Sea Grant
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Focal Points
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Shellfish Resource Management in Massachusetts

For many residents of Massachusetts, a visit to the tidal flats to harvest shellfish is not only a benefit of living near the coast, but also an indicator of the quality of life. Whatever your preference—oysters and littlenecks for a home raw bar, quahogs for a favorite chowder recipe, or soft-shell clams for a plate of steamers—the ability to gather and enjoy locally grown shellfish is dependent on two factors: availability and health and safety of the product.

In Massachusetts, shellfish resources are managed by the Commonwealth, through its Division of Marine Fisheries (DMF), and individual coastal towns. These entities oversee the productivity of shellfish beds as well as the health and safety of the populations for harvest and consumption.

Dale Leavitt

Floating spawning sanctuaries for bay scallops are being prepared for deployment in Lewes Bay on Cape Cod by the Yarmouth Shellfish Department.

Massachusetts Division of Marine Fisheries (DMF) Shellfish Management

The primary roles of Massachusetts DMF are to monitor shellfish resources for product wholesomeness and to provide guidance to individual towns related to maintaining shellfish productivity. DMF's chief objective—to protect public health—is mandated by a collaborative agreement between the Commonwealth and the federal government, through the Interstate Shellfish Sanitation Conference (ISSC).

To meet this obligation, DMF biologists and shellfish testing laboratories work closely with Massachusetts coastal towns to regularly test for the presence of coliform bacteria in shellfish beds. Coliform bacteria are an indicator of potential human waste contamination in shellfish producing areas. If an area tests positively for coliform bacteria, at a predetermined threshold, the DMF will issue an advisory to the town and order a

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closure of the area until the source of the contamination is identified, remedied, and the level of coliform bacteria is reduced below the threshold level.

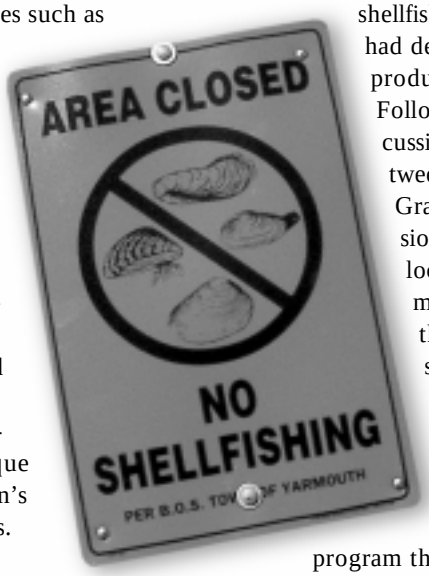
The role of DMF has not always been limited to monitoring and regulatory oversight. In days of more substantial budgets, shellfish biologists at DMF maintained a progressive shellfish research program that addressed highly applied projects to aid resource managers in optimizing natural production of shellfish. Many of the shellfish propagation programs that are in place today were first developed and implemented by DMF biologists working with the towns.

Town-based Shellfish Management

Massachusetts' "home rule" dictates that towns are responsible for maintaining and enhancing shellfish production in the Commonwealth. This is generally accomplished through a town's department of natural resources, via a shellfish constable. In many cases, the shellfish constable has some formal training or background as a marine biologist, and most participate in a certification program for shellfish constables offered by the Massachusetts Shellfish Officers Association, DMF, Massachusetts Maritime Academy, and the state's Sea Grant programs located at WHOI and MIT.

Shellfish constables are responsible for enforcement of federal, state, and local shellfish regulations, and management of the shellfish resource. Often, the shellfish constables work to increase the amount of productive shellfish areas in their towns. These duties require expertise in many areas, including law enforcement, aquaculture, biology, and public health and sanitation.

Shellfish constables may employ a variety of techniques to manage their shellfish resources. These techniques range from the simple—rotating shellfish harvest areas by closing one area following an intensive harvest period and opening new areas—to more innovative techniques such as promoting increased shellfish recruitment at non-productive sites. The challenge for shellfish constables is choosing and applying the best management technique for their town's shellfish areas.



Innovative Shellfish Management Techniques in Massachusetts

There is always a need for new and innovative techniques that can be used by local shellfish managers to manage their resources. Many new techniques have been developed through joint efforts of academic researchers, local and state shellfish managers, county and state extension agents, private shellfish aquaculture industry, and industry organizations, such as the Massachusetts Shellfish Officers Association.

Several examples of innovative shellfish management techniques are described below. It is worth noting that the success of such projects depends on cooperation and collaboration among a variety of individuals, organizations, and agencies.

Barnstable Harbor Shellfish Restoration and Enhancement Program (BHSREP)

In 1996, WHOI Sea Grant was approached by the Barnstable Shellfishermen's Association to assist them in re-establishing a number of shellfish beds that had declined in productivity. Following discussions between the Sea Grant extension agent, local fishermen, and the town's shellfish biologist, it was decided to implement a program that would test different techniques to promote shellfish recruitment. One technique was to deploy "clam tents" at selected areas within the harbor. At the time, clam tents were being developed and tested by private aquaculturists in other locations throughout the Commonwealth (*for a more detailed description of clam tents, see the WHOI Sea Grant Marine Extension Bulletin* "Clam Tents: An Innovative Approach to Soft-shell Clam Recruitment," *WHOI-G-98-006*).

