MPA news

Monthly news, analysis, and guidance on marine protected areas worldwide

Vol. 20, No. 2
September 2018

Unique study of partially protected MPAs offers new insights on when they protect biodiversity and when they do not

Most of the world's MPAs are partially protected: they restrict some extractive activities but allow others. For planners and decision-makers – especially in regions where extractive resource use is high – partially protected MPAs can be easier to designate than no-take areas. The partial protection indicates to resource users that socioeconomic and conservation objectives have been balanced.

How even that balance is, though, can depend on how partial the protection is. For example, an MPA that bans nearly all extraction might be expected to be better at conservation than one that *allows* nearly all extractive activities. But beyond such a broad generalization, how can we identify which forms of partial protection are in fact most effective in protecting biodiversity? And are weakly protective areas useful for conservation at all?

A new, unique study provides insights on these questions. As nations designate more MPAs, spurred by the approaching 2020 deadline for United Nations global marine protection targets, the study could prove valuable.

Highly regulated MPAs are effective; weakly regulated MPAs are not effective

Earlier studies of the effectiveness of partially protected areas (e.g., in 2013 and 2014) provided some insights but were limited. To classify levels of partial protection, these studies relied on relatively simple systems that were susceptible to inaccuracy. The 2014 study, for example, used the IUCN protected area management categories, which have been applied in different ways by different governments.

The new study, led by Mirta Zupan of MARE Marine and Environmental Sciences Centre in Portugal, applies a relatively novel classification system that was first described in 2016. The system categorizes MPAs – as well as each zone within them – according to allowed commercial and recreational uses. The more uses there are, the greater the cumulative impact, and that impact is reflected in an MPA's overall score. The resulting classifications range from "fully protected" to "unprotected", with various protection level categories in between. (MPA News reported on this system two years ago.)

The research team applied the classification system to 49 MPAs worldwide. These sites had already been studied for the effectiveness of their biodiversity conservation – namely, whether abundance and biomass of targeted fish species were higher in the MPAs than at control sites. Then the researchers compared how their conservation effectiveness correlated with three different levels of partial protection – "highly regulated", "moderately regulated", and "weakly regulated". Highly regulated areas were defined as allowing five or fewer types of low-impact fishing gear (e.g., lines, octopus trap); moderately regulated areas allowed up to 10 low- to medium-impact fishing gear types (e.g., gillnets); and weakly regulated areas permitted higher-impact gear types, like beach seines or bottom trawling. (Although this study focused on fishing activity, the classification system does take non-fishing activities into consideration as well, like petroleum extraction or aquaculture.)

The findings were:

- Highly regulated MPAs are effective for biodiversity protection;
- Weakly regulated MPAs are never effective for biodiversity protection; and
- Moderately regulated MPAs can be effective when adjacent to a fully protected area.

Lessons for planners

MPA News spoke with study co-author Joachim Claudet of the National Center for Scientific Research in France about the research and its implications for the planning and management of MPAs.

MPA News: What guidance do these results give for the planning and management of partially protected MPAs?

Joachim Claudet: What can be drawn from those results is that MPA networks of different MPA classes, or zoned multiple-use MPAs, can be used to achieve ecological goals if designed properly. It is important for planners to be able to mix different levels of protection as stakeholders' interests also have to be accounted for. Biodiversity conservation needs to go hand in hand with sustainable development.

Fully protected areas – no-take areas – can provide the greatest ecological benefits. But highly protected areas,

continued on next page

Table of Contents

MPA News is a publication of

OCTO
OPEN COMMUNICATIONS FOR THE OCEAN

which can allow some fishing, can also produce some ecological benefits. Such ecological benefits can even be reached in a moderately protected area, where more fishing is allowed, when a functioning fully protected area is attached to it.

With regard to weakly regulated areas, however, no direct ecological benefits can be expected as the impact of their allowed uses on biodiversity and habitat is too strong. But those areas could still be used to promote awareness-raising campaigns about the need for marine stewardship. Or they could provide a starting point for working with stakeholder groups on pathways to greater sustainability (i.e., strengthening the regulations), especially in co-management situations. This is the objective of some French MPAs (e.g., Gulf of Lion Natural Marine Park) that currently qualify as weakly regulated, where regulatory changes will need to come from the stakeholders themselves, as managers alone cannot implement such changes.

