



A Partnership Approach to Restoring the Maidford River

SNEP Symposium
May 18, 2022

Elizabeth Scott, Project Manager & RI Liaison for
Southeast New England Program – Network

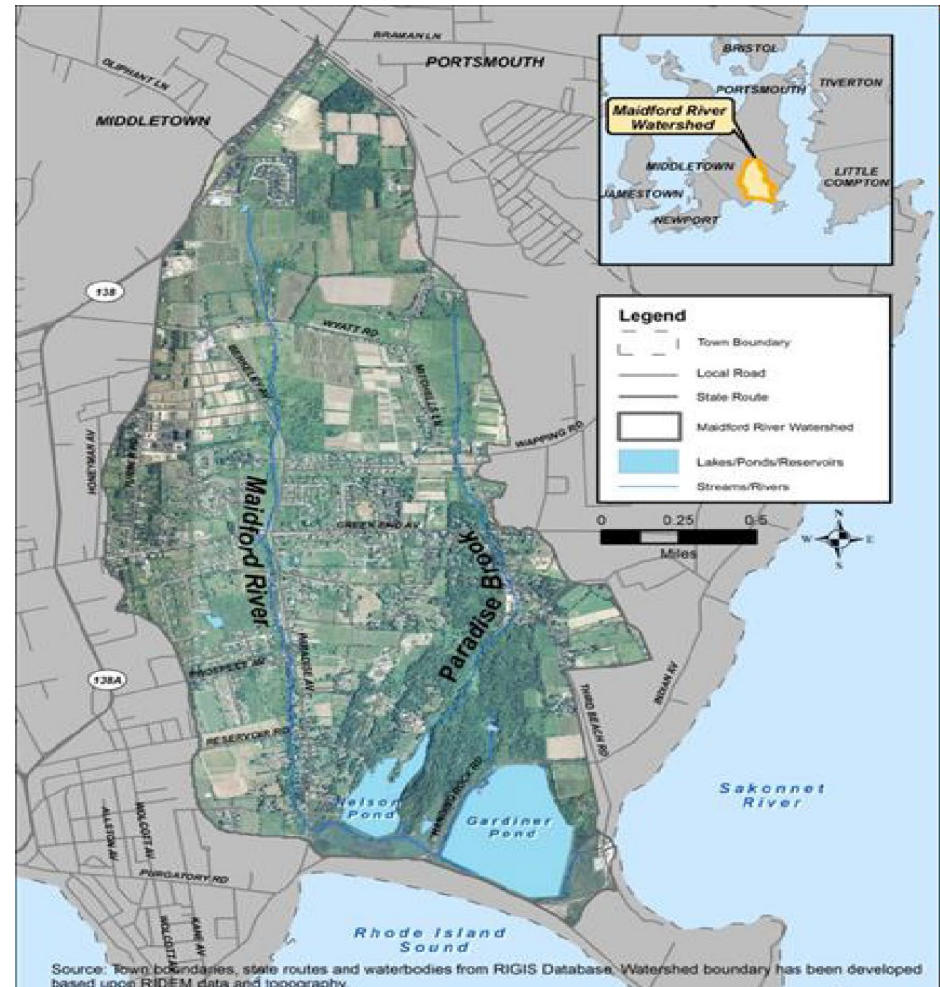
Josh Wilson, Senior Ecologist
Fuss & O'Neill



MAIDFORD RIVER RESTORATION PROJECT



With support from the Southeast New England Program Network, the Town of Middletown and its partners are advancing plans to restore the Maidford River to reduce flooding and improve water quality and habitat.



PROJECT PARTNERS



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



WATERSHED ALTERATIONS HAVE BEEN DECADES IN THE MAKING



1972



Spring 2020

Source: RIDEM

MAIDFORD RIVER FLOODING



TOWN OF MIDDLETOWN FLOOD HAZARD MAPPING FEMA FLOOD ZONES 2017



WATER QUALITY ISSUES



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

- Degraded water quality in Nelson & Gardiner Ponds – two water supply reservoirs which experience cyanobacteria blooms;
- 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.



SIGNIFICANCE OF WET WEATHER LOADING



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 & 70% of dissolved phosphorus flux
- Largest storm, 2.84 inches, accounted for 9% of total flow & 17% of dissolved phosphorus flux
- Proposed river & floodplain restoration along with “source control” & improved stormwater management will reduce nutrients delivered to reservoirs and build resiliency to climate change

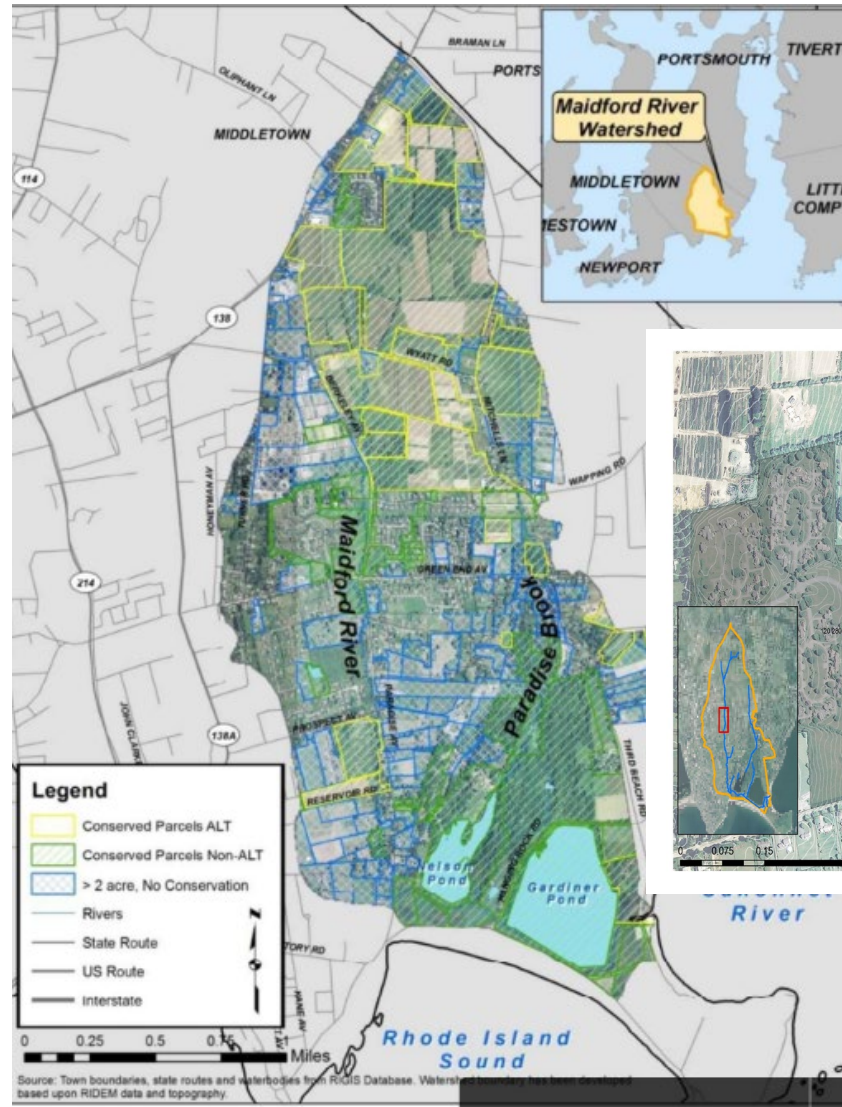


FLOODPLAIN RESTORATION: BEGINNING CONCEPT



Project builds upon ongoing watershed protection and stormwater management efforts by ALT & Middletown

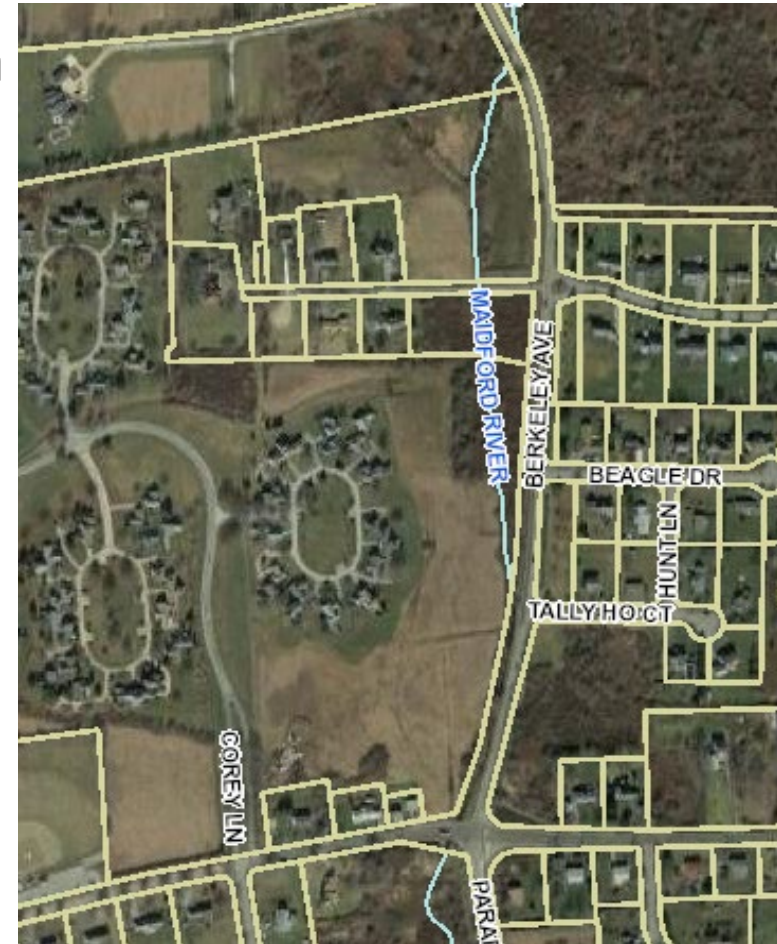
Design Concept proposed in Maidford River Conservation Plan (2017) prepared for ALT by Fuss & O'Neill



RIVER & FLOODPLAIN RESTORATION PROJECT APPROACH



- Project objectives:
 - Restore natural stream and floodplain processes and habitats,
 - Reduce the frequency and magnitude of local fluvial-induced flooding, and
 - Improve stream water quality
- Project team with support from Fuss & O'Neill has utilized modeling results to evaluate flood mitigation alternatives & to evaluate the benefits of the selected alternative.
- Project partner, Save the Bay has mapped wetlands boundaries to initiate permitting & dialogue with RIDEM
- Inter-Fluve conducted geomorphological reconnaissance survey to develop detailed design plans to meet water quality & habitat improvement goals

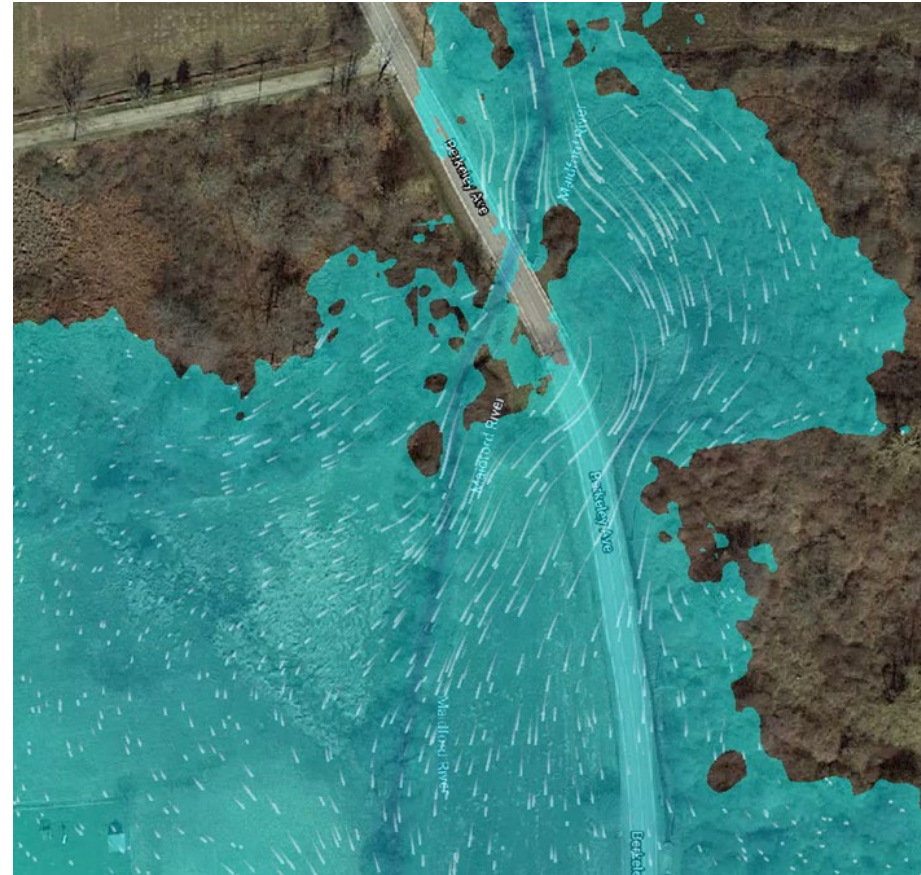


River & Floodplain Restoration Project Area

PHASE I: FLOODPLAIN RESTORATION DESIGNS EVALUATED



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.

