Safeguarding America's Seas:
Establishing a National System of Marine Protected Areas

A CALL FOR PRESIDENTIAL ACTION

Recognizing the ecological, economic, and social importance of the marine waters under US jurisdiction and the threats facing them, we urge the United States to establish a comprehensive system of marine protected areas (MPAs) that, in conjunction with other management approaches, safeguards the nation's marine environment.

Recommendations

1. There is an urgent need to protect the nation's declining marine environment, though we acknowledge the fact that democratic processes take time. Recognizing the urgency of the situation we urge the federal government to evaluate all marine regions of the US as the first step towards establishing a national system of marine protected areas. This should be achieved by establishing a permanent, interagency, high-level, federal National Marine Protected Area Council immediately, and instituting Regional Marine Protected Area Councils within one year to oversee the process of network design and new MPA designation in each region. Upon establishment, each Regional MPA Council should immediately begin the process of building the networks, taking advantage of existing opportunities and extant marine protected areas. The National Council should a) establish national standards for Regional Councils that are consistent with the criteria outlined in the Appendix below, b) identify opportunities for establishing MPA networks and individual MPAs within the federal framework, and c) work closely with Regional MPA Councils and local stakeholders. The processes used to build the MPA system must be participatory, decentralized, and transparent.

We suggest a benchmark goal of a minimum of 2% of US marine waters protected in no-take marine protected areas within 5 years, spread geographically and across biomes. The US government should begin designing ecological networks of marine protected areas immediately, with the goal of full implementation in 15 years time (see 'National Goal' below).

2. We urge federal agencies and Regional MPA Councils to take advantage of existing opportunities to begin developing an effective system of MPAs immediately. Federal

initiatives already begun include efforts by the interagency Coral Reef Task Force and ongoing management reviews at National Marine Sanctuaries. Moreover, to implement recommendations on MPAs made in Turning to the Sea: America's Ocean Future, we recommend that the principles included in California's Marine Life Protection Act be applied to federal waters within the Exclusive Economic Zone off California, and that the federal government provide financial assistance to the state of California to implement the mandates included in the Marine Life Protection Act. Federal funding to implement the Marine Life Protection Act would help the California process serve as a pilot project and learning experience for the creation of a National MPA system.

Why the US needs a national system of MPAs

Submerged lands under United States jurisdiction occupy more than 4.4 million square miles, an area much larger than all other federal lands combined; indeed larger than the entire US land area. Moreover, the United States–from Guam and Alaska to California, from Maine and Texas to Puerto Rico–has the highest marine ecosystem diversity of any nation in the world. Yet, the USA has no comprehensive system to protect this unequaled national treasure.

The sea is important

The portion of the Earth that supports life–the biosphere–provides goods and services essential for the survival, security and prosperity of the United States. Every bite of food we eat, every drop of water we drink, every breath of air that we breathe is produced by living things, and it would require more than the Gross Domestic Product of all the world's nations combined to duplicate these services. The living sea–covering 71% of the Earth and constituting more than 99% of the habitat for animals and plants–is the largest part of the biosphere. Marine ecosystems are home to many kinds of living things that occur nowhere else. They protect shorelines from erosion, break down wastes, moderate climate and maintain a breathable atmosphere. Marine species provide a livelihood for millions of people, food, medicines, raw materials and recreation for billions worldwide, and are intrinsically important.

The sea is imperiled

Life in the world's estuaries, coastal waters, enclosed seas and oceans is increasingly threatened by: 1) overexploitation of species, 2) physical alteration of ecosystems, 3) pollution, 4) introduction of alien species, and 5) global atmospheric change. In recent years we and other scientists have witnessed a rapid increase in severe environmental problems off our coasts, including the collapse of once-bountiful New England cod fisheries, the descent toward extinction of California white abalone, the appearance of a huge "dead zone" off Louisiana, the steady decline of Florida Keys coral reefs, and many more. There is no doubt that the sea's biological diversity and ecological integrity are in trouble.

