

MARINE PROTECTED AREAS: FRAMING THE CHALLENGES, AN OVERVIEW

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THIS ISSUE OF CURRENT introduces you to marine protected areas (MPAs) and MPA issues. The articles highlight some of the resources protected through MPAs such as underwater shipwrecks, seabirds, and endangered whale sharks. They illustrate some of the diversity of authorities that manage MPAs, and how different MPAs can be linked together to achieve common goals. They also describe how coastal resource managers are grappling with both societal and resource needs, by designing marine reserves through a participatory process, through evolving fisheries management, and by modern day application of traditional resource management approaches. The classroom activities can be used to introduce your students to concepts discussed in the articles; the additional resources listed at the end of each article allow you to further explore topics and link to online classroom activities.

Oceans affect everyone. They drive our climate, supply food, provide leisure opportunities, generate billions for our economy, and support national security. In turn, we influence the ocean through resource extraction, alteration of natural landscapes, and pollution. National attention has been drawn to the health of the oceans through climate change discussions, concerns about declining fisheries, and, most recently, the deliberations of the U.S. Commission on Ocean Policy. As the commission's preliminary report points out: "...contributions to the national economy are just one measure of the oceans' value. We also love the oceans for their beauty and majesty, and for their intrinsic power to relax, rejuvenate, and inspire. Unfortunately, we are starting to love our oceans to death."¹

Recommendations from this and other recent initiatives call for MPAs to be used as one type of management tool to support ecosystem-based management. Conservation of resources for long-term sustainable use is not a new idea; neither are MPAs. As early as the 1920s and 1930s, areas were set aside for scientific research (e.g., Friday Harbor Laboratory's Marine Biological Preserve in Washington) and long-lasting protection of unique natural and cultural features (e.g., Everglades National Park and Fort Jefferson National Monument in Florida). MPAs can be an effective tool to balance sustainable use with resource conservation, especially when they are planned, managed, and evaluated using sound natural and social science.²

MPAs have been established for a number of different goals, including conservation, protection, and restoration of habitat; resource enhancement (e.g., replenishing fish stocks); maintenance of biodiversity; research and education; preservation of cultural resources or aesthetic attributes; and public recreation. They provide different levels of access and use, and levels of resource protection, depending on their goals. Given the diversity of MPAs, the following questions need to be addressed as we explore how best to use this tool to achieve our conservation goals:

- What type of MPA is being discussed?
- How can we address pressing natural and social science needs in the design, management, and evaluation of MPAs?

- What is the MPA for and is it effective?
- Where should MPAs be located, how should they be managed, and how many are needed?

WHAT'S IN A NAME?

"Marine protected area" is an umbrella term for managed areas in the marine environment that provide some level of resource protection. In the U.S., the term marine protected area is broadly defined. Presidential Executive Order #13158 on marine protected areas, signed in May 2000, defines MPAs as "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein."³ In practice, the term marine protected area is often used in reference to marine areas and coastal protected areas containing terrestrial, intertidal, estuarine, and marine environments within their boundaries.

Using one term (MPA) for areas with different goals and different levels of protection has been a source of considerable confusion. Adding to the confusion, a variety of related terms are also commonly used, as descriptive terms, such as marine park, marine preserve, marine reserve, and coastal reserve, and officially, as state park, national wildlife refuge, national marine sanctuary, national park, and national seashore. Often used interchangeably with marine protected area, the implied meanings of these terms can vary greatly for different groups.

One common misconception is that all MPAs are no-take marine reserves closed to public use. In fact, most MPAs are managed for multiple uses. According to the Partnership for Interdisciplinary Studies of Coastal Oceans, "less than 0.01% of U.S. waters" are in marine reserves.⁴ To clarify the types of MPAs being discussed, the National MPA Center, located within the National Oceanic and Atmospheric Administration (NOAA), has developed a classification system. This allows MPAs to be described according to their overarching goal: conservation of natural resources or cultural heritage, or sustainable resource production. Added clarification is provided by identifying the level of protection, from open access to no-take, and other descriptors.