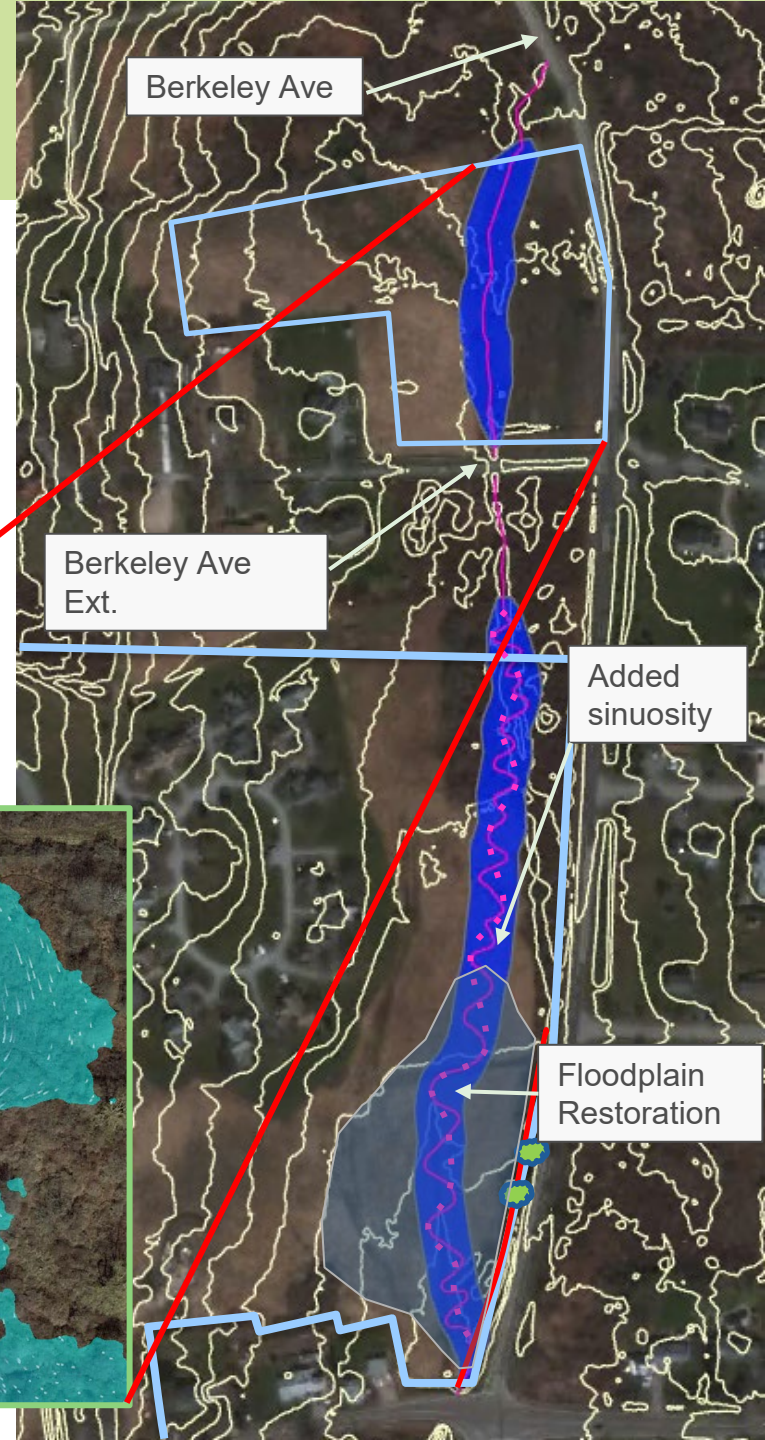
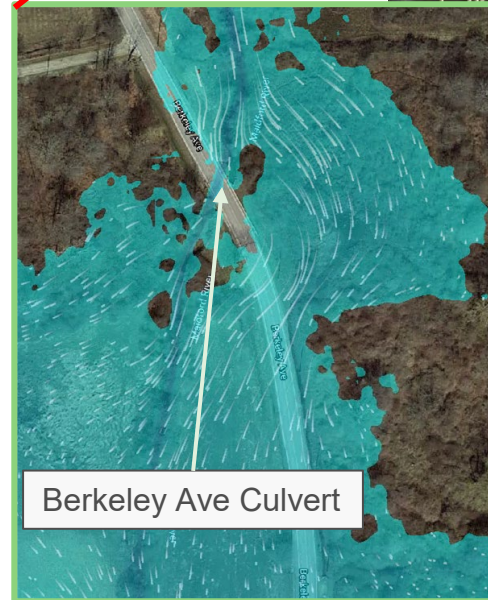


Preliminary HEC-RAS 2-Dimensional Hydraulic Model Output

Overview of Phase I outcomes

Phase I outcomes informing Conceptual Design:

- **Flow restriction:** Berkeley Ave is overtopping from limited culvert capacity at Berkeley Ave. and from backwater effects from Berkeley Ave Ext. culvert
- **River/Floodplain Restoration:** Moving river channel and adding sinuosity as part of floodplain restoration (upstream of Green End Ave) has water quality & habitat benefits but limited flood mitigation benefits



Phase I Conceptual Design



Phase II: Alternatives Analysis – Modeling/Design Objectives



- Determine feasible solutions to provide flood benefits
- Identify possible flood protections from design storms up to 100-year return storms
- Improve ecological and water quality benefits
- Ensure there is no net increase (vertical or horizontal) in flooding for the 100-year storm that would adversely affect existing development



Alternatives Analysis – Key Design Factors



Build, refine, and improve key design factors to maximize flood mitigation benefits

Key design factors:

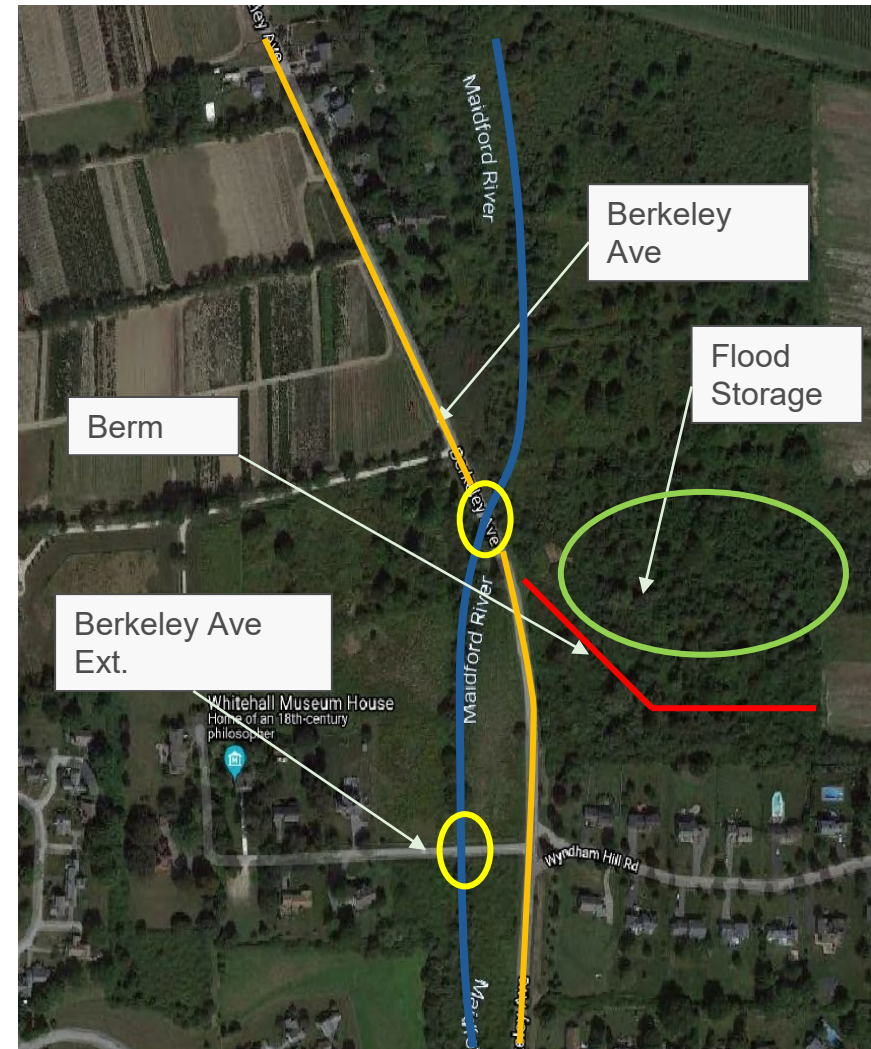
Enlarge the culverts at Berkeley Avenue Ext. and/or Berkeley Avenue (yellow)

Add a berm on Sweet Berry Farm (red)

Raise Berkeley Avenue (orange)*

Adding flood storage on Sweet Berry Farm (green)

*Raising Berkeley Ave includes raising all or a part of intersecting roads to tie into new elevations



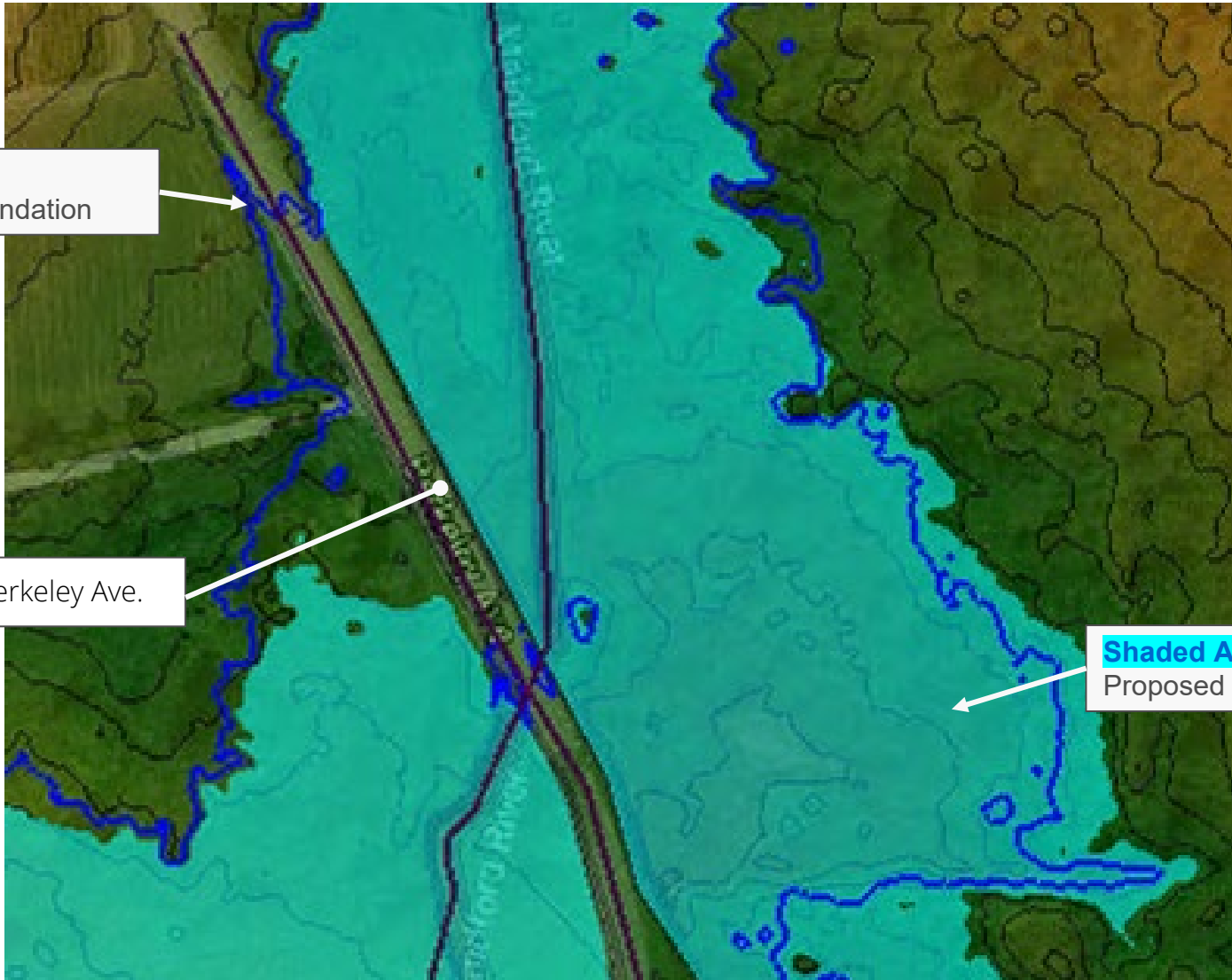
Model Output Key



Dark Blue Line =
Existing Flood Inundation

Berkeley Ave.

