

Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: Town of Falmouth

Project Title: Coonamessett River Restoration Project: Construction of Phase 2

Grant Award: \$760,000.00

Match: \$1,130,306

Community Overview:

Falmouth is located in the southwestern corner of Cape Cod and contains more than 100 miles of salt water coastline; it is vulnerable to natural hazards that will increase due to climate change, such as increasing sea level and an increase in number and intensity of storm events. Falmouth possesses many key assets in facing these changes, including a high level of community volunteerism, responsible and committed Town leadership and staff, key support facilities in Town (including Falmouth Hospital and Falmouth High School, which serves as a shelter during hazard events), natural barriers (beaches, dunes, marshes) that act as buffers to storm events (which this project addresses). One part of Falmouth is an Environmental Justice Community.

Description of Climate Impact:

Falmouth will be subject to increasing sea level rise, increasing temperatures, and increased frequency and intensity of storm events. The Coonamessett River, a groundwater fed system, provided a good opportunity to employ a nature based solution to increase coastal resiliency. The river and its buffers had been degraded through 300 years of industrial uses (mills and cranberry agriculture). The cold groundwater is less likely to be subjected to the expected warming of surface water. Removal of barriers (dams, undersized culverts) not only improves fish passage but allows for restoration of flood plain connectivity. This will provide flood storage capacity, allow for salt marsh migration upstream as a result of sea level rise, and improve wetlands functions, including removal of nitrogen and other pollutants.

Project Goals:

The goals of this project include:

- Naturalized, self-sustaining riparian wetlands
- Spatial connectivity
- Improved fisheries
- Improved public awareness of the importance of nature based solutions to climate change

Approach and Result:

The recently completed restoration of the lower Coonamessett River has resulted in increased coastal and community resiliency. The Town has currently completed the restoration of the lower Coonamessett River and associated former cranberry bog complex located entirely on Town-owned land in Falmouth, Massachusetts. Phase 1 was completed in May 2018, resulting in the removal of the first dam from the ocean (replaced by a 300 ft. pedestrian boardwalk; Dexter's Mill Crossing) and restoration of 1600 linear feet of in-stream habitat and 17 acres of riparian corridor (former cranberry bog). Phase 2 construction, support by this MVP Action grant, began construction in December 2019 and concluded in mid-May 2020. This work included (1) removal of a second ("Middle berm") dam, replaced by a new 400 ft. pedestrian boardwalk (Swift's Crossing); (2) replacement of a failing public road-stream crossing (culvert), by a MA DOT approved stream crossing; (3) restoration of the remaining 39 acres of the riparian corridor; and (4) reconstruction of 3,000 linear feet of the Coonamessett River. The final result of the lower Coonamessett River Restoration Project is 33 acres of restored wetland (with a mosaic of habitats), plus 23 acres of upland riverine habitat; a stream channel that added meanders to increase its length (from 1.48 miles to 1.91 miles), and increased habitat diversity; an increase in free flowing stream (from 0.25 mi before restoration to 2.2 miles post restoration); and improved fish access to spawning areas of Coonamessett Pond (156 acres) and Flax Pond (22 acres).

The Project has achieved its primary goal of a restored wetland complex and free flowing riverine system that enhances resilience and provides the ability to adapt to climate change. The Coonamessett is one of the largest rivers on Cape Cod. With glacial outwash as its geology, the hydrology of the river is extremely stable. It is less affected by storms, drought, and changes in air temperature than similarly-sized rivers that are surface-water driven. The actions taken during this restoration are detailed above; their relevance to the objectives of the MVP Grants Program include: (1) the removal "Middle Dam" eliminates a barrier to fish migration and it provides increased storm surge capacity that will be needed for the anticipated increase in the magnitude and frequency of storms; it also provides addition area for salt marsh migration; (2) the new John Parker Road culvert is a structure that can pass the full range of flows consistent with an increase in the magnitude and frequencies of storms as well as providing passage for fish and wildlife; it also improves public safety; (3) breaking up the cranberry platform and selective removal of the anthropogenic sand layer improves ground/surface water exchange (helping in removal of nitrogen and other pollutants), and increases flood storage and mitigation potential (habitat diversity and thus biodiversity, providing a natural system that can more easily recover from climate induced perturbations); and 4) restoring a free-flowing cold water river that can change width, depth, and form as necessary to adapt to changes in hydrology associated with changes in climate.

Lastly, at the same time (the past ten years) the Coonamessett River Restoration Project has developed, the Coonamessett River Heritage Trail has been created. This is valuable for both its recreational and educational opportunities. It is a network of trails along the length of the Coonamessett River from Coonamessett Pond in the north, 3 miles to Dexter's Mill Crossing in the south. There are 12 interpretive stations (27 panels; 23 already installed) along this trail that describe the rich cultural and natural history of the Coonamessett Valley, encouraging awareness of the importance of restoration of natural systems. Another goal is to provide access to all ages and all abilities. The lower mile long loop of the trail connects the two new river crossings

(boardwalks where dams were removed), and when it is completed in early 2021, will be ADA accessible. The new bridge at John Parker Road not only improves fish passage, but improves safety for vehicles, as well as providing a much needed sidewalk.

Lessons Learned:

Communication is key to a successful project. Prior to actual construction, monthly meetings were held among key partners (Town personnel, design engineers, funding agency personnel) and construction meetings were held every week during the duration. Inevitably issues arise, but there was almost daily communication between the Town Coordinator, the Town construction inspector, the Construction Team Lead, and the river restoration oversight geomorphologist, and problems could be resolved immediately as they occurred.

The second lesson learned is that providing opportunities for people to contribute and be part of something larger than themselves can enrich a project. The project was well covered by local newspapers and local TV, and partner organizations (in particular the Coonamessett River Trust and The 300 Committee Land Trust) provided a conduit for other groups interested in participating in the outreach and educational aspects of the project. Many people have donated their expertise and countless hours to help complete parts of this project, e.g., be it herring counting, designing and doing research for interpretive panels, providing signs when needed (such as “Please keep off the newly seeded banks of the river”), and many others.

Partners and Other Support:

In addition to MVP, the primary funders of this project included NOAA Restoration, NRCS, Division of Ecological Restoration, and the Community Preservation Fund. In total more than 40 organizations have contributed to this project as well as hundreds of local volunteers. Two community organizations have provided considerable assistance. The Coonamessett River Trust has done all the monitoring of biological, physical and chemical parameters starting in 2004, and The 300 Committee Land Trust has partnered with the Town to create a corridor of protected conservation lands almost the entire length of the river from Coonamessett Pond to its entrance to the estuary about 3 miles south. Both organizations promote educational and recreational activities to improve the public’s knowledge of the natural world, and how restoration increases coastal resiliency. Both organizations have partnered with the Town to complete the Coonamessett Greenway Heritage Trail (CGHT). It has 12 interpretive stations along its length that provide information on both the cultural as well as the natural history of the valley. The lower loop of the CGHT (about 1 mile long) is being constructed to be entirely ADA accessible. The trailhead, the Gateway to the Greenway, will be built beginning in late fall 2020.