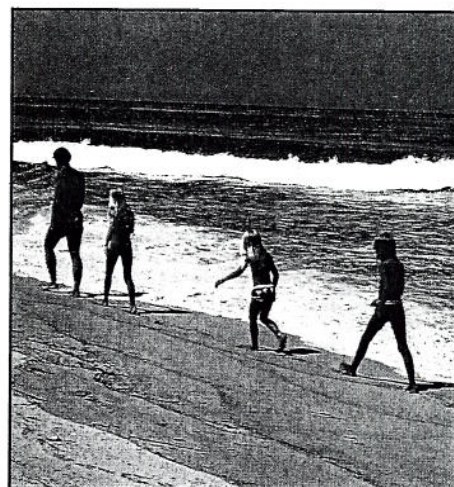
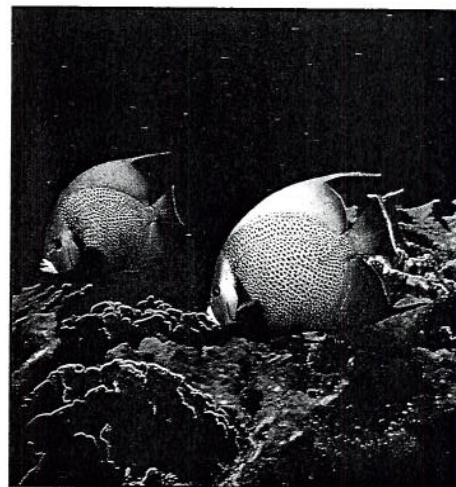
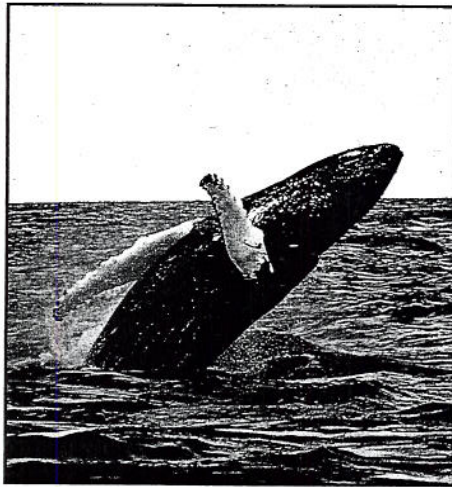


National Marine Sanctuaries:

Challenge and Opportunity



A Report
to the
National Oceanic and Atmospheric Administration

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Challenge and Opportunity

**A Report
to the
National Oceanic and
Atmospheric Administration**

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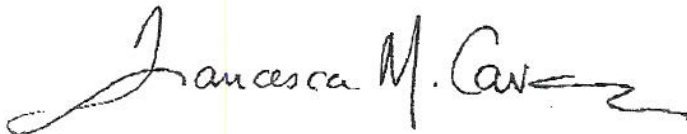
March 1993

Dear Reader:

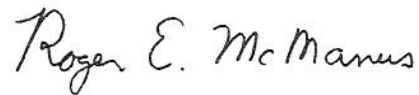
In 1972, Congress enacted Title III of the Marine Protection, Resources and Sanctuaries Act to establish the National Marine Sanctuary Program (NMSP), the only Federal program designed to comprehensively protect our special marine areas. The NMSP has tremendous potential to conserve America's most outstanding marine resources and has achieved considerable success despite limited resources and variable support from successive Administrations. Strong public support, new high-profile sites, and improved reauthorization legislation (enacted last year) provide an opportunity to take the program to new heights.

The National Oceanic and Atmospheric Administration (NOAA) is responsible for implementing the NMSP. Two years ago, NOAA recognized a need to review and evaluate the sanctuary program in light of its increasing popularity and rapid growth. NOAA convened an external "NMSP Review Team" consisting of experts representing a variety of interests including conservation, research, education, fishing, diving, hydrocarbon development, historic preservation, and state government.

The review team compiled this report, *National Marine Sanctuaries: Challenge and Opportunity*. It includes a constructive analysis of the program and insightful recommendations for improving it. Though preliminary, these suggestions can provide a foundation on which to build a successful program. Already, some of the recommendations have been incorporated into legislation and NOAA's federal advisory committee has commended the report. We are pleased to reprint this document so that it can be more widely distributed to decision-makers and the public. We hope it will act as a catalyst for continued improvement and expansion of the sanctuary program.



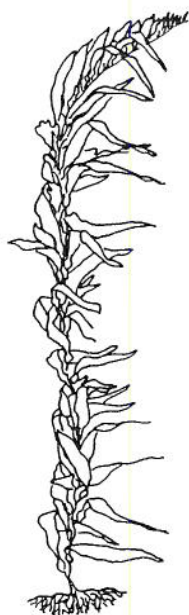
CAPT Francesca Cava
Chief, Sanctuaries & Reserves
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Introduction and Summary

The United States has long been at the forefront of international efforts to set aside national parks and other reserves on land, beginning with the establishment of the world's first national park at Yellowstone. One of the early champions of this movement was President Teddy Roosevelt, and he is still honored for his efforts.

This Administration now has a unique but fleeting opportunity to make a strong commitment to a new and equally high standard of stewardship in America's oceans and Great Lakes. The American public, increasingly aware of their heritage of marine resources, will support positive and immediate action to advance a strong and effective program to invigorate the National Marine Sanctuaries Program.

A successful sanctuaries program would not require a large staff, nor would it demand a disproportionate share of funds at a time when the pressure on all funding is heavy indeed. The program's budget has been so small, particularly when compared to similar programs in other agencies, that it could be multiplied tenfold without serious strain—sending a powerful signal to the rest of the world of this country's commitment to responsible environmental citizenship.

Among the major public benefits of a renewed Marine Sanctuaries Program would be opportunities to help restore depleted fisheries and promote environmentally sound recreation. The program can build on a solid track record of fostering cooperation among federal and state agencies charged with managing marine environments, and allow these agencies to conduct sanctuary-focused research into the impacts of environmental perturbations and other causes as well. Information about climate change, the maintenance of

marine biodiversity and the accumulation of badly-needed resource data over long timeframes will be important products of this research program.

The Exxon Valdez disaster in Prince William Sound demonstrated dramatically the vulnerability of our marine environments and the public outcry that can result when these environments are seen to be mismanaged. The time to react to the mounting threats to all of our coastal and offshore environments is *now*, before the accumulated impacts become either irreversible, or reversible at costs that would produce severe strains on an already overburdened national treasury. A rejuvenated Marine Sanctuaries Program will proclaim a clear symbol of this Administration's intention to act.

We see a clear vision of what this program might become in the future:

By the year 2000, the National Marine Sanctuaries Program will manage a comprehensive and integrated system of the nation's most significant marine areas. This management will be based on ecologically sound, well-researched principles of resource protection and sustainable use and will focus as well on improving public understanding of the nation's marine heritage and in extending sound marine resource management principles to areas beyond sanctuary boundaries.

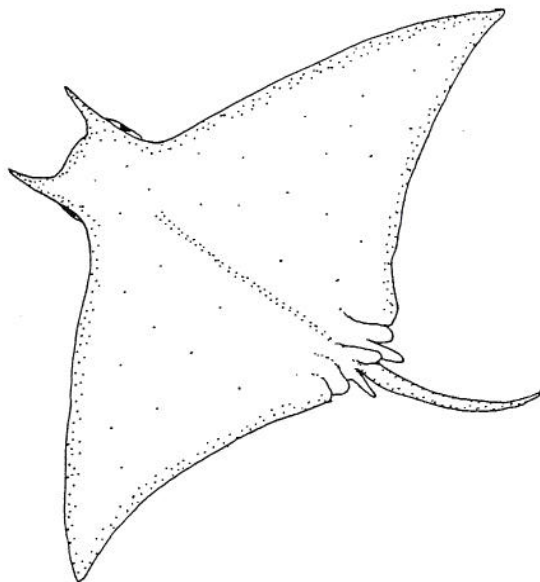
The steps that remain to be taken to achieve this vision are clear:

- The Administration should request, and the Congress should provide, a budget that is adequate to carry out this program.
- Priorities should be established to establish the Florida Keys and the sanctuaries on the central Califor-

nia coast as the centerpieces of this renewed effort.

- The National Marine Sanctuaries program should undertake an aggressive program to communicate this program to other agencies in government and to the public, and should work hard to establish cooperative relationships with the groups and organizations who share a stake in its success.

