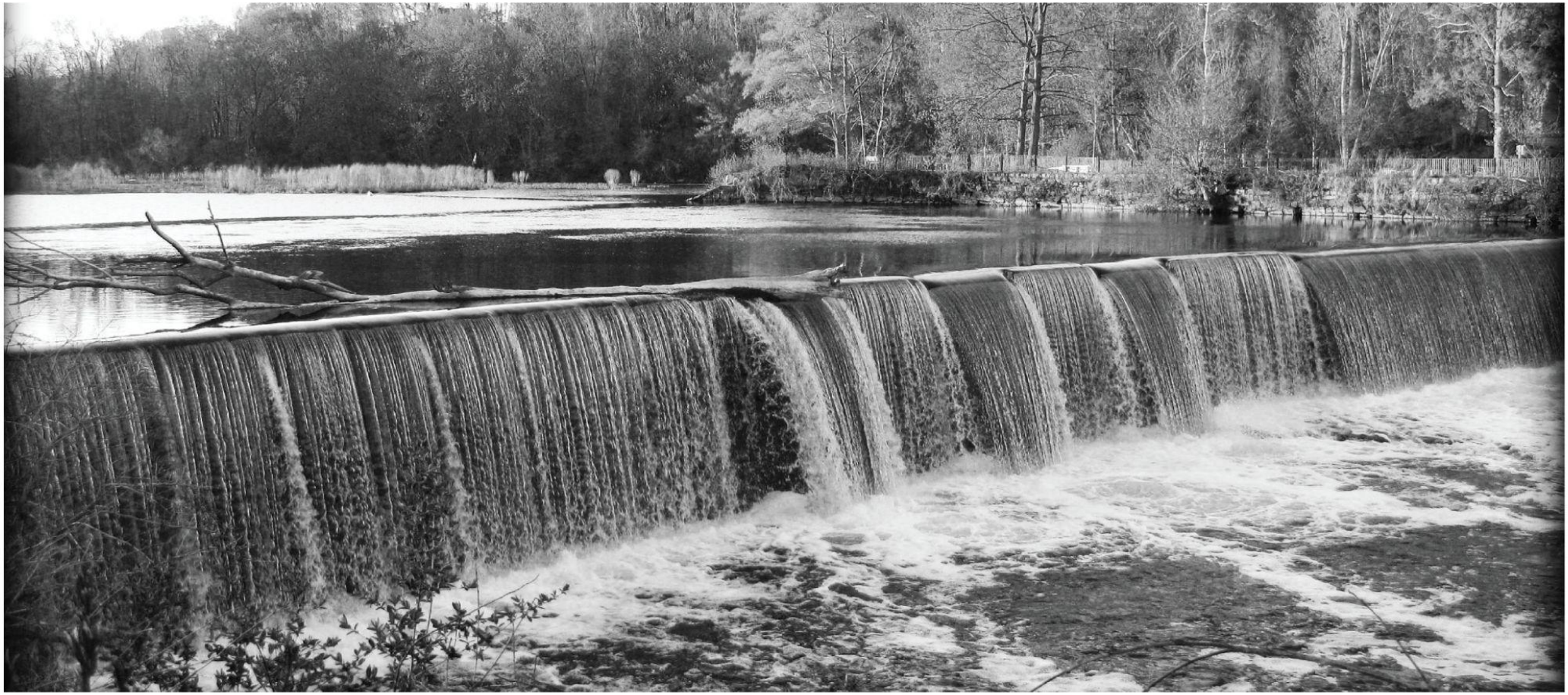
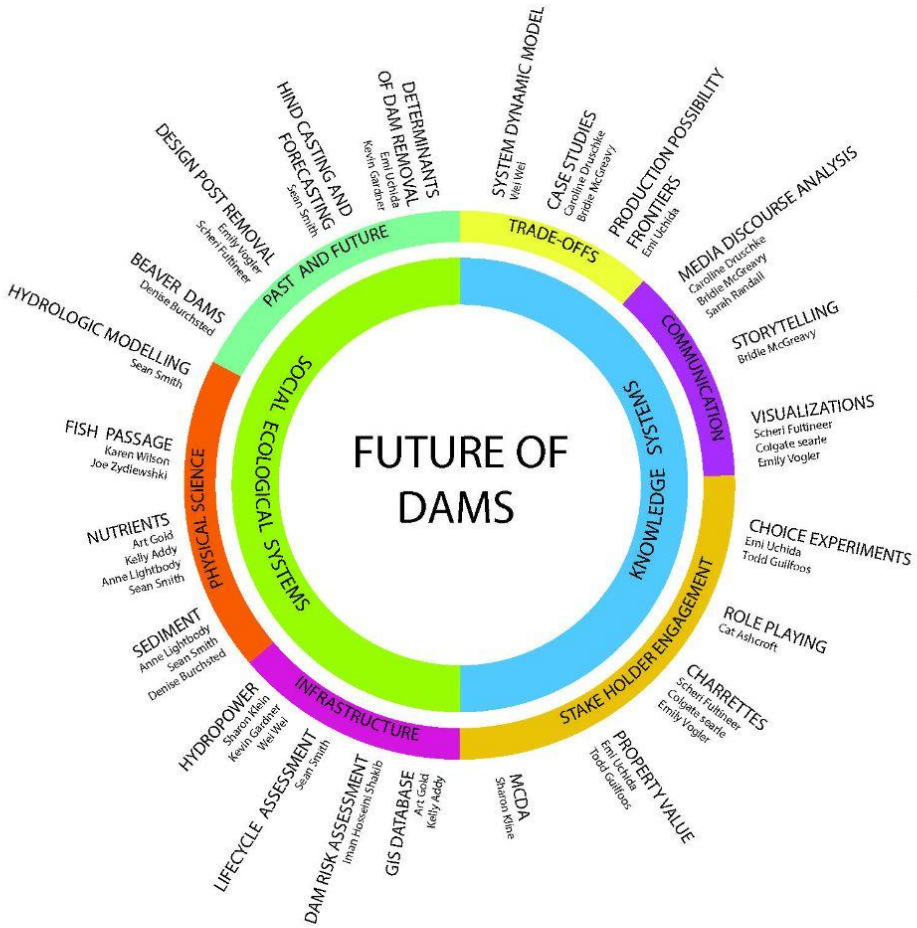


Restoring Kittacuck:

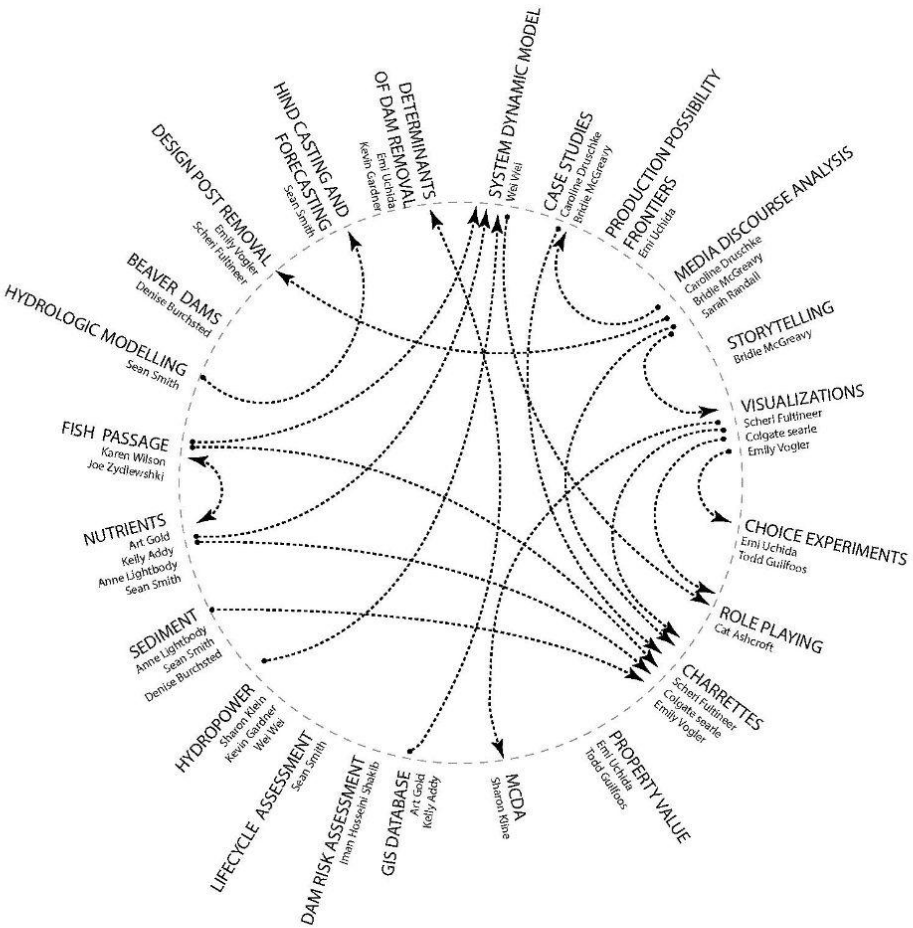
Reconnecting the River that Powered America's Industrial Revolution

