



NOAA Restoration Center

Mill Pond Salt Marsh Restoration

Project Background

Mill Pond is a hydraulically restricted salt pond that is located inland from the Annisquam River Estuary and the Mill River in Gloucester, Massachusetts. The 30-acre salt marsh used to be joined to the Mill River, but was separated from the estuary by a dam constructed for a mill in 1677. The current structure, the Washington street tidal gate, was built in 1989 and is opened and closed periodically in the spring and fall by the Department for Public Works to alleviate the smell and to control flooding.

Restoration Benefits

Restoring Mill Pond by increasing the tidal flow would increase wildlife viewing, diminish the adverse affects of invasive plants, improve the water quality and reduce algae. The improved aesthetic appearance will reflect a deeper achievement of improving thirty acres of coastal tidal pond and salt marsh habitat. Phragmites, an invasive plant that also can be a fire hazard when its stalks become dry in the winter, currently covers much of the pond including the area near the O'Malley Middle School. A regular flushing of ocean water will raise salinity levels to a point where the phragmites cannot survive and native salt marsh plants such as cordgrass will be able to recolonize the marsh.

Besides increasing the cover of native salt marsh vegetation, the restoration of dissolved oxygen and salinity levels will improve the habitat of sticklebacks, striped killifish, Atlantic silversides, mummichogs, American eels, periwinkle snails, and soft-shell clams. This in turn would attract a number and variety of birds and larger fish predators to the salt



marsh for food, including blue herons, winter flounder, striped bass and bluefish.

Restoration Needs

Allowing the tide to flow freely through the gate will improve the water quality and restore natural salinity levels. Native salt marsh plants require a certain level of salinity in the soil to flourish, and high water quality is an important characteristic for a healthy marine habitat for fish and invertebrates. Explosive algae growth, the resulting eutrophication, and low dissolved oxygen levels can be kept at a minimum with an effective purging of nutrients and organic material through unrestricted tidal flow.

Solution

The first and perhaps most important step to restore this habitat was to open the tidal gate for full tidal flow. After the gate was opened in May of 2004, the state of the estuary was evaluated to better understand the implications of allowing the tide to flow freely. Aerial photographs were taken in order to create a topographical map, tide measurements were recorded, the

ISSUE

Restoring tidal flow will improve the health and aesthetic appeal of salt marsh ecosystems.

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NOAA Community-based Restoration Program

Mill Pond Salt Marsh Restoration, Gloucester, MA

substrate and vegetation were mapped, and bathymetric surveys were conducted. During extreme tidal events MACZM, NOAA, and local staff inspected the tidal levels and found no adverse flooding effects with the tide gate open. This gave project workers a better idea of the effectiveness and feasibility of opening the gate. Additionally, once the open tide gate drained the estuary, community volunteers spent time cleaning up the trash and debris left on the bottom of the salt marsh. Removing these possible polluting items improves the health and appearance of the pond.

Another part of the solution involves taking steps to ensure that the restoration is sustainable and is continued into the future. Current plans include establishing a monitoring program that will set operating conditions that best serve the ecological and human needs of the salt marsh.

The Future

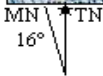
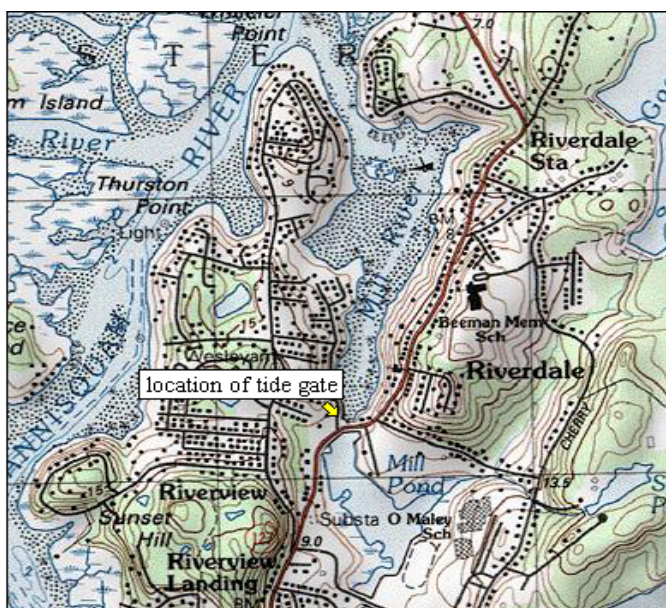
The overall ecological improvement of this habitat may one day lead to the Massachusetts Division of Marine Fisheries

opening up the pond to commercial shell fishing.

Currently this site is listed as "Prohibited" by the Division of Marine Fisheries (DMF). However, this restoration project in

combination with reduced fecal coliform bacteria counts because of the improvement of the North Gloucester sewer system could together provide the health this pond needs to support commercial shell fishing. In addition, it is hoped that a new and improved tide gate and culvert will be constructed. This project is part of a larger effort to improve coastal wetland habitat for native fauna and flora. The restoration of natural tide flows is an important step in continuing this effort in the Gulf of Maine.

The NOAA Community-based Restoration Program seeks to involve communities in the restoration of marine and estuarine habitat. Partnerships with Federal agencies, states and local governments, non-governmental and non-profit organizations, businesses, industry and schools have assisted over 700 projects nationally including 49 within the Gulf of Maine to restore coastal habitat. The NOAA Community-based Restoration Program and its partners provide funding and expertise to projects that promote coastal stewardship and a conservation ethic. Through partnerships, the Community-based Restoration Program has been able to leverage \$3-\$5 on average for every NOAA dollar invested.



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THE MILL POND PARTNERSHIP:

In addition to the NOAA community-based Restoration Program and the City of Gloucester, a number of organizations and agencies worked together to make this project possible. They include the following:

- The Conservation Law Foundation
- Metcalf and Eddy
- Clipper City Surveying and Engineering
- Coastal Zone Management Program
- Corporate Wetlands Restoration Partnership
- Gloucester Department of Public Works
- Gloucester Conservation Commission
- MCZM Wetlands Restoration Program
- Anderson Foundation