Making Fisheries Management Work for You
A Fact Sheet Series for Connecticut Fishermen

Marine Protected Areas: An Ecosystem-Based Fisheries Management Tool

Managing Marine Ecosystems

Coastal and marine resources are under stress. Many of them, along with the ecosystems upon which they depend, are showing signs of collapse as a result of increasing fisheries overexploitation and habitat degradation. Close to home, commercial fisheries in Connecticut and Long Island Sound are in transition as well, with a number of fish stocks overfished and one commercially important stock (lobster) suffering from a severe dieoff due to yet unknown causes. The potential impact of the degradation of coastal and marine ecosystems on human health, food security, biodiversity conservation, and local and national economies will be multiplied as coastal populations continue to increase. The pressure on these systems will be multiplied as well.

Ecosystem-based management is an approach to maintaining ecosystem health and sustainability through emphasis on protecting the productive potential and biological diversity of the system that produces goods and services from the ecosystem, as opposed to protecting an individual species or stock as a resource. Ecosystem management pays attention to species interactions such as competition and predation, conservation of habitat, and protecting critical life history stages of species. Ecosystem-based measures, such as marine protected areas, provide alternatives for protecting fish populations and the habitats upon which they depend.

Marine Protected Areas

Because of their integral role in marine biodiversity conservation and sustainable development policies, marine protected areas (MPAs) have recently emerged as a solution to intractable fisheries management problems. A marine protected area is a spatially-defined area in which all populations are free of exploitation. The primary purpose of MPAs is to protect target species from exploitation in order to allow their populations to recover. Perhaps more important, MPAs can protect entire ecosystems by conserving multiple species and critical habitats such as spawning areas and nursery beds. Stocks inside these areas can serve as a “bank account” or insurance against fluctuations in and the depletions of populations outside the protected area caused by mismanagement or natural variability. MPAs can also reduce conflicts between fishers and other users by providing areas where non-fishery users can pursue non-consumptive uses of the resources. MPAs can also play a role in helping to diversify the coastal economy through tourism and conservation work. The size of the MPA relative to home range and habitat requirements of target species is important. It is clear that MPAs can be effective in protecting species which are sedentary or have a

limited range, as in many reef fish. For species that have a large range or highly mobile life history stages (such as planktonic larvae), MPAs can serve to protect the spawning ground, spawning aggregations or the nursery area. 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, the extent to which MPAs can enhance fisheries is still unclear. MPAs should be considered a necessary but not sufficient component of fisheries management. One of the main concerns about relying too much on MPAs is that they simply displace fishing into adjacent areas, leading to extra depletion there. This, in turn, increases the difference in abundance between protected and exploited areas, which may increase emigration of fish from the former to the latter, thus reducing abundance in the protected areas. In addition, MPAs do not always result in higher density for target species or in higher biodiversity. Well planned studies of MPAs are still needed to understand how protected areas work.

Marine protected areas come in many types, shapes and sizes. Around the world, they encompass everything from small, locally managed marine areas established by coastal communities to help conserve dwindling marine resources or site of cultural interest to vast multiple-use areas that have a range of conservation, economic, and social objectives. In the United States, for example, 12 marine sanctuaries have been established in federal waters. No one approach has emerged as best in every situation; each can make a valuable contribution to maintaining biological diversity, depending on the ecological and socioeconomic factors in each area.

In some circles, MPAs have come to be 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 toolbox. Key to success of MPAs includes stakeholder participation, understanding and local acceptability, and monitoring and enforcement. Goals for the scope and purpose of MPAs must reflect a balance between scientific and social and economic needs and realities.