Stefanie Covino + Emily Vogler

NSF · Sea Grant · NBEP · National Fish and Wildlife Foundation · Blackstone Watershed Collaborative · University of Rhode Island HOPE 1892 · National Endowment for the Arts arts.gov · Rhode Island School of Design RISD 1877 · NRCS Natural Resources Conservation Service



TEAM



COLLABORATION

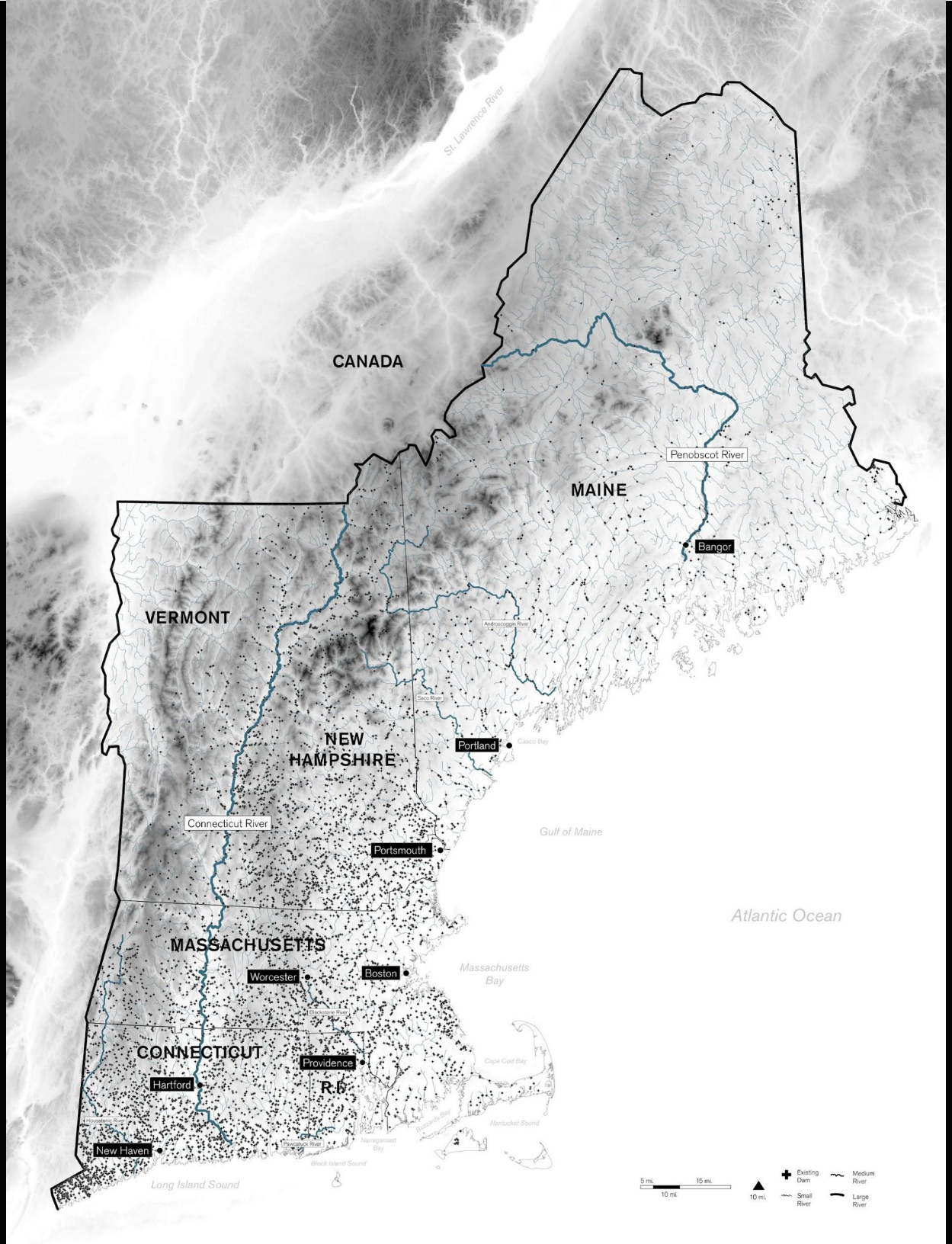
NSF

WICKED ENVIRONMENTAL PROBLEMS REQUIRE INTERDISCIPLINARY CREATIVE APPROACHES





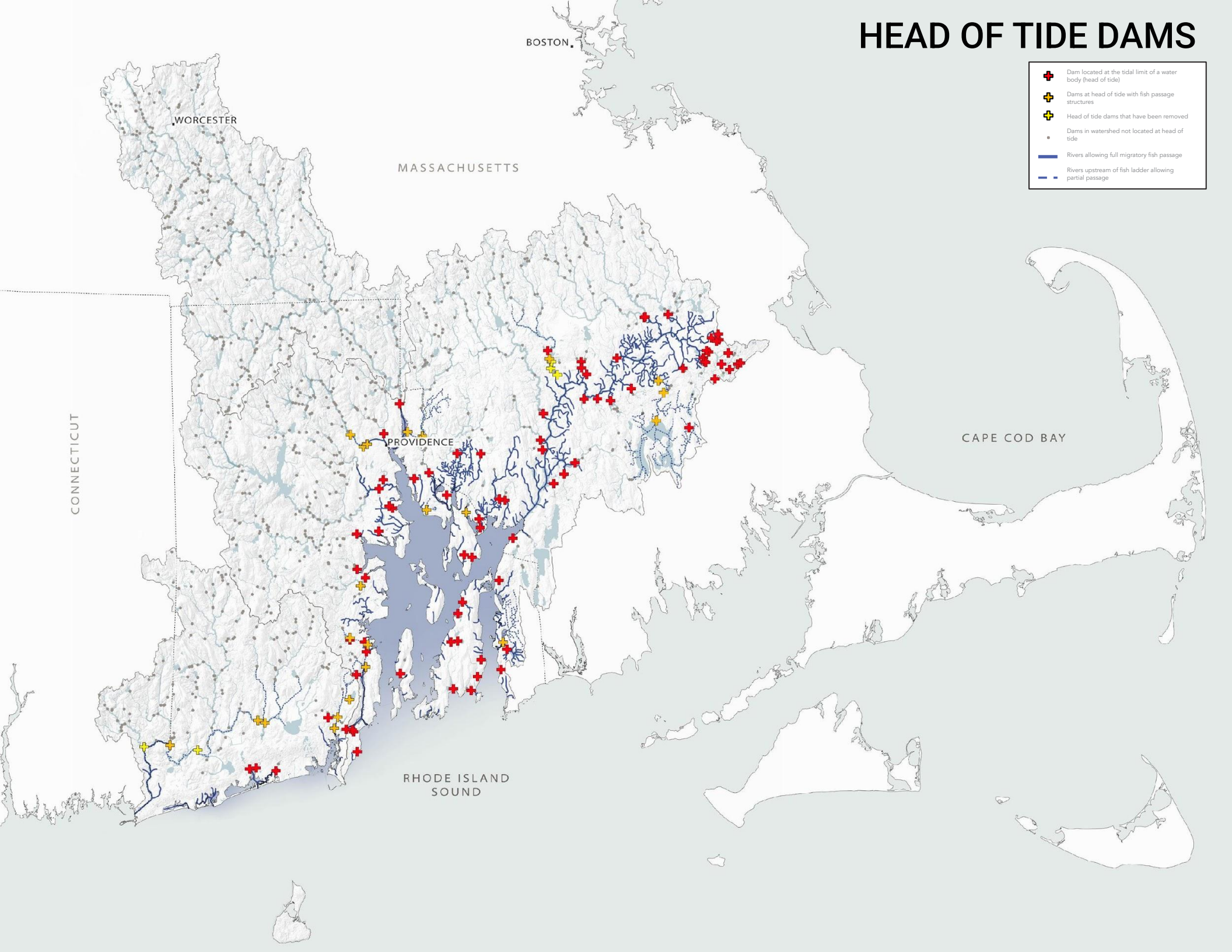



CANADA
St. Lawrence River
Penobscot River
MAINE
Bangor
VERMONT
Androscoggin River
Saco River
NEW HAMPSHIRE
Portland
Casco Bay
Connecticut River
Gulf of Maine
Portsmouth
Atlantic Ocean
MASSACHUSETTS
Worcester
Boston
Massachusetts Bay
Pawtuxet River
CONNECTICUT
Providence
Cape Cod Bay
Hartford
R.I.
Nantucket Sound
Pawcatuck River
Narragansett Bay
New Haven
Block Island Sound
Long Island Sound
5 mi.
10 mi.
15 mi.
10 mi.
Existing Dam
Small River
Medium River
Large River



