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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, 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 that your findings would apply to other marine ecosystems as well?

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).

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