NONPOINT SOURCE SUCCESS STORY

Rhode Island

Installing Fish Ladders on the Ten Mile River Restores Historic Herring Run

Waterbody Improved

Early in the 20th Century, dams were built for water supply and electricity generation along the Ten Mile River, blocking passage of anadromous river herring. To restore the Ten Mile River aquatic ecosystem to its natural state and allow for movement of anadromous fish, three Denil-style fish passage facilities were installed at the first three dams on the Ten Mile River—Omega Dam, Hunt's Mill Dam and Turner Reservoir Dam. Herring are now able to access over 340 acres of valuable nursery and spawning habitat. Funding for construction came from a wide variety of sources, including federal, state, city and non-governmental organizations.

Problem

Colonial records indicate that Rhode Island historically hosted large herring runs on at least 45 rivers and streams in the Narragansett Bay watershed—one of the most significant of which was the Ten Mile River. The Ten Mile River watershed, with a total drainage area of about 56 square miles, originates in Massachusetts, crosses into Rhode Island and flows through the city of East Providence into the Seekonk River. Historically, anadromous river herring entered the Ten Mile River from the Seekonk River, swam upstream through Omega and Hunt's Mill Ponds, and spawned in Turner Reservoir (Figure 1).

During the industrial revolution, most of Rhode Island's rivers were dammed to provide power to the many industrial mills in the state, as well as to provide a water supply and generate power for electric plants. These dams prevented passage of native anadromous river herring, particularly blueback herring, alewife and American shad, to their historic spawning areas.

River herring are considered a keystone species in Rhode Island, one that plays a disproportionately large role in the surrounding ecosystem. In the case of this small fish, it serves as a food source for everything from ospreys to striped bass, bluefish, tuna, cod and haddock to herons and otter. Herring are born in freshwater ponds and lakes, and then swim out to sea, where they spend years growing to adulthood before returning to their birthplace to spawn. Currently 21 streams support herring runs in Rhode Island but most are impaired to some degree and in need of restoration.

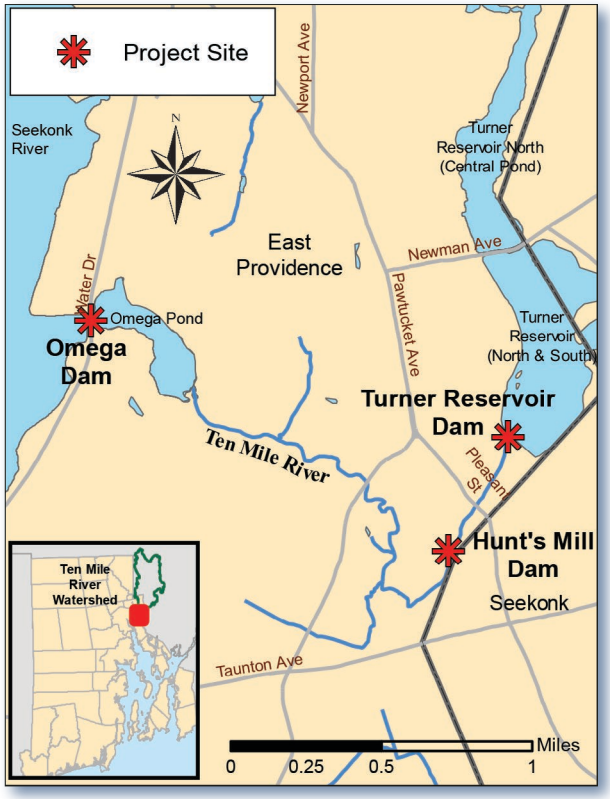

Figure 1. Herring must traverse multiple dams along the Ten Mile River.

Story Highlights

For many years, to help maintain the herring fishery, herring were moved by hand across the dams using dip nets. Rhode Island Department of Environmental

Figure 2. A fish ladder was installed to bypass the Turner Reservoir Dam in 2012.

Management (RIDEM) Division of Fish and Wildlife staff, Ten Mile River watershed volunteers and dedicated sport fishermen from the Salt Water Anglers Association assisted with the effort.

Significantly decreased herring returns between 2001 and 2005 prompted a complete moratorium on the herring fishery in Rhode Island to help increase herring stocks. The U.S. Army Corps of Engineers (USACE) designed a series of Denil-style fish ladders for the first three dams along the Ten Mile River so river herring could bypass the Omega Pond Dam, the Hunt's Mill Dam and the Turner Reservoir Dam (Figures 2 and 3). Fish ladder construction began in 2010 and was completed in two phases: (1) Turner Reservoir and Hunt's Mill ladders (completed September 2012) and (2) Omega Pond fish ladder (completed April 2015). The three fish ladders opened over 340 acres of spawning and nursery habitat, and approximately 3 miles of riverine spawning habitat for river herring. Based on the RIDEM's projections, these habitat areas have the potential to support a fish run of more than 200,000 river herring. Increasing populations of herring will restore this ecosystem's balance.

Results

RIDEM Division of Fish and Wildlife (DFW) staff have been stocking Turner Reservoir with river herring brood stock since the fish ladder was completed in 2015. The dedicated sport fishermen and Turner River

Figure 3. A fish ladder, completed in 2012, bypasses Hunt's Mill Dam on the Ten Mile River.

Watershed Association members who had previously volunteered their time to hand-dip the herring past the dams turned their attention to volunteering for fish counts during the returning herring runs. Herring returns above the Hunt's Mill Dam have been generally increasing from a low of 3,200 in 2015 to a preliminary count of over 10,000 during the 2018 herring run. While these numbers are encouraging, more work is needed to remove an additional obstruction downstream of the Hunt's Mill Dam. DFW staff are working with project partners to address a way to correct this obstruction to increase future herring returns. DFW staff noted that some river herring might not be completing the full spawning run to Turner Reservoir and instead could be spawning in Omega Pond.

Partners and Funding

Federal and state partners have provided technical and funding support for the projects, including USACE (stimulus funds: $460,000), National Oceanic and Atmospheric Administration (stimulus funds: $630,000); U.S. Department of Agriculture's Natural Resources Conservation Service and the city of East Providence ($465,000), and the Fish America Foundation ($50,000). Other funding sources include EPA CWA section 319 ($332,000), CWA section 206 (federal share: $4,900,000; nonfederal share: $2,600,000); Narragansett Bay Watershed Restoration Bond Fund ($1,065,000) and Rhode Island Coastal Resources Management Council Habitat Restoration Trust Fund ($100,000).

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