

Re-Examining the Role of MPAs in Ecosystem-Based Management

The concept of ecosystem-based management of our oceans involves applying a holistic approach to resource management rather than focusing on a single species or sector. The basic idea is that because the elements of an ecosystem are interconnected - including species, habitats, and humans - it makes sense to attempt to manage them as a whole rather than as a series of unrelated elements.

This concept of applying an "ecosystem approach" has been widely endorsed by management organizations worldwide. As its implementation grows and matures, so does practitioners' understanding of how MPAs may best fit within it. In the [October 2006 issue of *MPA News*](#), we explored what roles marine protected areas could play in ecosystem-based management (EBM), with examples from Indonesia, Mexico, the Great Barrier Reef, the Wadden Sea, and Antarctica. This month we revisit the topic with more examples, and a particular focus on the impact of EBM on MPA planning and management.

(Readers: Please participate in our quick poll on MPAs and EBM for the chance to win an *MPA News* canvas tote bag. Details are at the end of this article and at www.mpanews.org.)

Overseeing MPAs and EBM: TIDE in Belize

In the Toledo District of southern Belize, rivers flow down from the Maya Mountains through one of the largest and most diverse forests in Central America, emptying into estuaries that feed the Belize Barrier Reef. Most of the district's 22,000 human residents rely on access to natural goods and services from the rivers, forest, soil, and sea. Growth in the region's human population is accelerating the demand for these resources, while activities such as cattle farming and gillnet fishing are intensifying human impacts on the ecosystem.

The Toledo Institute for Development and Environment (TIDE), a nongovernmental organization, was founded in 1997 to meet the growing environmental and development needs of the Toledo District. TIDE has pursued the sustainable management of the area's "Maya Mountain Marine Corridor", covering nearly one million acres of land and 1000 square miles of sea. In doing so, TIDE has emphasized two goals: instilling a sense of ownership among residents in their common resources, and protecting those resources for future generations.

From these efforts, TIDE has become involved both in MPAs and EBM. The organization assists the Belizean government in planning and managing protected areas, including co-managing Port Honduras Marine Reserve and Payne's Creek National Park. It also leads the development of responsible tourism in the district and other environmentally sustainable economic alternatives by providing training and support to local residents. Its innovative programs include a scholarship fund for children whose parents agree to stop using unsustainable fishing and farming methods, and a net-exchange program that allows fishermen to trade gillnets for more environmentally sensitive gear.

TIDE's ecotourism program has conducted tour guide certification, and offers multiple forms of tourism training, including fly-fishing and kayaking. TIDE also implements the annual Freshwater Cup, a tournament in which football (soccer) clubs from the region must first complete an environmental project as a requirement for entry. At the close of competition, the winners of the environmental project portion and the football tournament are announced; the grand prize for each is BZ \$2000 (US \$1000).

"TIDE views its overall efforts as ecosystem management," says Executive Director Celia Mahung. "We ensure that management has a goal to maintain or improve ecosystems, and that ecosystems are of benefit to present and future generations."

She says sustainable development in Toledo would be difficult without protected areas as part of the management system. "Protected areas provide a defined boundary of protection that, at the very least, makes people stop and think before taking action," says Mahung. "Without the presence of the protected areas, Toledo might face uncontrolled development that would damage key resources. Managed development can actually promote sustainability and protected areas as part of its mandate. We recently met, for example, with a developer planning a coastal community and discussed the importance of the beaches

that provide nesting areas for the hawksbill turtle. We helped the developer understand that this was not a challenge to be overcome, but an opportunity to market the development - as one that integrated the nesting season of turtles into the development's lighting and building scheme."

Mahung says Toledo's protected areas are an integral part of the surrounding communities. "The Toledo District is poor and many of the inhabitants rely on subsistence farming or subsistence fishing," she says. "In the case of the Port Honduras Marine Reserve, there are two communities that border the reserve. Sustainable development within these communities is necessary to ensure that people are able to feed, clothe, and house their families. Development that provides some cash for these families, that promotes education for boys and girls, and that considers the importance of incredible natural resources of southern Belize is critical for our health and economy." For more information on TIDE, including descriptions of its array of sustainable development and education programs, go to www.tidebelize.org.

Role of MPAs in supporting regional EBM: Caribbean MPAs

Georgina Bustamante, Coordinator of the Caribbean MPA Management Network and Forum (CaMPAM), believes well-managed MPAs will be useful in enabling implementation of EBM at larger scales. "MPAs are just one coastal zone management tool, but very few countries have developed a nation-wide coastal management scheme," she says. "If we learn to manage small areas - like MPAs - with an ecosystem-based approach, that process will promote the scaling up of management to cover larger areas, including entire countries, or ideally ecoregions."

