Ann Ramus
Board of Directors
The Marine Wildlife Foundation

AR/bp

Address response to:
9582 Bird Rd. #6
Miami, Fla. 33165

National Audubon Society
SOUTHEASTERN FLORIDA OFFICE
and
Tropical Audubon Society, Inc.
5530 SUNSET DRIVE SOUTH MIAMI, FLORIDA 33143 (305) 666-5111

June 18, 1980

Coordinating with:
Florida Audubon Society
South Dade Audubon Society
Royal Palm Audubon Society
Monroe County Audubon Society
Broward County Audubon Society
Audubon Society of the Everglades

Director, Sanctuaries Program
Office of Coastal Zone Management
3000 Whitehaven Street, NW
Washington, D.C. 20235

RE: Looe Key Reef Marine Sanctuary

Dear Sir:

The National Audubon Society, through its six southeast Florida Chapters located from Palm Beach through the Florida Keys, strongly supports the proposal to designate Looe Key Reef as a national marine sanctuary. We especially support the educational objectives as stated in the Draft Environmental Impact Statement. We believe that the boundaries, under the circumstances, and the preferred regulations recommended by NOAA are reasonable.

Please see Generic Response # 1.

We believe that the enforcement of regulations limiting anchoring to specific zones, while prohibiting such activity on the Fore-Reef, is of vital importance if the reef is to be protected from further degradation.

We, among others, believe that in evaluating this matter, greater emphasis be placed on the value of the recreational features of the Looe Key Reef and waters as a unique natural resource than is reflected in the Environmental Impact Statement. The recreational usage is of great importance to residents of South Florida and tourists alike.

Tourist dollars play a major role in the Florida Keys economy, but perhaps of greater concern is the protection of the resource itself. Too many of the reefs in the Keys have suffered perhaps irreparable damage caused by the impact of anchors on the reefs, the removal of coral and the collecting of the species of fish used in aquariums.

The designation of Looe Key Reef as a marine sanctuary would be, we believe, a most significant step towards preserving a Florida reef habitat

before it is destroyed.

Sincerely,

Alice Wainwright

(Mrs.) Alice Wainwright
For the National Audubon Society as
Coordinator of its Southeast Florida
Chapters

NATIONAL FISHERIES INSTITUTE, INC.

1101 CONNECTICUT AVENUE, N.W. ■ WASHINGTON, D.C. 20036 ■ (202) 857-1110

July 28, 1980

Director of Sanctuaries Program
Office of Coastal Zone Management
300 Whitehaven Street, N.W.
Washington, D. C. 20235

Dear Sir:

The National Fisheries Institute appreciates the opportunity to submit comments on the Draft Environmental Impact Statement prepared on the proposed LOOE Key Marine Sanctuary. Our review of the document reveals no new discussion by the Agency which would change our general position that marine sanctuaries are not necessary due to the existence of Federal and state statutes which provide or have the potential to provide sufficient protection for the marine area concerned. A chapter in the DEIS entitled "Purpose and Need for Action" does not adequately demonstrate current adverse impacts or potential impacts which cannot be addressed under existing regulatory authority. The chapter further states that, "sanctuary designation will provide the long term integrated management necessary to protect and use wisely these resources." This statement is made without any apparent effort to determine whether or not existing law and regulations, particularly when properly coordinated, will provide sufficient protection for the area. 1

The Institute is particularly concerned with proposed regulations which would supersede Draft Fishery Management Plans when finally enacted with regard to regulation of trap fishing and lobster fishing within the sanctuary. Evidently the reason for proposing such regulations is the absence at the present time of commercial fishing regulations. This situation will not continue indefinately. Your office clearly understands that the regulations have been in process for some time and that the projected completion dates are as early as late 1980. It is likely that the FMPs will be approved before the final designation of a marine sanctuary.

The section of the DEIS entitled "Legal Status Quo" states that the most direct threats to the coral reefs are collecting and anchoring as well as the impacts of commercial fishing and the collection of tropical fish or invertabrates. That section of the DEIS then goes on to list in some detail the provisions of draft FMPs to regulate the Spiny Lobster Fishery, the Reef Fishery of the Gulf of Mexico and Coral and Coral Reef Resources. These plans appear to provide for the effective management of fishery resources as well as the protection of

E-112

1. Please see Generic Response #2.

coral and coral reef resources. These plans appear to provide for the effective management of fishery resources as well as the protection of coral and coral reef resources. In arguing against the effectiveness of provisions of the draft FMPs, the major point is the draft status of such plans rather than specific provisions of the plans. Again, it must be stated that the proposed regulations set forth in the DEIS are also in draft status and may not be in place prior to the effective implementation of the FMPs.

The National Fisheries Institute strongly considers the effective regulation and management of fishery resources to be an activity assigned to the regional fishery management councils under the Fishery Conservation and Management Act. The major concern expressed by the seafood industry with regard to the total marine sanctuary program is the extent to which the program will supersede fishery regulations that have been promulgated after long and serious deliberations by those individuals closest to the fishery, namely the members of the management councils. The imposition of regulations by the Secretary under the marine sanctuary program will result in duplicative regulatory authority and additional layers of bureaucracy which are not necessary. Approval by the Secretary, under the marine sanctuary program, of regulations which are more stringent that regulations which may have already been approved in conjunction with FMPs will certainly give credence to the arguments that the marine sanctuary program is a mechanism to override the regional fishery management councils. 1

For these reasons, it would appear to be preferable, in the event a marine sanctuary is designated, to exclude from the designation document any provisions for the regulation of commercial fishing activities. Failure to take such action will do much to support the fishing industry's concern that the program is a mechanism for the overregulation of the commercial seafood industry by the Federal government.

The Institute appreciates the opportunity to comment on this proposal and we look forward to future opportunities to work with the Agency toward the effective protection of marine resources under existing statutory authority.

Sincerely,

Gustave Fritschie

Gustave Fritschie
Director of Government Relations

GF:slw

cc: Bob Jones
Gulf Atlantic Fishery Management Council
South Atlantic Fishery Management Council

NEW YORK ZOOLOGICAL SOCIETY

New York Zoological Park
New York Aquarium

Bronx Zoo
Bronx, New York 10460
Telephone: (212) 220-5100

Center for Field Biology and Conservation
Osborn Laboratories of Marine Sciences

June 17, 1980

Dr. Nancy Foster,
Deputy Director
Sanctuary Programs Office
OCZM
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Dr. Foster:

This letter is in response to your request for comments on the draft environmental impact statement for the proposed Looe Key National Marine Sanctuary (April,1980).

I have submitted numerous statements on the Looe Key Sanctuary in the past from my previous post with Florida Audubon Society. Therefore I will be brief in this missive. 1

My main purpose is to applaud you and your colleagues for advancing the proposal to this penultimate stage. Designation will reflect a tenacious vitality in the Marine Sanctuary Program and a major contribution to American marine conservation; both, reassuring developments.

The only recommendation I will offer is that if the opportunity arises to expand the boundaries beyond the proposed 5 square miles, by all means take it. I am fully aware of the dark controversy that has surrounded the Looe Key proposal in Florida, stemming chiefly from the objections of elements of the commercial fishing community.

However, I have always maintained that a Marine Sanctuary around Looe Key will cause the fishermen only slight inconveniences. The draft EIS appears to substantiate that point. 2

Notwithstanding the objections, the objective point-of-view finds that one cannot conserve too much coral reef; not in the

Archie Carr, Assistant Director
Animal Research and Conservation Center
New York Zoological Society

Response #1

Please see Generic Response #1.

Response #2

Please see Generic Response #3.

waters of continental U.S.A. More of Looe Key will always be better than less.

I will now hazard the projection that commercial fishing for certain species, the spiny lobster among them, will improve following sanctuary designation. My hypothesis is based on two points: 1) Many marine species, like the lobster, are "r" selected. That is their reproductive strategy is to produce very large numbers of offspring (very many more than could conceivably find living space in a 5 square mile sanctuary, for example); 2) Looe Key, if protected from spearfishing and other cropping, will eventually harbor big, vigorous specimens of various vertebrate and invertebrate species. This protected brood-stock may make important contributions to harvestable
3 stocks outside the reserve.

Currently, the intensity of fishing for coral-dependent species throughout the reef tract, combined with the general degradation in quality of the coral habitat, may partly explain the perennial resource shortages commercial fishermen seem to experience. Protecting a piece of the reef, Looe Key, may help restock much of the rest.

It would be worth testing for this effect if for no other reason than to add an ironic footnote to the rugged history of the Looe Key designation.

In the meantime, the Looe Key Sanctuary will become a
4 cherished addition to the protected natural heritage of this country. I strongly favor its designation.

Sincerely,

Archie Carr III

Archie Carr, III Ph.D.
Assistant Director
ANIMAL RESEARCH AND
CONSERVATION CENTER

AC:rg

Response #3

NOAA concurs with your position and believes that the benefits of designating Looe Key Reef as a marine sanctuary include protection of a primary nursery, spawning, feeding area for commercial fish stocks. As other reviewers have suggested it is quite possible that the commerical fishing industry will benefit from designation.

Response #4

No response necessary.

NORINE ROUSE SCUBA CLUB
4708 North Dixie
WEST PALM BEACH, FLORIDA 33407

CZM
REC'D.

July 11, 1980

1980 JUL 22 PM 11:05

MAIL ROOM

Dr. Nancy Foster
Deputy Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D. C. 20235

Subject: Looe Key Marine Sanctuary
Tropical Fish Collecting

Dear Dr. Foster:

The preferred management alternative which would allow commercial tropical specimen collecting at a designated Looe Key Marine Sanctuary and contained in the Draft Environmental Impact Statement prepared by the Sanctuary Programs Office is in direct conflict with specified objectives of the Sanctuary Program and is inconsistent with other preferred regulatory measures for this site.

The DEIS states that prohibiting specimen collecting within the Sanctuary boundary would protect and enhance the tropical fish population at Looe Key, prevent the depletion of ecologically important (cleaner) species, add to the aesthetics of the area increasing diver enjoyment and maintain and enhance the long term productivity of the Looe Key coral reef. It admits that precedents prohibiting collecting have already been set in other federally protected areas, that there are numerous alternative sites available for commercial collectors and economic loss would be minimal. The preferred alternative of the Sanctuary Program, however, is to allow commercial collecting by those commercial enterprises "experienced in collecting" and willing to submit applications for permits.

The Norine Rouse Scuba Club considers this an unacceptable activity within a designated federal Marine Sanctuary and recommends that the Sanctuary Program reconsider its preferred alternative for this activity. Enforcement, regulation and management procedures will not be adequate at this site for some time after designation to adequately permit and understand such a biologically complex commercial enterprise.

Local commercial collectors even without the use of collecting drugs are an efficient lot utilizing a variety of types and sizes of drop and collecting nets. Gas powered air compressors are often used instead of SCUBA, allowing nearly unlimited collecting time in shallow water under good weather conditions which occur at the time of year of an abundance of juvenile reef fishes. Preferred specimens include juvenile angelfishes and butterflyfishes, neon gobies and several species of tropical reef shrimp all known to play an important role

1

E-116

Norine Rouse SCUBA Club

Response #1

Thank you for your comments. The final proposal includes a prohibition on tropical specimen collecting, except by permit for scientific and and educational purposes. Please see Generic Response # 4 for additional discussion.

Dr. Nancy Foster
Deputy Director, Sanctuaries Program Ofc.

July 11, 1980

in the cleaning symbiosis mechanism associated with larger reef fishes and morays. Collectors prefer Looe Key for its easeof relocation, usually clear water and diverse fish and invertebrate populations. Divers working alone or in tandem can easily collect hundreds of specimens in a day of collecting and duplicate this as long as weather conditions and availability of specimens allow. Juvenile and subadult reef fishes are very territorial and upon removing an individual from its niche it is often some time before the specific niche is reoccupied. It is known that a very high percentage of aquarium specimens die within a relatively short time of sale to the often inexperienced aquarist or from poor handling by the collector, further making the collection of specimens for financial gain within a federally designated marine sanctuary a ludicrous activity. The demand for specimens has increased dramatically in recent years and will assuredly continue increasing the number of collectors in the area and the effort expended. Imagine the loss of the aesthetic experience so desired by the Sanctuary Program by the first time Looe Key diver as he observes a commercial collector with a surface air supply, bags of specimens in his belt and nets in hand exploring the fore reef for financial gain. Numerous personal observations have revealed that collecting is a common practice in many areas of the Looe Key reef and because of the ease of collecting many specimens (gobies, damselfishes, brittle stars, urchins, feather worms and crustaceans), the seasonality of spawning by demersal spawners and the recruitment of larvae of pelagic spawners, the requirement of niche availability and the rareness of some preferred specimens, there is little doubt that continuous commercial collecting in a finite area reduces species richness and abundance and alters the community structure of reef fish and invertebrate populations. The long-term impact of removing the many cleaner species is unknown.

1

E-117

The Norine Rouse Scuba Club implores the Marine Sanctuary Program to reconsider the preferred alternative allowing the commercial collecting of tropical specimens at Looe Key and instead prohibit tropical specimen collecting within all boundary alternatives except for scientific and educational purposes with NOAA permits.

Respectfully submitted,

Norine Rouse

Norine Rouse, Director
NORINE ROUSE SCUBA CLUB

NR:ld

Royal Palm Audubon Society, Inc.

Boca Raton, Florida

June 12, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D. C. 20235

Dear Sir:

I have found the Draft Impact Statement on the Proposed Looe Key Marine Sanctuary, as prepared by the Office of Coastal Zone Management, and as received under cover letter dated May 8, 1980 from Mr. Bruce Barrett, Acting Director, Office of Environmental Affairs, to be quite satisfactory.

On behalf of the members of the Royal Palm Audubon Society, I urge acceptance of the conclusions of the Statement without change.

Sincerely yours,

John E. Gardner Jr.

Conservation Committee Chairman
1000 NW 5th Ave.
Delray Beach, Fl. 33444

cc:

Mr. Bruce Barrett, Acting Director, Office of Environmental Affairs, Department of Commerce

Ms. Mary Jane Breton, National Audubon Society

Mrs. Alice Wainwright, Coordinator, Southeast Florida Chapters of the National Audubon Society

Please see Generic Response # 1.

SIERRA CLUB The Florida Chapter

MARINE WILDERNESS

July 6, 1980

Sanctuary Programs Office
OCZM
3300 Whitehaven St., NW
Washington, D.C. 20235

Attn: Dr. Nancy Foster, Dep. Dir.
Ref: Looe Key Marine Sanctuary

Dear Dr. Foster:

As you know, the 4000-member Sierra Club Florida Chapter has officially taken a position of support for the designation of a 5-square-mile Looe Key Reef National Marine Sanctuary. We endorse your preferred alternative in most essential respects and urge that adequate enforcement be provided with regards to the prescribed regulations under your DEIS's preferred alternative.

We had observers at the recent hearings on Looe Key, and were quite appalled at the legal and regulatory ignorance of quite a few of the reviewers that offered verbal comments. Scientists who in their own fields would not even think of uttering a single formal conclusion without exhaustive research and supporting documentation, seemed quite content at these hearings to play amateur legal analysts. On several occassions, we heard these otherwise responsible professionals shoot from the cuff as they maintained, without a single fact to support them, that sanctuary designation for Looe Key was unnecessary -- possibly even wasteful -- in view of the "fact" that adequate and equal protection could and would be provided to the site under other federal regulatory programs.

This is definitely untrue. No other federal or state program can afford Looe Key Reef and its resources the comprehensive, site-specific management and protection which it would receive as a national marine sanctuary. And this is not just our organization's opinion -- it is the formal and official concensus of all professional goverment law analysts.

Your own Looe Key National Marine Sanctuary DEIS summarizes on page 71 the federal/regional agencies and existing regulations to protect Looe Key Reef. We find that only altering of the seabed and discharge of polluting substances currently have an empowered authority and existing regulation. There are currently no existing regulations for Looe Key with regards to coral collec-

P.O. Box 943 / Miami, Florida 33165

Sierra Club, Florida Chapter
Les King

Response # 1

Please see Generic Response #1.

Response # 2

NOAA concurs with your assessment. Please see Generic Response #2 for a discussion regarding the degree of comprehensive protection that can be afforded Looe Key under the marine sanctuary program and the Fishery Conservation and Management Act.

tion, wire fish trapping, lobster trapping, hook and line fishing, net fishing and tropical collecting. We also find that there is no currently existing authority outside the Marine Sanctuaries Program, empowered to promulgate regulations on Looe Key with regards to anchoring, spearfishing, and the salvage and recovery of historical and cultural resources such as the wreck of the H.M.S. Looe.

If Looe Key Reef's resources are to be protected, it must be done through marine sanctuary designation.

Too much emphasis has been placed by certain individuals on the potential scope of protection which might be afforded to Looe Key Reef under the Fishery Conservation and Management Act. In the first place, the FCMA's Fishery Management Plans and enabling regulations cannot be site-specific to the extent required in a marine sanctuary designation. In the second place, FMPs are maximum-yield oriented, not ecology-balance oriented. In the third place, FMPs and their attendant catch quotas are totally subject to annual change and alteration based on commercial yield criteria; they are not coherent, long-term protective measures which can maintain and preserve the entire ecological balance of a particularly valuable reef such as Looe Key.

According to NOAA's Looe Key DEIS:

" No FMPs are being prepared for other resources including numerous species of tropical fish with esthetic but limited commercial value, invertebrates, and other species which are interrelated in the ecosystem."

"The effectiveness of the (Fishery Management) draft plans to mitigate the adverse physical and ecological impacts of commercial and recreational fishing on the Looe Key reef cannot be assessed at the present time. However, it should be noted that there are distinct differences between managing fisheries for commercial development and managing an ecological system for the protection and maintenance of a coral reef with emphasis on enhancing public awareness and wise use of reef systems, public education, research and assessment..."

" In addition to these more direct threats, the disposal of sewage and trash, primarily by recreational boaters, could threaten the resources. These threats are not considered in any FMP and regulation under other laws is limited..." (all quotes, p. 72).

If comprehensive protection is to be given to the Looe Key Reef site, it can't be done through FMPs -- a marine sanctuary must be designated.

Almost no reviewers have commented on the archeological resources which would be protected on Looe Key via a marine sanctuary designation. NOAA's Looe Key Reef Resource Inventory reveals on page 33 that there are at least 5 shipwrecks already pinpointed and accounted for on Looe Key Reef. Most noteworthy is the wreck of the HMS Looe, which went down in 1744. The accessibility of the wreck's artifacts are supported by the following quote from the Inventory (page 33):

" The wreckage of the H.M.S. Looe herself lies to the southwest of the current marker post in 4.5 to 9 m of water... When Ed Davidson examined this site in company of a State of Florida underwater archeologist in the summer of 1977, hand fanning revealed fragments of flint, pieces of the original oak timbers, and some corroded iron fastenings...under only 18 inches of sand."

These archaeological resources, in such shallow depths, provide a great and unique situation for visitor and student observation and study. This is clearly under the programmatic objectives and sanctuary categories established for the Marine Sanctuaries Program. And these resources can only be adequately protected through the Marine Sanctuaries Program. (DEIS, p. 71, 72).

Finally, recent reports promulgated by the Congressional Research Service (and in particular, its Law Division) clearly show that the scope and type of protection which a marine sanctuary designation would provide for Looe Key Reef cannot be adequately duplicated by any other federal statutes or combinations of statutes.

In a December 5, 1979 report, the Congressional Research Service has found "...several respects in which the Marine Sanctuaries Authority is unique. These unique benefits divide into (a) coverage of specific environmental impacts not directly regulable under other authority, and (b) other benefits." (CRS, p. 27).

Further study of the above mentioned CRS report reveals that: "The Marine Sanctuaries Authority of MPRSA Title III permits a holistic approach to management of defined marine areas that is not readily atainable through resort to statutes focusing on specific environmental impacts...Research reveals a variety of respects in which the marine sanctuaries act appears to offer environmental protection benefits not directly achievable through other Federal statutory authorities." (CRS, p. 34).

The above is the official position of Congress' top law analysts and researchers; not the opinions of unqualified amateurs who seem to think that their eminent expertise in totally unrelated fields make them experts on federal statutory authority.

Response # 3

NOAA agrees that the HMS Looe is noteworthy and that the marine sanctuary program offers a means of adequate protection. Please see the response to the testimony of Dr. Duncan Mathewson at the Key West Public Hearing.

Response #4

Please see Generic Response #3 which discusses the desirability of sanctuary designation for Looe Key.

