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An Assessment Of The Need For A National Marine Sanctuaries Program

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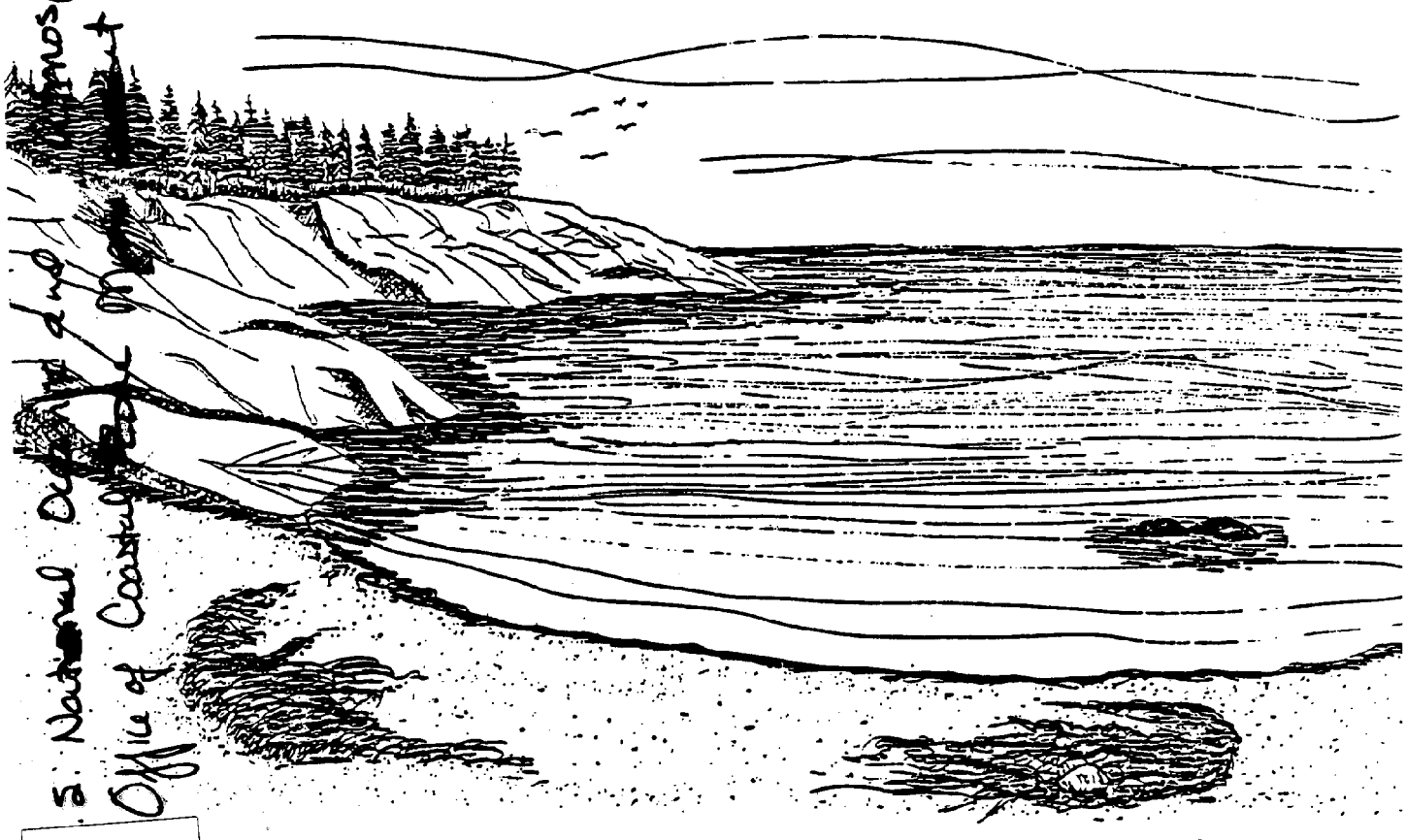
Study of the framework of the marine sanctuaries program



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

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BY THE

for Natural Areas

California; Washington, D.C.; South Gardiner, Maine

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An Assessment of the Need for a National Marine Sanctuaries Program

Contract Number # CNA/OCZM 7-35118

prepared for

The Office of Coastal Zone Management
National Oceanic and Atmospheric Administration
Department of Commerce

prepared by

The Center for Natural Areas

Washington, D.C.; South Gardiner, Me.; Los Angeles, Ca.

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

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From the days of discovery and colonization, America has looked to the sea. In times of stress the sea has been our ally, and in times of peace, a source of our prosperity. Sometimes hostile and sometimes generous in its moods, the ocean always has offered its abundant resources in countless ways. But only recently have we begun to perceive its true potential.

- Commission on Marine Science, Engineering and Resources, Our Nation and The Sea, A Plan for National Action, p. vi, (1969).

Acknowledgements
Prepared Under the Direction of
John B. Noble, Esq., Director of Law

Staff Members
Alfred G. Zangri, Director of Economics
Michael C. Blumm, Esq., Assistant Director of Law
John T. Epting, Environmental Planner
Stark Ackerman, Legal Assistant
David W. Laist, Coastal Ecologist

Legal Interns
Joel Blumstein
Gary Thompson
Jim Woeppel
Jim Cummings
Bill Booth

Consultants
Judith Penna Robinson
Rezneat Darnell

Support
Rosemary Roberts

Alfred Zangri and David Laist combined in the writing of Chapter II dealing with "Physical World Realties." Michael Blumm composed Chapter III's "Evolution of a Response: Legislative Recognition," in addition to being principally responsible for the "Executive Summary" in Chapter I. John Epting was principally responsible for Chapter IV's "Implementation of the Legislative Response: NOAA Policy and Strategy," while Stark Ackerman authored "The Federal/State Role in Managing Marine Resources" contained in Chapter V.

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PREFACE

In the late 1960's and early 1970's an enlightened sense of urgency was focused on the intensifying plight of the nation's coastal and marine environments. Most notably expressed in the Stratton Commission Report, Our Nation and the Sea, and the Department of the Interior's Studies, The National Estuarine Pollution Study and the National Estuary Study, this national concern for halting the deterioration of environmental quality in these areas was converted to action by the President's signature on a number of major environmental laws. Among the more significant of these laws were the Marine Protection, Research and Sanctuaries Act of 1972 and the Coastal Zone Management Act of 1972. Both of these Acts recognized the profound and prevalent effects exerted by man's activities on the coastal and marine environments, and incorporated provisions for the establishment of protected marine and estuarine sanctuaries that would preserve particularly valuable natural or cultural features of ocean and Great Lakes environments.

To date, however, efforts to develop a national system of marine sanctuaries have been slow in evolving. Due to a level of administrative and financial support substantially lower than that given the similar Estuarine Sanctuaries Program, the Marine Sanctuaries Program has failed to clearly articulate program goals and objectives necessary to effectively implement the marine sanctuaries concept to its fullest potential. Although two marine sanctuaries have been established -- the first being the site of the USS MONITOR off the North Carolina coast and the second being the ocean area adjacent to the John Pennekamp State Park in the Florida Keys -- it seems clear from the legislative

history of the Marine Protection, Research, and Sanctuaries Act, that Congress intended much more from the Marine Sanctuaries Program than that which has transpired in the nearly 5 years since its enactment.

Most recently, in an attempt to increase the level of effort towards a comprehensive Marine Sanctuaries Program, the Office of Coastal Zone Management (OCZM) requested in its 1977 budget cycle additional staff positions and funding. However, the Department of Commerce determined that as a prerequisite to approval, OCZM should prepare a program plan justifying the additional funding and emphasis. In an effort to ensure that the full potential of the Marine Sanctuaries Program is realized, the OCZM awarded a contract to the Center for Natural Areas, a non-profit research corporation specializing in environmental management from an interdisciplinary perspective, to conduct this study. The following study assesses the need for a continued or expanded federal Marine Sanctuaries Program.

An overview of the study's major findings and conclusions appears in Chapter I.

I. Executive Summary

The history of the United States is largely a history of taming the wilderness, of exploiting the frontier for its bountiful supply of natural resources. During the nation's formative years, most people advocated unrestricted use of these valuable and seemingly inexhaustible resources. With the dedication of Yellowstone National Park in 1872, the passage of legislation to preserve forests in a national forest system in 1891, and the establishment of the nation's first wildlife refuge in 1903, however, the nation began to recognize the need to protect and conserve its public land resources. Yet even among the conservation-minded there were both the John Muirs, who argued passionately for the preservation of pristine land areas for their own sake, and the Gifford Pinchots, who supported a more utilitarian approach to these resources.

The confrontation over the preservation and wise utilization of land-based resources continues. But it is only recently that such a confrontation has begun over marine-related resources. The oceans and Great Lakes, once considered a wasteland, have increasingly become recognized as the nation's new natural resources frontier. What today appears to be largely unexploitable or inexhastible may not remain beyond the reach of man's technology tomorrow. As the pioneers of this frontier, it is our responsibility to recognize the impending development of our marine resources and to ensure that development does not bring destruction, but is accompanied by a wise, well-considered approach to the utilization and preservation of the natural resources of the nation's oceans and Great Lakes. This study is an

examination of the potential role which the federal Marine Sanctuaries Program can play in developing such a national approach to the marine environment.

The succeeding chapters of the study analyze in detail the physical world setting encompassed by the ocean and Great Lakes environments; the Legislation and Legislative history that established the Marine Sanctuaries Program; the administrative policies and strategies for implementing the program; and the relationship of the program to other existing federal and state programs which might complement, enhance, or reduce the effectiveness of the Marine Sanctuaries Program. This Executive Summary will highlight some of the more salient findings and conclusions reached in the more detailed analyses that follow in the body of this study.

After describing publicly held attitudes concerning marine-related resources and summarizing the special treatment which various legal systems have accorded public uses of the marine environment, Chapter II examines the multitude of monetary and non-monetary values generally attributed to ocean and Great Lakes resources. The chapter also examines resource degradation occurring in these aquatic environments, concluding that a Marine Sanctuaries Program possesses a unique potential to stem this trend toward degradation in designated areas. This unique capacity results from the opportunity to restrict certain human activities incompatible with the exceptional values for which the area was set aside, while at the same time encouraging specific compatible uses. Chapter II culminates with an examination of the competitive nature of pressures exerted on these resources and concludes that an effectively implemented federal Marine Sanctuaries Program could also result in a

significant decrease in the "transactional costs" associated with allocating scarce ocean and Great Lakes resources among these competing pressures.

Chapter III focuses its attention on the congressional response to the competing pressures described in Chapter II which resulted in the 1972 enactment of Title III of the Marine Protection, Research, and Sanctuaries Act, dealing with marine sanctuaries. It first demonstrates that enactment of Title III was actually part of a larger national response to the congressionally perceived pressures being placed on the nation's land and water resources. The major impetus for the 1972 initiative consisted of a series of studies conducted in the late 1960's and early 1970's that documented the alarming extent of the degradation of the quality of the coastal and marine environments. The Legislative history of Title III clearly indicates that Congress intended the Marine Sanctuaries Program to be an important mechanism to preserve, maintain, and enhance the environmental quality of special areas of the ocean and Great Lakes environments. This is perhaps best demonstrated by the fact that the legislation grants the Secretary of Commerce considerable authority to ensure that activities within a designated marine sanctuary are consistent with the purposes for which the sanctuary was designated. Similar in many respects to the consistency provisions embodied in the Coastal Zone Management Act, Title III's consistency provision may be even broader in scope, since it does not merely pertain to federal activities. Chapter III concludes with an assessment of the congressional reaction to efforts to implement Title III in the nearly five years since its enactment.

Specific congressional attention, particularly that of the Chairmen of

the House Subcommittees with oversight functions, has focused upon the funding levels required to sustain a viable Marine Sanctuaries Program. That congressional interest in the program remains high is demonstrated by the fact that Congress authorized funding levels for fiscal year 1976 and the transition quarter more than 4 times higher than that which was requested by the previous Administration. There is, moreover, no evidence to indicate that Congress would not be receptive to appropriation requests comparable to authorization levels -- however no appropriations requests have been submitted to Congress. Congressional interest in the Marine Sanctuaries Program was most recently expressed on March 9, 1977, by Congressman John Breaux, now Chairman of the House Subcommittee on Fisheries and Wildlife Conservation and the Environment, who suggested that funding authorizations for the Marine Sanctuaries Program be closely tied to authorizations for the Coastal Zone Management Program.

Chapter IV turns its attention to the administrative efforts to implement Title III. It examines the existing policies of the National Oceanic and Atmospheric Administration, in order to close the circle between policy statements and specific implementation efforts. In this light, existing and nominated marine sanctuaries are described as well as the process by which sanctuaries can be designated. The potential of other sanctuary programs, such as the Estuarine Sanctuaries Program and existing state-level ocean sanctuaries-type programs, to complement and enhance the effectiveness of federally designated marine sanctuaries is analyzed, with the conclusion that by developing effective mechanisms to foster coordination with these complementary programs, the Marine Sanctuaries Program can take a large step toward

becoming the powerful tool that Congress envisioned. The Chapter culminates with an assessment of the efficacy of implementation efforts, concluding that the principal reasons why the program has not fulfilled its potential are the lack of specifically appropriated funds and the need for a viable framework within which to devise an effective nation-wide program.

Chapter V analyzes the potential of the Marine Sanctuaries Program in light of the federal/state role in the management of ocean and Great Lakes resources. In this regard, it critically assesses both the comprehensiveness and jurisdictional scope of authority of existing federal and state programs that can be utilized to preserve particular geographic areas or particular species, as well as those programs designed to regulate activities which may result in adverse impacts upon the ocean and Great Lakes environments. The Chapter concludes that because these programs are either land or shore-oriented, species limited, or conducted on an ad hoc, reactive basis, they may offer a potential for complementing the Marine Sanctuaries Program, but they are in no sense substitutes for it.

Special attention is devoted to the authorities conveyed to the Secretary of the Interior and the President under the Outer Continental Shelf Lands Act to withdraw certain marine areas from OCS mineral lease sales. Effective coordination with the OCS mineral leasing review process may provide a potentially valuable mechanism for identifying areas for marine sanctuaries designation. This chapter demonstrates, however, that because the authority to withdraw OCS lands is employed infrequently, on an ad hoc basis, and without a clear legislative mandate to protect marine resources and values, OCS with-

drawals, even permanent withdrawals by the President, are simply not viable substitutes for the Marine Sanctuaries Program.

The Marine Sanctuaries Program, with its broad mandate to protect and restore marine resources and values, its broad jurisdiction over marine areas, and its flexibility both in terms of designating sanctuaries and in tailoring regulations to the specific protection needed for individual sanctuaries, offers a unique, positive, and comprehensive program to protect highly valuable marine resources. In order to realize its full potential, however, the program must be guided by a comprehensive plan for implementing its mandates in the most cost effective manner possible. The Center for Natural Areas strongly believes these valuable marine areas warrant the kind of protection that can only be assured by an effective, comprehensive, national approach to the concept of marine sanctuaries.

II. Physical World Realities

A. The Public's View of the Sea

Historically, man has looked toward the sea with a sense of awe and emotion that has been the product of both fact and myth. Although the perceptions kindled by this combination are as rich and varied as the countless human cultures it has influenced, a consistent theme running throughout man's concept of the sea has been the vision of an apparently endless and inexhaustible resource that requires no moderation in its use.

For centuries the sea has served mankind. She[1] has given us nourishment for our tables. She has provided a transportation medium to satisfy our thirst for goods not economically producible within our land boundaries. She has provided us a convenient and seemingly limitless repository for our wastes. Today, in the face of growing demands for raw materials, energy, food, waste disposal, recreation, and the search for scientific understanding, the sea stands ready to continue her service. But she is trying to tell us something. The oil slicks and garbage floating in mid-ocean, the apparent near-death of some of our Great Lakes, and the pollution of some of our most attractive recreation areas all attest to the fact that the sea's ability to continue to serve man is dependent upon man's ability to moderate his demands.

Public awareness of the potential threat to the ocean and near-shore environment has increased dramatically in the last decade. Strong public concern has led to the enactment of national legislation to protect the coastal zone, marine mammals, and the quality of water entering the sea; to control sewage

outfalls, ocean dumping, and dredge or fill activities; to extend control over the management and conservation of fisheries resources; and to more closely coordinate ocean mineral development activities with comprehensive planning in the coastal zone.

These legislative enactments are each designed to meet specific problems. The concept of designating marine sanctuaries, however, represents an opportunity to manage areas of the ocean as units. It therefore provides a unique opportunity to look at the overall issues that necessarily arise when numerous competing demands are exerted on a scarce resource.

This recent spate of legislative activity, however, should be viewed in the historical context of the treatment of marine-related resources. As far back as the time of the Roman Empire, the Roman legal system recognized special public rights in marine and coastal areas. Roman law reserved the sea and the foreshore for free, common, and public use by all members of the Roman state.[2] While the Middle Ages witnessed a movement away from this notion of public rights, as maritime states began to appropriate marine resources for specific uses,[3] the concept of special public rights in navigable waters and the foreshore was adopted by English common law and embodied in what has become known as the public trust doctrine.[4]

Courts in this country have applied this concept of public trust to protect the public's interest in tide and submerged lands for navigation, commerce, and fishing purposes from incompatible uses.[5] Moreover, the highest court of at least one state -- California -- has recently interpreted the public trust

doctrine to be broad enough to encompass environmental and conservation purposes.[6]

Thus, special recognition of the importance of marine and coastal resources is not a novel concept. In light of the increasing and competing pressures being placed upon the marine environment, however, the concept of the public trust may serve as a valuable lodestar in developing viable approaches to wisely utilize and preserve marine-related resources.

B. The Marine Environment

Any major analysis of the marine environment must recognize the existence and implications of certain inherent broad-based ecological principles. Perhaps foremost among those is the fact that the sea's innumerable, diverse, but recognizably important ecosystems and offshore areas, such as coral reefs, sandy shoals, kelp beds, algal reefs, spawning grounds, offshore canyons, and shellfish beds, are all interconnected through an intricate network of physical, chemical, biological, and cultural processes that generally defy delineation. For example, incoming solar radiation, which fuels atmospheric winds, also drives the tremendous water currents, or "oceanic rivers," circulating throughout the world's oceans. Solar energy absorbed in the form of heat by the ocean water itself, when combined with the movement of ocean currents, acts as a major factor controlling world climatic conditions. Heat absorbed by ocean waters in the tropics is carried by moving currents, such as the Gulf Stream, to northern latitudes, where it exerts a moderating influence on the climate. The cooled water then returns to the tropics via southward-moving

currents, thereby completing its cycle around the North Atlantic. Similar current cycles or gyres are in evidence in other oceans and other hemispheres.

The ocean's ever-circulating waters, however, move much more than heat. Vital nutrients which provide nourishment for the grasses of the sea (i.e., phytoplankton), fish, and other living organisms are also distributed by the ocean's circulation. Unfortunately, this same water movement also circulates pollutants discharged by man into the oceans. The singular continuity of the sea is illustrated by the recent discovery of significant amounts of DDT in Antarctic animals which spend their entire life cycle thousands of miles from the nearest possible site of application. The DDT experience provides a significant insight into the ocean environment: man is not capable of completely isolating an ocean area from events that affect the quality of the ocean environment elsewhere. The simple truth lies in the knowledge that today's upstream water mass is also tomorrow's ambient environment at the downstream site.

Man's inability to control water circulation in the ocean environment is similarly true for other natural processes occurring in the sea. Storms, waves, chemical reactions, and the movement of chemicals through food chains are but a few examples. Thus, with limited exceptions (such as cultivating kelp beds and constructing artificial reefs), man has a limited ability to positively manipulate the marine environment. Instead, the level of man's success in achieving ocean and Great Lakes management objectives will be largely determined by his capacity to control activities which he believes are likely to impact negatively upon marine resources.

The following two sections of this chapter discuss the degradation that has been occurring in the marine environment and the publicly ascribed values and competing pressures exerted upon these environments.

C. Degradation of the Marine Environment

The past two decades have witnessed a massive human intrusion into the shallow marine waters bordering the North American continent. The complex of factors which have combined to create this situation include the expansion and "coastalization" of the human population, the depletion and contamination of terrestrial and freshwater resources, and the recent development of sophisticated marine technology which now allows man to enter, work and build on and under the sea. Of special importance is the nation's increasing desire for petroleum hydrocarbons as a source of fuel and industrial raw materials.

At the present time more than 50 percent of the population of the United States lives in the counties bordering the Great Lakes and the ocean, and this percentage is increasing. It is estimated that by the year 2,000 over 200 million people may live within close proximity to the nation's coastal zone.[7] This high population along our coasts must dispose of its waste products; and whether these are discharged into rivers, estuaries, or into the atmosphere, they ultimately reach the sea. Many coastal metropolitan and industrial areas have already rendered adjacent marine areas unfit for most human uses. Fisheries, recreation areas, and prime ecological habitats have been destroyed by mismanagement, or more properly, non-management of the marine habitats and resources. This is at least partially due to an exponential

growth of human activities in the coastal zone, a situation which is certain to be exacerbated in future years.[8] Another reason is that there has been an unbalanced emphasis on developing these habitats and resources, rather than conserving their natural attributes. The unclarified jurisdictional authority of the various governmental entities involved has, moreover, led to inefficient management of these marine resources.

Estimates for the nation's petroleum resources indicate that the continental shelves bordering our shores contain about 5 times the present proven U.S. reserves of oil and about 3 times the proven reserves of natural gas.[9] In pursuit of these resources a major coastal technology has been developed, and already over 2,000 oil platforms stand on the continental shelf off the Louisian coast alone. The drive for offshore oil is just beginning on the Atlantic and Pacific shelves of the contiguous states and on the extensive shelf off Alaska. In addition, enormous quantities of sand, gravel, and shells are dredged annually from nearshore marine bottoms to meet expanding requirements of the construction industry and other needs.

