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SNEP NETWORK

Presentation of Preferred Alternative to Property Owners

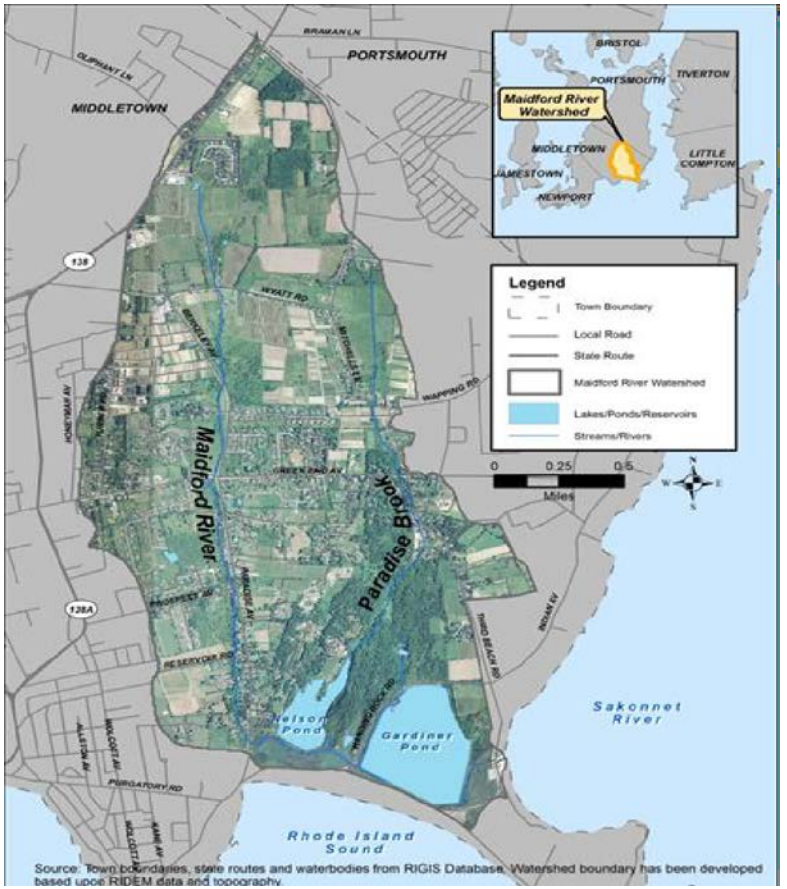
December 15, 2020

Maidford River Restoration Project

Project Objectives

Town of Middletown and Aquidneck Land Trust, with support from the Southeast New England Program Network, are advancing use of nature-based solutions to reduce flooding and improve water quality:

- **Floodplain restoration to increase the river's flood storage capacity**
- **Riparian buffer restoration, where feasible**



Project Team: Town of Middletown, Aquidneck Land Trust, SNEP Network partners (Save the Bay, Elizabeth Scott Consulting, Throwe Environmental, NE Environmental Finance Center), Eastern RI Conservation District, Fuss & O'Neill

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Southeast New England Program Network

A collaborative network of 15 partners with expertise in stormwater management, financing, and watershed-scale conservation and restoration.

- **Mission: To empower communities to achieve healthy watersheds, sustainable financing and long-term climate resilience through management of stormwater and restoration projects.**
- **Approach: Deliver technical assistance and training to municipalities, organizations and tribes, creating improved norms of practice and financing, and peer to peer exchange across the region.**
- **SNEP Network is administered by the New England Environmental Finance Center with funding from US Environmental Protection Agency.**
- **Maidford River Restoration Project is one of two SNEP Network pilot projects: *Assisting communities to overcome common obstacles and advance watershed scale nature-based solutions to mitigate flooding, improve water quality & build climate resilience.***