This study focused only on ecological benefits. But in most cases, such ecological benefits are needed in order to generate social and economic benefits.

MPA News: Do you view the regulation-based classification system as having a potential role in planning MPAs, not just in categorizing or evaluating them? Planners, for example, could use the system to make sure their prospective MPAs qualify at least as "moderately regulated" before finalizing them.

Claudet: Yes, definitely. This is already happening. The score of the Cerbère-Banyuls Natural Marine Reserve in France – the first marine protected area to be on the IUCN Green List – is 4.7 in our classification system and hence qualifies as a highly protected MPA.* The local administration in charge of the MPA sought to enlarge the site's partially protected zone, which surrounds a core no-take zone. But increasing only the size of the partially protected zone would have led the overall MPA score to be over 5, hence going from highly to moderately protected in the classification system. Because of that, the plan is now to try to increase the size of both zones proportionally to remain in the highly protected class.

MPA News: Most of the cases in your study database involved shallow-water coral reefs. Do you expect your findings would apply to other marine ecosystems, too?

Claudet: We believe so. The classification is based on the impact of allowed activities on species selectivity and habitats but while developing it we had in mind all possible types of ecosystems, whether it be tropical or temperate systems, coastal or more pelagic MPAs.

*** Editor's note:** The classification system assigns a numerical score to each MPA based on its cumulative uses. The scores range from 1 (fully protected) to 8 (unprotected).

For more information:

Joachim Claudet, National Center for Scientific Research, France. Email: joachim.claudet@gmail.com

To comment on this article:
https://mpanews.openchannels.org/node/23166

A compilation of resources and trainings on MPA design and management, across education levels (from MPA professionals to the general public)

Editor's note

The adjoining article is adapted from a piece that appears in the September 2018 issue of Marine Ecosystems and Management (MEAM) newsletter, a sister publication of MPA News.

In 2016, the EBM Tools Network compiled a list of hands-on, online activities for teaching about ecosystem services and ecosystem-based management that has since been updated with several more activities. Recently, a university professor asked the Network if any similar online resources existed for teaching MPA design and management. EBM Tools Network members pooled their collective knowledge again and came up with a list of resources for teaching about MPAs at *all educational levels*.

To that list, MPA News has added a compilation of *in-person* training opportunities that are aimed at MPA professionals. The combined list of resources and trainings is below.

We expect this is not comprehensive. If you would like to add a resource to the list or get contact information for someone involved with a resource, please contact MPA News at mpanews@openchannels.org.

For MPA professionals:

NOAA's International Marine Protected Areas Capacity Building Team (IMPACT) trainings. Run by the US National MPA Center (within NOAA's Office of National Marine Sanctuaries), IMPACT has trained thousands of MPA managers in over 40 countries. IMPACT webpage

CaMPAM's Training of Trainers course. This recurring course by the Caribbean Marine Protected Area Management Network and Forum (CaMPAM) offers lessons on MPA planning, management, and policy to MPA professionals in the Caribbean. Training of Trainers webpage

Reef Ecologic's International Coral Reef Management and Leadership course. Delivered in 2015, 2016, and 2017 to selected coral reef leaders, managers and scientists from the Caribbean, Indian, and Pacific regions. Course webpage

Western Indian Ocean Certification of Marine Protected Area Professionals (WIO-COMPAS) program. This program combines training courses, professional development seminars, workplace case studies, mentoring, continuing education, and networking. Participants receive a certification. WIO-COMPAS website

MPA management toolkit for MPA professionals. Developed by the Western Indian Ocean Marine Biodiversity Conservation Project, this toolkit features dozens of theme sheets on various management issues, with a focus on the Western Indian Ocean. Toolkit website

MPA Enforcement International trainings. These trainings, provided by experienced conservation law enforcement professionals, cover all aspects of MPA enforcement, compliance, evidence collection, vessel handling, and more. Trainings website

Curricular materials for 6-week course for MPA professionals. This material was developed by WWF South Africa to train MPA staff. Originally developed for presentation in one-week-per-month intervals over the course of six months, the material has also been modified for use in a 5-day introductory course. For more information, contact Robin Adams of WWF South Africa at radams@wwf.org.za.