Following a two-year testing interval, the Barnstable Harbor shellfish recruitment project met with success in some areas and failure in others. In relating this information to local shellfish biologists, one researcher became interested in studying the way clam tents work and what processes taking place in the harbor may be controlling soft-shell clam distributions on the flats. The researcher obtained WHOI Sea Grant funding to better understand these processes and research results are now being analyzed. It was through Sea Grant's extension service that many interested parties, including students, were brought together to understand the processes controlling soft-shell clam populations in Massachusetts.

The Martha's Vineyard Shellfish Group (MVSG)

One of the oldest and most successful collaborative shellfish management programs in Massachusetts can be found on the island of Martha's Vineyard. Six towns on the island formed their own shellfish hatchery in 1978, with the intention of producing young shellfish, or "seed," to use in restocking programs throughout the island. Each year, Rick Karney, hatchery manager and director of MVSG, produces approximately 35 million seed—a combination of quahogs, oysters and bay scallops—that are evenly distributed to the participating towns to augment the natural populations. The town shellfish biologists provide nursery care for the seed before transplanting them into the wild.

MVSG also oversees a formal training program in-

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tended to prepare displaced commercial fishermen for becoming shellfish farmers. For their efforts, MVSG is routinely cited as a model program for towns throughout the northeast interested in developing advanced shellfish management technologies.

Bay Scallop Restoration Programs

The bay scallop is often thought of as an indicator species within southeastern Massachusetts: their presence is indicative of a productive and healthy marine ecosystem. Over the last decade, stocks of the bay scallop are continuing a downward trend. This trend can be attributed to a variety of changing environmental conditions, including declining eelgrass beds, increased eutrophication of coastal bays, overfishing, increasing numbers of scallop predators, and other unexplained phenomena. The most likely culprit is a combination of these factors. While many of these coastal problems are being addressed, scallop stocks are so low in some areas that many scientists are looking to programs that, in effect, 'jump start' populations in hope that the bay scallops become reestablished.

One such program is run by the Water Works Group in Westport, Massachusetts. Active since 1993, the Water Works Group uses a technology known as "spat collection" whereby baby scallops are collected in spat bags in the river until they reach a certain size. At that point, the juvenile scallops are released in the river, where they can continue to grow and reproduce.

In addition to the large investment Water Works has made to restore bay scallops to the Westport River, they have been very active in taking their message to local schools, involving students and teachers in a hands-on approach to understanding a local issue.

Another effort aimed at improving bay scallop productivity was launched recently on Cape Cod. Barnstable County, through a collaborative effort between Cape Cod Cooperative Extension and WHOI Sea Grant, has mounted a research program to investigate the feasibility of placing bay scallop "spawning sanctuaries" in fifteen separate locations on Cape Cod. Locations chosen represent areas where bay scallops have been prevalent historically, but not recently. Spawning sanctuaries concentrate reproductively active scallops in a small area in an effort to maximize spawning success. Ideally, the scallop larvae will, in turn, repopulate these once productive areas, with the eventual result of enhanced scallop harvests throughout Cape Cod.

Quahog and Oyster Restocking Programs

Many towns in Massachusetts have developed collaborative efforts to enhance their shellfish resources. Cape Cod Cooperative Extension has collaborated with DMF and the fifteen towns in Barnstable County to provide approximately 14 million seed quahogs to the towns for inclusion in their shellfish restoration programs. The seed are purchased small (approximately 2 mm) and held in local nursery culture systems until they reach planting size (approximately 15 mm).

In Marion, Massachusetts, the town joined forces with Tabor Academy, a private boarding school, to grow-out seed stock for town shellfish beds. Tabor contributes a shorefront facility and student labor, and the town contributes financial resources and technical expertise. Together, they implemented a collaborative upwelling shellfish nursery that allows the town to purchase smaller and less expensive shellfish seed from commercial hatcheries. The end result? The Town of Marion gets a greater number of seed to use in their restoration program, while Tabor gets an excellent teaching tool that both motivates students and provides unlimited opportunities for science education.

Oyster Reef Development

Borrowing a technology developed on the west coast, the Town of Barnstable recently teamed up with the sole commercial shellfish hatchery in Massachusetts, Aquaculture Research Corporation of Dennis, to augment its natural oyster resources. The technology involves the use of remote setting to establish oyster reefs in areas lacking suitable oyster habitat, such as Barnstable Harbor. To create the reef, a base of surf clam and ocean quahog shell, supplied by a shucking house in New Bedford, is put on the harbor bottom. Next, juvenile oysters are introduced with the hope that they acclimate to the reef and establish themselves.

In Barnstable, the town shellfish biologist was able to establish an oyster resource that was open for recreational harvesting within two years from the start of the project. Not only has this technology enabled the town to propagate large numbers of oysters, it requires minimal labor. The end result is a viable oyster reef that provides the daily bag limit of oysters to a large population of recreational fishermen on a regular basis, in an area that had not supported oysters for years.

Massachusetts shellfish harvests contribute largely to the overall fishery within the Commonwealth. Much of the credit for this contribution stems from the collaborative efforts of many players, including state and local shellfish biologists; federal, state, and local public health managers; private fishermen and aquaculturists; and the marine research community. With an annual landed value of approximately $20 million, it is apparent that a concerted approach to shellfish management translates to a significant contribution to the local economies of Massachusetts' coastal communities. And, used as an indicator, productive shellfish resources signify a healthy coastal environment and improve the quality of life for Massachusetts residents and tourists.

For more information about the research or outreach projects profiled in *Focal Points*, contact WHOI Sea Grant at the address shown above.

This *Focal Point* was prepared by WHOI Sea Grant in collaboration with Cape Cod Cooperative Extension.