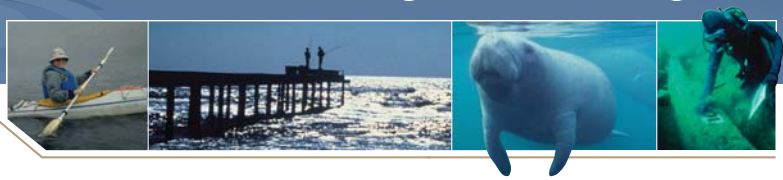
Vertical Zoning in MPAs and Understanding Benthic-Pelagic Linkages



Do all MPAs Need to be no-take reserves to be effective?

Policy-makers and stakeholders increasingly demand that new MPAs have clearly articulated conservation objectives and that user restriction be demonstrably linked to significant environmental threats. These concerns are often reflected in disputes over whether a proposed MPA be a no-take reserve to be truly effective, or whether recreational fishing for pelagic species could be permitted without compromising the integrity of the underlying benthic communities—often the primary target of MPA protections. In such situations, managing recreational fishing through "vertical zoning" that restricts fishing to the marine protected area's upper waters might represent a practical way to facilitate existing uses consistent with the site's primary conservation goals.

What is vertical zoning? What are benthic-pelagic linkages?

Vertical zoning is an emerging topic in marine protected area (MPA) design and management, and requires a much better understanding of benthic-pelagic linkages than is currently available. Vertical zoning is the allocation of certain human uses, such as surface trolling for tunas and salmon, within specific depth zones in the water column that are consistent with the goals of the MPA. In order to apply vertical zoning appropriately, it is crucial to understand when and where interactions occur among benthic and pelagic communities.

Benthic-pelagic linkages are the relationships that occur among organisms that live in the *pelagic* environment (the part of the open sea comprising the water column) with those that live in *benthic* environments (the part of the ocean near the sea floor). Many MPAs have been designed with the goal of protecting bottom dwelling organisms and their benthic habitats. Protection is usually accomplished through regulating human activities that may negatively impact benthic populations, such as fishing for bottom fish. What is less understood is whether or not pelagic fishing is compatible with the protection of benthic communities.

How is the National Marine Protected Areas Center improving our knowledge of benthic-pelagic linkages?

The National Marine Protected Areas Center recently convened research scientists, recreational fishermen, and managers from the United States to explore the current state of knowledge on benthic pelagic linkages in marine environments. During this workshop, the participants:

- discussed the current state of scientific knowledge about vital benthic-pelagic linkage in U.S. marine ecosystems;
- defined research topics that address critical gaps in our ability to implement and evaluate the effectiveness of vertical zoning in MPAs; and
- developed preliminary and practical guidelines for using vertical zoning in multiple-use MPAs.

What will the U.S. gain from understanding benthic-pelagic linkages and using vertical zoning for MPAs?

A better scientific understanding will:

- Guide managers on when, where and how to employ vertical zoning for multiple-use MPAs that effectively protect benthic resources and also allow recreational fishermen access to pelagic fishes.
- Provide a stronger scientific basis for the MPA design process.
- Reduce unnecessary contention over location and design of MPAs.
- Focus on multiple-use MPAs rather than no-take MPAs to meet conservation and human use objectives of MPAs.
- Integrate MPA planning and design into broader ecosystem management and ocean zoning efforts.

Recommendations for vertical zoning

In a workshop hosted by the National Marine Protected Areas Center's Science Institute, considerable progress was made toward developing guidelines for vertical zoning. These preliminary recommendations included:

1) Vertical zoning is generally not appropriate to consider at spawning aggregations sites, because these are areas where pelagic species congregate in large numbers in a spatially and temporally predictable fashion.

2) Vertical zoning is generally not appropriate to consider in depths less than 50-100 meters in coral reef and temperate reef ecosystems because at these shallow depths there is little separation between benthic and pelagic systems.

3) Areas beyond the shelf edge are often appropriate for vertical zoning since depths often exceed 100 meters.

4) Vertical zoning is generally not appropriate to consider around atolls or shallow seamounts.

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