The vision is within our grasp. To achieve it, we need only stretch out our hands and our imaginations.



Background

In November, 1990, this panel was asked by NOAA's Assistant Administrator for Ocean Services to review the National Marine Sanctuaries Program and to make recommendations on ways to improve it. This report identifies a number of potential opportunities to revitalize the sanctuaries system, and to enhance its position in the foreground of international efforts to protect and preserve a critical element of man's heritage.

While the panel is critical of some elements of the program, it concluded that the inadequacies of the past several years were due not so much to neglect or malign indifference to the marine resources involved as they were to an ambivalence about the nature of, and need for, active leadership and management of a complex set of biological and social systems, coupled with the always difficult problem of competition for scarce personnel and funds.

The personnel associated with the program have helped and supported the efforts of the study effort. Our requests for information have been promptly met, and the cooperation of the program managers has been generous.

It seems scarcely necessary, in these days of heightened environmental awareness, to underscore the importance of coastal and marine resources to a healthy and functioning ecosystem. A few excerpts from current and authoritative sources put these issues into perspective:

"...the margins of the sea are affected by man almost everywhere, and encroachment on coastal areas continues worldwide. Habitats are being lost irretrievably to the construction of harbors and industrial installations, to the development of tourist facilities

and mariculture, and to the growth of settlements and cities. Although difficult to quantify, destruction of beaches, coral reefs and wetlands, including mangrove forests, as well as increasing erosion of the shore, are evident all over the world. If unchecked, this trend will lead to global deterioration in the quality and productivity of the marine environment."

GESAMP: The State of the Marine Environment; UNEP Regional Seas Reports and Studies No. 115, 1990

"The coastal zone is where land, sea and atmosphere interact, and has the highest biological productivity on earth. It is also home to most of the world's population, who depend on its resources and largely determine its state of health. Global change due to growth in resource consumption and population will have its biggest impacts in the coastal zone. Six out of ten people live within 60 kilometers of coastal waters, and two-thirds of the world's cities with populations of 2.5 million or more are near tidal estuaries. Within the next 20-30 years, the population of the coastal zone is projected to almost double.

"The more people use the oceans for waste disposal, the fewer living resources will be available. The ecosystems and resources of the coastal zone are rapidly deteriorating due to intense and increasing human pressure, including poorly planned and regulated urban, industrial, commercial and agricultural development, and over-exploitation of living resources. Coastal engineering and development projects

are modifying coastal ecosystems on a very large scale. Wetlands, coral reefs, and seagrass beds are the ecosystems most at risk.

* * *

"Billions of dollars and thousands of lifetimes have been spent worldwide to understand and regulate human impact on the sea and its resources. But the efforts have not even approached what is needed. Most often, they have focused on symptoms rather than causes. In general, we have not yet grasped the concepts needed to manage relations between people and the oceans. The challenge for the next 20 years is to redress this basic misunderstanding and develop suitable institutions and management mechanisms.

* * *

"Priority actions—

"Ecosystems that most urgently need protection from unplanned or poorly regulated coastal development include estuaries, salt marshes, mangroves, and other wetlands; seagrass beds; and coral reefs. Governments should greatly accelerate the establishment and effective management of coastal and marine protected areas. Where possible, the protected areas should be integrated as part of a comprehensive planning mechanism for all uses of coastal ecosystems (as pioneered by the Great Barrier Reef Marine Park Authority in Australia)."

Caring for the World: A Strategy for Sustainability (2nd Draft, 1990), prepared by IUCN, UNEP

and the World Wide Fund for Nature

"Whereas...The Global water cycle is essential to life on earth...and Short-term economic benefits from exploitation of ocean and water resources deprive future generations, diminish the quality of life, disrupt international stability and global security, and even threaten life itself;

NOW, therefore, be it resolved that... nations join together in international convention and by individual action in an effort to...

* * *

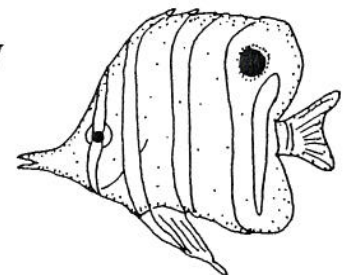
- Develop and implement comprehensive national and international plans to manage activities in the coastal zone... (and)

* * *

- Protect marine biodiversity and productivity by developing mechanisms to preserve sensitive coastal areas such as wetlands, barrier islands, estuaries, coral reefs, and other critical wildlife habitats"

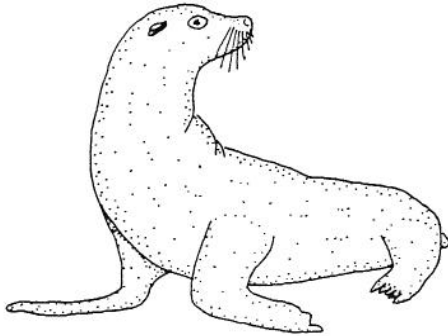
Resolution unanimously adopted at the Interparliamentary Conference on the Global Environment, Washington, D.C., May 2, 1990

The National Marine Sanctuaries Program provides a unique opportunity for this Administration to make a strong commitment to a new standard of environmental stewardship. A relatively small investment of resources could produce enormous returns in the form of a model re-



source protection system.

A successful sanctuaries program would not require a large staff, nor would it demand a disproportionate share of funds at a time when the pressure on all funding is heavy indeed. The program's budget has been so small, by comparison to similar programs in other agencies, that it could be increased tenfold without serious strain—sending a powerful signal to Americans and the rest of the world of this country's renewed commitment to responsible environmental citizenship.



The Marine Protection, Research and Sanctuaries Act of 1972 (sometimes called the Ocean Dumping bill) passed both Houses of Congress without serious opposition. The marine sanctuaries provisions of the legislation (Title III of the Act) were a product of earlier congressional concerns to protect specific coastal regions. The principal purpose of the legislation was identified as protection of threatened coastal and marine resources. Although the issue of "multiple use" was raised from time to time during the debate, the concept was never fully discussed, nor were the ambiguities in the concept ever discussed, still less resolved.

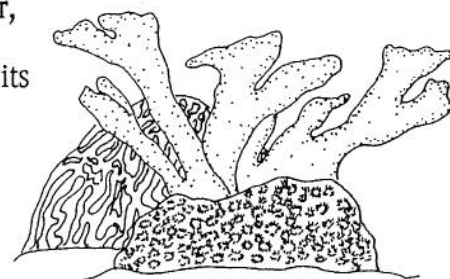
Following enactment of the legislation, not much happened for several years. The first marine sanctuaries were established in 1975, one of them when the legislation was found to offer protection for the wreck of the *Monitor*—a fortuitous conjunction of need and resource, since no other laws on the books at the time were adequate to handle a job that all conceded was important.

The next four sanctuaries (Channel Islands, Gray's Reef, Looe Key and the Gulf of the Farallones) were created in the closing days of the Carter Administration. The Reagan Administration was strongly opposed to the program, but Congressional support, coupled with tacit NOAA assistance, kept it alive through eight lean years. One tiny site, Fagatele Bay in American Samoa, was designated in that period. Independent studies of the program in 1980 and 1981 by the Congressional Research Service and the General Accounting Office supported the view that the sanctuaries program filled important needs that were not otherwise being met.

The Cordell Bank was designated in 1989, bringing the total to eight areas, with several others under active review. Congressional impatience with the pace and operation of the program had also escalated; the results of this impatience produced direct legislative involvement in the selection and in some cases designation of the Florida Keys, Monterey Bay, Stellwagen Bank, Flower Garden Banks, Washington Outer Coast and Northern Puget Sound areas, shortcutting a process that, to some observers, had become glacial.

[Ed.—Since this report was written, the sanctuary program has expanded its scope and several additional sanctuaries have been proposed or designated. The Congress established the Florida Keys National Marine Sanctuary in 1990, incorporating the entire sweep of the Florida Keys, from Biscayne Bay to the Dry Tortugas (and including the Key Largo and Looe Key sanctuaries in its boundaries). The Monterey Bay sanctuary has now been designated, as have two contiguous areas in the Gulf of Mexico, known as the Flower Garden Banks sanctuary, and Stellwagen Banks off the Massachusetts coast. The Congress has also taken steps leading to the designation of a sanctuary off the outer coast of the State of Washington, from Gray's Harbor to the San Juan straits, and has designated the Hawaiian Islands Humpback Whale National Marine Sanctuary off the islands of Lanai, Maui, Molokai and Kauai. It might be noted, however, that the funds authorized for this program have not kept pace with its growth.]