For students:

50-minute teaching unit on MPAs for undergraduates. This unit is part of a two- to three-week module on ocean sustainability created for the InTeGrate project. Students review current pressures on ocean ecosystems, learn to define MPAs, and examine marine reserve science. They also conduct a hands-on exercise to map ideal locations for an MPA, considering oceanographic, biological, and sociological factors in their decision-making process. Access the teaching unit.

Interactive simulation on marine reserves and local fisheries for advanced undergraduates and graduate students. Created by the American Museum of Natural History, this tool allows users to look at how species attributes (such as reproductive rate and mobility), fisheries economics, and reserve design influence short-term fisheries dynamics and longer-term sustainability. The simulation comes with an associated exercise and exercise solutions. Access the simulation. Read a published description of a classroom activity using the simulation.

Teaching module on MPAs for advanced undergraduates and graduate students (available in English and French). This module, hosted on the Network of Conservation Educators and Practitioners website, introduces MPAs, including costs and benefits, relationships to biodiversity and fisheries management, design and implementation, and governance and management issues. An accompanying role-playing exercise allows students to experience the challenges of developing an MPA plan that satisfies diverse users while meeting common objectives. Access the module.

***Science of Marine Reserves* summaries for undergraduates, graduate students, and conservation/management professionals.** *The Science of Marine Reserves* summaries, developed by global experts under the leadership of the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), present scientific information from over 300 recent publications about marine reserves and other MPAs. The data are presented in an engaging and easy-to-understand format, highlighting case studies from diverse places.

- Versions of the *Science for Marine Reserves* summaries are available for the Mediterranean, European Union, Latin America/Caribbean, US, and other locations.
- Graphics from the summaries are also available for download and use in teaching materials.

For stakeholders and the general public:

Multi-player serious game on marine spatial planning for stakeholders, including the planning and implementation of MPAs. Designed to educate stakeholders about complexities and conflicts in MSP processes, this tool includes the planning and implementation of MPAs in an MSP context. The recent introduction of Ecopath with Ecosim (EwE) in the MSP Platform game also allows it to account for the short- and long-term ecological impacts of MPAs. Games have been implemented for the North Sea and Firth of Clyde, and a game for the Baltic is under development. Learn more about the game. Read about game usage here and here.

30-minute video on the Cabo Pulmo MPA and other MPAs for general public. In this video from The Economist, viewers join the crew of a vessel on a mission to save the vaquita, one of the most endangered animals on Earth. Issues pertaining to the Cabo Pulmo National Marine Park and MPAs in general (e.g., local livelihoods, overfishing, poaching, tourism) are discussed. See the video.

For a combination of audiences:

US NOAA National MPA Center and National Marine Sanctuaries websites for general public, stakeholders, undergraduates, graduate students, and conservation/management professionals. These provide a wealth of easily readable information about understanding, managing, and communicating about MPAs. Some critical pages include:

- MPA education resources
- Lesson plans and units on marine sanctuaries for teachers.

To comment on this article:

https://mpanews.openchannels.org/node/23167

Editor's note
This recurring column, MPA Training in a Nutshell, distills advice from what is the largest and longest-running MPA management capacity training program in the world – the International MPA Capacity Building Team (IMPACT). Run by the US National MPA Center (within NOAA's Office of National Marine Sanctuaries), the program has trained thousands of MPA managers in more than 40 countries. MPA News profiled IMPACT in our July 2015 issue.

Anne Nelson co-leads IMPACT. In these columns, Anne is sharing quick and useful tips – best practices gathered by IMPACT from MPA managers worldwide.

MPA Training in a Nutshell: Filling data gaps through partnerships

By Anne Nelson and the IMPACT team

How many times have you had a discussion on the potential impact of future human activities in your MPA and the conclusion is, "We don't have enough information on that species, habitat, use, or impact"? Often the reasons for the data gaps are that there is no funding for data collection without a related project, or not enough capacity, or it's not in someone's plan of work to focus on the activity and there's no direction from leadership to do the work.

Unfortunately this means that when a new use of the MPA's resources arises – like a proposed increase in tourist boats, or port expansion, or new ocean energy project – the time allotted to assess impacts is often not enough to produce sufficient data from scratch.

Think of right now as an opportunity to get prepared. There is often more data available than you know. Think creatively and reach out to new potential partners. Here are a couple examples for inspiration:

- Cetacean rapid assessment: An approach to fill knowledge gaps and target conservation across large data deficient areas: This project integrated cetacean data from visual, acoustic, and interview surveys with multiple other existing data sources to produce a rapid assessment of cetacean abundance, diversity, and threats in Tanzania.