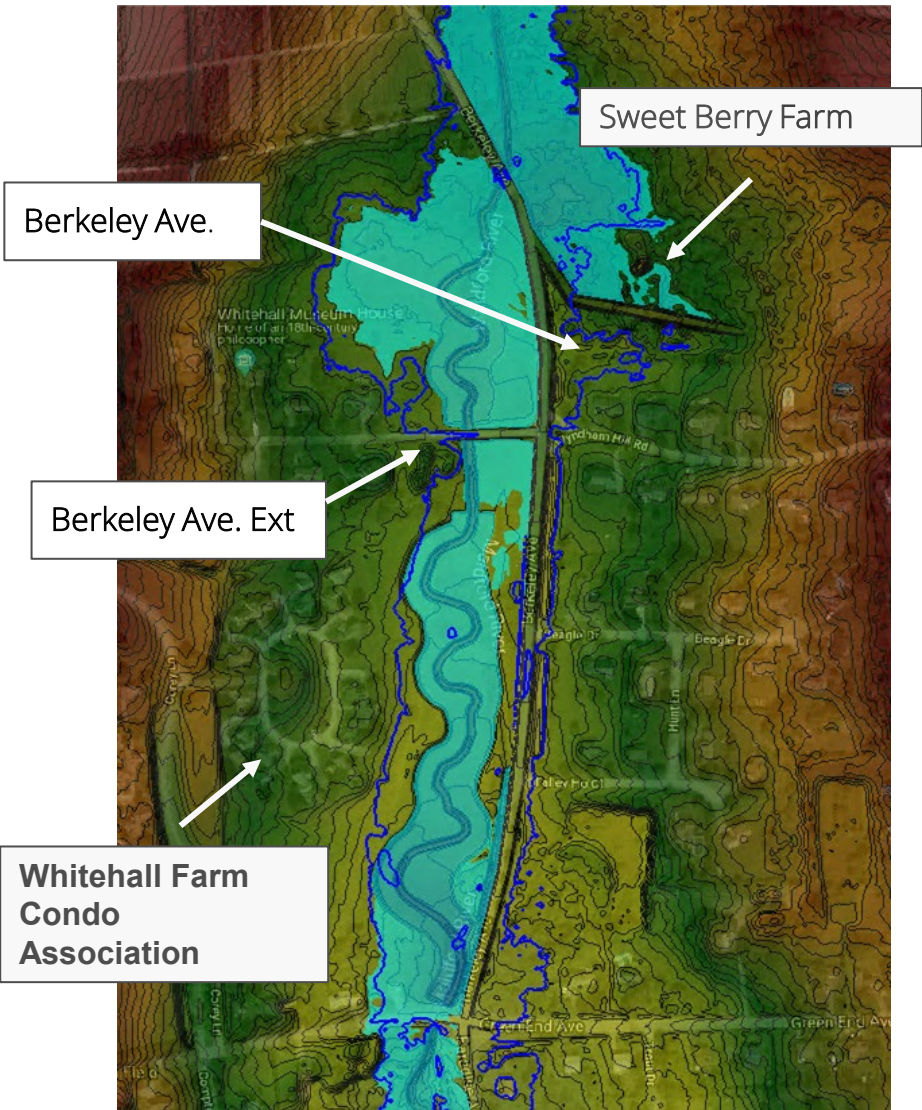
Shaded Area =
Proposed Inundation



Preferred Alternative: 100-year Storm Event

Design Elements:

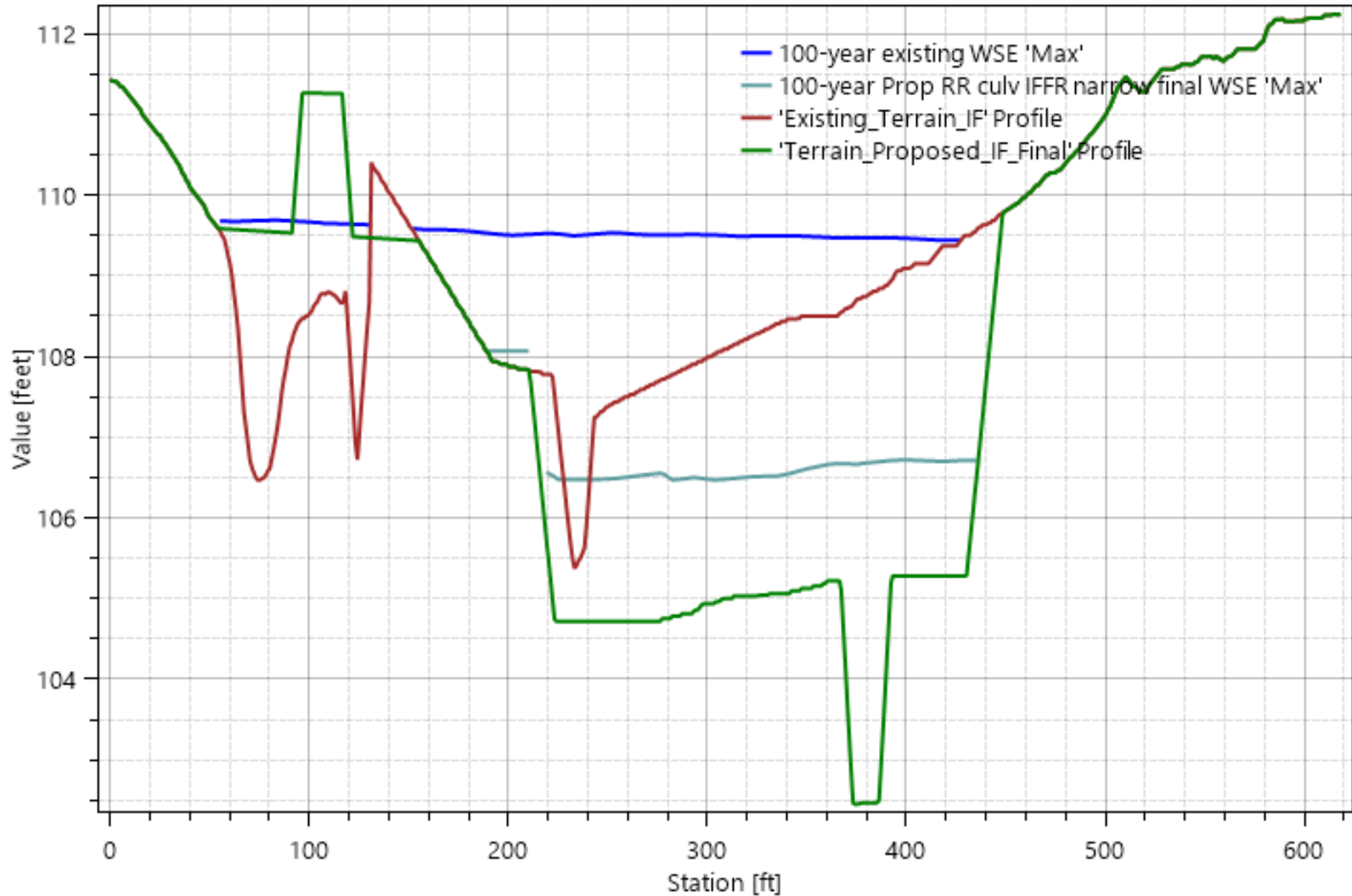
- Raise Berkeley Ave road (~2.5 ft)
- Add berm on Sweet Berry Farm property (2-3 ft)
- Increase culvert capacity at Berkeley Ave and Berkeley Ave Ext. (35-ft)
- Modeling includes floodplain restoration modification



Condo Assn Cross Section 1 – 100-year



Water Surface Elevation on 'Condo Assn 1'



Intermediate Conclusions



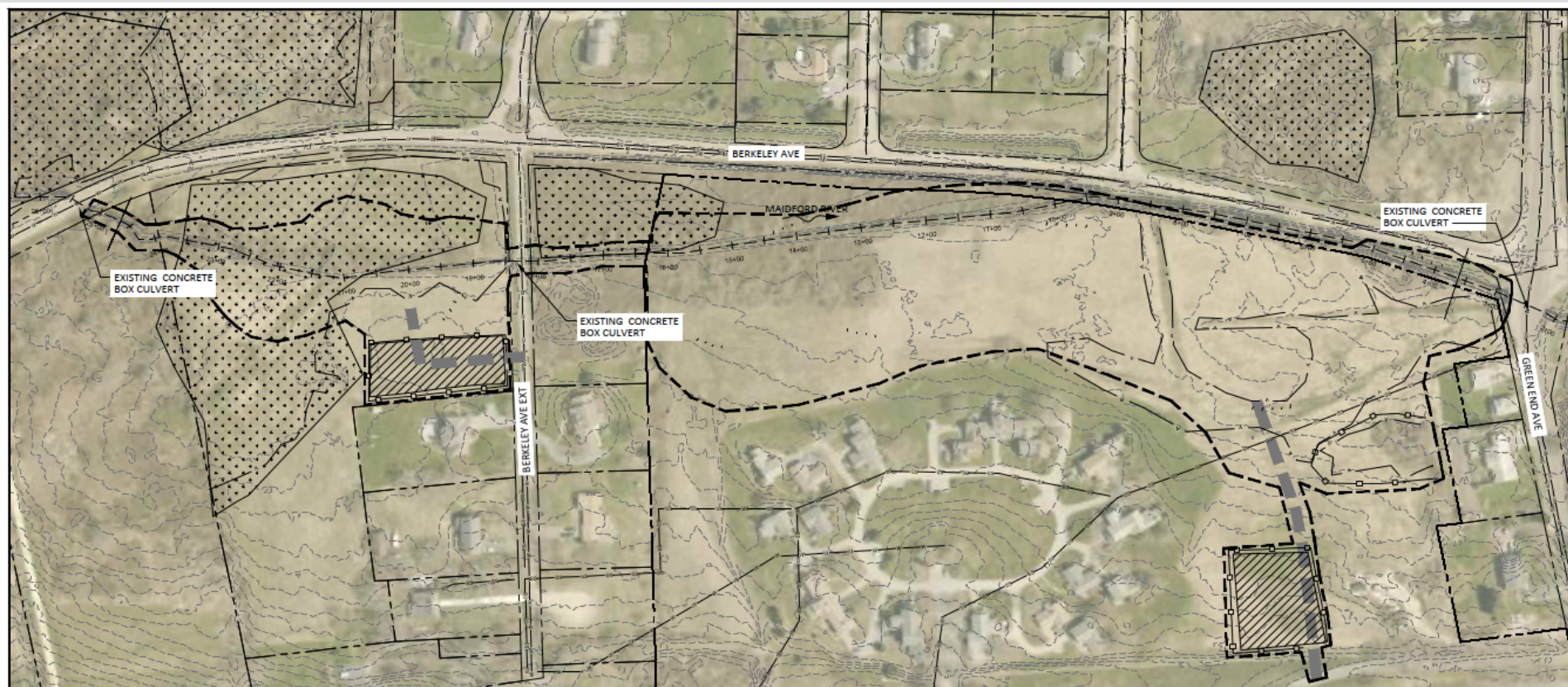
- Culvert size needs to be increased at Berkeley Ave to prevent flooding
- If the culvert at Berkeley Ave is increased, the Berkeley Ave Ext. culvert will also need to be increased to prevent additional backwater flooding (more than existing conditions)
- Berm upstream of Berkeley Ave (regardless of design storm) is required
- Storage on Sweet Berry Farm does not provide significant, additional flood mitigation benefits
- Floodway increase upstream of project area must be further evaluated
- Decisions made:
 - 100-year storm event selected as Design Storm
 - Increase culvert dimension to 35 ft width to accommodate existing flood flows
 - Plan design in anticipation of projected changes in precipitation due to climate change

30% Design Plans for Floodplain Restoration










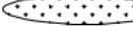



Fuss & O'Neill and Inter-Fluve:

- Created an existing conditions surface in CAD by combining topographic survey data and LiDAR
- Developed an existing conditions longitudinal profile and determine a proposed conditions longitudinal profile and culvert invert elevations
- Created a proposed conditions surface in CAD that reflects the proposed changes to the channel and floodplain to be vetted in the hydrologic and hydraulic model
- Produced river and floodplain restoration designs to the 30% completion level sufficient to facilitate initial discussions with project partners and permitting agencies

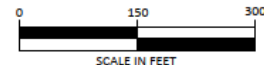


LEGEND

-  TEMPORARY ACCESS
-  LIMITS OF DISTURBANCE
-  STAGING AREA
-  TAX PARCEL
-  SILT FENCE
-  EXISTING 1FT CONTOUR
-  EXISTING ALIGNMENT
-  EXISTING SANITARY SEWER
-  EXISTING WATER MAIN
-  NATIONAL WETLAND INVENTORY WETLAND
-  DELINEATED WETLAND BOUNDARY

NOTES:

1. TOPOGRAPHIC SURVEYS WERE PERFORMED BY INTER-FLUVE MAY 14, AND JUNE 22, 2021.
2. FOR SURROUNDING TOPOGRAPHY, 1 FT CONTOURS ARE FROM USGS, COLLECTED WITH AIRBORNE LIDAR TECHNOLOGY AFTER HURRICANE SANDY AND RELEASED IN 2014.
3. PARCEL DATA WAS OBTAINED FROM RIGIS.
4. THE HORIZONTAL COORDINATE SYSTEM IS THE NORTH AMERICAN DATUM OF 1983, RHODE ISLAND STATE PLANE, US FEET.
5. THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988, US FEET.
6. AERIAL COLLECTED IN SPRING OF 2018 AND WAS OBTAINED FROM RIGIS.
7. ALL UTILITY LOCATIONS ARE APPROXIMATE. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR. SANITARY SEWER LINES APPEAR TO CROSS THE LIMIT OF DISTURBANCE.



NO.	BY	DATE	REVISION DESCRIPTION

MYS	SS, NN, CC	CC, MH
DRAWN	DESIGNED	CHECKED
APPROVED	DATE	PROJECT

**TOWN OF MIDDLETON RI
MAIDFORD RIVER RESTORATION
30% DESIGN**



220 Concord Avenue, 2nd Floor
Cambridge, MA 02136
617.714.5537
www.interfluve.com

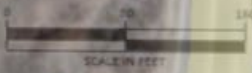
**EXISTING CONDITIONS,
ACCESS, AND STAGING**

SHEET
2 OF 8

Berkeley Ave

Berkeley Ave

Berkeley Ave



EXCAVATE OFF-CHANNEL FLOODPLAIN WETLAND FOR AMPHIBIAN HABITAT

EXISTING COVERT TO TRAIN

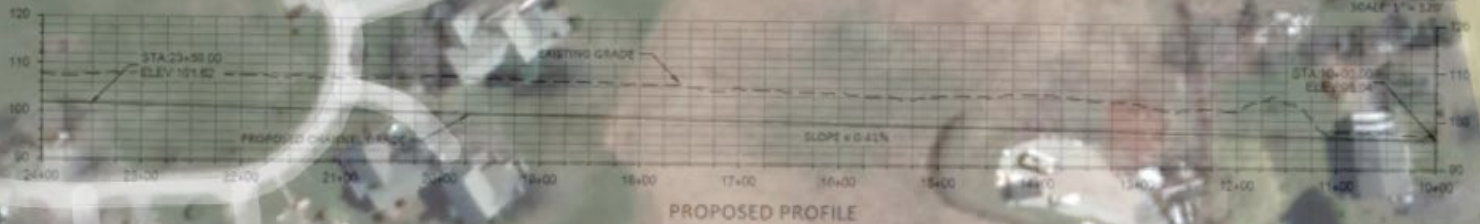
EXCAVATE NEW CHANNEL AND FLOODPLAIN

MICROTOPOGRAPHY TO BE GRADED INTO FLOODPLAIN THIS IS A FIELD FIT ITEM TO BE CONDUCTED WITH THE ON-SITE PRESENCE OF THE ENGINEER AT THE TIME OF CONSTRUCTION.