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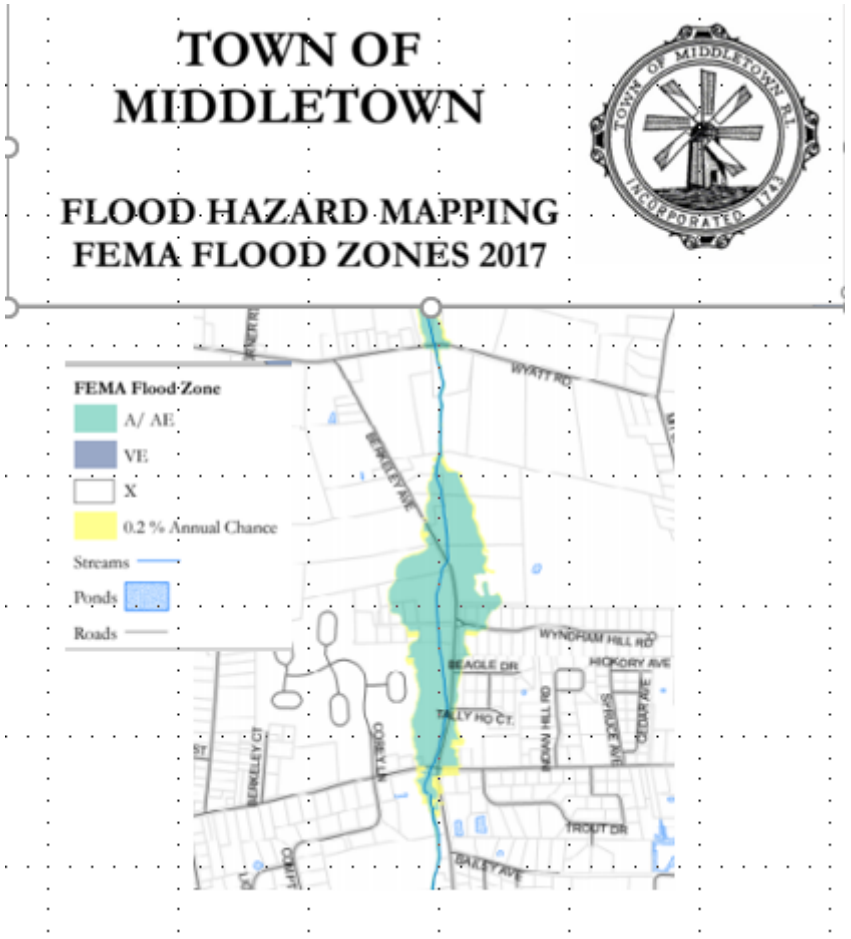
Flooding Problems

- **Frequent flooding of local roads, lawns and farm fields create public safety hazards, damage private property, and contribute to water quality problems.**
- **Flashy stream flow in wet weather**

Photos taken 9/30/15 by S. Ribas/RIDEM



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Water Quality Impacts

A small river with an outsized impact on sensitive water resources

Maidford River is impaired by bacteria, nutrients, and suspended solids. It contributes to:

- Degraded water quality in Nelson Pond and Gardiner Reservoir – two of Newport's water supply reservoirs;
- Degraded habitat of Sachuest marsh home to the saltmarsh sparrow, a species of high conservation concern;
- Threatened recreational and shellfishing uses in near coastal waters of Sakonnet River including Third Beach.

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Water Quality problems predominately wet weather

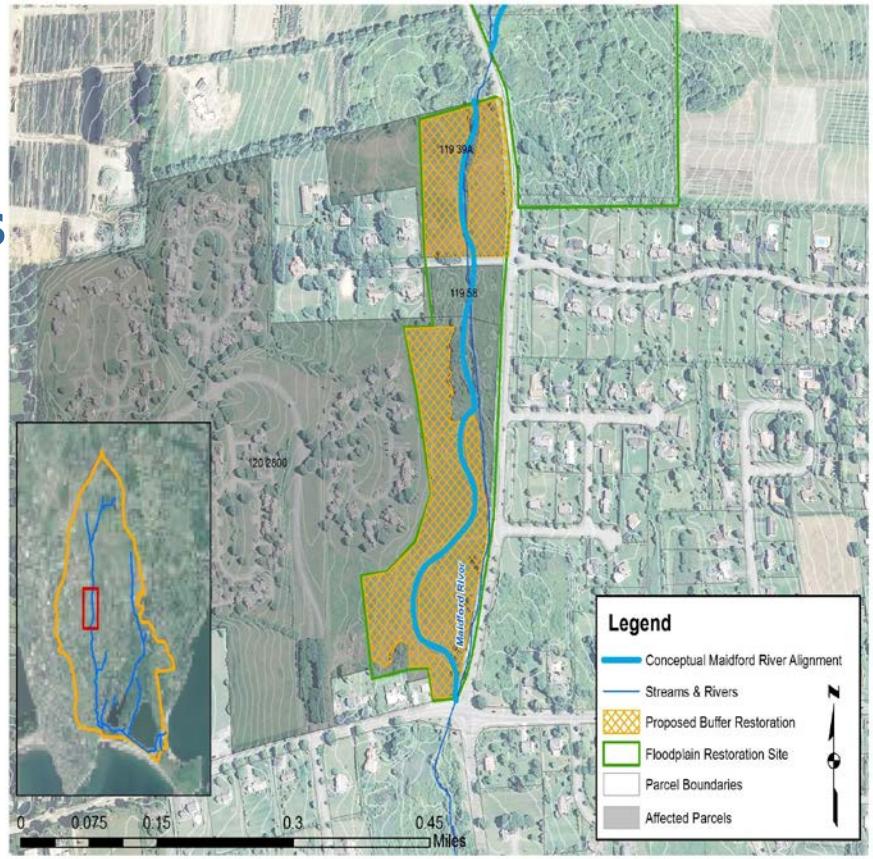
Study by URI Dept of Natural Resources confirmed significance of storms and high flow events to dissolved nutrient flux in the Maidford River:

- 16 storms accounted for 30% of total flow and 70% of dissolved phosphorus flux
- Largest storm, 2.84 inches, accounted for 9% of total flow and 17% of dissolved phosphorus flux
- Proposed floodplain and riparian restoration along with “source control” will reduce amount of nutrients delivered to reservoirs and build resiliency to climate change

Floodplain Restoration: Beginning Concept

Project builds upon ongoing watershed protection and stormwater management efforts by Aquidneck Land Trust and Town of Middletown

Design Concept proposed in Maidford River Conservation Plan (2017) prepared for Aquidneck Land Trust by Fuss & O'Neill



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Field Observations (Sep. 21, 2020)

- **Stream is already evolving to form meanders and scour pools → mobilizing sediment downstream**
- **Dry channel throughout site; soils dry in floodplain**
- **Heavy sediment deposition in streambed and on floodplain**

Sediment deposition in the streambed

Sediment deposition in Whitehall culvert

Field Observations (Sep. 21, 2020)

- Numerous invasive species on site
- Stone wall and large trees along west channel bank between Green End Avenue and Tally Ho Court are being undermined by erosion

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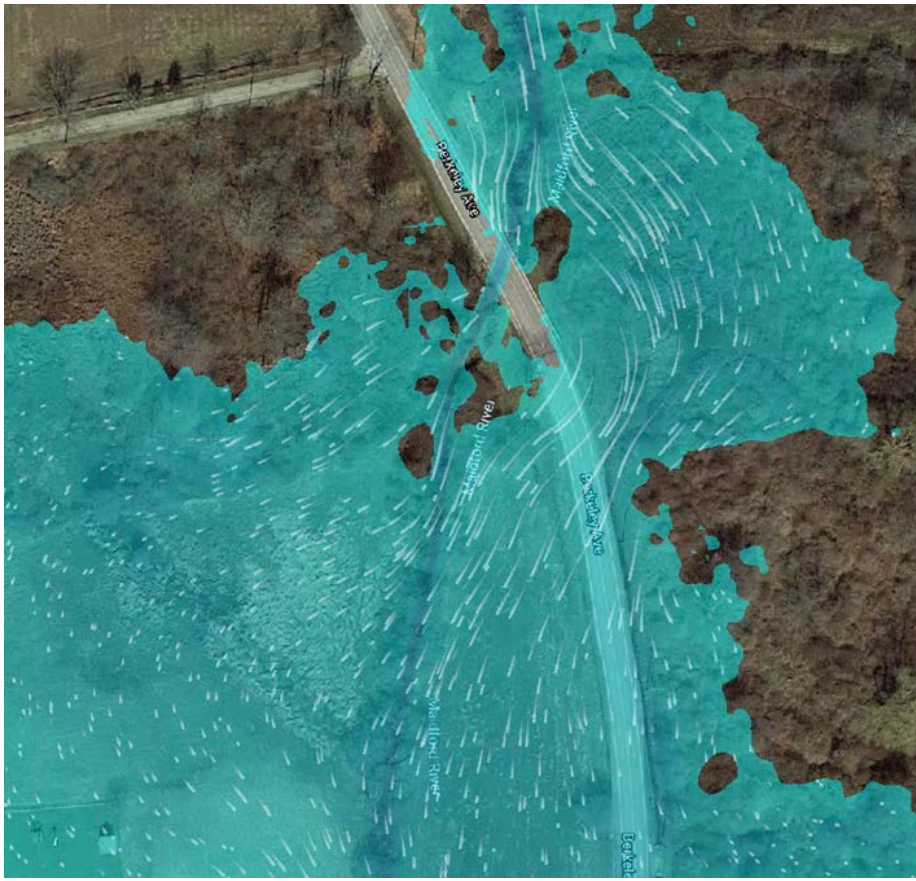
Floodplain Restoration Designs evaluated

Project area: just upstream from Berkeley Avenue overpass to Green End Avenue.

Using information collected from field assessments, historical topographic maps, and modeling, various floodplain restoration designs were evaluated for their flood mitigation and water quality benefits.