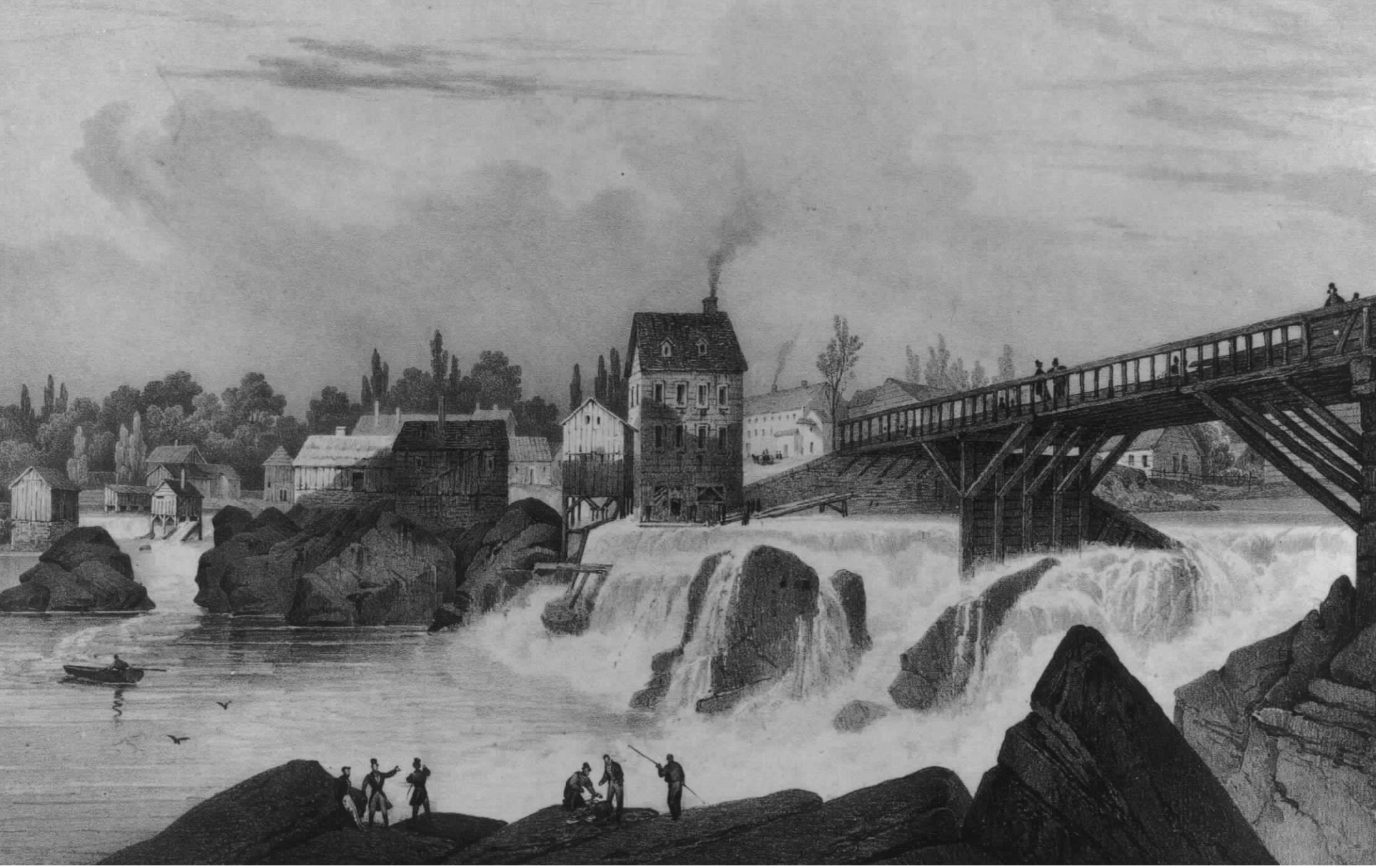
In the early 1800’s alewife, American shad and salmon were abundant in the regions rivers. By 1900 most of these species were commercially extinct

HEAD OF TIDE DAMS





In its 2021 Infrastructure Report Card, the American Society of Civil Engineers gave the nation’s dams a ‘D’ grade, indicating the lack of maintenance and poor condition of many of the dams



For many indigenous communities, dams and the diminished migratory fish runs continue to symbolize the injustices of colonization and its impact on indigenous cultures and loss of respect between people and rivers



Managing sediment during the Bradford Dam Removal © Ayla Fox

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"You kill the dam, you are killing a part of me": Dam removal and the environmental politics of river restoration

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ABSTRACT

River restoration through dam removal provides an opportunity to investigate the changing nature of environmental conflicts and politics in long-humanized landscapes. In New England, where over 14,000 dams fragment the region's rivers, dam removals are often highly contested. This is due, in part, to how the intertwined roles of history, identity, and aesthetics coalesce to create attachment to place and inspire the defense of dammed landscapes. Dam removal provides a useful lens to consider the following: How do the historical and geographical contingencies of this region shape and alter conflicts over dam removal in specific ways? In instances where conflicts emerge, what do the conflicts reveal about the politics of ecological restoration in highly altered landscapes? We use a political ecology approach to reveal how complex cultural dynamics, competing interpretations of science and the environment, micropolitics, and the role of multiple actors generate and shape conflicts over dam removal. We show that the historical geography of New England influence conflicts over removal in important ways, particularly with regard to the roles of aesthetics and identity in landscapes that are characterized largely by consumptive as opposed to productive uses. Our findings also suggest that restoration in long-humanized landscapes will embroil new constellations of human and nonhuman actors, requiring attention to the political and cultural, as well as the ecological, dimensions of restoration. This paper contributes to research on the political and social dimensions of dam removal, as well as to research at the nexus of ecological restoration and environmental politics.

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1. Introduction

In 2008, following an eight-year study by the United States Army Corps of Engineers (USACE), the Town of Greenfield, Massachusetts (MA) agreed to remove both the Wiley and Russell and Mill Street dams as part of a broader river restoration project on the Green River. After town officials determined that removing the Mill Street Dam would be too costly due to upstream infrastructure issues, the focus of the project shifted to the Wiley and Russell Dam. The dam, which the MA State Office of Dam Safety had previously labeled as "high hazard,"[1] blocks passage for migratory fish such as American eel, blueback herring, sea lamprey, and Atlantic salmon. It is, according to nearly all independent estimates, an economic liability that no longer serves its original purpose of providing power to 19th century industrial facilities. All told, 17 agencies and organizations, ranging from the National Ocean and Atmospheric Administration (NOAA) to Trout Unlimited, partnered in the proposed removal, spending >$500,000 over five years. Yet, in August of 2014, after a campaign by community members concerned about the loss of the dam and the landscape that it created, which "have been an essential part of the ecosystem for 200 years,"[2] the Mayor of Greenfield unilaterally decided to halt the removal.

Similar stories are emerging across New England. In Warren, Vermont (VT) local townsfolk are fighting to preserve the village's dilapidated crib dam (and surreptitiously repair it, if necessary) as a crucial element of the area's industrial heritage, while the VT Agency of Natural Resources (ANR), the dam's owner, has said that the structure is irredeemable and must go. In Durham, New Hampshire (NH), townspeople angrily protested in 2009 when state officials attempted to discuss removal of aging dams on the Oyster River (Fig. 1). The proposal was subsequently dropped. In central

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[1] State agencies throughout New England define a dam's hazard according to the potential loss of human life and economic damages incurred should the dam fail ("high hazard"). In other words, the designation it is not a reflection of the dam's material condition.