Independent of the above report, the Natural Resource Policy Division of the Congressional Research Service produced its own report on February 14, 1980. The findings just as conclusively show that the only way to protect Looe Key Reef's unique resources and site is to designate it as a national marine sanctuary. Here is that report's conclusion:

" The marine sanctuaries provision is an environmental protection law that offers a positive approach to the protection of marine areas of recognized importance. It is a multiple-use provision that was designed to protect a site, rather than stop certain activities or eliminate adverse impacts. As demands on the marine environment increase, the need to protect highly valued sites will also increase...Without the sanctuary provision, sites could only be protected indirectly (and probably less completely) through a maze of federal programs... one could easily conclude that the long-term protection or restoration of marine sites for conservation, recreational, ecological or aesthetic values without the direct approach of a sanctuary program is likely to be more difficult." (p. 12-13).

We don't believe that, after the above, there is anything left to be said. Looe Key Reef is a uniquely valuable marine site of recognized importance which is in need of a positive protection approach which will, in the long-term, safeguard and restore the reef's unique assets and resources for the purposes of MSA's recreational, ecological and educational programmatic objectives. Marine Sanctuary designation fits Looe Key Reef to a T, and should be implemented without further delay or further question.

Thank you very much for your attention.

Sincerely,

Les King (as)

Les King, Chairman
Sierra Club Florida Chapter

OCZM
REC'D
1980 JUL 22
MAIL ROOM

SIERRA CLUB Miami Group
P.O. BOX 430741 Miami, Florida 33143

July 7, 1980

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office
OCZM
3300 Whitehaven St., N.W.
Washington, D.C. 20235

Ref: Looe Key DEIS Comments

Dear Dr. Foster:

The Sierra Club Miami Group and its 800 individual members fully support the designation of a 5-square-mile area of Looe Key Reef as a National Marine Sanctuary. This unique and valuable reef offers precious opportunities for recreation, education, research and ecological conservation which cannot be matched by other reefs in the lower Florida Reef Tract. To safeguard and maintain the reef resources which make these opportunities possible, a marine sanctuary must be designated in the area to deal, on a site-specific basis, with the human impact and visitation now being experienced at Looe Key Reef.

During the recent set of hearings on the Looe Key marine sanctuary proposal, some reviewers contended that it is the creation of the sanctuary which would bring about the damaging human impact to the reef. The implied conclusion of these reviewers is that Looe Key is best left alone, so that human impact won't happen. We are hereby formally pointing out that this is a glaringly erroneous argument which must not be allowed to interfere with the designation of a Looe Key National Marine Sanctuary.

NOAA's own "Looe Key Reef Resource Inventory" points out that " This resource...will come under ever increasing stress by a growing local population as well as a growing flow of tourists... Visitation pressure on reefs in the northern sector of the reef tract is increasing...It is reasonable to expect that overflow from this area will impact the reefs of the Lower Keys. In addition, the shallow nature of much of the Looe Key reef system predisposes it toward utilization by a broader spectrum of sport divers than other, deeper reefs. Consumptive users of the reef tract's resources, facing restrictive management regulations in

Response #1

Please see Generic Response #1.

Response #2

The text has been expanded to incorporate your suggestions.
The estimated $250,000 income reported by charter dive boats is total gross revenue from Charter boat services. Estimated passengers on these charter operations was 7500, not 17,858 for 1978 based on onsite survey questionnaires. Costs to private individuals with their own boats is obviously less than if they chartered boats to take them to the reef----hence the $16.50 combined value. (The estimate of $14.17 has been changed in the FEIS to $16.50, See page C-11). Combining the 7500 commercially transported divers with an average of 15,000 private divers using their own transportation, and adding the 5,500 per year from students at Newfound Harbor Institute as you have suggested, the diver/snorkeler load for 1978 would have been 28,000.

the Upper Keys protected areas (Biscayne National Monument, Key Largo Marine Sanctuary, and John Pennekamp Coral Reef State Park) will undoubtedly be forced to increasingly exploit the resources of the Lower Keys." (quoted from page 41-42)

Consider the implication of the statement above in light of the promotional publicity and advertising which is already appearing in national and local media. Attached to this letter, you will find copies of several publicity articles and dive shop advertisements geared to attract ever increasing visitor traffic to the Looe Key area. The meaning of all this promotion is inescapable: Looe Key Reef is facing "imminent development" and thereby clearly qualifies for inclusion and protection under the marine sanctuary system.

The visitation and human impact level on Looe Key Reef already is very great, particularly when you consider the reef's small geographic area. NOAA's Looe Key National Marine Sanctuary DEIS points out that there are already 100 commercial fishing boats (page C-3) and 6 dive shops (page C-2) utilizing Looe Key Reef.

Even without counting the anchoring and sewage impact of sport fishing and commercial fishing boats on Looe Key, we find the following:

Chartered boat divers to Looe Key.....17,858 per yr.
(Based on $250,000 yearly dive boat revenue from p. C-5 divided by $14.17 avg. dive cost from p. C-11)

Private boat divers to Looe Key.....14,377 per yr.
(Based on averaging low and high estimates, 9694+19061, from p. C-11)

New Found Harbor Marine Institute visits..... 5,500 per yr.
(Based on student load from p. C-10 and assuming <u>only</u> an average of <u>ONE</u> reef visit per student during stay)

CURRENT DIVE/SNORKELER LOAD..... 37,735 per yr.

The conclusion is clear: Looe Key Reef has already been discovered and is now under escalating development and human impact. This rate of visitation and impact is not only going to be maintained; it is going to increase due to promotion, advertising and word of mouth. This visitation and human impact is site-specific; therefore, <u>only</u> the designation of a Looe Key National Marine Sanctuary can deal with it and protect Looe Key's resources (Congressional Research Service Natural Resource Policy Division Report of February 14, 1980, pages 12-13)

Respectfully,

Marie-Therese Delate

Marie-Therese Delate
Group Chair

Tropical Anglers Club
6720 SW. 39 Terrace
Miami, Florida

July 14, 1980

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office - OCZM
3300 Whitehaven St., N.W.
Washington, D.C. 20235

re: Looe Key Reef

Dear Dr. Foster:

1 Through this letter, the Tropical Anglers Club joins the many other organizations that have already endorsed the creation of a 5-square-mile National Marine Sanctuary on Looe Key Reef. We believe that this reef's combination of resources and opportunities for human activities is unique in the Florida Keys and in imminent threat of enduring damage if not protected under the Marine Sanctuaries Act.

We wish to emphasize that under no circumstances should the use of wire mesh fish traps be permitted in any portion of the designated Sanctuary.

E-125

The state of Florida has finally moved by action of the Legislature to ban the use or possession of wire-mesh fish traps within the waters of South Florida. The Reef Fish Management Plan of the Gulf of Mexico Fishery Management Council advocates in its latest draft a ban on the use of wire-mesh fish traps within a designated "stressed area" which includes the Lower Florida Keys out to the 100-foot depth line. Overwhelming scientific evidence clearly indicates that this same prohibitive attitude should be extended to protect all depth zones to be included within the Looe Key National Marine Sanctuary.

2 We include with this letter the latest data available from a state of Florida Department of Natural Resources survey study on wire-mesh fish traps, which was conducted by accompanying fish trap operators during regular operations. This data clearly shows that:

(a) 45% of all fish caught in wire mesh fish traps are not marketed because they are not food fish.
(b) 35% of all fish caught in wire mesh fish traps are "grunts."
(c) Not counting groupers, the average weight of the food fish caught by wire mesh fish traps is <u>less than one pound per fish!</u>
(d) At least 30% of all fish caught by wire-mesh fish traps are tropical reef fish.
(e) Out of seventy seven different fish species caught by the wire mesh fish traps in this study, only fifteen species (19%) were considered to be food fish.

The use of these wire mesh fish traps has a disastrous effect on

William A. Moore

Response # 1

Please see Generic Response #1.

Response #2

The latest information from the Florida Department of Natural Resources survey study on wire mesh fish traps has been incorporated into Chapter Four of the FEIS, Environmental Consequences, Regulatory Alternatives for Wire Trap Fishing.

2 the size distribution of reef fish populations. The traps are non-selective and capture all reef species. Juveniles are caught in abundance by the traps. The combined effect of these factors is to decimate marine fish stocks -- a condition which is utterly intolerable in a marine sanctuary. How is Looe Key Reef to fulfill research and public education objectives of the marine sanctuaries program if the fish populations are seriously affected by this indiscriminate overharvesting technique. What can the quality of a recreational diving experience on Looe Key be if its tropical fish and other species are overharvested and overstressed by fish trapping?

3 This "diving experience" mentioned above must be considered an integral and essential component of the Looe Key Reef marine sanctuary nomination. Research, educational and recreational objectives cannot be properly attained if diving observation of the reef and its inhabitants is not freely possible. There is ample evidence in the experience of the Key Largo Marine Sanctuary and Biscayne National Monument to definitely establish that the actual impact of even tremendous numbers of diving observers is minimal -- even on a small, limited site such as Molasses Reef in Pennekamp. Any evidence of impact on such reefs is attributable to improper anchoring techniques and not to the divers themselves.

4 However, diving observation and spearfishing are for the most part antagonistic. Fish are not all that stupid. The continued presence of spearfishermen on a reef site teaches the reef's inhabitants to consider human divers as dangerous predators to be avoided. Thus, just the splash of a diver's entry will send schooling species out into the open water, drive groupers and other such species into caves to hide, etc. Similarly, tropical fish collection will teach those target species to stay out of sight any time any divers are in the water. This situation would definitely interfere seriously with the research, education and recreation intents of a Looe Key Reef marine sanctuary designation. Observer divers should be free to explore all areas of a Looe Key Reef National Marine Sanctuary; but spearfishermen and tropical fish collectors should be kept out as contradictory to the sanctuary's purposes.

5 The same is not true of the line fisherman. This harvesting technique does not in any way incorporate the negative aspects of spearfishing or tropical fish collecting. No matter how many line fishermen ply a reef, the fish never develop a fear of humans in thewater. Line fishing has absolutely no impact on tropical species and almost no impact on juvenile fish either. Finally, the taking by line of larger predators such as grown groupers is self-limiting; as more groupers are taken, a greater food supply is naturally left for those that remain thereby making them less and less interested in the angler's offered bait.

6 The Tropical Anglers Club hopes that your office will agree with the observations made above. And we urge you to move on the Looe Key National Marine Sanctuary designation without delay.

Sincerely,

William A. Moore, President

Response #3

No response necessary.

Response #4

As you will note, the DEIS proposed prohibiting spearfishing within the sanctuary and the final proposes to prohibit tropical specimen collecting as well. Please see Generic Response # 4 for a discussion of this change.

Response # 5

Please refer to response #1 , the J. Connor Davis letter.

Response # 6

No response necessary.

Tropical Audubon Society, Inc.
5530 SUNSET DRIVE
MIAMI, FLORIDA 33143

June 17, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, NW
Washington, D.C. 20235

Dear Sir:

1 Tropical Audubon Society, representing over 3,000 residents of Dade County, strongly supports the designation of Looe Key Reef as a marine sanctuary under Title III of the MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT (PL92-532).

2 The proposed boundary of the sanctuary and the proposed rules for regulation of the sanctuary (as described in Appendix A of the Draft Environmental Impact Statement) are satisfactory.

3 However, we do question the figures on p.65 of the document concerning Commercial Fishing and Recreation. The amount for Commercial Fishing seems to be grossly overestimated, while that for Tourism underestimated. It is clear to all who live in South Florida that this area is far more important for tourism (diving, snorkeling, etc.) than for commercial fishing.

In general, the Draft Environmental Impact statement is a well written, informative document. We support its recommendations and hope to see the sanctuary established as soon as possible.

Sincerely,

R. L. Kelley
MR

R.L. Kelley, President

cc: Bruce Barrett, Acting Director, Office of Environmental Affairs, U.S. Dept. Commerce
Alice Wainwright, Coordinator, S.E. Florida Chapters National Audubon Society
Ed Davidson, President, Florida Keys Audubon Society
Charles Lee, Vice President, Conservation Florida Audubon Society

CONSERVATION IN ACTION IN SOUTH FLORIDA
305 666-5111

R.L. Kelley
Tropical Audubon Society, Inc.

Response #1

Please see Generic Response # 1.

Response # 2

Most of the sources interviewed during the preparation of the DEIS agreed that the target user group at Looe Key combines snorkelers, SCUBA divers and recreational fishermen. However, the importance of this sector of the economy and the value of their activities were difficult to quantify. The questionnaires that were intended to gather information on commercial dive boat operations went largely unanswered. The economic values from the commercial fishing questionnaires, although higher than the Monroe County average, were within the range of probability and appropriate for general economic analysis purposes (see Chapter Three, Section C. Looe Key Onsite Survey).

Response # 3

No response necessary.

Tropical Audubon Society, Inc.
5530 SUNSET DRIVE
MIAMI, FLORIDA 33143

July 14, 1980

CZM
REC'D.
1980 JUL 19 AM 12:43
MAIL ROOM

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office
OCZM
3300 Whitehaven Street, NW
Washington, D.C. 20235

Dear Dr. Foster:

1 As expressed during the recent public hearing in Miami, the Tropical Audubon Society and its 3,000 members are in strong support of marine sanctuary designation for a 5 square-mile area of Looe Key Reef. Ample evidence has been submitted demonstrating the unique character of Looe Key Reef and the opportunities it offers for recreation, research and education within the meaning and spirit of OCZM's programmatic objectives for marine sanctuaries.

2 We noted at the Miami public hearing criticism of the sanctuary nomination on the grounds that the Looe Key Reef site was too small to be of significance. It was also suggested that the site's relative smallness made it too susceptible to total obliteration of the sanctuary by some unspecified natural catastrophe.

We disagree very vigorously with these contentions, and consider them to be not supported by the actual conditions on Looe Key Reef and by the actual parameters of the sanctuary nomination.

It is certainly true that Looe Key Reef is a comparatively small reef. But it is precisely a relative scarcity which makes special sites such as Looe Key unique and particularly qualified for inclusion in the marine sanctuary program.

In the words of your office's own Looe Key National Marine Sanctuary Draft Environmental Impact Statement,

> " The Looe Key area represents one of the few remaining living sections of the Florida Reef Tract which includes portions of Patch Reefs, a Reef Flat, Fore Reef, Deep Reef and Deep Ridge in a small, manageable unit which allows for a focus on public education and research aimed at a better understanding of reef dynamics." (p. 4, emphasis added)

CONSERVATION IN ACTION IN SOUTH FLORIDA
(305) 666-5111

1. Please see Generic Response #1.

2. NOAA has used the information that you provided in developing Generic Response #3. Please see that response.

As explained above, the smallness of the area in which Looe Key displays a cross section of reef zonation is precisely one of the factors making it uniquely suited for research, education and the attendant programmatic objectives of the Marine Sanctuaries Office.

The compactness of reef zonation on Looe Key also makes it especially valuable in terms of the Marine Sanctuaries Program's recreational programmatic objective. In terms of esthetics and visitor attraction, the most uniquely outstanding feature of Looe Key is, according to the Looe Key Reef Resource Inventory:

> "The Fore Reef zone of Looe Key (which) is a well developed and especially spectacular formation. Its main portion is a high profile spur groove system, bordering the Reef Flat in very shallow water..." (p. 13)

It is the extreme proximity of these spectacular formations to a very shallow Reef Flat which makes Looe Key "...ideal for recreational uses by both amateur and experienced individuals." (Looe Key DEIS, p. 4).

Aside from the above, Looe Key Reef is biologically significant and qualified for marine sanctuary status because of its superior coral species diversity. (Looe Key Reef Resource Inventory, p. 37-38) This diversity is due at least in part to the particularly privileged geographical position enjoyed by Looe Key Reef. Sheltered from colder Florida Bay waters by the large land mass of Big Pine Key, Looe Key Reef offers corals a more stable water temperature range and conditions for frowth than surrounding areas in the Lower Florida Keys. These conditions existed in a "large" ocean area throughout the Lower Florida Keys, then Looe Key Reef would not be special.

In conclusion: the smallness of Looe Key Reef is a function of its uniqueness with regard to coral species diversity, reef zonation distribution and human opportunities for recreation, research and education.

To safeguard these unique attributes, we concur with the National Audubon Society Research Station in Islamorada in their findings that a 5 square mile boundary option is both necessary and sufficient to maintain a viable sanctuary. This is true, not only in terms of maintaining the integrity of the sanctuary, but also in terms of providing sufficient protected habitat and spawning areas to lend stocking support to the surrounding stressed zone (which is part of the defined "stressed area" delineated in the Draft Reef Fish Management Plan of the Gulf of Mexico Fishery Management Council).

At this point we must emphasize that Looe Key's smallness does not in any way prove it to be more vulnerable or susceptible to a natural disaster than a larger area. In fact, the exact opposite might be more

indicated.

We have already commented on the temperature stabilizing effects of Looe Key Reef's geopraphical location opposite the large land mass of Big Pine Key. This makes Looe Key Reef more potentially resistant as a whole to winter cold coral kills than the other reefs in the Lower Florida Keys.

In the case of hurricanes and storms, the very shallow Reef Flat could act as a protective buffer for the Patch Reefs of Looe Key, thus minimizing damage to the corals in this sector when compared to other reefs in the general region.

Finally, the primary esthetic and recreational Fore Reef Zone is primarily composed of the most massive and storm resistant of coral species. From the Looe Key Reef Resource Inventory:

2 "...the most important, certainly the most spectacular part of the Looe Key Reef....show(s) a profile here of up to 7 m high, caused mainly by the vigorous construction activity of the "mountainous" star coral Montastrea annularis. This species builds buttresses of 2 to 3 m in diameter and 4 to 5 m from top to bottom...On top of the spurs, Montastrea annularis is still represented in boulders of 1.5 m to 2 m in diameter, accompanied by similar sized specimens which are primarily brain corals such as Diploria strigosa and Calcophyllia natans. Due to the massive nature of the reefbuilders in this subzone, there are few holes in the reef framework..." (p. 12)

The Sanctuary Programs Office does not need to be overly concerned with what nature may inflict on a designated 5 square-mile Looe Kay National Marine Sanctuary. The true potential for disaster lies in what humans may inflict upon Looe Key Reef if it is not protected under the Marine Sanctuaries Program.

Sincerely,

Robert L. Kelley

Dr. Robert L. Kelley
President

Upper Keys Citizens Association

P.O. Box 1044 • Tavernier, Florida 33070

CZM
REC'D.
1980 JUL 22 PM 11: 59
MAIL ROOM

July 12, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N. W.
Washington, D. C. 20235

Dear Sir:

Please see Generic Response # 1.

This letter will serve to express the feelings of the members of the Upper Keys Citizens Association in regard to the designation of Looe Key in Monroe County as a Marine Sanctuary. We are an organized group of some 500 Keys citizens who are vitally interested in preserving the "quality of life" in the Keys.

The public hearings that have been held so far on this project have been dominated largely by a very vocal minority of persons consisting of local commercial fishermen. From an economic standpoint, they contribute a very small percentage to the total tourist related income of the county.

The vociferous objections of this small, special interest group, completely ignore the fact that Looe Key lies in federal waters, outside of state and local jurisdiction. It is the province and public heritage of all Americans. The objectors tend to dislike any type of regulation of fisheries and marine areas. Their major objection seems to be based on the fear that once a Sanctuary is established, it will immediately expand to take in the entire reef area from Key Largo to Dry Tortugas.

It is a little difficult to understand just why this small group of objectors is so intensely interested in this extremely small patch in the Atlantic. We have heard it said, "It is a BIG ocean," - they could do their fishing elsewhere. On the other hand, this is a spot that draws tens of thousands of divers and viewers who cannot find this beauty elsewhere.

It is unfortunate that this matter comes before our County Commission in an election year. Any expression of the feelings of some of those Commissioners up for re-election, is likely to be made with one eye on the ballot box. This fact should be kept in mind.

Our preference is for the 4.9 square mile area shown as No. 2 on page 23 of the April, 1980 Draft Environmental Impact Statement of the Office of Coastal Zone Management. Whichever area is selected, we urge it be designated as soon as possible.

Sincerely,

Ken Durr

Ken Durr
President

KD:gk

cc:Mr. Bruce R. Barrett
Office of Environmental Affairs
Room 3425
U. S. Dept. of Commerce
Washington, D. C. 20230

RESOLUTION IN SUPPORT
LOOE KEY REEF MARINE SANCTUARY

WHEREAS, Looe Key Reef, in the waters off the Florida Keys, supports endangered and valuable marine life in one of the most diverse and biologically productive coral reef communities in the entire Florida Reef Tract, and

WHEREAS, the aesthetic, recreational, research and ecological values of Looe Key Reef are valuable socio-economic resources which are under increasing stressful pressure that must be alleviated by a site-specific program able to provide comprehensive management within the reef's geographically defined area,

NOW, THEREFORE, be it hereby resolved that Looe Key Reef should be designated as a marine sanctuary area under Title III of the MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT (P.L. 92-532),

Please see Generic Response # 1.