EXCAVATE OFF-CHANNEL MICROTOPOGRAPHY WETLAND FOR AMPHIBIAN HABITAT

LEGEND

- TEMPORARY ACCESS
- LIMITS OF DISTURBANCE
- STAGING AREA
- T&E RANGE
- SILT FENCE
- EXISTING 15" CONTOUR
- PROPOSED 15" CONTOUR
- PROPOSED ALIGNMENT
- EXISTING SANITARY SEWER
- EXISTING WATER MAIN
- EXISTING ALIGNMENT



PROPOSED PROFILE SCALE 1" = 1.20'

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TOWN OF MIDDLETON RI MAIDFORD RIVER RESTORATION 30% DESIGN

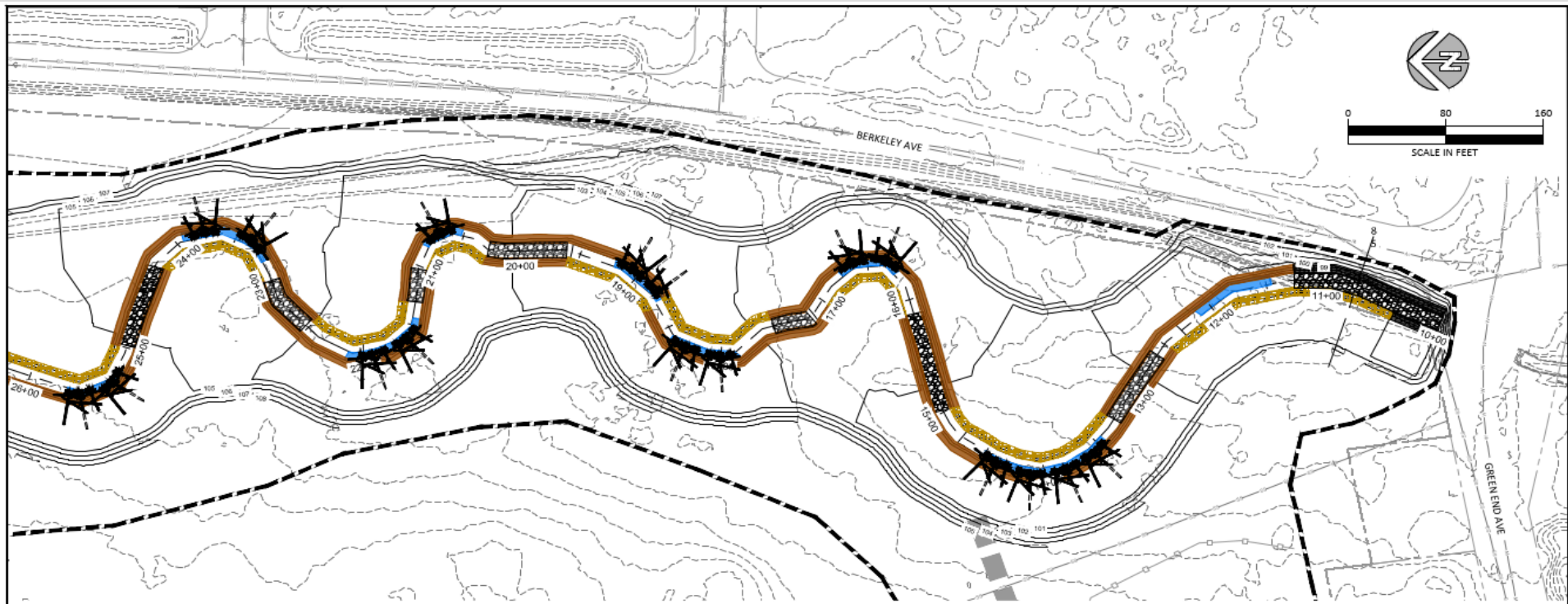
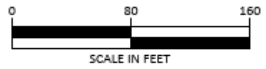


200 Concord Avenue, Sudbury, MA 01876 978.724.2167 www.interflow.com






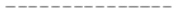
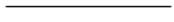
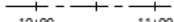


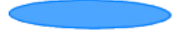





GRADING PLAN (2 OF 2)

SHEET 4 OF 8





LEGEND

-  TEMPORARY ACCESS
-  LIMITS OF DISTURBANCE
-  STAGING AREA
-  TAX PARCEL
-  SILT FENCE
-  EXISTING 1FT CONTOUR
-  PROPOSED 1FT CONTOUR
-  PROPOSED ALIGNMENT
-  EXISTING SANITARY SEWER
-  EXISTING WATER MAIN
-  POOL
-  FES LIFTS
-  SURFACE FABRIC
-  GRADE CONTROL RIFFLE
-  CHANNEL BANK RIPRAP
-  LARGE WOOD BANK STABILIZATION

NO.	BY	DATE	REVISION DESCRIPTION

MYS	SS, NN, CC	CC, MH
DRAWN	DESIGNED	CHECKED
	11-29-2021	21-05-14
APPROVED	DATE	PROJECT

**TOWN OF MIDDLETON RI
MAIDFORD RIVER RESTORATION
30% DESIGN**



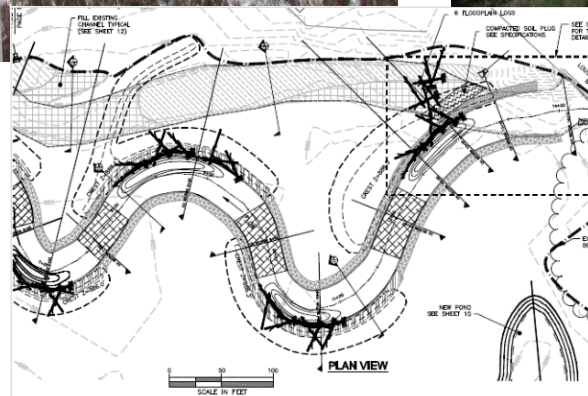
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www.interfluve.com

TREATMENT PLAN (2 OF 2)

SHEET
7 OF 8



MEANDER RESTORATION



Photos courtesy of Inter-Fluve

LARGE WOOD BANK STABILIZATION



Photos courtesy of Inter-Fluve

FLOODPLAIN/BACKWATER WETLANDS



Photos courtesy of Inter-Fluve

FES LIFTS AND RIFFLES



1 year post construction

Photo courtesy of Inter-Fluve

GRADE CONTROL RIFFLE



4 years post construction

WETLAND HABITAT



Side channel
Clackamas River, OR
3 years post construction



Floodplain wetlands
Lake Tahoe, NV
3 years post construction

Wetland habitat

- Microtopography grading
- Oxbow ponds
- Side channels
- Anastamosing channels
- Natural levees



Floodplain wetlands
Eel River, MA
3 years post construction

NEXT STEPS



- Town is working with property owners to secure approval to move the project to the next phase of site assessment and design and engineering
 - Next steps entail development of soil sampling plan to assess the quality of soils in the project area and develop a soils management plan
- Town has received grant from Restore America's Estuaries to advance the project to 60% design and engineering, and is seeking other sources of funds to advance the project
- Eastern RI Conservation District has begun meeting with property owners to discuss implementation of restoration initiatives as part of \$ 1 Million Regional Conservation Partnership Program grant.

TO LEARN MORE



To learn more, visit the Maidford River Restoration Project webpage on the SNEP Network's website:

<https://snepnetwork.org/maidford/>

Or contact project leads:

Elizabeth Scott, Project Manager

SNEP Network

elizabethscottri@gmail.com

Josh Wilson, Sr. Ecologist

Fuss & O'Neill

JWilson@FANDO.com

The Stewardship Mapping and Assessment Project of Southeast New England (StewMAP SNE): Supporting environmental stewardship and justice in the region

Jesse S. Sayles, Bryce DuBois, Lynn Carlson, Casey Merkle, and Curt Spalding

2022 SNEP Symposium
May 18, 2022



Research team

Jesse Sayles (ORISE Postdoctoral Fellow, Appointed with the U.S. Environmental Protection Agency, Office of Research and Development, Center for Environmental Measurement and Modeling, Atlantic Coastal Environmental Sciences Division)

Bryce DuBois (RISD)

Lynn Carlson (Compass Cartographic, *formerly, Brown University*)

Casey Merkle (RISD MA Student, Nature Culture and Sustainability Studies)

Curt Spalding (Consulting, *Brown University*)

Previous assistance from:

Shreya Kaipa (RISD)

Benjamin Myers (SRPEDD, *formerly, Brown University*)

With support from:

Erika Svendsen, Lindsay Campbell, Michelle Johnson and **Sophie Plitt**

(USDA Forest Service, Northern Research Station NYC Urban Field Station and Natural Areas Conservancy)

Overview

1) What is StewMAP and why do it?

1) Results (preliminary) of our stewardship mapping

- **Attribute data** → information about the organization
- **Spatial data** → the area they steward, a.k.a their “turf”
- **Network data** → who they turn to for knowledge, funding, etc.

1) Supporting environmental justice collaborations and work

1) Next steps

After the presentation:

Look for the link → Dashboard user feedback survey!



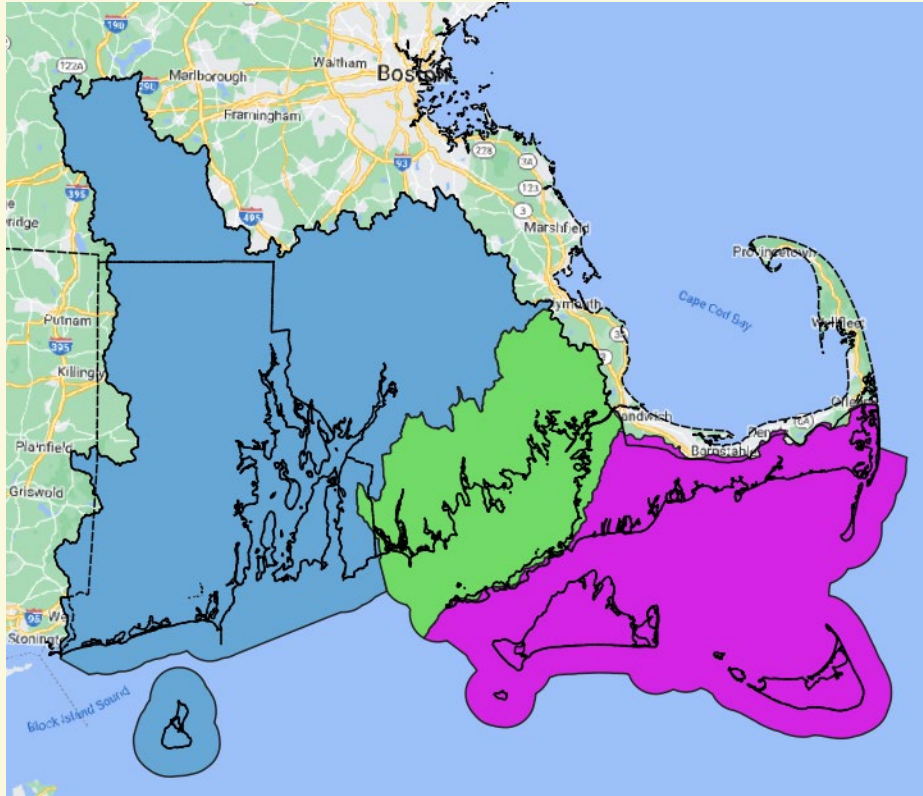
Forest Service
U.S. DEPARTMENT OF AGRICULTURE

THE STEWARDSHIP MAPPING AND ASSESSMENT PROJECT



StewMAP Southeastern New England

- Large geographic scope
- Beyond urban boundaries
- Watershed focus
- Embedded within a collaborative effort to support stormwater and green infrastructure projects



Study area map of the SNEP region showing the three major estuary watersheds (Narragansett Bay, Buzzards Bay, Cape Cod, and adjacent Islands), spanning the states of Rhode Island and Massachusetts, USA.