[2] http://www.industrialhistory.org/save-the-historic-wiley-and-russell-dam.

http://dx.doi.org/10.1016/j.geoforum.2016.02.013
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"The Swift River has been part of me since I was a little kid. You kill the dam, you are killing part of me"

Quote from resident of Swift River*



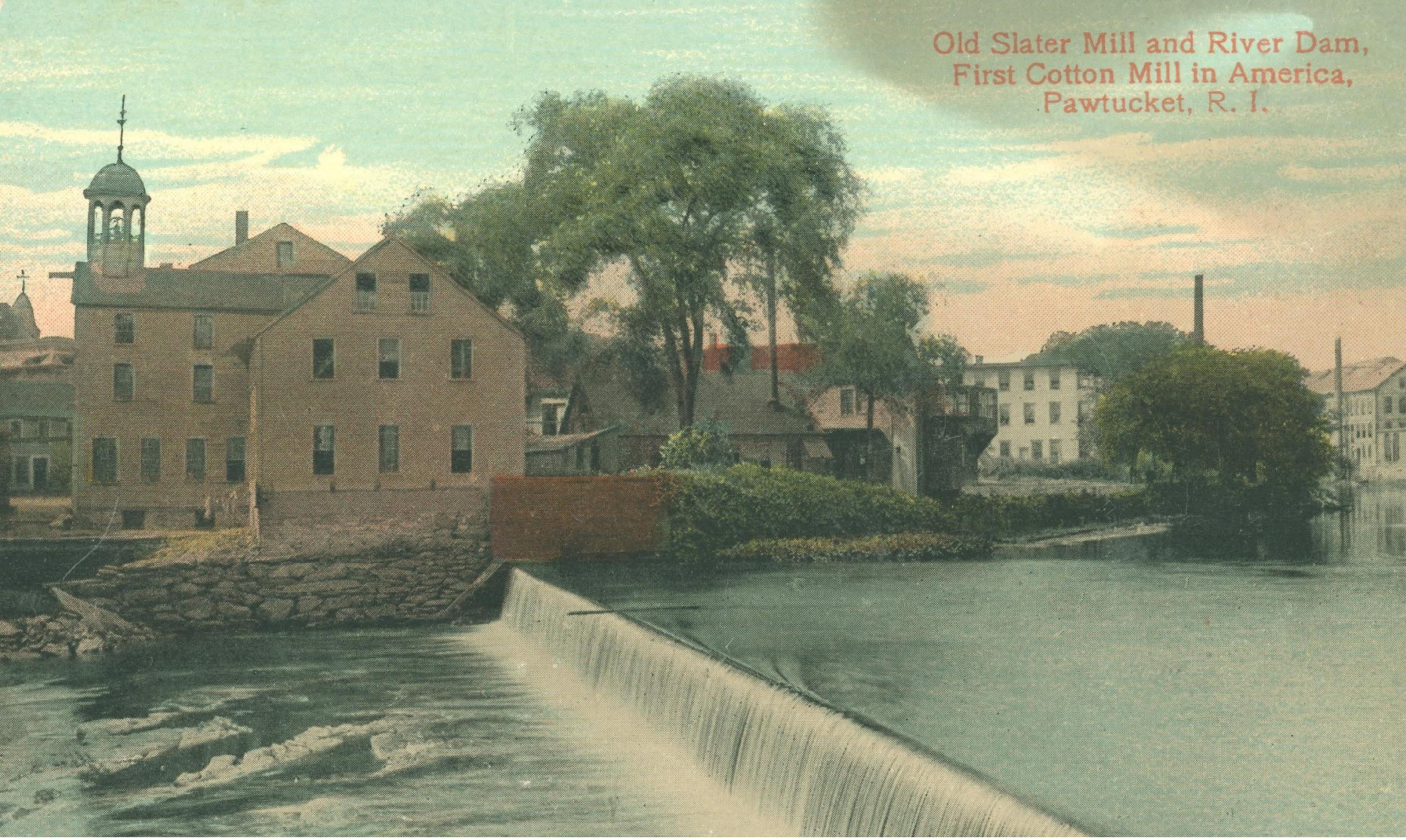
More than **50** dams identified for potential removal by state agencies in New England have been stalled or delayed due to opposition on a variety of grounds.

Conflicts often center on 2 main factors:

1. Perceived loss or threat to individual and collective sense of place around dams and impoundments
2. Sense that the dam removal process ignored community-based stewardship of local resources



These controversies raise important questions about how the public should be involved in decision-making about the management of rivers, water, and other common pool resources. We need new models of what environmental democracies can look like.



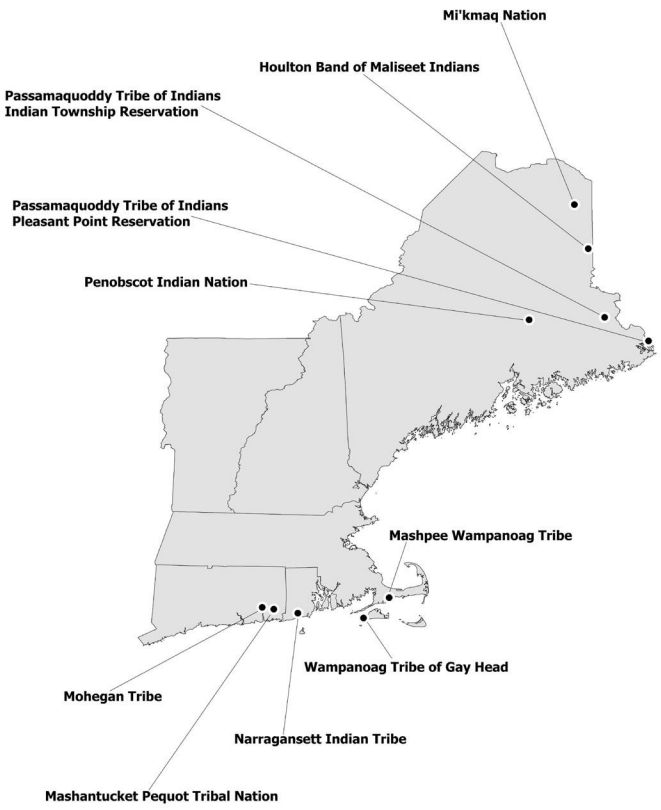
How can we envision new creative social practices that bring people together at the local level to compassionately discuss divergent viewpoints; to critically re- evaluate history, science, and personal values; and to fully consider the social and environmental repercussions of individual and community beliefs, identities, and actions.



In the coming decades there will be the need to make decision about thousands of aging dams- How can we improve the decision making process to reduce the number of dam removal projects that stall or fail due to community opposition?



How can we use design to maintain and strengthen sense of place even if landscapes are changing and use visualization tools to help communities build a landscape imagination to envision future scenarios?



Mi'kmaq Nation

Houlton Band of Maliseet Indians

Mashantucket Pequot Tribal Nation

Mohegan Tribe

Narragansett Indian Tribe

Passamaquoddy Tribe, Indian Township

Passamaquoddy Tribe, Pleasant Point

Penobscot Indian Nation

Wampanoag Tribe of Gay Head (Aquinnah)

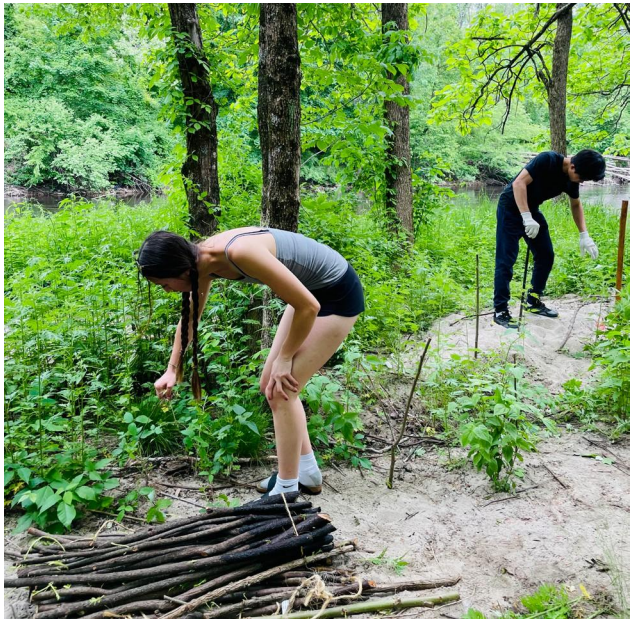
Mashpee Wampanoag Tribe

10 federally recognized tribes within the New England states of Maine, Massachusetts, Connecticut and Rhode Island

271 federally recognized tribes in Alaska, Idaho, Oregon, and Washington.

How do we ensure that Indigenous communities are heard within the predominantly white cultural context of rural New England?







How can we reclaim rivers as a commons and support community care, stewardship, and connections to their local fresh water resources?