- Filling historical data gaps to foster solutions in marine conservation: This study discusses several unconventional sources for filling data gaps (menus, newspaper articles, cookbooks, museum collections, artwork, benthic sediment cores), novel techniques for their analysis, and opportunities for integrating these data sources into conservation and management.

It also helps to have a group of managers and partners who see the value in *proactively* collecting data, even if a particular human activity or ecosystem feature is not a current focus of management. The goal is to be ready for any decision-making that may arise for the MPA managers. Give yourself a head start!

- Build relationships with university and agency researchers examining issues similar to the MPA's resources. There may be unpublished literature or data available on, say, species distribution, fisheries, or economic valuation. There could also be interest in developing a joint research proposal, or a group of graduate students ready to support your data collection.

- Having good baseline data is essential for effective long-term management of protected areas. It's never too early to start collecting and processing those data.

- Knowing about and participating in the early planning for any new project or process that could impact your MPA is critical. Your engagement helps to ensure that decision-making considers and ultimately protects key species and habitats of your site.

For more information:

Anne Nelson, on contract to NOAA National MPA Center.
Email: anne.nelson@noaa.gov

To comment on this article:
https://mpanews.openchannels.org/node/23168

Editor's note

Much of what we learn – in the MPA field and in life in general – comes to us informally. We receive advice from a colleague or from a stakeholder, or we figure out something ourselves. This kind of knowledge can be invaluable.

In this occasional feature in MPA News, we ask practitioners what they wish they had known when they got started in MPAs. This month's response is from Sibylle Riedmiller and Eleanor Carter. Sibylle (sibylle@chumbeisland.com) is founder/owner and director of Chumbe Island Coral Park Ltd. in Zanzibar, and Eleanor (ecarter@sustainablesolutions.consulting) is the park's former project manager and advisor to date. MPA News has featured Chumbe Island Coral Park several times over the years, including here and here. The park's budget is entirely funded through ecotourism revenue.

Perspective: What we wish we had known when we got started in the MPA field

By Sibylle Riedmiller and Eleanor Carter

When Chumbe Island MPA was first conceived in the early 1990s we could never have foreseen the kind of struggles we were going to encounter. Having such an original approach, with Chumbe being the first privately managed MPA in the world, we understood that it wasn't going to be easy. Building an ecolodge on a remote island, undertaking outreach, engaging and training community members to be conservation stewards, building capacity of former fishers to become environmental education specialists, introducing high-end hospitality skills into communities with little experience in this area — these were all challenges we expected and planned for.

What we hadn't expected was the entrenched mindset across both government and wider echelons of society that the marine environment was about extractive industries alone. Remembering this was the early 1990s, if we had been proposing a heavily extractive industry (e.g., fishing, mining, or physical infrastructure) it would have been easily understandable to all. But proposing to "utilize" the area for biodiversity conservation was met with distrust and confusion.

Even amongst the wider international conservation NGO community, the idea of setting up a privately managed MPA was met with a level of skepticism and resistance. It took enormous (and unexpected) advocacy, struggle, investment, and development to prove the value of the Chumbe concept – becoming the first (and to date one of the only) financially self-sustaining MPAs in the world.

Twenty years on, Chumbe flourishes, with a reef sanctuary boasting up to 86% live coral cover, and fish biomass in the park increasing by more than 750% in this period. The education program has reached more than 7400 schoolchildren, with off-shoot environmental clubs being established throughout Zanzibar.

Despite this success, however, the concept of privately managed protected areas (PPAs) continues to be met with some level of uncertainty in many corridors of power in conservation. This is a situation we wish we had both known and understood better from the start. And despite the increasing recognition of PPAs — through IUCN resolutions no. 4.072 (2008) and no. 036 (2016) particularly — greater understanding and advocacy continues to be required if PPAs are going to receive the recognition and support they deserve as an alternate and viable governance framework for conservation.

