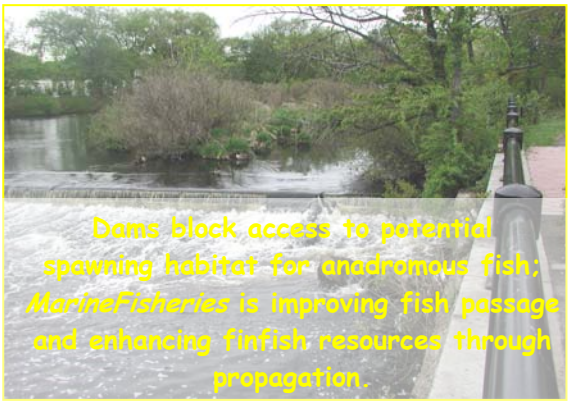
Anadromous Fish Restoration

Enhancing finfish resources in Massachusetts

Massachusetts Division of Marine Fisheries

Background:

Anadromous fishes are an important part of the near-shore fauna along the Massachusetts coast. Seventeen species of anadromous fish reside in our marine and inland waters at various times of the year. The potential impact to anadromous fish populations from disruption of the near-shore environment during spawning and migration periods can be significant. Dams and culverts prevent anadromous fish from accessing spawning habitat in the upper reaches of many coastal systems. Siltation resulting from construction activities can smother eggs or can block the spawning migration of species that are trying to reach the headwaters of rivers. Pollution and poor water quality can decrease the number of successful spawning adults and increase mortality in embryonic and juvenile fish.



Dams block access to potential spawning habitat for anadromous fish; *MarineFisheries* is improving fish passage and enhancing finfish resources through propagation.

Siltation from marine construction projects can alter spawning and rearing habitat.

In response to assumed impacts from the HubLine pipeline construction in Massachusetts Bay, *MarineFisheries* is restoring and enhancing anadromous fish resources in the associated embayments and watersheds. Methods include propagation and/or stocking, monitoring, construction and repair of anadromous fishways, stream side re-vegetation, and improvements to habitat. There are three parts to this effort.

Anadromous Fish Passage Enhancements:

This effort will enhance and increase hundreds of acres of spawning habitat for alosid fishes (alewives, *Alosa pseudoharengus*; blueback herring, *Alosa aestivalis*; American shad, *Alosa sapidissima*). *MarineFisheries* identified sites along the Massachusetts coast where anadromous fish are impeded or blocked from reaching their spawning grounds. Many of these sites are located in the Boston Harbor, watershed, including the Charles, Neponset, Mystic, and Back Rivers. Project selection is based on the costs of construction and/or repair versus the combined benefits of acreage of habitat restored, historical presence of a fish run, community support, water quality, and the reliability of adequate water supply.

Rainbow Smelt Propagation and Habitat Enhancement:

MarineFisheries is working to assist the restoration of rainbow smelt (*Osmerus mordax*) populations in the Crane and North Rivers in the Beverly-Salem area. Restoration efforts include the physical enhancement and restoration of spawning habitat by adding spawning substrate, improving river contours, and by the implementation of a larval hatching/stocking program. Propagation techniques include stream-side portable hatcheries which greatly enhance larval production. Portable hatcheries reduce egg mortality in the wild from 80-100% to less than 10%. Otoliths (inner ear bones) of hatchery-spawned fish will be marked to differentiate them from naturally-spawned fish which will gradually become more abundant than hatchery-spawned fish over several years if the program is successful.


Rainbow smelt (*Osmerus mordax*)


Incubating smelt eggs for stream-side propagation

American Shad Propagation:


MarineFisheries is working to restore American shad (*Alosa sapidissima*), the largest member of the clupeid family, in Massachusetts Rivers

Over the last century, shad were reduced to unsustainable populations in many Massachusetts rivers due to the construction of dams, pollution at spawning grounds, and over-fishing. *MarineFisheries* is restoring viable populations of shad to the Neponset and Charles Rivers with a fry-stocking program and fish passage improvements. This effort is a collaboration between *MarineFisheries* and the U.S. Fish and Wildlife Service (USFW). Brood stock shad are obtained from the Merrimack River, where the shad population has rebounded in recent years from water quality improvements and the construction of efficient fish passage structures on dams. Shad fry will be reared in USFWS hatcheries, marked, and then stocked by *MarineFisheries* in the upper Charles and Neponset Rivers. Adult fish returning to these systems will be sampled and examined by *MarineFisheries* to confirm hatchery origin.


American shad hatchery tank with adult fish ready for spawning

For more information and project updates visit our website at www.mass.gov/marinefisheries and click on the "HubLine" link