THAT the marine sanctuary area should, within its five square miles, adequately include representational sections of all reef zones and provide an essential buffer zone between the main reef sector and the unregulated-activity areas outside the sanctuary,

AND THAT comprehensive sanctuary regulations should be implemented to maintain and restore an essentially natural condition and ecological balance on the Looe Key Reef Marine Sanctuary.

ADOPTED by organizational vote on _____.

THE FOLLOWING ORGANIZATIONS SUBMITTED THIS RESOLUTION IN SUPPORT OF THE LOOE KEY MARINE SANCTUARY:

Harlan B. Herbert, Conservation Chairman
Lake Region Audubon Society
P.O. Box 2471
Lakeland, Florida 33803

Kenneth Flowers, President
Friends of the Lower St. Johns Inc.,
P.O. Box 1401
Orange Park, Florida 32073

R. Skinner, President
Isaak Walton League-Mangrove Chapter
175 Fontanblew Blvd.
Miami, Florida 33172

Franklin B. Adams, President
Cypress Chapter Isaak Walton Legue of America
4272 19th Place S.W.
Naples, Florida 33999

Foundation for Pride, Inc.
P.O. Box 5232
Miami, Florida 33143

Steve Huff, President
Florida Keys Fishing Guides Assn.
Box 936
Islamorada , Florida 33036

Gerald O. Grow, Acting Chairman
Big Bend Group/Florida Chapter/Sierra Club
1405 Colonial Drive
Tallahassee, Florida 32303

Dr. Arnfried Antonius, Scientific Director
Florida Reef Foundation
P.O. Drawer 1468
Homestead, Florida 33030

Alexander Stone, Marine Conservation Chairman
Sierra Club Florida Chapter
1414 Hilltop Drive
Tallahassee, Florida 32303

Norine Rouse, Director
Norine Rouse Scuba Club
4708 North Dixie
West Palm Beach, Florida 33407

Periwinkle Alliance
P.O. Box 1009
Fernandina Beach, Florida 32034

R. Goldston, DVM, President
Marine Mammal Foundation
3258 5th Avenue
St. Petersburg, Florida

W. Lee Morris, President
Underwater Society of America
Box 513
Christiansted, St. Croix USVI 00820

Key Biscayne Anglers
15 Harbor Drive
Key Biscayne, Florida

Everglades Protection Association, Inc.
P.O. Box 216
Islamorada, Florida 33036

Allen Lowrie, President
Save the Bay, Inc.
Bay Saint Louis,
Mississippi 39520

Ann Ramus, Research Team Leader
Dade Marion Inst.
4400A Rickenbacker
Miami, Florida 33149

H. Jeff Cutler, President
Environmental Law Society
Holland Law Center, University of Florida
Ginesville, Florida 32604

Mary Jan Neale, Camp Director
Camp Wesumkee
Route 1 Box 781A
Big Pine Key, Florida

Islamorada Charter Boat Assn.
P.O. Box 462
Islamorada, Florida 33036

Layton Kiwanis Club
P.O. Box 763
Layton, Florida 33001

Jack Klienberg, Chairman
Volusia Flagar Sierra Group
3116 Jon Anderson Road
Ormond Beach, Florida

James D. Martin, President
National Association of Retired Federal Employees
28501 S.W. 152 Ave., Lot 266
Homestead, Florida 33033

Mary Delate, Chairperson
Sierra Club-Miami
P.O. Box 430071
South Miami, Florida 33143

Capt. James W. Baumiester, President
Marathon Guides Assn.
P.O. Box 2446
Marathon Shores, Florida 33032

Donald I. Roskin
Sarasota County Sportsman's Club
P.O. Box 44
Sarasota, Florida 33577

1315 Border Dr.
Winter Park, FL 32789

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., N.W.
Washington, D.C. 20235

Dear Director:

This letter is to urge you to declare Looe Key reef, off the lower Florida Keys, a National Marine Sanctuary. Due to misuse of our oceans, there are very few living reefs remaining in the world. It is our responsibility to insure that the ones remaining will be preserved for the future.

We have become aware that a few fishermen and oil companies, with only personal monetary gratification in mind, have frustrated efforts toward sanctuary status for Looe Key. These special interest groups are motivated by greed and selfishness, without thought for the result of their actions. Someday we may need places like Looe Key to provide breeder fish for parts of the ocean depleted of fish by commercial fishermen or oil spillage.

At this time boaters and fishermen anchor directly on the coral, breaking it irreparably, due to ignorance or irresponsibility. The damage being done may never be rectified unless steps are taken now. There is no protection for this area other than that provided by concerned divers and dive boat captains. With sanctuary status the area could be patrolled by the U.S. Coast Guard and the Florida Marine Patrol to insure that the reef is not abused.

We strongly urge you to consider the future now and to avoid the danger of waiting until hindsight suggests you should have acted sooner. Please do not allow the special interest groups to win this issue and continue their destruction of this important coral reef.

Sincerely,

Frankye Wilkerson
Jeannie Goluba
Christine Ainsworth
Beatrice Kelly
Rose Renda
Julie Moore
Susan J. Arbaugh
Pat Alpiste
June Hutel
Robert L. [illegible]
Carolyn J. Crews
Connie E. [illegible]
Georgia G. Williams
Evelyn Jennings
Catherine Thompson
Jane Tapia
Jean Gardner
Glenna Correll
Virginia [illegible]
[illegible]
[illegible]

Please see Generic Response # 1.

July 1, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., N.W.
Washington, D.C. 20235

Ref: Looe Key Proposed Marine Sanctuary

To Contact Person and Mr. Bruce R. Barrett:

We, the undersigned, who live on Little Torch Key, are definitely against the Proposed Looe Key Marine Sancuary. It would serve only a very few who are interested in underwater marine life and would limit the fishing ground of many people who come here and live here. The fishermen and lobstermen of the Keys would also be hurt by the proposed sanctuary, and they are a great part of the economy of the Keys. Therefore, we definitely would and do vote against the above proposal.

Sincerely,

Hazel A. Collins, Rt. 2 Box 849F Summerland Key Fla 33042
Capt John A. West Rt. 2, Box 849-B. Summerland
Bernard J. Morin RT4 Box 880 Key Fla 33042 Summerland
Albert H. Morin RT4 Box 880 Key 33 04.
Michael Dwyer Box 850 RL Summerland
Neil Sullivan Box 850 RL Summerland
Pete Davern Box 850 RL Summerland

Please see Generic Response #2.

Karen Leialoha Achor

116 S. Bay Harbor Drive
Key Largo, Florida 33037
(305) 852-9348

June 18, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Stree, N.W.
Washington, D.C. 20235

Please see Generic Response # 1.

Dear Sir:

I would like to urge you to declare the LOOE KEY reef in the Lower Florida Keys a Marine Sanctuary. I believe that it is necessary to protect the reef and to alert the public for the need to protect re maining reefs or areas of high ecological value.

I also think that it is important for the Marine Sanctuaries program to declare this area a sanctuary without further delay.

Local objections can always be expected and are short-sighted and selfish. For the good of the general public and the sanctuaries program, I urge you to finally and quickly declare LOOE KEY NATIONAL MARINE SANCUTARY.

Sincerely,

Karen Achor

Karen Achor

Please reconsider placing Looe Key in the status of a Marine Sanctuary. We do not need nor do we want this sanctuary which will only serve a select few in this area. Why Looe Key and not the whole Reef? Mr. & Mrs. J. S. Baker

Response #1

Please see Generic Response #2 & 3.

Box 132,
Big Pine Key,
Fla., 33043

Hon. Dante Fascell,
Senate Office Bldg.,
Washington, D.C.

Dear Mr. Fascell,

1 Enclosed is a newspaper article from last nights' Key West Citizen. I have circled some of the pertinent parts and commented on them except for one which is the taking of coral from this area. We already have a coral act on the books and this is already protected, as was pointed out by Mr. William Causey of Big Pine. I am tired of paying out tax dollars for this assinine study or that assinine study and having them overlap and repeat themselves. I am not in favor of this preserve because I think it will serve only a few who think that this area is their private domains. I am tired of being chased off islands and sandy beaches by young people who think that because they attend one of these teaching establishments, that they own them all. I certainly feel that I will be chased from Lone Key by these same interests, when and if this proposal goes into effect, and that once they have this preserve they will enlarge it to include Newfound Harbor, and Pine Channel and God knows where else. My family and I are not fisherman so we do not have that axe to grind. My soapbox is very large and getting larger every day. You will be hearing from me more often about other things. I felt very bad to hear so

2 many men, veterans of WWII and Korea, even Viet Nam stand up and say that they no longer trusted our government. How sad! I fear that Krushev was right when he said the Russians would bury us from within. Attitudes like this make their job much easier. If you are not familiar wth this Lone Key project won't you take a few moments to see what you can do for the rights of the majority-the premise on which this country was founded. Thank you.

Sincerely,

(Mrs.) Jerome S. Baker

3 P.S. I would like to know why they selected just Lone Key and not the whole reef? Is it because it is so conveniently located?

E-139

Response # 1

Thank you for your letter. Please see Generic Response # 2.

Response # 2

A number of administrative and legal constraints are placed upon NOAA that prevents us from expanding the boundaries of the sanctuary. If it is enlarged, NOAA must go through the entire designation process which includes substantial public notice and input, and the issuance of draft and final environmental impact statements. If the sanctuary is designated management will included maximum public involvement through advisory panels, workshops, and formal and informal lines of communication. The public should be able to feel a part of sanctuary management since national public benefit is a program objective.

Response #3

Please see Generic Response #3.

4/24/80

Dear Director:

I feel as through LOOE KEY reef off the lower Fla. Keys should have National Marine Sanctuary status. I hope you agree

Mary Grace Bruce

Please see Generic Response # 1.

Walter S. Boardman
5663 ROGERS AVENUE
PORT ORANGE, FLORIDA 32019

May 30, 1980

COMMENTS OF WALTER S. BOARDMAN UPON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT UPON THE PROPOSED LOOE KEY NATIONAL MARINE SANCTUARY

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Mr. Director:

The above cited document has been read with deep interest. Those who prepared it are to be commended for their excellent work. Furthermore, the "Preferred Alternative" presented in Chapter 2 with the specific preferred alternatives as follows are supported:

1 D. 1. Coral Collecting (2.)
D. 2. Wire Trap Fishing (3.)
D. 3. Lobster Trapping (3.)
D. 4. Tropical Marine Specimen Collecting (2)
D. 5. Spearfishing (3.)
D. 6. Historic and Cultural Resources (2.)
D. 7. Discharges (3.)
D. 8. Anchoring (4.)

2 I favor, under C. "Preferred Boundary Alternatives" (3.), 10 square nautical miles. My basic reason is that the larger area provides a buffer zone. It will be less easy for violators to claim error in location. Also, We NEED the larger area.

3 There is also a question in mind about the exceptions for scientific and research collections. I have observed some respected scientists getting carried away in their enthusiasm and especially for 'trade' purposes. This, however can be controlled by the permit system.

4 It is also very good to note that a protective patrol is included in the recommendations.

Again, a marine sanctuary is needed and the proposal is EXCELLENT.

Walter S. Boardman

Note: The writer was Executive Director of The Nature Conservancy from 1960 to 1965 and has been active in environmental matters since that time.

Response #1

Please refer to Generic Response #1. In reference to the comments on the proposed preferred alternative changes have been made in the anchoring and tropical marine specimen collecting regulations. The FEIS proposes to prohibit anchoring on coral on the Fore Reef and encourage sand anchoring in the sanctuary and to prohibit tropical marine specimen collecting throughout the proposal area without a permit for scientific or educational purposes. Please see Generic Response #4.

Response #2

Please see Generic Response #3 for a discussion of the proposed sanctuary boundary.

Response #3

NOAA is aware of the potential problems associated with scientific and educational research permits. All efforts will be made to ensure adequate monitoring of sanctuary research.

Response #4

NOAA has initiated consultation with the U.S. Coast Guard for arrangements to insure special attention to the Looe Key area should it be designated as a sanctuary. An on-site presence will be required and arrangements will be made to that effect.

6392 S.W. 39th Terr.
Miami, Florida 33155
(305)-665-6023
17 June 1980

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D. C. 20235

Dear Dr. Foster:

1 The following recommendations are being submitted concerning the Looe Key Marine Sanctuary. I am in favor of the sanctuary and find most of the recommendations satisfactory. I feel qualified to comment having utilized Looe Key Reef continuously since 1960. Recently I have accumulated hundreds of hours of research time at Looe Key Reef and in the surrounding area while conducting doctoral research on reef fish ecology. I have successfully completed my M.S. and Ph.D. at the University of Miami in marine ecology.

E-142

2 1. I recommend that the regulation prohibiting collecting chemicals under any circumstance be modified so that use of chemicals can be allowed with a NOAA permit. I would expect such use would be for scientific research and should be decided on a case by case basis. I would not anticipate many such requests. Certain scientific projects demand the use of collecting chemicals. Despite popular belief, collecting chemicals can be used with no significant impact on the reef system. An example is my research in which it was necessary to remove some resident individuals in order to measure the resiliency of the coral reef fish community. Without stressing the community such questions can not be scientifically asked or answered. Certainly our understanding of community resiliency is an important factor in properly monitoring and managing coral reef habitats. The point is that in some cases the use of chemicals is justified. Chemicals should be allowed in cases where the potential knowledge gained will more than offset any short term damage to the reef. It is foolish to capriciously cut off any chemical usage, especially in a marine sanctuary where the community is most closely similar to natural ecosystems. The banning of chemicals may cost the loss of valuable scientific opportunity.

3 2. I would like to emphasize the importance of allowing collecting with the use of permits for scientific and educational purposes. This policy recognizes that there are cases where the benefits of collecting far outway any detriments. In fact, to properly manage and monitor the reef some collecting is essential.

Response #1

Please see Generic Response #1.

Response #2

Please refer to Generic Response #4. The use of collecting chemicals will be considered on a case by case basis along with each permit application for scientific and educational purposes. Please see Section 937.8 of the proposed sanctuary regulations for permitting procedures.

Response #3

Collecting will be allowed in the proposed sanctuary by permit for scientific and educational purposes.

3. I am not sure why some forms of resource harvesting are given privilege over other forms. Why allow hook and line fishing when totally banning spearfishing? If Looe Key Reef is truly to be a sanctuary then all fishing should be stopped within the park's boundaries. There is no other park, preserve, or sanctuary in the south Florida region which bans all types of fishing. Such a small area shouldn't have any significant negative impact on the economy or sportfishing. In fact, banning all fishing may have a positive economic effect by allowing the reef to act as a source region for dispersal of fishes and other marine life into the surrounding areas which are harvested. The
4 idea of having a "sanctuary" where fishes and other marine life face no harvesting pressure is long overdue. Anyway, diving and fishing are not compatable activities in a restricted area. Divers usually inhibit fishing success and there is always a danger of being hooked or being hit by a trolling boat.

4. Much of the sanctuary nomination process has been marred by local politics and various pressure groups. At present the animosity between some factions has created an explosive atmosphere. To minimize further friction I suggest that the park manager hired to supervise the
5 sanctuary be someone entirely from outside the region and someone who has not had any involvement with the nomination process. Many groups fear (and perhaps justifiably so) that the "other group" will gain control of the sanctuary for their own benefit and at the detriment of other groups. It is essential that the manager who must enforce regulations be someone who is unbiased by the past political climate.

E-143

5. I recommend that NOAA funds not be used to widely advertise the sanctuary. There will be sufficient publicity anyway. A great influx of people could have tremendous impact because of the very samll size of the reef proper, unlike Pennekamp and Key Largo Sanctuary.
6 Certainly many people can utilize the reef (many more than at present) but too many people could adversely effect the reef. Public funds should be restricted to advertising regulations within the Keys and to educate the public about the reef and proper anchoring procedures, etc .

6. I recommend that 5 years after establishment that all regulations
7 be reviewed for modification as knowledge dictates. An adequate method should exist for changing unreasonable or unnecessary regulations or adding new ones.

7. Adequate funds should be set aside for "scientific" monitoring of the reef. This should be a quantified and properly done study which will detect shifts in community structure and indicate potential detrimental
8 changes to the reef. A species listing is inadequate.

I hope these comments are useful.

Sincerely,

James A. Bohnsack

James A. Bohnsack, Ph.D.

Response #4

Please refer to the anchoring and spearfishing discussions in the FEIS Chapter Four, Environmental Consequences. The text has been expanded and revised based on new information and written comments. The anchoring regulations have been been changed to prohibit all anchoring over the Fore Reef. This includes anchoring for commercial and recreational hook and line fishing. This change will probably limit the "take" of important reef species by hook and line in that area. This management measure is consistent with that proposed for the HAPC in the Coral and Coral Reef Resources FMP. Sanctuary management staff will work closely with the Gulf of Mexico Fishery Management Council to find cooperative means of controlling the impacts of hook and line fishing within the sanctuary in the event that it becomes a problem in the future.

Response #5

Sanctuary management will be comprised of objective personnel thoroughly versed in special area management in the marine environment. In addition, management will seek continuing advice from outside expertise and from members of the various user groups. Please see Response #17, Defenders of Wildlife.

Response #6

NOAA recognizes the potential adverse impacts of heavy visitor use in small areas such as Looe Key. Because of the small size of the proposed sanctuary Looe Key management will stress education and regulatory enforcement measures to protect the reef and de-emphasize management techniques which encourage visitation. However, even without sanctuary designation and whatever limited publicity that brings, it is anticipated, that the Looe Key Reef area will receive an ever increasing number of visitors, as the population of the nearby Keys continues to increase. Projections indicate rising levels of tourism. In that event, having a management framework in place to monitor and control these uses will become even more critical. Key Largo will remain the marine Sanctuary which publicizes visitor use. Such activities as glass bottom boat rides etc., are and will remain appropriate at that site but the emphasis will be totally different at a small sanctuary such as Looe Key.

Response #7

Sanctuary regulations are normally reviewed following studies designed to assess the effectiveness of management measures. The Management Plan will be revised at the end of a five year period and, all management measures, including regualtions, evaluated.

Response #8

Scientific monitoring is part of the Marine Sanctuaries Program and will be carried out as time and funds permit.

PHONE 267-6189

C. M. Buckman
R. D. 1, ~~SCHWENKSVILLE, PA. 19473~~
BOX 347 BIG PINE KEY FLA
33043

Dr. Nancy Forter
Sanctuary Programs Office
NOAA 3300 Whitehaven St.
N.W. Washington DC. 20235

Dear Dr. Forter:

We have lived here for the past 3 years and have spent our winters here for the 9 preceding years. I attended the meeting in Big Pine Key on the evening of June 13th Concerning the proposed Sool Key Sanctuary.

The vast majority of those present and speaking were not typical residents of this area. They were local commercial fishermen who were interested only in what they could get from the ocean today with no thought of future years or future generations.

My personal feeling is that 5 square miles is somewhat superfluous. I would go along with the 5 square miles but would prefer the One square mile proposed by Sea Camp with everything but diving prohibited within that area.

Response #1

No response necessary.

Response #2

Please see Generic Response #3.

2

PHONE [illegible]

C. M. Buchman

R. D. 1, ~~[illegible]~~ 19473

3 As the fish population builds up within that area, the fish would not be confined by its boundaries and fishing would improve in all the surrounding areas. It would be a benefit to local fisherman rather than a handicap.

Sincerely,

C. M. Buchman

Response #3

Management of the area as a sanctuary should result in protection of spawning, juvenile and other fishery habitat. Ultimately, the sanctuary may result in increased fish populations.

July 15, 1980

Director, Sanctuary Programs
Office of Coastal Zone Management
3300 Whitehaven St. NW
Washington, D.C. 20235

Dear Sir:

This is to state that I am in full agreement that the Looe Key area in the Florida Keys be made into a sanctuary.

There is a definite difference in the amount and kind of animal and plant life in the protected versus the unprotected areas in the Florida waters. I have been making trips to Florida approximately once a year for the past 7 years, for the sake of scuba diving and/or snorkeling. One can tell almost immediately if diving in an area open to commercial and spear fishermen. The Looe Key Reef dive was, from my experience, one of the poorest and most disliked by divers because of the lack of sea life, and also the poor visibility.