History of Marine Sanctuaries



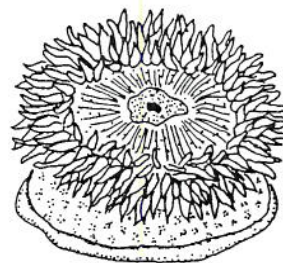
History of Panel

The members of the panel (identified in Appendix A) were invited to serve as an independent review team in October 1990. The twelve members of the panel are associated with a range of institutions and organizations concerned with coastal and marine issues. No panel members speak for their organizations in this endeavor—each represents his or her view alone, informed by contacts within that organization and experience acquired in connection with its activities.

The panel first met in November 1990 to receive a briefing from people associated with NOAA and/or the sanctuary program, and from G. Carleton Ray and M. Geraldine McCormick-Ray, consultants who were asked to prepare a report on the sanctuaries program and to assist the panel in its efforts. This report, entitled "A Future for Marine Sanctuaries," proved to be a highly useful resource to the panel.

The panel next met on Key Largo in January 1991 to talk with people actively involved in sanctuary operations and to visit the Key Largo Sanctuary itself. The panel's co-chairman visited the Channel Islands Sanctuary office and spoke with state and local officials involved in the California sanctuary program. The panel last convened in February 1991, when it met to complete and present its final report.

The panel was also given copies of a NOAA internal review report of the program, dated August 30, 1990, reflecting the results of a May, 1990, retreat designed to evaluate the program and to help prepare for an anticipated reauthorization of the program in 1992.



In general, the panel has concluded that this program affords this Administration a rare opportunity to take important and bold steps to protect and enhance these important parts of our heritage, and in the process, to create a model for the rest of the world of how to respond to this challenge. What makes the program particularly attractive is that these results can be accomplished with a relatively small investment of time, effort and funds.

In the past, NOAA's administration of the Marine Sanctuaries Program has lacked leadership, focus, resources and visibility, and the program has suffered for it. It has generally been treated as the runt of the NOAA litter, receiving only occasional pats on the head as executive and legislative attention was focused on its larger and better endowed siblings.

We consider it unproductive to discuss the failings of the program in detail; in a sense, it is not even particularly important. In fact, given the serious limitations imposed upon it, it has achieved some notable successes. What matters today is where it can and should go from here. It is for this reason that we prefer to concentrate on the positive directions the program should take from this point onward.

Program Leadership

The objective of the Marine Sanctuaries Program should be to develop a global reputation for enlightened resource management. This objective is within NOAA's grasp, should it choose to reach out and take it.

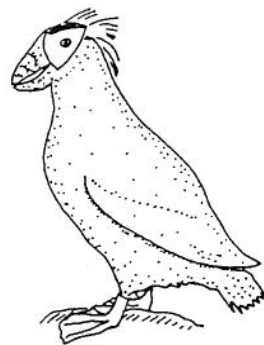
NOAA should look at examples of successful programs in similar areas. One excellent place to begin would be to examine closely the history and operation of the Great Barrier Reef Marine Park in Australia. That undertaking (relying in part, as it happens, on the U.S. legislation that created the Marine Sanctuaries program) has been a pioneer in its field, and we can learn much from it. To be sure, there are important differences between the two programs, but there are important similarities as well. Some of their initiatives and concepts might travel well.

From its inception, NOAA has been cautious about assuming the mantle of management of resources entrusted to it. There has always been a certain tension between the worlds of science and information development, on the one hand, and active management or involvement with resources on the other; the marine sanctuaries program has not been spared from this split focus. We believe that the sanctuaries program *does* require active management, and that NOAA should accept the fact and acknowledge that it can and will carry out the job.

NOAA should be willing and able to provide leadership to the sanctuary program, should announce this to the world, and should then carry it out to the best of its abilities. If it cannot or will not, it should acknowledge that to be the case and step aside in favor of another agency of government that is willing to do the job. It is no secret that other candidates exist, and would welcome the opportunity.

Regulations can be defended and supported if they are designed to meet an identified and accepted objective

Recommendations



and are no more restrictive than they need to be to accomplish that purpose. If sanctuary management is, and is seen to be, fair and competent by the communities and activities affected by their programs, these communities and activities will support the program. Cooperative programs have already been developed for the management of sanctuary operations in the Florida Keys, and these might be used as models in other regions as well.

Successful management of any program or resource implies the ability and willingness to regulate, and to enforce those regulations when necessary. This does not, however, connote heavy-handed, harsh or insensitive law enforcement. On the other hand, regulations must be enforced, if they are to be believable.

The two sanctuaries in the Florida Keys offer a useful model of enlightened regulation, based on education of the visitors to the sanctuaries.

The United Nations Conference on Environment and Development (UNCED) in Brazil in 1992 would be an ideal place for this nation to demonstrate the initiatives that this panel urges for enlightened stewardship of these important natural and cultural resources.

Recommendation:

The Administration, NOAA and the Marine Sanctuaries program should commit themselves to a leadership role in protecting the resources entrusted to them.



Program Vision

Today the Marine Sanctuaries Program lacks a clear statement of its vision. We found that some individuals did have a vision for the program, but that vision was not widely shared, nor did every vision coincide. The panel spent considerable time identifying what it felt to be a positive and acceptable vision for the program, attempting to define a sense of where the program should be if it were to achieve the goals that we felt reasonable and achievable.

By the year 2000, the National Marine Sanctuaries Program will manage a comprehensive and integrated system of the nation's most significant marine areas. This management will be based on ecologically sound, well-researched principles of resource protection and sustainable use and will focus as well on improving public understanding of the nation's marine heritage and in extending sound marine resource management principles to areas beyond sanctuary boundaries.

In support of this vision, the panel identified the following objectives:

- By the beginning of the next century there should be in place a national marine resources program to identify and manage the resources of the Nation's coastal and offshore waters and Great Lakes. This program will fully evaluate the ecological, cultural, historic, recreational, economic and esthetic values of these resources, and provide a foundation for a reasoned and comprehensive management plan to protect these vital assets.

- We will have made significant progress toward the development of an integrated network of coastal and marine protected areas through strengthening existing sanctuaries, identifying and designating additional sites within the twelve biogeographical provinces surrounding the Nation. Habitats and living resources in these areas will be identified and provided with whatever protection is necessary to ensure their sustainable existence as elements of functioning biological and ecosystems; cultural resources will be similarly protected.
- Adequate funding and resources will be available to allow the National Marine Sanctuaries Program to achieve these important objectives. This will be made possible through increased public support and awareness, innovative funding mechanisms and better use of existing resources within and outside the program.
- The principal goals of the program will be to protect and sustain the use of our biological and cultural heritage. Educational and interpretive programs will communicate to citizens of this and other nations the strength and value of our marine heritage. In this way the educational and interpretive programs will develop a strong constituency for its future. Research and monitoring programs will allow us to evaluate local and global forces that affect these resources.
- It will be necessary to consolidate and coordinate the public and private agencies concerned with these resources as a means of developing an integrated, multiple-use system for their development and protection. Only in this way can the conflicting demands upon these resources be reconciled in such a way as to establish the minimum amount of interference consistent

with the overriding need to protect their existence and to conserve them for the use of future generations. The program will be characterized by a willingness to learn and to cooperate in defining and achieving objectives shared by government agencies, non-government agencies and private citizens and groups.

- Decisive action will be necessary to allow this program to achieve its objectives. Leadership will be required at the national level to support it and to ensure the commitment of adequate financial and human resources. Without this support, the program must inevitably fail; with this support, it can only succeed.

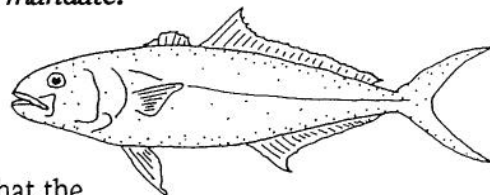
Our vision may not be that of NOAA, which certainly can and should feel free to identify and incorporate its own concept of what the program should be and become. It is not important that ours be the vision adopted; it is essential that *some* vision be adopted, and that it be made widely known within the agency, within the government and public affected by the marine sanctuary program.

Recommendation:

NOAA should identify and endorse a clear vision of what it believes the Marine Sanctuaries program should become, consistent with its statutory mandate.