Pollution of our coastal waters results from the continuous outpouring of chemical materials and solid wastes. Among the chemicals of particular concern are the chlorinated hydrocarbons, such as DDT and PCB's (substances with broad-spectrum toxicity and long half-lives), and certain radioactive materials of the transuranic series (resulting largely from weapons testing and nuclear fuel plant outputs). A great variety of other chemical substances are of concern on a more local and shorter term basis. Of these, crude petroleum and its derived products (especially heavy fuel oils) and municipal sewage should be

mentioned. To these should be added a variety of solid wastes derived from the dumping of construction and industrial wastes, overboard disposal of wastes from marine surface craft, and the debris of marine wrecks and coastal storms. Many of the solid wastes are long-lived and tend to accumulate on the bottom areas.[10]

Physical damage to marine bottom habitats results from dumping of dredge spoil, solid wastes, sewage sludge and other materials; water transport of pollutants from other areas of discharge; and direct human activities (e.g., construction; dragging of anchors; dragging of fish nets; and over harvest of shells, coral, and other materials by divers.)[11]

In the great expanse of water, the surface observer is not likely to perceive the deleterious effects of such activities. However, the bottoms and water masses are not as unchanging as the surface might suggest. In areas of poor flushing, toxic materials tend to accumulate, both on the bottom and in the water column. Of special importance here is the problem of organic waste accumulation (resulting chiefly from municipal sewage). This material requires a vast amount of oxygen for complete breakdown. In areas of poor circulation, sewage accumulation may lead to near or complete exhaustion of oxygen, especially near the bottoms, and this may severely reduce or completely eliminate marine life from large areas of the sea bottom. Toxic metals and other chemicals, which accompany the organic sewage, also tend to accumulate in such areas. For these reasons, marine sewage dumps and outfalls may poison marine life and restrict habitats for many miles downstream of the primary area of contamination. Submerged hills, ridges, reefs, and other "topographic highs" are often

favored places for commercial ships to anchor and are thus subject to the discharges of trash and other pollutants during their layover period. Party boats and private pleasure craft seek out such areas for fishing, scuba diving, and other activities. These features are, therefore, subject to multiple damage from anchors, chemical pollution, and in some cases, overharvesting. It should be observed that topographic highs often support the rarest and most sensitive of the marine systems.[12]

What are the impacts of all these activities on marine species and marine ecosystems? Most of the activities are clearly deleterious, but for the most part, we are ignorant of the specifics. Marine systems are enormously complex; and critical, problem-oriented, scientific investigations are far too rare and too restricted in scope to provide the basis for informed judgment, much less for management recommendations. In a recent National Academy of Sciences' study on the assessment of potential ocean pollutants it was concluded that not enough data exists to pinpoint the effects of pollution on marine species and ecosystems.[13] In pointing out the need for more critical data, the report concluded that, "the time when we could afford to stumble from crisis to crisis has passed and we must begin to anticipate our impacts on the oceans...." In a similar vein, after reviewing society's impact on the coastal zone, Bostwick Ketchum, in his study of critical problems in the coastal zone, concluded that, "if we are to arrive at an effective management scheme for the coastal zone, we will need to sort out these kinds of interrelationships of uses, and recognize the constraints they impose on one another."[14] The need for management is obvious, and the need for research to support this management is critical.

In the absence of legal and management constraints, society is free to pursue its destructive practices in all areas of the continental shelves with impunity. Species, habitats, and ecosystems of the coastal waters are clearly in jeopardy, but site-specific information and the extent of the damage in most cases remain to be determined.

Because many of these areas are being degraded, it is important to understand their worth and value to society in their non-degraded state. The following section of this chapter analyzes the value of these areas to the public and examines the competing pressures being exerted upon them.

D. Publicly Ascribed Marine Values

> There is that moment on a long cold day of fall drizzle in the Pacific Northwest when the mouth of the river suddenly bursts with the first opening of the steelhead run. There is that moment when the clump of fishing boats float still and silent on the endless blue of Long Island Sound in late September and early October, and then burst their tranquility. First, from nowhere, there is the rising, screaming, swirling gathering of seagulls, chasing and driving toward the sea. Then the boats roar in equal abandon to join the ever massing seagulls. The bluefish are rising and have caught us in their eternal web. The rational order of daily life is broken. We are part of the great cycles of seagull, sun and moon; the mingling of waters in estuaries, the phragmites and spartina of the wetlands, the seagrass and plankton, the birth and death and wonder of ocean life./15

William Burch's eloquent prose serves to remind us all that there are values not readily expressed in monetary terms. The fisherman, the recreator, the homebuyer, and the developer, all go down to the sea, for reasons not entirely reflected in the dollars and cents return they expect to obtain. There is a

reason why coastal land values are higher than similar inland property. There is a reason why coastal residents and visitors, and even those who have never seen the sea, join forces to fight oil development in adjacent coastal waters. There is also a reason why coastal areas support a large portion of our recreation areas. From time immemorial, mankind has been attracted by the mystery and majesty of the sea.

A struggle is taking place concerning the utilization of our oceans and Great Lakes resources. The recognition that these bodies of water are a limited resource has evolved as a natural social and economic consequence of the increasing demands being placed upon them. Any resource that is abundantly and freely available, such as air (drinking water, once free, has increasingly during this century become a priced commodity), commands no "price" in a market economy. With only few exceptions such as scuba divers, man has never felt the necessity to pay for the air he breathes.

Recent events have, however, demonstrated that we do have to pay to breathe clean air. The price of clean air is reflected in increased prices for goods and services whose production and utilization affects air quality. But these payments have not been a result of the normal operation of the market place. Rather, they are the result of public intervention in the economy. They are the result of publicly supported legislation and administrative regulation enforcing specific levels of air quality. When viewed from this perspective, these laws constitute an economic demand for clean air. This demand for clean air must necessarily be balanced against increased production costs of other goods and services, as well as the potential impact on national income and em-

ployment that these increased costs may precipitate.

The history of the struggle for clean air is long and involved, but the lessons apply to the current struggle for the preservation, maintenance and enhancement of the environmental quality of our oceans and Great Lakes.

Over the last decade, numerous efforts have been made to identify and quantify the values associated with the marine environment.[16] On the one hand are the monetary values associated with extraction and utilization of the sea's resources. A study prepared in 1974 for the Senate Committee on Commerce measures some of these monetary values:[17]

> In 1972-73, the level of primary economic activity, or output, represented by development of all U.S.-controlled ocean resources is roughly estimated at $7.5-$7.8 billion in 1973 dollars. Comparable total values for 1985 are crudely projected at $23-26 billion, and for 2000 at $33-44 billion, all in 1973 dollars. These figures exclude the ocean's value as a receptacle for waste, not now even roughly quantifiable.

The table accompanying the report estimates the monetary value by category and projects the ocean's increased value to the year 2000.[18]

TABLE 1.—ESTIMATED AND PROJECTED PRIMARY ECONOMIC VALUE OF SELECTED OCEAN RESOURCES TO THE UNITED STATES, BY TYPE OF ACTIVITY, 1972-73-2000, IN TERMS OF GROSS OCEAN RELATED OUTPUTS

[In billions of 1973 dollars]

Activity	Chapter	1972	1973	1985	2000
Mineral resources:					
Petroleum	2	.....	2.40	9.50	10.50
Natural gas	2	.....	.80	5.80	8.30
Manganese nodules	4	.....	.....	.13	.28
Sulfur	3	.....	.04	.04	.04
Fresh water	5	.....	.01	.02	.04
Construction materials	6	.....	.01	.01	.03
Magnesium	7	.....	.14	.21	.31
Other	7	.....	.....	.01	.02
Total		.....	3.40	15.82	19.52
Living resources:					
Food fish	8	0.74	.....	0.95- 1.58	1.37- 4.01
Industrial fish	9	.05	.....	.05- .08	.05- .14
Botanical resources	10	(1)	.....	(1)	(1)
Total		.79	.....	1.00- 1.66	1.42- 4.15
Nonextractive uses:					
Energy	11	.....	.....	.58- .81	3.78- 6.03
Recreation	12	0.70- .97	.....	1.12- 1.50	1.64- 2.53
Transportation	13	2.57	.....	4.40- 6.21	6.88-11.41
Communication	15	.13	.....	.26- .36	.44- .85
Receptacle for waste	14	(2)	.....	(2)	(2)
Total		3.40- 3.67	.....	6.36- 8.88	12.74-20.82
Grand total		7.59- 7.86	.....	23.18-26.36	33.68-44.49

[1] Insignificant.
[2] Potentially significant, but unmeasurable.

Source: Chs. 2 through 15. (Resources and uses other than minerals, there estimated and projected in 1972 dollars, are here adjusted to 1973 dollars to facilitate comparison.)

There should be little question that these monetary values have increased greatly since 1973, both as a result of the movement to extend the nation's economic jurisdiction over marine resources, as evidenced by the recently established 200-mile fisheries management zone, and recent shifts in our energy status.

Competing with activities that generate direct monetary values are a host of activities that generate either less direct monetary values or non-monetary values. Many of the indirect or non-monetary values commonly attributed to the sea are dependent upon the quality and condition of the broad geographic setting in which they are located. Many of these values are derived from relatively small geographic areas. Examples of localized but significant ocean ecosystems and areas are included in Table 2:

Table 2. Localized Areas of Exceptional Value

A. Examples of special ecosystem or habitat types

1. Coral and algal reefs
2. Kelp beds
3. Sponge communities
4. Topographic highs
   a. Rocky outcrops
   b. Snapper banks
5. Areas of high production
6. Areas of high species diversity
7. Areas characterized by unique floral and/or faunal assemblages

B. Habitats of species of commercial importance (fish, shrimp, crab, lobster, mollusk)

1. Spawning grounds
2. Other sensitive life history areas (feeding, migration, etc.)

C. Habitats of species of esthetic or other importance (birds, mammals, fish, crustaceans, mollusks, etc.)

1. Rookeries
2. Feeding and nursery areas
3. Migration routes

D. Unique geological features

1. Topographic sites (topographic highs, submarine canyons, etc.)
2. Ice-age relics (submerged bogs, reefs, special artifact sites, etc.)

E. Archaeological sites

1. Submerged human habitation sites
2. Historical wrecks
3. Other submerged human artifact sites

F. Areas of exceptional recreational value

1. Viewsheds adjacent to established coastal parks
2. Marine scuba diving areas
3. Recreational fishing grounds

Generally, the most important of these areas are concentrated on the continental

shelves stretching from the shoreline out to the continental slope, an area which contains approximately 43% of this nation's federally held public lands.[19] Areas such as those in Table 2 contribute both directly and indirectly to many of the values commonly ascribed to the oceans bordering our shores. For recreationalists, these areas provide sites for fishing, boating, scuba diving, and nature study. Coastal residents and visitors find inspiration and a sense of serenity in the timeless motion, openness, and change of these sites. For scientists and non-scientists alike, these areas provide abundant source material for investigation into the working of nature and the marine environment.

Some of these values are, as the above quotation from William Burch aptly illustrates, non-monetary and probably non-quantifiable. On the other hand, numerous studies have attempted to approach the valuation issue using indirect methodologies[20] and, in many cases, have arrived at rough estimates of these non-monetary values. William Brown, for example, has estimated the value of sport fishing for salmon and steelhead in the State of Oregon alone to be approximately $24.6 million (1974 dollars).[21] It should be observed, however, that the difficulties in arriving at accurate quantifications are illustrated by a 1970 report of the U.S. Fish and Wildlife Service, which reported variations in estimated expenditures on oceanic recreation ranging from $50 million to $3.86 billion for the year 1964.[22]

Clearly, there are strong competing pressures to utilize the ocean and Great Lakes environment. It is equally clear that there are strong economic interests behind these competing demands. Just as there is no formal market for clean air, there is no formal market for a living ocean environment. The

public cannot "buy" a living ocean, but the public can regulate man's impact to achieve an optimum amount of living oceanic environment. With the passage of legislation and the promulgation of regulations concerning marine mammals, endangered species, dredging or filling, ocean dumping, and outer continental shelf (OCS) leasing, the public has become increasingly involved in decisions affecting the oceans and Great Lakes.

This public involvement has, however, been largely limited to repetitive, continually arising use decisions at specific ocean sites. That is, each new use proposed for any site currently requires a determination of suitability. A poignant example of the ad hoc nature of current decision-making affecting the marine environment is provided by the present OCS mineral-leasing process.

As is discussed more fully in Chapter V of this study (see pp. 89-91), the current OCS leasing process allows the Secretary of the Interior to delete specific areas from lease sales for, among other reasons, their critical environmental significance. Because one of the procedures for deletion serves only to exclude the specified areas from the immediate lease sale, the areas are not "withdrawn" from future sales. Thus, subsequent sales may require reconsideration of these areas, which would increase administrative and public review and, consequently, drive up "transactional costs."

While the President possesses authority to permanently withdraw specific tracts from OCS leasing, such action has been taken only twice in the past 24 years. These two areas are the Key Largo Coral Reef Reserve and the Santa Barbara Ecological Preserve and Buffer Zone (see pp. 62-63). There exists, more-

over, no program-wide regulations or guidelines for these permanent withdrawals. And, since they are made on an ad hoc and infrequent basis, it is difficult to predict those activities which might be restricted in these areas (see pp. 89-91). Thus, the potential for multiple reviews remains, suggesting that the potential for high transactional costs may be as great in the case of "permanent" withdrawals as it is with respect to temporary deletions.

On the other hand, by employing a comprehensive review process to assess which marine areas are best suited to specific uses, transactional costs can be significantly decreased. The potential for such an approach exists in the Marine Sanctuaries Program. For example, the Key Largo Marine sanctuary, which encompasses over 100 square miles of coral reef, is permanently protected and managed for only $55,000 per year.[23] To understand the potential of this program, however, it is necessary to thoroughly review the legislation which established the program, in terms of the events which led to its enactment, its specific legislative history, the legislation itself, and congressional reaction to efforts to implement the program. The succeeding chapter of this study analyzes these factors in detail.

Footnotes, Chapter II

1. Although the Center for Natural Areas recognizes that the sea has no gender, there seems to be a consistent convention in some quarters to refer to the sea with a female pronoun. With due regard to Poseidon and Neptune, the Center makes this concession to convention.

2. See, e.g., G. Knight, THE LAW OF THE SEA: CASES, MATERIALS, AND READINGS pp. 5-6, (1976); and J. Sax, DEFENDING THE ENVIRONMENT pp. 163-64, (1971).

3. Knight, supra note 2, p. 8.

4. P. Delaney, "TITLE, JUS PUBLICUM, AND THE PUBLIC TRUST: AN HISTORICAL ANALYSIS," 1 Sea Grant Law J. 13, 17-18 (1976).

5. See J. Sax, "THE PUBLIC TRUST DOCTRINE IN NATURAL RESOURCE LAW: EFFECTIVE JUDICIAL INTERVENTION" 68 Mich. Law Rev. 471 (1970). For a recent reexamination of the public trust doctrine, see G. Berland, "TOWARD THE TRUE MEANING OF THE PUBLIC TRUST," 1 Sea Grant Law J. 83 (1976).

6. MARKS v. WHITNEY, 6 Cal. 3d 251, 259-60, 91 Cal. Rptr. 790 (1971). For a review of California's interpretation of the public trust doctrine, see Center for Natural Areas, THE ROLE OF LAW IN THE DESIGN AND IMPLEMENTATION OF THE SANTA CATALINA ISLAND CONSERVATION AND RECREATION PLAN: A GUIDE FOR MANAGEMENT, pp. 288, 293-300, (1976).

7. Rezneat M. Darnell, "ANALYSIS OF THE NEED TO EXPAND THE MARINE SANCTUARIES PROGRAM: FOCUS UPON CONSERVATION AND ECOLOGICAL NEEDS," (1977) (unpublished study) p. 4.

8. Bostwick H. Ketchum, THE WATER'S EDGE: CRITICAL PROBLEMS OF THE COASTAL ZONE, (1972).

9. Darnell, supra note 7, p. 4.

10. Id., p. 5.

11. Id.

12. Id., pp. 5-6.

13. National Academy of Sciences, Ocean Affairs Board, ASSESSING POTENTIAL OCEAN POLLUTANTS, (1975).

14. Ketchum, supra note 8.

15. William R. Burch, Jr., "Social Aspects in the Allocation of Marine Recreational Resources" in MARINE RECREATIONAL FISHERIES, First Annual Marine Recreational Fisheries Symposium (February 27, 1976).

16. See, e.g., Commission on Marine Services, Engineering, and Resources, OUR NATION AND THE SEA (1969); U. S. Department of the Interior, THE ESTUARINE POLLUTION STUDY (1969); Bostwick H. Ketchum, THE WATER'S EDGE -- CRITICAL PROBLEMS OF THE COASTAL ZONE (1972); Arnold W. Reitze, Jr., ENVIRONMENTAL PLANNING: LAW OF LAND AND RESOURCES, chapter 19 (1974); U. S. Department of the Interior, NATIONAL ESTUARY STUDY (1970).

17. National Ocean Policy Study of the Senate Committee on Commerce, 93d Cong., 2d Sess., THE ECONOMIC VALUE OF OCEAN RESOURCES TO THE UNITED STATES, p. 3 (1974).

18. Id., p. 5.

19. See, J. Muys, "The Federal Land," in FEDERAL ENVIRONMENTAL LAW, pp. 493, 504, (1974).

20. See, e.g., P. Bohos, "Estimating the Demand for Public Goods: an Experiment," in EUROPEAN ECONOMIC REVIEW (1972); C. Cicchetti, and A. Freeman, "Option Renewal and Consumer Surplus," in QUARTERLY JOURNAL OF ECONOMICS (1971); M. Clawson, METHODS OF MEASURING THE DEMAND FOR AND VALUE OF OUTDOOR RECREATION, (1959); J. Knetach, "Economics of Including Recreation as a Purpose of Eastern Water Projects," in JOURNAL OF FARM ECONOMICS (1964); K. McConnell, "Some Problems in Estimating the Demand for Outdoor Recreation," AMERICAN JOURNAL AGRICULTURAL ECONOMICS (1975).

21. See, W. Brown, "Economic Implications of Allocation" in MARINE SEA FISHERIES, First Annual Marine Recreational Fisheries Symposium, (1976).

22. U.S. Dept. of Interior, NATIONAL ESTUARY STUDY, (1970).

23. Comments of Phillip C. Johnson, Officer in Charge of the Marine Sanctuaries Program, on the Center for Natural Areas' Draft Phase I Study (March 23, 1977), p. 2.

III. Evolution of a Response: Legislative Recognition

The competing legislative responses to pressures being exerted on the nation's coastal, nearshore, and offshore environments are better understood if they are placed in the larger context of the national efforts to maintain and enhance the nation's environmental resources. Before describing the congressional initiatives which resulted in the establishment of the Marine Sanctuaries Program, this chapter will, therefore, overview similar legislative efforts to protect environmental quality in general, and the marine environment in particular. In this manner, a more complete perspective can be gained as to the reasons Congress determined that a federal Marine Sanctuaries Program was a necessary element in the nation's evolving oceans policy. This chapter will also review the congressional reaction to the current Marine Sanctuaries Program, as exhibited in appropriations, legislative, and oversight hearings, in order to ascertain the concerns of Congress with respect to the implementation of the program.

A. Overview of the National Response to Threats Upon Natural Resources

In his 1970 State of the Union Address, former President Nixon signalled that the time had come to develop national responses to the pressures being placed on environmental resources.[1]

> I now turn to a subject which, next to our desire for peace, may well become the major concern of the American people in the decade of the seventies....
>
> The great question of the seventies is, shall we surrender to our surroundings, or shall we make our peace with nature and begin to make reparations for the damage we have done to our air, our land and our water?

> restoring nature to its natural state is a cause beyond party and beyond factions. It has become a common cause of all the people in America. It is a cause of particular concern to young Americans -- because they more than we will reap the grim consequences of our failure to act on programs which are needed now if we are to prevent disaster later.

On January 1, 1970, as his first official act of the new decade, the President signed into law the National Environmental Policy Act (NEPA). In announcing a comprehensive national policy for protecting, maintaining, and restoring environmental quality, NEPA ushered in a new era of legislative environmental initiatives, both on the federal and state levels.[2] One month after the signing of NEPA, the President, in his Message on the Environment, indicated that the establishment of the nation's environmental policy constituted only a necessary first step in developing better programs to manage the nation's natural resources:[3]

> Like those in the last century who tilled a plot of land to exhaustion and then moved on to another, we in this century have too casually and too long abused our natural environment. The time has come when we can wait no longer to repair the damage already done, and to establish new criteria to guide us in the future.

The year 1970 also marked the submission of the final report of the Public Land Law Review Commission, One Third of the Nation's Land. Among the recommendations of that report was that:[4]

> environmental quality should be recognized as an important objective of public land management, and public land policy should be designed to enhance and maintain a high quality of environmental quality both on and off the public lands.

Actually, a change in the nation's federal land management policies, which had historically emphasized disposal of public lands and exploitation of their

natural resources, was apparent in the 1964 congressional act that established the Public Land Law Review Commission:[5]

> It is hereby declared to be the policy of Congress that the public lands of the United States shall be (a) retained and managed or (b) disposed of all in a manner to provide the maximum benefit for the general public.

Since a considerable portion of the nation's public lands are those lying on the continental shelf, public land management policies are of no small import regarding the utilization and management of marine resources. In fact, if the estimated 570 million acres of outer continental shelf lands are compared with the approximately 750 million acres of federal public lands lying within the 50 states,[6] over 43% of the nation's public lands lie beneath the oceans.

With the submission of the Public Land Law Review Commission's recommendations, the enactment of NEPA, and growing public awareness of environmental values, as perhaps best exhibited in the Earth Day demonstrations, the year 1970 may be viewed as a milestone in the national response to the competing pressures being placed on its natural resources. The succeeding half decade would witness the institution of national environmental protection programs to control air, water, noise, solid waste and toxic chemical pollution. The nation would also move toward establishing comprehensive resource management programs in the coastal zone and on the public domain, while increasing the number of geographic areas set aside for conservation purposes, such as wilderness areas, wildlife refuges, and wild and scenic rivers. Although the thrust of these initiatives was basically directed toward the management of land-based resources, better management of the marine environment has also been a goal of legislative initiatives in recent years.

B. Overview of the Legislative Responses to Pressures on the Marine Environment

The starting point for considering the congressional responses to the competing pressures placed upon the marine environment is the enactment of the Marine Resources and Engineering Act of 1966.[7] That act, largely a response to studies prepared by the National Academy of Sciences and U. S. Navy on marine science activities and the role of the seas in assuring national security,[8] declared it the national policy to "develop, encourage, and maintain a coordinated, comprehensive, and long-range national program in marine science."[9] It also established the Commission on Marine Science, Engineering, and Resources (the Stratton Commission), whose final investigative report, Our Nation and the Sea,[10] made a number of recommendations concerning marine science and technology and the utilization of ocean resources. Two of the recommendations of the Stratton Commission's report, submitted to Congress in January, 1969, were the establishment of the National Oceanic and Atmospheric Administration and the enactment of national coastal zone management legislation. In addition, the Commission strongly emphasized the compelling need to establish a balanced national program to develop and protect marine-related resources.[11]

> The Nation's stake in the uses of the sea is synonymous with the promise and threat of tomorrow. The promise lies in the economic opportunities the sea offers, in the great stimulus to business, industry, and employment that new and expanded sea-related industries can produce.... The promise lies in making available new reserves of important minerals and in ensuring new sources of food. The threat lies in the potential destruction of large parts of the coastal environment and in the future deterioration of economically important ports, recreational facilities, coastal shellfisheries, and fisheries on the high seas....