NARRAGANSET BAY DAM ATLAS

1

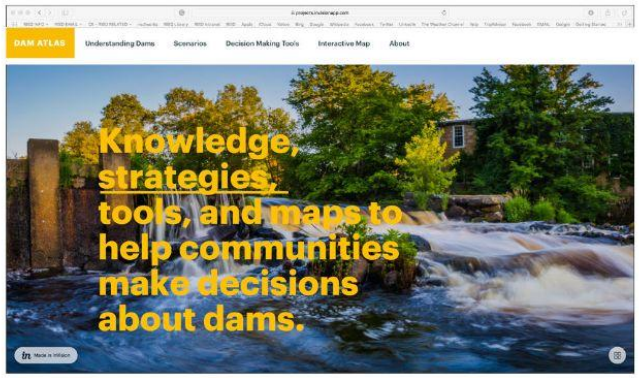
Understanding Dams:
GIS Analysis of Social and Ecological Attributes

2

Case Studies

3

Open Source Decision Support Tools



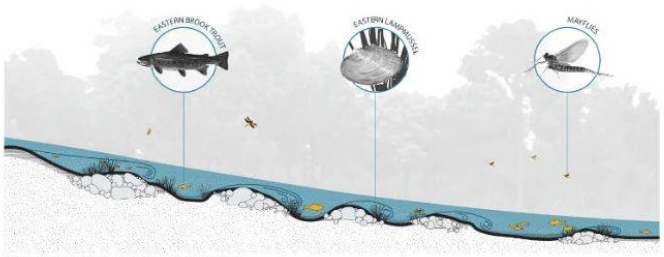


FISH PASSAGE + ECOSYSTEM IMPACTS

River systems are dramatically altered by the construction of a dam, which often has a lasting impact on interspecies relationships and overall habitat connectivity. More than just flowing water, rivers transport fish, sediment, and aquatic organisms between the headwaters (the smallest parts of river and stream networks) to the mouth (where the rivers discharge into coastal waters), sustaining healthy ecosystems along the way. Dams disrupt the system by acting as barriers that disconnect upstream and downstream river lengths, effectively weakening multiple ecosystems[1].

RIVER FLOW AND ECOSYSTEM DYNAMICS

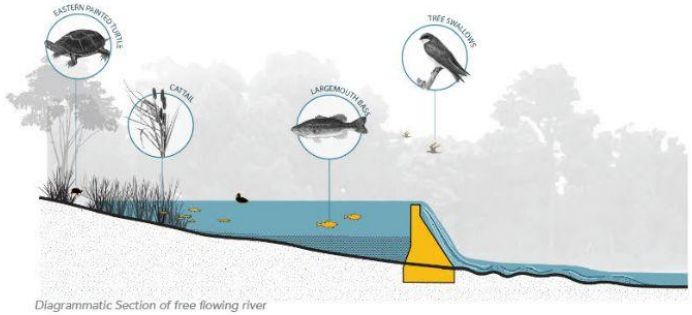
Before European settlement, beaver dams and ponds were common in the smaller streams of the Narragansett Bay Watershed. However, these beaver dams did not generate the extent of changes associated with current dams in the watershed; beaver dams are relatively small, highly porous (leaky) and often seasonal or temporary. In contrast to beaver dams, dams constructed for industry and power along the rivers in the Narragansett Bay and coastal watersheds were permanent and impervious, creating a large-scale shift in the flow and ecology of rivers. Dams effectively transform portions of a river ecosystem into a lake ecosystem (or impoundment). While different aquatic and terrestrial species thrive in these distinct habitats, both rivers and impoundments can provide critical wetland habitat. These wetlands may serve as travel corridors; nesting, feeding, resting, nursery and brood-rearing sites; drinking water sources and escape cover; and provide seasonal breeding, migration and overwintering habitat for wildlife[2].



Diagrammatic Section of free flowing river

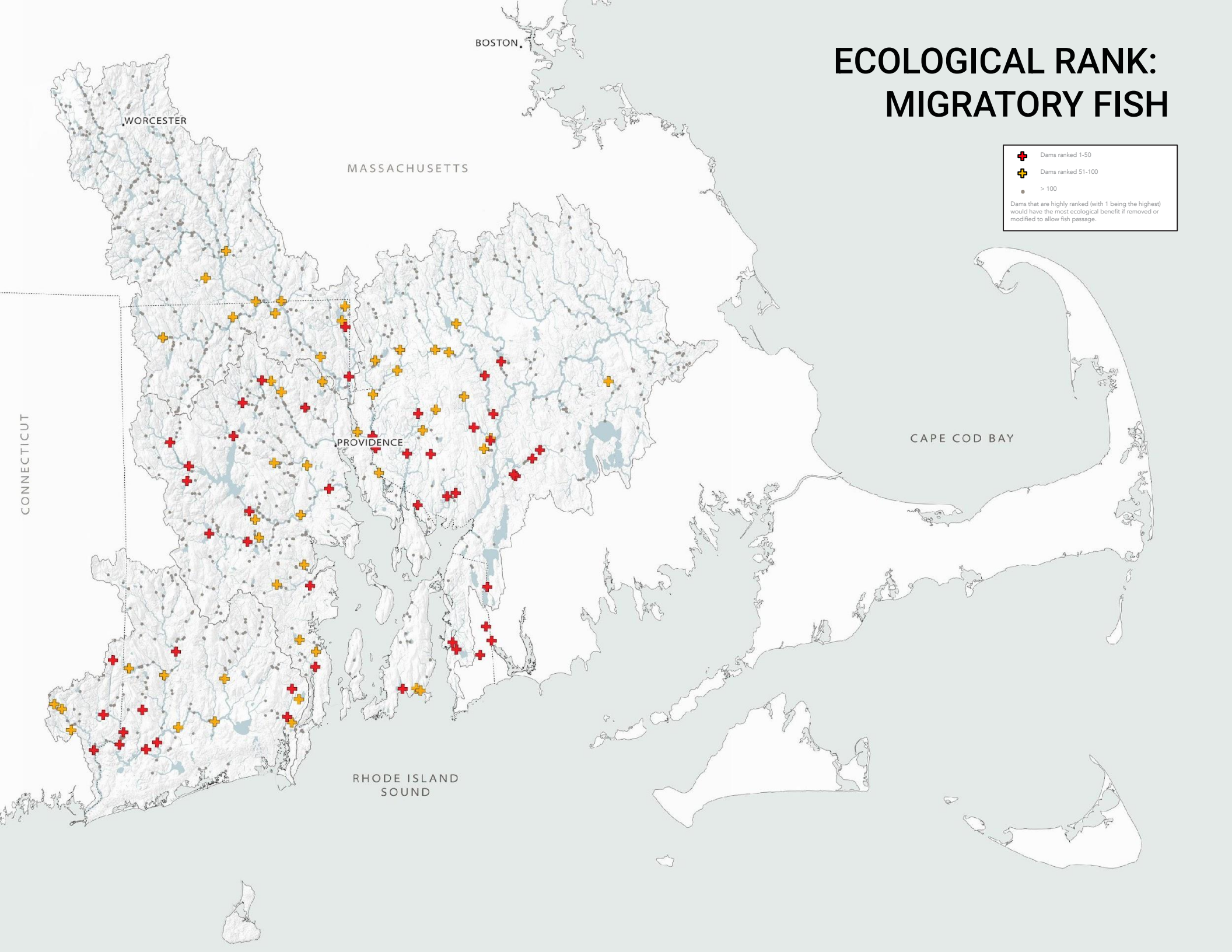
Free-flowing reaches of rivers and streams transport wood, rocks, and other natural debris downstream where they accumulate to create characteristic riffles (shallow rocky areas), pools, and meanders. These habitat features act as shelter for prey species and help to support coldwater fish species such as Brook Trout, Fallfish, Blacknose Dace, and Longnose Dace. There is also a unique macroinvertebrate fauna of mayflies, stoneflies, caddisflies, midges, craneflies, blackflies, dragonflies and damselflies, crayfish, and mollusks. In Rhode Island, due to habitat loss, dams, water pollution, and climate change, Eastern brook trout are listed as a Species of Greatest Conservation Need.