Program Mission

The panel concluded that the Marine Sanctuaries Program lacks a clear statement of its mission: today the priorities that must be established within the agency to accomplish its objectives, once established. In defining the purposes of the original legisla-

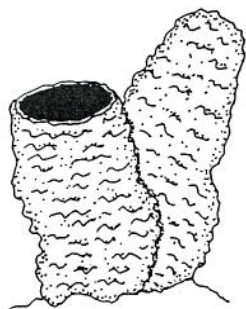


tion, the Congress took important steps to establish a mission statement, but its conception of its mission should reflect the events that have occurred since then. We suggest the following mission statement, with the clear recognition that Administration policy may suggest alternatives, but again with the adjuration that *some* statement of mission be adopted and published.

We propose the following:

The principal mission of the program is to identify, manage and protect areas of the marine environment of special national significance. To the extent that the following objectives are consistent with this purpose, it is also the mission of the program:

- to identify and designate a representative network of biogeographically representative ecosystems to ensure the continuing biodiversity of our coastal and marine areas, linked to an international system of biosphere and wilderness reserves aimed at maintaining the diversity of the Earth's natural living communities;
- to use the authority provided by its own and other legislative instruments for comprehensive and coordinated conservation and management of these marine areas, and areas that affect them directly;
- to develop coordinated plans for the protection and management of these areas with appropriate federal, state and local agencies of government, and with other public and private interests that are concerned with the continuing health and resilience of these areas;
- to support, promote, and coordinate scientific research (especially long-term monitoring and other long-term research projects) on the resources of these marine areas and



changes that may be taking place within them;

- to enhance public awareness, understanding, appreciation and wise use of the marine environment;
- to facilitate all public and private uses of these marine areas not prohibited pursuant to other authorities;
- to create models of and incentives for ways to protect and conserve these marine areas;
- to maintain, restore and enhance the diversity of the biological resources by providing places of refuge for exploited species that depend upon these areas to survive and propagate themselves; and
- to make a positive contribution to global programs encouraging conservation and sustainable use of resources.

It would be a useful and important step for NOAA, once it has defined a statement and mission for the program that it finds congenial and acceptable, to set goals to be met as the sanctuary program goes forward. These goals should be as specific as circumstances will allow, and should incorporate specific timetables and programmatic milestones.

Some of those goals will not be achieved within the timeframe contemplated. This should be considered not as a disaster, but as an occasion to review those goals, to identify those events that made it impossible to achieve them, and to define more realistic objectives in the future.

It must be pointed out that this goal-setting process implies an ability to monitor events, both in headquarters and in the field, that does not appear to exist today. This situation should be

rectified and much clearer communications should be established in both directions in the chain of command.

Recommendation:

A mission statement should be articulated, identifying the steps necessary to achieve this vision.

Budget

The existing budget for the Marine Sanctuaries Program is quite inadequate to meet the demands made upon it today, far less tomorrow, if the program is to be revitalized. An annual budget of \$4 million does not begin to meet the needs of the sanctuary program in place today, to say nothing of the program as it has been and is likely to be further extended by Congressional initiative.

While the panel was not able to specify a definitive budget for the program, we can recommend a process for constructing an adequate budget. There are currently eight sanctuaries in the system, and another eight well on the way to designation. An adequate budget for the Florida Keys National Sanctuary alone would be \$7-8 million. The California sanctuaries, as a group (Channel Islands, Monterey Bay, the Gulf of the Farallones and Cordell Bank), should probably receive a similar level of funding.

NOAA should build the sanctuaries budget in three components: (1) a budget for operating the sanctuaries themselves, which would allow each sanctuary to accomplish its fundamental purpose, (2) a separate budget for selecting and designating new sanctuaries, and (3) a budget for administering the program itself. Final funding for

the program should allocate amounts for each of these components. We estimate that this process would produce a budget on the order of \$30 million.

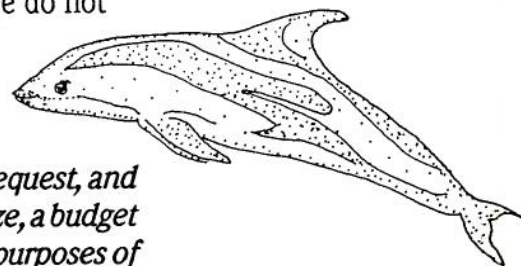
Although this would represent a major increase in the budget for the program, the returns on this investment would be at least as great, in our view. To put this into perspective, it might be noted that such a budget would be approximately 3% of the budget of the National Park Service for the coming year.

The panel was intrigued by the concept of a regime in which federal funds might be matched by contributions from state or local sources, or perhaps be augmented by the activities of a private foundation, as already described. If such a system could be established, the leverage of federal funds might be considerably increased.

Can the program achieve the position that we envision as a model of environmental resource management without additional funds? We do not believe that it can.

Recommendation:

The Administration should request, and the Congress should authorize, a budget adequate to accomplish the purposes of the individual sanctuaries, to establish new sanctuaries and to administer the program. For these three functions, an adequate budget would be on the order of \$30 million.



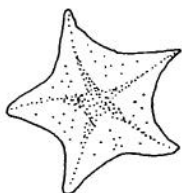
Improving the Designation Process

A substantial part of the budget for, and management of, the marine sanctuary program is now committed

to the process of preparing environmental impact statements and the designation of new sanctuaries. Not harmful in itself, this process is draining scarce resources from the actual management of the sanctuaries already in existence. More than half of the personnel in the program office work in Washington, D.C. As the program grows, the balance between the field and headquarters staff should be reexamined and the duties and responsibilities of headquarters staff redefined.

The designation process should be tied directly to the program's mission and vision. Emphasis should be placed on designating areas for the purpose of integrated ecosystem management of marine areas, using the criteria identified in this report (**Criteria, Number and Size**, page 19).

NOAA should explore the possibility of assigning parts of this process to other competent agencies within the Department, where this can be done without vitiating the integrity of the work that they also handle. It should also reevaluate its priorities between acquiring new sanctuaries and adequately dealing with those already in the system. There is very little sense to biting off new pieces when it is already incapable of digesting the old ones. If the Congress chooses to impose new burdens on the program by designating additional sanctuaries to be managed and work to be done, the Congress should also provide the necessary funds and support to allow this job to be done competently and thoroughly.



At present, the sanctuary designation process is estimated to require two and a half years. This may be necessary, but it may also be that this process could be shortened. This question deserves attention.

The sanctuary Program Development Plan is now more than eight years old—it is possible that it is still perfectly suited to the program, but that should be determined anew. In like manner, the Site Evaluation List and the process for determining what gets placed on it should be examined in the light of whatever decision the agency makes on the future of the sanctuary program.

The Ray report bears on this point:

"A thorough revision of the SEL is necessary to resolve how ecologically scaled representativeness may be achieved — i.e., at regional, local, and inter-regional scales — and to define what a "nationally significant" sanctuary system should be. Sanctuaries established on a hierarchy of scales are required to address such issues as sustainable resource use, biodiversity, and global change. This is a challenging scientific question that requires state-of-the-art GIS, modelling, and interpretation."

Recommendation:

Adequate resources must continue to be available to the sanctuary designation process. Rather than divert these resources, new funding and personnel resources are needed to manage effectively the sanctuaries already in the system.

Transfers of Resources and Responsibility to the Field

The responsibilities of the sanctuary headquarters office should be clearly established, and the lines of authority should be clearly drawn. One step that should be taken at the headquarters level would be to bring in

national research and education coordinators, to work with appropriate people in the field and in other agencies as well. Specific responsibilities that should be assigned to these individuals would include: (1) monitoring ongoing projects; (2) developing research and education agendas to support sanctuary activities; (3) developing program priorities and helping to arrive at an overall program budget; (4) facilitating communication of the results of programs developed within individual sanctuaries; and (5) developing guidelines for research and education activities and helping to define job descriptions for people handling these duties in the field.

Having achieved this, it is the panel's view that there may be merit to relocating regional managers from headquarters to new regional offices much nearer to the field sites. The sanctuaries are, after all, the program's *raison d'être* and the places where the program will ultimately succeed or fail. Such regional centers need only accommodate the existing regional management framework located in Washington, and they should wherever practicable use space and support staff already available to the sanctuary program or its partner agencies in the states. The establishment of effective ways to maintain regular communication upward to headquarters and outward to site managers and partner agencies must be an integral part of this structural adjustment.