To comment on this article:
https://mpanews.openchannels.org/node/23169

MPA News

EDITOR-IN-CHIEF:
John B. Davis

ASSISTANT EDITOR
Stephanie Stinson

OPENCHANNELS MANAGER:
Nick Wehner

EDITORIAL BOARD:
Chair - David Fluharty
University of Washington
Patrick Christie
University of Washington
Michael Murray
Channel Islands National Marine Sanctuary

CORRESPONDENCE:
MPA News
c/o OCTO
P.O. Box 1931
Woodinville, WA 98072
mpanews@openchannels.org
Tel: +1 425 788 8185

MPA News is published monthly by OCTO, a 501(c)(3) not-for-profit corporation, in association with the School of Marine & Environmental Affairs, University of Washington.

Financial support for MPA News comes from the David and Lucile Packard Foundation and the Gordon and Betty Moore Foundation.

Subscriptions to MPA News are free.
To subscribe, go to
https://www.openchannels.org/subscribe-mpanews
Thanks!

MPA Science Corner:

The Blue Paradox – Measuring coral connectivity among MPAs – Why vertical zoning might not protect the seabed – Reducing underwater noise

These recent articles on MPA-related science and policy are all free to access.

• **Article:** McDermott, G. R. et al. "The blue paradox: Preemptive overfishing in marine reserves." Proceedings of the National Academy of Sciences 1802862115 (2018)

Finding: This study examines evidence of what the authors term the "blue paradox" – that fishers' anticipation of an impending no-take marine reserve can trigger an unintended race to fish in the soon-to-be-closed area, leading to overextraction.

• **Article:** Lequeux, B. D., et al. "Coral connectivity between equatorial eastern Pacific marine protected areas: A biophysical modeling approach." PLOS ONE 13, e0202995 (2018)

Finding: Existing MPAs in the equatorial eastern Pacific region form a relatively well-connected network for corals: at least 40% of coral larvae released per year from these MPAs should stay within the network. But more coastal MPAs are needed to improve the connectivity.

• **Article:** O'Leary, B. C. & Roberts, C. M. "Ecological connectivity across ocean depths: Implications for protected area design." Global Ecology and Conservation 15, e00431 (2018)

Finding: This study examines emerging evidence that upper-ocean communities and processes are linked in multiple ways to seabed ecology. The authors conclude that vertical zoning of MPAs – in which the seabed is protected but fishing is allowed in waters above – fails to safeguard an intact deep sea ecosystem.

• **Article:** Gabriele, C. M., et al. "Underwater Acoustic Ecology Metrics in an Alaska Marine Protected Area Reveal Marine Mammal Communication Masking and Management Alternatives." Frontiers in Marine Science 5, (2018)

Finding: Modeling of underwater noise in Glacier Bay National Park (US) indicates that typical vessel traffic causes substantial communication losses for whales and seals. However, synchronizing the arrivals and departures of ships could lessen some losses.

For a free, weekly list of the latest publications on ocean planning and management, including MPAs, subscribe to the OpenChannels Literature Update here.

In addition, OCTO – the organization that produces MPA News and OpenChannels – also runs MarXiv, the free research repository for marine conservation science and marine climate change science. Each week the MarXiv team produces brief, one-page summaries of selected papers in its repository for an audience of managers and policymakers. Share your research in MarXiv now and we may summarize your paper, too!

To comment on this Science Corner:
https://mpanews.openchannels.org/node/23170

Notes & News

UK environment secretary calls for 30% of world ocean in MPAs by 2030

On 24 September, UK Environment Secretary Michael Gove called for 30% of the world ocean to be protected by 2030. The goal echoes the 30%-by-2030 target set by IUCN members two years ago. But it is rare for a politician to champion the goal specifically, particularly as most nations are still working to meet the 10%-by-2020 target for MPA coverage under Aichi Target 11. Gove's announcement was made in New York City to coincide with the current session of the United Nations General Assembly. A UK Government press release is here. A UN Environment news article on Gove's call is here.

First round of negotiations held for high seas biodiversity treaty

The first round of UN negotiations for an international treaty on the conservation and sustainable use of high seas biodiversity was held this month (September). The next round will be in March/April 2019. Between now and then, initial draft treaty text is expected to be prepared. That text will capture what was expressed in the first round, highlight where there is agreement, and note where more work is required.

This was the first of four intergovernmental conferences to negotiate the treaty. There will be two in 2019 and a final one in 2020. The High Seas Alliance's synopsis of the first round is here. (The Alliance also has a Treaty Tracker tool that is following all developments in the treaty negotiations.) Additional analysis of the first round is here and here.