When dams are constructed, the river habitat above the dam is transformed into a lake habitat that supports warm-water species such as large and smallmouth bass, bluegill, and chain pickerel. Within these impoundments, wetlands often emerge along the shoreline or in shallow areas, providing

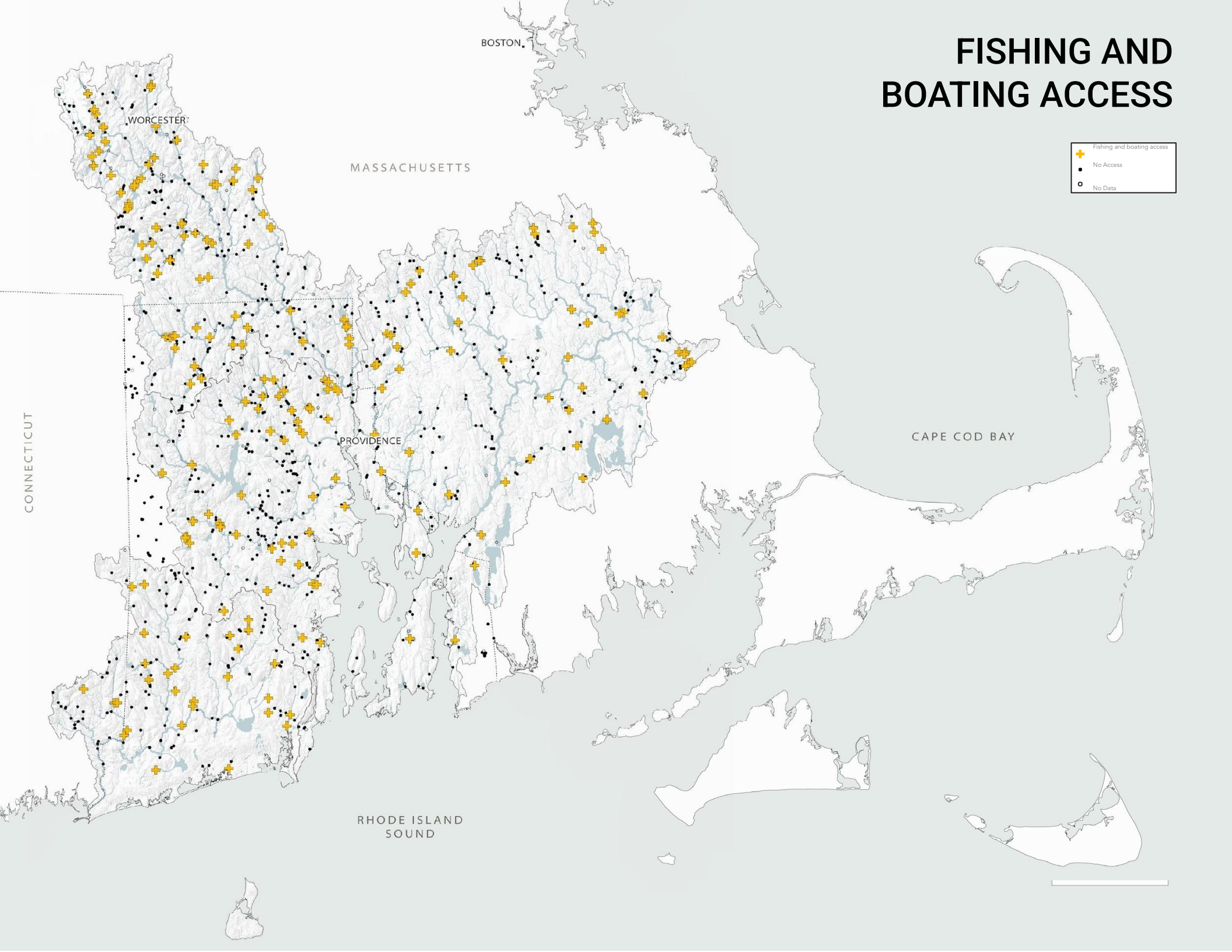


Diagrammatic Section of free flowing river

ECOLOGICAL RANK: MIGRATORY FISH



FISHING AND BOATING ACCESS



CASE STUDIES - REMOVAL

HEAD TIDE DAM

PROJECT SUMMARY

Although outside of the Narragansett Bay watershed, the High Tide Dam in Alna provides a case study of a partial removal of a dam. The project consisted of the removal of 26 feet of the west side of the dam, the construction of an overlook in its place, construction of a retaining wall at the foundation of an old mill, and the addition of a path to the river. The modification of the Alna dam is the second project in a series of three projects aiming to improve fish passage in the Sheepscot River, improve public safety and access, and honor the history at the individual sites. The first of the three projects, completed in 2018, was the removal of the Coopers Mills Dam in Whitefield upstream of the Head Tide Dam. The third project, at Branch Pond Mill in the town of China, Maine, will stabilize the dam and install a fishway. Together the project aims to improve fish passage on the Sheepscot River which is home to the southernmost genetically unique wild populations of Atlantic salmon remaining as well as 11 other species of migratory species.



LOCATION
Alna, Maine

RIVER
Sheepscot River

YEAR
2019

GOAL
Improve fish passage, enhance public safety and access, and honor the history of individual sites.

TYPE
Partial Removal

COST
$515,000.

PROJECT PARTNERS
Town of Alna, Atlantic Salmon Federation (ASF), The Nature Conservancy, Midcoast Conservancy, National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service, Maine Department of Marine Resources, Maine Department of Environmental Protection, and the National Fish and Wildlife Foundation.

FUNDING SOURCES
NOAA Community Habitat Restoration Program, US Fish and Wildlife Service, Enbridge Corporation, The Nature Conservancy, Elmina B. Sewall Foundation, Davis Conservation Foundation, Patagonia, Farnsworth Foundation, Trout and Salmon Foundation and others.

CHALLENGES:

The Head Tide Dam was constructed over 250 years ago to power a series of mills in Alna. The Jewett family donated the dam to the town in 1964. One of the main challenges in the project was deciding whether work could proceed due to a covenant in the deed stating the dam could never be destroyed.

SOLUTIONS:

To address the concerns about the legal deed covenant, the decision was made to partially remove the western portion of the dam. The partial dam removal and construction of the overlook platform – which maintained one contiguous line from shore to shore" – was deemed acceptable by the selectmen and legal counsel complying with the legal deed nant. In addition, the partial val maintained a portion of the c structure as a landmark for the unity.

ccess was an important aspect design of the site. Over the ortion of the river where as removed, an elevated sible viewing platform was . The viewing platform pace for informational a lookout onto the a grate rather than e elevated walkway, the pped that it wouldn't n can be sensitive to ncrete. The final d and strengthened tunities at the site. t of the dam, a swimming hole that has been a popular destination for generations was preserved. In addition, the pedestrian path down to the river provided access to the river and a safe place to put in and take out kayaks and canoes.

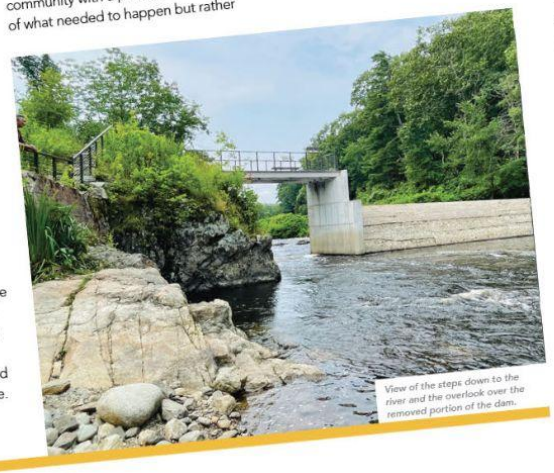
SUCCESSES:

The partial removal of the Head Tide Dam is a good example of the ability to think and work creatively to address legal limitations on a project. It also was successful in providing habitat connectivity as well as preserving the historic dam structure that was important to the community.

LESSONS LEARNED:

The partial removal of the Head Tide Dam dam resulted from a strong team that worked on the project. The restoration team did not go into the community with a preconceived idea of what needed to happen but rather worked with the community to decide how to improve fish passage and river connectivity.

Just because there are legal challenges or deed restrictions on a dam, doesn't mean that modifications can not be made to a dam. This project highlights the opportunity to think creatively to work through legal challenges and deed restrictions.



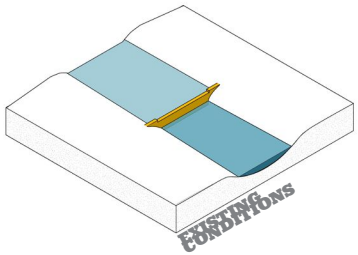
View of the steps down to the river and the overlook over the removed portion of the dam.

