Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: City of Fall River
Project Title: South Watuppa Green Infrastructure – Blue Water Restoration Project
Award Year (FY): 2023
Grant Award: $ 415,127.50
Match: $ 138,075.50
Match Source: City of Fall River
One or Two Year Project: One Year Project
Municipal Department Leading Project: Department of Community Utilities Sewer/Water Divisions
Project Website URL: https://www.watuppareserve.com/ and https://www.facebook.com/groundworksouthcoast

Community Overview:

The City of Fall River is home to nearly 94,000 people and is located roughly 50 miles south of Boston, near the Massachusetts/Rhode Island border. South Watuppa Pond (Pond) is approximately 1,460-acres, making it the third largest naturally occurring body of water in Massachusetts. In addition to the City of Fall River, the Towns of Westport, MA and Tiverton, RI are also within the Pond's 18.4 square mile watershed, and co-sponsors of this project.

None of the nature-based retrofits are in Environmental Justice (EJ) areas; however, the Pond is a significant regional recreational and environmental resource with value to all residents of Fall River and the towns of Tiverton-RI, and Westport. As a potential emergency/back-up water supply for the Fall River system, the Pond has a value for the residents of Fall River and the communities that interconnect to its supply (Somerset, Dighton, Swansea) and for those that purchase water from the system (Tiverton and Westport). Further, the Pond is situated immediately near EJ populations in Fall River and the Town of Westport, including the Maplewood Neighborhood. These communities have access to the recreational benefits of the Pond, such as the Boat Ramp.

More than a dozen Block Groups within the Pond vicinity are EJ-designated by income. These populations are most likely to use public recreation resources and will benefit from the project and continued work to improve water quality and reduce harmful algal blooms (HABs) in the Pond. In addition to their EJ status, these areas are identified as socially vulnerable by the CDC Social Vulnerability Index, making them ranked high for vulnerability to climate change stressors and most at risk during emergency events. As such, they are most likely to benefit from resilient water supply.

The Pond has a history of summer and fall public advisories due to cyanobacterial HABs, posing a significant health threat to humans, animals, and aquatic ecosystems and compromises the ability of a resource to support potable and primary/secondary recreational uses. The City has responded to these issues by initiating the South Watuppa Pond Water

Quality Project, driving the development of the *South Watuppa Pond Nutrient Management Plan* (Plan). The Plan, completed in 2022, and associated ongoing water quality monitoring efforts have received support from the Bay Coast Bank and UMass Dartmouth.

Project Description and Goals:

The South Watuppa Pond Green Infrastructure – Blue Water Restoration Project included three stormwater treatment retrofit designs and one watershed restoration analysis for the Sucker Brook wetland area. The three stormwater retrofit site locations were in each of the municipalities of Fall River, Westport, and Tiverton – all of which are located in the South Watuppa Pond Watershed. The Sucker Brook restoration efforts occurred within the City of Fall River boundaries. All of the project sites are near the boundary of South Watuppa Pond.

Increased temperatures, light availability, flow alteration, changes in pH, and nutrient loading have led to seasonally reoccurring HABs within the Pond. These pollutant drivers are exacerbated by drought, extreme precipitation, and extreme temperatures as a result of climate change. Surface water supplies throughout the country will be increasingly vulnerable to drought, requiring resiliency in these systems. Climate change impacts can be mitigated by treating polluted stormwater runoff before it enters the Pond, either through retrofits within the stormwater infrastructure, or natural methods occurring in surrounding wetlands. This Project aims to maximize benefits by applying both of these methods.

To reduce phosphorus loading to South Watuppa Pond to improve water quality; reduce the occurrence of HABs; and protect its use as a water supply and recreational resource for the City and EJ residents, three stormwater retrofits were identified - Cherry Lane, Tickle Road / Chabot Street, and the South Watuppa Pond Boat Ramp (off Jefferson Street Extension). After additional investigation and coordination with Westport regarding the Tickle Road/Chabot Street project site, it was determined a stormwater retrofit in this location was not feasible and therefore, the City and Westport agreed to design a stormwater retrofit on Plymouth Boulevard located in Westport. The Sucker Brook Wetland area, southwest of the Pond, is surrounded by industrial businesses, residential neighborhoods, and the Atlantis Charter School. Wetland restoration and flood mitigation opportunities at this site could also be combined with public access concepts and regional benefits. The project goals, as identified in the MVP grant application, were to work intermunicipally with the towns of Westport, MA and Tiverton, RI, and in collaboration with Groundwork Southcoast (a local non-profit organization) to educate the public regarding nutrient pollution, its impacts, and best management practices to reduce it; to educate the public as to the impact of climate change on waterbodies; and to install nature-based retrofits to reduce phosphorus loading to South Watuppa Pond to protect its potential use as a back-up water supply and recreational resource for the region. The four retrofits that constitute the South Watuppa Pond Restoration project are identified in the South Watuppa Pond Nutrient Management Plan and were selected based on overall feasibility, public site ownership, phosphorus reduction potential, and educational / recreational opportunity.

The Project achieved the goals identified in the application, as well as the following:

- Employed nature-based solutions;
- Improved equitable outcomes for and fostered strong partnerships with EJ and other Climate Vulnerable Populations within the City boundaries;
- Provided regional benefits by partnering with Westport, Tiverton, the Atlantis Charter School, and Ground Work Southcoast;
- Implemented the public involvement and community engagement plan set forth in the City's MVP application in coordination with Ground Work South Coast;
- Finished the Project by the identified deadline of June 30, 2023, on time.