> A time of decision is here. Multiple pressures force the Nation to turn to the sea, and multiple opportunities await the seaward turning. The time of decision is not for the Federal Government alone, although Federal leadership is essential. State and local governments, industry, academic institutions, and the American people must share in the decision and action.
>
> The ocean does not yield its food and mineral treasures easily; damaged environments are not restored by scattered attacks or the good intentions of a few; the planet's dominant element cannot be understood, utilized, enjoyed, or controlled by diffuse and uncoordinated efforts. The Nation's stake can only be realized by a determined national effort great enough for the vast and rewarding task ahead.

Within a year of the submission of the Stratton Commission's final report, the Department of the Interior completed two major studies on the estuarine environment. The first, The National Estuarine Pollution Study,[12] submitted to Congress in November, 1969, recommended the establishment of an integrated and comprehensive national program to manage and protect the nation's estuarine and coastal resources. The second, The National Estuary Study,[13] submitted to Congress in January, 1970, inventoried the nation's estuarine areas and depicted the deteriorating condition of estuarine resources.[14]

While these studies were directed to the nearshore and estuarine environments, similar efforts were undertaken concerning the offshore marine environment. In an April, 1970, message to Congress on waste disposal, President Nixon called attention to the alarming increase in the amount of wastes being dumped into the marine environment.[15] At the direction of the President, the Council on Environmental Quality undertook a comprehensive study to ascertain the dimensions of the problem.[16] In addition to detailing the amount of wastes

being dumped into the oceans and recommending legislation to regulate the dumping of materials from the nation's shores, that report made the following policy recommendation:[17]

> High priority should be given to protecting those portions of the marine environment which are biologically most active, namely the estuaries and the shallow, nearshore areas in which many marine organisms breed or spawn. The biologically critical areas should be delimited and protected.

The cumulative impact of these studies resulted in numerous congressional responses designed to protect and manage the nation's marine-related resources. Congressional recognition of coastal and estuarine areas as critical environmental areas was evidenced by the enactment of the Coastal Zone Management Act of 1972.[18] Special protection for endangered and threatened marine-related species was provided by the Marine Mammal Protection Act of 1972[19] and the Endangered Species Act of 1973.[20] Comprehensive regulatory programs to control dredge or fill activities and the discharge of pollutants from stationary sources into ocean waters were expanded or established by the Federal Water Pollution Control Act Amendments of 1972.[21] A program to regulate the transportation of pollutants for discharge into ocean waters was instituted by virtue of the enactment of Title I of the Marine Protection, Research, and Sanctuaries Act of 1972.[22] Most recently, an expanded national fisheries management program to conserve and regulate fisheries resources in waters on the U. S. continental shelves was effected by the passage of Fishery Conservation and Management Act of 1976.[23]

Thus, the decade following the enactment of the Marine Resources and Engineering Development Act of 1966 has witnessed a spate of legislative re-

sponses to the competing pressures placed on the marine environment. These responses, however, have not been part of a balanced, comprehensive national policy toward the preservation and wise utilization of the marine environment, but rather ad hoc responses to demands placed on specific ocean resources. This is evidenced by the 1974 adoption of Senate Resolution 222,[24] which established the National Ocean Policy Study to assist in developing a clear, comprehensive, long-range national ocean policy. Any consideration of the congressional recognition of the need for a federal Marine Sanctuaries Program must therefore, be prefaced with the understanding that a nationwide ocean policy remains still in its formative stages, and that it is still possible for that program to play a vital role in assuring that the nation's policy regarding the marine environment is one that reflects a balanced approach to the preservation and wise utilization of ocean resources.

C. Legislative History of the Marine Sanctuaries Program

An overview of the legislative history of the Marine Sanctuaries Program is important not simply because courts attach great weight to legislative history in determining the meaning of statutes,[25] but because it often provides a clearer indication than does the statutory language itself of those factors which the legislature considered in determining the need for legislation. In the case of legislation such as that establishing the Marine Sanctuary Program which contains no congressional findings of fact or specific policy declarations,[26] an analysis of the legislative history is critical in establishing the perceived need for the legislation.

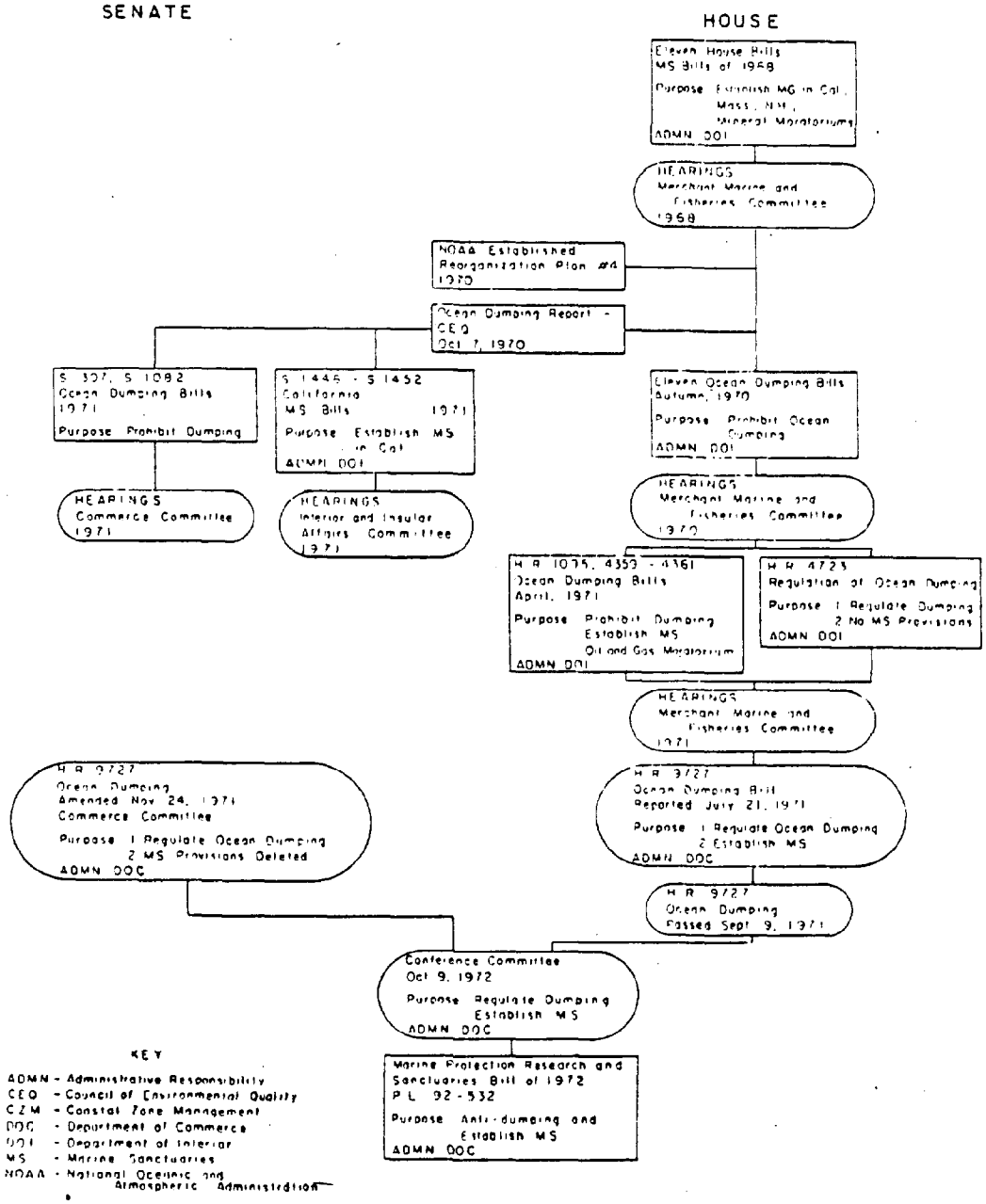
As the accompanying chart developed by the Virginia Institute of Marine Sciences[27] illustrates, the origins of the legislation which established the Marine Sanctuaries Program can be traced to the introduction of eleven distinct bills in the House of Representatives in 1968. The bills were basically a reaction to public outrage stemming from a series of incidents which resulted in the degradation of popular marine recreation areas, such as the dumping of nerve gas and oil wastes off the coast of Florida and the infamous Santa Barbara oil spill.[28] These bills, which contemplated the establishment of marine sanctuaries off the coasts of California, Massachusetts, and New Hampshire, were directed, in large measure, to instituting moratoria on mineral exploration in those areas which would be considered for sanctuary designation. As noted by the Virginia Institute of Marine Sciences,[29]

> Marine sanctuaries were proposed as a mechanism to attain a national balance of uses in the marine environment and ensuring compatibility of conflicting uses. Some witnesses advocated marine zoning to minimize conflict between competing uses. The concept of sanctuaries as areas for studies of the natural system unencumbered by pollution was brought forward as was the concept of preserving marine areas so that scenic beauty, ocean recreation, and fishing activities could be perpetuated.

But largely due to the fact that they were coupled with moratoria on mineral exploration, these bills were not even reported by the House Merchant Marine and Fisheries Committee during the 90th Congress. While similar bills were introduced into the 91st Congress, it was not until after the completion of the Council on Environmental Quality's study of ocean dumping[30] that a marine sanctuaries provision, was reported by the House Merchant Marine and Fisheries Committee. This provision was incorporated into H.R. 9727, a bill which

MARINE PROTECTION, RESEARCH
AND SANCTUARIES ACT
OF 1972

LEGISLATIVE HISTORY



Source: Virginia Institute of Marine Sciences, MARINE AND ESTUARINE SANCTUARIES, Rep. No. 70 (1973), p. 10.

also contemplated the regulation of ocean dumping.

In the House Report accompanying H.R. 9727, the Committee explained the purposes which the marine sanctuaries provision were designed to serve:[31]

> Title III deals with an issue which has been of great concern to the Committee for many years: the need to create a mechanism for protecting certain important areas of the coastal zone from intrusive activities by man. This need may stem from the desire to protect scenic resources, natural resources or living organisms: but it is not met by any legislation now on the books... The pressures for development of marine resources are already great and increasing. It is never easy to resist these pressures and yet all recognize that there are times when we may risk sacrificing long-term values for short-term gains. The marine sanctuaries authorized by this bill would provide a means whereby important areas may be set aside for protection and may thus be insulated from the various types of "development" which can destroy them.

The Committee apparently recognized, as is more fully developed in part V of this study (pp. 89-91), that the authority which would be conveyed to the Secretary of Commerce under Title III was considerably more comprehensive than that granted the Secretary of the Interior by the Outer Continental Shelf Lands Act of 1953 to withdraw marine areas from OCS lease sales. This is amplified by the Committee's statement of the role which marine sanctuaries would play in achieving a balanced approach to the utilization of ocean resources:[32]

> The reasons for designating a marine sanctuary may involve conservation of resources, protection of recreational interests, the preservation or restoration of ecological values, the protection of esthetic values, or a combination of any or all of them. It is particularly important therefore that the designation clearly state the purpose of the sanctuary and that the regulations in implementation be directed to the accomplishment of the stated purpose.

Both the House floor debates on H.R. 9727 and the accompanying Report contain numerous statements on why a federal program of marine sanctuaries was needed and the mechanisms that should be employed to implement it. Some of the more salient of these are included in Appendix A of this study. It is significant to note that even at the time of the House passage of H.R. 9727, concern was expressed over the level of authorized funding for the program. For example, as Congressman Harrington noted:[33]

> These sanctuaries will immediately preserve vital areas of our coastline from further damage. My only reservation is that we may be drastically underfunding [Title III].

After it passed the House on September 9, 1971, the Senate Commerce Committee began its consideration of H.R. 9727. It reported an amended bill on November 12, 1971.[34] The Committee's amended version did not include Title III. As the Committee Report explained, there were two reasons for this. First, while the Committee noted that the continental shelf was within the jurisdiction of the federal government, it believed that control over the superjacent water column outside of the limits of the territorial sea and the contiguous zone was beyond its jurisdiction.[35] That Congress no longer fully ascribes to this restricted view of the nation's authority over ocean waters is evidenced by the enactment of the Fishery Conservation and Management Act of 1976, which extended the nation's control over its fisheries resources to areas within 200 miles offshore.[36]

The second reason the Senate Commerce Committee deleted Title III was because it believed that since the establishment of marine sanctuaries would

affect the continental shelf, the reservation for special protection of certain areas of the continental shelf was already within the authority conferred to the Secretary of the Interior by the Outer Continental Shelf Lands Act.[37] As noted earlier, however, the House Merchant Marine and Fisheries Committee was more correct in its assertion that the Title III authority was more comprehensive in scope than that contained in the OCS Lands Act (see p. 34). It should also be observed that while the Senate Commerce Committee did not agree with the approach adopted by the House, it was in full agreement with the concept of establishing marine sanctuaries:[38]

> The Committee believes that the establishment of marine sanctuaries is appropriate where it is desirable to set aside areas of the seabed and the superjacent waters for scientific study, to preserve unique, rare, or characteristic features of the oceans, coastal, and other waters, and their total ecosystems. In this we agree with the members of the House of Representatives. Particularly with respect to scientific investigation, marine sanctuaries would permit baseline ecological studies that would yield greater knowledge of these preserved areas both in their natural state and in their altered state as natural and manmade phenomena effected change.

To resolve differences between the House and Senate versions of H.R. 9727, a Conference Committee was convened. On October 9, 1972, it agreed to a revised bill which included Title III, with certain modifications in the language with the House passed. In explaining these modifications, the Conference Committee stated:[39]

> The Committee on Conference adopted the House approach, but modified the language in some respects to make it clear that the regulations and enforcement activities under the title would apply to non-citizens of the United States only to the extent that such persons were subject to U.S. jurisdiction, either by virtue of accepted principles of International law, or as a result of specific intergovernmental agreements.

Signed into law on October 23, 1972, over 13 months after it originally passed the House, Title III of Public Law 92-583 became the first, and to date the only broad-based, comprehensive federal legislation capable of striking a balance between the need to develop and utilize and the need to protect and conserve the nation's marine resources.

D. Title III of the Marine Protection, Research, and Sanctuaries Act of 1972

October of 1972 may perhaps be the most remarkable month in the history of this nation's attempts to develop a balanced approach to the management of its natural resources. In that month -- indeed within an 18 day period from October 9 to October 27 -- a plethora of environmental and natural resources legislation became law. This fertile period witnessed the establishment of 3 historic sites; the designation of 4 wilderness areas; the establishment of or additions to 3 national monuments; the establishment of a national wildlife refuge; and the establishment of a national seashore and 3 national recreation areas.[40] In addition comprehensive legislation was enacted to control water, noise, pesticides pollution; to provide for the protection of marine mammals; and to establish state coastal zone programs.[41] Thus, the congressional response to the competing pressures on the marine environment which resulted in the passage of the Marine Protection, Research, and Sanctuaries Act was actually part of a larger response to develop mechanisms to better manage the nation's natural resources.

Title III of the Act authorizes the Secretary of Commerce to designate marine sanctuaries, with the approval of the President, in ocean waters as

far seaward as the edge of the continental shelf, in other coastal waters subject to the ebb and flow of the tide, and in Great Lakes or their connecting waters.[42] The purposes for which marine sanctuaries may be designated are listed in section 302(a) of the statute as the preservation or restoration of these areas "for their conservation, recreational, ecological, or esthetic values."[43]

The language of section 302 of the Act indicates the expectations Congress had concerning cooperation and coordination between the Secretary of Commerce (who has delegated his authority to administer Title III to the Administrator of NOAA)[44] and other federal agencies, involved states, the public and foreign governments. First, before designating any marine sanctuary, section 302(a) requires the Administrator to consult with the Secretaries of State, Defense, Interior, and Transportation, the Admministrator of the Environmental Protection Agency, and the head of other interested federal agencies. This consultation process must include an opportunity to review and comment upon proposed sanctuaries.[45] Second, if a proposed marine sanctuary would include ocean waters within the 3 mile jurisdictional limit of any coastal state,[46] or in any U.S. areas of the Great Lakes, section 302(b) stipulates that the Administrator of NOAA must "consult with, and give due consideration to" the views of state officials before designation. Moreover, the governor of the "involved" state may, in effect, veto areas within that states' jurisdiction by notifying the Administrator within 60 days of the notice of designation.[47] Third, when sanctuaries include areas of ocean waters outside the "territorial jurisdiction"[48] of the United States, section 302(c) requires the Secretary of State

to take "appropriate" actions to negotiate international agreements to protect the sanctuary and promote the purposes for which it was established.[49] Fourth, pursuant to section 302(e), before a marine sanctuary can be designated the Administrator is to hold public hearings in coastal areas "most directly affected."[50] Fifth, after a marine sanctuary has been designated, section 302(f) requires that the Administrator consult with other interested federal agencies before promulgating regulations regarding permissible uses within the sanctuary.[51] Finally, section 302(g) requires that any regulations promulgated by the Administrator be developed in accordance with the "recognized principles of international law." Beyond the limits of the nation's territorial jurisdiction,"[52] these regulations are only applicable to United States citizens, unless amplified by international agreements or in conformity with other recognized principles of international law.[53]

Thus, the crucial importance of intrafederal, federal-state, and international cooperation, as well as effective public involvement, in the designation of marine sanctuaries was recognized by the drafters of the legislation. The reasons behind this concern are perhaps best illustrated by the powerful tool provided in section 302(f).

Section 302(f) states, in pertinent part, that after a marine sanctuary has been designated,[54]

> ... no permit, license, or other authorization pursuant to any other authority shall be valid unless the Secretary shall certify that the permitted activity is consistent with the purposes [for which the marine sanctuary was established.]

Similar in many respects to the federal consistency requirements of section

307 of the Coastal Zone Management Act,[55] section 302(f) provides a clear indication that Congress intended the designation of marine sanctuaries to be an important mechanism in the development of a balanced approach to a national ocean policy. In fact, because section 307(f) applies to any permitting authorization, it appears to be considerably broader than the scope of authority contained in the CZMA's consistency provisions, since it does not merely apply to federal authorizations.

Authority to enforce violations of regulations promulgated by the Administrator is contained in section 303. Persons subject to the jurisdiction of the United States are liable for civil penalities of up to $50,000 per violation, and vessels are liable in rem for these fines. In addition, U.S. District Courts have jurisdiction to restrain violations of the regulations and to grant other "appropriate" relief.[56]

To implement Title III, section 304 authorized $10 million for each of the fiscal years 1973-75. A 1975 amendment extended funding authorization for fiscal year 1976 and the transition quarter at $7.75 million.[57] In spite of these authorizations, however, no funds have ever been appropriated. In order to ascertain the congressional reaction to nearly five years without funding, as well as congressional views as to the need for a federal Marine Sanctuaries Program, it is, therefore, necessary to review the budget and oversight hearings which have taken place since the enactment of Title III.

E. Legislative Reaction to Title III -- 1972-77

In the years since Title III took effect, numerous appropriations, legis-

lative and oversight hearings have been conducted concerning the implementation of the Marine Sanctuaries Program. For the most part, the oversight hearings contain the greater amount of comments on Title III. The scarcity of comments on Title III in appropriations hearings may be credited to the fact that funding for Title III has never been requested by past Administrations as part of NOAA's annual budget request to Congress. Thus, comments on Title III appear only as an aside to considerations of budget requests to implement Titles I and II.

1. Appropriations Hearings

The most pertinent comments pertaining to Title III are embodied in the Senate appropriations hearings for fiscal years 1974 and 1975. As a part of fiscal year 1974 hearings, Thomas Kimball, Executive Vice-President of the National Wildlife Federation, in a letter inserted into the record on what he felt was inadequate funding to implement the entirety of the programs established by the Marine Protection, Research, and Sanctuaries Act, stated:[58]

> ... the Act also authorized the Secretary of Commerce to designate marine sanctuaries in offshore waters, in consultation with appropriate states... The Administration despite past rhetoric on the subject, is proposing to leave the program completely unfunded.

The following year, testifying before the Senate Appropriations Committee, Dr. John Townsend, Associate Administrator of NOAA, underscored the importance of coordinating effective management of marine areas with research activities:[59]

> We must continue to focus our research capabilities to provide critical environmental information for the effective management of the marine environment and its resources.

During the same hearings, Senator Hollings specifically inquired as to the proper personnel and funding levels needed to sustain the Marine Sanctuaries Program. NOAA responded by distinguishing between administrative costs required to process nominations and those needed to cover the operational expenses of designated sanctuaries. It was estimated that a minimum staff of 5 persons and a budget of approximately $100,000 was required to process the 6 nominations which were proposed at that time. Total operational expenses, expected to vary widely from sanctuary to sanctuary, were estimated to involve an additional $280,000, if all 6 nominations were to receive designation.[60] The full text of NOAA's response to Senator Hollings' inquiry is reprinted in Appendix A.

2. Legislative and Oversight Hearings

Some of the most poignant comments on the implementation of the Marine Sanctuaries Program were made in the 1974 House Oversight Hearings by Congressman John Dingell, then Chairman of the House Subcommittee on Fisheries and Wildlife Conservation and the Environment. Chairman Dingell specifically asked about the proper level of funding required to sustain the program.[61]

> The Chair would like to receive your comments as to your submissions through the internal budgetary structure of the Department of Commerce with regard to your need under title III...
>
> The Chair also advised you that this is to be done without clearance through the Bureau of the Budget.
>
> I am rather tired of receiving well-strained information from the Bureau of Budget. I want to know what your needs and wishes are, and not what the wishes of the Bureau of the Budget are.

NOAA's review of its Title III budget requests for fiscal years 1973-75 was summarized and inserted into the record as follows:[62]

> In FY'73, NOAA prepared a supplemental request of $75,000 to initiate the program but it was not approved for transmittal to the Congress. No funding has been requested by NOAA for implementation of Title III for FY'74 or FY'75. The studies and activities we have had underway have required only limited funding, and this has been done within existing resources.

Chairman Dingell then went on to express his feelings as to the importance of the Marine Sanctuaries Program, as well as the need to coordinate it with complementary federal programs:[63]

> Now, the Chair wishes to stress to you the importance and advise you of utilizing the marine sanctuaries provisions with regard to the coastal unit of the refuge system.
>
> You folks down at NOAA and the Department of the Interior, Bureau of Sport Fisheries and Wildlife are engaged in some very important discussions. You shall keep us informed of your progress, and move with considerable vigor.
>
> This is a rather novel and wholesome stride forward, and it is my hope that you will not get deterred in other matters, and will move with considerable vigor with regard to protection of these areas.
>
> I am referring to the Arcadian National Park, which is in need of some protection, and some of your other coastal parks and seashore areas, both along the Atlantic and Pacific and Gulf Coasts, and also out in the Great Lakes, where we have similar opportunity in connection with the Painted Rocks and Sleeping Bear Dunes, and other areas of this sort.
>
> Your comments with regard to potential for taking steps in this direction for inclusion in the record would be much appreciated.

> Also, I would like your comments with regard to cooperation between your Agency and the Department of the Interior with regard to steps of this sort, which will be appreciated, and we will direct a similar communication to the Interior Department, as I have done in these Migratory Bird Commissions.