Because of these reasons, I firmly believe that if the Looe Key area were made into a sanctuary, sea life would gradually once again start to flourish on this reef, as it does on other protected areas.

There's no sense in ravaging and polluting any more of Florida's waters, particularly around the reefs, where the marine life is more abundant and beautiful than in any other part of the ocean.

I strongly urge you to support this legislation! If a petition is being signed, I and about 20-30 friends would gladly sign it if it will help the Looe Key area.

Sincerely,

(Mrs.) Diana R. Bruns
415 Buttonwood Ave.
Bowling Green, Oh. 43402

Please see Generic Response # 1.

8775 SW 147 St.
Miami, FL 33176
July 7, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., N.W.
Washington, D.C. 20235

Dear Sir:

Thank you for the opportunity of commenting on the draft environmental impact statement on the proposed Looe Key Marine Sanctuary.

These comments pertain to that segment of the impact statement dealing with spearfishing.

In my opinion, you have not presented sufficient evidence to support the conclusion that spearfishing should be prohibited within the sanctuary.

You state in the preferred alternative paragraph on page 108 of the proposal that "one of the most significant consequences of this preferred alternative is the elimination of the human injury potential to snorklers and SCUBA divers." You also cite this as the first controversy or issue prompting the proposed prohibition of spearfishing on Looe Key. Yet, nowhere in the impact statement

E-147 1

Response #1

The discussion of spearfishing has been revised to incorporate additional information from the public hearings and subsequent written comments (see Chapter Four, Regulatory Alternatives for Spearfishing). Based upon reevaluation of this issue, NOAA continues to believe that a prohibition on spearfishing within the proposed sanctuary should be the preferred alternative.

is there any evidence documented, or even suggested which details the "human injury potential" of spearfishing in general, or at Love Key in particular. In effect, you are asserting that there is a significant injury potential but have produced no supporting evidence. You have not shown that there is any significant safety problem at Love Key, or even at comparable locations, yet you rely heavily on such a contrived safety problem in arriving at the statement of the preferred alternative.

You make a major point that "spearfishing competes with more traditional rod and reel or handline fishing" and you list this as your second major controversy or issue arising from spearfishing in reef areas. Certainly, one form of water sport should not be sacrificed simply because it is "less traditional" than another form. But, this is in effect what you propose to do in this instance.

The third controversy or issue that you list states/implies that spearfishing "removes large mature fish and reduced

breeding stock and recruitment potential."
Yet you offer no evidence whatsoever of the relative numbers or size of fish taken by traps, rod and reel, handline or spearfishing at or near Looe Key. My personal impression is that the relative number taken by spearfishermen is minimal. But, you as the experts should be expected to produce evidence before proposing the sweeping type of change included in this segment of the impact statement. You offer no such evidence and I can only therefore assume you possess none. Controls should not be implemented without some form of supporting evidence.

Your 4th and 5th controversies/issues are similarly not supported by any form of evidence.

In short, you have failed to convey to the public the product of sufficient evidence or research to support your conclusions as to the action you propose regarding spearfishing at Looe Key. The section on spearfishing should be removed from final rules implemented regarding the proposed Looe Key Marine Sanctuary unless and until such evidence is available to support such drastic action.

Sincerely,
Charles A. Buchel

cc. Mr. Barrett

Mrs. Jennings D. Carter
P. O. Box 656
Marathon, Fla. Keys 33050

June 16, 1980

Director, Sanctuaries Programs
Office of Coastal Zone Management
3300 Whitehaven St. N.W.
Washington, D.C. 20235

Re: The Looe Key Proposal

Gentlemen:

My husband and I wish to endorse the Sanctuary proposal. We feel it is very important to make the Looe Key Sanctuary because so much of our beautiful Keys have already been sacrificed in the name of progress and business.

Of course, not all has been bad, but there is so little left to preserve for our next generation, we feel it is very necessary to protect Looe Key.

Sincerely,

Josephine D. Carter

(Mrs. J. D. Carter)

We have been in the Keys for twenty years, + full time residents and registered voters for the last ten years. We have been property owners for eighteen years.

Please see Generic Response # 1.

Miami, Fl.
June 18, 1980

Director, Sanctuaries Program
Office of Costal Zone Mgt.
3300 Whitehaven St. N.W.
Washington, D.C. 20235

Dear Sir:

I am a great advocator of keeping as much of our wildlife and natural beauty from the spoils of "progress" as possible.

I am all for and give my endorsement of the sanctuary proposal of "LOOE KEY" in Monroe County Florida.

The self interest groups have had their way too long. Please keep some natural beauty for future generations.

It might be of interest that I sell real Estate part time in the keys but have always tried to endorse proper development and shy away from projects that fail to adhear to these standards.

Thank you for registering me in this matter.

* yes I am a property owner in Monroe County.

James M. Critcher
14940 N.W. 16TH DR.
Mi, FLA. 33167

Please see Generic Response # 1.

HALE AND DORR
COUNSELLORS AT LAW
60 STATE STREET
BOSTON, MASSACHUSETTS 02109

TELEX
94-0478
TELECOPIER
DOMESTIC (617) 367-6133 (617) 742-9100
INTERNATIONAL (617) 367-6100

TELEPHONE
(617) 742-9100
CABLE ADDRESS
HAFIS BSN

July 10, 1980

Director, Sanctuaries Program
Office of Costal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Gentlemen:

Every year I go south to the Florida Keys or the Caribbean to scuba dive. My principle satisfaction comes from seeing the various reefs and the numerous fish that abound. My favorite reef in the United States is the Looe Key reef off the Florida Keys.

I think it is certainly in the best interest of the country and the Florida Keys to establish a sanctuary at Looe Key in order to preserve its very special forms of sea life.

I understand that there have been several public hearings I have been unable to attend; however, if I had been able to attend, I would certainly offer my support for the five square mile sanctuary which has been proposed.

Very truly yours,

Paul P. Daley

PPD:lp

Please see Generic Response # 1.

4650 Overseas Highway
Marathon, FL 33050

13 July 1980

1980 JUL 19 12:43
MAIL ROOM
CZM

STATEMENT IN SUPPORT OF PROPOSED 5 SQUARE MILE LOOE KEY SANCTUARY and DRAFT EIS

by CAPT. ED DAVIDSON: President, Florida Keys Audubon Society
President, Middle Keys Citizens Association
Chairman, Florida Keys Citizens Coalition
Past Chairman, Florida Keys Planning Advisory Council
Member, Florida Keys Marine Advisory Council
Member, South Atlantic Fisheris Council
Coral Advisory Panel
Vice President for Operations, Florida Reef Foundation
Consultant, U.S. Dept. of Interior Continental Lands Act enforcement in the Florida Reef Tract, gov't expert trial witness

Having made (by logbook record count) slightly more than 1000 trips to Looe Key over the past 10 years, this writer claims to speak not only as a representative of listed citizens' groups, but also as one with expert and intimate knowledge of the lower Florida Keys reef tract, Looe Key in particular, and of the various commercial and recreational marine activities that occur therein.

1 The Looe Key section of the reef tract lies, of course, in federal waters outside the protection of Florida state laws and Marine Patrol enforcement efforts. Since the Department of Interior recently lost its juristiction over non-mineral exploration related damage to reef resources, and since the National Fisheries Councils remain semi-inert under the pressure of exploitation interests, having in this respect been directly responsible for stalling NOAA's protective efforts for almost 2 years, Looe Key is essentially without functional protection by any agency as it's spectacular and valuable resources come under increasing pressure.

The 5 square mile preferred alternative is smaller than might be desired for optimum resource management and rejuvenation of depleted species, but is the minimum viable proposal. There is certainly no sound scientific justification for amputating the smaller 1 square mile core area "heart" out of the center of what is a functionally interdependent and contiguous ecosystem composed of specialized sub-areas, radical surgery which would only displace
2 more intense pressure around it's periphery without insuring any of the beneficial effects of viably sized and dimensioned sanctuary - such as the protection of relatively unmolested breeding stocks which range over more than the core area and whose rejuvenation should significantly improve both harvestable and non-harvestable marine populations in areas adjacent to sanctuary boundaries.

The Draft EIS seriously underestimates the recreational value of Looe Key while listing commercial fisheries figures which are so grossly exaggerated as to be wildly unrealistic by several orders of magnitude. The most casual and infrequent observation of the reef site would reveal that visitation is
3 overwhelmingly recreational, from which it follows that few commercial activities could possibly flourish. This writer has often seen 30-40 vessels anchored at Looe Key on any given summer weekend day, and has more than once seen as many as 50 vessels anchored there. Ingress to and egress from the area during a typical day increases the aggregate visitation 50-75% over the static count.

Captain Ed Davidson

Response #1

No response necessary.

Response #2

Please see Generic Response #3.

Response #3

Existing, new information and written comments on the Looe Key DEIS support your observations on current heavy recreational pressure on Looe Key reef. As was noted in the text, however, a poor response rate in the survey of commercial recreational businesses and the difficulties of obtaining accurate data on private recreational users made it extremely difficult to place an economic value on that particular segment of the economy. The FEIS discusses the fact that the results of the commercial fishing survey, particularly with respect to lobster trapping were higher than average Monroe County data. However they were still within a range suitable for analysis. The sanctuary management, after designation will institute a visitor-use survey which will be able to more accurately evaluate user-related impacts.

3 In all of this writer's more than 1000 trips to Looe Key, only a few commercial boats have ever been observed working in the 5 square mile proposed boundaries. Simple computation of the number of traps and frequency of visitation and number of commercial craft required to produce the claimed yields produces figures which are multiples several times over of those actually observed. Comparison to activity and productivity in the rest of the Lower Keys reef tract also casts doubt on the validity of claimed yields in the proposed sanctuary area.

4 Tropical specimen/acquarium collecting is similarly overreported in comparison with actual observations. The concession to permit tropical collecting albeit without chemicals and only with demonstrated expert knowledge is unwarranted by the minor economics involved, and is is little justified by the proliferous available alternate collecting sites in the immediate area of the reef tract. The tendency of collectors to concentrate on cleaner species with the subsequent probable deleterious effects upon the entire food web of sports, food, and other tropical fishes runs counter to basic sanctuary objectives as well.

5 In addressing the reduction of anchoring damage to the reef community, some standards of acceptable ground tackle should be established, perhaps in reference to such authorities as "Chapmans", which would decree that, for instance, all boats have at least 150 feet of serviceable anchor line for proper working scope in 30 feet of water - a standard that many recreational boats and nearly all rental boats would fail to meet at present. Attention should also be paid to the possibility of discharges and marine activities upcurrent of the sanctuary area which might adversely effect water quality within the boundaries, such as oil spills, pollutant generation or discharge, and salvage activities and/or groundings.

Overall, NOAA and the Office of Coastal Zone Management are to be commended on having drafted a generally excellent and comprehensive EIS, the adoption of which - with the above suggested improvements - would be heartily supported by many concerned citizens in South Florida and across the country.

Respectfully submitted,

Capt. Ed Davidson

Response # 4

Please see Generic Response 4 for the change in the final proposed tropical specimen collecting regulation. NOAA proposes to prohibit such collections throughout the sanctuary except by permit for scientific and educational purposes.

Response #5

The anchoring study to be initiated if designations occurs, will consider your suggestions on standards for acceptable ground tackle. NOAA will work with other agencies to minimize impacts from activities up current or outside the sanctuary but within Federal jurisdiction which might adversely effect water quality within the sanctuary.

Response # 6

No response necessary.

3901 Lynwood Ave.
Tampa, Fla. 33611
July 11, 1980

Dr. W. Foster, Deputy Director
Sanctuary Programs Office
3300 Whitehaven Street, N.W.
Washington, D.C.

Dear Dr. Foster:

1 As a fishery biologist and avid diver, I object very strongly to the regulatory strategy which is outlined in the Looe Key Sanctuary DEIS. The idea of a sanctuary is a good one and I congratulate you for trying, but the proposal contains far more bad points than good ones. My objectons fall into three categories (1) the mix of proposed regulations is unfair and irrational (2) the rationale used to justify several measures is scientificly invalid or selectively applied and (3) the combination of 1 and 2 leaves the sanctuary on very poor legal ground, highly vulnerable to litigation. As my experiance lies primarily in the area of 1 and 2, I will concentrate my comments there.

2 Harvest of fish with hook and line and non-consumptive diving are specificly excluded from any possible regulation under the sanctuary designation. This seems irrational considering the present or potential impacts of these groups. It is well established that line fishing can substantially impact some bottomfish populations. These include grouper and snappers in the inshore waters of the Gulf of Mexico and Florida Keys, halibut in the Pacific, black bass and trout in many freshwater areas. The Gulf Fishery Management Council is proposing that the inshore waters in the Gulf and Keys be considered for special restrictions on fishing effort because it has been overfished, primarily by recreational line fishing. This area includes most of the proposed sanctuary. The Looe Key Inventory documents the occurance of substantial commercial and recreational line fishing within the proposed sanctuary. To exclude this gear from regulation within the sanctuary is not biologgically supportable and is contrary to goal I of the sanctuary.

3 Non-consumptive divers make up the vast majority of the present and future users of Looe Key. Becasue these tend to be inexperienced, there will be a large amount of continuing contact with the coral substrate. I can easily envision a time when their sheer numbers will begin to adversely impact the reef. Both O'Kane (1979) and the Looe Key Inventory point out damage to corals related to non-consumptive divers. The present poor condition of reefs at Buck Island (V.I.) and Key Largo appear related, in part, to this very factor. At present, no regulation may be needed. However this group could potentially have impact on the coral of the fore reef zone than any other group. I strongly recommend that the sanctuary retain authority to regulate if needed.

4 The rationale for prohibiting spearfishing is extremely poor. I fully support the prohibition of spearfishing in the sanctuary, but it should be based on fact. Poor and/or one sided analysis greatly weakens the argument and threatens the entire sanctuary concept.

Response #1

No response necessary.

Response #2

The anchoring regulation has been changed to prohibit all anchoring on coral on the Fore Reef, including anchoring by vessels engaged in commercial and recreational hook and line fishing. This will likely result in somewhat limited access to the reef and consequently the "take" of important species by hook and line fishermen in that area. Although insufficient information exists at the present time to regulate hook and line fishing beyond this, every attempt will be made to work closely with the Gulf of Mexico Fishery Management Council to find cooperative means of controlling the impacts of hook and line fishing in the event that it becomes a necessity.

Response #3

The regulations as proposed in the DEIS (Appendix A, Draft Regulations Part 937.6 (1)), prohibit activities which would damage coral or other natural features. In addition the regulation prohibits the handling or standing on coral. NOAA recognizes the potential adverse impacts of large numbers of people visitors on limited coral areas like Looe Key. Management experiences in underwater reserves elsewhere serve to illustrate the damage caused by heavy user pressure. User pressures will be carefully monitored if Looe Key is designated a sanctuary.

Response #4

Your insights into the spearfishing issue were very helpful. The discussion of that activity has been significantly revised in the FEIS. The final analysis reflects your comments and addresses the concerns outlined in your letter (please see Chapter Four, 4. Regulatory Alternatives for Spearfishing)

The text indicates that the primary rationale concerning spearfishing is based on safety. No facts or data are presented on spear related injuries. In 15 years of active diving and personal contact with thousands of divers, I have personally known only one diver who was injured by a spear. That incident involved an unloaded gun and occurred out of the water. To my knowledge, such accidents are extremely rare, even among inexperianced divers. Have you any data to support the bald statements contained in the DEIS? Perhaps even more to the point is the relation of such a benefit to the sanctuary goals. Safety has no relation to any goal or objective that is stated in the DEIS, Why is it listed as the "primary basis for this alternative"?

The supporting rationale used to indicate environmental impacts of spearfishing leans very heavily on a paper (O'Kane, 1979) which is purported to be a valid scientific study. I am disappointed and disturbed that this type of material would be presented without a discussion of it obvious weaknesses. This paper is based entirely on visual observations made during two days of casual diving at Looe Key. It is hardly a scientific study. The conclusions Lt. O'Kane draws from his observations are totally unsupportable on any scientific basis by the level of data he presents. Further, the logic of his argument is questionable in the extreme. He bases his entire argument on the supposition that high sea urchin density is directly related to the removal of reef preditors by spearfishermen. I would point out that all but one of the species which might be affected by spearfishing (groupers, snappers, and barracuda) do not consume sea urchins. To the contrary, they eat those species (triggerfish and some wrasses) which do prey on sea urchins. Large male hogfish do prey on Diadema to a small extent, but even complete removal of all hogfish would hardly have any significant impact on Diadema populations. Even if one were to accept the doubtful premis that urchin populations could be significantly impacted by spearfishing induced alterations in populations of urchin preditors, there should be less urchins at Looe Key than at Key Largo, not more.

The data from Austin et al.,(1977) comparing spear and line fishing is not fairly or completely presented. In the DEIS, the inference is made that spearfishing is a major competitor of line fishing and takes more fish. A more complete review of that paper shows that the recreational hook and line catch of grouper exceeded the spear catch by a factor of 2.5 to 1. Snapper catches by hook and line were estimated a 48,539 fish, while spear catch was too small to estimate. The total catch of all reef dwelling species by line fishermen exceeded that of spearfishermen by an order of magnitude. The catch rate of spearfishermen exceeded that of line fishermen (for grouper) only under conditions which were ideal for spearfishing and fair to poor for linefishing. I would further point out that the Dade County area contains the greatest density of spearfishermen and the highest percentage of total users of any area in the Gulf of Mexico or Keys. In any other area, the percentage of total harvest attributable to spearfishing would be sustantially less than in the Austin study. The only other estimate of spearfishing catch was made by Murdock (1957). He estimated that spearfishing accounted for 4.3 percent of the finfish landings in Monroe County, Florida during 1956.

The DEIS indicates that part of the rationale to prohibit spearfishing is to "increase the availability of snapper and grouper populations to the hook and line fisherman". First, I would point out that all the available scientific information indicates that speared fish do not make up a very large portion of the total catch. Therefore, prohibition will have little impact. Second, I would ask why the sanctuary program is attempting to allocate the resource among user groups. This has no relation to any goal or objective stated in the DEIS or embodied in the sanctuary program as a whole. Third, I again question why a gear which has been primarily responsible for overfishing the grouper and snapper resources in the Keys should have unlimited and exclusive right to harvest in the sanctuary.

4

E-156

4 Part of the rationale charges that spearfishing removes unusual numbers of large mature fish, reducing breeding stock. As I have already pointed out, this argument applies better to line fishing. The idea that spearfishermen take all the large fish is a myth. Data in Austin et al.,(1977) clearly demonstrates that the average size of fish taken by both spear and line is quite small. The average is slightly larger for spear, primarily because spearfishermen do not normally take grouper smaller than one pound. Grouper from one quarter to one pound were common in the line catch.

There are numerous other allegations of ecological change or damage from spearfishing None of these are supportable. I suggest deleting all of this type of material.

The only supportable fact which is applicable in this case is that spearfishing makes some species very wary and hard to observe. This is documented in the Inventory and will be supported by any experianced spearfisherman. Such wariness interferes with the primary uses of the sanctuary, observation, education, and research. Allowing spearfishing conflicts with goals 2 and 3. To me, no further rationale is needed.

5 The DEIS proposed to allow collection of tropicals. I would point out that high levels of collecting effort can reduce the local abundance of some tropicals. While this has no overall adverse impact of the stocks, it can affect abundance in areas like the fore reef. I suggest that tropical collecting not be allowed on the fore reef.

6 The DEIS analysis of fish traps is out of date. There is a substantial amount of new material available through the Miami Laboratory of NMFS or through the Gulf Fishery Management Council. This material will strengthen your rationale.

7 The anchoring alternative preferered in the DEIS seems to the best solution (for the present) to a most difficult problem. Good luck on that one.

8 The 5 sq. mile boundry alternative does not seem to be the best alternative. The basis for the sanctuary is the fore reef. Some buffer zone around it is also necessary. However the prefered alternative is too large, especially in view of the discriminatory management strategy. The DEIS indicates that the area is so large primarily to include patch reefs, deep reefs and a deep ridge. I would point out that large areas of these two zones are alreadu protected at Key Largo. Even if you wish to include them, the charts in the DEIS indicate that they could be included in a 1-2 mile boundry.

The above points are only a few of many which can be usdd against the sanctuary program in court. Primary grounds for suit would be that the regulations are arbitrary and capricious. To strengthen your position, I reccommend that the sanctuary office consider three options:

1. Reduce the sanctuary size to 1-2 miles, prohibit all consumptive uses, and retain authority to regulate non-consumptive diving.