Recommendation:

Headquarters should be charged with placing sanctuary managers, setting policy for sanctuary operations, providing strong and effective guidance where appropriate, and monitoring sanctuary operations to see that policies and guide-

lines are being followed. At the same time, much responsibility for sanctuary management and operations should be decentralized and assigned to regional managers, or sanctuary managers that are closer to the sanctuaries themselves.

Responsibilities of Sanctuary Managers

A first-rate sanctuary program will need first-rate people to operate the sanctuaries, and we ought not to settle for less. The current selection process relies heavily upon assignments from the NOAA Corps, provides little or no opportunity for adequate training of managers, nor does it provide the guidance and resources they need to do the job properly.

If NOAA expects their field personnel to work effectively with state and local organizations, it must include, as an important element of the selection process, the ability to locate these people. Once in place, regional and sanctuary managers should be given encouragement and authority to handle field operations without constant reference to headquarters for decisions that should be made in the field. Responsibility must be assignable, and with it, accountability.

Permits for nonconsumptive scientific research and educational activities ought to be delegated to field offices instead of being referred to Washington, as they now are. If the field offices fail to fulfill their responsibilities, the solution is to find the right people in the field—not to further separate authority from responsibility by clasping it to headquarters' bosom. Clearly some permits, involving significant risk to the integrity of



specific areas, should still be discussed at length with agencies and people elsewhere, but this decision ought properly to be a function of the discretion vested in the management of the system.

Regional and sanctuary managers should be encouraged to develop new initiatives and innovative programs with local communities and organizations. An excellent start has been made in the Channel Islands sanctuary to develop a range of educational materials and programs, using resources cooperatively developed with schools, museums, colleges and other community groups. This kind of effort should be given wide encouragement within NOAA in general, not just within the sanctuary program.

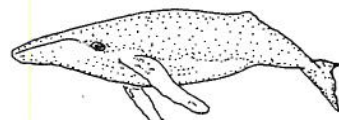
Managers should be enabled and assisted to develop better lines of communication between sanctuaries, as well as up and down the chain of command. Periodic meetings of sanctuary managers, augmented by electronic mail capabilities, will help all stay abreast of new developments, as well as take advantage of new concepts that appear to be working in one or more of the individual sanctuaries.

As the sanctuary program develops, it will inevitably be necessary to shape it to meet local conditions. When and as the Florida Keys sanctuary takes shape, it will clearly be beyond the ability of a single manager to administer the entire area, as well as work with state and local officials concerned with the area. Similarly, as the sanctuary system in California, and perhaps in the state of Washington, matures, it will almost certainly be necessary to break these areas into subsets, perhaps under the supervision of an overall sanctuary supervisor. Here again it will be important to allow the delegation of authority

to the appropriate officials in the field.

Recommendation:

The program must attract, train and support effective sanctuary managers. Once in place, managers should be encouraged to work closely with local groups and institutions.



Personnel

Many of the goals and objectives that we believe reasonable for this program to achieve depend upon the adequacy of financial and personnel resources if they are to be achieved. Today those resources are clearly insufficient. Requesting adequate financial resources is the responsibility of the Executive Branch; providing these resources is that of the Legislative Branch.

A successful marine sanctuaries program will ultimately stand or fall on the quality of the personnel who carry it out. This is no reflection upon the capabilities of the people currently involved in the sanctuaries program; it is a clear call to identify and select the right people to make it work in the future. While there are undeniable advantages inherent in drawing site management personnel from the NOAA Corps, it is important that steps be taken to develop and maintain a cadre of non-Corps managers who can make a long-term commitment to the marine sanctuaries program as a career.

The program we propose is exciting and will attract highly competent and motivated personnel. These people exist. They should be identified, recruited where necessary, trained and given the tools to allow them to do the job.

Recommendation:

The program needs to identify, retain or attract and train high-caliber personnel.

Visibility

The Marine Sanctuaries program today is a well-kept secret with respect to other agencies in NOAA, the Department of Commerce, the Federal Government and the public at large. Most of those who know something about it seem to have reservations about its adequacy or importance. Even in the areas where sanctuaries are located, it is often not easy to find the sanctuary office, let alone people who are familiar with and supportive of sanctuary operations.

With all these constituencies, the sanctuary program needs, and would profit from, much wider visibility and awareness of what it means, and what it could mean to them. We are particularly sensitive to the need to develop closer cooperative relationships with people in the communities directly affected by sanctuary operations, and with those who are most likely to visit and use sanctuaries, but these are far from their only potential supporters.

Many more people have heard, and have strong positive feelings, about the Grand Canyon and the Great Barrier Reef than will ever visit them. The Florida Keys, to take one example, could achieve that kind of public support and encouragement if NOAA were to develop the public awareness and understanding that it could, if it were to seize the opportunity.

The panel feels strongly that the program should be elevated in importance within NOAA, removing it from

the relative obscurity in which it now languishes and placing it at a point in which the Administrator is directly involved. If the Sanctuaries Program were redesigned as a Program Office within the National Ocean Service, at the level of the four other offices within that service (Charting and Geodetic Services, Ocean and Earth Sciences, Ocean Resources Conservation, and Assessment and Ocean and Coastal Resource Management), it would provide a measure of visibility and vitality that it critically requires. If the program is to achieve the kind of preeminence that we believe it capable of, and assume the leadership role that we contemplate, it must clearly assume a larger role within the agency.

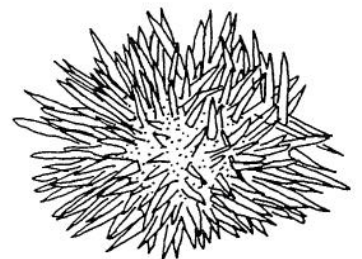
Recommendation:

The sanctuaries program needs to be given higher visibility and status within the agency, with other agencies and with the public. It should be elevated to Office status within the agency.

Priorities

The panel has looked carefully at the priorities that appear to exist today, and at what it considers those priorities might be, if the program were to be reorganized and reconstituted.

In terms of the Sanctuaries Program itself, the panel considered it a matter of highest priority to put into place as soon as possible an effective, well-managed operating model. For a number of reasons, chiefly having to do with the integrity and geographical reach of the system, we recommend that the proposed Florida Keys National Marine Sanctuary be so designated and established.



The highest level of priority should be given to strengthening the management of existing sanctuaries and developing more effective, well-managed operating models from the sanctuaries now in the process. For different reasons, the sanctuaries currently under development for the Florida Keys and the central California sanctuaries offer outstanding opportunities. NOAA should recognize this, take full advantage of the opportunity and make a priority of the rapid development of these excellent models.

Given its integrity, geographic reach and its international reputation, the Florida Keys is an excellent choice to be brought on line as soon as this can be done. This would involve an open and complete public planning process, a well-designed research and monitoring agenda, an expanded enforcement program patterned after the one already in the Key Largo and Looe Key sanctuaries, and an education and outreach program. It would also require adequate staffing, clear rules and regulations, adequate facilities, the continuation of an already well-designed and defined working arrangement between the federal and state governments, with participation as appropriate on the part of local authorities, an adequate operations budget and the infusion of additional trained and competent managers. It will probably be useful to subdivide the management of the Florida Keys Sanctuary into as many as four subdivisions under the overall direction of a sanctuary supervisor, retaining close working arrangements between the subdivisions.

Similarly, the marine resources of Monterey Bay and the central California coast, combined with their visibility and the extraordinary level of public support for resource protection and the sanctuary program in the area, offer an

important opportunity to the sanctuary program. The strong public support in the area makes this priority particularly attractive, since it virtually assures success if an effective sanctuary system can be established. Equally importantly, the informed and environmentally-oriented community in the area will view this effort as a failure unless the sanctuary's boundaries and regulations provide real protection from threats to this system's integrity, including oil and gas activities, vessel traffic, overfishing and pollution. The operational elements mentioned in connection with the Florida Keys sanctuary will also be important for this effort.

Although these would surely be ambitious undertakings, the time, effort and resources required to create such model operations would be well repaid in heightened public appreciation and support for the Marine Sanctuaries Program.

It is also important to assign some sense of priorities in the designation and establishment of sanctuaries themselves. Individual sanctuaries may, and usually will, satisfy a number of criteria. It would be useful and important for the sanctuary system to encompass areas adjacent to the United States in such a way as to incorporate a true sample of each of the twelve biogeographical provinces that have been identified in U.S. waters. As it happens, the Florida Keys precisely meets this criterion. Within these provinces, it should further be possible to take steps to protect and enhance their biodiversity, and this is an important element of an effective sanctuary system.