Bustamante defines a well-managed MPA as having benefits for natural resources and human livelihoods. As management is scaled up from these MPAs, she says, the effect will be of creating larger marine managed areas. The core MPAs will essentially become learning centers on how to manage coastal natural resources in a larger and ecologically effective spatial scale.

To enable MPAs to play this role, she says, there need to be capacity-building and networking among MPA managers and planners. "Educated MPA practitioners can understand the scale at which their marine resources are biologically connected with other areas, and this allows them to develop appropriate management interventions," says Bustamante. "Networking and communication among MPA practitioners facilitate the process of implementing coordinated management, and eventually promote nationwide or transboundary policy development." She notes that although some Caribbean countries have developed national systems of MPAs, many have not yet recognized the transboundary nature of the biological connections of their marine populations. This insufficiency, she says, can jeopardize the effectiveness of their management measures - for example, if important regional sources of fish larvae are not covered by national systems of protection.

To build Caribbean regional capacity on MPA planning and management, CaMPAM in recent years has co-sponsored a series of regional "training of trainers" courses on MPAs. The courses instruct managers, who in turn train local MPA stakeholders. The most recent course was held this month in Trinidad and Tobago, and included an overview of the Wider Caribbean's ecosystems. In addition to the courses, CaMPAM also coordinates site visits and staff exchanges among MPAs throughout the region.

Robin Mahon of the University of the West Indies (Barbados) says that given humans' history of ecosystem abuse and poor performance in protecting marine ecosystems, "most would agree that MPAs are needed in the Caribbean." However, he cautions that some policy-makers may consider it sufficient simply to have MPAs. "Most practitioners are certain that MPAs are not sufficient by themselves, and that complementary measures will be required to achieve sustainability," says Mahon. "Another area of concern is who determines the location and nature of protected areas. So far, tourism agendas have been the primary drivers, and fisheries have often been marginalized or disadvantaged (or the protected areas have simply not been successful). This reflects differences in organization and power among stakeholders that must be considered in how we incorporate protected areas into EBM."

Both Bustamante and Mahon presented their thoughts on MPAs and EBM in presentations last December at a meeting on EBM in the Caribbean, *Marine Ecosystem Based Management in the Caribbean: An essential component of Principled Ocean Governance*. The presentations from that meeting are available at http://marineaffairsprogram.dal.ca/MAP_Projects/EBM_Symposium.php.

Benefits to MPAs of operating under regional EBM: OSPAR

Since 1972, the Convention for the Protection of the Marine Environment of the North-East Atlantic - the OSPAR Convention - has worked to identify threats to its regional marine environment, and has organized programs to ensure effective national action to combat them. The OSPAR Commission, responsible for implementing the convention, is formally guided by the ecosystem approach to management. Its application of the ecosystem approach includes, but is not limited to, MPAs. Along this line, in 2003, OSPAR ministers representing the region's fifteen nations recommended establishing an ecologically coherent network of well-managed MPAs in the North-East Atlantic by 2010.

David Johnson, Executive Secretary to the OSPAR Commission, says OSPAR's adoption of the ecosystem approach was an

early political acknowledgement of the need to integrate all human activities and evaluate their impact on biodiversity. "OSPAR has worked hard subsequently to determine ways of assessing whether the measures put in place for different strategies have been effective," says Johnson. "A pilot system of 'Ecological Quality Objectives for the North Sea' and an OSPAR list of threatened and declining species are examples of such efforts. Notwithstanding the above, MPAs remain one of the only tools collectively embraced by OSPAR Contracting Parties."

Johnson says the 2010 goal has spurred Contracting Parties to designate MPAs that contribute to the network. "Currently OSPAR is gearing up to 2010, with more nominations of MPAs and pioneering work in areas beyond national jurisdiction," he says. "Currently within areas under national jurisdiction, there is considerable overlap with Natura 2000 sites [an ecological network of protected areas in the territory of the European Union], and OSPAR will look to achieve added value."

For managers of MPAs within the OSPAR area, says Johnson, the existence of an overarching approach across the region allows them to assume that certain human impacts and external effects are being addressed. "They therefore do not need to chase additional resources to tackle such issues, such as eutrophication," he says.