Existing programs are inadequate

There are federal and state programs with mandates to protect particular aspects of the marine environment, and we recognize that the existing regulatory structure has promise. However, each program was created independently, and in combination they do

not provide a comprehensive, integrated approach to marine ecosystem protection. We have observed continued degradation of marine environmental health in recent decades despite the existence of these programs. The United States needs new vision for managing our seas. We find that marine protected areas–particularly no-take marine reserves–are essential for protecting and restoring ecological integrity, and ensuring that use of marine life is ecologically sustainable.

MPAs provide crucial benefits

Well-designed and managed marine protected areas provide a variety of benefits, including some that complement other marine management tools and some that are unique to MPAs. They:

- maintain and encourage the recovery of functioning natural ecosystems and ecosystem processes
- protect and restore biodiversity (including genetic, species, and ecosystem - diversity moreover abundance)
- protect endangered/rare species
- protect unique ecosystems
- protect marine wilderness
- protect important habitat, including spawning and nursery areas
- reduce overexploitation and provide refuge from fishing pressure
- enhance fisheries in surrounding areas
- provide an “insurance policy” against uncertainty and errors in fishery management
- provide sites for observational and manipulative research, including areas that can serve as benchmarks and as a source of baseline data in our changing world
- provide educational opportunities
- protect or improve recreational opportunities
- protect or improve opportunities for tourism
- protect cultural and historical resources
- provide economic benefits to local communities and the nation
- provide opportunities to learn from innovative approaches in marine management
- foster appreciation, understanding, and passion for the marine environment
- protect traditional lifestyles
- provide a mechanism to manage the marine environment using the precautionary approach

A national goal for the 21st century

In view of the above benefits to the nation now and for future generations, we urge the United States to establish a comprehensive system of marine protected areas that, in conjunction with other management approaches, safeguards the nation's marine environment. This system must maintain biological diversity and ecosystem functioning, preserve historical and cultural sites, and be resilient to changing environmental and societal forces. The system should also provide support for fisheries management. Management of the system should be precautionary in the face of uncertainty. The system

must include ecological networks that both preserve the connections of ecosystem functioning over local and regional scales and protect viable representatives of all marine ecosystem types in all US marine biogeographic regions. Individual MPAs in the network can have different goals, but should contribute to an interactive and comprehensive network.

To achieve these objectives, diverse lines of evidence indicate the need to eliminate extractive and harmful human activities on the order of a minimum level of 20% of each ecosystem type. Some ecosystems will require higher levels of protection because they are rare, highly threatened, vulnerable, or are critical habitats for key life stages of marine species. This 20% figure is contingent on the quality of management outside marine protected areas. Greater levels of protection will be required where management outside protected area boundaries is poor.

Appendix: Guidelines for Establishing, Designing and Managing a National System of Marine Protected Areas

Definition of MPA

A marine protected area is any area of intertidal or subtidal terrain, together with overlying waters and associated flora and fauna, and historical and cultural features, that have been reserved by law or other effective means to protect part or all of the enclosed environment. Categories of protected areas can range from strictly protected wilderness areas to multiple-use areas. (As adopted by IUCN/World Conservation Union and United Nations Man & the Biosphere Programme).

We take the IUCN definition to mean any marine area, the plants, animals, and other organisms that live there, as well as historic and cultural features, which receive special protections from particular threats. These areas can be moveable, are not necessarily connected to the seabed, and can include areas from the coast to deep water.

Procedures for establishing regional MPA networks

MPAs should be carefully selected, located, designed, and managed to meet the objectives described above. Doing so will optimize their biological and social value domestically and contribute meaningfully to a global representative system of MPAs. Such an approach would also provide a valuable model to other efforts around the world. All efforts to design MPA networks will differ according to the needs and opportunities present in any region. However, there are procedural steps that can be standard in all cases.

First, Regional MPA Councils should do a scoping exercise based on the best available scientific information to describe the target region, delineate the boundaries of the system, explain the ecological connections, and characterize the overall geography.

Second, this characterization should be communicated to the public as a first step toward achieving participatory planning. Outreach efforts should engage the public by communicating the great value of the coastal and marine realms both to local communities and to the nation and planet at large. Through this awareness-raising process, Regional MPA Councils should systematically identify stakeholder groups to be involved in planning.