A number of values are likely to be incorporated in any existing or proposed sanctuary. Some of these values will be present, to some degree, in most areas. Principal among these

are the biological and ecological values that they contain, but other values are to be found as well: recreational, economic, esthetic and cultural/historical. How these are to be ranked or weighted is a complex decision, not within our capability to resolve at this time. Still, it is important to recognize that this multiplicity of values does exist and that enhancing and protecting these values is a vital element of this program.

Recommendation:

A high priority should be assigned to strengthening the management of existing sanctuaries and utilizing the tremendous opportunities to develop strong effective model sanctuaries in Florida and California. In addition, priority should be given to new sanctuaries that will enhance biogeographic representation and plug gaps in the existing system.

Cooperation with Other Programs

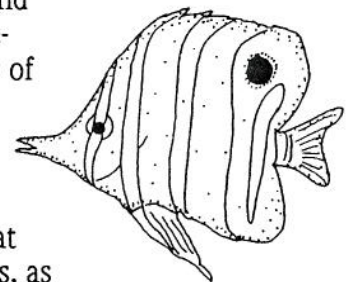
At present, the sanctuary program is small and is not generally known within other agencies of government, or to the public at large. Where it is known, it is frequently regarded as an irritant or as essentially irrelevant to ongoing activities.

This program cannot achieve its objectives acting alone, nor should it attempt to do so. Others, inside and outside government, have parallel or complementary objectives, and it is only good sense to work with these to achieve a purpose that all can support. A vigorous outreach program would, we believe, pay handsome dividends.

Heightening the visibility of the program will be an important step in this direction—people can't help you do your job if they don't know what it is or who you are. The other half of the equation involves selling your program—letting people know how they themselves will *benefit* from what it is you are trying to accomplish.

There are already several federal agencies whose programs intersect those of the Marine Sanctuaries Program. Many of them are within NOAA (Hazardous Materials, Strategic Assessment, Endangered Species, Marine Mammals, Sea Grant, NMFS, Coastal Zone Management are included in this list, and there are almost certainly others). Sanctuaries and their operation intersect with several other existing NOAA programs, and some thoughtful work should be done on the best way to integrate these. Among these, NMFS, Sea Grant, CZM, etc. are currently performing research that could be done in marine sanctuaries, thus satisfying needs of both agencies. For example, marine mammals can be found, some of them also endangered or threatened, in the California sanctuaries. Precisely **who** assumes **what** role for their protection and management may not be clear—it certainly was not clear to us. Other agencies in the federal government have extensive responsibilities that affect coastal and marine ecosystems, such as the Department of the Interior, the Corps of Engineers and the Environmental Protection Agency.

State governments also have considerable powers and duties that affect the management of resources, as well as education, research and law enforcement. Close working relationships with state agencies is an essential element of an adequate marine sanctuaries system, and important strides



have already been taken in this direction. Cooperation with the State of Florida is strong and effective, and should serve as a model for such efforts in other states.

All services of NOAA, and its state partners in the sanctuaries program, should examine the merits of using these sanctuaries as their public "windows" on the marine environment—places wherein not only the sanctuaries program itself but also other NOAA and state marine environmental management and research programs can reach a much broader public audience than is currently available to them. The benefits of heightened cooperation among agencies, and of much greater public awareness and understanding of marine environmental issues, and government initiatives to address them, will be obvious.

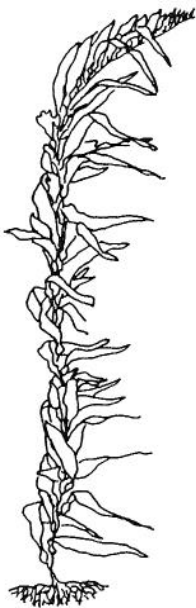
Local communities have perhaps the strongest direct interest in a workable marine sanctuary program, since it is here that the use of the sanctuaries takes place. In some cases today, relationships with local institutions are already close and supportive, but there are, of course, always additional steps that might be taken.

In situations where other agencies share enforcement and protection responsibilities with the Marine Sanctuaries Program (e.g., marine mammals and endangered species), memoranda of understanding should be developed, specifying what tasks each should take on. These memoranda should be used to strengthen and enhance, not weaken, the program's protective mandate.

The Chairman of the Great Barrier Reef Marine Park Authority, has commented eloquently on this point: "...it will be clear that the key to any suc-

cessful program will be public support. This only comes from deliberate and enthusiastic involvement of the public in all elements of planning and research. I cannot emphasize this point too strongly. Bureaucrats, who often judge the value of their lives according to the power they have wielded either publicly or covertly, fight like the devil to prevent the public from having any real say. This is a formula for failure. If you want to do what we have done, you will need to work very closely with the Non Government Organisations (NGOs) as your allies. None of the above implies that the public actually has the decision making power. Neither does it suggest that you will ever get agreement from all of the public, nor that you will get full agreement from any sector of the public (e.g., an NGO). However, as Churchill said about democracy 'it is a very poor system, but it is much better than any alternative'." (Letter from Graeme Kelleher to Frank Potter, December 20, 1990.)

NOAA should develop an energetic and comprehensive program to increase public awareness and support of marine sanctuaries. One step might be to provide a range of materials for public education, such as interpretive exhibits, formal and informal education materials, public television programs, videotapes and other educational materials. These could be made available in local communities through aquaria, museums, dive shops and other organizations interested in water activities. The Great Barrier Reef Marine Park Authority has developed just such an array of informational materials, and it plays an important role in ensuring that program's justly deserved international reputation. We are not here proposing yet another barrage of brochures and glossy handouts, but material with some depth and



weight, that will inform what we believe to be an interested and supportive constituency for the rejuvenated program.

The story that NOAA should be communicating is that of the positive impact that a healthy marine ecosystem can have, and the steps that are necessary to achieve this objective. Where concentrated tourist use of a sanctuary can threaten the quality of conditions in the sanctuary, that story must be told. NOAA has already produced materials for some of the waters for which it is responsible in Florida, and this effort deserves to be amplified and communicated to a wider audience.

National and local organizations with environmental concerns are an obvious constituency for the marine sanctuary program, and here NOAA's record is mixed. In some regions, good working relationships have evolved, and in others, bureaucratic dragons thrive. It would be very much worth the effort to improve these connections wherever possible, enabling organizations with strong local and national memberships to pass on the message that the process of cleaning up and protecting critical marine areas has begun and that this is an issue in which everyone has an important stake.

A critical element of this message is that these systems, like most environmental systems, are ones for which a longer-term vision is necessary than is customary in decision making today, particularly in the public sector. In the recent past, there has grown up a doctrine of discounting assets for the future. Such a concept may perhaps make sense when applied to standard economic assets and values—it makes no sense at all when applied to the

physical environment that supports life on this planet. To treat the future of an essential element of a support system that involves tiny elements of an ecosystem, such as microbes and algae, and large elements of that system, such as trees, whales and man, as irrelevant in the very near future (a discount rate of 10% assumes a zero value in less than eight years) is, it seems to us, a philosophy that is leading us in the wrong direction. NOAA could play an important role in reversing this trend.

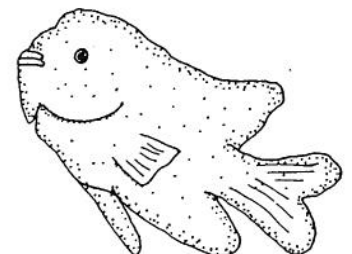
Recommendation:

The Marine Sanctuaries program must develop effective, cooperative and supportive working relationships with other institutions and organizations with related interests.

Experience in Other Programs

We have already mentioned the Great Barrier Reef Marine Park as an important potential model for the U.S. system. NOAA could profit from a careful review of that park, with particular attention being paid to the success which it has achieved, as well as the problems that it still faces. The working arrangement that has evolved over the years between the Australian national and state authorities may suggest similar possibilities for consideration as the U.S. system develops. The Florida Keys sanctuary is a place where such insights might be invaluable.

Other nations have taken steps that might offer useful information on opportunities and risks for an ambitious program for marine sanctuaries. Canada, England, New Zealand and Scotland have all done some innova-



tive work in this field. The office of the World Conservation Union (formerly International Union for the Conservation of Nature) in Gland, Switzerland has developed a large database of national laws and regulations that might be particularly useful in designing such a system.

