

Future Directions in MPA Site Selection

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Collectively, stakeholders in most MPA processes are interested in science-based network designs that provide confidence in the long-term persistence of biological diversity and the maintenance of important ecosystem processes and services. Therefore, a big challenge for marine conservation scientists and planners is to utilize features (i.e., what people want to conserve), target levels (how much is needed or how much can be afforded), and new algorithms that fully achieve stakeholder visions for their seascapes.

Since systematic conservation planning is data-intensive, planners have traditionally chosen features such as sets of species or habitats for which data are readily available. There is a growing appreciation, however, that we can also address other ecological and social interests by transforming these species and habitat data to more explicitly represent key ecosystem processes and services, and then use these estimated functions and services as new features with site-selection software.

In addition, since stakeholders and planners are often interested in management goals that extend beyond MPAs - such as how protected areas can complement other types of management outside of protected areas or across a more complex zoned seascape - it is important to move beyond simplistic protected/non-protected dichotomies where all contributions to management targets come exclusively from reserved areas. Instead, we need algorithms that allow us to assess the contributions of ecosystem functions and services across whole seascapes.

Finally, another important extension into MPA network planning is the incorporation of true seascape processes into site-selection algorithms. Ecological connections among different habitat types, such as those caused by developmental migrations of species from a nursery habitat to an adult habitat, may make certain nearby combinations of different habitats more valuable to management targets than the same habitats when farther apart. Population connectivity, if known for management targets, should also influence the selection of "upstream" (e.g., larval release) and "downstream" (e.g., larval recruitment) sites that are especially well-connected. By looking at these processes across the whole seascape, both inside and outside of protected areas, or even across a wider range of use zones, we can develop a more realistic view of how MPAs may work for different objectives.

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