Third, the Regional MPA Councils should begin the process of objective-setting with all key stakeholders. These objectives will constitute the specific goals of the networks in that region.

Fourth, the Regional MPA Councils should begin the science-based selection and design of sites, using the standards developed by the National MPA Council, including size, shape, management, and evaluation processes. These criteria can and should be weighted differently in the development of each individual MPA and each network, depending on the specific objectives articulated by stakeholders.

The National MPA Council should establish national standards for Regional MPA Councils to use that are consistent with the criteria outlined below.

Site selection and design

To date, most MPA site selection and design have involved little scientific justification and even less consideration of a network approach. A national system of MPAs will be far more effective if its design and implementation is scientifically sound and it meets well-established environmental, social, and political criteria. MPAs can serve a wide variety of functions, and come in a wide array of sizes and shapes. The establishment of new MPAs and the monitoring and evaluation of new and existing MPAs will help improve our understanding of MPA design and siting. The decision of whether and where to establish MPAs should be considered in relation to other management options.

Decision-makers should use the best available information, including scientific, local and traditional knowledge, to examine, systematically, potential sites that could fulfill specific MPA policy goals. Priority should be given to sites that do one or more of the following:

Biological criteria:

- Represent all major ecosystem types in each biogeographic region, based on the best available information.
- Complement or replicate existing and planned MPAs in nearby nations, such as Mexico, Canada, Cuba, and the Bahamas. (Note particularly MPAs established under international conventions such as RAMSAR)
- Retain naturalness, or conversely, have potential to recover from past modification
- Have oceanographic conditions and currents with desirable influence on biological exchange and larval dispersal
- Have adequate distribution, quantity and quality of habitats both inside and outside MPA boundaries that allow for appropriate conditions on adjacent areas for meeting management goals (particularly important for successfully enhancing fisheries outside no-take reserves)
- Are vulnerable or face threats to ecosystem structure and function that can be mitigated by designation as an MPA
- Possess high levels of biodiversity at one or more levels, including genetic diversity, species richness, and diversity of communities in their ecosystems
- Support unique ecosystems or natural features, including areas that are important to rare or endangered species or species assemblages
- Represent a particular level of biological productivity so that the whole network includes the full spectrum of productivity, from low to high
- Support species known to have particularly important ecological roles
- Support economically important species
- Are important to maintaining ecological processes, life-support systems, and life history stages, including areas of upwelling, spawning or nursery areas, feeding and breeding areas, resting areas and migratory stopover areas

- Are important to maintaining productive fisheries, including areas that serve as population sources that can replenish areas outside the MPA, and are capable of returning to historical levels of productivity for fisheries
- Are considered irreplaceable

Socioeconomic criteria:

- Have special cultural or historical values
- Are socially and politically acceptable (not just among local user groups, but acceptable by general public as well)
- Have educational value
- Have aesthetic value
- Have recreational values that would be enhanced or protected by designation
- Are valuable for scientific research and monitoring
- Are valuable based on other criteria, for which there is opportunity to designate an MPA
- Are accessible and safe for education, research, tourism, and recreation (if appropriate, based on the goals and objectives of the individual site)
- Designation as an MPA would create long-term economic benefits that will help offset short-term costs
- Designation as an MPA would provide identifiable benefits to local communities

Other factors to consider in siting include:

- Effects on traditional and/or existing uses (consumptive and non-consumptive
- Legal claims by native/aboriginal people
- The design and management of any single MPA will be a function of the objectives particular to that site as it contributes to a larger MPA network. Some important design considerations include:
- Sizes can vary. However, each MPA should constitute a self-sustaining ecological entity, either individually or as part of a network.
- Networks should consist of large MPAs that can allow for various types and levels of activities within the area (i.e. zones), and/or an integrated network of smaller MPAs with a high degree of protection.
- Where possible, provide protection to adjacent terrestrial areas.
- Context is critical; reserve efficiency is likely to fall as human pressures increase outside reserves. Larger reserves may be more successful in areas of higher impact.