In addition, the Subcommittee's interest in designating all or part of the Georges Bank as a marine sanctuary was expressed by staff counsel.[64] It should be noted that in an earlier letter to Dr. Robert White, Administrator of NOAA, Chairman Dingell strongly supported the establishment of a marine sanctuary on the Georges Bank, stating:[65]

> I do wish to be kept closely informed of progress in this matter. We did not intend for this Title [the Marine Sanctuaries Program] to be a nullity, and from everything that I can see, it appears that the need which it was designed to fill may occur most acutely in the particular case to which I have referred.

The following year in 1975, oversight hearings were held in both the House and the Senate. The House hearings were held in the context of authorizing appropriations to carry out both Titles I and III of the Act. Dr. Donald Marinteau, NOAA's Deputy Associate Administrator for Marine Resources, described the Marine Sanctuaries Program as being "a powerful tool for conservation and protection of some of the nation's more valuable marine areas."[66] Dr. Martineau then quoted former Secretary of Commerce Dent's remarks at the designation ceremony of the first marine sanctuary, the U.S.S. MONITOR:[67]

> There is no heritage upon which marine sanctuaries can rest, no record on which to measure the contribution. But the potential is tremendous viewed in terms of the interrelationship between marine sanctuary programs and those other conservation activities conducted by NOAA under the Coastal Zone Management Act, the Fish and Wildlife Act and other legislation. In this montage, we have what amounts to a

> substantial body of law spelling out a major national environmental obligation; a commitment to the proposition that as demands for the world's marine resources increase and intensify, the obligation and the opportunity to provide for balanced well managed, environmentally sound use of these resources go hand in hand.

Noting that NOAA expected "the program pace to increase," Dr. Marinteau expressed support for extended funding authorizations for Title III, recommending $1.25 million for both fiscal year 1976 and the transition quarter and $10 million for fiscal year 1977. In response to a question posed by staff counsel concerning Title III appropriation requests, NOAA observed that while it had requested that the Secretary of Commerce seek $400,000 to implement Title III for fiscal year 1976, the Department of Commerce did not approve this request.[68]

In the 1975 Senate Hearings, NOAA Associate Administrator David Wallace again referred to the Marine Sanctuaries Program as a "powerful tool":[69]

> The marine sanctuary title of the act is a powerful tool for conservation and protection of some of the Nation's more valuable marine areas. NOAA believes that the program for implementing the authorities in title III must be developed and applied wisely and carefully to accomplish the intent of the legislation which is to assure balanced protection and utilization of unique coastal areas ... we are proceeding with a program to establish marine sanctuaries to preserve valuable coastal areas.

The Senate's Subcommittee on Oceans and Atmosphere, in a question submitted for the record, specifically asked why no funds had been requested of Congress to implement Title III in fiscal years 1973-75.[70] In response, NOAA noted that the costs of the program were being borne by the administrative budget of the Office of Coastal Zone Management, and stated that in many in-

stances costs could be kept to a minimum by utilizing existing operational capacities and ensuring against duplicative administrative functions:[71]

> We believe that the program can develop and function by making every effort to utilize existing capabilities for the operational requirements of the sanctuaries. Thus, minimal funding will be needed directly under Title III. Once a given agency has taken on a particular role, the base program can be augmented to perform the new function. This should be more cost effective.

Among the existing administrative authorities of greatest utility to the Marine Sanctuaries Program are those of the Coast Guard, particularly with respect to monitoring compliance with regulations. In this regard, Rear Admiral Robert Price, Chief of the Coast Guard's Office of Marine Environment and Systems, has testified before committees of both the House and Senate to the effect that the Coast Guard is prepared to provide operational support to designated marine sanctuaries.[72]

One largely unresolved issue in the operational stage of marine sanctuaries concerns the legal questions of enforcing sanctions, where the sanctuary lies outside the territorial jurisdiction of the United States. In response to a question posed by the Subcommittee on Oceans and Atmosphere, NOAA stated:[73]

> All of the legal issues involved in the creation of a marine sanctuary outside the territorial waters of the United States have not been identified. However, certain legal issues have been addressed in connection with the creation of the MONITOR Sanctuary. Legal issues vary depending on the nature of the sanctuary and therefore must be addressed on a case by case basis. One major issue, that of jurisdiction, seems to be resolved.
>
> The consensus of those who reviewed and commented on the MONITOR Marine Sanctuary which is about 16 miles offshore, is that activities of U.S. citizens can be

> controlled in any given designated sanctuary area. However, the activities of foreign citizens must be controlled by means of an international agreement negotiated by the State Department.

It should be noted that the term "territorial jurisdiction" has been generally interpreted to mean only that area over which the United States exercises dominion and control as a sovereign power[74] -- that is, the territorial sea, which at present extends to the three mile limit. Seaward of the territorial sea, extending an additional nine miles, is the contiguous zone, in which the United States exercises special customs, fiscal, immigration, and sanitary controls. The recent expansion of fisheries jurisdiction to the 200 mile limit (see p. 84), should be viewed as an extended contiguous zone for the limited purpose of the management of fisheries resources. Whether extended fisheries jurisdiction, or other unilateral actions by the United States, may affect the legal questions concerning the enforcement of sanctions will be investigated in subsequent Phases of the Center for Natural Areas' on-going study.

But perhaps the largest unresolved questions concerning the Marine Sanctuaries Program lie with its level of funding. In the 1972 legislation Congress authorized funding levels at $10 million per year for three years. As has been documented, however, no funds were ever appropriated, largely because Congress never received any appropriations request from past Administrations. Nevertheless, congressional interest in the program remains high. This is demonstrated by the fact that when the issue of extending Title III's funding authorization was under consideration by Congress in 1975, it authorized a

funding level of $7.75 million for fiscal year 1976 and the transition quarter, in spite of the fact that only $1.75 million was requested.[75]

That NOAA perceives the need for the program was underscored in the most recent House oversight hearings, conducted on February 27, 1976. In response to a question by Congressman Murphy, Chairman of the Subcommittee on Oceanography, as to whether Title III was more important in 1976 than it was when initially passed, Robert Knecht, now NOAA's Associate Administrator for Coastal Zone Management stated, "I would say it is dramatically more important today than it was in 1972 when the bill was passed."[76]

The following colloquy between Chairman Murphy and Mr. Knecht, although somewhat lengthy, pointedly illustrates the constraints that have been placed on the program by the lack of funding.[77]

> MR. MURPHY. Would the program, in your opinion, be operated any differently if funds were appropriated specifically for the purposes of Title III? For instance, would we have more than just two marine sanctuaries today?
> MR. KNECHT. Yes, I would have to answer that in the affirmative, Mr. Chairman. The activity we have been able to carry on in the Marine Sanctuaries area has been limited because of the lack of specifically appropriated funds. The decision not to request funds was made by the administration.
> MR. MURPHY. By the administration, do you mean the Office of Management and Budget?
> MR. KNECHT. That is correct. Because of the fiscal stringencies that the administration has had to face, it was a question of setting priorities. Mr. Chairman, the point of your question is quite correct. Our program activity has been limited to slightly more than 1 man-year of effort per year. I think where the effort has suffered has been in the area of developing a management program framework. Without such a framework, we have not been able to apply the device as aggressively as perhaps the Congress intended, and as I feel the problems now require.

MR. MURPHY. Well, we would probably have more than two marine sanctuaries had we had some direction and funding for the title III amendments.
MR. KNECHT. That is a bit speculative and it is difficult to know. I think, had we laid out a framework and pointed out opportunities to the various user groups or interested people for the kinds of objectives that might be achieved using the marine sanctuary device, I am sure there would have been greater response with more people proposing and nominating potential sanctuaries. It is a lengthy process...but I think I agree with your general point.

Thus, there appears to be both legislative and administrative agreement that the lack of budget appropriations for Title III has hampered implementation of the congressional intent. At the same time, there has been continuing and active legislative recognition of the vital role which a viable Marine Sanctuaries Program can play in helping to devise a balanced national approach to the wise utilization and preservation of ocean resources. In order to clearly delineate the potential of the program, however, it is necessary to thoroughly review NOAA's existing policies and strategies for implementing Title III, as well as assess its role in relation to other federal and state programs. The succeeding chapters of this study will, therefore, focus their attention on these matters.

Footnotes -- Chapter III

1. State of the Union Address (Jan. 22, 1970), reprinted in CEQ, ENVIRONMENTAL QUALITY, THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY, Appendix B, p. 250, (1970).

2. Although NEPA is aimed exclusively at federally-related activities, the Council on Environmental Quality reports that as of April, 1976, 26 states had enacted legislation resembling NEPA in order to require environmental analyses of state-related activities. CEQ, ENVIRONMENTAL QUALITY, THE SEVENTH ANNUAL REPORT OF THE COUNCIL OF ENVIRONMENTAL QUALITY, p. 135 (1976).

3. The President's Message on the Environment (Feb. 10, 1970), reprinted in CEQ, ENVIRONMENTAL QUALITY, THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY, Appendix C, p. 254 (1970).

4. Public Land Law Review Comm'n., ONE THIRD OF THE NATION'S LAND, p. 68, (1970). See also Id., p. 70, where the Commission recommended that Congress enact specific environmental and quality goals for the management of Public Lands. For an overview of federal land management policy, at least through 1974, see J. Muys, "The Federal Lands" FEDERAL ENVIRONMENTAL LAW, pp. 492-549 (West Pub. Co. 1974).

5. 43 U.S.C. s. 1391.

6. See Muys, supra note 4, pp. 493, 504.

7. P.L. 89-454, 80 Stat. 203 (1966) 33 U.S.C. ss. 1101-08.

8. For an overview of the events preceeding the Act, see Comm'n. on Marine Science, Engineering and Resources, OUR NATION AND THE SEA, Appendix 3, pp. 278-79, (1969).

9. P.L. 89-54, s. 2(a).

10. OUR NATION AND THE SEA, supra note 8.

11. Id., p. 19.

12. Report of the Secretary of the Interior, THE NATIONAL ESTUARINE POLLUTION STUDY, S. Doc. No. 91-58, 91st Cong., 2d Sess. (1970). This report was prepared pursuant to the directives of section 5(g) of the Clean Water Restoration Act of 1966 (Pub. L. 89-753).

13. U.S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries, NATIONAL ESTUARINE STUDY (1970). This 7 volume study was prepared pursuant to the directives of the Estuary Protection Act of 1968 (Pub. L. 89-454).

14. For a critical analysis of the two Department of the Interior studies, see W. Hedeman, "Federal Wetlands Law," in A. Reitze, ENVIRONMENTAL PLANNING: LAW OF LAND AND NATURAL RESOURCES, pp. two-12-18, (1974).

15. See C. Letlow, "The Control of Marine Pollution," in FEDERAL ENVIRONMENTAL LAW, supra note 4.

16. Council on Environmental Quality, OCEAN DUMPING - A NATIONAL POLICY (1970).

17. Id., p. vi.

18. Pub. L. 92-583, 86 Stat. 1280, 16 U.S.C. ss. 1451-64.

19. Pub. L. 92-522, 86 Stat. 1026, 16 U.S.C. ss. 1361-1407.

20. Pub. L. 93-205, 87 Stat. 884, 16 U.S.C. ss. 1531-43.

21. Pub. L. 92-500, 86 Stat. 816, 33 U.S.C. ss. 1251-1376.

22. Pub. L. 92-532, 86 Stat. 1052, 33 U.S.C. 1401-21.

23. Pub. L. 94-265, 90 Stat. 331, 16 U.S.C. ss. 1801-57.

24. S. Res. 222, 93d Cong., 2d Sess., 120 Cong. Rec. 3472 (1974). See also S. Rep No. 93-685, 93d Cong., 2d Sess. (1974).

25. See, e.g. TRAIN v. COLORADO PIRG, U.S. , 6 ELR 20549 (1976), where the Supreme Court relied heavily on the legislative history in interpreting s. 502(6) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. s. 1251 et.seq.), in spite of the apparent "plain meaning" of the statutory language.

26. While there are congressional findings and declarations of policy in Title I of the Marine Protection, Research, and Sanctuaries Act (see 33 U.S.C. s. 1401), these are directed exclusively to the regulation of ocean dumping activities. There are no similar findings or policy declarations in Title III (see U.S.C. s. 1431-34).

27. Virginia Institute of Marine Sciences, MARINE AND ESTUARINE SANCTUARIES, Rep. No. 70 (1973), p. 10. The Center for Natural Areas is indebted to Virginia Institute of Marine Sciences for the analysis of the legislative history of Title III, upon which much of its assessment of the early legislative history (1968-71) of the marine sanctuaries legislation is based.

28. Id., p. 9.

29. Id.

30. See note 16, supra.

31. H. R. Rep. No. 92-361, 92d Cong., 1st Sess. (1971) p. 15.

32. Id., p. 27.

33. 117 Cong. Rec. 8251 (1971) (Remarks of Cong. Harrington).

34. S. Rep. No. 92-451, 92d Cong., 1st Sess. (1971).

35. Id., p. 15.

36. P.L. 94-265, s. 101, 33 U.S.C. s. 1811.

37. Senate Report, supra note 34, p. 15.

38. Id.

39. H.R. Rep. No. 92-1546, 92d Cong., 2d Sess., p. 18, (1972).

40. Pub. L. Nos. 92-475, 92-524, and 92-527 (historic sites); 92-476, 92-493, 92-510, 92-521 (wilderness areas); 92-501, 92-525, 92-537 (national monuments); 92-514 (national wildlife refuge); 92-536 (national seashore); and 92-592, and 92-593 (national recreation areas).

41. Pub. L. Nos. 92-500 (water pollution); 92-574 (noise); 92-516 (pesticides); 92-522 (marine mammals); 92-583 (coastal zone management).

42. 16 U.S.C. s. 1432(a). No further definition of these areas is provided in the statute of the implementing regulations (15 C.F.R. s. 922).

43. Id. The implementing regulations add research to the purposes for which a sanctuary can be established [15 C.F.R. s. 922.11(b)].

44. 39 Fed. Reg. 10255 (May 19, 1974).

45. 16 U.S.C. s. 1432(a).

46. As established by the Submerged Lands Act of 1953, 43 U.S.C. s. 1301. It should be noted that the jurisdiction of certain states bordering the Gulf of Mexico extends slightly beyond 3 miles.

47. 16 U.S.C. s. 1432(b). Because the scope of authority possessed by "involved" states is not clearly defined by the statutory language if the proposed marine sanctuary encompassed the waters of two states, s. 302(b) could possibly be read as allowing one state the opportunity to veto sanctuary designation not only to waters lying within the jurisdiction of that state, but also to waters lying within the jurisdiction of adjacent states. This is because the language of s. 302(b) speaks only to "waters lying within the territorial waters of any state." Thus, while it may be unlikely that a court would choose to do so, it is at least conceivable that s. 302(b) could be interpreted

as modifying the Submerged Lands Act to, in effect, give states a veto over areas of proposed sanctuaries lying within the jurisdiction of other states. Regulations could serve to clarify or preclude this potentiality.

48. See text accompanying note 74, infra.

49. 16 U.S.C. s. 1432(c).

50. Id., s. 1432(e).

51. Id., s. 1432(f).

52. See text accompanying note 74, infra.

53. 16 U.S.C. s. 1432(g).

54. Id., s. 1432(f).

55. Id., s. 1456. For a comprehensive assessment of the CZMA's federal consistency provisions see M. Blumm and J. Noble, "The Promise of Federal Consistency Under Section 307 of the Coastal Zone Management Act," 6 ENVIRONMENTAL LAW REPORTER 50047 (1976).

56. Id., s. 1433.

57. Id., s. 1434, as amended by Pub. L. 94-62.

58. Hearings on H.R. 8916 before a Subcomm. of the Senate Comm. on Appropriations, 93d Cong., 1st Sess. pt. 2, p. 1639, (1973).

59. Hearings on H.R. 15404 Before a Subcomm. of the Senate Comm. on Appropriations, 93d Cong., 2d Sess., pt. 2, p. 841, (1974).

60. Id., pp. 864-65.

61. Ocean Dumping Oversight Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment and the Subcomm. on Oceanography of the House Comm. on Merchant Marine and Fisheries 93d Cong., 2d Sess., Ser. No. 93-98, p. 280, (1974).

62. Id.

63. Id.

64. Id.

65. Id., p. 282.

66. Hearings on H.R. 5710 and H.R. 6282 Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment and the Subcomm. on Oceanography of the House Comm. on Merchant Marine and Fisheries, 94th Cong., 1st Sess., Ser. No. 94-10, p. 41, (1975).

67. Id., P. 42.

68. Id., p. 44.

69. Hearings Before the Subcomm. on Oceans and Atmosphere of the Senate Committee on Commerce, 94th Cong., 1st Sess., Ser. No. 94-32, p. 44-45, (1974).

70. Id., p. 53.

71. Id.

72. Id., p. 34; House Hearings, supra note 66, p. 34.

73. Id., pp. 53-54.

74. CUNARD S.S. v. MELLON, 262 U.S. 101 (1923).

75. Pub. L. 94-62.

76. Oversight Hearings of the Marine Protection, Research, and Sanctuaries Act of 1972, Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment and the Subcomm. on Oceanography of the House Comm. on Merchant Marine and Fisheries, 94th Cong., 2d Sess., Ser. No. 94-25, p. 200 (1976).

77. Id.

IV. Implementation of the Legislative Response: NOAA Policy and Strategy

Just as significant as the legislative response in establishing the Marine Sanctuaries Program is a consideration of the policies and strategies employed by the National Oceanic and Atmospheric Administration (NOAA) in carrying out the legislative intent. NOAA's policy and strategy is examined in some detail in this chapter so that a clear need can be demonstrated for closing the circle between expressed policy and how the program has actually evolved. In this manner, the potential of the program as expressed in NOAA policy can be better reflected by NOAA action. In addition, this section will focus on existing and nominated marine sanctuaries as a means for evaluating what actions have been accomplished since the program was initiated. Similar programs, including the federal Estuarine Sanctuary Program, state sanctuary-type programs, and international sanctuary-type programs are preliminarily examined to determine how they may be coordinated with the marine sanctuaries program. Finally, this section examines NOAA's effectiveness in implementing existing policies and strategies of the Marine Santuaries Program.

A. Existing Policies and Goals of the Marine Sanctuaries Program

1. Policy Statements

The most recent annual report to Congress on the implementation of Title III of the Marine Protection, Research, and Sanctuaries Act provides perhaps the best starting point for considering current administrative policies in implementing the Marine Sanctuaries Program. In reemphasizing the critical need

for a continued active Marine Sanctuaries Program, this NOAA report states that:

> "[t]rends over the last few years have made the marine sanctuaries program even more important now than in 1972 when the legislation was passed. Recently, the United States has been looking toward the sea and our marine resources with increased appreciation and concern. Examples of this interest are numerous. The 200-mile extended jurisdiction has been passed and negotiations continue on the Law of the Sea. Oil, gas, and ocean mining exploration and production on the Outer Continental Shelf are now, more than ever before, within America's technological grasp. The on-shore impact of these activities is coming under increasing scrutiny, as is the siting of power facilities and deepwater ports. The controversy and rivalry between foreign and domestic fleets, and depletion of our fishing resources have had far-reaching effects."/1

In response to these trends, the Report adds that:

> "[t]he cumulative impacts of these marine oriented events have made it imperative NOAA insure the requisite emphasis is placed on identifying, categorizing, and protecting or utilizing certain resources under the purview of the marine sanctuaries law and regulations."/2

In testimony before Congress in 1976, Robert Knecht, Associate Administrator for Coastal Zone Management expressed the national importance of the Marine Sanctuaries Program by placing it in the context of the increasing pressures on marine resources. Responding to a question posed by Congressman John Murphy, Chairman of the House Subcommittee on Oceanography, as to whether the need for the Marine Sanctuaries Program had increased since its establishment in 1972, Mr. Knecht answered:

> It appears very likely that we are about to extend our control over the economic resources of the oceans that border the United States out to 200 miles. As you know, Congress is well advanced in taking that step. This

> will bring under the purview of the United States a vast amount of additional ocean, and the resources contained therein. Marine mining is under active consideration, and will not only involve manganese nodules, but sand and gravel as well. Third, energy pressures have increased dramatically, and many of them are focused on the shore land.
>
> These together are development-extraction-exploitation activities. It is timely, perhaps even overdue, that we put as much attention on the other side of that equation, that is to begin to set aside areas for conservation, protection, and long-term use for other purposes, such as recreation, research, esthetic enjoyment. As we move to develop our ocean coastal resources, we have to make a similar move to study, select, and designate those areas that need conservation and protection. I think the act is more important today by a long shot than it was in 1972, Mr. Chairman./3

Mr. Knecht also noted that NOAA was aware of the Marine Sanctuaries Program's potential overall role in the management of marine resources:

> We believe the marine sanctuaries title of the Marine Protection, Research and Sanctuaries Act is a significant part of [the Nation's total responsibility to the oceans, since it can] provide for balanced, well-managed, environmentally sound use of the nation's marine resources./4

2. Classifications of Marine Sanctuaries

With the defined programmatic objective of "[p]reserving, restoring or enhancing areas for their conservational, recreational, ecological, research, or esthetic values,"[5] NOAA's regulations implementing Title III of the Marine Protection, Research, and Sanctuaries Act divide marine sanctuaries into five classifications.[6] The regulations also stipulate that multiple uses within each classification are allowed to the extent that they are compatible with the primary purpose(s) for which the sanctuary was established.[7] The five

classification established by the regulations are:

(a) Habitat areas -- These areas are established for "...the preservation, protection, and management of essential or specialized habitats representative of important marine systems."[8] In these areas, Dr. Robert Kifer, former Marine Sanctuaries Coordinator, has explained that the "management emphasis will be on protecting the well-being of the living resources of the area so as to maintain a healthy, continuous, balanced population of the living resources.... In essence, the primary purpose is to protect the habitat and its resources so that desired uses can continue."[9]

(b) Species areas -- These consist of areas designated for "...the conservation of genetic resources."[10] Dr. Kifer emphasizes that "the distinction between a habitat and a species area is that in the latter the focus will be on protecting selected species during part or all of its life cycle. The management emphasis will be on maintaining sufficient genetic resources to insure continued reproduction of a species at a level sufficient to maintain the population in its ecological niche over its present geographic range."[11]

(c) Research areas -- These are areas established for "...scientific research and education in support of management programs carried out for the purpose of the title."[12] In order to better manage the nation's ocean resources, Dr. Kifer states that "information and understanding of the ocean and its multiple resources are needed. A research sanctuary provides the opportunity to learn the natural ecological baselines so as to ascertain the impact of a given management decision."[13] "In general," Dr. Kifer notes, "the areas will be chosen according to the biota they support, to include representative samples of the significant ecosystems in the nation, and according to the history of re-

search carried out in the area as well."[14]

(d) Recreational and esthetic areas -- These areas are designated "... based on their recreational or esthetic values."[15] Dr. Kifer adds that "the central purpose of the marine sanctuary program is to augment the existing parks, national seashores, or their equivalents by insuring that a portion of the seascape is protected to provide an experience equal to that obtained on land."[16]

(e) Unique areas -- These are areas established "...to protect unique or nearly one of a kind geological, oceanographic, or living resource features."[17] According to Dr. Kifer, "the unique object may have historic, cultural, economic, physical, chemical or biological value or use."[18]

3. The Designation Process

The process by which marine sanctuaries are designated is detailed in the implementing regulations. The regulations provide that "the nomination of a given marine area for consideration as a designated marine sanctuary may result from studies carried out by Federal, State, or local officials or from any other interested persons."[19] In other words, the program offers the opportunity for any individual, organization, or governmental body to nomimate an area for consideration as a marine sanctuary. Each nomination is required to contain a general description of the site including the:

(1) purpose for which the nomination is made;
(2) geographic coordinates of the site;
(3) plant and animal life in the area;
(4) geological characteristics of the area; and
(5) present and prospective uses and impacts on the area and resources thereof./20

A nomination for a research area requires certain additional information. This information is to include "a specific scientific justification, a statement of how the research will aid in management decision, and a history of prior research carried out in the area."[21]

After NOAA receives a marine sanctuary nomination, the involved state(s) and other federal agencies are notified of the nomination. These entities are requested to participate in a preliminary review of the feasibility of the nomination. If a preliminary review indicates that designation is feasible, a more in-depth study of the area is made. Moreover, an impact analysis will be prepared "of how the sanctuary will impact on the present and potential uses, and how these uses will impact on the primary purpose for which the sanctuary is being considered."[22]

From the factual information and the impact analysis, a draft environmental impact statement, including proposed regulations, is prepared and made available for public review and comment.

