



FISHERIES FACT SHEET

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Marine Protected Areas: an Ecosystem-based Management Tool

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Because of their integral role in marine biodiversity conservation and ecosystem-based management, marine protected areas (MPAs) have recently emerged as an alternative for protecting fish populations and their habitats. MPAs are defined as geographic areas that have been designated to conserve and enhance marine resources through restrictions on some activities. MPAs vary in type, size, and shape, ranging from small, highly protected 5- or 10-acre areas to larger multiple use areas such as the 350,000-km Great Barrier Reef Marine Park in Australia. In the United States, for example, 12 marine sanctuaries have been established in federal waters.

MPAs can serve a variety of purposes including:

- Conserving marine biodiversity
- Protecting important ecosystems, habitats, species and cultural resources
- Supporting scientific research
- Enhancing fish stocks
- Providing places and opportunities for tourism and education

Some Benefits

MPAs can protect entire marine ecosystems by conserving multiple species and critical habitats such as spawning areas and nursery beds. For fishery management specifically, MPAs can serve to protect habitat, enhance spawning potential, and contribute to larger populations through larval transport and adult spillover. Fish stocks inside these areas can serve as a "bank account" or insurance against fluctuations in and the depletion of populations outside the protected area caused by mismanagement or natural variability. MPAs can also reduce conflicts between fishermen and other marine users by providing areas where non-fishery users can pursue non-consumptive uses of the resources. MPAs can help diversify the coastal economy through tourism and conservation work.

Consistently-observed ecological benefits of MPAs include increased abundance and size of species, improved habitat, and more complete community structure within the MPA as compared to outside. Ecological benefits such as effects on larval transport and spillover of juveniles and adults to open areas have not been consistently observed. It has been difficult to determine the extent to which these processes enhance fisheries, given the complexity within and among biophysical and human systems.

The size of the MPA relative to home range and habitat requirements of target species is important. Clearly, MPAs can be effective in protecting species which are sedentary or have a limited range, such as mollusks and crustaceans. For species that have a larger range or highly mobile life history stages (such as planktonic larvae), MPAs can serve to protect the spawning ground, spawning aggregations, or nursery areas.

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In other cases, protecting vulnerable life history stages of the adults, such as spawning migrations, may prove effective.

Some Concerns

While it is clear that MPAs can be a powerful means of protecting critical marine areas, there is concern among fishermen and others about the anticipated shifts in fishing effort, the timing and distribution of social and economic costs, and other practical implications. One of the main concerns about relying too much on MPAs is that they simply displace fishing effort into adjacent areas, leading to extra depletion there. Effort displaced from the closed areas may become concentrated at the edge of the closed area, leading to “fishing the line” rather than broad fishery enhancement. Increased fishing on the edge of protected area may cause negative ecological impacts such as depletion of some species and increased habitat damage. Crowding may result in areas that are left open and safety issues for fishermen may increase as they have to travel further to reach fishing grounds. Closed areas can result in lower catches, especially in the short term, and associated social and economic impacts on fishermen and fishing communities. The likelihood that benefits within and outside the MPA will be realized in the long term, rather than immediately, and are more likely to result where stocks are substantially depleted, pose critical challenges to the use of MPAs.

In some circles, MPAs are advocated as the solution for all fisheries and ecosystem management problems. In reality, MPAs are not substitutes for fishery management, but are one of several tools in the management toolbox. Key success of MPAs includes stakeholder participation in siting, planning and implementation; understanding and local acceptability; and monitoring and enforcement. Goals for the scope and purpose of MPAs must reflect a balance between scientific and local knowledge about the resources, and social and economic needs and realities.