Description and Methods

Participants and Sample:

Environmental stewardship organizations active in the SNEP region working to *“conserve, manage, monitor, transform, care for specific living things, build partnerships, engage in place-based traditional gathering of resources for consumption, restore native habitat, prepare for environmental disturbances, fund or provide in-kind material support, and educate on and/or advocate for the environment across a defined city, region, or landscape.”*

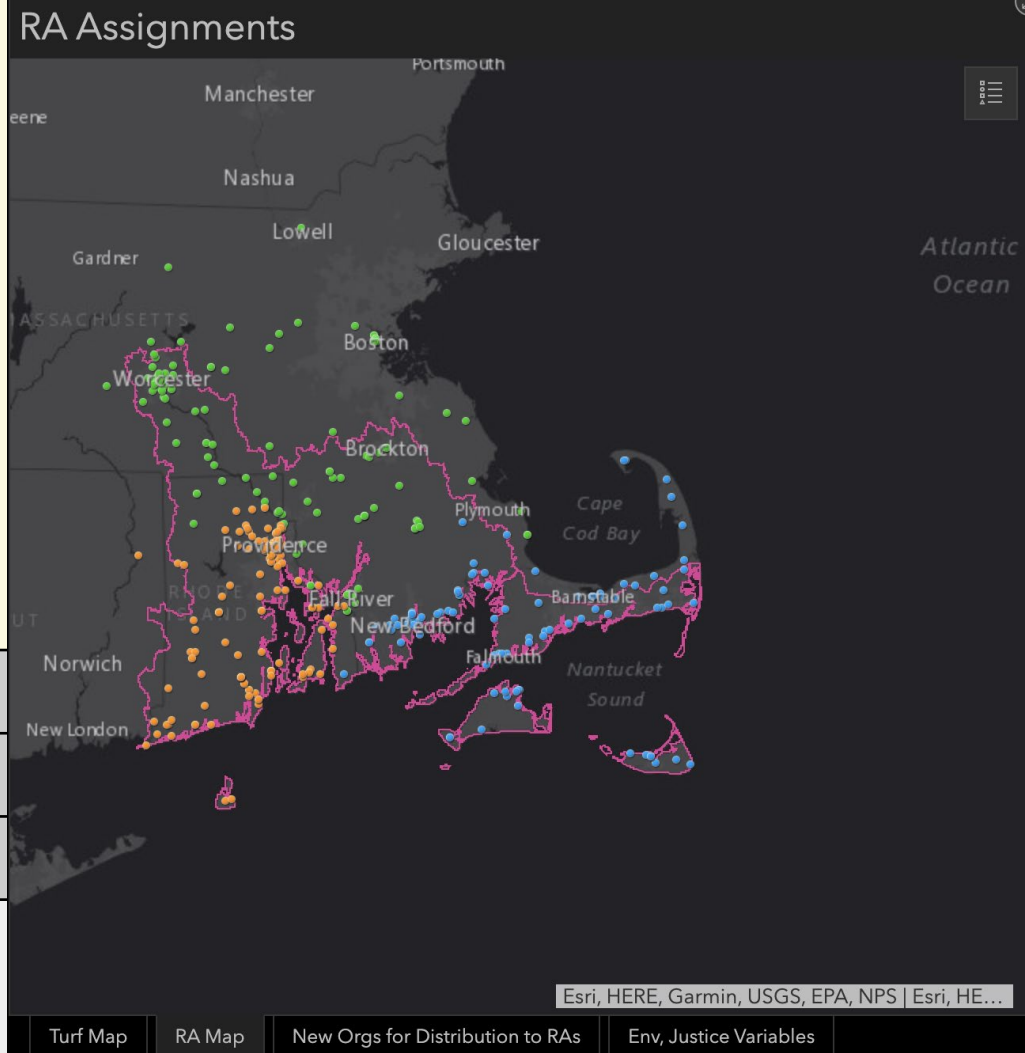
Data Collection: Nov 2020 to June 2021



Methods

- Targeted recruitment (phone and email)
- Initial list, n = 390 (from coalition websites and SNEP Network outreach databases)
- Respondents listed additional groups
 - Knowledge, funding, other key partners, & desired relationships
 - New groups contacted → 3 rounds
- Manually validated data
- **Focused on civic society “like” groups**
 - Some subjectivity
 - Sub-groups and agencies vs. parent org.

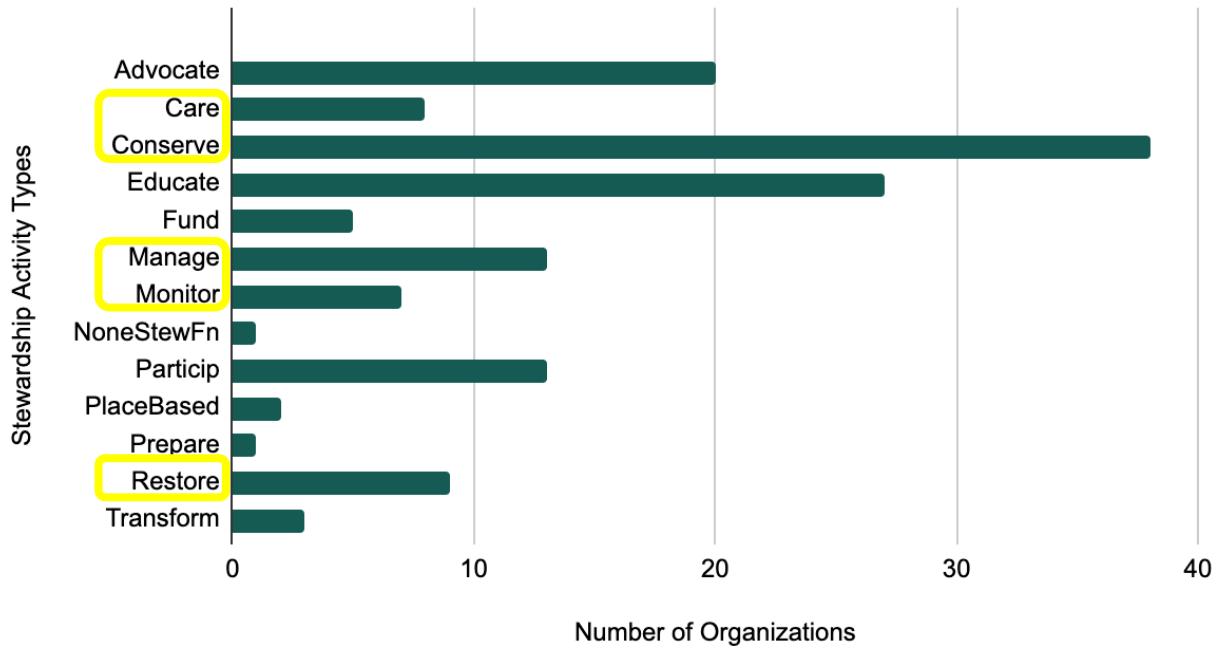
Initial sampling frame	390
Groups in final sampling frame	718
# of total responses	170
Final (less groups that requested to be omitted from public database)	149 (143 public dashboard)



Organizational attribute data

Stewardship Activities

Primary Stewardship Activities (Just pick one)



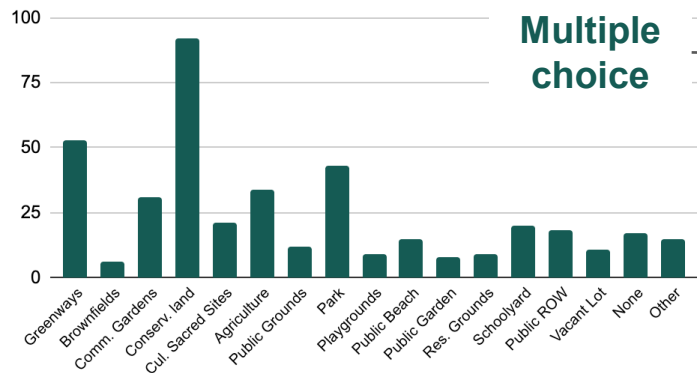
Multiple choice Stewardship Activities

(reporting moderate correlations only, 49-60%)

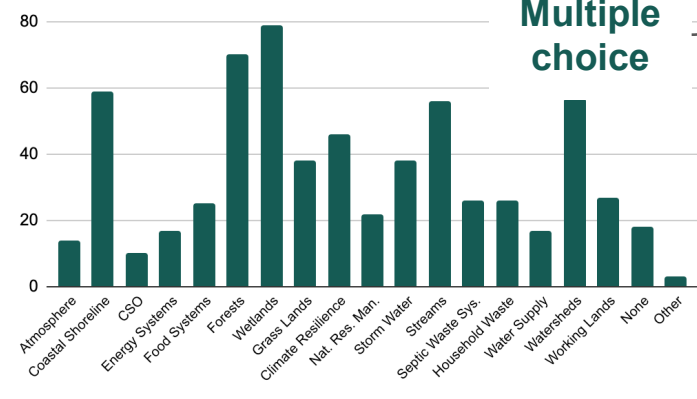
- Care
 - + Conserve (.49)
 - + Manage (.50)
 - + Monitor (.49)
 - + Restore (.53)
- Conserve
 - + Monitor (.49)
 - + Restore (.57)
- Restore
 - + Monitor (.60)

Stewardship Sites, Systems and Green Infrastructure Activities

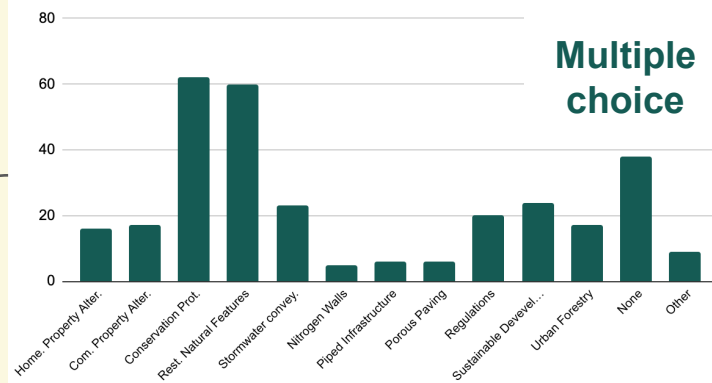
Stewardship Sites



Systems Stewarded

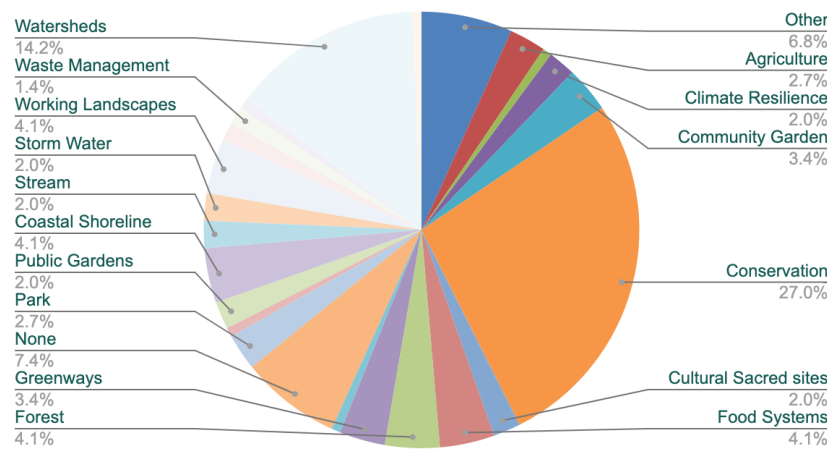


Green Infrastructure Stewardship Activities



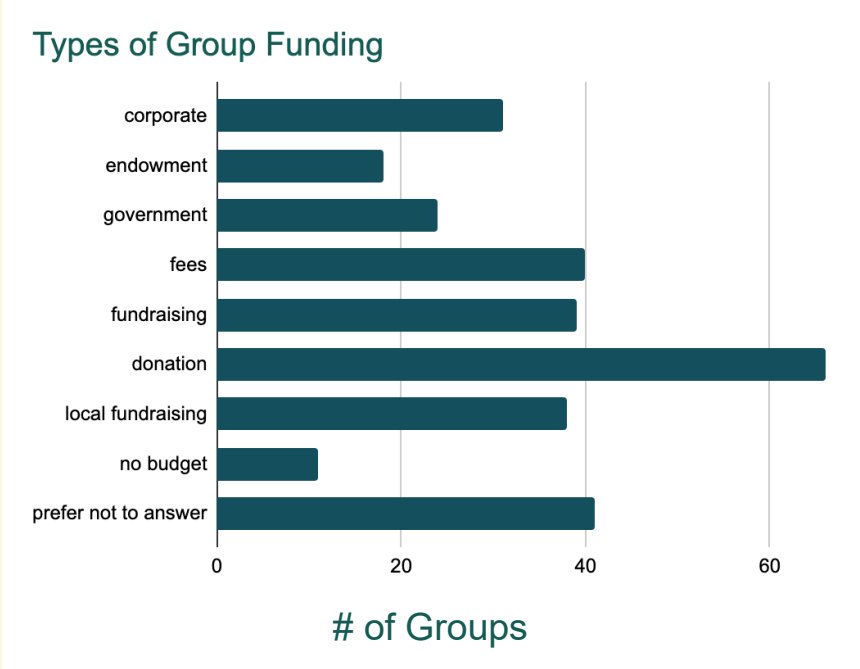
Single Choice

Primary Sites, Systems and Green Infrastructure Activities



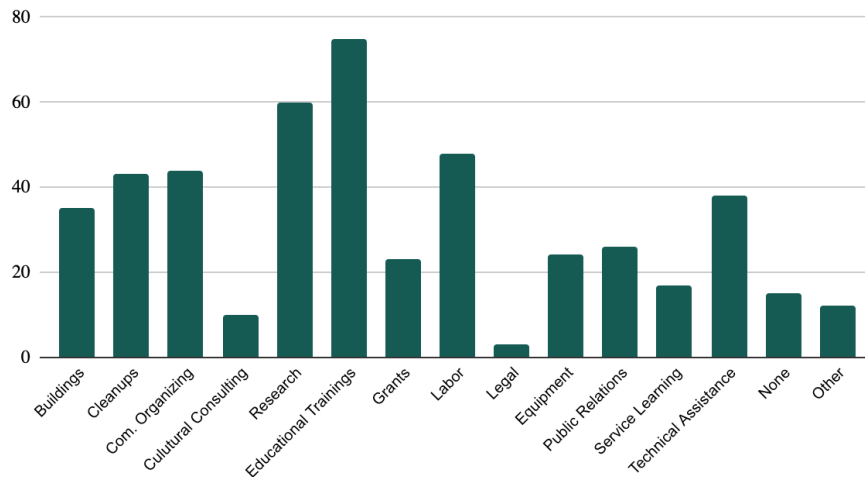
Organizational Capacity

n=149	Org. Staff				Org. Budget
	Full Time	Part Time	Members	Volunteers	
Mean	81	27	7,105	374	\$1,068,840.01
Median	0	1	100	40	\$75,000.00
Max	1,000	600	170,000	15,000	\$40,121,000.00
Min	0	0	0	0	\$0 (6)