Due to the broad public impact of marine sanctuary designation, public participation is an essential element of the nomination process. Once a nomination has been received, at least three opportunities for public involvement exist:

1. When a nomination has been determined feasible, a press release will be issued by the NOAA announcing the nomination and noting that a draft environmental impact statement is being prepared. Information and ideas are solicited from the public.

2. When the Council on Environmental Quality publishes notice of the draft EIS in the Federal Register, NOAA will simultaneously issue a press statement.

3. a public hearing is required in the area most affected by the nomination. These hearings will be held in the areas most directly affected and are to take place no earlier than 30 days after the public notice./23

Prior to designation of a sanctuary, consultation between affected Federal agencies and the state or states involved is required to provide an opportunity for review and comment on a specific proposed designation (see pp. 38-40 for a more detailed discussion of this consultation process).

Clearly, one of the principal issues involved in the designation process is the identification of those activities the regulations will control and to what extent. Section 302(f) of the MPRSA stipulates that "...necessary and reasonable regulations to control any activities permitted within the designated sanctuary..." be issued after a sanctuary has been designated. (See p. 39 for a further discussion of section 302(f). What is particularly important is that the regulations can be tailored to fit the needs of each individual sanctuary and the various types of activities that will be allowed or prohibited, based upon this need.

B. Existing and Nominated Marine Sanctuaries

1. Existing Sanctuaries

There are presently two designated marine sanctuaries. The site of the wreck of the MONITOR off the coast of North Carolina, was designated as a marine sanctuary on January 30, 1975. The second marine sanctuary, the Key Largo Coral Reef, was designated on December 18, 1975. As discussed in Chapter III (pp. 40-49), no funds for the Marine Sanctuaries Program have been appropriated.

It is significant to note, then, that two sanctuaries have been designated and are being managed without any specifically appropriated funds. The following discussion reviews these sanctuaries and their regulations.

a. MONITOR Marine Sanctuary

Final regulations promulgated for the MONITOR Marine Sanctuary were issued on May 19, 1975.[24] These regulations specifically prohibit activities (hereafter, referred to as prohibited activities) which would adversely affect the sanctuary.[25] The regulations do, however, provide a process where these prohibited activities may be permitted by the Administrator under certain circumstances.[26] Activities approved by the Administrator can only be conducted with "...the condition that any information and/or artifacts obtained in the research shall be made available to the public."[27]

Two permits to conduct research on the MONITOR were denied because the researchers could not ensure reasonable integrity of the site. On June 29, 1976, a permit[28] was finally issued to the Monitor Research and Recovery Foundation, Inc., to conduct scientific research within the MONITOR marine sanctuary.

b. Key Largo Coral Reef Marine Sanctuary

By Proclamation No. 3339[29] and pursuant to the authority vested in the President by Section 12(a) of the Outer Continental Shelf Lands Act,[30] President Eisenhower withdrew the Key Largo Coral Reef from disposition from leasing and established the Key Largo Coral Reef Preserve On March 17, 1960. (See also chapter V of this study concerning the Outer Continental Shelf Lands Act, pp.

89-91). The only other area which has been permanently withdrawn from disposition is the Santa Barbara Ecological Preserve and Buffer Zone in California.[31]

The proclamation establishing the Key Largo Preserve requested the Secretary of the Interior "...to prescribe rules and regulations governing the protection and conservation of the coral and other mineral resources in this area and to cooperate with the State of Florida and its conservation agencies in the preservation of the reef."[32] While the establishment of the preserve ensured that the area would not be leased for mineral exploration, it did not comprehensively assure the reef's protection. Consequently, the area was nominated and subsequently established as the nation's second marine sanctuary. The designation of Key Largo Coral Reef as a marine sanctuary not only established a "living" national monument by declaring that destruction of the reef would no longer be tolerated, but also guaranteed that a portion of the reef would be preserved for scientific study.[33]

The purpose of the sanctuary as expressed in the final environmental impact statement is:

> to protect and conserve the coral and coral reef ecosystems, to regulate uses thereof, to insure the health and well-being of the coral, and associated flora and fauna, and to make available the continual opportunity for the esthetic and recreational enjoyment which healthy reefs afford the American people./34

Interim regulations[35] for the Key Largo Coral Reef Marine Sanctuary were published on January 16, 1976, and final regulations are to be promulgated during the summer of 1977.[36]

The present and future permissible uses of the sanctuary include "recreational boating and fishing, snorkeling and scuba diving, commercial transport, fisheries activities and scientific endeavors."[37] Activities allowed within the sanctuary will be subject to certain rules and regulations designed to provide for maximum public use of the area consistent with the primary purpose for which the sanctuary was established. The regulations[38] also detail the types of activities prohibited within the sanctuary.

Similar to the regulations concerning the MONITOR Marine Sanctuary, the regulations implementing the Key Largo Coral Reef Marine Sanctuary provide that any person or activity may conduct any of the prohibited activities if the "...person or entity is in possession of a valid permit issued by the Administrator of NOAA authorizing the conduct of such activity."[39] As in the case of the MONITOR Marine Sanctuary, a permit for research related to the sanctuary can only be granted if it contains "...the condition that any information obtained in the research shall be made available to the public."[40]

By written cooperative agreement with NOAA, the Key Largo Sanctuary is administered by the Florida Department of Natural Resources (DNR).[41] In essence, the Florida DNR serves as the on-site manager of the sanctuary. DNR is assisted in the administration of the sanctuary by an advisory board. The board consists of representatives of the National Park Service, the U. S. Coast Guard, the Department of Justice, and the National Marine Fisheries Service; the State of Florida's Division of Marine Resources, its Division of Marine Law Enforcement, and its Department of Environmental Regulations; a local citizens association; and an association of dive boat captains.[42]

While the implementation and administration of the rules and regulations governing the sanctuary is the responsibility of the State of Florida's DNR (acting as NOAA's contract manager), the U. S. Coast Guard[43] has the responsibility for surveillance and enforcement of the rules and regulations promulgated for the Key Largo Marine Sanctuary.[44]

2. Nominated Sanctuaries

At present, there are three nominations for marine sanctuaries designation. The first area, the Looe Key Reef in the Florida Keys, was nominated on November 23, 1976, by the Florida Keys Citizens Coalition, primarily for the protection of coral.[45]

Before the Looe Key Reef nomination can receive designation, however, information is needed in order to fulfill the requirements of OCZM's regulations.[46] In this regard, a proposal to inventory the resources of Looe Key Reef has recently been submitted to OCZM by Drs. Arthur H. Weiner and Arnfried Antonius.[47] If this inventory provides the additional information required to satisfy the regulations, the assimilated information will be used in preparing a draft EIS for the proposed designation.

The second area under consideration encompasses the waters and associated flora and fauna of the area known as Cape Lookout Bight and Shoals, off the North Carolina coast. These waters are directly adjacent to the proposed Cape Lookout National Seashore.[48]

The area is being nominated under two of the possible marine sanctuary

classifications: (1) recreational and esthetic, and (2) unique. Present recreational uses of the area include: recreational boating, sailing, snorkeling and skin diving activities, swimming, and fishing.[49] The esthetic and unique aspects of the area are eloquently summarized in the following quotation:

> .....Like a necklace of precious jewels the Outer Banks encircle the coast of North Carolina; a living and dynamic system of sand that stretches precariously seaward into the Atlantic and returns. The Outer Banks are unique unto themselves; however, it is Cape Lookout that is perhaps the most unique. Geologically, no other cape possesses its characteristics, but its uniqueness lies in its other attributes as well. It is an area that speaks to Nature's vissicitudes as well as her dramatic beauty. Quite simply, it is a place where earth, sky, and water are free to meet with few interruptions...../50

One reason for nominating the area is that designation as a marine sanctuary would augment existing recreational environments, i.e., parks and the national seashore, by ensuring that a portion of the seascape would also be protected.[51] According to Dr. Robert Kifer, former Marine Sanctuaries Coordinator, the protection of a portion of the seascape is one of the central purposes of the Marine Sanctuary Program (see p. 59).

The third area presently being considered, the proposed Puget Sound Killer Whale Marine Sanctuary off the coast of the state of Washington, was proposed by Senator Magnuson. As its name implies, one of the fundamental purposes for nominating this area is to provide protection for killer whales.

One of the primary factors influencing Senator's Magnuson's nomination was adverse public reaction to the capture of six killer whales in Puget Sound on March 6, 1976. The whales were captured by an aquarium and display corpora-

tion. Although the corporation held the proper permits issued by the Secretary of Commerce [pursuant to the Marine Mammal Protection Act] for the taking of marine mammals for display purposes, the public demanded the release of the whales.[52] Three of the whales subsequently escaped and the others were released.[53] OCZM is presently preparing a draft EIS on the proposed designation. When completed, the EIS will be available for review and comment by all involved state and federal agencies and interested members of the public.

It should again be noted that the costs of processing these nominations, as well as the operational costs of the existing designations, has been borne by OCZM without the benefit of specifically appropriated funds.

C. Complementary Programs

Complementary programs, particularly the Estuarine Sanctuaries Program established pursuant to Section 315 of the amended Coastal Zone Management Act. (CZMA), can be very important to the overall effectiveness and comprehensiveness of the Marine Sanctuaries Program. This fact is emphasized in the regulations implementing the program, which state that "it is anticipated that the Marine Sanctuaries Program will be conducted in close cooperation with [the Estuarine Sanctuaries Program]."[54]

In a similar manner, the regulations implementing the estuarine sanctuaries program provide that: "[t]he estuarine sanctuaries program will be conducted in close cooperation with the marine sanctuaries program.... It is anticipated that the Secretary (of Commerce) on occasion may establish marine sanctuaries to complement the designation by States of estuarine sanctuaries,

where they may be mutually beneficial."[55]

1. The Estuarine Sanctuaries Program -- Comparison with Marine Sanctuaries

The establishment of both of these programs was authorized in 1972 with the passage of The Coastal Zone Management Act (Estuarine Sanctuaries) and the Marine Protection, Research, and Sanctuaries Act (Marine Sanctuaries). Although they may appear quite similar at first, a closer examination reveals several distinct features. The most obvious distinction is that they were established by two different laws and were established to achieve different goals and purposes. Section 315 of the CZMA authorizes the Secretary of Commerce to make available to coastal states and territories, grants of up to 50% of the cost for the purpose of "acquiring, developing, or operating estuarine sanctuaries."[56] An "estuarine sanctuary" is defined as:

> "a research area, which may include any part or all of an estuary, adjoining transitional areas, and adjacent uplands, constituting to the extent feasible, a natural unit set aside to provide scientists and students the opportunity to examine over a period of time the ecological relationships within the area./57

The implementing regulations stipulate that "the primary use of estuarine sanctuaries shall be for research and educational purposes, especially to provide some of the information essential to coastal zone management decision-making."[58] Present objectives and uses of the estuarine sanctuary program include:

(1) "to gain a thorough understanding of the ecological relationship within the estuarine environment;

(2) to make baseline ecological measurements;

(3) to monitor significant or vital changes in the estuarine environment;

(4) to assess the affects of man's stresses on the ecosystems and to forecast and mitigate possible deterioration from human activities; and

(5) to provide a vehicle for increasing public knowledge and awareness of the complex nature of estuarine systems, their values and benefits to man and nature, and the problems which confront them."/59

Both the legislative history of former section 312 (now section 315) of the CZMA and the estuarine sanctuary guidelines[60] clearly indicate that the intent of the estuarine sanctuary program shall be:

> to preserve representative estuarine areas so that they may provide long-term (virtually permanent) scientific and educational use.... In an era of rapidly degrading estuarine environments, the estuarine sanctuary program will ensure that a representative series of natural areas will be available for scientific or educational uses.... Any use, research or otherwise, which would destroy or detract from the natural system would be inappropriate under this program."/61

In contrast to the basic goals of the Estuarine Sanctuaries Program, which emphasize preserving representative ecosystems for research, the goals of the Marine Sanctuaries Program are more broad-based. The fundamental goal of the Marine Sanctuaries Program is the preservation or restoration of designated areas for their conservation, recreation, and esthetic values, as well as promoting research.[62] Thus, in addition to the obvious differences in geographic scope of the two programs, the primary difference in terms of their goals is that the estuarine program seeks long-term protection of representative ecosystems for research and study, while the marine program seeks the preservation of areas based on their existing and potential values, and the recognition that

the preservation of these values is vital to the integrity of marine resources.

The manner in which the designation process is initiated is also different for the two programs. The process of designating an estuarine sanctuary is initiated by a state's request for a grant to establish a sanctuary. The designation of marine sanctuaries is initiated through NOAA action or nomination from any other individual, organization, state or federal agency. The regulations governing the Estuarine Sanctuary Program state that "[i]t is intended that estuarine sanctuaries not be chosen at random, but should reflect regional differentiation and a variety of ecosystems so as to cover all significant variations."[63] To ensure adequate representation of all estuarine types, a biogeographic classification scheme has been devised for the Estuarine Sanctuary Program. (See Appendix C).

The geographic areas intended to be covered by the two programs are also distinct. Estuarine sanctuaries may be located in estuarine water bodies and adjacent waters, wetlands and uplands to the extent that they constitute a natural ecological unit. Marine sanctuaries may be located in areas of the ocean waters, as far seaward as the outer edge of the Continental Shelf, as defined in the Convention of the Continental Shelf,[64] of other coastal waters where the tide ebbs and flows, or of the Great Lakes and their connecting waters.

The differences in the nature and scope of the two programs necessitate different management practices. Estuarine sanctuaries are owned and managed by the state. Marine sanctuaries, on the other hand, may be managed by the state, by NOAA, or cooperatively through various types of agreements with the

state(s) and other federal agencies (such as in the Key Largo Coral Reef Marine Sanctuary (see pp. 62-65), as well as by private, municipal, institutional, or local entities. Enforcement of the regulations established for the two types of programs requires distinct techniques. Estuarine sanctuaries can rely primarily on land-based monitoring techniques, while marine sanctuaries cannot.

Another key distinction between the programs concern funding. The funding for estuarine sanctuaries is based on a 50/50 match between the federal government and the state for the acquisition, development, and operation of a sanctuary. Funding for marine sanctuaries is entirely federal and includes funds for acquisition, development, and operation. As noted previously, however, no funds have been appropriated for the program to date.

Despite their differences, or perhaps because of them, the Marine Sanctuaries and the Estuarine Sanctuaries Programs can effectively complement each other. Mechanisms for achieving a more complementary overall sanctuary program will be discussed in greater detail in Phase II of this study.

2. Similar State Programs

Several states have programs similar to the federal Marine Sanctuaries Program in that they protect research, recreation, aesthetic, habitat or unique areas. Florida and Massachusetts are two of the prime examples. While the state data base is to be greatly expanded in Phases II and III of this study, there does appear to be a trend among several of the coastal states with respect to sanctuary-type programs. Such states are using these types of programs to ful-

fill the geographic area of particular concern requirements[65] in formulating their coastal management plan. For instance, Florida is employing its aquatic preserves program to help fulfill these requirements.[66] Other states are protecting fish beds and spawning grounds as part of fulfilling the areas of particular concern requirements.[67]

a. Florida

Florida has two programs of importance to the Marine Sanctuaries Program. The first is the John Pennekamp Coral Reef State Park adjacent to Key Largo. The park, designed to protect coral and to provide for underwater recreation, has been coordinated with the Key Largo Coral Reef Marine Sanctuary. (See pp. 62-65). The second program is the state's system of aquatic preserves. An aquatic preserve is defined as "an exceptional area of submerged lands and its associated waters set aside for maintaining essentially in its natural or existing condition."[68] The program recognizes three types of preserves: biological, aesthetic, and scientific. Thirty-one aquatic preserves and their boundaries are included in the Act. As noted above, presently the program is being used in partial fulfillment of the requirements of the state coastal management plan.

b. Massachusetts

Massachusetts has five distinct Ocean Sanctuaries established by five legislative enactments. Each sanctuary has slightly different uses, conditions, and criteria. The state, however, is considering the feasibility of consolidating the five programs into a single sanctuary program. As they presently

exist, the sanctuaries cover the entire coastline out to the three mile limit, with the exception of two narrow lanes around the Greater Boston and Fall River areas. A very important fact about the Massachusetts sanctuaries is that they exert complete authority over the water column and seabed, and preclude the siting of any OCS facilities within the sanctuaries, including pipelines. It is possible, however, that the Massachusetts Energy Facilities Siting Council, which in effect has override authority over all energy siting questions (including override of the state's coastal management program) could allow the siting of OCS related facilities within a sanctuary.

It is significant to note that in addition to seeking ways to better coordinate the existing five state ocean sanctuaries, Massachusetts is beginning to look more carefully at means to coordinate the ocean sanctuaries program with its coastal management program. There also appears to be an active interest on the part of the state in the development of mechanisms to coordinate their ocean sanctuaries programs with the federal Marine Sanctuary Program.[70]

More in-depth analysis of state sanctuary-type programs will take place in Phase II of this study. Specific means by which such state programs are and can be coordinated with both the state's coastal zone management program and the Marine Sanctuary Program will be investigated.

3. International Marine Sanctuary-Type Programs

The international recognition of the need for marine sanctuaries is outlined in Appendix B.

D. Effectiveness/Accomplishments of the Marine Sanctuaries Program

This brief review of NOAA's policy with respect to the Marine Sanctuary Program and the previous section describing Title III of the MPRSA indicates that the program has a significant potential for providing a balance between the various uses of marine resources. In its five years existence, the program has made several accomplishments, notably the designation of two marine sanctuaries -- the MONITOR and Key Largo Coral Reef. While it is true that both of these sanctuaries have been designated and are being managed without funds appropriated to run the program, the question that remains is -- has enough been accomplished? Robert Knecht's response to a similar question by Congressman John M. Murphy, Chairman of the House Subcommittee on Oceanography, provides insight into the answer to the question. Referring to the fact that while Congress had originally authorized 36 million dollars over 4 years for the Marine Sanctuaries Program, Congressman Murphy asked if the program would be more effectively implemented if funds were specifically appropriated for it.[71] In reply, Mr. Knecht stated:

> Yes, I would have to answer that in the affirmative.... The activity we have been able to carry on in the Marine Sanctuaries area has been limited because of the lack of specifically appropriated funds.... I think where the effort has suffered has been in the area of developing a management program framework. Without such a framework, we have not been able to apply the device (the marine sanctuaries program) as aggressively as perhaps the Congress intended, and I feel the problems now require."/72

In discussing the program's future, Mr. Knecht noted that:

> "...we will begin work on the development of a comprehensive programmatic framework for the marine sanctu-

> aries as a whole. Such a framework will be useful in ascertaining the merits of unsolicited nominations as well as directing a federally initiated program."/73

The Center for Natural Areas' on-going study is part of the comprehensive framework that Mr. Knecht refers to. This comprehensive potentially four-phased study can play a large role in helping to ensure that the Marine Sanctuaries Program realizes its potential.

In order to ascertain more clearly the existing need for a federal Marine Sanctuaries Program, however, it is necessary to carefully compare the congressional mandates given to that program with those assigned to other potentially complementary programs, both on the federal and state levels. The following chapter of this study is directed to this assessment.

Footnotes -- Chapter IV

1. United States Department of Commerce "Report to the Congress on Continued Implementation of Title III of the Marine Protection, Research, and Sanctuaries Act of 1972," July 1975 through June 1976, p. 1.

2. Id.

3. Robert Knecht, Associate Administrator for Coastal Zone Management, NOAA, Department of Commerce, in OCEAN DUMPING -- PART 2, JOINT HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, AND THE SUBCOMMITTEE ON OCEANOGRAPHY OF THE HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES, 94th Cong., 2d Sess., Ser. No. 94-25 (1976) p. 200.

4. Id., p. 193.

5. 15 C.F.R., s. 922.2.

6. Id., s. 922.10

7. Id.

8. Id., s. 922.10(a).

9. Robert R Kifer. "NOAA's Marine Sanctuary Program," 2 COASTAL ZONE MANAGEMENT JOURNAL, 179-180, (1975).

10. 15 C.F.R. s. 922.10(b).

11. Kifer, supra note 9.

12. 15 C.F.R. s. 922.10(c)(1).

13. Kifer, supra note 9.

14. Id.

15. 15 C.F.R. s. 922.10(d).

16. Kifer, supra note 9.

17. 15 C.F.R. s. 922.10(a).

18. Kifer, supra note 9.

19. 15 C.F.R. s. 922.20(a).

20. Id., s. 922.20(b)(1)(i)-(v).

21. Id., s. 922.20(b)(2).

22. Id., s. 922.21(c).

23. Kifer, supra note 9, p. 182.

24. 15 C.F.R. s. 924.

25. 15 C.F.R. s. 924.3

The following activities are prohibited within the sanctuary;

(a) anchoring in any manner, stopping, remaining, or drifting without power at any time;
(b) any type of subsurface salvage or recovery operation;
(c) any type of diving, whether by an individual or by a submersible;
(d) lowering below the surface of the water any grappling, suction, conveyor, dredging or wrecking device;
(e) detonation below the surface of the water of any explosive or explosive mechanism;
(f) seabed drilling or coring;
(g) lowering, laying, positioning or raising any type of seabed cable or cable-laying device;
(h) trawling; or
(i) discharging waste material into the water in violation of any Federal statute or regulation.