9 This is the best option. It is fair to all, does not unduly affect consumptive users, is scientificly supportable, and provides the maximum protection to the resource.

2. Prohibit consumptive uses on the fore reef and a small buffer zone around it, retain authority to regulate non-consumptive uses, and allow consumptive uses of all kinds, under adequate restrictions, in the remainder of the sanctuary.

These seems to be a less desireable alternative. However, it would be fair workable , and scientificly valid.

Response #5

Please see Generic Response #4. In the FEIS NOAA proposes to prohibit tropical specimen collection except by permit for scientific and educational purposes. This is consistent with management measures currently proposed in the Coral and Coral Reef Resources FMP.

Response #6

Thank you for your suggestion. Information from the report has been used to revise the text (Please see Chapter Four, 4. Regulatory Alternatives for Wire Trap Fishing).

Response #7

Based on information received through public comment, the preferred alternative for anchoring has been changed to prohibit anchoring on coral on the Fore Reef and encourage sand anchoring within the sanctuary. This will serve as an interim measure until a study can be completed on the actual anchoring impacts and a solution can be developed that will result in minimum inconvience to user groups and maximum protection for the resources.

Response #8

Please see Generic Response #3.

Response #9

Please see Generic Response #3 and above responses #2 & #3.

10 J. At the very minimum, clean up the rationale, retain authority to regulate non-consumptive users and line fishermen

11 I thank you for the opportunity to comment. I would very much appreciate the oppurtunity to review any future material concerning Looe Key.

Sincerely,

J. Connor Davis

Response #10

NOAA believes that the final proposal with revised regulations for anchoring and tropical specimen collecting should satisfy your concern.

Response #11

No comment necessary.

ALFRED R. DIXON and ASSOCIATES, INC.
Manufacturers' Representatives
1200 W. ELEVEN MILE ROAD 313: 547-0141 ROYAL OAK, MICH. 48067

June 30, 1980

Director, Sanctuaries Program
Office of Costal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Gentlemen:

It has just come to our attention that the LOOE Key reef, off the lower Florida Keys, is again being considered for a National Marine Sanctuary. We sincerely hope that your office is giving this favorable consideration.

We feel very strongly that such areas must be reserved for proper use and enjoyment by all citizens and not be "gobbled" up and destroyed by minority users or business interests.

It is important that we make obligations today to preserve such areas for future generations.

Yours very truly,

ALFRED R. DIXON & ASSOCIATES, INC.

Alfred R. Dixon

Alfred R. Dixon, President

bjs

Please see Generic Response # 1.

THE PENNSYLVANIA STATE UNIVERSITY
208 ERWIN W. MUELLER LABORATORY
UNIVERSITY PARK, PENNSYLVANIA 16802

College of Science
Department of Biology

Departmental Office
Area Code 814-865-4562

June 24, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St
Washington, DC

Dear Sir:

This is written in support of the designation of Looe Key reef in Florida as a National Marine Sanctuary.

I am a marine biologist with considerable experience both in Florida and in western Pacific areas with rich coral reef faunas (Australia, Philippines, Palau). I also own a house on Summerland Key very near to Looe Key and am very familiar with conditions in the Lower Keys. I strongly urge you to take immediate action to preserve as much of the Looe Key area as possible. It is a unique region that is being destroyed by local fishermen and divers. On my last visit there in May I observed a diver spearing fish right on the main part of the reef and a local commercial fisherman setting traps adjacent to it. Present regulations provide very little protection for the area. Looe Key needs special status and protection if it is to regain a natural undisturbed community of marine organisms. It is very important that a substantial part of the sanctuary be completely undisturbed by any activities other than observing the reef and its inhabitants.

With proper protection Looe Key can be enjoyed in a non-consumptive fashion by tens of thousands every year. It will be a sad commentary on our system if a small number of vociferous local interests can prevent the public's right to view the fantastic beauty of this area restored to its pristine state. If I can be of any assistance in a professional capacity to assist you in preserving Looe Key, please feel free to call on me.

Sincerely,

William A. Dunson, PhD
Prof. of Biology
Phone 814-865-2461

AN EQUAL OPPORTUNITY UNIVERSITY

Please see Generic Response # 1.

156 Dove Ave.
Tavernier, Fla. 33070
26 June 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Sir:

Enclosed are the comments I have made while examining the DEIS on Looe Key. The first section consists of detailed comments on the DEIS statements; the second section consists of my discussion and conclusions.

page 3, last para., line 3 -- "the area consists of five square nautical miles...". The implication here is that Looe Key covers the entire five square miles, when in actuality it is a very small area. The five square miles is the area that OCZM wants to designate a sanctuary, even though the borders of Looe Key don't even come close to the OCZM proposal. Buffer zones are not very useful in the marine environment because of water transport of fish and invertebrate larvae, pollution, silty and low-temperature water, etc.

page 4, first line -- Thre are a lot of living sections of the Florida Reef Tract throughout its whole length. Already there is the Biscayne National Monument, the Key Largo Coral Reef Sanctuary, and the Dry Tortugas Preserve. Do you mean to tell me that these huge areas do not contain many living reefs (as implied by the sentence)?

2

page 4, line 6 -- These shallow reef areas are <u>not</u> close to shore. In fact, they are 6.7 miles from the nearest land (as stated on the previous page).

3

page 4, goal 2 -- Although this is a legitimate goal, why is Looe Key necessary for pursuing this goal when Biscayne, Key Largo, and Dry Tortugas are already available and far more appropriate for the studies?

4

page 5, goal 3.-- This will serve only to enhance public visitation to the Key. If visitation in uncontrolled, then extreme damage to the corals will result due to souvenir hunters, the touching and breaking of corals by accident, the flushing of marine sanitation devices, anchors, etc. If visitation is controlled by mooring buoys, there are going to be major conflicts among the boats who want to tie up. If people are not allowed to visit the area after traveling to it, this represents

5

E-161

Henry A. Feddern, Phd

Response #1

The text has been clarified to remove the implication that the Looe Key reef covers 5 sq nm. The establishment of traditional buffer zones was never an issue in the selection of the preferred boundaries of the sanctuary. Please See Generic Response # 3 for further discussion of the boundary question.

Response #2

The text has been revised to clarify the discussion of living sections of the Florida reef tract.

Response #3

The text has been clarified to state that these shallow water reef areas are easily accessible to the public rather than physically close to shore.

Response #4

When the sanctuary program office identifies an active candidate for proposed designation an important aspect of the proposal is the definition of goals and objectives for the particular site in question. Promoting marine research will be a goal of a Looe Key Sanctuary should it be designated. Sites are selected, first based on merit then management goals are designed which are appropriate to that site. This is standard planning technique for special area management. Each sanctuary in the national system will have a comprehensive management plan based on a framework of goals and objectives and in most instances research will be a primary focus.

Response #5

NOAA recognizes the potential adverse impacts of large numbers of people on small areas such as Looe Key. Because of its small size Looe Key management will stress education and enforcement measures to protect the reef and will de-emphasize management techniques which encourage visitation. Key Largo will remain the Marine Sanctuary which publicizes visitor use. Such activities as glass bottom boat rides, <u>etc.</u> are and will remain appropriate at that site but the emphasis will be totally different at a small sanctuary such as that proposed for Looe Key. However, without sanctuary designation it is anticipated that the Looe Key Reef area will receive an ever increasing number of visitors as the population of the nearby Keys continues to rise. Projections indicate rising levels of tourism. Having a management framework in place to monitor and control these increasing uses will become even more critical.

a tremendous waste of time, gasoline, and money on the part of the boaters. Establishing a land-based visitation permit system is also unworkable because of the open access to boats from a large area of the Keys. If commercial sightseer or dive charter boats monopolize permits, then again major conflicts will result. It is better (if the major desire is to protect Looe Key) to de-emphasize any publicity about it.

5

page 5, para. 3 -- I don't have much faith in obtaining surveillance personnel from the listed agencies. They are undermanned even for their current duties. Asking them to go to an area remote from their present patrol areas would not be feasible.

6

page 6, lines 10 & 11 -- I think snorkeling and SCUBA diving should be regulated in that it be prohibited to touch or otherwise damage the corals.

7

page 12, Anchoring -- I do not recommend allowing anchoring in the sand channels between the spurs. Winds are generally easterly, and the Gulf Stream also flows east. As a result, an anchored boat's resting position would be uncertain, and the anchor chain would probably come to lie across the ridges and chafe the coral. Also, trying to drop an anchor on a specific small area when the seas are high, the wind is blowing, and there is a water current, is almost impossible, and even if successful, the final orientation of the boat and anchor cannot be predicted in advance.

8

page 13, last para.-- "exploitation of the resources of the entire reef complex is increasing at an alarming rate." Does the Florida Keys Citizens Coalition have any data to back up this statement, or is it merely an opinion?

9

page 14, para. 5, lines 5 & 6 -- Vessels do not anchor when setting fish traps. They merely stop while dropping the trap overboard, or retrieving it.

10

page 15, para. 1 -- The paragraph is disjointed, with the first half talking about tropical fish collecting. Then suddenly the paragraph switches to neon gobies (which are not mentioned in the previous sentence as sought after) and mutualism. The last sentence is quite true; however, small wrasses are in very limited demand for aquaria, and are not caught except on rare occasions. Small wrasses are in unbelievable abundance.

11

page 15, para. 2 -- How could the lack of large reef predators cause high sea urchin densities? You are really trying hard to connect unrelated (or slightly -related facets) of the ecology together.

12

page 16, line 9 -- None of the soft corals allowed for harvest under the Council's coral plan occurs on Looe Key.

13

It is not the intent of the NOAA to use mooring buoys to control visitation but rather to reduce the damage to coral from anchoring. Research, after designation, may actually find that mooring bouys are inappropriate for the Looe Key Marine Sanctuary and that other management techniques are better suited.

Response #6

NOAA has initiated consultation with the U.S. Coast Guard for arrangements to insure special attention to the Looe Key area should it be designated a sanctuary. NOAA agrees that adequate Looe Key enforcement and surveillance cannot be achieved as an add-on to existing patrols. An onsite presence will be required and arrangements will be made to that effect.

Response #7

In the DEIS NOAA proposed regulations that address this concern. Section 937.6(a)(1) of Appendix A prohibits damaging coral or any natural features and prohibits handling or standing on coral. In addition, all efforts will be made to reduce damage to coral from the physical contact of recreational visitors by educating the public through the sanctuary management program. Monitoring of use after designation will enable management to detect the point at which the numbers of divers reach levels adversely affecting the reef. Experiences in underwater parks and reserves in other parts of the world have shown this to be possible. In that event other steps will be taken, with full public involvement, to correct the problem.

Response #8

The preferred alternative regulating anchoring has been changed to prohibit anchoring on coral on the Fore Reef as defined by the HAPC core trapezoid area (Figure 7) and to encourage anchoring on the sand bottom areas elsewhere within the sanctuary. This change more closely corresponds to the HAPC special management measure currently proposed in the Coral and Coral Reef Resources FMP.

Response #9

The quote cited is the opinion of the Florida Keys Citizens Coalition based on their collective observations. Biological field studies and present population projections have also indicated that exploitation of the resources will continue at an increasing rate.

Response #10

The text has been revised to reflect this information.

Response #11

NOAA believes the paragraph to be easily understood and coherent and finds no compelling reason to make changes.

Response #12

Additional analysis of predator-prey relationships and information received through public comment has resulted in the revision and expansion of the discussion concerning the connection between the lack of large reef predators and the high densities of sea urchins (Chapter Four, 4. Regulatory Alternatives for Spearfishing).

Response #13

The discussion in question describes existing statutory authorities in the proposal area and is not an evaluation of species distribution. The affected environment is described in detail in Chapter Three.

14 page 16, para. 3 -- An FMP for tropical fishes and invertebrates is currently under consideration for initiation.

15 page 19, line 4 -- How is Looe Key threatened -- by coral collectors? But this is illegal now, because it is against the law to bring it into State waters. Where else would they bring it? More coral will be collected by visitors as souvenirs when visitation increases as the result of publicizing Looe Key as a Marine Sanctuary with superior scenic beauty. By anchor damage? But more anchors will be dropped by the increased visitation. How will designation of a Sanctuary save Looe Key?

16 page 19, para. 2 -- How does Looe Key offer a unique opportunity, when the entireties of Biscayne Monument, Key Largo Sanctuary, and Dry Tortugas are available?

17 page 25, para. 5, lines 5-9 -- Butterfly fishes, hamlets, creole wrasses and blue chromis naturally occur mostly in deeper waters (beyond 30-40 feet) than in shallower waters. Those fishes found only on the deep reef by Antonius et al also naturally occur in waters deeper than 80 feet. This slipshod writing is the result of not letting an ichthyologist do the fisheries work.

18 page 25, para. 6, line 3 -- The implication here is that these coral species used to grow abundantly on the Fore Reef -- is there evidence for this, or only opinion?

19 page 26, line 1 -- You admit that the 5-mile boundary only contains portions of each reef zone. If established, sooner or later the Sanctuary manager will decide that the boundaries need to be expanded to take in the whole area of the zones.

20 page 26, para. 2 -- This paragraph sounds nice, but there is no basis for determining that it is a "systematic" unit. Most of its food, for instance, ultimately is derived from food that drifts in from outside its borders. It is only a guess to say that the preferred boundary alternative will provide a basis for achieving the sanctuary goals. That can only be determined by the proper studies. What if it is found that 5 square miles is not enough? Once the Sanctuary is established, it can be expanded very easily.

Response #14

This comment has been incorporated into the text (Introduction and Summary, VI Summary of the Status Quo or No Action Alternative).

Response #15

The State prohibition will not stop casual collecting beyond the territorial waters. The Florida State law (370.14) regarding the taking of coral and sea fans make it unlawful to posses fresh or uncured specimens. It does not prohibit possession of bleached or cured coral and since coral can be quickly killed and bleached on board a boat, the law is not adequate to protect the coral at Looe Key form collection. Boaters in these waters may not even be aware of State law. Once the coral is collected the damage is done. Later confiscation at Florida docks will have no impact on protecting those specimens. Please See Response #5 above for a discussion of increased visitor use and Generic Response #2 regarding the need for a sanctuary.

Response #16

The unique management opportunity mentioned in the paragraph in question refers to the fact that the Looe Key proposal represents:

- a small discrete management unit as compared to the 100 sq miles of the Key Largo Marine Sanctuary;
- an easily accessible area with respect to recreational users; and
- an unusually shallow water reef offering recreation, research and educational potential.

Biscayne National Park is managed by the National Park Service under that agency's management goals and objectives, which may or may not be consistent with those of the Marine Sanctuary Program.

Response #17

The text has been revised to reflect your comment. Information on Looe Key fish species was taken from the Looe Key Reef Resource Inventory, prepared in part by John Halas, a fisheries specialist.

Response #18

It is well documented that the coral species in question live in shallow water environments in much the same abundance as in deeper water. It is a reasonable scientific interpretation to conclude that these species could likely have once grown on the Fore Reef.

Response #19

Since it is acknowledged for example, that patch reefs occur intermittently along the entire Florida reef tract it would be illogical in a management sense to even try to include them all in a sanctuary or park of any kind. The DEIS states repeatedly that a cross section of the reef tract (containing patch reefs, the reef flat, fore reef, deep reef and ridge) is included in the five sq nm boundary. It is therefore highly unlikely that the boundary would ever be expanded to include more patch reefs etc. unless it could be scientifically demonstrated that the fore reef system was dying because outlying areas were being destroyed.

The coordinates for the proposed boundary have been included in the Designation Document. This will insure that boundary changes cannot be undertaken in the future without Presidential approval and full public involvement.

pages 26-38 -- The only discussions of the regulations are based on the alternative 5-mile boundary. A fair DEIS should discuss each regulation for each boundary alternative, including no sanctuary, instead of merely listing the alternatives. 21

page 34, activity. coral collecting -- I do not agree that there will be low to no damage to the reef if coral collecting is prohibited. This does not take into account human nature. If visitation increases, coral collecting will increase, primarily by people getting souvenirs. 22

page 35 -- Where is the evidence for "moderate damage" to the coral reef by tropical specimen collecting? I want to know the author of the study and the complete citation. The only thing that the Sanctuary proposes is to give permits to collectors and ban the use of quinaldine. Quinaldine has been so far cleared of the charges of damaging coral. On the contrary, using quinaldine makes the fish groggy and prevents accidental breakage of coral by collectors trying to capture a fast-moving fish. 23

page 40, para. 4, line 4 -- If the Sanctuaries program encourages scientific research and assessment, why are there so few research programs being conducted in the Biscayne, Key Largo, and Dry Tortugas protected areas? 24

Response #20

The Looe Key Marine Sanctuary boundary was selected to include a "representative slice of the ecological pie." Systems in this respect, relate to broad ecological interrelationships Chapter Three, Section E, Looe Key Reef Area). In the marine environment there are essentially no closed systems. Selection of boundaries in the context of a protected area about which little is known is inevitably an "educated guess" based on available data, experience, expertise and administrative realities. Future management related studies will provide answers to the question of the effectiveness of the proposed management measures.

Response #21

Chapter Four, the Environmental Consequences considers the alternative regulations for the various boundary options including the status quo, which is the "no sanctuary" alternative (Section III). In many instances, the proposed regulations would be the same regardless of the boundary alternative.

Response #22

See Response #5

Response #23

"Moderate damage" to the coral reef from both amateur and professional collectors includes, among other things, impact to the ecological system from removing "cleaning fish", disrupting cleaning stations, removing large numbers of other species which play an important role in the Looe Key reef system, using acetone and quinaldene improperly, damaging coral and live molluscs in the pursuit of fish, removing other tropical specimens, such as empty shells utilized by other animals. Tables 1 through 5 assess collectively the impacts of each alternative on the marine resources, based on available data. There is no one study which determines the degree of the impact noted in the matrix.

Response #24

Biscayne Bay and the Dry Tortugas are areas protected by the National Park Service (NPS) and are not marine sanctuaries. The NPS develops goals and objectives focused on its own agency mission. In the Key Largo Marine Sanctuary research is a primary objective. Since 1977, the following research objectives were accomplished:

- a baseline geological assessment in cooperation with U.S. Geological Survey to determine coral reef growth over the past fifty years;
- a bibliography completed listing past relevant research in the area;
- permits granted for studies on coral carbonate production, effects of drill muds on coral, coral ecology, behavior and physiology, and the concentration of heavy metals in the Sanctuary waters.

Planned studies are described in the Key Largo Coral Reef Marine Sanctuary Management Plan, September, 1979, available from the OCZM in Washington. Also please see response #4.

25 page 40, para. 5, line 8 -- In regards to "responding to the interests of affected user groups", would this mean the same as when Everglades National Park threw out commercial fishermen why used nets and still allowed commercial fishermen who guide other fishermen?

26 page 67, para. 3, lines 2 & 3 -- This sentence is misleading, since the protected areas are miles away, not "adjacent" or "in close proximity".

27 page 73 -- After reading the first two paragraphs, the conclusion the writer apparently reached, but glosses over, is that there is no enforcement group that can provide adequate supervision for a Looe Key Sanctuary.

28 page 80, para. 4, line 2 -- What species?

29 page 91, para. 3, lines 1-3 -- Very true -- souvenir coral collecting is probably the most serious drain on the reef. Designate this area as a Sanctuary, then see visitation and souvenir collecting mushroom.

30 page 92 -- The perpetuation of the status quo would <u>not</u> allow coral collecting to continue, since it is already illegal to transport the coral into State waters.

Response #25

The National Park Service which administers the Everglades National Park is part of the Department of the Interior and separate and distinct from NOAA in the Department of Commerce. The issues surrounding the Everglades National Park controversy are not the same as those involving the "affected user groups" at Looe Key.

Response #26

The text has been clarified to satisfy your concern (Chapter Three, Section IV State and other Federal Resource Management Provisions in Adjacent and nearby Areas).

Response #27

Please see response #6.

Response #28

The text has been expanded to answer the question.

Response #29

Please refer to Response #5

Response #30

Please refer to Response #15

31 page 103, last para -- Less than a dozen species of marine aquarium fishes are being successfully raised and sold, but not yet at a level to make a profit for the companies. Aquaculture could eventually serve as a viable alternative for a few of the fish species caught in South Florida. These would have to have the following characteristics: sold for a high price; sold while very small; grow rapidly; and are scarce in nature. The vast majority of fishes, and all the invertebrates, do not qualify. Based on my professional opinion, aquaculture will only be able to complement marine organism collecting in a small way, not supplant it.