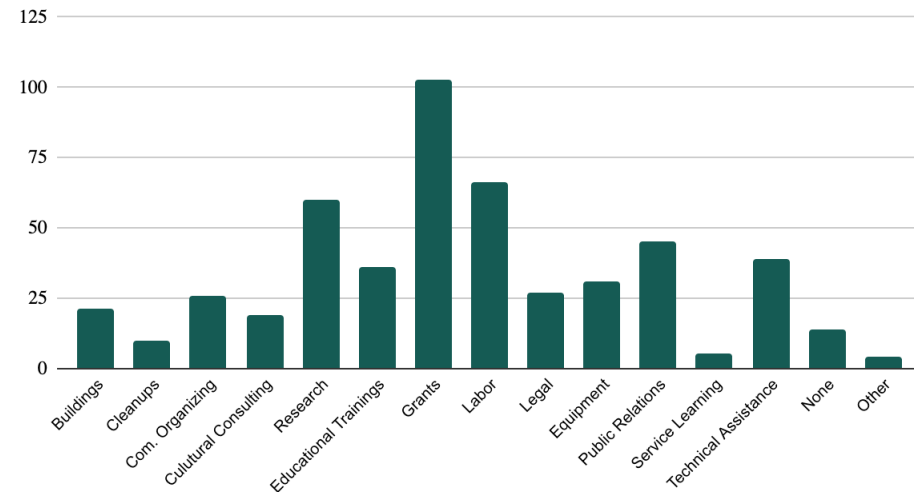


Org. Services Provided and Seeking

Services Provided (n=149)



Services Seeking (n=149)

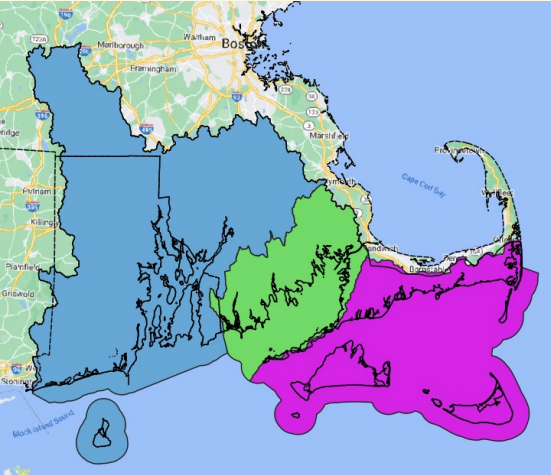


Caveats:

- We did not survey Federal, State, and similar entities
- Note: later on, we will report a larger funding network

Spatial data

Org. Turf Spatial Analysis



Basins	Count	Turf Area (hectares)		
		Mean	Max	Min
Narrag...	62	39,637.33	602,116.91	0.05
Buzzards	7	3216.70	9,619.87	0.02
Cape Cod	18	20,271.77	189,915.17	113.65
Nar/Buz	28	230,311.42	432,591.23	279.57
Buz/Cape	7	94,778.33	280,107.37	92.70
All three	21	6,920,020.39	37,531,652.18	9,472.80
Total	143			

ArcGIS online spatial dashboard (in preparation)

Organizations by Major Watershed

Select a Major Watershed from the list below to view the organizations whose turfs intersect that watershed

- Buzzards Bay
- Cape Cod and Islands
- Narragansett Bay and Islands

The number of organizations with turfs intersecting this watershed is:

Organizations with turfs intersecting this Major Watershed are:
Select to see organization details

- Aquidneck Community Table
- Aquidneck Land Trust
- Association to Preserve Cape Cod
- Audubon Society of Rhode Island - Conservation
- Audubon Society of Rhode Island - Education
- Audubon Society of Rhode Island - Policy
- Barnstable Clean Water Coalition
- Barrington Land Conservation Trust
- BiodiversityWorks
- Blackstone Parks Conservancy
- Blackstone River Coalition
- Blackstone River Valley National Historical Park
- Blackstone River Watershed Association
- Blackstone River Watershed Council/Friends Of The Blackstone

Turfs in the SNEP Region

Map showing the SNEP region with various watersheds and turfs. Major watersheds include Buzzards Bay, Cape Cod and Islands, and Narragansett Bay and Islands. Turfs are shown as green areas. The map includes labels for various locations like Springfield, Hartford, and Nantucket Sound. A search bar and a bookmark icon are visible in the top right corner of the map area.

Organizations by River Basin

Select a River Basin from the list below to view the organizations whose turfs intersect that basin

- Allens Pond
- Apponagansett Bay
- Aucoot Cove
- Beaverdam Creek
- Blackstone River
- Brant Island Cove
- Butler Cove
- Buttermilk Bay
- Clarks Cove
- Cuttyhunk Pond
- East Branch Westport River
- Eel Pond (M)

Organizations with turfs intersecting this River Basin are:
Select to see organization details

- Council
- Wood-Pawcatuck Watershed Association
- Woonasquackett River Watershed Council
- Young Farmer Network of Southeastern New England
- Youth In Action
- YouthBuild Providence

The number of organizations with turfs intersecting this River basin is:

Powered by Esri

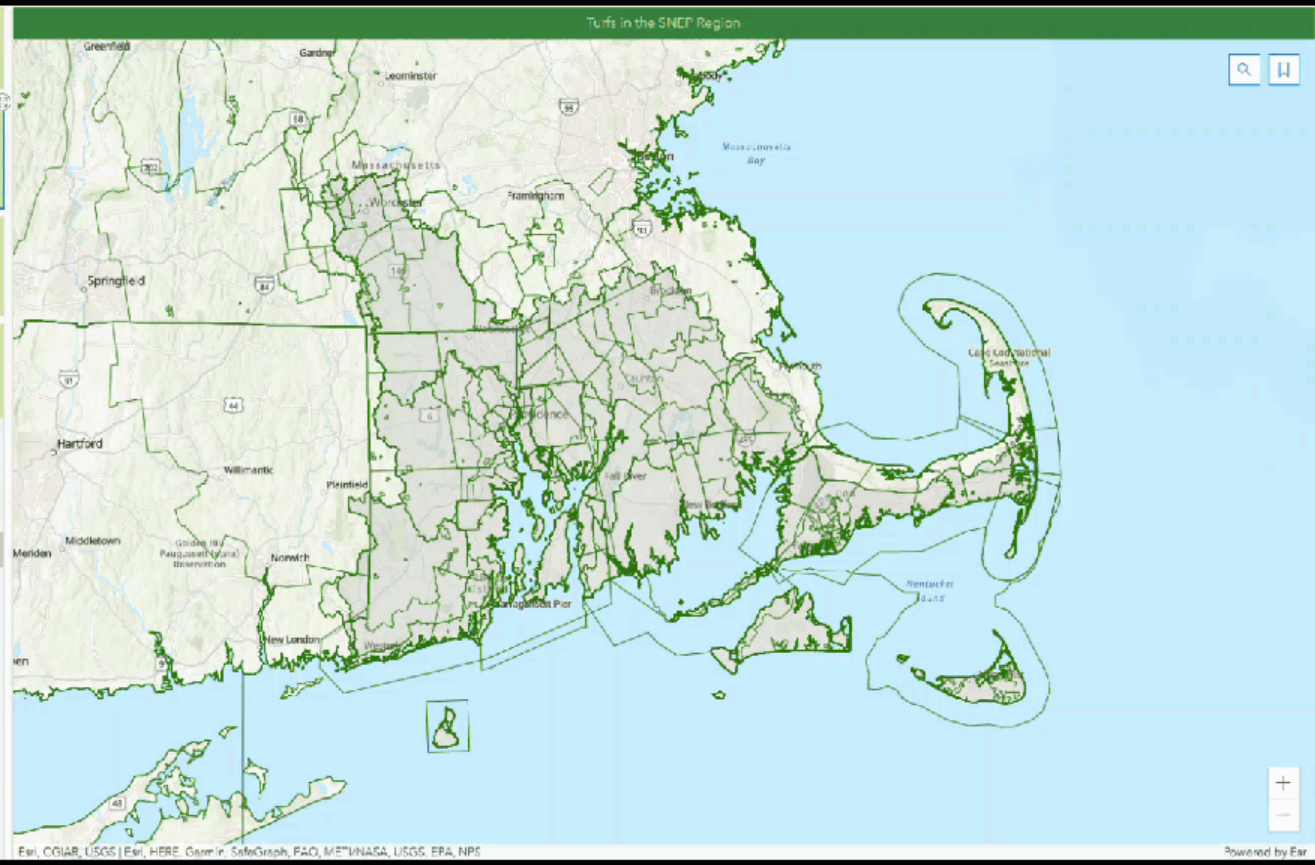
Organizations by Major Watershed
 Select a Major Watershed from the list below to view the organizations whose turfs intersect that watershed

- Buzzards Bay
- Cape Cod and Islands
- Narragansett Bay and Islands

The number of organizations with turfs intersecting this watershed is:

Organizations with turfs intersecting this Major Watershed are:
 Select to see organization details

- Eating with the Ecosystem
- Environment Council of Rhode Island
- Fairhaven-Acushnet Land Preservation Trust
- Falmouth Water Stewards
- Farm Fresh Rhode Island
- Friends of Chatham Waterways
- Friends of Mashpee National Wildlife Refuge
- Friends of Pleasant Day
- Friends of the Moshassuck
- Garden Time, Inc.
- Greater Worcester Land Trust, Inc.
- Harwich Conservation Trust
- Haymarket People's Fund
- Historic New England
- Honey's Harvest RI



Organizations by River Basin
 Select a River Basin from the list below to view the organizations whose turfs intersect that basin

- Allens Pond
- Apponaugset Bay
- Azucot Cove
- Beaverdam Creek
- Blackstone River
- Brand Island Cove
- Butler Cove
- Buttermilk Bay
- Clarks Cove
- Cullyhunk Pond
- East Branch Westport River
- Eel Pond (M)

- Organizations with turfs intersecting this River Basin are:**
 Select to see organization details
- Location
 - Tatnuck Brook Watershed Association
 - The Attleboro Land Trust
 - The Community Compost Depot, Inc.
 - The Massachusetts/Rhode Island Chapter of The American Chestnut Foundation
 - The Rhode Island Chapter of Trout Unlimited

71 turfs
 intersect this River Basin

Network data

Stewardship networks

Survey respondents = 149

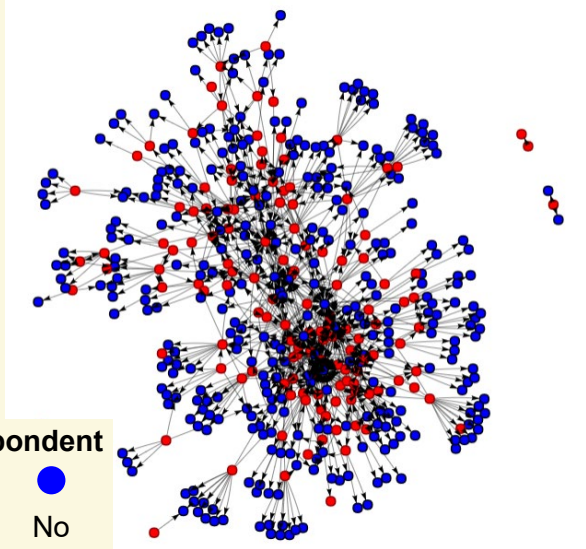
Total reported network

- 740 with sub-programs / chapters
- 638 aggregated

Overview

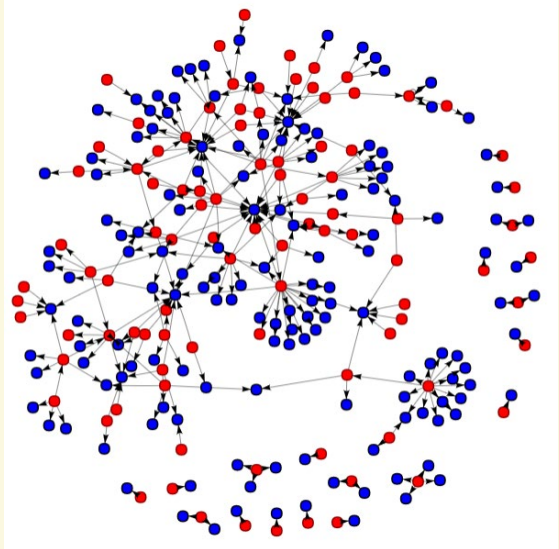
- Density low for all nets < 0.0046
- All nets are decentralized < 0.086
- Reciprocity variable (ratio, for respondents only)
 - Knowledge ~ 15%
 - Funding 0.00%

Aggregated knowledge source network (n = 466)

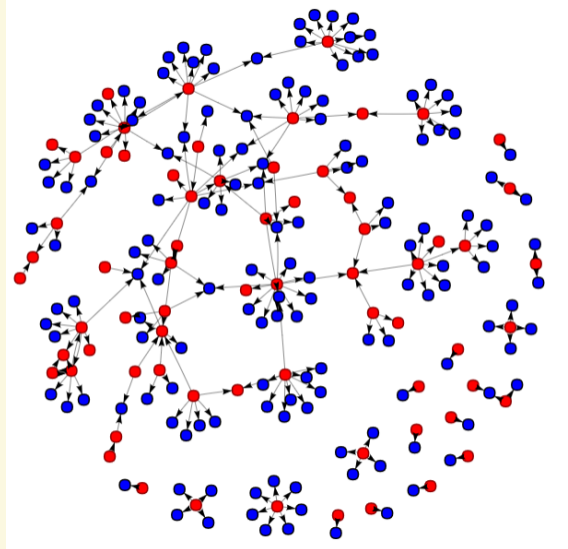


respondent
 ● Yes (red)
 ● No (blue)

Aggregated funding source network (n = 245)



Aggregated other key collaborator network (n = 214)



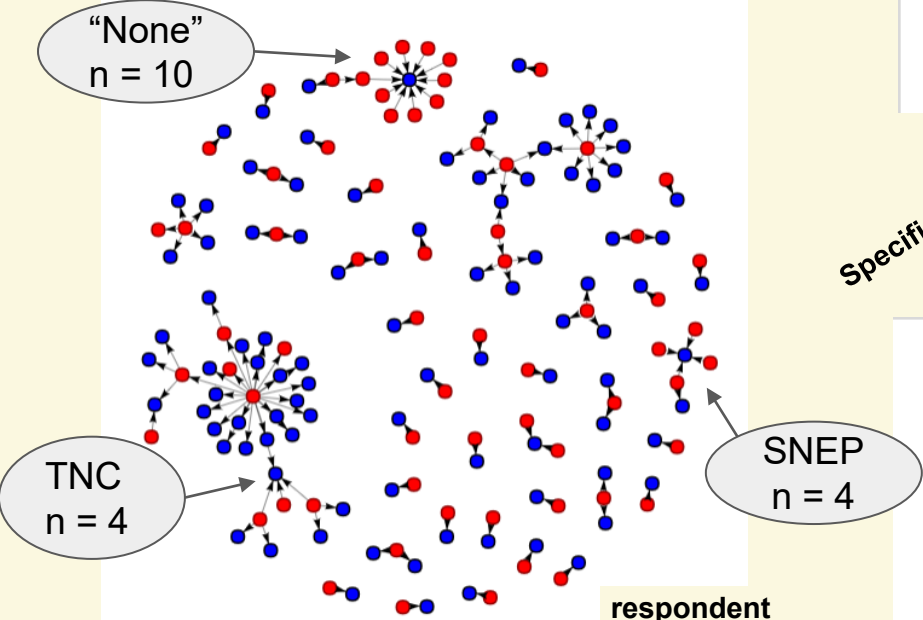
Top Orgs	RI DEM (n = 42)	URI (n = 26)
	TNC (n = 31)	Mass Audubon (n = 20)

RI Foundation (n = 17)	RI DEM (n = 11)
USDA NRCS (n = 12)	SNEP (n = 9)

TNC (n = 4)	URI (n = 4)
Mass Audubon (n = 4)	(Many Orgs.)