26. The regulations provide that the prohibited activities (noted in 15 C.F.R. Section 924.3) may be conducted by any person or entity if the activity is either: "(1) for the purpose of research related to the MONITOR, or (2) pertains to salvage or recovery operations in connection with an air or marine casualty" and the "...person or entity is in possession of a valid permit issued by the Administrator authorizing the conduct of such activity." In addition, the regulations recognize that in certain emergency situations, there may not be time to secure a permit. Thus, the regulations provide that "...no permit is required for the conduct of any activity immediately and urgently necessary for the protection of life, property, or the environment."

27. 15 C.F.R. s. 924.6(e).

28. As required by the regulations [15 C.F.R. s. 924.6(d)], OCZM has sought the advice and comments of the Advisory Council on Historic Preservation (hereafter, Advisory Council). Since the Advisory Council felt that the

issuance of the permit would cause adverse impacts on the MONITOR, OCZM and the Advisory Council have worked out a "Memorandum of Agreement" (August 25, 1976) to mitigage these impacts. The agreements contain the stipulation that "(t)he Office of Coastal Zone Management will consult with Advisory Council on Historic Preservation pursuant to 36 C.F.R., Part 800, prior to a final decision on the disposition and proposed treatment of any artifacts that may be retrieved as a result of the activities of the expedition." Both parties feel that this agreement would "satisfactorily mitigate any adverse effects on the [MONITOR]."

29. Proclamation No. 3339, 25 FED. REG. 2352, (1960).

30. 43 U.S.C. s. 1331-1343.

31. Public Land Order, #45-87, 34 FED. REG. 5655 (1969).

32. Proclamation No. 3339, 25 FED. REG. 2352 (1960).

33. United States Department of Commerce, "Report to Congress on the Continued Implementation of Title III of the Marine Protection, Research and Sanctuaries Act of 1972," July 1975 through June 1976, p. 2.

34. FEIS, KEY LARGO CORAL REEF MARINE SANCTUARY, p. 7, (1976).

35. 15 C.F.R., s. 929 (1976).

36. Conversation with Commander Phillip C. Johnson, OCZM, (March 3, 1977).

37. 15 C.F.R. s. 929.4.

38. Id., s. 929.4(a)-(k). Prohibited activities include, but are not limited to:

> Removal or destruction of natural features and marine life;
> discharge of refuse and polluting substances;
> dredging, filling, excavating and building activities;
> destruction, defacement, removal, etc. of archaeological and historic substances;
> defacement, displacement, removal, etc., of markers;
> certain specified activities relating to fishing;
> disturbing of coral, etc., while scuba diving and skin diving;
> certain specified activities associated with the operation of motor craft;
> certain specified activities related to photography;
> prohibition of advertising or publicity; and
> use or possession of explosives and dangerous weapons.

39. 15 C.F.R. s. 929.6. Additionally, the regulations recognize that in certain emergency situations, there may not be time for a permit. Thus, the regulations provide that "...no permit is required for the conduct of any activity immediately and urgently necessary for the protection of life, property, or the environment."

40. Id., s. 929.7(e).

41. Cooperative Agreement No. 04-6-158-44116 for the "Management of the Key Largo Coral Reef Marine Sanctuary, between the U. S. Department of Commerce, NOAA, and the Florida Department of Natural Resources." Agreement runs from July 1, 1976 to June 30, 1977.

42. FEIS, KEY LARGO CORAL REEF MARINE SANCTUARY, p. 7, (1976).

43. 14 U.S.C. s. 89, gives the Coast Guard general authority to "...make inquiries, examinations, inspections, searches, seizures and arrests upon the high seas and waters over which the United States has jurisdiction, for the prevention, detection, and suppression of violations of the laws of the United States."

44. FEIS, KEY LARGO CORAL REEF MARINE SANCTUARY, p. 19, (1976).

45. A. Weiner, Ph. D. and A. Antonius, Ph. D., LOOE KEY REEF RESOURCE INVENTORY, March 8, 1977. (Submitted to OCZM as part of the nomination of Looe Key Reef as a marine sanctuary), p. 2. The need to protect coral reefs has been recently expressed in several reports discussing the deteriorating environmental conditions and direct man-induced damage to coral reef communities. Most notable of these reports are: A. Antonius, "Coral Mortality in Reefs: A Problem for Science and Management, PROCEEDINGS THIRD INTERNATIONAL SYMPOSIUM ON CORAL REEFS (In Press); Id., FINAL REPORT ON THE CORAL REEF GROUP OF THE FLORIDA KEYS PROJECT FOR YEAR 1973; Fort Pierce, Florida: Harbor Branch Foundation (1974). G. M. Griffen and A. Antonius, "Turbidity and Coral Reef Health in Waters of Pennekamp Park, Upper Keys;" 37 THE FLORIDA SCIENTIST, QUARTERLY JOURNAL of The Florida Academy of Science 15 (1974); R. J. Johannes, CORAL REEFS AND POLLUTION: FAO Technical Conference on Marine Pollution, Rome, Italy, (1970); G. L. Voss, "Sickness and Death in Florida's Coral Reefs," 82 NATURAL HISTORY 40-47 (1973).

46. 15 C.F.R. s. 922.20 (b).

47. A. Weiner, supra note 45. The budget for the proposal is $6,000. Commander Phillip C. Johnson, the Marine Sanctuaries Coordinator, OCZM, said that he expected the money to be funded, March 24, 1977.

48. Information concerning the nomination of Cape Lookout Marine Sanctuary sent to Commander Phillip C. Johnson, Marine Sanctuaries Coordinator, OCZM, from the North Carolina Office of Marine Affairs, June 21, 1976.

Note: While Cape Lookout is still a viable nomination, OCZM has received word from the North Carolina Marine Affairs Office that the status of the nomination is dormant until the change in administration is completed. (Handwritten memorandum by Commander Phillip Johnson regarding a call from Roger Pratt of the N.C. Marine Affairs Office, February 8, 1977.)

49. Id.

50. Id.

51. Id.

52. Congressional Research Science, Library of Congress, CONGRESS AND THE NATION'S ENVIRONMENT, pp. 1220-1221, (1977).

53. Id.

54. 15 C.F.R. s. 922.1(c).

55. Id., s. 921.6(b).

56. CZMA, s. 315(1).

57. 15 C.F.R. s. 921.2(a).

58. Id., s. 921.3(a).

59. Id., s. 921.3(a)(1)-(5).

60. Id., s. 921.

61. NOAA Comments on Estuarine Sanctuary Guidelines, 39 FED. REG. 19922, June 6, 1974.

62. MPRSA, s. 302(a). The implementing regulations added research to the purposes for which a sanctuary can be established. [15 C.F.R. s. 922.11(b)].

63. 15 C.F.R. s. 921.4(a).

64. 15 U.S.T. 74, TIAS 5578.

65. See 15 C.F.R. ss. 920.13 and 923.13.

66. Conversation with William Millhouser, Assistant Regional Coordinator, Gulf Region, OCZM, March 4, 1977.

67. Conversations with John Tolson, Assistant Regional Coordinator, Great Lakes Region, OCZM, March 4, 1977.

68. FLORIDA STATUTES, Section 258.37(1), (1975).

69. Conversation with Mark Kaufmann, Massachusetts Coastal Zone Management Program, March 3, 1977.

70. Id.

71. Robert Knecht, Associate Administrator for Coastal Zone Management, NOAA, Department of Commerce, in OCEAN DUMPING--PART 2, JOINT HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT AND THE SUBCOMMITTEE ON OCEANOGRAPHY OF THE HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES, 94th Congress, 2d Sess., Ser. No. 94-25 (1976), p. 202.

72. Id.

73. Id., pp. 194-95.

V. The Federal/State Role in Managing Marine Resources

As has previously been discussed in chapter III, the federal government has assumed an ever-increasing role in managing and protecting natural resources. State governments, local governments, international bodies, and even private citizens and citizens groups are also taking broader actions to protect natural resources. For the most part, however, this increasing involvement is embodied in legislation or programs to conserve a specific resource or value, or to regulate a particular activity. This focus on narrow issues and the overlapping of state, federal, and international jurisdiction, has resulted in the inconsistent, compartmentalized, uncoordinated management of natural resources.

The near and offshore environment that falls within the scope of the Marine Sanctuaries Program is particularly subject to a fragmented matrix of regulation and protection from a variety of federal and state agencies, under a variety of statutes and international treaties. Since existing programs already provide varying degrees of protection and regulation of the marine environment, however, it is important in assessing the need for an expanded Marine Sanctuaries Program to know the scope of these existing programs, and to determine if they, singly or together, meet the goals of the Marine Sanctuaries Program. Moreover, we must know how or if they might complement or conflict with an expanded Marine Sanctuaries Program.

A. Jurisdictional Extent of Other Federal Programs

Of the expanding list of federal environmental and conservation programs. many exert an impact on the areas within the scope of marine sanctuaries juris-

diction. Because of the intermittent manner in which these programs developed, and because many of them are primarily land-oriented, the complete picture of federal jurisdiction over activities and resources in and affecting the marine environment is a complicated one. Programs overlap, conflict, and even, in some cases, fail to include a particular area of jurisdiction. The following discussion outlines the scope of other federal programs that overlap or complement the Marine Sanctuary Program, and indicates how successfully these other programs might meet the goals established for marine sanctuaries.

1. Federal Resource Management Programs

Marine sanctuaries are established to preserve or restore ocean waters for their conservation, recreational, ecological or esthetic values. The marine santuaries' regulations address these purposes by providing for the establishment of marine sanctuaries as habitat areas, species areas, research areas, recreational and esthetic areas, and unique areas (see pp. 57-59). Numerous other federal programs, however, already achieve similar purposes in coastal or offshore areas.

a. Species Protection/Management Programs

The protection of threatened species in the marine environment is the object of federal programs authorized by the Endangered Species Act,[1] the Marine Mammal Protection Act,[2] and the Fishery Conservation and Management Act.[3] Under the Endangered Species Act, the Department of the Interior (Fish and Wildlife Service) and the Department of Commerce (National Marine Fisheries Service) extend protection to designated endangered and threatened species of animals and

plants. The Secretaries have the authority not only to limit the "taking" of species, but also to protect critical habitat. Moreover, other federal agencies are required to take all actions necessary to ensure that their activities, including the granting of permits, do not jeopardize the survival of endangered or threatened species or their critical habitat.

The Marine Mammal Protection Act, also administered by both the Departments of Interior and Commerce, extends protection to species or stocks of marine mammals even before they reach an endangered status. However, the integrity of the species is not the only factor considered in their protection -- the "conservation, development, and utilization of fishery resources"[4] is also a criterion in prescribing regulations. Consequently, as has happened with respect to the porpoises being caught in yellow-fin tuna fishing operations, certain numbers of marine mammals may, depending upon the outcome of this controversy in the courts and before the Congress, be permitted to be killed in the interest of protecting the fishing industry.

The Fishery Conservation and Management Act of 1976, in addition to extending U. S. management authority over most living marine resources to 200 nautical miles, requires the setting of optimal quotas for fish catches, gives U. S. fishermen first priority in harvesting stocks, and provides strict protection for species that are or fall below optimal levels. Fishery management plans, set by regional councils or by the Secretary of Commerce (through the National Marine Fisheries Service), may designate zones where fishing is limited or prohibited, establish limitations on the catch or fish where necessary for the management or conservation of the fishery, set regulations concerning the

use or nonuse of certain types of boats and equipment, and prescribe other measures necessary for the management and conservation of the fishery.

Although there has been criticism of the way this legislation is being initially implemented (primarily because some observers believe undue consideration is being given to foreign fishing interests), the Act does provide a mechanism to protect fish species within the 200-mile fishery conservation zone. However, the Act's focus on conserving and managing the fishery resources is different and narrower than the protection available under the Marine Sanctuaries Program. The latter program is specifically designed to provide broad-based management for conservation and preservation purposes. The Fisheries Act, in contrast, provides only for the conservation of certain marine resources to achieve its overriding goal of assuring optimum yield and efficiency in the utilization of fishery resources,[5] (but see p. 90, concerning the effect of this Act on the Secretary of Interior's authority under the Outer Continental Shelf Lands Act).

One additional aspect of the Fisheries Conservation and Management Act is of particular significance to the Marine Sanctuaries Program -- namely, the fact that the Act was passed before, albeit in anticipation of an international agreement on a 200-mile economic resource zone. By this unilateral action Congress, while still recognizing and dealing with the international implications, demonstrated a marked turnabout from the deference it, especially the Senate, paid to international jurisdiction in debating the Marine Sanctuaries Title of the Marine Protection, Research and Sanctuaries Act of 1972 (see p. 35).

The protection provided to marine species under the Fisheries Conservation, Marine Mammal Protection, and Endangered Species Acts, while substantial, still does not offer the protection available by a marine sanctuary. A marine sanctuary is not limited by commercial considerations as are the fishery and marine mammal programs, and need not delay its protection until a species is endangered or threatened. Moreover, a marine sanctuary, while limited in area in a way these other programs are not, can be established specifically to protect species by preserving important or unique habitats for purely non-commercial reasons. Although the endangered species legislation can also protect critical habitat, it can do so only for endangered or threatened species.

B. Land Management Programs

Federal involvement in the conservation and management of natural resources includes several programs to acquire and manage land for conservation and preservation purposes. Most notable among these programs are those involving lands within the National Park System, the Wilderness Preservation System, the National Wildlife Refuge System, and the Estuarine Sanctuaries Program.

The National Park Service administers areas under its jurisdiction for the dual purposes of recreation and preservation. Park Service areas are generally land areas and, while the system does include National Seashores and coastal and lakeshore units, even these units are oriented toward shore activities. In a few instances, however, such as the Virgin Islands National Park, Park Service areas do include offshore areas, usually of interest for their coral formations.

Areas within the Wilderness Preservation System are managed so as to pre-

serve primitive, unspoiled land areas in their natural state -- preservation of land for its own sake. No exclusively marine areas have as yet been designated as wilderness areas, although islands, keys, and some associated submerged lands and waters have been so designated. Although it does not appear that Congress contemplated the inclusion of submerged areas within the system, their inclusion is not prohibited and, in fact, could fall within the wilderness definition. It is not clear, however, whether wilderness designation, or for that matter any action under federal public land laws, is appropriate on outer continental shelf lands.[6]

Both National Park and Wilderness designation would seem, therefore, to offer a means of protecting and managing certain marine areas. However, neither program can provide anything like the protection available under the Marine Sanctuaries Program. With respect to flexibility in designating an area, a marine sanctuary can be designated after an administrative approval procedure involving the Secretary of Commerce and the President and the Governor of any state involved. National Park System units and Wilderness Areas, in contrast, require Congressional approval, although for some types of National Park units a Presidential Proclamation is sufficient. Wilderness areas are further limited because they can only be created out of existing federal lands, and because mining is generally not prohibited. The Marine Sanctuaries Program also has the advantage of a much clearer mandate to act to protect marine resources.

The Fish and Wildlife Service manages the National Wildlife Refuge System primarily to protect and provide habitat for wildlife, expecially migratory birds and endangered species. The Secretary of the Interior can designate additional

refuges out of the public domain or acquire further lands for the system. Once designated, each refuge is managed in a manner tailored to the species and habitat being protected, with wide discretion given to the Fish and Wildlife Service to regulate activities. Yet, despite this capability of providing broad protection, the orientation of the Refuge System is distinctly wildlife as opposed to fish, and land/shore as opposed to offshore. Thus, the Wildlife Refuge Program can complement but not substitute for the Marine Sanctuaries Program.

The Estuarine Sanctuaries Program, administered by the Secretary of Commerce through the Office of Coastal Zone Management, is a fourth program which can assist in the protection of marine resources through "land" acquisition and management. However, as discussed in more detail on pages 68-71, the Estuarine Sanctuaries Program and the Marine Sanctuaries Program differ in their geographical scope, their goals, the availability of funding for the programs, their manner of designation, and the agencies managing the day-to-day operation of the designated sanctuary.

In conclusion, it appears that, among federal land management programs which protect land and possibly marine resources, there is no program that can provide the broad scope, the flexibility, and uncompromised and unconflicting purposes of the Marine Sanctuaries Program.

C. Federal Land Use Planning Programs

The Coastal Zone Management Act of 1972[7] established a grants-in-aid program for state land use planning for the coastal zone. Under the supervision of the Office of Coastal Zone Management, the states are encouraged to establish

management programs for the use of land and water in coastal areas which extend landward from the shoreline to the extent necessary to control shorelands, and seaward to the limit of the territorial sea. State coastal zone management programs will not have the geographical breadth of the Marine Sanctuaries Program, and although they are required to address the management of marine resources, they cannot be viewed as viable substitutes for a Marine Sanctuaries Program. But, as the focus of all state and federal programs affecting the coastal zone (since federal agencies must ensure consistency with state management plans), the state coastal zone management plans will be an important and perhaps the primary tool to coordinate all marine-resource-oriented programs, as well as to control on-shore activities that have an impact on marine resources.

2. Federal Regulatory Programs

Essential to the preservation of any area for a special purpose is the authority to prescribe regulations to control activities within that area. Such regulatory control is provided for in the Marine Sanctuaries Program. The following analysis focuses on whether that control is necessary to meet the goals of the Marine Sanctuaries Program, since many activities in, on, and under the oceans are already ostensibly regulated by federal agencies.

a. Outer Continental Shelf Mineral Leasing

Mineral leasing on the outer continental shelf beyond territorial waters is regulated by the Secretary of the Interior through the Bureau of Land Management under the terms of the Outer Continental Shelf Lands Act of 1953[8] and its implementing regulations.[9] Under this act, the Secretary can prescribe regula-

tions for the conservation of the natural resources of the outer continental shelf. One judicial interpretation of this authority is that the Secretary can issue regulations for the conservation of all natural resources of the outer continental shelf -- marine life, recreation, aesthetics, as well as mineral resources;[10] however, in light of the Act's overwhelming focus on mineral leasing and the subsoil and seabed, another possible interpretation is that the Secretary's authority extends only to the regulation of non-living resources. Moreover, since the Fisheries Conservation and Management Act (see page 84) vests authority over fisheries resources, including corals, on the outer continental shelf in the Secretary of Commerce, it may be that this legislation has preempted whatever authority the Secretary of the Interior had over these resources.

Under the OCS Lands Act, the Secretary of the Interior can suspend drilling operations under existing leases "whenever he determines that the risk to the marine environment outweighs the immediate national interest in exploring and drilling for oil and gas."[11] But of greater importance with respect to marine sanctuaries-like protection is the Secretary's authority to exempt outer continental shelf lands from mineral leasing. Two procedures are available. The President may permanently withdraw areas from leasing,[12] as was the case with the Key Largo Coral Reef Preserve and the Santa Barbara Ecological Preserve and Buffer Zone. There are, however, no regulations or guidelines for these withdrawals; thus, while they are permanent, they are created only on an ad hoc basis. After such withdrawal, the Secretary can issue regulations controlling activities in these areas. In the case of the Key Largo Coral Reef Preserve,

now designated as a marine sanctuary, the regulations were essentially the same as those of the adjacent John Pennekamp Coral Reef Park administered by the State of Florida. Regulations for the Santa Barbara area, however, are limited to non-leasing of oil and gas drilling rights, indicating the discretion available in establishing such regulations. Alternatively, the Secretary can delete certain areas from outer continental shelf leasing sales for lack of information, or for esthetic, environmental, geological or other reasons.[13] These "withdrawals," however, are not permanent.

Thus, while there is probably authority to withdraw and protect outer continental shelf areas from mineral leasing and environmental degradation, this authority is exercised on an ad hoc basis, is not always permanent, and is not tied to a comprehensive review program to assess what areas would be best for withdrawal. In addition, this authority only applies to outer continental shelf lands more than three miles offshore, since the states have jurisdiction within the three-mile limit. The Marine Sanctuaries Program not only has broader jurisdiction than that given the Secretary of the Interior under the Outer Continental Shelf Lands Act, but, even more importantly, has a greater mandate to protect marine resources.

b. Pollution of Ocean Waters

(i) Ocean Discharges

The control of discharges into ocean waters is regulated in part through the National Pollutant Discharge Elimination System (NPDES)[14] through ocean discharge criteria established under s. 403 of the Federal Water Pollution Control

Act.[15] This program, administered by the Environmental Protection Agency (EPA), in cooperation with the states, requires all distinct sources of discharges into navigable water to obtain a permit from EPA or the state if its program has been approved by EPA. Thus, all point sources of pollution, including vessels, but excluding discharges of oil into the waters of the contiguous zone which are regulated under the 1961 Oil Pollution Act,[16] are required to obtain permits which require conformance with EPA-determined national guidelines. For ocean discharges, no permit may be issued where there is insufficient information upon which to make a reasonable determination about the impact of a proposed discharge on the marine environment.[17] In light of the data gaps on the impact of pollutants on marine ecology, many discharges may not be permitted.

With respect to those NPDES programs administered by the states, which include permits for marine discharges, states can have standards stricter than the federal guidelines. The state programs, however, extend only to the three-mile limit of state jurisdiction in marine waters, and are always subject to EPA review and withdrawal of approval. Beyond three miles, with respect to the discharge of oil and hazardous substances[18] and sewerage from vessels,[19] EPA has full regulatory authority.

The regulation of discharges into ocean waters, then, is achieved through a comprehensive program that does consider the effect of pollutants on the integrity of the ocean ecosystem. In attempting to achieve broad environmental goals, however, this program has sacrificed the flexibility to deal differently with special circumstances -- a flexibility that is a key factor of the Marine

Sanctuaries Program.

(ii) Ocean Dumping

Ocean dumping is subject to a combined regulatory scheme under the provisions of Title I of the Marine Protection, Research and Sanctuaries Act.[20] The Environmental Protection Agency is the permit agency for the transportation of all non-dredged materials for the purposes of ocean dumping. For dredged materials, the Army Corps of Engineers grants permits according to criteria established by EPA, which can veto any Corps permit approval. The Coast Guard has the surveillance responsibility for all ocean dumping.

Overall, this system regulates ocean dumping, but on an ad hoc basis -- it can only react to permit applications. Radiological,chemical and biological warfare agents and high-level radioactive wastes are not eligible for permits, but otherwise the ocean dumping program essentially represents a license to pollute. The offensiveness of this "licensed pollution" depends on the criteria upon which the permits are granted. In establishing criteria for reviewing ocean dumping applications, the integrity of the marine ecosystem is considered, but along with other economic and human health and welfare factors that offset the importance of ocean resource protection.[21] A recent General Accounting Office Report[22] on the problems of regulating ocean dumping states that EPA regulations are not adequate to protect the marine environment, because dumped sewage sludge often exceeds safety levels for mercury and cadmium. EPA officials conceded that such dumping may degrade the environment, but they feel that dumping of municipal sewage sludge must continue until alternative disposal methods

are found.[23] Even though EPA recently strengthened its regulations, the problems with the standards and with their monitoring will limit the effectiveness of the ocean dumping to protect marine resources. The program will continue to allow dumping and the degradation of the marine environment. The best that can be expected is that such degradation be kept to a minimum.

