The Southeast New England Program Network

MAIDFORD RIVER RESTORATION PROJECT:

COLLABORATIVE APPROACH TO WATERSHED SCALE RESTORATION USING NATURE BASED SOLUTIONS

PROJECT SUMMARY

The Maidford River is a highly altered river in need of water quality and hydrologic restoration. Located in the town of Middletown, RI, the Maidford River may appear small and insignificant, but it serves as the primary water source for two of Aquidneck Island's water reservoirs, Nelson Pond and Gardiner Pond. Land uses in the watershed are predominantly agricultural and residential, which contribute to flooding, poor water quality, and elimination of natural river buffer habitat. The river's intermittently heavy flows flood local roads, farm fields and lawns. Its sediment and nutrient loads contribute to frequent cyanobacteria (also known as blue green algae) blooms in the island's drinking water reservoirs. The polluted river waters also negatively affect the downstream coastal saltmarsh that is critical breeding habitat for saltmarsh sparrow and seaside sparrow, two species suffering considerable declines. At its discharge into coastal waters of the Sakonnet River, the river's high bacteria levels threaten recreational and shellfishing uses.

To reduce road flooding and improve water quality and habitat, ***the floodplain restoration project proposed moving the river away from roads, adding meanders, recreating floodplain storage, and re-establishing naturally vegetated and protected buffers along the river.*** The entirety of the project takes place on privately owned property. A key element of the project therefore was effective communication and community engagement to win the support of property owners as well as the broader community.

Typical view of the highly altered Maidford River channel during drought period



PROJECT HIGHLIGHTS

SNEP NETWORK PARTNERS:
Elizabeth Scott Consulting, Save the Bay, New England Environmental Finance Center;

Consultants: Fuss & O'Neill, Inter-Fluve

LOCAL PARTNERS:
Town of Middletown, Aquidneck Land Trust, Eastern RI Conservation District

LOCATION:
Maidford River watershed located entirely in Town of Middletown, RI on Aquidneck Island

SCALE/SIZE:
Small watershed; 2.85 sq. mi

KEYWORDS:
Collaboration, flood mitigation, nature-based solutions, buffer restoration, floodplain restoration, water quality and habitat improvement

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CLIMATE RESILIENCE PLANNING

NATURE-BASED SOLUTIONS

STORMWATER PLANNING

FUNDING + FINANCING

LID/BYLAW REVIEW

COLLABORATIVE APPROACH

The SNEP Network used a ***collaborative approach to bring together a project team that included biologists, engineers, advocates, and town staff.*** Consultant services were tapped to undertake modeling, engineering, and design of the floodplain restoration project. Together the team created a work plan and completed tasks within the plan to lay out the major design elements and establish a cost estimate and timeline. The Town also received assistance to identify appropriate funding to support project implementation.

Trusted local partners identified property owners willing to participate. The project team communicated with cooperating property owners via email and in person briefings at project milestones. Written approvals from property owners were obtained at critical steps, for example to access properties for site assessments and to submit preliminary permit applications on their behalf.

The team used a phased approach to identify solutions to the water quality and flooding problems in the Maidford River. The first step involved collecting both current and historic landscape data including location of wetlands and soil types in the project area. Using this information, the engineering team conducted iterative modeling analyses to develop the design - ultimately determining that an undersized upstream culvert was the primary cause of road flooding in larger storms, and that floodplain restoration and culvert replacement (at two locations) was not enough to alleviate road flooding. To address the flooding concern, the design was refined to include raising a section of roadway 2+ feet and constructing two flood control berms.

In addition to the floodplain restoration project, the team explored a public education initiative targeted to all property owners living along the Maidford River to promote restoration of buffer on their land to a naturally vegetated condition. The team mailed letters and postcards designed to empower individuals and remind them that one property owner can make a difference. The mailings also offered resources including conservation seed mix and free site consultations to discuss more river-friendly ways to landscape. An on-line Maidford River Buffer Restoration Guide was developed to provide additional guidance.

KEY FINDINGS

- Nature Based Solutions on their own were not sufficient to mitigate road flooding due to the small size of the restoration project and the relatively small flood storage provided as compared to the volume of flood waters from the upstream watershed. However, adding sinuosity to the realigned river channel and recreating its floodplain along with culvert replacement could greatly enhance habitat and improve water quality.
- All project goals are met with a hybrid approach using both nature based and conventional structural methods. With this approach, flooding impacts associated with smaller more frequent storms (road flooding) and larger less frequent storms (area of roads, lawns and fields covered in flood waters) are reduced.



Maidford Watershed Field Assessment

BEST PRACTICES / LESSONS LEARNED

- Involve ***trusted local partners and town leadership to establish property owners' trust and confidence in the project team, and to communicate with local elected officials and community.***
- Even relatively small watershed scale projects can be complicated; hiring a multi-disciplinary team is critical in overcoming potential challenges and addressing varied environmental and social objectives.
- Developing a strategic communications plan that identifies target audiences and their interests is key to the creation of impactful messaging.
- Public projects proposed on private property entail significant investments of time to engage property owners and to address a range of concerns.
- Efforts to restore measurable increases in riparian buffer are better directed to public property owners.

NEXT STEPS

The Town of Middletown has requested assistance from the Natural Resources Conservation Service as part of its Watershed and Flood Prevention Operations (aka PL-566) Program. A Preliminary Investigation and Feasibility Report which will determine the project's eligibility for this grant program is expected in mid-2023. The SNEP Network is completing water quality monitoring and preparation of a Baseline Watershed Conditions Report.



ABOUT THE NETWORK

The SNEP Network provides free training and assistance to municipalities, organizations, and tribes in Rhode Island and Massachusetts to achieve healthy watersheds, sustainable financing, and climate resilience The SNEP Network is a project of the New England Environmental Finance Center and is funded by the U.S. Environmental Protection Agency's Southeast New England Program. To learn more about or request network services, SNEP communities can visit www.snepnetwork.org

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ADDITIONAL RESOURCES:

- Maidford River Restoration Project Story Map: https://storymaps.arcgis.com/stories/9677a4d4f6a941968668efc53234460d
- Maidford River Floodplain Restoration Alternatives Report: https://snepnetwork.org/wp-content/uploads/2022/07/Maidford-Report_20220215-final.pdf
- Maidford River Restoration Project -30% Design Report: https://snepnetwork.org/wp-content/uploads/2022/07/Maidford-River-30-Design-Report_021622.pdf
- Maidford River Restoration - 30% Design Plans: https://snepnetwork.org/wp-content/uploads/2022/07/Maidford-River-30-Design-Report_021622.pdf
- Canoe River Aquifer Pilot Project Story Map: https://snepnetwork.org/taunton-river-watershed/