- When designing the networks, use information on life histories, ocean circulation and other relevant factors to create reserves that are ecologically connected so that organisms can recolonize from one to another at some time in their life history.
- Networks should consist of reserves that replicate habitat and species protections and encompass a wide range of places and conditions as a hedge against predicted climate change and catastrophic events. This is also a useful design for study of the responses of marine systems to these events.
- Networks and/or individual MPAs should avoid designs that make enforcement difficult; fewer large areas or zones may allow for more effective enforcement than multiple small areas.
- For fishery benefits, design reserves with the life history characteristics of the targeted species in mind. Individual reserves will provide less benefit to species with high rates of movement and migration, and greater protection to species with shorter dispersal distances. However, networks of reserves can increase benefits to highly mobile species.
- Consider how displaced users will affect other areas.
- Unrealistic expectations can do more harm than good. MPAs will only be effective if based on realistic expectations of effects. Take into account the rates of population growth, reproduction, and maturity of organisms and ecological processes such as succession when evaluating effects of the MPA and when those effects will be evident.

Management

Management of each individual MPA will depend upon the purposes of the particular site. However, certain principles should guide the management of all MPAs:

- Develop clear and measurable goals and establish baseline social and ecological data so that effectiveness can be evaluated on an ongoing basis.
- Design broad monitoring programs that measure target and non-target species and ecological processes inside and outside reserves. Recognize unforeseen benefits that might arise.
- Each MPA should have clear boundaries and a secure status that can only be revoked through a rigorous process.
- Many benefits will be realized only through long-term protection and management.
- Rights to use or access resources must be well-defined.
- Local communities should reap some social and/or economic benefits. When possible and appropriate, provide training and employment to local stakeholders for research and management activities. This can develop desirable skills, enhance local sense of stewardship, and increase credibility of management activities.

- Management must be integrated with and complement other coastal and marine management regimes in surrounding areas. Adjoining waters must also be sustainably managed to address other concerns such as pollution, alien species, overuse, fisheries and more. Adjacent lands should be managed to limit land-based pollution and other adverse impacts.
- Management responsibilities among agencies and other entities must be clearly established to avoid jurisdictional disputes, and agencies should establish communication mechanisms to minimize misunderstandings and coordinate management. Joint use of facilities such as vessels can reduce costs and increase cooperation and efficiency.
- Research, monitoring, and mapping programs (of both ecosystem structure and function) are necessary for understanding the resources to be protected, and providing information necessary for adaptive management and evaluation of management plans. Include monitoring indicators important to the local community. Involvement of stakeholders in research, monitoring and management increases community support and reduces non-compliance.
- Timely and rigorous evaluation of reserve performance is essential if reserves are to be effective and management plans must be periodically reviewed to allow for adaptive management. Establish a mechanism with feedback loops between science, monitoring, and management.
- Develop education/participation plans for interested stakeholders and the local community. Continuing public education and outreach can help stimulate compliance, understanding, and appreciation. Reporting of management results should be included as part of these public programs.
- Adequate enforcement is necessary to meet the goals of each MPA. Enforcement includes effective monitoring, appropriate graduated sanctions, and accessible conflict resolution mechanisms. A “threat analysis” should be performed to predict the likelihood of compliance and the resources needed for adequate enforcement.
- Biodiversity protection and ecosystem functioning should be the top management priority. Some MPAs, and portions of other MPAs, should be managed free from extractive activities as “marine wilderness” to enhance protection of marine biodiversity and ecosystem functioning.
- Zoning of different uses within a large protected area should be examined to help protect resources and biodiversity. This could include “core” zones with strict protection and “buffer” zones that allow uses compatible with MPA goals; but is not limited to this approach.
- A precautionary approach should be used in management, in which managers err on the side of caution in the face of scientific uncertainty. The precautionary approach emphasizes the prevention of ecological damage by dictating that an activity be restricted or prohibited, or that corrective action be taken, when a negative environmental effect is deemed likely, even when the scientific evidence is inconclusive. Rather than requiring proof that a

proposed activity will cause harm, it requires convincing evidence that a proposed, potentially damaging, activity will not cause environmental harm.

- Adequate funding for implementing the management plan is necessary for success, including adequate funding for research and monitoring, evaluation, restoration and enforcement. To enhance funding, managers should be encouraged to look beyond agency-provided funding to seek support from a variety of sources.