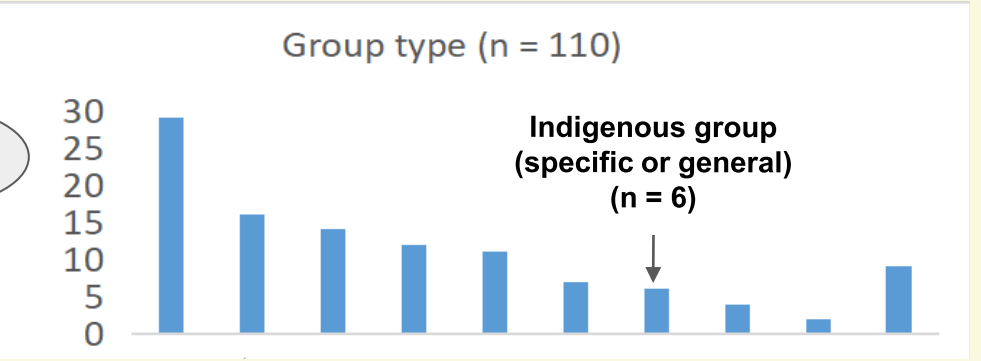
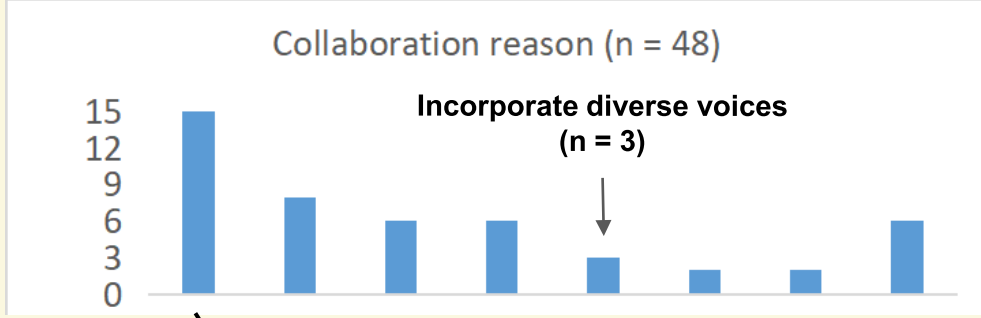
Stewardship networks

Non-aggregated “unable but would like to” network
(n = 163, reciprocity = 0.00)



- Response types
- 78 named specific groups
 - 28 named general categories
 - 10 said “none”
 - 03 said “all groups”
 - 03 “other”

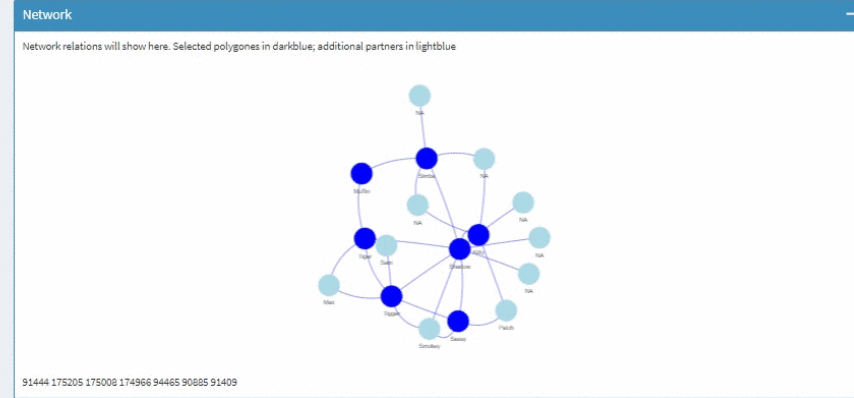
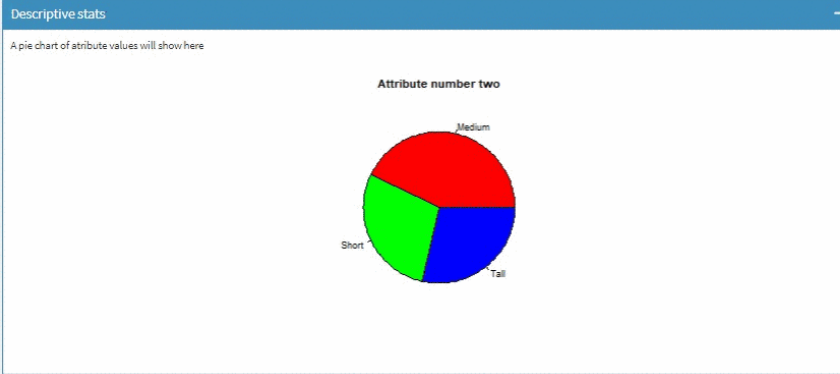
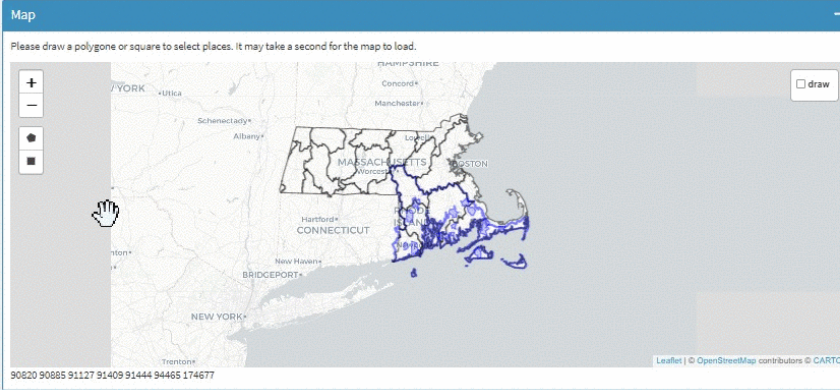
respondent
● Yes
● No



Nonprofits (etc.)
 Generic
 University
 Fed gov
 State gov
 Funder
 Indigenous
 Local gov
 K - 12
 Other

Data visualization tool: Linking spatial and network data (in prep)

StewMap of Southeastern New England (SNEP) data explorer



Qualitative responses

Entire Network Selected Node & Neighbors

Show 10 entries Search:

	name	phrase
1	NA	no data
2	NA	no data
3	NA	no data
4	NA	no data
5	NA	no data
6	NA	no data
7	Simba	A dish fit for the gods
8	Shadow	A different kettle of fish

Supporting Environmental Justice Collaborations and Work

&

Next Steps

Supporting Environmental Justice Collaborations and Work

- Among other things... we are looking at how our data can help address environmental justice questions in the SNEP region
- We are working with the SNEP Network Environmental Justice Initiative Strategy Team
- Our work touches upon issues of justice in several ways
 - Group missions and needs
 - Group foci, expertise, etc.
 - Central and peripheral network actors
 - Desired relationships
 - Stewardship capacity in an area (e.g., number of groups, staff, etc.)
 - Large database of groups in the region (> 700 groups)
- Limitations and caveats
 - Did not set out to study environmental justice issues explicitly
 - Survey responses are largely limited to civic society groups and tribes (not towns, state, or fed)

Next steps

- **Ongoing data analysis**
 - Local summaries of data, perhaps at estuary watershed scale and smaller watersheds.
 - Develop capacity indicators by region (e.g., watersheds) and link those to environmental needs.
 - Analyze network among SNEP sub-regions and outside SNEP region.
 - Continue to understand how best to support environmental justice interests.
- **Refine and publish**
 - **Dashboard(s):** (review and hosting by USDA US Forest Service)
 - **Report:** (to be shared on the SNEP Network website)
 - **Webinars:** (two webinars in June hosted by the SNEP Network)
- **PLEASE BE IN TOUCH WITH SPECIFIC INTERESTS OR QUESTIONS**

Thank you

StewMAP SNE Dashboard(s) User Feedback

- what would you like to see?

<https://forms.gle/RtyoWayQKMUDmnts6>



Stewardship Activities Multiple Selections

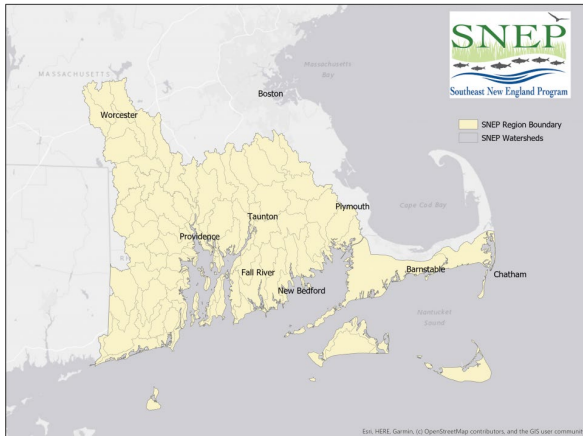
(n=149)	Advocate	Care	Conserve	Educate	Fund	Manage	Monitor	Particip	PlaceBased	Prepare	Restore	Transform
Advocate	1.00											
Care	0.10	1.00										
Conserve	0.13	0.49	1.00									
Educate	0.10	0.22	0.25	1.00								
Fund	0.09	0.12	0.03	0.04	1.00							
Manage	-0.03	0.50	0.38	0.18	0.10	1.00						
Monitor	0.26	0.49	0.49	0.33	0.27	0.32	1.00					
Particip	0.33	0.13	0.16	0.34	0.09	0.05	0.24	1.00				
Place Based	0.14	0.27	0.21	0.16	0.11	0.16	0.22	0.16	1.00			
Prepare	0.08	0.22	0.27	0.17	0.14	0.20	0.21	0.17	0.33	1.00		
Restore	0.01	0.53	0.57	0.29	0.23	0.48	0.60	0.20	0.27	0.33	1.00	
Transform	0.34	0.10	0.19	0.11	0.29	-0.04	0.27	0.15	0.26	0.22	0.14	1.00

Local Approaches to Climate Resilience Funding and Financing

2022 SNEP Symposium
Wed., May 18, 2022



About the SNEP Network:



“The Southeast New England Program Network is a collaborative network of partners with expertise in stormwater management, financing, water quality and habitat restoration, green infrastructure, low impact development, and watershed-scale conservation and restoration.”

For more information about the SNEP Network, please visit www.snepnetwork.org.

About Throwe Environmental, LLC:



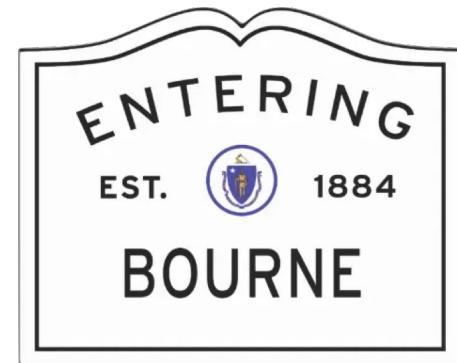
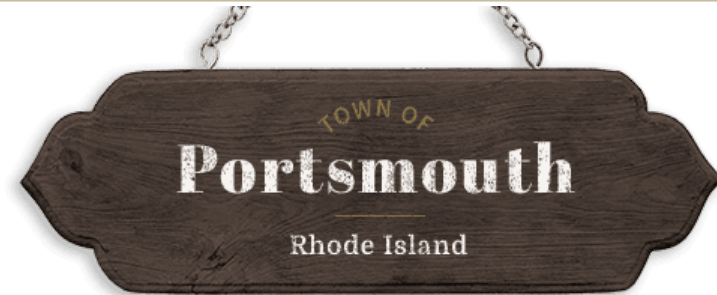
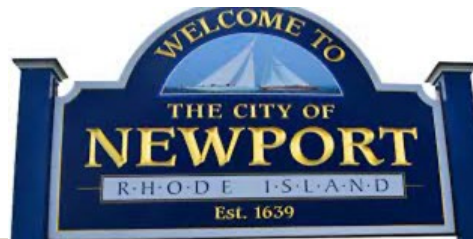
Through analysis, technical assistance, and outreach, we help communities address environmental challenges including climate finance, water infrastructure, policy development, and climate resilience.

Our goal is to enable our clients to address their environmental challenges through resilient, sustainable, and practical methods.