32 page 104, para. 4 -- Prohibiting the use of quinaldine and allowing the discharge of toilet tank chemicals does not make any sense. It seems to be that you are picking on an activity that can not fight back, rather than tackle a larger activity that can do more harm, but that you cannot prevent. Have any studies been done with these tank chemicals on corals?

33 page 104, last para. -- Sure, some of this loss can be made up elsewhere, until the Sanctuary boundaries are extended, and entended. (The boundaries are not specified in the Designation Document).

34 page 105, last para. -- O'Kane, 1979, is not in the literature cited section. This is unfortunate because he (or the DEIS writers) tries to make a very vague and questionable connection between the lack of large reef predators and an over-abundance of sea urchins. Unfortunately, I cannot go back to this man's paper, to find out the story, or even to find out his qualifications. Was he quoted out of context? I can't think of any large reef predators that feed on sea urchins.

If this paragraph is in fact valid, and the Sanctuary is truly interested in preserving the ecology of Looe Key, the I would vigorously oppose spearfishing as well as hook and line fishing, the latter of which harvests as many or more large reef predators than spearfishing. I note the political nature of allowing hook and line fishing on page 107, para. 6, lines 1 & 2.

35 page 111 -- The regulation would not prevent floating or submerged waste debris, since it is very easy to dump trash over the side of a boat without anyone noticing. Have highway litter laws prevented roadside trash? Also, huge quantities of trash can drift in on water currents, dumped from passing ships on the high seas.

36 page 117 -- I note that two of the original petitioners for a Looe Key Sanctuary wereWeiner and Antonius. They also were the major preparors of the Looe Key Inventory, a faulty document that OCZM is relying on as the major reason for setting up the Sanctuary, and which tried to make a case for the Sanctuary. They are also two of the preparers of this DEIS.

No wonder that this DEIS is in favor of the Sanctuary, rather than being an impartial statement of the situation, as required by law.

Response #31

This information has been incorporated into the text. (Chapter Four 3. Tropical Specimen Collecting.

Response #32

The Environmental Protection Agency, Marine Activities Office (responsible for developing the regulations), and the U.S. Coast Guard, Office of Marine Environment and Systems, Branch Enforcement (responsible for implementing the regulations), have informed NOAA that there are no existing studies on the effects of MSD chemicals on corals. These agencies believe that MSD discharges will not negatively impact the health of the reef. On the other hand there are studies that bring into question the effects of quinaldine. However, NOAA will monitor closely the effects of discharges on the reef. Under the revised proposal, the use of chemicals will be evaluated on a case by case basis during review of permit applications.

Response #33

Please see Response #19. The proposed boundary coordinates has been included Designation Document in response to concerns raised at the public hearings.

Response # 34

O'Kane, 1979, has been included in the bibliography. Refer to above Response #12 with reference to O'Kane's paper. Refer to responses #1 and #3 of J. Connor Davis letter regarding spearfishing and hook and line fishing.

Response #35

The text has been clarified to reflect this comment.

Response #36

The Looe Key DEIS was prepared in accordance with the Council on Environmental Quality regulations and has followed the National Environmental Policy Act requirements (NEPA). NOAA believes that the document presents available information in an unbiased manner. The proposal reflects analyses based on this information and NOAA welcomes any new data or corrections based on fact, experience or expert interpretation. The DEIS as released for review was prepared by NOAA based on an environmental impact assessment written under contrac by Sager, Gardiner and Wilcox (SGW), a McLean, Virginia consulting firm.

37 Appendix A, article 3 -- Much too vague to have any value in justifying article 3.

Article 4 -- Hook and line fishing should be listed, since it is an activity that could cause harm.

38 Article 5, section 3 -- This paragraph seems useless, since it seems to imply that if it is not included, then someone with a permit would be prohibited from doing the activity, while someone without a permit would

39 be permitted (when not regulated by the Sanctuary).

page A-6 -- The permit application process seems to be excessively laborious, as far as tropical fish collectors are concerned, and it gives the Assistant Administrator complete authority to grant or deny a permit, solely

40 on his subjective decision. Even though tropical fish collecting would be allowed (at least initially), that does not mean that ~~that~~ all (or even most) of the fish collectors that apply for a permit will be granted one.

This DEIS, overall, is a very poor example of scientific writing, because of the following glaring faults:

1. It is heavily biased throughout its discussions, in favor of establishing a 5-square-mile marine sanctuary at Looe Key.

41 2. It justifies its stance by saying that Looe Key is the best-known reef in the Reef Tract. The only study is in fact an inadequate survey of Looe Key, done by the same people who petitioned to have the reef designated as a Sanctuary, and who also by chance took part in preparing this DEIS.

3. A great many citations in the text, referring to people and scientific papers, are absent from the listing of people and papers in the Literature Cited sections. This prevents anyone from checking the accuracy of statements made in the DEIS by going back to the original sources.

42 Note, for instance, Zieman & Roblee, 1979 (page 25), Hoffmeister & Muller, 1964 (page 47), Antonius et al (page 89), Munro, Reeson & Graut, 1971 (page 96), Gillen, 1979 (page 98), Stevenson, 1978 (page 98), Hess & Stevely, 1979 (page 102), and O'Kane, 1979 (page 105).

4. Your "Constitution", the "Designation Document" gives you the right to regulate those activities listed in it. Adding to this list requires another entire designation

43 process. However, adding regulations only requires public review and comment, and can be imposed in spite of public comment. (Look at Everglades National Park,

Response #37

Article 3 is meant to be only a general description and NOAA believes that the language in the DEIS is adequate for that purpose.

Response #38

Please see response # 3 of the J. Connor Davis letter.

Response #39

Article 5, Section 3 is standard legal language acknowledging the validity of other permits as long as the activity in question does not violate a sanctuary regulation.

Response #40

Please see Generic Response #4.

Response #41

The "Looe Key Reef Resource Inventory," prepared by the Florida Reef Foundation, was adequate for the purposes of the discussion in the DEIS. The two principal marine biologists with the Florida Reef Foundation were subcontracted by SGW, the preparers of the environmental impact assessment, because they were qualified coral reef marine scientists with a great deal of onsite field experience. See also response #36.

Response #42

These citations, inadvertently omitted from the DEIS, have been added to the bibliography.

Response #43

Please refer to Responses #19, #25.

43 which banned commercial net fishing for political reasons, in spite of agreements to allow this activity in perpetuity with the park was set up). In addition, if OCZM wanted to stop fish collecting in the Sanctuary but could not force through a regulation banning it, they could merely deny permit applications with no fuss and no bother.

44 Sanctuary programs in this region are a very spotty method of protecting a reef. A much more sensible method is being developed right now -- the Gulf of Mexico and South Atlantic Fishery Management Councils are planning to prohibit the gathering of all corals, except by permit or for a very few gorgonians, over the whole of the region. They plan a Habitat Area of Particular Concern for the Looe Key area.

45 OCZM claims to want to preserve representative ecosystems around the United States. Why then does it want to establish Looe Key, whose ecosystem duplicates that of Biscayne National Monument, Key Largo Coral Reef Sanctuary, and Dry Tortugas Preserve.

Go Away !

Yours truly,

Henry A. Feddern

Henry A. Feddern, PhD
Ichthyologist
Executive Director, Florida
Marine Life Association

Response #44

Please see Generic Response #2.

Response #45

Please see Generic Response #3.

1315 Border Dr.
Winter Park, FL 32789

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., N.W.
Washington, D.C. 20235

Dear Director:

This letter is to urge you to declare Looe Key reef, off the lower Florida Keys, a National Marine Sanctuary. Due to misuse of our oceans, there are very few living reefs remaining in the world. It is our responsibility to insure that the ones remaining will be preserved for the future.

Please see Generic Response # 1.

We have become aware that a few fishermen and oil companies, with only personal monetary gratification in mind, have frustrated efforts toward sanctuary status for Looe Key. These special interest groups are motivated by greed and selfishness, without thought for the result of their actions. Someday we may need places like Looe Key to provide breeder fish for parts of the ocean depleted of fish by commercial fishermen or oil spillage.

At this time boaters and fishermen anchor directly on the coral, breaking it irreparably, due to ignorance or irresponsibility. The damage being done may never be rectified unless steps are taken now. There is no protection for this area other than that provided by concerned divers and dive boat captains. With sanctuary status the area could be patrolled by the U.S. Coast Guard and the Florida Marine Patrol to insure that the reef is not abused.

We strongly urge you to consider the future now and to avoid the danger of waiting until hindsight suggests you should have acted sooner. Please do not allow the special interest groups to win this issue and continue their destruction of this important coral reef.

Sincerely,

Mr. & Mrs. Ron Geluba

1300 Galiano
Coral Gables, FL 33134

July 2, 1980

Director of Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehave Street N.W.
Washington, D.C. 20235

Dear Sir:

I am writing to make strong objections to the "Draft Environmental Impact Statement on the Proposed Looe Key National Marine Sanctuary." I attended the public hearing in Miami, June 17, 1980 and made a statement. This letter is to further clarify my views as expressed at the hearing and to explain my objections.

Attached to this letter is a summary of my background and special experience on coral reefs. I am currently a faculty member of the University of Miami's Rosenstiel School of Marine and Atmospheric Science and a member of several scientific organizations, but this statement reflects my personal views and in no way does it represent the opinions or positions of the University or any organization.

Sincerely yours,

Robert N. Ginsburg

RNG: jr
Enclosures

SUMMARY VITA

ROBERT N. GINSBURG

Ph.D. University of Chicago (Geology) 1953

Senior Research Geologist, Shell Development Company 1954-1965

Professor of Marine Geology and Oceanography, The Johns Hopkins University, 1965-1970

Professor of Marine Geology, University of Miami, 1970-present

President, Society of Economic Paleontologists and Mineralogists, 1969

Councilor and Fellow, Geological Society of America, 1978-1981

Fellow (nominee), American Association for the Advancement of Science

Gold Medal for excellence in research, Florida Academy of Science, 1976

Senior Queen's Fellowship, Australia, 1979

Chairman, Organizing Committee, Third International Symposium on Coral Reefs, Miami, 1977

Member, International Union for Conservation and Nature, Advisory Committee on Coral Reefs, 1979-present

Chairman, Atlantic Reef Committee

Author of several scientific works on coral reefs in South Florida, the Bahamas, Bermuda, and Belize

CRITICISM OF THE DRAFT ENVIRONMENTAL IMPACT
STATEMENT ON THE PROPOSED LOOE KEY NATIONAL MARINE SANCTUARY

ROBERT N. GINSBURG
1300 Galiano
Coral Gables, FL 33134

I want to make it quite clear that I view the Sanctuary Program here in Florida as a definite success. Much thought and effort is going into the management and from personal experience, I know that the reefs are being well protected; I was cited and fined a year ago for merely having picked up two pieces of dead coral in the Key Largo Sanctuary. The current research supported by OCZM will add to our basic knowledge of reefs and hopefully provide the basis for developing a much-needed program of public education in the Sanctuary.

Please see Generic Response #3.

The Sanctuary Program here in South Florida is off to such a good beginning, that it seems to me imperative that any additional sanctuaries in the area be established on the same sound basis of need, location, and special resources. From my reading of the Draft Impact Statement, I am deeply concerned about several aspects of the proposed designation of Looe Key as a Sanctuary. The history of the nomination of Looe Key and the considerable emotion surrounding it have, I feel, obscured some fundamental questions about the proposed Sanctuary. To make my comments clear, I have organized them into five questions.

1. Is there a need for an additional Sanctuary in the Florida Reef Area?

At present, there are three coral reef preserves in the South Florida area:

1) The Key Largo Coral Reef Marine Sanctuary, managed by NOAA;
2) The John Pennecamp State Park, managed by the State of Florida, DNR;
3) Biscayne National Monument, operated by the National Park Service.

Together, these preserves cover some 260 square miles off Key Largo and adjacent Keys; included within them are most of the major reef areas of the Upper Keys and several representatives of the major reef-building communities--shelf-margin, lagoonal or patch reef. These reefs are readily accessible to the public, knowledge about them is expanding, and management practices established. In the light of these three preserves, it is reasonable to ask whether additional coral reef sanctuaries are needed? Nowhere in the Draft Impact Statement is this fundamental question considered or even mentioned. The existence of the Draft Statement for Looe Key makes it quite clear that the Office of Coastal

Zone Management believes that additional sanctuaries are needed, but no explanation is provided as to how this conclusion was reached. I think the failure to address the question of the need for additional sanctuaries is a most serious omission and I urge that the proposal to designate Looe Key a Sanctuary be tabled until the question is given the proper consideration. The kind of consideration that is needed is that traditionally provided by a Committee of the National Academy of Science.

2. Is Looe Key the best location for a Sanctuary in the Lower Keys?

Assuming that the answer to question 1 posed above is yes, there is a need for an additional sanctuary (ies) in the Lower Keys, then it seems altogether appropriate to ask whether Looe Key is the most appropriate place to site it. Again, I see no evidence that this question was given any consideration in the Draft Impact Statement. There is only the briefest mention of the fact that Looe Key is but one of several shelf-margin reefs in the Lower Keys. All the effort and preparation has been centered on Looe Key and unless one were familiar with the area, he or she would get the impression that it is the only luxuriant reef in the area, and that it has a constellation of unique features not present elsewhere. This impression of uniqueness is in my opinion totally exaggerated and I will explain my reasons below in item 3. What is significant here is that again the Draft Impact Statement failed entirely to consider the question "Is Looe Key the best location for a Sanctuary in the Lower Keys?" I understand that the nomination of Looe Key was made by a coalition of citizens groups in the Lower Keys, but I am also informed that the Office of Coastal Zone Management has the responsibility to review nominations, to consider them in a broad perspective and to reject those they do not consider appropriate. Was the proposal to establish a sanctuary at Looe Key considered in the context of the entire Lower Keys area? I find no evidence that the question was examined, and again as in item 1 above, I feel that a crucial step in the whole process was omitted.

3. What are the special features of Looe Key that justify its designation as a Sanctuary?

By implication as well as by its direct statements, the Draft argues that Looe Key is one of those "special marine areas with unique conservation, recreational, ecological or aesthetic values" (p. 3 Purposes of the

National Marine Sanctuary Program). Here I will consider two kinds of potential uniqueness: 1) the reef itself, its organisms, and aesthetic aspects; and 2) the historical-cultural resources.

The Draft provides the results of a thorough survey of the marine plants and animals of Looe Key, but there is no discussion of their uniqueness as compared with other reefs. There are no comparable studies of other reefs, but from what I know of the reefs in the Upper Keys based on some thirty years of observations and from what I have learned from the work of colleagues, I find no indication that the reefs and reef-building organisms on Looe Key are greatly different from many other shelf-margin reefs. The reefs at Molasses Lighthouse, at Sand Key (off Key West), or at Carysfort Lighthouse have the same morphology, the same plants and animals as does Looe Key. In my opinion, Looe Key is by no means unique.

The Draft Statement makes repeated reference to the wreck of HMS Looe and its companion vessel, the Snow. However, the Draft and reports of divers make it clear that the wreckage of the Looe is all but gone and the only way that a visitor can gain any hint of its presence is by diving to the bottom and fanning away the sand to reveal ballast and debris, an activity that will be prohibited if the areas are designated a Sanctuary. Surely, the existence of a wreck that can not be seen does not qualify as a unique historical resource? There are shiprecks on essentially all the major reefs.

4. Does protection of the reef-building coral require that Looe Key be designated a Sanctuary?

The Draft emphasizes that protection of corals from souvenier collectors is a principal goal of the proposed Sanctuary, and by implication one of the major reasons for its designation. Yet as indicated in the Draft, the Fishereies Management Plan that is expected in final form early in 1981 will in all likelihood control the collection of corals, not just for tiny Looe Key but for the entire coastal areas. Surely, the need for control is not so urgent that a Sanctuary needs to be established at once, if indeed it could be established in less than a year, when next year the needed regulations will be in place?

5. Is the Proposed Sanctuary sufficiently large enough to ensure its preservation?

One of the major lessons of conservation policy that is forcefully

demonstrated in South Florida is that a preserve, park or sanctuary needs to be large enough to prevent what might be termed upstreaming. The surface water supply of Everglades National Park, the life blood of this largely aquatic preserve is controlled by a State Agency. As a result of this control, the natural alternation of wet and dry seasons has at times been seriously interrupted with significant consequences to the flora and fauna. Both of the existing marine preserves--Key Largo-Pennecamp and Biscayne are large enough to reduce the likelihood of upstreaming.

The proposed Looe Key Sanctuary is five square nautical miles, an area that encompasses one and only one shelf-margin reef and several small patch reefs. Such a small preserve is vulnerable to any activities of a harmful nature outside its boundaries. Some reef-dwelling animals are migratory, and almost all the reef-building biota have planktonic larva stages, facts that make Looe Key as dependent on its surroundings as any open ecosystem. Yet the proposed Sanctuary will have no control or ability to regulate fishing, dredging, or whatever outside its miniscule boundaries.

Limiting the proposed Sanctuary to a single reef forces consideration of what might happen if this one reef died? Along the Florida Reef Tract there are several "rubble piles" accumulations of coral debris that at present have little or no living coral. Two of the most prominent examples are Little Molasses, within the Key Largo Coral Reef Sanctuary; and Western Sambo, off Key West. These areas were, sometime in the not too distant past, sites of flourishing reef growth comparable to Looe Key, but for reasons that are not understood, there is little living coral there today. In view of this risk, and I consider it a real one, is it wise to establish such a small Sanctuary?

I have gone to considerable effort to clarify my objections to the proposed designation of Looe Key as a Marine Sanctuary because I feel strongly that such action would be most unwise. The Draft has failed to consider the most fundamental aspects (Items 1 and 2), it has not established that Looe Key has unique features justifying the sanctuary designation, it has not given proper emphasis to the forthcoming prohibition of coral collecting by the Fisheries Management Plan, and it proposes such a small area as to put the whole concept of a preserve in jeopardy. Any one of the five objections I have outlined would in itself be cause for serious concern, but taken together, they raise a major alarm.

I feel sure that each proposed designation of a Sanctuary has its own special questions and controversies, but is seems to me that the Looe Key proposal, because of the intense pressure that has been mustered in its support, poses an unusual dilemma for the Office of Coastal Zone Management. In my opinion, the designation of Looe Key is not in the spirit or the letter of the Sanctuary Program and if it is done, it will be a serious detriment to the Sanctuary Program.

Robert N. Ginsburg 7/2/80

Re: Looe Key Marine Sanctuary
Please help us to preserve as
much of these gorgeous reef waters
as possible. There are surely
enough fish around for commercial
fisherman if they do not waste
that precious commodity. My
husband and I swim daily, and
he snorkels often at nearby
reefs. Looe Key must be protected.
7-5-80 Thank you. Dorothy Harte, P.O. Box 956,
Key West, Florida 33040

Please see Generic Response # 1.

4345 S.W. 13 Street
Miami, FL 33134
June 21, 1980

Director, Sanctuary Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

CZM
REC'D
1980 JUN 30 PM 2:12
MAIL ROOM

Dear Sir,

As a private citizen I am most concerned about our dwindling wilderness and the lack of efforts to support the natural beauty for future generations. It is this concern which brings me to write you of my support for the Love Key National Marine Sanctuary. After having spent this weekend snorkeling over the reef, I know of its beauty and can appreciate the efforts of time and nature in all her splendor in creating such a masterpiece. Unfortunately, if we do not take great effort to preserve this wonder and the abundant life that thrives, it will be soon lost and future generations will never have the beautiful experience I have just witnessed. I encourage you to accept Love Key as a National Marine Sanctuary of at least a five mile area.

Thank you for your efforts.

Sincerely,

Lynn Holleman

Please see Generic Response # 1.

6/18/80
Box 981
Marathon Fl 33050

Dear the Sanctuary Program
Office - Coastal Zone Management
Washington DC 20235

Dear Sir,

We fully and heartily endorse the Sanctuary Proposal of Looe Key

Sincerely yours
Melvin P. Hawe

Please see Generic Response # 3.

MRS. FERDINAND HINRICHS
8200 NORTH GREEN BAY ROAD
MILWAUKEE, WISCONSIN 53209

Dear Sir -

Please help our efforts to pressure hook Key reef for national marine sanctuary status. The pressure on this fragile area increases every year - as 12 year residents of Key Largo we are aware of our disappearing Treasures.

Sincerely yours,

Anita Vogel Hinrichs
Ferdinand Hinrichs
20 Perky Road
Key Largo, Fla. 33037

July 11, 1980

Please see Generic Response # 1.

36 Allamanda Avenue
Key West, Florida 33040
June 17, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Please see Generic Response # 1.