(iii) Protection of Navigation

The U. S. Army Corps of Engineers has the responsibility for maintaining the free navigability of the nation's waterways. Included within this responsibility is authority over the dredging[24] and disposal of dredged materials[25] in navigable waters, and the creation of any obstructions to navigation in navigable waters.[26] It is evident from the Corps' combined regulations for these activities[27] that the Corps, in its permit program, does not share the same concerns as those of the Marine Sanctuaries Program. Although environmental impacts are considered by the Corps in reviewing permit applications, economic, navigation, and public need and welfare factors are also considered in the final balancing process. By balancing marine resource values against these other considerations, the protection of the marine environment receives less than the full emphasis provided within the Marine Sanctuaries Program.

Moreover, since it is based on a permit system, the Corps program is merely reactive. Without tying the permit program to a comprehensive planning process, the Corps is limited in the affirmative measures it can take to decide the best place or the best way to conduct an activity within its permit jurisdiction.

As the system now operates, a proposed activity need not be designed in

the most environmentally sound manner, but only in a manner that is not unacceptable. The result is less than optimal environmental decision-making.

(iv) Shipping

Shipping in the coastal and offshore waters of the United States is regulated by the Coast Guard under the Ports and Waterways Safety Act of 1972.[28] As part of this regulation, the Coast Guard can act to protect navigation and environmental quality by establishing vessel traffic systems, requiring certain safety equipment, and setting procedures for handling dangerous cargo and for operating in hazardous areas. In addition, the Coast Guard is authorized to establish minimum design and safety standards for oil tankers and ships carrying hazardous substances -- for new and existing vessels, both domestic and foreign.

Despite this authority, the Coast Guard has been slow to enforce these provisions. According to a statement by Senator Kennedy at a recent hearing on oil tanker mishaps:

> The discretionary authority that was granted to the executive agencies under the Ports and Waterways Safety Act of 1972 has been abused. Delay, timidity, and bureaucratic lethargy characterize the past five years of that law's history./29

Not only is the promulgation of standards and regulations at the discretion of the Coast Guard, but the authorizing Act provides several exceptions to the application of the standards. Moreover, the Coast Guard, influenced by the State Department, maintains that acting unilaterally to regulate international vessel design standards would weaken the U. S. position in international negotiations.[30] Thus, despite its authority to control vessel movements and design features, the

Coast Guard does not appear to be doing all it could to regulate shipping in the interest of protecting navigation and environmental quality.

c. Special Ocean Uses

(i) Deepwater Ports

The regulation of deepwater ports, currently being considered to avoid some of the hazards of onshore oil delivery while at the same time accommodating the larger oil tankers, is completely within the jurisdiction of the Department of Transportation (Coast Guard) if the port is located more than three miles out to sea. Although individual permits from other federal agencies would normally be required for an activity such as the construction and operation of a deepwater port, the Deepwater Port Act[31] provides for a streamlined administrative review procedure resulting in one coordinated application for all required federal authorizations. Although the Secretary of Transportation is responsible for developing regulations to govern the expedited environmental and safety review process, the Environmental Protection Agency may veto the application if it determines that the application would conflict with the standards established pursuant to the Clean Air and Water and Ocean Dumping Acts. In addition, the governor of adjacent coastal states may veto the application for, inter alia, conflicts with state environmental protection standards, land/water uses regulations, or its coastal zone management program.

In territorial and inland waters, however, the states have primary jurisdiction. Although state regulation would still be subject to Army Corps of Engineers approval of obstructions to navigation, neither the Corps of Engineers

nor the states are under any obligation to conform to the construction and operating regulations promulgated by the Department of Transportation under the Deepwater Port Act. Thus, in state waters, the federal standards specifically designed to regulate deepwater ports in the national interest, need not be met.

(ii) Offshore Power Plants

The regulation of offshore power plants, such as the floating nuclear power plant currently being considered for the coast of New Jersey, is subject to a federal/state bifurcation of jurisdiction similar to that described above for deepwater ports. However, unlike for deepwater ports, there is no central federal agency will full responsibility over offshore power plants outside state waters. The construction and operation of a floating nuclear power plant, for example, would probably require approval by, among others, a state (if within the three-mile limit), the Army Corps of Engineers (for the building of a structure in navigable water), the Environmental Protection Agency (for discharges into navigable water), and the Nuclear Regulatory Commission (for the construction and operation of a nuclear power plant). All these agencies would grant or deny their approval based upon different standards, none of which has as its primary concern the protection of marine resources.

d. The Ability of Federal Regulatory Programs to Protect Marine Resources

The preceding discussion has outlined the major federal programs with authority to protect marine resources. It is clear that these programs do not singly, or in combination, achieve the purposes expressed in the Marine Sanc-

tuaries Title of the Marine Protection, Research, and Sanctuaries Act: to preserve or restore designated areas for their conservation, recreational, ecological, or esthetic values.[32] These regulatory programs do provide a mechanism for controlling activities potentially harmful to ocean resources and values but, since the programs were established to meet different purposes, the standards used in implementing the programs do not give the conservation of ocean resources the priority available in the Marine Sanctuaries Program. Furthermore, the differing standards among the various programs make coordination and consistency real problems if an attempt were made to integrate these existing programs into a mechanism to protect ocean resources outside the Marine Sanctuaries Program. A comprehensive program implemented under a single set of minimum criteria, with fine-tuning for individual marine sanctuaries, would be likely to more simply and efficiently meet these needs.

In addition, of these regulatory programs, only the OCS leasing program contains provisions to protect specific areas from activities that might degrade ocean resources. But this protection is limited because it only applies beyond the three-mile limit, is not always permanent, and is not incorporated into a comprehensive effort to protect ocean resources. And while the Secretary of the Interior has the authority under this program to issue regulations for the conservation of most natural resources of the outer continental shelf, under the Fisheries Conservation and Management Act (see pages 84 and 85) the Secretary of Commerce has responsibility over continental shelf fisheries resources including corals. Moreover, the Secretary of the Interior has conflicting considerations in the use of this authority, so that his mandate for and interest

in regulating for the protection of marine resources will be less than that under the Marine Sanctuaries Program.

B. Comprehensiveness of Existing State Programs

Because they hold substantial authority over land use, as well as over the use of the oceans and underlying land to the three-mile limit, the states have a significant role to play in the management of marine resources. And, while the federal government can or does preempt state jurisdiction in certain fields (e.g., the protection of navigation), the federal government has generally allowed the states to share regulatory control, although usually subject to federal guidelines.

State regulation and management of marine resources, however, is subject to certain inherent limitations. First, state jurisdiction ends abruptly at a state's borders, including the seaward boundary of three miles. To manage marine resources that do not respect political boundaries, an effective program must possess the broadest possible geographical area. The Marine Sanctuaries Program encompasses this broad scope (as broad as federal jurisdiction extends), although in the state-regulated territorial waters a marine sanctuaries designation is subject to state veto. Second, individually devised state programs will inevitably differ, providing differing standards, differing protection, and difficulties in coordinating the programs. Third, states will often lack the momentum occasionally found at the federal level to implement an environmental protection program. The more parochial nature of state viewpoints and the comparative shortage of funds at the state level could result in a reduced

motivation on the part of a state in acting to protect marine resources, particularly when the benefits, but not the costs, are shared by other states.

Although a complete inventory of current state marine sanctuary-like programs has not yet been completed by the Center for Natural Areas, it seems clear that the divergency in state programs is immense. Some states, such as Connecticut and New York, have no programs analogous to the Marine Sanctuaries Program. Other states have limited programs, such as Rhode Island's program to protect fishlands. Still other states, like Massachusetts and Florida, possess a comprehensive marine sanctuaries-type program. (See a discussion of some of the programs on pp. 71-73). Perhaps the most significant conclusion that can be presently drawn from these state programs is that states are attempting to incorporate their marine sanctuaries-like efforts within the structure of their coastal zone management programs.

The coastal zone management program is a good example of other state, federal/state, and even private programs that overlap or complement the Marine Sanctuaries Program. All states, pursuant to their authority over land and water, have programs for the regulation and management of particular resources. However, these programs, dealing with such areas as wetlands, fish and game, and recreation, are usually land-oriented, and usually fail to fully recognize that these individual programs deal with an integrated system which is best managed in a comprehensive manner.

Numerous federal/state cooperative programs, such as the estuarine sanctuaries, the endangered species, and the marine mammal protection programs, as

well as the National Pollutant Discharge Elimination System Permit Program, also affect the management of marine resources. In addition, federal money from the Land and Water Conservation Fund (which comes in part from the leasing of outer continental shelf lands) is available to the states for the protection of natural resources, including coastal and estuarine areas, as part of outdoor recreation projects. Funds from the Fish and Wildlife Restoration Program are also available to the states for the acquisition of fish and game lands and water areas.

State and federal authority over marine resources also overlap in the territorial sea -- from the shoreline to three miles seaward. The state has substantial jurisdiction here, but is subject to overriding federal authority. Thus, within this three-mile zone, the states regulate such activity as offshore mineral development and, in conjunction with the Army Corps of Engineers, the siting and regulation of such structures as deepwater ports and offshore power plants.

State programs, then, can -- and, to varying degrees, do -- play a significant role in the regulation and management of ocean resources. While their limited jurisdiction, funding, and frequent lack of motivation make them no substitute for the federal Marine Sanctuaries Program, especially since the states have limited control over federal activities, the state programs will provide an important complement to marine sanctuaries protection. Moreover, in light of the veto power of involved states over the designation of marine sanctuaries in their territorial waters, cooperation with the states is even more important.

C. Trends in Ocean Management

The purpose of the following discussion is to mention some of the considerations that are likely to become major new factors in formulating future ocean policy. (These considerations will be expanded on during Phase II.) Notable among these are the pending issues at the United Nations Law of the Sea Conference, the recent expansion of fisheries jurisdiction, and anticipated efforts to control deep seabed mining. Although these topic areas are still in their formative stages, it is not too early to anticipate what form policy in these areas may take, and how those forms might affect a marine sanctuary program.

At the present time, there is little effort on an international level to establish a program to protect marine resources. The 1972 United Nations Conference on the Human Environment considered this issue, but in the end could only make several recommendations encouraging the protection of marine resources through the prevention of ocean pollution, the protection of species inhabiting international waters, the preservation of areas of international significance, and the preservation of genetic resources (see Appendix B).

While no international program to protect marine resources is readily foreseeable, there are international negotiations underway that may substantially modify national jurisdiction over ocean resources. The United Nations Law of the Sea Conference is conducting negotiations on the sensitive issues of the exploitation of seabed resources, the extent of coastal national jurisdiction of coastal waters, the protection of the marine environment from land-

based activities, and the regulation of vessel operations, including vessel pollution. Although no final agreements have been reached, it is possible that the Conference will accept the concepts of a 12-mile territorial sea and a 200-mile economic zone within which a coastal nation has jurisdiction over fishing and other resource exploitation.

With respect to controlling pollution, the extension of coastal nation jurisdiction could be quite important in giving nations greater power to control vessel pollution. In addition, the present authority over the contiguous zone to control infringement of sanitary regulations could be interpreted as being applicable to the control of pollution as well, thereby giving coastal nations power to regulate the seaworthiness and the pollution-control equipment of incoming vessels.

The thorniest problem at the Law of the Sea Conference may be deep seabed mining. While there is general agreement on the need for an international body to set and enforce environmental standards for deep seabed mining, there is widespread disagreement about the ownership of exploration and exploitation rights. Nations with the present capability of developing these resources want a scheme under which they can extract the minerals immediately. Developing nations, on the other hand, are arguing for development by an international authority for the benefit of all.

In the face of impasse at the Law of the Sea Conference, the United States has or may soon take unilateral action with respect to some of the important issues being negotiated. The Fishery Conservation and Management Act of 1976

is a Congressional assertion of United States jurisdiction over coastal fisheries to a distance of 200 nautical miles. Congress recognized and made provision for the needs of foreign fishing fleets, and recognized the possibility of an international agreement on such extended resource zones, but was simply unwilling to wait for the outcome of the seemingly endless conference. Bills currently before Congress[33] may result in similar unilateral action being taken in the area of deep seabed mining.

The potential of international consensus on a 12-mile territorial boundary and a 200-mile economic zone bodes well for the viability of a marine sanctuaries program. It would also defuse many of the objections made to the marine sanctuaries legislation because of its potential interference with activities and areas under international jurisdiction. Moreover, Congress' unilateral extension of jurisdiction over fishery resources to 200 miles indicates that Congress is not willing to allow an identified problem to be aggravated because of the inertia of international negotiations.

D. The Potential Role of the Marine Sanctuaries Program

Although there exists significant overlaps between federal and state programs and the Marine Sanctuaries Program, these other programs do not offer, singly or in combination, a substitute for the Marine Sanctuaries Program. Programs (such as those encompassing National Park areas, National Wildlife Refuges, Wilderness areas, and Estuarine Sanctuaries) that protect and preserve areas of special value for recreational, esthetic, scientific, environmental, or fish and wildlife values, are generally land-or-shore-oriented, with marine

area protection only incidental to the management of other land areas. Programs (such as those under the Endangered Species Act, Marine Mammal Protection Act, and the Fishery Conservation and Management Act) that protect particular species, and in certain circumstances critical habitat, are limited in the species they can protect and the countervailing considerations that often compromise any protection. Regulatory programs covering activities in the marine environment suffer the limitations of being reactive and negative in nature, (i.e., unable to initiate action according to a comprehensive plan). Federal and state programs affecting marine resources are also limited in their jurisdiction; within the three-mile territorial sea, state programs (such as those dealing with submerged lands) are sometimes exclusive, while in other areas (such as the protection of navigation), federal programs prevail. Beyond the three-mile limit, even though the states have no jurisdiction, federal programs are limited by international agreements and other national interest considerations.

These limitations on federal and state programs are not offered to suggest that the programs fail to achieve their own goals. Rather, the described limitations were meant to illustrate that the goals of these program differ from those established for the Marine Sanctuary Program, and that, in meeting their own goals, these programs cannot at the same time meet the goals of the Marine Sanctuaries Program. Thus, one of the two reasons why the Senate Commerce Committee originally rejected the marine sanctuaries provisions of H.R. 9727 (see pp. 35-36)-- that the Secretary of the Interior already had authority, under the Outer Continental Shelf Lands Act, to reserve and protect certain outer con-

tinental shelf lands -- is highly circumpsect. As discussed at pages 89-91, the authority to withdraw lands to protect natural resources (available to both the Secretary of the Interior and the President) only applies to outer continental shelf lands beyond the three-mile territorial seas, does not necessarily ensure permanent protection, is exercised on an ad hoc basis with no review process to determine what areas should be withdrawn, and lacks a clear congressional mandate to protect marine resources and values. Obviously, the protection available (and likely to be given) to ocean resources under the Outer Continental Shelf Lands Act is not a substitute for the protection offered by the Marine Sanctuaries Program.

Furthermore, the second objection raised by the Senate Commerce Committee also appears to have been negated by changed circumstances. The Committee concluded that, although control over the outer continental shelf was within the federal government's jurisdiction, control over the water column beyond the contiguous zone was outside federal jurisdiction. However, the passage of the Fishery Conservation and Management Act of 1976,[34] which extended United States jurisdiction over fishery resources to 200 miles offshore, indicates that Congress is now willing to assert jurisdiction over the water column beyond the contiguous waters (see pp. 35, 85). Thus, both of the reasons given by the Senate Commerce Committee for deleting Title III from H.R. 9727 should not be persuasive.

The Marine Sanctuaries Program, in its mandate for preserving and restoring marine resources and values, in its broad jurisdiction over marine areas, in its flexibility in designating sanctuary areas, and in its almost total

authority to regulate activities in a designated sanctuary, offers a unique, positive, and comprehensive program to protect marine resources. Moreover, in some instances, as with the MONITOR Marine Sanctuary, marine sanctuary authority is the only legal authorization for protection available.[35] Then Acting Secretary of Commerce, John K. Tabor, indicated the great potential of the program in a letter to the Honorable Carl Albert, Speaker of the House of Representatives, dated April 16, 1974:

> In formulating the marine sanctuary provision, the Congress provided a powerful tool for conservation and protection of some of the Nation's more valuable marine areas. This legislation offers potential for development of a landmark program, analogous to well-established Federal programs that are already providing protection to some of our outstanding terrestrial areas such as national parks, national seashores, national wildlife refuges, wild and scenic rivers, and wilderness areas....
>
> The program for implementing the authorities in Title III must be developed and applied wisely and carefully to accomplish the intent of the legislation and to assure balanced protection and utilization of marine resources in the face of burgeoning national needs./36

The comprehensiveness of the Marine Sanctuaries Program does not mean, however, that other programs are not critical to the efficient and successful implementation of the Marine Sanctuaries Program. As former Secretary Tabor went on to state:

> The marine sanctuary provision must be meshed carefully with the objectives and provisions of related Federal legislation, and must take into account State programs, particularly those being develped under the Coastal Zone Management Act of 1972./37

The Coastal Zone Management Program will be a positive means of integrating the

Marine Sanctuaries Program with other related programs, not only to resolve possible conflicts, but also to provide added support for marine sanctuaries, since jurisdiction of the Marine Sanctuaries Program does not extend to land areas, even though land-based activity can affect marine resources and values.

In conclusion, the Marine Sanctuaries Program offers the best means of preserving selected areas of the marine environment. The passage of the Marine Protection, Research and Sanctuaries Act provides the congressional mandate for this protection. Both the subsequent passage of the Fishery Conservation and Management Act and the above-mentioned limitations of the Secretary of the Interior to protect outer continental shelf lands refute the Senate Commerce Committee's objections to the legislation. And since, as demonstrated above, no existing programs, even in combination, can provide comprehensive protection to marine resources and values, the need for a viable Marine Sanctuaries Program is clear. In the words of Robert W. Knecht, Assistant Administrator for Coastal Zone Management:

> NOAA believes the Coastal Zone Management Act, the Marine Protection, Research, and Sanctuaries Act, the Marine Mammal Protection Act, the Endangered Species Act, and other pieces of legislation related thereto amount to a substantial body of law spelling out a major national environmental obligation.
>
> We believe the marine sanctuary title of the Marine Protection, Research, and Sanctuaries Act is a significant part of this total obligation and is an opportunity to provide for balanced, well-managed, environmentally sound use of the Nation's marine resources./38

Footnotes -- Chapter V

1. 16 U.S.C. s. 1531 et. seq.

2. 16 U.S.C. s. 1361, 1362, 1371-1384, 1401-1407.

3. 16 U.S.C. s. 1801 et. seq.

4. 16 U.S.C. s. 1373(b)(4).

5. See 16 U.S.C. s. 1851(a).

6. See 43 U.S.C. s. 1333 and 43 C.F.R. s. 3300.0-4.

7. 16 U.S.C. s. 1451 et. seq.

8. 43 U.S.C. s. 1331-1343.

9. 43 C.F.R. s. 3300.

10. UNION OIL COMPANY OF CALIFORNIA v. MORTON, 512 F.2d 743 (1975).

11. GULF OIL CORPORATION v. MORTON, 493 F.2d 141 (1973).

12. 43 U.S.C. s. 1341(a).

13. 43 U.S.C. s. 1337(a).

14. s. 402 of the Federal Water Pollution Control Act, 33 U.S.C. s. 1342.

15. 33 U.S.C. s. 1343.

16. 33 U.S.C. ss. 1001-1016. See 33 U.S.C. s. 1321(b)(3).

17. 33 U.S.C. s. 1343 (c)(2).

18. 33 U.S.C. s. 1321.

19. 33 U.S.C. s. 1322.

20. 33 U.S.C. ss. 1401-1444.

21. 33 U.S.C. s. 1412(a).

22. Reported in CONSERVATION REPORT, Report No. 4, February 4, 1977, p. 53. (Published by the National Wildlife Federation).

23. Id.

24. 33 U.S.C. s. 403.

25. 33 U.S.C. s. 1343; 33 U.S.C. ss. 1413.

26. 33 U.S.C. s. 403, 43 U.S.C. s. 1333(f).

27. 33 C.F.R. s. 209.120.

28. 33 U.S.C. ss. 1221-1227.

29. Quoted in CONSERVATION REPORT, Report No. 2, January 21, 1977, p. 21. (Published by the National Wildlife Federation).

30. See CONSERVATION REPORT, Id.

31. 33 U.S.C. ss. 1501-1524.

32. 16 U.S.C. s. 1432.

33. H.R. 3652 and H.R. 3350 (95th Cong., 1st Sess).

34. 16 U.S.C. s. 1801.

35. United States Department of Commerce, "Report to the Congress on Implementation of the Marine Protection, Research and Sanctuary Act (Title III)," July, 1974 through June 1975, p. 2.

36. Letter from John K. Tabor, Acting Secretary of Commerce to the Honorable Carl Albert, in OCEAN DUMPING OVERSIGHT HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT AND THE SUBCOMMITTEE ON OCEANOGRAPHY OF THE HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES, Ser. No. 93-38 (1974), p. 278.

37. Id.

38. Statement of Robert W. Knecht, Assistant Administrator for Coastal Zone Management before House Hearings, in OCEAN DUMPING - PART 2, JOINT HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT AND THE SUBCOMMITTEE ON OCEANOGRAPHY OF THE HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES, 94th Cong., 2d Sess., Ser. No. 94-25 (1976), p. 193.

APPENDIX A

Selected Excerpts from the Legislative History of the Marine Sanctuaries Title of the Marine Protection, Research, and Sanctuaries Act*

*Page numbers, denoted in parenthesis, are references to U.S. Environmental Protection Agency, LEGAL COMPILATION: STATUTES AND LEGAL HISTORY, EXECUTIVE ORDERS, REGULATIONS, GUIDELINES, AND REPORTS, vol. III, supp. "water" (1973).

1. Report of the House Committee on Merchant Marine and Fisheries [H.R. Rep. No. 92-361, 92d Cong., 1st Sess., 1971].

A. Federal Consultation

(a) The consultation process is designed to coordinate the interests of various Federal departments and agencies, including the management of fisheries resources, the protection of national security and transportation interests, and the recognition of responsibility for the exploration and exploitation of mineral resources. It is expected that all interests will be considered, and that no sanctuary will be designated without complete coordination in this regard. In any case where there is no way to reconcile competing uses, it is expected that the ultimate decision will be made at a higher level in the Executive branch. (1563).