A relatively small amount of time and energy spent in examining these experiences might be well invested in seizing opportunities and avoiding problems in the United States Marine Sanctuaries Program.

Recommendation:

NOAA should carefully examine and evaluate similar programs now in place or under development in other countries.

Criteria, Number and Size

The number of the units in the National Marine Sanctuaries Program, as well as their size, will be determined by the designation of sites based on a clear set of site selection criteria. These criteria focus attention on the marine areas that best fulfill the goals and objectives of the program.

Site selection criteria may be divided into two broad categories:

A) Outstanding marine areas (on a relatively large geographical scale) representative of the biogeographical provinces of the U.S. coast and,

B) Areas that meet one or more of the following criteria:

- They contain habitats and/or living resources that are unique in their occurrence.

- They contain unique or outstanding ecological, biological, geological, oceanographic, cultural or historical resources.
- They contain habitats critical to rare, threatened or endangered species.
- They contain habitat critical to the conservation of living marine resources.
- They represent relatively pristine/undisturbed coastal marine resources.
- They are areas in which harvest refugia (reproductive refuges) should be designated to maintain or replenish depleted living resources.
- They are areas of particularly high natural productivity.
- They are significant in maintaining biodiversity in coastal marine ecosystems.

The marine sanctuary system today contains several distinct areas, each with its own unique set of resources, problems, and opportunities. These are located in five of the twelve recognized biogeographical provinces in U.S. coastal waters. Beginning off the coast of Maine and proceeding in order, they are: Acadian, Virginian, Carolinian, West Indian, Louisianian, Vera Cruzan, Californian, Oregonian, Sitkan, Aleutian, Arctic/Subarctic and Indo-Pacific. (For a more complete description of these, refer to the study by Carleton and Jerry Ray: "A Future for Marine Sanctuaries.")

Five of these now contain sanctuaries that meet at least some of these criteria; when and if Stellwagen Bank, Norfolk Canyon and Flower Garden Bank are added, this will bring the total to eight. In the case of the Florida Keys, Channel Islands, Gulf of the

Farallones, and Cordell Banks, the units provide sufficient resources to protect biodiversity and offer an opportunity to create one or more reproductive refuges where depleted species could recover.

In giving attention to the completion of the marine sanctuary system, it is important that the sanctuaries program not attempt to be all things to all who bring their expectations to them. Early scientific attention should be given to the thorny question of how much representation of a biogeographic province is "enough." It should be borne in mind that the ideal would be for sanctuaries to be capable of management as functioning ecosystems. The regions encompassed should be large enough to be managed with full regard to those elements and resources that allow them to function as ecosystems. Useful guidance may perhaps be taken from the Brundtland Commission's recommendation that 12% of the Earth's surface should be set aside within protected areas, although the adequacy of that standard in marine environments warrants more study—it may be too low.

The larger sanctuary units (like the Florida Keys or Monterey Bay) can provide the focus and marshal the resources necessary for a coordinated long-term research and monitoring program. Such an effort could be directed toward achieving comprehensive understanding of the systems ecology of marine areas of significant size and scope. Models developed for these areas will be useful not only to inform the ongoing resource management for the specific sanctuary units, but also as models which might be applied to other and larger marine areas throughout the world.

It is understood that while the National Marine Sanctuary Program can hope to develop informed and comprehensive management plans for the sanctuary units themselves, the effective management of the majority of marine resources, both living and non-living, will require the coordinated efforts and significant levels of research funding from other NOAA offices as well as other agencies of government.

We are unquestionably seeing increasing signs of accelerating degradation of living marine resources. Marine sanctuaries offer the possibility of arresting, and perhaps even reversing that process, at least in some areas. In fact, this is already happening in some sanctuaries, although on a very small scale: Large fish are beginning to return to Looe Key after limitations were placed on the manner in which they may be taken.

The global climate change that may already be occurring may be particularly relevant to fragile marine ecosystems. Today we have little ability to monitor those changes. Further, it might be possible—and if possible, it would certainly be enormously useful—to use marine sanctuary areas as laboratories to develop insights into relationships of resource protection to its long-term sustainable use.

The last twenty years has seen the evolution of the concept of "biosphere reserves," or areas to be protected as critical elements of important ecosystems. The concept has taken hold on land, and a number of areas have been established that meet the criteria established for such regions. Marine sanctuaries would be a perfect example of what might be done with such a concept, and the Florida Keys Marine Sanctuary may be ideally



situated for such status. The Man and Biosphere program should be reviewed in the light of its particular and potential relevance to a revitalized Marine Sanctuary program. Here again, NOAA is confronted by a real opportunity.

Recommendation:

At a minimum, each of the biogeographical provinces in U.S. waters should be represented in the system, with one in each of these being sufficiently large to offer reasonable assurance that these regions will be adequately represented. In addition, sanctuaries should be established to protect natural and historical areas that contain rare, critical, unique, outstanding or otherwise special resources, and there should be further analysis of how much representation is required in the system.

Outside Review

The panel has had an excellent, albeit limited, opportunity to examine the overall direction of the marine sanctuary program. Some deficiencies and shortcomings have been disclosed that, from the advantage of distance, seem fairly obvious, although they may not have seemed so to people charged with everyday operation of the program.

The program should continue to use outside review as a check on its progress. We are not requesting reappointment, but we do recommend that some comparable institution be created. Whether such a panel should be created as an "Advisory Committee," with all the attendant rules and obligations that such committees are subject to, is beyond the scope of our review. Another possibility is that such a panel be

given authority comparable to that of the Marine Mammal Commission, which can make recommendations to the Secretaries of Commerce and Interior that *must* be responded to.

Individual sanctuaries could also profit from closer involvement with advisory groups. Some may feel that this could make it impossible to reach decisions—that operating in a "goldfish bowl" may inhibit sound decision processes. We find this argument unconvincing and suggest that local communities may find it much easier to support sanctuary activities if they are allowed to play a greater role in guiding their operations.

Recommendation:

Regular independent review should be a continuing element of the sanctuary program.

Creation of Supporting Institution

Organizations, some with federal charters, exist to fill these roles with respect to other programs. The National Park Service and Fish and Wildlife Service have such organizations associated with them.

Such organizations can serve as foci for national publicity programs, as centers for private fundraising to support individual areas, and to act as interfaces with local or commercial ventures anxious to play a positive role in furthering program objectives. Interactions between such organizations and their federal counterparts can be valuable for all concerned.



Recommendation:

NOAA should explore the possibility of a national nonprofit organization that is in a position to advise and encourage the marine sanctuary program; local cooperating organizations can also be of great value to the operation of sanctuary programs.

User Fees and Outside Support

In recent years, the concept of "user fees" has been widely discussed as a supplement to regular legislative appropriations. We are unable to specify what those fees should cover, what their level should be, or how they should be collected, but we do note the success of the "Golden Eagle Passport" program in the National Park System, and suggest it as a useful example for further study with respect to the sanctuary system.

Fines and penalties from ship groundings and other violations of regulations are currently allocated to the sanctuaries themselves; this practice should be continued, and perhaps even amplified by making certain that all those funds be allocated to the sanctuary in which the violation occurred. Similarly, vessel confiscations as a result of criminal activities may continue to provide an important asset to the program.

NOAA may also wish to look into the possibility of establishing concession arrangements for activities associated with sanctuary operations, although we are aware that this is an area not without controversy, and that we may conceivably be opening

Pandora's Box in suggesting it. Accordingly we do no more at this point than suggest it for further consideration.

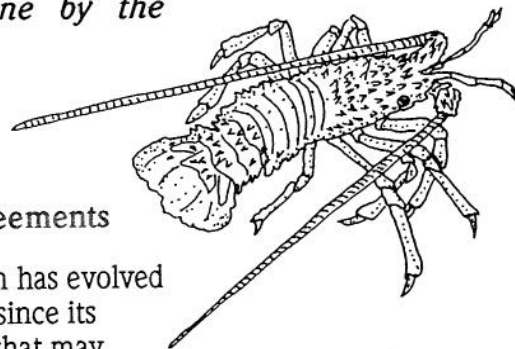
Recommendation:

Part of the costs of the sanctuary program should be borne by the constituencies it serves.