Dear Sir:

I strongly endorse the nomination of Looe Key reef for National Marine Sanctuary status, and ask that it be designated as such. The interests who oppose the sanctuary designation will not be as adversely affected as their spokesmen may claim, while the general public will be greatly benefitted. Preventing a harm in the area of the public good automatically confers a benefit. The reef is in the province of all the citizens of the United States, and in the public interest it needs be accorded National Marine Sanctuary status.

Sincerely,

Nan B. Keefer

Nan B. Keefer
(Mrs. William L. Keefer)

June 23, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Dear Sir:

This letter is to serve as our unqualified endorsement and approval of a Marine Sanctuary status for the LOOE KEY reef off the lower Florida Keys.

Sincerely,

Hand & Grace Kendall

Hand & Grace Kendall
124 San Remo Drive
Islamorada, Fl. 33036

Please see Generic Response # 1.

12 June 1980

Dear Dr. Foster,

1 As a lifelong Florida resident, a former commercial tropical fish collector and a government marine biologist with a Masters degree in Marine Biology from a Florida university I believe the the Sanctuary Programs Office has erred in proposing to allow by permit the commercial collection of tropical specimens from a federally designated Looe Key Marine Sanctuary.This is a very inappropriate activity within a Marine Sanctuary and is inconsistent with objectives of your office and the other regulations proposed for Looe Key. I support in their entireity the other preferred alternatives but believe that you have been misled by your local information sources as to the present level of commercial collecting at Looe Key and the biological and aesthetical consequences of allowing this activity to continue in the event of a formal designation of Looe Key.

Permitting would be a very ineffective means of dealing with the problem and I recommend that the Sanctuary Programs Office reconsider and prohibit tropical specimen collecting within all boundary alternatives except for scientific and educational purposes with NOAA permits.

Sincerely,

Curtis R. Kruer
Rt. 1 Box 510D
Big Pine Key, Fl
33043

Response # 1

The FEIS proposes to prohibit tropical specimen collecting except by permit for scientific and educational purposes. Please see Generic Response # 4, for additional discussion.

EAST CAROLINA UNIVERSITY
GREENVILLE, NORTH CAROLINA 27834

DEPARTMENT OF SOCIOLOGY
and
ANTHROPOLOGY

Telephone (919) 757-6883

June 24, 1980

1980 JUL -1 PM 3:36

Dr. Nancy Foster, Deputy Director
Sanctuary Programs Office
U.S. Department of Commerce
National Oceanic & Atmospheric Admin.
Office of Coastal Zone Management
Washington, D.C. 20235

Dear Dr. Foster:

This letter is in reference to yours of May 9, 1980 and our conversation of June 18, requesting comments on the Looe Key DEIS. I will confine my remarks to the Socio-economic portions of the document.

E-183

1. On pages 59-60, the document refers to sociological conditions when, in fact, only a few demographic data are presented. Sociological analysis includes a description of social and technical organizations, to wit, values, norms, interaction patterns, and other such sociocultural properties which are present through time and provide the basis for understanding human behavior. In a DEIS such as the one under consideration, a treatment of sociological conditions would have to include the nature of the local maritime social organization and how it relates to the Looe Key issue. I would suggest that you jettison the current title (unless, of course, you would wish to carry through a sociological analysis) in favor of something like Population Size" (the title Demographic Data would be inappropriate also since there is no description of the population other than size, nor a description of racial/ethnic characteristics, nor migration patterns).

John R. Maiolo
East Carolina University

Response #1

The text has been changed to reflect your comments. The section, "Sociological Conditions," was inappropriately titled. The information in the socioeconomic analysis is not a sociological analysis but a socio-economic description and economic analysis.

2. From the document, plus conversations with Evelyn, the Onsite Survey did not use a probability sample. Therefore, no generalizations to the larger population can be made, nor can claims be made that the sample is representative (e.g., page 61, "...commercial fishermen...derive about 28% of their annual

*The methodology by which projections were made should be stated in the narrative.

East Carolina University is a constituent institution of The University of North Carolina

Response # 2

During the course of designing and completing the Looe Key on-site survey, it was not possible to draw a stratified random sample based on a finite population.

In most surveys of commercial fishermen the only way to define a population is through boat registrations, licenses, permits, etc. In Florida, boat registrations are defined at only the county level. Thus, due to the large size of Monroe County and the small size of Looe Key within the county, the county boat registration list would not have defined an acceptable population. Also, it is not necessary to have a commercial boat registration in Florida to sell fish, nor is a commercial fishing license required. Although fishermen are required to have a spiny lobster permit, the large numbers of species sought around Looe Key renders the spiny lobster permit list useless as a population delimiter.

Specifically, no population listing from secondary data sources of users of Looe Key resources was known and, therefore, no population list was available from which to draw a stratified random sample. In addition, no previous research was available which could be used to determine the population variance. Variance and population size are both required to determine necessary sample size.

Even if it had been possible to meet all necessary statistical sampling requirements, considerable research experience in fisheries suggests completely random samples are often not practical during the interview phase due to the characteristics of the fishing industry such as mobility. Two examples make this apparent. Prochaska and Cato (1977) conducted a mail survey in early 1975 of all 9,539 fishermen who had registered commercial boats or vessels in 1974 with the Florida Department of Natural Resources. Approximately eight percent of the questionnaires mailed were returned because fishermen no longer lived at the old address and forwarding addresses were not known. In addition, approximately two percent of those sent questionnaires reported that the individual was deceased, had retired or left the fishery for other reasons. Also, a comparison of the number of commercial fishing boats registered in 1972 with the number of boats and vessels reported in 1972 statistics of the National Marine Fisheries Service suggested that many commercially registered boats are not actually used for commercial fishing.

catch..." - such a statement cannot be made on the basis of the survey design). Nor can statements about how much revenue is made per boat per year. The best that can be said is to characterize the profile of the sample only, and then make it clear that the sample was not scientifically derived nor defensible. As such, generalizations to the overall fishing population cannot be made.

2

Next, time and money constraints, severe as they may be, do not permit scientific type conclusions with non-scientific sampling.

Also, even if the sample were systematically derived, an n of 25 will not allow a reasonable confidence level without extremely broad limits.

Response # 2

Liao (1979) also attempted to draw a stratified random sample in the South Atlantic shrimp fishery. License data files for 1976 were obtained from each state's fishery agency in the South Atlantic. A desired sample size of 391 was randomly selected from the stratified population. A total of 301 sample trawlers were surveyed of the 391. The remaining 90 were not surveyed due primarily to the dislocation problem particularly in Florida. That is, they could not be located. Because of this problem, lack of time and economic limitations, attempts to reach the remaining trawlers were terminated after an eight-month sampling period.

In summary, no effective population could be defined from secondary sources for the Looe Key area. Even with a population from secondary sources, problems would have been encountered in trying to reach those drawn in the sample. Thus, due to the mobility problem and the fact that the survey was commissioned by the Office of Coastal Zone Management subject to severe time and budgetary constraints, a stratified random sample was not drawn.

Given these limitations, a logical scientific approach was employed to estimate parameters necessary to meet the objectives of this study. The scientific method which characterizes scientific research does not necessarily require the use of statistics based on random sampling. This is only one of many "techniques" which can be used within the framework of the scientific method. The logical approach utilized in this study included the following steps and attributes:

(1) Meetings were arranged with fishery representatives (members of the Organized Fishermen of Florida and Marine agents) to determine (a) the structure of the fishing industry which is based on Looe Key resources and (b) a list of fishermen representative of this user group.

(2) In order to prevent the sample from being biased since the initial list would only represent fishermen from one fishery organization, members of the research team also questioned other members of the community to determine additional fishermen who could be added to the list of fishermen to be interviewed.

(3) A local citizen with research and academic experience was employed to assist in the interviewing process to further insure that a representative sample was obtained. This interviewer was also familiar with the fishing industry.

(4) While the "population" of fishermen was being developed, an honest attempt was made to make the list representative. For example, both fishermen who fished the area for over ten years and newcomers to the area were included in the li

3 Finally, survey research has a specific terminology and I would suggest that the DEIS be edited in a way to be consistent with it. For example, questionnaires are self administered. Interview Schedules are administered to respondents by an interviewer. As picky as that point may be, the proper use of terminology is important in documents such as the Looe Key DEIS. As a biologist, I'm sure you would be concerned about a document where important taxonomic terms were improperly used (e.g., in labeling hard clams as mercanaria instead of m. mercenaria.

I hope these comments will be useful. Under a separate cover I am sending a previously written memo on sampling. Evelyn has suggested that it may be helpful to her. I would appreciate your sending it along to her after you have had a chance to examine it.

Sincerely,

John R. Maiolo
Professor and Chair

JRM:jas

(5) The area from which fishermen's names were collected was based on previous research results which indicated distances fishermen traveled from home ports to fishing grounds in the Keys (see Appendix C of the Draft Environmental Impact Statement).

(6) Once the list was completed an attempt was made to complete interviews with all that were noted to be representative, knowledgeable Looe Key fishermen. A total sample of 25 fishermen was interviewed. This appeared to be a sample of adequate size for two reasons. The on-site population estimate determined that there were approximately 100 fishermen that could be affected by the Looe Key National Marine Sanctuary proposal. The sample of 25 represents 25 percent of the population which would generally be considered of significant size. Williams (1976) completed a dissertation on the Florida Keys Spiny Lobster fishery in which a sample size of only 21 fishermen was determined adequate at the 10 percent bound on the error of estimate about the population mean to draw inferences about the entire Florida Keys spiny lobster industry. It should be noted that this 1976 dissertation was voted in 1977 one of the three outstanding Ph.D. dissertations written in the Agricultural Economics Profession by the Awards Committee of the American Agricultural Economics Association. Spiny lobster trapping accounted for approximately 62 percent of the fishing income earned from Looe Key. Thus, it appears the sample of 25 fishermen did provide a representative sample.

(7) It may also be argued statistically that a sample based on previous information about population characteristics (such as information generated in the initial interview phase of the on-site study when population size and members were determined) can lead to smaller standard deviations than completely random samples.

(8) The final step in the scientific method utilized in this constrained study was to subject its conclusions to public review. Overall, the fishing industry was satisfied that the results adequately represented the Looe Key fishing industry.

These comments indicate that the sample should be representative, that the results of the study are reliable and that generalizations to the population are appropriate.

Response #3

The text has been changed as you requested. The term "questionaires" has been replaced with "interview schedules.

Mr + Mrs. Robert F. Merrick
Rt. No. 1, Box 74 E, Islamorada, Fla. 33036

June 22nd 1980

Director of the Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St. N.W.
Washington, D.C. 20235

Dear Sirs,

We strongly approve the LOOE KEY proposal for National Sanctuary status.

Margaret Merrick
R. F. Merrick

Please see Generic Response # 1.

William R. Meyers
7630 Gulfstream Blvd.
Marathon, Florida 33050

June 16, 1980

Director of Sanctuaries Program
Office of Coastal Zone Mgt.
Washington, D.C.

Dear Sir:

I am writing to you on the behalf of the Looe Key preservation program. It is essential for generations to come that our natural resources should remain, especially when protecting them does not provide extreme harm to local residents. The fishermen who are complaining about the regulation have hundreds of square miles to ply their trade and the only reason they object to the Looe Reef protection plan is they feel it is the start of some infringements on their fishing areas. From my experiences up North as well as here in the Keys, I have found that they will fish or lobster or clam or crab an area till it is depleted of marine life.

PLEASE PROTECT OUR RESOURCES.

Thank you very much.

Yours truly,

Wm R Meyers

WILLIAM R. MEYERS.

Please see Generic Response # 1.

To whom it may concern 7/11/80

I am presently a Marine Biologist for Dade County (Dept of Environmental Resources). Prior to this job, I worked for the State of Florida (Dept of Natural Res.). I lived and worked in the Florida Keys for 3½ years.

Initially, I would like to commend your team of biologist on a job well done. I do have reservations on just Looe Key being designated a marine sanctuary. The fact that we have only 35 sanctuaries to designate, I would suggest enlarging the area so that other parts of the reef tract are protected. I question Looe Key's uniqueness. It was used as a bombing site during WWII therefore exerting some of its uniqueness to nearby divers. Areas of the reef tract from American Shoals Light to Sands Key Light are areas to investigate further. I do want Looe Key protected, but is this the only way? Are there not other programs that would be more specific. I also have reservations on the proposed enforcing body. The Marine Patrol is overburdened at present with State territorial waters. An additional load on the Marine Patrol will only hurt their present job duties and ultimately Looe Key.

In closing, I appeal to you to seek out and investigate additional areas along the reef tract in the Lower Keys before making your final decision. In addition, include in your proposed budget adequate monies to cover a separate enforcement agency, so that our reefs will be preserved for future generations.

Sincerely, [illegible]

Please see Generic Response # 1.

WILLIAM T. MILLS, P. E.
347 STIRRUP KEY BLVD.
MARATHON, FLORIDA 33050

(305) 743-2818

July 15, 1980

Director of Sanctuaries Program
Offices of Coastal Zone Management
3300 Whitehaven Street N.W.
Washington, D. C.

Dear Sir,

I wish to support the 5 square mile Looe Key sanctuary program.

I am concerned that the commercial fishermen, if they are allowed to control this legislation, will pursue their usual course of "take all and take it now". It disturbs me that they are now gearing up to fight the fish trap bill and the Everglades fishing restrictions. Even now the Marine Patrol has seized and smashed over 7,000 illegal lobster traps placed in public waters well ahead of the official season. Their track record hardly qualifies them to be stewards of public waters.

Yours very truly,

William T. Mills

Please see Generic Response # 1.

UNDERSEA SAFARI EQUIPMENT:
REEFNETS TM, Special Barrier Nets

SUPPLIER FOR:
DOMESTIC
Aquarium of Niagara Falls, USA
Cedar Point, Inc.
Childrens Museum of Hartford
Cleveland Aquarium
Dallas Aquarium
Fort Worth Zoo
Hanna-Barbera's Marineland
Marineland of Florida
Marine World - Africa USA
Mystic Marinelife Aquarium
New England Aquarium
New York Aquarium
Ocean World, Inc.
Pittsburgh Zoo
San Antonio Aquarium
Sea Arama
Sealand of Cape Cod
Sea World of Florida
Sea World of Ohio
Sea World - San Diego
John G. Shedd Aquarium
FOREIGN
Antwerp Zoo
Montreal Aquarium
Quebec Aquarium
Rotterdam Zoo
Vancouver Public Aquarium
COMMERCIAL MEMBER:
American Association of
Zoo Parks & Aquariums
Slide Talks:
Baltimore, 1976
Denver, 1978
MEMBER
Florida Marine Life Assn.
American Fisheries Society
Organized Fishermen of Florida
FISH DISEASE WORKSHOPS
University of Georgia, 1976
New England Aquarium, 1979

JOHN C. NOYES
MARINE LIFE FISHERMAN
(SINCE 1956)

A DIVISION OF:
SEVON PROPERTIES, INC.
P. O. BOX 212
FORT LAUDERDALE, FLORIDA 33302
(305) 791-SALT
CABLE ADDRESS: NOYESFISH

July 11, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N. W.
Washington, D. C. 20235

Gentlemen:

The Draft for the Looe Key Sanctuary has been reviewed by me. First, I would like to state my qualifications to make comments. Having logged 25 years and about 10,000 hours of underwater time in the Carribbean/Bahamian/Florida area, I can draw upon much experience. This has been orientated towards marine life, gradually learning the ecology of the more than 200 species of fishes and the more than 100 species of invertebrates which occur in these waters. I am conservation oriented and practice ecologically sound fishing methods in the pursuit of my livelihood as a marine life firsherman. Presently, 80% of my gross is with public aquariums, institutions of a professional nature who look to me for specimen supply of reliable quality, captured using methods not harmful to the environment. I am a commercial member of the American Association of Zoological Parks and Aquariums, a membership granted only to well known and reliable animal suppliers meeting rather strict qualifications and recommendations. Further, I am a member of the American Fisheries Society, the Florida Marine Life Association (presently Executive Secretary), the Broward County Chapter of Organized Fishermen of Florida, and Vice-Chairman of the Marine Archeological Advisory Panel of the Broward County Historical Society. Additionally, I am a panel member on the SAFMC's Coral Advisory Panel and on the GMFC's Tropical Reef Fish Advisory Panel.

My interest in the Looe Key proposal is not one of a matter of direct livelihood, since my fishing activities are in Broward County waters. My interest lies in correcting statements made in the DEIS for Looe Key which appear to me to need reworking. To allow these statements to go unchallenged is likely to allow these statements to become "fact" within the public document structure.

MY COMMENTS:

1 First, may I suggest a terminology change? Would the term Marine Life Fisherman (Fishery) be more suitable for the commercial Marine Specimen or Tropical Specimen Collector? The term "collector" I object to on the basis that it cannotes amateur, non-commercial activities.

2 PAGE 1 ¶4 - "unique and significant value - -" leads the reader to believe that Looe Key is unique without similar areas in the reef tract. This is not the case.

3 PAGE 4 ¶1 - "one of the few remaining living section of the Florida Reef tract" - I object to this. I would suggest that frequently along the reef tract these conditions exist. For example, Fowey Rocks would offer an outstanding alternative close to a populated area, Miami. We already have Key Largo Coral Reef Marine Sanctuary. The point is that Looe Key area is a very nice reef, but so are many other areas.

4 PAGE 4 - GOAL 1 - Why pick this small reef site for intensive protection, when the entire reef tract will be protected as determined by GMFMC & SAFMC.

Response #1

The text has been changed wherever applicable, to use the term marine life fishery for commercial tropical specimen harvesting. NOAA is concerned with amateur as well as commercial tropical fish collecting in the area. In several text discussions the term is also too general to convey the distinction between tropical specimen collecting and other types of fishing activities. In those instances the older terminology was retained in order to avoid confusion.

Response #2

See Response 4 Feddern letter.

Response #3

The text has been revised to clarify the discussion of living sections of the Florida reef tract (please see Introduction and Summary).

Response #4

Please see Generic Response #2.

5 GOAL II - A marine sanctuary is not necessary to achieve this goal.

GOAL III - Remove "Looe Key" and this goal can be achieved by other methods and media.

6 In general, at the gut level, the DEIS appears to me to be stretching the point, trying to justify the sanctuary program's existence with the Looe Key Proposal.

7 PAGE 6 11 - In the event that the sanctuary comes into existance, and then later net fishing becomes regulated, let it be recorded that marine life fishermen use nets. Such netting is significantly different from other types of net fishing and needs to be recognized as a legitimate method not harmful to reefs and reef life. Such netting sometimes includes the use of barrier nets which are necessary for the capture of some species of fishes. Refer to the Hawaiian marine life fishery where nets are used extensively without harm.

8 PAGE 14 15 & 6 - PAGE 70 12 - The damage to reef structures due to major hurricanes is extensive and overshadows human impact on a reef area when it occurs. This perspective should be kept in mind when evaluating human impact on a reef area. It has been 15 years since a major hurricane has hit the Keys so it is easy to overlook this now. To quote,"As of Summer, 1975, Key Largo Dry Rocks and Carysfort reefs, the most prolific of the Florida reef, were more lush than the author has observed since 1950. This seems surprising in light of increased tourism which has resulted in damage by boats, anchors and by divers standing on corals in shallow areas. Studies by Ball, Shinn and Stockman (1967) and Perkins and Enos (1968), which showed the extreme devastation caused by hurricanes, provide background for understanding the reefs' present lush condition. Ball, Shinn and Stockman (1967) pointed out that on the average hurricanes have affected any particular Florida reef once every 6 years during the Holocene period (the past 10,000 years). As of 1975 it has been 10 years since such a storm affected the reefs off Key Largo. These reefs thus have had an unusual amount of time for uninterrupted growth. Consequently, when the inevitable hurricane does hit these reefs, the degree of destruction will appear unprecedented and will most likely make current damage by man seem insignificant by comparison. Yet research by Ball, Shinn and Stockman (1967) and by Perkins and Enos (1968) indicates that no matter how severe the destruction may seem, rapid recovery will occur."

REF: Eugene A. Shinn, "Coral Reef Recovery in Florida and the Persian Gulf"
Environmental Geology VOL. I pp 253-264, 1976

It has therefore been scientifically documented that reefs of *Acropora sp.* corals are subject to tremendous damage by hurricanes,but that complete recovery is extremely quick - just a few years. Obviously, damage done by anchoring, fish traps, lobster traps, divers, coral collecting and other human physical influences, although upon first reaction seem terrible, in perspective such damage is minimal. In any event, it is quick to recover. This tone needs to be injected into the FEIS to provide readers with accurate, up-to-date decision making material.