New Caledonia strengthens protection for reefs in its Coral Sea Natural Park

In August, New Caledonia designated no-take zones around five coral reefs within its 1.3-million-km^2 Coral Sea Natural Park. The new no-take zones together encompass 28,000 km^2, increasing the park's total no-take area tenfold. The multiple-use Coral Sea Natural Park was designated in 2014 and covers the entire EEZ of New Caledonia. A government announcement of the new protections is here (in French). Other coverage of the new protections is here and here.

Interesting times for Australian MPAs

As previously reported in MPA News, the Australian Government's new management rules for its national system of marine parks took effect on 1 July of this year. The rules effectively reopen large areas of the marine park system to fishing. (The history of the marine parks' management status is synopsized in MPA News' reporting, linked above.) Most impacted is the 1-million-km^2 Coral Sea Marine Park. In its original management plan, half of the park was zoned no-take; now just 24% of it is.

An attempt by opposition politicians (in the Labor and Green parties) to block the new management rules was defeated in Parliament in August. On 21 August, the ruling Government announced an AUD 35 million (USD 25 million) Fisheries Assistance and User Engagement Package to help fishers adjust to the marine park regulations.

Also in August, the Government of the Australian state of New South Wales proposed a new marine park that would comprise 25 separate sites (rather than a single large marine park) in state waters surrounding Sydney. According to the proposal, some of the sites would be no-take while others would allow limited fishing. The Government initiated a six-week public consultation process on the proposal, which immediately faced strong opposition from fishing groups. Before the consultation period was even concluded, the Government indicated it was already backing away from the proposed no-take protections. Scientists and conservation groups criticized the Government's reversal.

Shell relinquishes petro exploration rights in support of new MPA in Canada

The Canadian affiliate of petroleum company Royal Dutch Shell is voluntarily relinquishing 50,000 km^2 of exploration permits in waters surrounding a new MPA off the Pacific coast of Canada. Shell Canada announced that although petroleum resources likely exist in the area, the company preferred to support the Canadian government, provincial government (British Columbia), and First Nations groups in their protection of the MPA. The Scott Islands Marine National Wildlife Area covers 11,546 km^2 off the northern end of Vancouver Island and was designated by the Canadian government in June 2018. To see the geographic relationship between Shell Canada's relinquished permits and the MPA boundary, compare the map here with the map here (you'll need to scroll down for both maps).

New database has systematic conservation plans from over 150 marine projects worldwide, including MPAs

A valuable new resource is available for MPA planners and other marine conservation professionals. The Marine Conservation Planning Database compiles systematic conservation plans from marine projects around the world – MPA zoning plans, MPA network plans, regional marine spatial plans, and more. Over 150 plans are currently in the database, which seeks additional submissions. The database is produced by the Conservation Planning Group at the ARC Centre of Excellence for Coral Reef Studies at James Cook University (Australia). A journal article describing the database and its goals is here.

Survey: Nearly half of fishers have observed poaching in MPAs

A survey of fishers in seven countries found that nearly half (48%) had observed poaching inside MPAs, but their most common response to seeing it was inaction. The primary reasons given for the inaction were (1) conflict avoidance, (2) a sense that it was not their responsibility, and (3) the perception that poaching was a survival strategy. The survey involved 2111 fishers living adjacent to MPAs in the countries of Australia, Costa Rica, Indonesia, Kenya, Madagascar, Papua New Guinea, and Tanzania. The study, led by Brock Bergseth of the ARC Centre of Excellence for Coral Reef Studies at James Cook University, is behind a journal paywall but a press release is here.

To comment on these Notes & News items:
https://mpanews.openchannels.org/node/23171

From the MPA News vault

Five years ago: September-October 2013

- Australia's New Government to Review Boundaries, Regulations of MPAs Designated in 2012
- Perspective: Closing the knowledge gap between academics and MPA managers

Ten years ago: September 2008

- What Will MPA Planning and Management Be Like in 10 Years?: MPA Practitioners Forecast the Future
- Perspective: Managing the "Nemo Effect" of Globalization in the Reef Fish Community

Fifteen years ago: September 2003

- Biodiversity "Hotspots" Discovered for Large Ocean Predators; Can Serve as Basis for Open-Ocean MPAs, Say Researchers
- Perspective: The Diminishing Returns of MPA Science

For these and all other issues of MPA News, go to
https://mpanews.openchannels.org/mpanews/archives