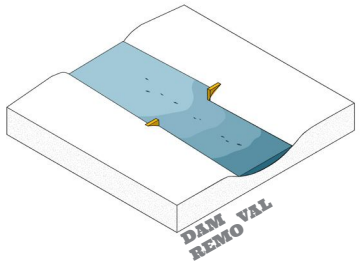
DDITIONAL RESOURCES

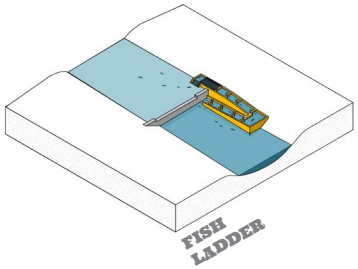
storation.org/projects/magic-on-the-river

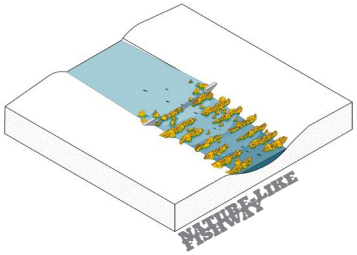
tnews/work-starts-at-head-tide-dam-in-

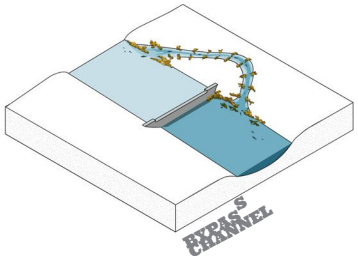
tnews/head-tide-dam-project-a-gift-



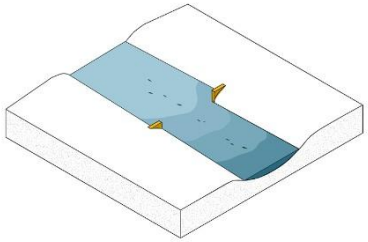








DAM REMOVAL



FISH PASSAGE UP AND DOWN STREAM

Low Fish Passage — 1 2 3 4 5 — *High Fish Passage*

UPSTREAM WATER LEVELS

Potential Lowering of Water Levels — 1 2 3 4 5 — *Maintain Existing Upstream Water Levels*

RECREATION ON THE IMPOUNDMENT

Reduced Flat Water Recreational Opportunities — 1 2 3 4 5 — *Maintains Existing Flat Water Recreational Opportunities*

RECREATION ON THE RIVER

Maintains Existing Difficulties to River Recreation — 1 2 3 4 5 — *Improves River Recreation by removing hazards and portages*

VISIBILITY OF DAM

Dam Structure No Longer Visible — 1 2 3 4 5 — *Dam Structure Remains Visible*

WATER QUALITY

Maintain Existing Water Quality — 1 2 3 4 5 — *Improve Water Quality*

RISK OF DAM FAILURE

No Risk of Failure — 1 2 3 4 5 — *Maintain Existing Risk of Failure*

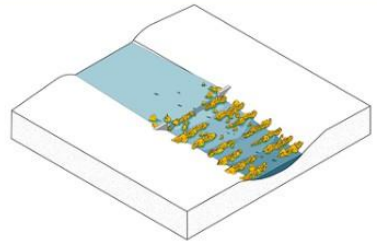
UP-FRONT COST

Less Expensive — 1 2 3 4 5 — *More Expensive*

LONG-TERM COST AND MAINTENANCE

Lower Long Term Cost And Maintenance — 1 2 3 4 5 — *Higher Long Term Cost And Maintenance*

NATURE-LIKE FISHWAY



FISH PASSAGE UP AND DOWN STREAM

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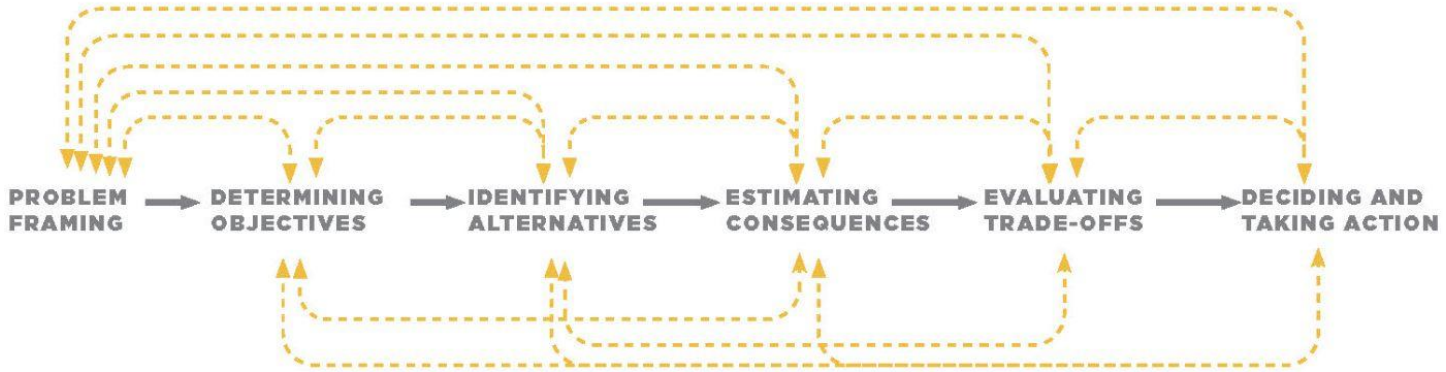
UP-FRONT COST

Less Expensive — 1 2 3 4 5 — *More Expensive*

LONG-TERM COST AND MAINTENANCE

Lower Long Term Cost And Maintenance — 1 2 3 4 5 — *Higher Long Term Cost And Maintenance*

DESIGN CHARRETTE + STRUCTURED DECISION MAKING



2.2

MAKING DECISION - DETERMINING OBJECTIVES

OBJECTIVE CARDS

WHO:
General Public

TIME:
3-5 hours

PURPOSE:
Clarify project objectives and help people focus on interests not positions.

MATERIALS:
Trade-off cards

OVERVIEW

The deck of "Trade-Off Cards", are 6"x4" physical cards that on one side have written out the objective and on the other side have a diagram and text that further explained the issue.

Many people come into a public meeting about a dam with a clear position (ex. keep or remove the dam). One of the goals of the trade-off cards is to help shift the conversation away from a focus on positions to a conversation about the underlying interests (ex. improve fish passage, preserve the history of the town, etc.). This shift Is key because while positions lock participants into advocating for a single alternative, many of the underlying interests that they care about could be achieved through multiple alternatives.

Using the trade-off cards early on in the public process can allow people to start by building a common ground. For example, many participants may agree that having a healthy river is important. This agreement then can allow for participants to collectively discuss and consider options that could help to achieve their shared goals later on in the process.

This process allows for the public to agree on what matters and will need to be assessed in order to effectively compare alternatives. By doing it in a public setting it also ensures that all considerations (both ecological and social) are being factored into the final decision. One of the goals of this process is to engage the public in determining the project objectives.



THE OBJECTIVE:

1. Allow participants to introduce themselves in a structured way that encouraged dialogue.
2. Help participants clarify the issues that they felt most strongly about.
3. By choosing 5 cards it helps participants move beyond a focus on single issue.
4. Encourage participants to shift from thinking about their position (keep or remove the dam) to thinking about their interests (improve fish passage, preserve sense of place, etc.).
5. Communicate to the participants that both scientific facts and social values are being considered in the discussion about the future of the dam.

PRE-WORKSHOP PREPARATION:

First you need to determine what the objectives are for the project. This should come from discussions with the steering committee. It can also be informed by research into the history of the dam and any previous community involvement. While you should try to represent all the issues, there will also be blank cards that the community members can fill in which will help determine if any objectives are missing.

Once you have a sense of the key objectives for the project, print out the trade off cards from the card deck that are most relevant. In addition, print enough extra blank cards so that community members can add additional project objectives.

SETTING UP THE EXERCISE:

Following an introduction presentation that outlines the decision context and the goal of the workshop, place trade-off cards face down in a row in the center of the table.

Ask participants to select 5 cards that represent their interests and concerns about the dam and to place them in front of themselves in ranked order from left to right with left being highest priority and right being lowest priority. Facilitators ask participants to use the cards as a way of sharing with the group the issues and concerns they have regarding the project.

It is suggested that enough cards are printed so that everyone can take 5 cards. However, if printing costs are a concern, you can ask community members to look at the cards and make a list of their top 5 choices on a sheet of paper. When it is an individuals turn, you can ask the participant to pick up their top 5 cards during their turn and return them to the middle of the table when their turn is over.

Go around the whole table until everyone has had a time to introduce themselves and go over their cards.