Jen Ashworth, Regional Coordinator of the North East Atlantic for the World Commission on Protected Areas, says MPA managers in the OSPAR region can share lessons with other Contracting Parties. "OSPAR has produced several useful documents on MPA management and stakeholder involvement," she says. (For a list of such publications, visit the OSPAR website - www.ospar.org - and click on "Publications".) Although Ashworth notes it appears unlikely OSPAR will meet its 2010 goal of a coherent MPA network, the effort remains worthwhile. "Planning an MPA network on a regional basis, as opposed to purely a country-by-country basis, is more in line with an ecosystem approach," she says. "Such planning also helps facilitate ecological coherence within biogeographic areas."

Using an ecosystem approach to determine where MPAs would be helpful

In a study to be published soon in the journal *Conservation Biology*, an international team of researchers states that coral reef conservation requires a variety of responses to adapt successfully to climate change. Led by Tim McClanahan of the Wildlife Conservation Society, the team concludes that the most appropriate response for each region will depend on at least three main factors:

- The current pristineness of the reef;
- How susceptible it is to climate change; and
- The adaptive capacity of local human communities, including their ability to cope with potential management actions (like tolerating the closure of fishing areas).

Failure to understand this context could result in wasted efforts, including designation of ineffective MPAs, say the researchers. The study's integration of natural and social factors in decision-making is consistent with an ecosystem approach to management.

McClanahan's research team analyzed 24 human communities and adjacent coral reef ecosystems in five countries of the Western Indian Ocean. They found that the scale of the threat from climate change varied significantly from place to place, based on several environmental variables. They also discovered that some places were more likely to be able to cope or to adapt their management than others. This was based on multiple indicators of adaptive capacity, such as occupational mobility, infrastructure, and recognition of factors affecting marine resources. Based on its findings, the team concluded that more investment in MPAs could be effective in certain countries - Tanzania, for example - which generally exhibited lower climate change stresses and higher human capacity to adapt to the closure of some fishing areas.

Kenya, however, was a different story, says McClanahan. "Kenya has a high pristine index in the few parks that it has because it has been effective at stopping fishing in the parks, but the coral fauna has been badly affected by a 1998 bleaching event and recovery is poor," he says. "The prognosis is not hopeful given climate change, so the international attraction [of visiting Kenya for its MPAs] is likely to decline in favor of areas with better coral fauna where the fish fauna is also protected."

Over time, he says, tourism to Kenya will likely suffer as a result, and the country should have a policy that acknowledges this potential loss. "Interestingly, we have found that southern Kenya has lower environmental susceptibility and good conditions for corals," says McClanahan. "So in the south we would suggest a policy of creating protected areas and favoring ecotourism developments, in contrast to the north. We are also suggesting that the infrastructure of Kenya needs to be built up to where people are not overly reliant on just tourism or harvesting natural resources. We would like to see a diversified economy that is more typical of countries with higher education and associated infrastructure."

McClanahan says there is always a need for protected areas, but they need to take different forms and finance models in different contexts. "There are tradeoffs, lost opportunities, and social contexts that will not allow the transfer and adoption of poorly contextualized ideas and technologies," he says. "This is a call for being practical. You cannot have it all, but have to make hard decisions and drop some of the idealism that frequently motivates, steers, and many times paralyzes the utility of the environmental movement."

For a PDF copy of the forthcoming paper "Identifying Reefs of Hope and Hopeful Actions: Contextualizing Environmental, Ecological, and Social Parameters to Respond Effectively to Climate Change", e-mail Tim McClanahan at tmccclanahan@wcs.org.

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MPA News Poll: For ecosystem-based management to be successful, does it need MPAs?

With the trend toward applying an "ecosystem approach" to marine resource management, what role should MPAs play in it? *MPA News* would like your opinion. Please take our quick poll on MPAs and ecosystem-based management at the *MPA News* website: www.mpanews.org. *MPA News* will compare the results to those of our similar poll in 2006.

Three respondents will be picked at random to receive an official *MPA News* canvas tote bag. Thank you for participating!

Box: Getting started on EBM

For advice on how to begin applying the ecosystem approach, these two sources may be helpful:

"The Ecosystem Approach"

www.cbd.int/ecosystem

This portion of the Convention on Biological Diversity (CBD) website provides links to CBD principles on applying an ecosystem approach, as well as case studies and an Ecosystem Approach Sourcebook that offers guidance for "beginners" and "advanced users".

Ecosystem-Based Management of Marine Capture Fisheries

http://assets.panda.org/downloads/ebm_report.pdf

This 2006 report by WWF offers principles for applying EBM, along with a 12-step implementation plan. Although most of it focuses on applying EBM to fisheries, the report also addresses managing the impacts of other industry sectors, such as shipping and oil/gas. It draws detailed examples from around the world.

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