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In the last decade, we have seen dozens of experiments throughout the world to implement the principles of marine ecosystem-based management (EBM) in diverse social and ecological contexts. Why?

A number of reasons, mostly stemming from the inadequacies of traditional marine management's narrow approaches, which often focus on the impacts of single sectors (e.g., fisheries, wastewater treatment). Governance is also fragmented among multiple institutions, which begs for a broader approach. And decision makers from the local to international levels are concerned about

sustaining the benefits provided by ocean systems.

In contrast, ecosystem-based strategies recognize the cumulative impacts of varied human activities on ecosystems. Fisheries strategies that recognize the linkages between predators and prey; marine protected areas; and habitat restoration are just a few of the ecosystem-based tools practitioners are using. Implementing these approaches in an ecosystem-based framework creates opportunities to explicitly identify tradeoffs. It also acknowledges that people are part of ecosystems.

From the Arctic to New Zealand, community members, conservation practitioners, resource managers and scientists are translating knowledge of the close and diverse linkages between people and nature into innovative, in-the-water conservation strategies. For instance:

- Off the coast of New England, The Nature Conservancy has contributed important information on underwater habitats to inform *ecosystem-based planning for offshore wind development*. Rhode Island's state government, in collaboration with U.S. federal agencies, industry and other non-government partners, has led this effort.
- In Fiji, at the epicenter of the biological rich Coral Triangle and home to the world's third largest barrier reef, government and non-governmental partners (including Wildlife Conservation Society) have taken *an ecosystem-based approach to stewarding coastal lands and the adjacent coral reefs*. These ecosystems are highly valued by both residents and visitors alike, particularly for their fisheries and cultural significance.

Underwater in Parque del Retiro.

A *new interactive portal* that several colleagues and I have just launched features 65 case studies of EBM from around the world. Combing through these examples, we have found some interesting patterns:

- While these projects' high-level objectives are often quite similar, focusing on improving ecosystem health and human well being, the strategies pursued in particular places vary widely (for details, see McLeod & Leslie 2009, Sievanen et al. 2012, Wondolleck & Yaffee 2012, Leslie et al. in review).
- Marine ecosystem-based efforts also share many characteristics of the processes documented in terrestrial settings (Wondolleck & Yaffee 2012), which suggests that we could be leveraging knowledge from an even broader suite of cases when seeking to meet people and nature objectives on land or in the sea.
- And perhaps most importantly, ecosystem-based efforts take a long time and, to date, few have achieved their ultimate aims (Sievanen et al. 2011, Leslie et al. in review).

As a scholar of EBM in practice and someone who is actively engaged in research to support EBM in New England and Mexico's Gulf of California, I see

this last point as critical. EBM's goals – restored fisheries, sustainable tourism, and economically diverse and vibrant coastal communities – are big and bold. They will take a long time to achieve. As conservation scientists, working together with practitioners and community partners, we need to assess just how long and develop specific, measurable indicators of progress.

"EBM's goals are big and bold. They will take a long time to achieve. As conservation scientists, we need to assess just how long and develop specific, measurable indicators of progress." – *Heather Leslie*

We also need to establish data-driven predictions about the types of intermediate outcomes one would expect from this work and test those hypotheses based on the diverse set of ecosystem-based experiments underway. Think of these outcomes as signposts along a trail: if the goal is to improve the status of coastal ecosystems and the people who are part of them, we need to know we are on a proper path. Identifying and achieving intermediate outcomes provides some indication that we are headed in the right direction. Falling short with these outcomes signals that we likely need to shift strategies, and that the ultimate goals are not getting any closer.

What might those intermediate outcomes be? In the social domain, increased social capital and the ability to locally enforce management measures are two possible intermediate outcomes. We already know from investigations of marine fisheries and other common-pool resource-management situations that these factors are vital to achieving ecologically and socially sustainable management (Ostrom 1990, Ostrom 2009, Basurto & Nenadovic 2012).

A tuna catch being landed and processed in Benoa Harbour, Bali, Indonesia — one of the Coral Triangle's major tuna ports.

On the ecological side, we also know from studies of marine protected area success that fast-growing, site-affiliated, exploited species often respond more quickly to protection than longer-lived, non-target species, particularly those with large home ranges or migrations (e.g., Halpern 2003, Lester et al. 2009). In addition, we know that biological success does not necessarily go hand in hand with indicators of social or economic effectiveness (e.g., Christie 2004, Pollnac et al. 2010).

Ecosystem-based efforts enabled by The Nature Conservancy and the Wildlife Conservation Society provide a rich set of experiences with EBM in practice that could be used to develop and test empirically grounded predictions about the type, magnitude and timing of these important, albeit incremental, outcomes. Learning from the deep experience of TNC and WCS staff and their partners is vital, both for the success of individual projects as well as to achieve a broader shift towards conservation strategies that benefit both people and nature.

Note: This piece was informed by collaborations and conversations with many, many scientists and practitioners over the years, including speakers in the recent related session at the 2013 International Congress on Conservation Biology in Baltimore, Maryland (USA): K. McLeod, E. Goldman, S. Yaffee, A. Lipsky, C. Lasch, and P. Christie. The author gratefully acknowledges support from The David and Lucile Packard Foundation, Brown University's Environmental Change Initiative, and the US National Science Foundation. All errors and opinions are

the author's alone.

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September 24, 2013. The views expressed above are the author's and should not be taken as those of SNAP or its member organizations.

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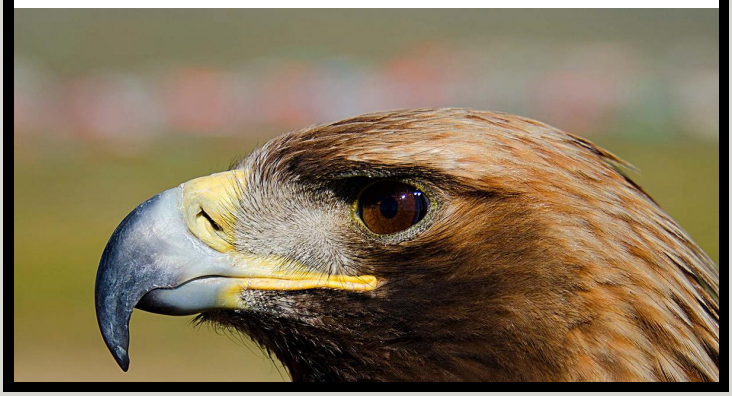

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