Review of Existing Intergovernmental Agreements

The sanctuary system has evolved and changed in the years since its inception. Arrangements that may have worked well in the past should be reviewed in the light of new circumstances and conditions. For example, the State of California has been assigned responsibility for regulatory enforcement in sanctuaries in and near state waters. Its enforcement budget and program are clearly inadequate to meet the demands on the system. Most of the funds supporting enforcement come from permit fees levied upon fishermen who operate in coastal waters. State enforcement agents are understandably reluctant to enforce regulations upon these fishermen, since vigorous enforcement might well drive some marginal operators out of business, thus further eroding the financial base of the enforcement program. The result, in the Channel Islands, at least, is that the local sea urchin and abalone resources have been devastated by overfishing; paradoxically, scarcely any of these animals can now be found within the Channel Island sanctuary itself. The "Tragedy of the Commons" reasserts itself, and we are the poorer for it.

A more useful example may suggest itself from the cooperative working arrangements with enforce-



ment personnel in Florida. Here the concept of "interpretive enforcement" seems to work well, as it does in Australia, where enforcement responsibilities have been undertaken by officials of Queensland. In these cases, enforcement officers exist as an important element of public contact, not just as police officers checking permits and visitor activities, but also as helping visitors understand what activities may be harmful to the reef and how to avoid these.

Our remarks should not be taken as necessarily critical of California, but as suggestions that we may be able to learn useful lessons from other places, and that those examples could perhaps replicate themselves in new territories. In a similar vein, the educational programs that have been developed in California and Georgia (in connection with the Gray's Bank sanctuary) could well suggest themselves as useful models elsewhere in the sanctuary system.

Time has passed since the sanctuary system was first established, and NOAA ought now to be in a position to derive some useful experience from the history of individual sanctuaries, and to explore the possibility of transferring this experience elsewhere within the entire sanctuary system.

Recommendation:

Existing intergovernmental arrangements with state and local authorities should be reexamined and, where appropriate, renegotiated by NOAA.

Name of the program

There has been considerable discussion about the value of changing

the name of the program. The panel concludes that the program's name should not be changed without a clear and compelling reason to do so.

Recommendation:

The name of the program should not be changed.

Zoning

One characteristic of successful marine protected area programs is that they provide a complex and sophisticated conception of multiple use of marine resources, while at the same time ensuring the protection of vulnerable species, communities and habitats. Use of these resources can be separated by boundaries of space, time or both. Zoning of large sanctuaries is very much an option, and this is a practice that has been implemented with great success on the Great Barrier Reef. Zoning is also an important management tool in many other international marine protected area programs.

Zoning systems have also been suggested for sanctuaries in this country. Once the system begins to include large areas, such as the proposed Florida Keys Sanctuary, an effective zoning system will become an essential management tool. Within a properly designed sanctuary system some species and habitats will receive almost complete protection, but this is certainly not the case for all areas, at all times and in all places. There will undoubtedly be a requirement for zones of strict preservation, or "harvest refugia," but there will also be zones within which varying intensities and types of resource use can be accommodated. Zonation will allow a degree of

protection not available outside sanctuary boundaries.

NOAA has already initiated the study of zoning concepts, both internally and in discussions with managers of protected areas in other nations. This work must continue, with a view to putting in place effective zoning systems when management plans are prepared during the designation process for large new sanctuaries such as the Florida Keys sanctuary, and those proposed for Monterey Bay, the Outer Washington Coast and Puget Sound. An important part of this task will be to determine what resource uses and scales of use are appropriate to the various zoning categories that are identified.

Recommendation:

NOAA should devise and adopt an appropriate zoning system for national marine sanctuaries as a priority matter, beginning with the new, large sanctuaries now in the designation process.

Relationship with National Estuarine Research Reserves Program

Another thorny and ultimately unresolved issue has to do with the relationship between the marine sanctuary program and the estuarine research reserve program authorized by the Coastal Zone Management Act (which, not entirely coincidentally, was also enacted into law in 1972). The programs have much in common, and NOAA, not unreasonably, moved both programs into the same office.

A comparison of the two programs is instructive, showing the

similarities between the two programs, as well as the differences, which are also important. If, as we suggest, the sanctuaries program should be elevated within NOAA, and perhaps moved elsewhere within the agency, it will also be important to maintain good working relationships between the sanctuary and estuaries programs.

"These programs both have strong features that can be enhanced via synergism. Some estuarine and marine sanctuaries coexist in an ecological and regional context, especially over wide continental shelves.... Management of these can be coordinated and directed toward land/sea ecosystem protection. Coordination could benefit program management, education, and research, as well as simplify management."

We concur completely.

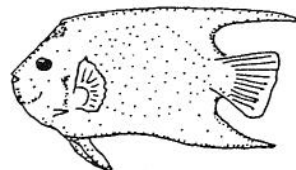
Recommendation:

The Marine Sanctuaries Program and the National Estuarine Research Reserve Program have much in common and should continue to be encouraged to work closely together in the future, as they have in the past.

Development of Research and Education Agendas

Here, we can do no better than to cite the Ray report once again:

"The NMSP, with experience gained from Estuarine Research Reserves and other programs such as the National Park Service, should develop a research agenda



that is directed towards conservation and management, but that is also open to basic research. This requires that a research coordinator at a senior level be hired to help identify research needs at national and site levels, and to develop a research and monitoring PDP. Efforts should be made to develop projects that can address the major environmental problems of the '90s and that are cognizant of the many on-going programs of NOAA and other agencies, as well as internationally.

"Similar to the Research Agenda, an Education Agenda would guide educational goals and differentiate between education and public relations. Such an Agenda could determine how best to utilize services that can complement both the Program and local interests."

A clear agenda for research and education would go far to demonstrate to the public NOAA's commitment to a vital, functioning marine sanctuary system.

The National Research Council has created a Committee on the Coastal Ocean to focus on coastal ocean science, particularly on issues that are not currently receiving adequate attention, and that might benefit from a fresh assessment effort using data and information available today.

The sanctuaries program is not represented on this Committee, but it should be, because this Committee's efforts are concentrated on precisely the kinds of issues that an ongoing and alert sanctuary program must deal with.

Recommendation:

NOAA should develop clear research and education agendas for the Marine Sanctuaries Program. These agendas should be fully integrated with the research and education agendas of other NOAA agencies and also, to the maximum extent possible, integrate these agendas with those performed outside NOAA by other federal agencies, and private and international organizations.

NOAA should ensure that all its coastal and marine programs are appropriately represented on the National Research Council's Committee on the Coastal Ocean.

Panel Conclusion:

If the issues discussed in this report are clearly addressed by the Administration and the Congress, the Marine Sanctuaries program can achieve success and meet the expectations created when it was established in 1972. All that is required is the resolve to make it happen.



Appendix A

Members, Marine Sanctuaries Review Panel

Co-chairmen:

Frank Potter—Secretary-General, International Network for Environmental Policy

Douglas Yurick—Assistant to the Assistant Deputy Minister, Canadian Parks Service

Members:

Jim Brown—Executive Training Director, NAUI

Jay Calkins—Director of Marine Extension, Sea Grant, Georgia

Jake Dykstra—President (ret), Pt. Judith Cooperative

John Humke—Vice-President for Agency Relations, Nature Conservancy

Pamela McVety—Director, Division of Marine Resources, Florida Department of Natural Resources

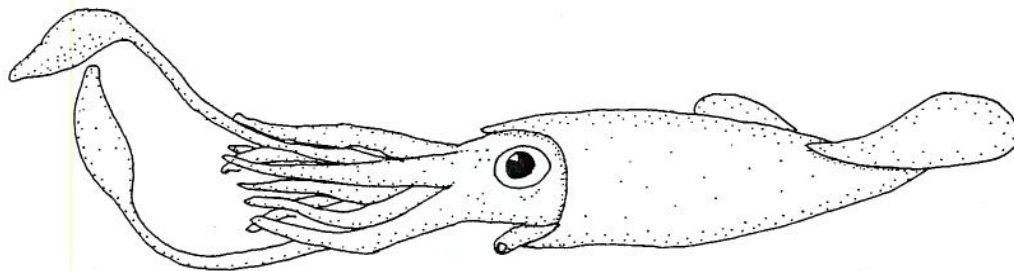
Michael Naab—Director, Maritime Preservation, National Trust for Historic Preservation

John Peschke—American Petroleum Institute

Jack Sobel—Director, Marine Protected Resources Program, Center for Marine Conservation

Sarah Taylor—Executive Director, Critical Area Commission

Steven Webster—Education Director, Monterey Bay Aquarium



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