For more information about the Throwe Environmental, please visit throwe-environmental.com or follow us on [LinkedIn](#)

Outline

- Resilience Financing Framework: **Planning to Action: Climate Toolkit (*PACT)**
 - Funding/Financing Mechanisms
 - Portsmouth, Bourne & Newport
- WTGHA



Resilience Financing Framework

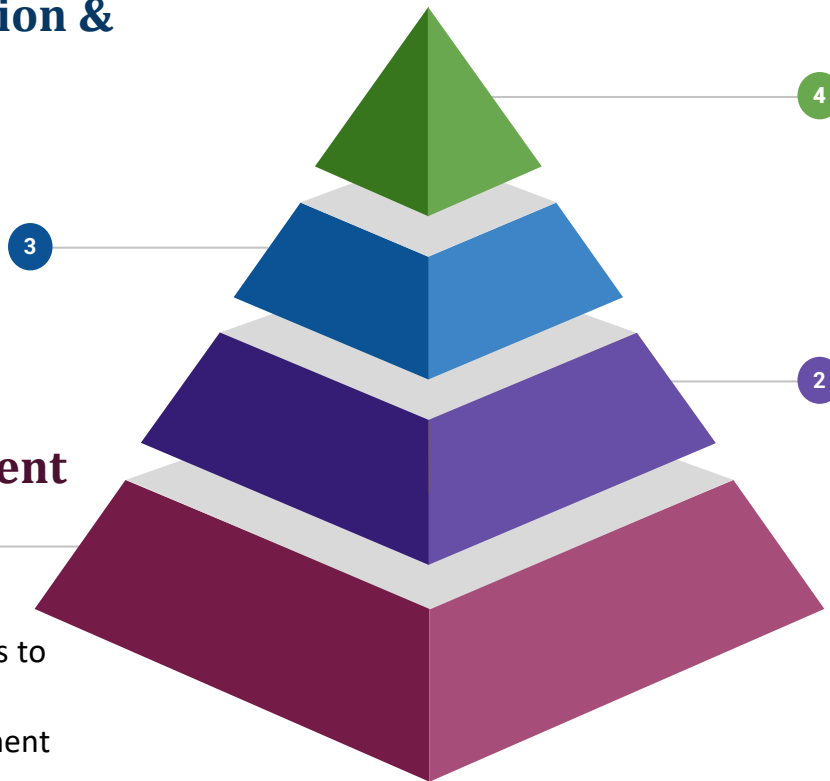


Resilience Prioritization & Project Portfolio

- Develop action plan to address vulnerabilities and risks
- Identify priority resilience projects and estimate implementation costs

Community Assessment and Leadership Engagement

- Ensure buy-in, receptiveness to financing recommendations
- Codify community commitment



Sustainable Funding & Financing

- Establish dedicated and sustainable revenue streams
- Generate pathways for investment

Vulnerability Analysis & Risk Assessment

- Assess climate hazards
- Identify key assets and understand impacts
- Analyze risk & vulnerability

Funding and Financing Mechanisms

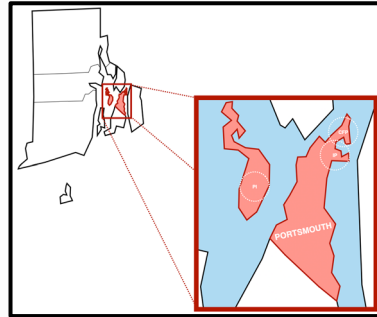
- Grants: Governmental funds made available, typically on a competitive basis, to fund programs and infrastructure projects.
- Bonds: Fixed-income securities sold by public or private organizations to raise capital.
- Tax Increment Financing: Formally established tax districts where increases in property taxes are diverted for capital improvements to incentivize development.
- Fees: cost assessed to property owners or developers based on their various environmental impacts (e.g. stormwater utility fees, development impact fees...).
- Special Purpose Funds: A dedicated stream of funding that diverts capital raised using one or more of the various mechanisms discussed for a specific purpose (e.g. Bourne Climate Resilience and Stabilization Fund).

Funding and Financing Mechanisms

- Public Private Partnerships: Performance-based contract between the public and private sector for the financing, delivery, and maintenance of public infrastructure.
- Special Tax Assessments: Cost assessed to residents based on the special benefits they receive from various public goods and services.
- Tax Exemptions: A property tax break or credit used to incentivize individual property owners to “do the right thing”.
- Loans: Repayable funds with a fixed interest rate used to provide upfront capital for programs or infrastructure (e.g. Clean Water State Revolving Fund)
- Insurance: Investments that increase the insurance value of communities.
- Resilience Authorities: Institutional structures set up to fund and finance resilience projects.

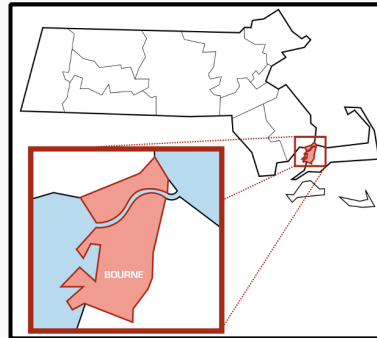


Climate to Action: Community Overviews



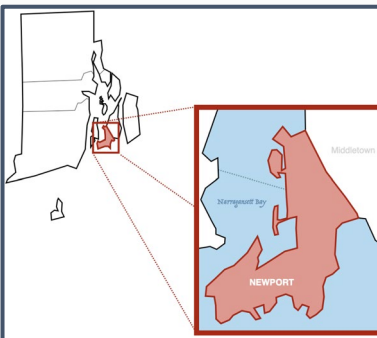
Portsmouth, RI

- Population: approx. 17,226
- 59 mi² (39% land)
- Vulnerable areas:
 - Common Fence Point
 - Island Park
 - Prudence Island



Bourne, MA

- Population: approx. 19,872
- 52.86 mi²
- Vulnerable areas:
 - Buzzards Bay
 - Monument Beach
 - Pocasset
 - Sagamore and Sagamore Beach



Newport, RI

- Population: XX
- XX mi² (X% land?)
- Vulnerable areas:
 - Area 1
 - Area 2
 - Area 3



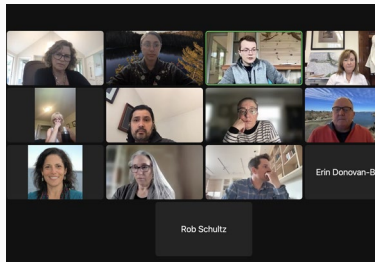
Climate to Action: Leadership and Community Engagement

Community Resilience Capacity Review

The Resilience Capacity Review (RCR) takes a question-and-answer-based approach to provide a streamlined overview of a community's resilience baseline. While this approach is standardized, it is also modified to ensure the most fundamental aspects to each community are emerging. At its core, the RCR works to understand how a community is 1) defining its challenges, 2) prioritizing its assets, 3) pursuing sustainable financing, and 4) optimizing its performance, all in the context of comprehensive community resilience.

DEFINING CHALLENGES

1. Is there a clear existing town-wide definition of, and community-based vision for, resilience that considers environmental, economic, and social resiliency?
 -
2. Has the community identified and inventoried the cultural, historical, economic, social, environmental, and capital assets that are valued in relation to resilience?
 -



Portsmouth, RI

- **Goal: Secure input, commitment, and buy-in**
 - Climate Resilience Workgroup
 - Stakeholder Engagement Workshop
 - Resilience Capacity Review (*PACT)

Bourne, MA

- **Goal: Ensure that the leadership is in place to be receptive to recommendations**
 - Workgroup of department heads from across town
 - Strong commitment from town selectmen and administrator

Newport, RI

- **Goal: Encourage inclusion of local expertise and a wide variety of perspectives**
 - Workgroup of various town stakeholders
 - Regular meetings with town project-leads and clear commitment to project goals



Climate to Action: Vulnerability Analysis and Risk Assessment

Hazards of High Concern	Coastal Flooding
Hurricane	Snowstorm
Nor'easter	High Winds

Portsmouth, RI

- **Goal: Assess climate hazards, identify priorities**
- Existing Plans : HMP, MRP, Comp Plan
- Determine priorities for action
- Climate Priority Tool (*PACT)

All Hazards

Mitigation Action #11
Seek funding to digitize paper records located in the basement of Town Hall and identify off site storage locations outside of the floodplain and other known hazard areas. As feasible, relocate records.

Project Type: Planning
Responsible Dept: All Departments

Funding Source(s): Grants, Town Staff Budget, <\$100,000

Timeframe: Duration: 3 years

Consistency With Mitigation Goals:
Reduce the loss of life, property, infrastructure and the impacts on environmental and cultural resources in the Town from natural hazards; Seek and take advantage of funding opportunities to implement the Hazard Mitigation Plan; Ensure mitigation measures are sensitive to natural features, historic resources, and community character

Consistency With Other Town Plans:
Operations and Maintenance Plan

Priority: MEDIUM

Bourne, MA

- **Goal: Establish a clear understanding of challenges**
- Clarifying asset inventory for Bourne
- Town had already created MVP report & Hazard Mitigation Plan

Hazard	Probability* (Next 5 Years) (H,M,L)
Wind Related Hazards	Medium
Winter Related Hazards	High
Flooding Related Hazards	Medium
Conflagration (Fire)	Medium
Drought	Low
Extreme Heat	Low
Geological Related Hazards (Earthquake)	Low

Newport, RI

- **Goal: Identify and prioritize top assets and hazards**
- Review town planning documents and assessments to compile a comprehensive list of assets
- Identify current and future threats to these assets

Natural Hazard Mitigation Plan, 2016 Update, p.35



Climate to Action: Resilience Action Planning and Project Portfolio

Options	Resilience	Economics	Environmental Impact	Implementable
Option 1	●	●	●	●
Option 2	●	●	●	●
Option 3	●	●	●	●
Option 4	●	●	●	●
Option 3 & 4 combined	●	●	●	●

Portsmouth, RI

- **Goal: Refine and prioritize capital needs**
- Assessment of recommended actions
- Resilience Capital Improvement Program (RCIP)
- Action Evaluation Tool (*PACT)

Proposed MVP Actions	Short-Medium/ Long-Term Funding	What are the acute issues?
Vulnerability Assessment of Low Lying Roads <small>Identify and prioritize roads, develop plan and projects to protect the most vulnerable roads or otherwise reduce their vulnerability. Partner with entities using roads that provide key services to a neighborhood</small>		
Wings Neck Road	SHORT	Stormwater issues due to high water table, priority for engineering, low lying road issue, built over historic salt marsh
Circut Avenue	SHORT	Services - 100 homes on island causeway, stormwater issues and leading to soil sandy dirt flooding
Academy Drive	SHORT	Marina will be impacted at 30, at 40 vehicle area is underwater (short term), sunny day flooding at 3-4ft long term - 200 homes + school in area
Saltmarsh Lane	MEDIUM	Services - 10-12 island/causeway homes (this portion is unoccupied)
Mashneck Road	MEDIUM	Low lying road, island/causeway w/ 200 homes
Red Brook Harbor Rd	MEDIUM	SLU and storage issues
Scrappy Neck Road	MEDIUM	Very low lying causeway - 100-150 homes
Emmons Road	LONG	Bottomack - 0 homes

Bourne, MA

- **Goal: Create an action plan to respond to anticipated risk and vulnerability**
- What are your priorities?
- Positioning to move into financing



Newport, RI

- **Goal: Develop a comprehensive, prioritized list of hazard mitigation activities**
- Incorporate relevant information gathered from existing plans and workgroup feedback
- In progress



Climate to Action: Climate Financing and Investment



Portsmouth, RI

- **Goal: Build a long-term resilience financing strategy**
- Understand necessary systems and institutions for climate resilience investment
- Recommendations: Establish a dedicated **Climate Resilience Fund, leverage RIIB funds to advance RCIPs**



Bourne, MA

- **Goal: Establish a comprehensive and sustainable financing system**
- Put institutions in place for sustainable financing
- Establishment of **Climate Resilience and Infrastructure Stabilization Fund**

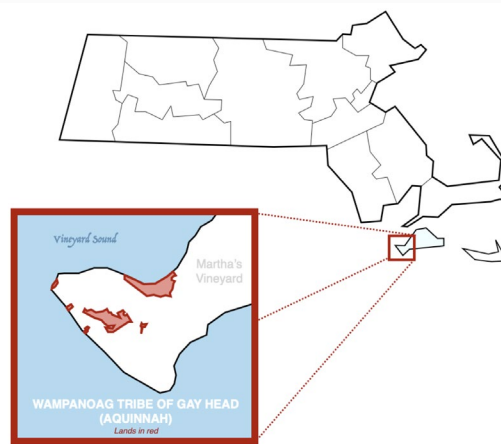


Newport, RI

- **Goal: Provide a financing plan of action to addresses project needs**
- Recommendations for funding and financing that position Newport for long-term sustainable resilience
- In progress



Developing a Climate Adaptation Plan: Community Overview



Wampanoag Tribe of Gay Head (Aquinnah), MA

- Population: approx. 1,100 enrolled members, 130 reservation residents
- 580 acres on Martha's Vineyard
 - 57% wetland
 - 29% unimproved upland
 - 7% conservation
- Vulnerable areas:
 - Commonlands
 - Gay Head Cliffs
 - Tribal Housing



Developing a Climate Adaptation Plan: A Flexible Approach



Wampanoag Tribe of Gay Head (Aquinnah), MA

- Our planned approach: follow the Planning to Action Toolkit (*PACT)
- Our actual approach: adapt PACT tools to develop a Climate Adaptation Plan in partnership with the tribe
 - Regular check-ins with tribal project leads
 - Leadership exchange with 12 tribes from across New England
 - Final Climate Adaptation Plan including funding and financing recommendations



Developing a Climate Adaptation Plan: Leadership Exchange



Wampanoag Tribe of Gay Head (Aquinnah), MA

- 12 tribes/nations in attendance
- Facilitated group discussion
- Discussed key challenges and barriers and identified potential opportunities and solutions
 - Barriers: Capacity, public understanding, controversial language in contracts/solicitations, unclear priorities
 - Opportunities: General Assistance Program (GAP), education, meaningful involvement in solicitations and grant design
 - Solutions: Organize & prioritize, dedicated staff, technical assistance, flexibility in funding

Thank You!

Please reach out with any questions:

Joanne@Throwe-Environmental.com

www.throwe-environmental.com