B. State Consultation

(b) This subsection provides for appropriate consultation with State Officials before a marine sanctuary is designated which includes waters within the territorial limits of a State or any other waters lying above the subsoil or seabed, the natural resources of which are recognized by the Submerged Lands Act as belonging to the respective State or States. In addition to the consultation process, State interests are protected by suspending any sanctuary designation by the Secretary of Commerce as to any such waters until 60 days after publication of such designation and limiting the scope of any such sanctuary with respect to any part within the territorial jurisdiction of a State which the respective Governor certifies as so limited. The Governor may subsequently withdraw his objection in which case the designation, if still pending, will become effective immediately. This subsection is intended to protect State title and ownership in the lands beneath its navigable waters and seaward boundaries and is expected to be administered in a way to give full effect to that intent. (1563).

C. International Agreements

(c) This subsection directs the Secretary of State to take appropriate action to obtain those international agreements which may be necessary to protect the purposes of any sanctuary which includes waters lying outside the contiguous zone.

D. Annual Reports

(d) This subsection directs the Secretary of Commerce to take action under this title within two years and requires him to submit annual reports as to his actions.

E. Public Hearings

(e) This subsection establishes a public hearing process designed to give all interested parties an opportunity to express their views. Public hearings need not be held on each proposal for a marine sanctuary; after sufficient facts are available to the Secretary which indicate that designation action appears to be desirable, such hearings should be held. The Secretary may develop preliminary information in any manner he sees fit; however, a scheme for processing preliminary information is considered necessary if the designation process is to be responsive to the public interest and need, and the Secretary is expected to develop and publish such a scheme.

F. Regulations

(f) This subsection authorizes regulations to protect the purpose of the sanctuary designation. Any activity permitted within the sanctuary must, therefore, conform to the regulations issued under this subsection, and no activity shall be valid which does not do so. (1563).

2. Excerpts from the Floor Debates on Title III in the House of Representatives

A. Remarks of Congressman Dingell (Michigan)

The title also goes into some detail in the matter of public hearings on proposed sanctuaries -- echoing a continuing concern of the committee that the public must be brought into the decisionmaking process and given adequate information in connection with matters arising under this act.

Let me stress the point that title III is permissive -- it allows the Secretary of Commerce to declare sanctuaries in appropriate cases. We make no attempt to force him to do so. While it is conceivable that the views of future Cabinet officers may differ -- and I have heard no suggestions that the present Secretary is overly well disposed to the protection of environmental values at the expense of resource exploitation -- it is also clear that the means for resolving these disputes is in the hands of the President, who can instruct the Secretary to withhold sanctuary status from an area deemed important for military, resource, diplomatic, or any other reasons. In title III we do no more than provide the tools with which to preserve important assets for generations yet unborn. (p. 1678).

B. Remarks of Congressman Harrington (Massachusetts)

These sanctuaries will immediately preserve vital areas of our coastline from further damage. My only reservation is that we may be drastically underfunding both titles II and III. (p. 1759).

C. Remarks of Congressman Keith (Massachusetts)

Title III simply provides for an orderly review of the activities on our Continental Shelf. Its purpose is to assure the preservation of our coastal areas and fisheries, thus protecting our source of protein and at the same time assuring such industrial and commercial development as may be necessary in the national interest.

Title III gives more than mere consideration to both of these compelling national problems. It provides for multiple usage of the designated areas. It provides a balanced even-handed means of prohibiting the resolution of one problem at the expense of the other. It guards against "ecology for the sake of ecology." It also guards against the cynical philosophy that the need for oil is so compelling that it justifies the destruction of our environment. (p. 1690).

D. Remarks of Congressman Mosher (Ohio)

The report of your committee makes it abundantly clear that the designation of a marine sanctuary is not intended to rule out multimple use of the sea surface, water column or sea bed. Any proposed activity must, however, be consistent with the overall purpose of this title. An inconsistent use, in my opinion, would be one which negates the fundamental purpose for which a specific sanctuary may be established.

This title, Mr. Chairman, is intended to insure that our coastal ocean waters are utilized to meet our total needs from the sea. Those needs include recreation, resource exploitation, the advancement of knowledge of the earth, and the preservation of unique areas. All are important.

This title is not designed to terminate the use of our coastal waters to meet any of these needs. (p. 1683).

E. Remarks of Congressman Lennon (North Carolina)

Title III concerning the designation of marine sanctuaries provides a scheme whereby areas may be preserved or restored in order to insure their maximum overall potential and would, in effect, provide for national decisions on competing uses in the offshore waters. (p. 1686).

F. Remarks of Congressman Mailliard (California)

We must also undertake to survey in a broad sense our coastal waters extending over the Continental Shelf to pinpoint those areas which are of particular value. In those areas, which we have termed marine sanctuaries, we should be certain that man's use of the sea or his intervention in the sea is in har-

mony with the unique attributes of the area. That is not to say that man should not go into the sea to exploit its resources, living and non-living, but only that he must do this intelligently, giving due consideration to all of the uses and benefits which these areas may contribute for our well-being.

Title III of this legislation, therefore, is intended to assure the development of these resources and at the same time provide some legitimate protection against thoughtless abuse of the sea. (p. 1688).

G. Remarks of Congressman Frey (Florida)

The philosophy of establishing marine sanctuaries is that instead of designating areas where dumping may be conducted safely, we should determine which areas of our marine environment are most valuable and set them aside as sanctuaries. There is a need to relate the problem of ocean dumping to the broader problem of preserving certain ecosystems within the coastal zone areas. (p. 1694).

H. Remarks of Congressman Keith (Massachusetts)

Specifically, that purpose is to preserve or restore, for their conservation, recreational, ecological, or esthetic values, coastal and other waters as far seaward as the outer edge of the Continental Shelf. Most importantly, this title specifically authorizes the Secretary of Commerce to consult with the Secretaries of State, Defense, Interior, and Transportation, as well as with the Administrator of the Environmental Protection Agency -- before designating any such area as a marine sanctuary.

Certainly we do not intend, here, to punish consumers by denying them the necessary food and energy of the sea and seabed. Neither, however, do we intend to be so responsive to the mineral interests that we adversely affect the essential protein resources of the sea.

I certainly believe in the dual usage concept for our coastal waters. But I also believe such dual usage must be balanced. Neither usage should be permitted to destroy the other. In short, we need the oil and gas and we need the fish. Our bill recognizes this key fact. And it provides the proper safeguards to preserve that balanced basis. (p. 1689).

I. Remarks of Congressman Pelly (Washington)

Let me reemphasize the fact that marine sanctuaries as proposed in title III of this legislation are not intended to prevent legitimate uses of the sea. They are intended to protect unique areas of the ocean bordering our country. How many such marine sanctuaries should be established remains to be determined. It is likely that most of them will protect sections of our national seashores. A sanctuary is not meant to be a marine wilderness where man will not enter.

Its designation will insure very simply a balance between uses.

This fear is groundless. Let me assure the distinguished chairman of the Interior Committee that it has never been our intention to stop the development of these vast resources. As the gentleman from Ohio (Mr. Mosher) stated during general debate yesterday, the Merchant Marine and Fisheries Committee has led the way in fostering the increased utilization of the oceans to satisfy man's need for food, energy sources, and hard minerals. We have constantly endeavored to advance technology and basic knowledge, so that these offshore resources and the wealth of the deep sea bed can be extracted economocally. (pp. 1720-21).

Appendix B

International Recognition of the Need for Marine Sanctuaries

The need for governments to establish coastal and marine sanctuaries, parks, and reserves has received increasing attention in recent years at national and international conferences. A Selection of pertinent principles, resolutions, and recommendations is included below.

A. Principles of international conduct relative to the human environment

1. United Nations Conference on the Human Environment, Stockholm, Sweden, 5-16 June, 1972.

   Declaration on the Human Environment, A Statement of Principles

   Principles

   Principle No. 2

   The natural resources of the earth including the air, water, land, flora and fauna and especially representative samples of natural ecosystems must be safeguarded for the benefit of present and future generations through careful planning or management as appropriate.

   Principle No. 3

   The capacity of the earth to produce vital renewable resources must be maintained and whenever practicable restored or improved.

   Principle No. 4

   Man has a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat which are now gravely imperilled by a combination of adverse factors. Nature conservation including wildlife must therefore receive importance in planning for economic development. (Note: Although these principles are not specific to the problem of marine sanctuaries, their intent is clear.)

B. Recommendations arising from international conferences

1. First World Conference on National Parks, Seattle, Washington, 30 June - 7 July, 1962

Recommendation No. 15

Whereas it is recognized that the oceans and their teeming life are subject to the same dangers of human interference and destruction as the land, that the sea and land are ecologically interdependent and indivisible, that population pressures will cause man to turn increasingly to the sea, and especially to the underwater scene, for recreation and spiritual refreshment, and that the preservation of unspoiled marine habitat is urgently needed for ethical and esthetic reasons, for the protection of rare species, for the replenishment of stocks of valuable food species, and for the provision of undisturbed areas for scientific research.

THE FIRST WORLD CONFERENCE ON NATIONAL PARKS invites the Governments of all those countries having marine frontiers, and other appropriate agencies, to examine as a matter of urgency the possibility of creating marine parks or reserves to defend underwater areas of special significance from all forms of human interference, and further recommends the extension of existing national parks and equivalent reserves with shorelines, into the water to the 10 fathom depth or the territorial limit or some other appropriate off-shore boundary.

2. Regional Symposium on Conservation of Nature - Reefs and Lagoons, Noumea, New Caledonia, 5-13 August, 1971

Resolution No. 8

The Symposium:

Being concerned that the representative examples of marine environments should be conserved for the benefit of the island peoples and the world at large because of their scientific and educational value and to ensure the survival of species;

Recommends to all governments concerned that action be taken to create a range of underwater reserves and marine parks suitably and effectively protected under appropriate legislation.

3. Eleventh General Assembly of the International Union for the Conservation of Nature and Natural Resources (IUCN), Banff, Alberta, Canada, 16 September, 1972

Resolution No. 11

Welcoming the active interest in many parts of the world, notably the Caribbean, the Mediterranean, the Tanzanian and Kenyan sectors of the East African coast, the Indian Ocean Islands, Australia and Sourh Africa, in the establishment and effective management of marine and national parks;

Noting that despite the prominence given to this issue at the Symposium on Conservation in the South Pacific Region held at Noumea in August 1971, the progress hitherto made in this matter in parts of the Pacific region is not yet in keeping with their high scientific interest;

The 11th General Assembly of IUCN meeting at Banff, Canada in September 1972;

Urges governments concerned to promote the establishment of marine parks and reserves;

And in particular urges the Government of FIJI to take action in its archipelago of exceptional interest, where some of the reefs are under increasingly destructive pressure, and to give support to the efforts of the National Trust of Fiji in arousing public interest in this matter.

4. Second World Conference on National Parks, Grand Teton National Park, Wyoming, USA, 22-27 September, 1972

Recommendation No. 4

Recalling Recommendation 15 of the First World Conference on National Parks urging that governments extend national parks and equivalent reserves with shorelines to appropriate offshore boundaries;

Expressing satisfaction at the action already taken by some countries to establish marine national parks and other protected areas to conserve underwater habitats of special significance, and sites where the remains of past cultures are to be found under the sea;

Being informed of action taken by IUCN to prepare guidelines for the establishment of marine national parks and other protected areas;

The Second World Conference on National Parks, meeting at Grand Teton National Park, USA, in September 1972;

Urges all governments concerned to set aside appropriate marine areas as national parks and reserves and to take action to extend the boundaries of existing terrestrial national parks and reserves to include representative marine ecosystems.

5. South Pacific Conference on National Parks and Reserves, Wellington, New Zealand, 19-27 February, 1975

Recommendation No. 6

Recalling Recommendation 4 of the Second World Conference on National Parks (Grand Teton National Park, USA, September 1972) concerning the establishment of marine national parks and reserves;

Recognizing that marine ecosystems are not easily protected by national parks and reserves covering limited areas, but that such protection requires a broad programme of conservation measures;

Being concerned at the irreparable damage to coral reefs, lagoons, mangrove forests and other marine sites through pollution, dredging, mining, land reclamation, dumping, dynamiting and other deleterious methods of fishing, shell collecting and other activities;

The South Pacific Conference on National Parks and Reserves meeting in Wellington, New Zealand, on 27 February 1975;

Urges the Governments of the region to take immediate action to control these damaging factors;

Recommends that action to conserve marine areas should include planning of coastal areas and control of destructive and disturbing activities both on shore and off shore;

Recommends also that the Governments of the region set aside appropriate marine areas as national parks and reserves and take action to extend the boundaries of appropriate existing representative marine ecosystems;

And recommends further, that the executive administration and control of such marine parks and reserves be vested in the same authority that administers and controls terrestrial national parks and reserves.

6. Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean Including the Red Sea and the Persian Gulf; Sponsored by the Department of the Environment of the Imperial Government of Iran and the IUCN, with the support of the U.N. Environmental Programme (UNEP) and the World Wildlife Fund (WWF) and the co-sponsorship of the UNESCO, Tehran, Iran, 6-10 March, 1975.

General Recommendations

1. National Parks and Equivalent Reserves as an Integrated Part of Regional Development of Coastal and Marine Areas

Considering the ecological and economic values of coastal lands as transitional areas between interacting terrestrial and marine ecosystems, including a wide range of highly productive renewable natural resources such as estuaries, mangrove forests, sea-grass beds and coral reefs, which are vital as spawning grounds and nurseries for fish and invertebrates which in turn at adult stages are the basis for commercially important fisheries as well as being a condition of existence for many other marine animals important as a protein resource;

Realizing the unique physical characteristics of the coastal zone which make it a focal point for settlement and economic activity and that diverse activities on the often congested coastal areas tend to conflict with each other and also interact and sometimes negatively influence a highly complex and sensitive environment;

Recalling Resolution 1802 (LV) of the United Nations Economic and Social Council emphasizing the importance of an interdisciplinary approach in studying the problems of coastal area development, which implies the importance of ecological considerations;

Convinced that development activities must be undertaken in accordance with sound ecological principles if maximum short-and long-term benefits are to accrue to the peoples of the countries concerned;

Recalling, also resolutions concerned with marine parks and reserves made by international gatherings including Recommendation No. 15 of the First World Conference on National Parks (Seattle, U.S.A., 1962), Recommendation No. 11 of the Eleventh General Assembly of IUCN (Banff, Canada, 1972), Recommendation No. 4 of the Second World Conference on National Parks (Grand Teton National Park, U.S.A., 1972), as well as those from regional meetings notably the Regional Symposium on Conservation of Nature-Reefs and Lagoons (Noumea, New Caledonia, 1971) and the Arab League Educational, Cultural and Scientific Organization (ALESCO) expert meeting (Jeddah, Saudi Arabia, 1974) for representatives of the Red Sea and Gulf of Aden countries on the Red Sea Regional Programme for Environmental Studies;

Recognizing the usefulness of a network of national parks and nature reserves as samples of natural ecosystems, biomes and habitats for monitoring and comparison with areas influenced, altered or destroyed by human activities;

Recalling Project No. 8 of UNESCO Man and the Biosphere Programme concerned with promoting the conservation of natural areas and genetic resources through the establishment of a co-ordinated series of biosphere reserves;

The Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean, held at Tehran, Iran, 6-10 March 1975;

Recommends to the Governments of the region and agencies concerned;

1. That in all regional and national development planning of coastal and marine areas, surveys to identify characteristic ecosystems, biomes and habitats of the region should be undertaken before any forms of land and sea uses are decided upon;

2. That regional and national systems of national parks and equivalent reserves be established as soon as possible as a result of preceding surveys indicating cultural, educational, environmental and scientific values, tourist potential and other features favourable to promoting the development of the region;

3. That such a regional system should be integrated in development and management programmes at regional and national levels.

2. Procedures Towards the Planning and Management of Regional and National Systems of Marine Reserves

Considering that the legal steps towards the establishment of marine reserves must necessarily be followed by adequate follow-up actions and in particular take into account the following aspects:

(a) Existing and proposed development plans affecting coastal areas and other marine ecosystems, in particular land and water use patterns and their likely evolution insofar as they affect the physical and chemical properties of waters reaching the sea;

(b) Use of the best management tools in satisfying different properties and functions of marine reserves such as monitoring, productivity, tourism and recreation, and other uses;

(c) Dependence on a number of factors that are regional in origin and scope and therefore require a regional approach for management;

(d) Need to win the good will and co-operation of local populations in the management of marine reserves;

The Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean, held at Tehran, Iran, 6-10 March 1975:

Recommends to the Governments of the region:

1. That planning for marine parks and reserves should be considered as an integral part of national and regional land-use planning, and that national land-use planning teams should include experts in marine and wildlife affairs; the selected marine parks and reserves should be planned by appropriate experts;

2. That adequate and periodically revised management plans be designed for each selected reserve, taking into account the evaluation of new data and giving full weight to changes among interacting factors, new appraisals of uniqueness, depleted faunal and floral resources, interdependence with productivity and other relevant aspects;

3. That full use is made of such management concepts and tools as zoning, buffer zones, changes in jurisdictional status as well as various administrative devices;

4. That methods for regional co-operation be devised in those management aspects that necessarily require a regional approach;

5. That in achieving these objectives, maximum collaboration and participation be sought from local populations, in particular after such reserves have been established.

3. Research and Monitoring

Considering that research aspects related to marine reserves have national as well as regional implications and that there is a great lack of baseline information on physico-chemical conditions, biology, productivity and pollution and other degradations of marine environments;

Taking into account that there is a particular need for continuous monitoring of environmental parameters and for environmental impact studies, which can be carried out under particularly desirable conditions if there is an adequate network of stations, including marine reserves, that are equipped for such activities;

The Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean, held at Tehran, Iran, 6-10 March 1975:

Recommends to the Governments of the region and concerned international organizations and institutions:

1. That marine research institutes, universities and other research institutions be involved in setting up marine reserves where research can be carried out, and be strengthened to collaborate in the collection of baseline information;

2. That continuing monitoring stations be established making full use of marine reserves;

3. That every possible attempt be made to co-ordinate and integrate such research and monitoring programmes through regional centres equipped with mechanisms for retrieval and dispersion of the information gathered for the benefit of the region;

4. Technical and Financial Assistance

Considering that there will be a growing need to establish marine parks and reserves and to promote research, planning, development and management programmes related to them, and that some countries of the region might have to rely on assistance in carrying out such programmes that have regional and world-wide implications;

The Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean, held at Tehran, Iran, 6-10 March 1975:

Recommends to the Governments of the region that they take full advantage of the technical assistance already available;

Recommends to the international organizations concerned, in particular those of the UN system, as well as other assistance programmes and non-governmental institutions, that they step up their technical assistance and provide the necessary financial support; and

Recommends to the Governments of the region that they encourage programmes and activities based on mutual assistance within the region.

5. Public Awareness

Recognizing the impact marine national parks may have upon the social, economic and political base of a country;

Considering the need for public and institutional acceptance and understanding;

The Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean, held at Tehran, Iran, 6-10 March 1975:

Recommends to the Governments of the region that they consider at various stages of their planning programmes, efforts directed at interest group participation and information dispersal, particularly in connection with productivity, research, living laboratories, recreation and other uses, through adequate production of audio-visual aids and other tools in educational and interpretative programmes at all levels.

6. Training of Personnel for the Management of Marine Reserves

Considering that there is a need for trained personnel to undertake planning, management, and development of marine parks and reserves;

Taking into account that in the majority of already established marine parks and reserves there is a shortage of trained personnel at all levels;

The Regional Meeting on Marine Parks and Reserves in the Northern Indian Ocean, held at Tehran, Iran, 6-10 March 1975:

Recommends to the Governments of the region:

1. That existing national training institutions (incorporating various aspects of marine parks and reserves) be strengthened and whereever necessary new institutions be established; and

2. That the fullest use be made of existing facilities and manpower of other institutions on a regional or multinational basis.

Appendix C

Description and Distribution of Basic Estuarine Sanctuaries by Biogeographic Classification, Including Proposed Sub-Categories

1. Acadian - Northeast Atlantic Coast, south to Cape Cod glaciated shoreline subjected to winter icing; well developed algal flora, boreal biota; Maine, New Hampshire, Massachusetts.

    a. Rocky shore
    b. Sandy shore

2. Virginian - Middle Atlantic Coast, from Cape Cod to Cape Hatteras; Lowland streams, coastal marshes and muddy bottoms; characteristics transitional between 1 and 3; biota primarily temperate with some boreal representatives; Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina.

    a. Northeast subregion, centered around Long Island Sound;
    b. South-central subregion, outer banks estuaries;
    c. Fresh-water dominated systems: Chesapeake and Delaware Bays.

3. Carolinian - South Atlantic Coast, from Cape Hatteras to Cape Kennedy; extensive marshes and swamps; waters turbid and productive; biota temperate with seasonal tropical elements; North Carolina, South Carolina, Georgia, Florida.

4. West Indian - South Florida coast, from Cape Kennedy to Cedar Key; and Caribbean Islands; shoreland low-lying limestone; calcareous sands, marls, and coral reefs; coastal marshes and mangroves; tropical biota; Florida, Puerto Rico, Virgin Islands.

    a. Continental
    b. Insular

5. Louisianan - Northern Gulf of Mexico, from Cedar Key to Mexico; characteristics of 3 with components of 4; strongly influenced by terrigenous factors; biota primarily temperate. Florida, Mississippi, Alabama, Louisiana, Texas.

    a. Low energy and delta
    b. Lagunal

6. Californian - South Pacific Coast from Mexico to Cape Mendocino; shoreland influenced by coastal mountains; rocky coasts with reduced fresh-water runoff; general absence of marshes and swamps; biota temperate. California.

7. Columbian - North Pacific Coast from Cape Mendocino to Canada; mountaineous shoreland; rocky coasts; extensive algae communities; biota primarily temperate with some boreal. California, Oregon, Washington.

    a. Coastal watershed;
    b. Freshwater dominated with large watershed: (Puget Sound and Columbia River).

8. Fiords - South coast Alaska and Aleutians; precipitous mountains; deep estuaries, some with glaciers; shoreline heavily indented and subject to winter icing; biota boreal to sub-Arctic; Alaska.

9. Sub-Arctic - West and North coasts of Alaska; ice-stressed coasts; biota Arctic and sub-Arctic; Alaska.

10. Insular-Larger Islands (Pacific) - sometimes with precipitous mountains; considerable wave action; frequently with endemic species; larger island groups primarily with tropical biota; Hawaii, Guam, American Samoa.

11. Great Lakes - Great Lakes of North America; bluff-dune or rocky, glaciated shoreline; limited wetlands; freshwater only; biota a mixture of boreal and temperate species with anadromous species and some marine invaders; Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, New York.

    a. Dune, lowland shores: Lakes Erie, Ontario, Huron
    b. Bluff or rocky: Lakes Superior and Michigan

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