KEEPING THE PUBLIC IN PUBLIC RESOURCE MANAGEMENT

In the United States, coastal and marine waters, and shorelines are considered by and large to be public trust resources. They are considered resources held in trust for open access and use by the public, even those who live far from the coasts or those who do not regularly use marine resources. This public trust and the public's corresponding sense of ownership and common use of these resources has culminated in unsustainable patterns of use (e.g., overfishing, pollution). These, in turn, have resulted in the loss of resource quality and viability, and unequal benefits from and access to resources across different segments of the public.

Present-day resource management institutions must balance resource quality and equitable access to these public trust resources, which is a difficult task. The National Research Council's Committee on the Evaluation, Design, and Monitoring of Marine Reserves and Protected Areas in the U.S. frames the challenge thus: "The general public, as well as special interest groups, cherishes the right to use marine areas and resources without restriction. Historically, attempts by government to limit this freedom, even for the benefit of the users, have been fought bitterly by those users. ...It is difficult to change the perception that access to marine resources is a right because the open-access doctrine has deep roots in the United States."⁵

National marine sanctuary managers are directed by the National Marine Sanctuaries Act⁶ to protect public trust resources while facilitating multiple compatible uses. Other agencies responsible for managing MPAs are also challenged with similar dual mandates. Problems related to this balancing act cross scientific disciplines and institutional jurisdictions. They are also nested within other complex issues and resist simple solutions. Such problems often have "no value-free, objective answers...only choices that are better or worse depending on your viewpoint."⁷

In the past, most decisions were relegated to or assumed by the resource agency responsible for managing the site, with limited opportunities for public input. However, law and common sense dictate that affected parties are given an opportunity to voice their views. Current management decisions increasingly involve open dialogue between different stakeholder groups. But because resource management goals and public demands are often not aligned, satisfying both societal goals and the needs of the resource usually involves compromise.

EVALUATING EFFECTIVENESS

As the use of MPAs increases around the globe, a corresponding interest arises in determining their effectiveness as a management tool. This interest arises out of a genuine concern for showing (and improving) management effectiveness, and from the fact that many MPAs are "paper parks" complete with legislative mandates, management goals, and boundary maps, but lacking effective implementation on the ground. But effectiveness can be difficult to define and gauge. Objective measurement of MPA effectiveness can only be assessed in terms of success or failure



of an MPA to achieve stated management goals and objectives over a realistic timescale.

The World Conservation Union (IUCN) has developed a model for evaluating management effectiveness. The IUCN considers three main aspects: (1) the design aspects (size and shape, connectivity, representativeness), and suitability of design relative to stated management goals; (2) the appropriateness of management, such as on-the-ground efforts, responsiveness, collaborative processes, management capacity, and social relations; and (3) the delivery, such as how well the MPA is functioning toward conservation or cultural management goals, what barriers to management exist, and local attitudes toward the MPA.⁸

As more information becomes available on the effectiveness of MPAs, managers need to employ adaptive management strategies, such as processes for continually improving management by learning from experience and evaluation.

MPA INITIATIVES

A number of agencies are evaluating existing MPAs and considering new sites. The U.S. currently has a collection of MPAs created for a wide range of purposes by various authorities or legislative measures. Even though these MPAs may have been established for a while, no collective analysis has been done to ensure they are effectively protecting the nation's natural and cultural heritage, or represent the diversity of U.S. marine ecosystems. To address these concerns, NOAA and the Department of the Interior are working with other federal agencies, states, tribes and other interested and affected parties, to develop a science-based national system of MPAs. The first step, which will take several years, is to develop a framework for the system, which will outline:

- the goals of the national system;
- the current inventory of marine managed areas;
- an assessment of current levels of effective, existing MPAs;

- biogeographic characterization of vital U.S. marine ecosystems;
- key cultural resources;
- an assessment of the patterns and potential impacts of human uses in marine habitats; and
- an assessment of gaps in protection among ecological or economically important habitats, resources, and cultural sites.