Preliminary HEC-RAS 2-Dimensional Hydraulic Model Output

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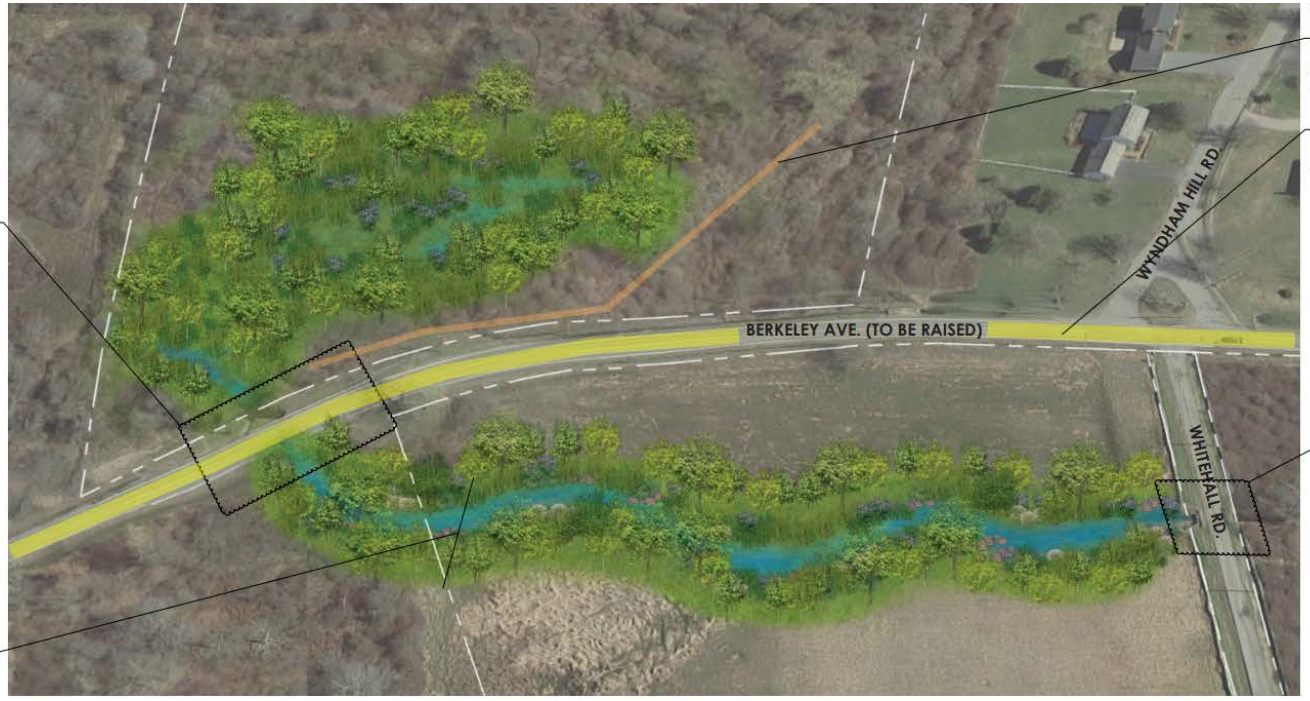
Preferred Design chosen to maximize flood reduction and water quality benefits



Potentially replace culvert at Berkeley Avenue, and/or Install floodplain relief culverts under Berkeley Avenue (need and dimensions to be determined based on additional modeling)

Add river sinuosity in the northern portion of project area; Expand floodplain to 80-foot terrace

Install deflection berm (dimensions to be determined based on additional modeling)

Raise Berkeley Avenue ±2 feet from upstream of Maidford River crossing to Green End Avenue

Replace Whitehall Road culvert to lower elevation and increase capacity.

Deepen channel in vicinity of Whitehall Road to meet lower elevation of Whitehall Road culvert

Potentially, install floodplain relief culverts under Berkeley Avenue (need and dimensions to be determined based on additional modeling)

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Preferred Design (continued)

Add river sinuosity in the northern portion of project area; Expand floodplain to 80-foot terrace

Relocate Maidford River to the west, away from Berkeley Avenue, and into the open field

Expanded floodplain area at southern extent of the river in the area upstream of Green End Avenue

Raise Berkeley Avenue ±2 feet from upstream of Maidford River crossing to Green End Avenue

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Next Steps

- Seeking property owner endorsement of preliminary design to proceed to next step
- Present preliminary findings to Town Council for endorsement – ultimately town will seek funding/financing to construct project
- Submit wetlands verification form to RIDEM; schedule meeting with RIDEM to discuss project
- SNEP Network contract with Fuss & O'Neill to undertake detailed modeling, engineering and final design, and prepare permit application – at no cost to property owners or town
- Final design presented to property owners; if acceptable, owners provide written approval to submit necessary permits to RIDEM

Project Team

THANK YOU!!

The Southeast New England Program Network is providing support for this project. Funding is made possible by a grant from US EPA to New England Environmental Finance Center.

MIDDLETOWN
Rhode Island

Aquidneck Land Trust

ELIZABETH SCOTT CONSULTING

New England Environmental Finance Center

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