9 PAGE 15 11 - This is a paragraph which needs rewriting. May I suggest: Both a limited marine life fishery and amateur fish and invertebrate collecting occur throughout the Looe Key area as well as adjacent reef areas. Such activity is centered on the patch reef, reef flat, and deep reef areas. The fore reef is usually avoided due to the difficulty in capturing marine life in a labyrinth-type area. Also the highly popular queen angelfish is naturally scarce in the proposed area, occurring in greater numbers more shoreward. The neon goby, a cleaner fish, is now being raised in large numbers in hatcheries, and the wild catch has deminished due to the market/price pressure. There is little danger of this species, only one of the cleaner organisms, from being overfished. It is highly renewable in any event.

10 The commercial marine life fishery is not concentrated in the Looe Key area. However, the right to continue this fishery in the Looe Key area should be allowed on the basis that such fishing insignificantly affects the renewable resources involved.

11 PAGE 15 12 - I can see no way to connect a decrease of large reef predators (which ones - groupers, snappers, sharks?) to a corresponding increase in high sea urchin densities. The first sentence of this paragraph is ludicrous. Sea urchin densities fluctuate normally. I know of no reef predators which prey upon sea urchins. This paragraph appears to be composed of common logic errors which sway the reader unfairly.

12 PAGE 19 12 - Again, emphasis that Looe Key area is a "unique opportunity" misses the point that there are many unique opportunities not the least of which are the existing Key Largo Marine Sanctuary and the adjacent Pennekamp Park.

13 PAGE 25 & 89 15 - The word "still" carries the implication that groupers did in fact populate the fore reef zone. Did they, before the alleged fishing pressures began? Groupers, snappers and other species prefer certain reef areas which appear not unlike other areas. The fore reef zone may not be a preferred area for groupers and snappers for some natural reason.

Response #5

See response #4 of Feddern letter.

Response #6

The goals and objectives in the DEIS were written for a proposed Looe Key coral reef marine sanctuary. The goals and objectives discussed in the DEIS are management targets, not general program goals. Sites are identified as potential sanctuaries based on selection criteria and then a management strategy, including is goals and research will likely be a management goal in all national sanctuaries.

Response #7

In the event that commercial fishing is ever regulated in the Looe Key Marine Sanctuary, the term netting will be clearly defined.

Response #8

Although it is true that protection programs cannot control impacts of natural disasters, regulations can minimize the effects of human activities. However, continuous repeated damage to coral reefs from anchoring, fish traps, lobster traps, divers, coral collecting and other human physical impacts does not give coral reefs sufficient time to recover as is the case with infrequent major hurricanes, judging from studies of heavily visited coral reef areas such as Buck Island in the U.S. Virgin Islands.

Response #9

The text has been changed to incorporate your suggested rewrite (see Introduction and Summary), of the Status Quo or No Action Alternative)

Response #10

Please See Generic Response #4

Response #11

See Response 12 Feddern letter

Response #12

See Response 4 Feddern letter.

Response #13

According to interviews with local residents and other users of Looe Key, groupers did, in fact, populate the fore reef zone at one time.

The "missing corals" of the fore reef zone (the species are not mentioned) may in fact prefer the deep reef area.

14 Of the fishes mentioned, the butterflyfishes naturally range into the shallower areas, but range down to the deep reef depths too, especially the adults. The hamlets, blue chromis, and creole wrasses normally range the 80 to 70 foot depths. The purple reef fish, sunshine fish and spotfin hogfish are even deeper inhabitants normally found in the 55 to 120 foot range and rarely shallower. To mention these species in the DEIS and their range at Looe Key without stating that these are perfectly normal depth distributions for these Caribbean species leads the reader to believe that some human factor is involved causing the lack of these species on the fore reef. The writers are obviously trying to sway the reader to believe this implication. The depth distributions are in fact entirely natural.

15 PAGE 25 & 89 ¶6 - Again, depth zonation is natural, even for the numerous species of coral. In the third line "no longer occur on the fore reef" needs to be changed to "since they naturally prefer this depth zone."

16 PAGE 55 ¶3 - The gray snapper frequently congregates in reef areas not unlike other reef areas. It's hard to predict by the type of area where the grey snapper will occur. It is normal for black groupers to be seen only on the edge of the range of visibility. It is the most leary of the groupers. The reference to snappers and groupers at this point in the DIES is inappropriate and doesn't fit in with the discussion. Left as it is the reader can again be lead to think that human pressures have caused the snapper and groupers to leave the fore reef, which may not be the case at all.

17 PAGE 56 ¶4 - Again these depth-species distributions are normal. This paragraph should be struck from the paper or a sentence added such as, "These observations are perfectly normal. Many reef species prefer only certain depth zones. The species mentioned here show these same depth zonations throughout the Caribbean."

18 PAGE 58 ¶3 - Since pillar coral is definitely not an endangered coral, the sentence should be struck from this paragraph, and add "there are no endangered species that the proposed sanctuary would protect."

19 PAGE 70 ¶2 - "Collecting" needs to be clarified. Collecting of corals, fishes or both? Suggest "the taking of corals" as a possible alternative phrase.

20 PAGE 81 ¶4 - *Mussa angulosa* prefers only certain depth zones, and it just may not prefer the fore reef area! My experience has shown this coral to be most abundant at the 30 to 40 ft. zone in Broward County waters. The lack of this and other slow growing species in the *Acropora* Fore Reef Zone is probably due to depth and competition by the fast-growing Acropora. The pillar coral is scarce in Florida waters, but it has frequent large heads throughout the reef tract. There are probably 3 dozen large heads in Broward County waters. These are healthy, growing and not in danger of being "exterminated."

21 PAGE 100 ¶2 - "Resident Population" To state that lobsters, *Panulirus argus*, maintain resident populations in a reef area, is to overlook the known fact that the lobsters are migratory. Sanctuary regulations cannot maintain such a resident population unless the boundary is fenced in.

22 PAGE 100 ¶3 - The FMPs will go into effect eventually. Any adverse situations have been going on for many years. There is no panic, is there, in needing immediately emergency protection? Your regulations are permanent, and need to be carefully installed. Six to eight months goes by quickly.

23 PAGE 102 ¶3 - The name "bluebeard" wrasse is new to me. Could this be the bluehead wrasse, *Thalassoma bifasciatum*? Removal of the major cleaner species in large numbers will not take place in Looe Key area or in any other reef area unless it is a determined effort towards just that end. There is little to fear about this becoming a reality. The species are highly renewable, except the French Angelfish (the "French" should be capitalized) which is moderately renewable. It should be pointed out that it is only the juveniles of the French angelfish and porkfish which are cleaners, and these two species quickly grow too large to perform the cleaning process. The angelfishes are minor cleaning species.

Response #14

The text has been revised to reflect your concern. (Chapter Two, Preferred Boundary Alternative)

Response #15

See Response 18 Feddern letter.

Response #16

Results of preliminary field studies, associated with the Looe Key Reef Resource Inventory as well as comments from experienced divers indicate that human pressure has very likely contributed to decreased levels of snappers and groupers on the fore reef.

Response #17

The text has been revised to reflect your concern.

Response #18

The reference to pillar coral does not indicate that it is a Federally endangered species but rather that it was nominated but did not qualify. The section in question states that there have been no sightings of listed endangered species in the proposed sanctuary.

Response #19

The text has been changed to read "the taking of coral and anchoring." (Chapter Four, Legal Status Quo A. Summary and Analysis)

Response #20

Your observations are appreciated. However, NOAA believes that the naturally scarce pillar coral, being a much sought after collectors species, is vulnerable and worthy of discussion.

Response #21

Studies on lobster populations in the Dry Tortugas have shown that individual lobsters return to the same general area each year. That is not to say that all lobsters do not migrate.

Response #22

Minutes from several of the GMFMC & SAFMC meetings quote members of the joint-coral committee as referring to the emergency situation regarding Coral (Looe Key in particular) and the need to complete the coral plan as quickly as possible. The Coral and Coral Reef Resources FMP must be approved by NMFS and go through the lengthy environmental impact statement public review and hearing process before implementation.

Response #23

The text has been revised to incorporate the suggested changes.

24 PAGE 104 15 - The precedent set by Key Largo Marine Sanctuary and Biscayne National Monument in prohibiting the taking of marine life was apparently arbitrary. Such action restricts the commercial and non-commercial marine life fisherman unfairly when other types of fishing are allowed. There are serious constitutional questions involved here involving the fishing rights of persons to take non-endangered species by means not harmful to the environment. Basic fishery rights of everyone to be recognized.

25 PAGE 105 11 - The on site manager will likely be a person not familiar with the highly varied marine life fishery. May I suggest that such regulations and permitting decisions be made subject to review and endorsement by the private sector representative - Florida Marine Life Association, Inc., a Florida corporation not for profit. In this manner the on site manager will have access to persons who do know the fishery in a professional manner. Decisions can be made which reflect reality rather than guesswork and hearsay, avoiding shotgun-type regulations which harm minority users of the resources.

26 PAGE 119 - 128 - Some statements in the draft are poorly documented. I suggest that the FEIS be prepared more carefully in this regard. For example: PG 14 16 where reference is made to "recent observations (1976 and 1979)" it would be helpful to the reader to know who made these observations and where this can be verified. PAGE 25 13 - I cannot find in your list of scientific literature the reference to Zieman and Robloe, 1979. PAGE 36 11 - Odum (1971) cannot be located.

27 PAGE A-1 - PREAMBLE - Suggest changing lines 3 and 4 to "for the purpose of managing this resource", since this is not a particularly unique and fragile area as I discussed above.

28 PAGE A-1 - ARTICLE 1 - Suggest changing lines 3 and 4 to read "such regulations which are required on a scientific basis to manage this resource."

29 PAGE A-1 - ARTICLE 3 - Change to read "The sanctuary area is a diverse and biologically productive living coral reef community in the lower Keys area. There are fewer such reefs in the lower Keys as compared with the upper Keys. This area is heavily used as a commercial, recreational, and educational resource which provides evidence of its particular value."

30 PAGE A-3 937.2 - PURPOSE - Change "protect and preserve" to "manage". Insert "commercial" prior to "resource" at the end of the first sentence (line 4). Strike all the remaining parts of this paragraph on the basis of my discussion above.

31 PAGE A-4 937.4d - For sake of clarification, I suggest changing this to: "Marine Life" means fishes and invertebrates other than food fish which live in close relationship to reefs and other structures which provide cover and protection.

32 PAGE A-4 937.6 (1)(b) - Change "tropical fish" to "marine life".

33 PAGE A-6 937.8 (a) - Change "marine specimen collection" to "marine life fishing".

34 PAGE A-7 937.8 (d) - Third line after "entity" insert "including recognized professional/commercial organizations,".

35 PAGE B-1 TO B-21 - There appears to me to be no species in the inventory that cannot be found elsewhere along the Florida reef tract and northward to Broward County waters and probably Palm Beach County waters. There are no unique species that I can pinpoint. I would expect the species' diversification to run along the lines of the inventory. In fact there are missing species indicating that the inventory was indeed performed in an incomplete manner using the more economical plotless lines method. IF such an inventory was required then I endorse this method due to the lesser expense.

36 PAGE C-10(c) - Suggest replacing "Tropical Fish Collectors" with "Marine Life Fishermen"

Thank you for the opportunity to review the draft for the Proposed Looe Key Marine Sanctuary. The comments I expressed here are submitted as suggestions and are offered as constructive criticism.

Respectfully,

John C. Noyes

John C. Noyes
Marine Life Fisherman

Response #24

The Marine Protection, Research and Sanctuaries Act of 1972 authorizes the Secretary of Commerce, after consultation with other Federal agencies, the affected State, a thorough public participation process, and Presidential approval, to designate certain ocean areas with distinctive values as marine sanctuaries. Regulations, necessary to conserve and protect the area, are authorized under the statute in the public interest and are constitutional.

Response #25

Sanctuary management will be comprised of personnel thoroughly versed in special area management in the marine environment. In addition, management will seek continuing advice from outside expertise and from members of the various user groups. Such public involvement will utilize formal management structures such as task forces and advisory panels as well as informal lines of communication the latter will and receive a high level of emphasis in the Looe Key Sanctuary. See Chapter Two for a more detailed discussion of proposed management. Decisions affecting resource use will receive maximum public input.

Response #26

The text has been clarified and corrected in response to these suggestions.

Response #27

NOAA does not believe the suggested language characterizes the basic purpose of this proposed designation. The phrase in question now reads "... valuable and fragile ...".

Response #28

The text has been changed to incorporate the suggested language.

Response #29

Purpose. The purpose, set forth in the designation document, as amended, is consistant with the purposes of the Marine Sanctuary Program as a whole and the Looe Key Sanctuary in particular.

Responses #30, #31, #32, #33, #34

The text has been changed to incorporate the suggested language.

Response #35

The Looe Key DEIS does not mean to convey that Looe Key species listed in Appendix B are unique and not part of an entire system of species which runs along the outer reef tract of the Florida Keys. Looe Key is unique however, as stated in the DEIS because of its unusual accessibility to the public, its shallow areas, suitable for inexperienced snorkelers and SCUBA divers and the quality of its coral reef environment.

Please refer to Appendix B Site Analysis Research Methods for a complete answer to your questions on the Looe Key Reef Resource Inventory and the plotless lines method.

Response #36

The text has been changed to incorporate the suggested language.

June 24, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D. C. 20235

J. L. Pinckney Jr.
Rt. 2 Box W101
Orangeburg, S.C. 29115

Dear Sir:

The purpose of this letter is to endorse the formation of a National Marine Sanctuary at Looe Key Reef located off the lower Florida Keys. Being an active diver with many hours spent observing the various reef formations in the Keys,
1 I am under the opinion that Looe Key Reef is one of the most beautiful formations in the northern Carribean. Besides beauty, this reef contains some species of flora and fauna that can not be found anywhere else in the World.

If commercial interests are allowed to exploit this virgin reef, the destruction of a completely functional ecosystem will surely occur. On my last visit, I personally observed the commercial collection of tropical fish. I was later told that the life expectancy of these fish would only be two weeks after they
2 were captured due to the techniques used in their capture. It is clear that this senseless destruction of irreplaceable wildlife must be halted or else some of the most valuable resources of the United States will be lost forever.

It is my hope that the Office of Coastal Zone Management will endorse the formation of a Marine Sanctuary for Looe Key before it is too late. As I write this letter, Looe Key is being senselessly raped of marine wildlife which can not replace itself overnight. Time is of the utmost importance!

Sincerely,

J. L. Pinckney Jr.

Please see Generic Response # 1.

FRANK S. POTTS
ATTORNEY AT LAW

963 HAMPTON HILL ROAD
COLUMBIA, SOUTH CAROLINA 29209
803 787-6671

June 27, 1980

Dr. Nancy Foster
Deputy Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D. C. 20235

Re: Looe Key Reef, Florida

Please see Generic Response # 1.

Dear Doctor Foster:

I recently had the privilege of scuba diving at Looe Key while on a trip to Florida. It is my understanding that your office is considering implementing some form of protection for this reef.

As one of many citizens interested in the preservation of reef ecosystems, I would heartily endorse any program to provide Looe Key with protection from spear fishing, fish collecting, and other forms of commercial and sport fishing. Looe Key is a truly beautiful and fragile piece of our country which must be preserved for future generations--serious damage has already been done and must not be allowed to continue.

In writing you this letter I know that I am speaking not only for myself and my wife but for hundreds and possibly thousands of sport diving citizens who are not aware of the need to communicate with your agency in order to preserve and protect what belongs to all Americans.

Very truly yours,

Frank S. Potts

FSP/ts

cc: Honorable Floyd D. Spence
Honorable J. Strom Thurmond

Director, Sanctuaries Program June 12, 1980

Dear Sir:

I am William Pantel, vice president of the State Division. Izaak Walton League, chairman of Monroe Co. Friends of the Everglades and Member, South Atlantic Fisheries Management Council, Coral advisory panel.

Living in the Florida Keys for 30 years and watching the degradation of our Coral reefs prompts me to urge the proposed designation of Love Key as a National Marine Sanctuary.

Every million skin divers come to the Keys yearly to view our Coral reefs adding to the economic health of the Keys.

Unrestricted harvesting of tropical fish by professionals and amateurs, traps which breaks coral, dragging through the coral beds with heavy oaken doors by shrimpers all contribute to infection diseases.

Because most coral is beyond the 3 mile limit the State cannot protect this precious resource. Only a Federal Sanctuary can help.

So that future generations may view as we have the beauty of the Love Key reef I respectfully support the concept of the proposed designation of Love Key as a National Marine Sanctuary.

Yours Truly

William Pantel

P.S. I cannot attend a [illegible]

Please see Generic Response # 1.

July 8, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven St., NW
Washington, D.C. 20235

To Whom it may concern:

After diving in the Looe Key area this July 4th weekend, I heartily endorse the creation of a 5 square mile sanctuary in this area. Hopefully this will happen and we will continue to have this beautiful reef available for diving in the Florida Keys.

Thank you,
Marcy Schiff.

Please see Generic Response # 1.

John J. Schoendorf
2650 Bird Avenue
Coconut Grove, Florida 33133

Re: Looe Key Sanctuary 6/23/80

Dear Sir,

This is to advise you of my great hope that something good can come out of the mess our congressmen have made in Washington, as a citizen of Florida since 1953 who both enjoys fishing above and below the surface I should like to cast my vote in favor of making Looe Key into a protected sanctuary. Over the years I have watched our tourists and locals ruin too much of our natural resources here in South Florida. Surely with all the thousands of acres of forest land we could spare a few acres of sealed for future generations. Really, how little we protect some of the smaller jewels our coast has to offer.

Sincerely
John J. Schoendorf

Please see Generic Response # 1.

June 17, 1980

Bruce R. Barrett, Acting Director
Office of Environmental Affairs
3425 U.S. Dept. of Commerce
Washington, D.C. 20230

Please see Generic Response # 1.

Dear Sir:

Being a resident of Miami for 25 years, I was pleased to hear of the proposed Looe Key Marine Sanctuary, under Title 3, Marine Protection, Research and Sanctuaries Act (PL92-532).

It is imperative that we take steps to insure the preservation of these magnificent reefs. I wholeheartedly support the proposed recommendations.

Sincerely,

Susie Schultz

SS:MB

CZM
REC'D

1980 JUL 23 AM 12:00

MAIL ROOM

July 14, 1980

Director, Sanctuaries Program
Office of Costal Zone Management
3300 White Haven Street N. West
Washington, D. C. 20235

Gentlemen,

As a diver who has recently experienced the magnificent beauty of the Looe Key Reef, I am strongly in favor of establishing this area as a protected zone from fishing or other activities which would deplete or alter the marine life. The flora and fauna of Looe Key are comparable to the Pennecamp Park area.

Please see Generic Response # 1.

Larry Verdier

Larry Verdier
7014 Second Street
Holland, Ohio 43528

LV/gs

The Tree House
120 Gimpy Gulch Drive
Islamorada, Florida 33036

June 22, 1980

Director, Sanctuaries Program
Office of Coastal Zone Management
3300 Whitehaven Street, NW
Washington, D.C. 20235

Ref: Looe Key Sanctuary

Dear Sir;

Please add Mr. Warner's and my voices to the list of residents of the Florida Keys who urge the preservation of Looe Key as a National Marine Sanctuary.

The protection of Looe Key for all generations of Americans to come is imperative that its unique reef tract and availability to recreational divers be preserved.

Sincerely yours,
William M. Warner

Please see Generic Response # 1.

MEMBER PROFESSIONAL ASSOCIATION OF DIVING INSTRUCTORS
INTERNATIONAL

LEE WOOD
YMCA-PADI INSTRUCTOR

7140 ABBOTT AVE.
MIAMI BEACH, FL. 33141

Bus: (305) 866-4631
Res: (305) PL8-0827

July 11, 1980

To whom it may concern,

Gentlemen,

As a scuba diving instructor for the YMCA, I am keenly aware of our water environment & the effect man plays on it. Through his own ignorance and greed, man if left uncontrolled will succeed in eventually destroying the last few remaining good reefs left to lower Florida. I believe that Looe Key is in the elite class of Pennycamp & thus deserves similar protection laws. I therefore support the 5 mile sanctuary proposal for Looe Key, in hopes that this beautiful reef will be there someday for my son to see as it was for me a short weeks ago.

Thank you for your time

Lee Wood

Please see Generic Response # 1.

NOAA COASTAL SERVICES CENTER LIBRARY
3 6668 00000 5225