The national system framework, once developed, will help guide and inform the actions of existing MPA programs, such as national marine sanctuaries, national parks, and state MPAs. The framework will be beneficial as these entities consider using their independent authorities to add new MPAs or improve the effectiveness of existing sites. Ultimately, the national system framework and the ensuing national system of MPAs will enhance the nation's ability to achieve broad and complex marine stewardship mandates. It will also minimize duplication and gaps in protection for areas identified as especially important.

KNOWLEDGE IS THE KEY

MPAs are about managing resources held in trust for the public. However, as the eminent 19th century Japanese conservationist Tanaka Shozo said, "The care of rivers is not a question of rivers but of the human heart." People must first care *about* the resource so that, eventually, they will care *for* the resource. Education is essential to creating an informed public knowledgeable about our coastal and marine resources, through interpretation, education, and outreach programs.

Want to know more about MPAs in your region, increasing effectiveness, and plans to develop a national system of MPAs? The National MPA Center's website provides information and resources about MPAs, including background information, a virtual library, an inventory, and much more. Visit www.mpa.gov.

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FOOTNOTES

1. *Preliminary Report of the U.S. Commission on Ocean Policy*. Governors' Draft. 2004. Washington, D.C.: U.S. Commission On Ocean Policy. Online at: <http://www.oceancommission.gov/documents/prelimreport/00_complete_prelim_report.pdf>.
2. NOAA. 2003. *Social Science Research Strategy for Marine Protected Areas*. Santa Cruz, CA: National MPA Center, MPA Science Institute. Online at: <http://www.mpa.gov/virtual_library/Publications/Strategy_11504.pdf>
3. Executive Order No. 13158. Title 3 Code of Federal Regulations. (2000): 273-276. Online at: <http://www.mpa.gov/executive_order/execordermpa.pdf>.
4. "Partnership for Interdisciplinary Studies of Coastal Oceans." *The Science of Marine Reserves*. (2002). Online at: <http://www.piscoweb.org/outreach/pubs/reserves/booklet_final.pdf>.
5. National Research Council. 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems*. Washington, DC: National Academy Press. Online at: <http://books.nap.edu/catalog/9994.html?onpi_newsdoc110900>.
6. The National Marine Sanctuaries Act (16 U.S.C. § 1431[b][6]). Online at: <<http://www.sanctuaries.nos.noaa.gov/natprogram/nplegislation/nplegislationact.html>>
7. Cunningham, W. P., Cunningham, M.A., & B. W. Saigo. 2002. *Environmental Science: A Global Concern* (7th Edition). New York: McGraw-Hill. Pg. 220.
8. Hockings, M., S. Stolton, & N. Dudley. 2000. *Evaluating Effectiveness. A Framework for Assessing the Management of Protected Areas*. Gland, Switzerland: IUCN. Online at: <http://www.iucn.org/themes/wcpa/pubs/pdfs/Evaluating_Effect.pdf>

FOR MORE RESOURCES:

The Tragedy of the Commons:

<http://www.sciencemag.org/sciext/sotp/commons.shtml>

Interpreting Critical Resource Issues and Controversy:

<http://www.nps.gov/idp/interp/340/critiss-contr.htm>

How is your MPA doing?:

<http://ipo.nos.noaa.gov/mgmteffect/docs/dguidebk.pdf>.

ILLUSTRATION CREDIT:

JIM TOOMEY (illustrator) is the creator of the daily comic strip "Sherman's Lagoon," which appears in over 200 newspapers in North America, and has just completed his eighth book. Jim holds a bachelor's degree of science in mechanical engineering from Duke University, and a master's degree of arts from Stanford University. Visit his website to see more of his inspiring work at www.shermanslagoon.com. (His art also appears on pages 9, 21, 25, and 30 in this issue.)