Results and Deliverables:

Once implemented, the three retrofits are expected to capture and treat a water quality volume based on 1-inch of stormwater runoff from approximately 14.2 acres of land area. The proposed retrofits and infrastructure improvements include an enhanced biofiltration basin, upgrades to an existing stormwater basin, four non-infiltrating proprietary bioretention structures, a subsurface detention system, two hydrodynamic separators, a drain manhole with high flow bypass, and upgrades to an existing swale.

The Sucker Brook restoration modeling and research efforts indicated that flood mitigation would be best accomplished by replacing an existing 36-inch marsh berm culvert with a 3-ft by 16-ft (or equivalent) box conduit. Results of the alternatives analysis indicate that this alternative would reduce flood depths in the Anderson Street area of Fall River by 1.7 feet during the 25-year storm event and 0.7 feet during the 100-year storm event. Additionally, water quality benefits could be achieved through the eradication of the invasive reed plant species, Phragmites, in the southern marsh area of the Sucker Brook wetland complex. This alternative provides approximately 1.1 MG of additional storage volume for passive treatment of the first inch of precipitation from the 210-acre Dickinson Street Outfall.

There were numerous deliverables completed throughout the project that contributed to the overall results, including:

- 100% design drawings, specifications, and high-level cost estimates for the three retrofit locations (Boat Ramp, Cherry Lane, and Plymouth Boulevard).
- One Notice of Intent (NOI) Stormwater Report for the Boat Ramp retrofit submitted to Fall River Conservation Commission for permitting purposes.
- Two Design Basis Reports for the Cherry Lane and Plymouth Boulevard retrofits.
- Outreach materials (multi-lingual door hangers, handouts, and flyers) and over 350 hours of engagement and educational work by Groundwork Southcoast (GWSC), specifically in EJ communities, schools, and public housing.
- A Geographic Information Systems (GIS) mapping tool, created by GWSC to indicate locations of the Pond's retrofits and demographics of the surrounding EJ communities.

- A Study Report describing the existing conditions hydrologic & hydraulic (H&H) model for the Sucker Brook wetland, as well as public access visioning, CCTV/pole camera footage, H&H modeling of flood mitigation and wetland restoration alternatives, permitting considerations, and cost estimates for the recommended alternatives.
- A public meeting held in June 2023, regarding the Project's past, current, and future efforts towards restoring the Pond.

Lessons Learned:

As this project involved coordination across three municipalities, stakeholders, and the residents of the retrofit locations, there were several obstacles faced throughout the process. One of the initial site locations – Tickle Road/Chabot Street in Westport – was deemed infeasible after surveying and wetlands analysis were completed. This required the City and Westport to pivot and they chose to select a different location to improve water quality in the Pond. Coordination and outreach with the Plymouth Boulevard property owners was necessary and the team had to move quickly to meet the grant deadline.

The City learned that early coordination is crucial to project success. The City plans to continue to build its relationship with Atlantis Charter School and coordinate in the future regarding Sucker Brook wetland restoration and educational opportunities.

Partners and Other Support:

- Project Partners:
    - City of Fall River, Paul Ferland: advocated for, coordinated, and supported the entire Project
    - Town of Westport: Coordinated with Fall River for the location of one retrofit to be within the Town's boundaries (Plymouth Boulevard)
    - Town of Tiverton: Coordinated with Fall River for the location of one retrofit (Cherry Lane)
    - Department of Fish & Game: Property owner of Boat Ramp; coordinated with City and approved retrofit design
- Project Technical Support:
    - Woodard & Curran: consultant retained by the City to execute the Project
    - GWSC: Led public outreach and education efforts
    - WSP: Completed survey work for the four site locations
    - LEC Environmental Consultants: Completed wetlands assessments for the four site locations
    - CDCI: completed soils work for the Boat Ramp and Cherry Lane site locations
    - Atlantis Charter School: collaborated with Fall River during the public access visioning process and expressed interest in the future involvement in the Sucker Brook restoration efforts
- Project Supporters: submitted written support for the Project
    - Paul Coogan, Mayor, Fall River, MA

- Tess Curran, Director, Health and Human Services, Fall River, MA
- James Hartnett, Town Administrator, Westport, MA
- Chris Cotta, Town Administrator, Tiverton, RI
- John Romiti, Board of Directors, East End Sportsman's Club
- Armand Watts, President, Fall River Rod & Gun Club
- Julie Jasmin, President, Maplewood Neighborhood Association
- James Terrio, Chairman, Watuppa Water Board
- Michael J. Rodrigues, State Senator, First Bristol and Plymouth & Chair, Senate Committee on Ways and Means
- Paul Schmid, State Representative, 8th Bristol District
- Mark A. Fuller, PhD, Chancellor of UMass Dartmouth
- Paul M. Cloutier, Board Chair, Watuppa Rowing Center
- Robert L. Beatty, Executive Director, Atlantis Charter School

Project Photos:

Shoreline of South Watuppa Pond near the Boat Ramp retrofit location

Boat Ramp parking lot

Existing storm drain infrastructure at the Cherry Lane retrofit location

Where Sucker Brook discharges into South Watuppa Pond

Soil sampling at the Boat Ramp retrofit location

Existing stormwater infiltration basin at the Cherry Lane retrofit location