REFERENCES and ADDITIONAL RESOURCES

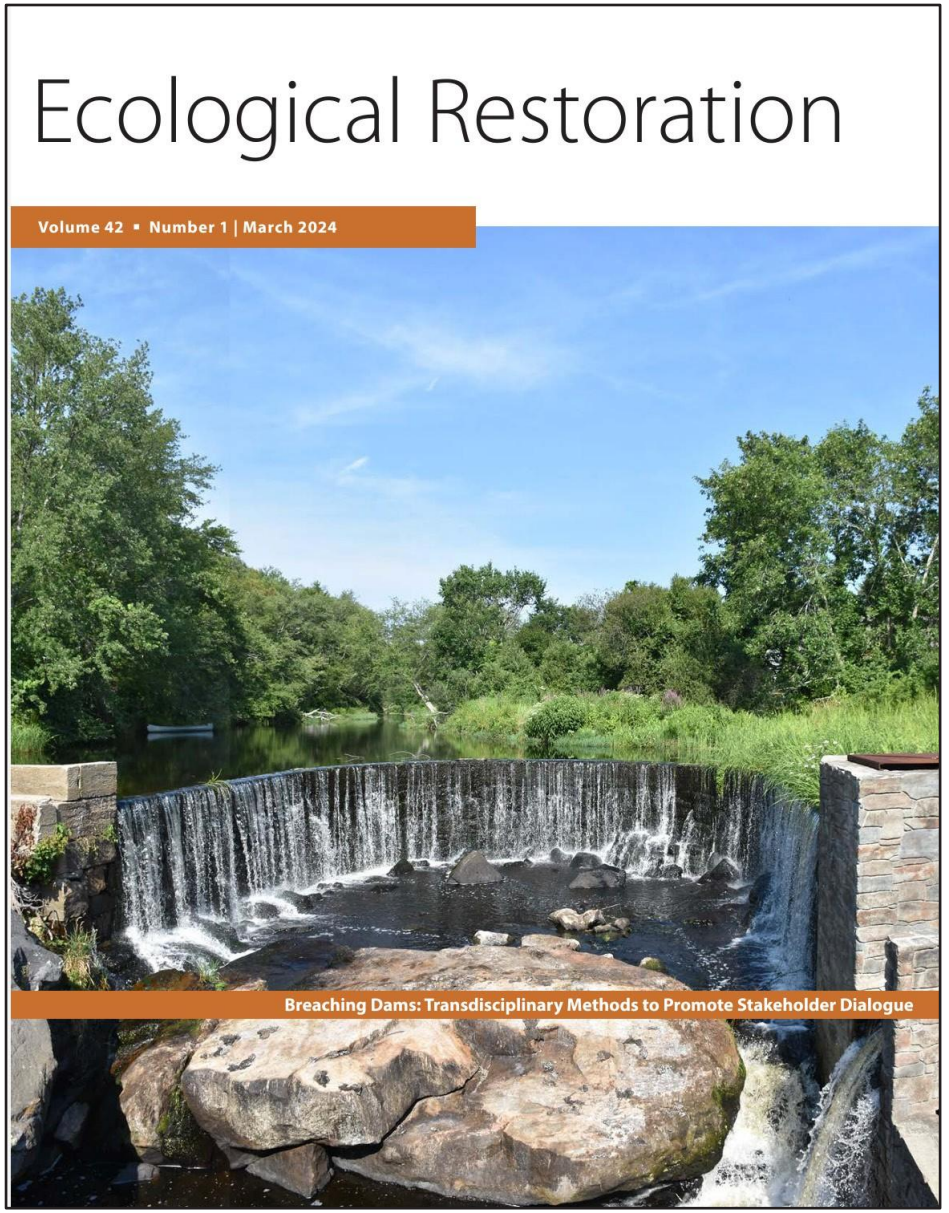
RIVER ALTERNATIVES SUMMARY TABLE

			No Action Alternative	Sediment Trap	Remove Wareham St Dam	Full River Restoration Remove Wareham St Dam Naturalized channel Widen 3 bridges
ECOLOGICAL OBJECTIVES	**Fish Passage up and downstream**		**NO CHANGE**	**MINOR IMPROVEMENT**	**IMPROVED**	**GREATLY IMPROVED**
	Improve Water quality + Habitat		— Disolved Oxygen — Water Temperature — Sediment Transport	— Disolved Oxygen — Water Temperature ↓ Sediment Transport	↑ Disolved Oxygen ↓ Water Temperature ↓ Sediment Transport	↑ Disolved Oxygen ↓ Water Temperature ↓ Sediment Transport
	Improve low-flow aquatic connectivity	Points along river where challenging for Herring to pass	**7** potential low points	**7** potential low points	**5** potential low points	**4** potential low points
INFRASTRUCTURAL AND OPERATIONAL OBJECTIVES	**Minimize flood damage to infrastructure and property downstream of APC.**	Flooded Area (100 Year storm)	**723** Acres	**723** Acres NO Reduction	**680** Acres 6% Reduction	**653** Acres 10% Reduction
		Impacted buildings	**27** Buildings	**27** Buildings	**23** Buildings	**19** Buildings
	Reduce ongoing maintenance by working with river morphology		**Works against river morphology**	**Works against river morphology. Requires ongoing maintenance**	**Works with river morphology**	**Works with river morphology**
	Permitting		**N/A**	**VERY CHALLENGING**	**CHALLENGING**	**CHALLENGING**
RECREATIONAL OBJECTIVES	**Maximize quality and quantity of recreation on the river**	Boating Opportunities Expanding fishery habitat diversity	**FLAT WATER RIVER RECREATION** Maintains Existing "flat water" recreation on river + ease of round trips	**FLAT WATER RIVER RECREATION** Maintains Existing "flat water" recreation on river + ease of round trips	**FREE FLOWING RIVER RECREATION** No portage at Wareham st and fewer low flow areas 	**FREE FLOWING RIVER RECREATION** No portage at Wareham st and fewer low flow areas 
ECONOMIC OBJECTIVES		Cost	**N/A**	**$**	**$$**	**$$$**
		Availability of Funding	**N/A**	**UNLIKELY**	**LIKELY**	**LIKELY**

GREEN = Preferred
YELLOW = Acceptable
RED = Oppose
You must use at least one green and one yellow sticker



Guiding decisions on the future of dams: A GIS database characterizing ecological and social considerations of Dam decisions- 2023



Beyond Binaries: Transdisciplinary Methods for Engaging Communities in Decision Making about Aging Dam Infrastructure in New England- 2024



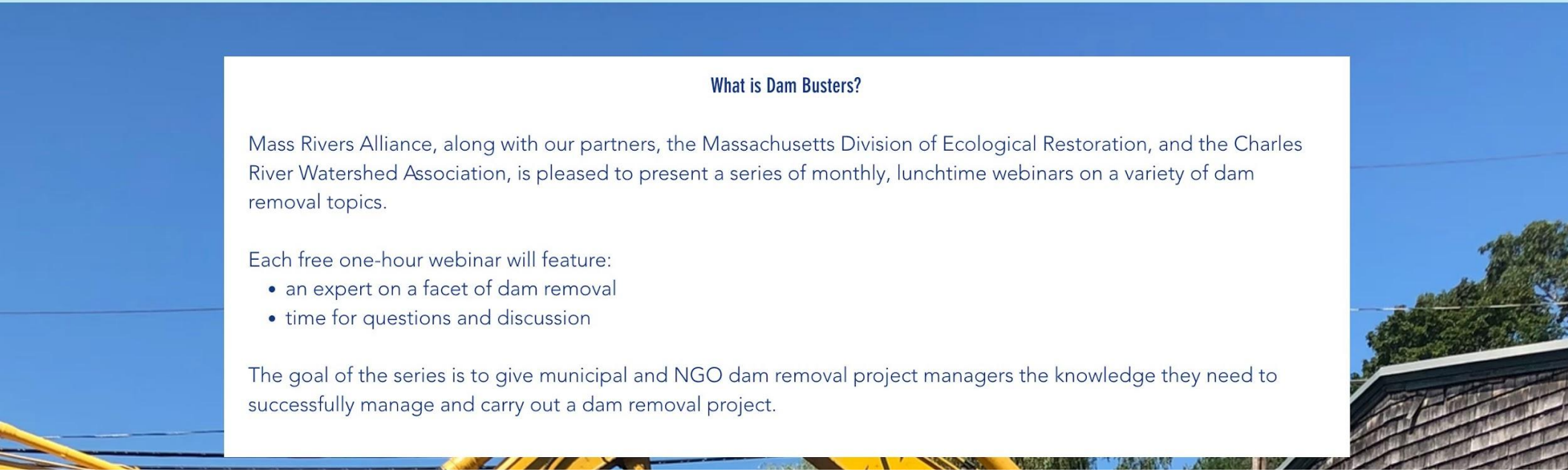


Dam Removal Workshop
Clark University
2023



Dam Busters

SAVING RIVERS WITH MASS RIVERS
Division of Ecological Restoration
Invested in Nature and Community
Charles River Watershed Association



What is Dam Busters?

Mass Rivers Alliance, along with our partners, the Massachusetts Division of Ecological Restoration, and the Charles River Watershed Association, is pleased to present a series of monthly, lunchtime webinars on a variety of dam removal topics.

Each free one-hour webinar will feature:

- an expert on a facet of dam removal
- time for questions and discussion

The goal of the series is to give municipal and NGO dam removal project managers the knowledge they need to successfully manage and carry out a dam removal project.

DAM BUSTERS

Community Engagement Workshop

SEPT 26, 2025 - Worcester

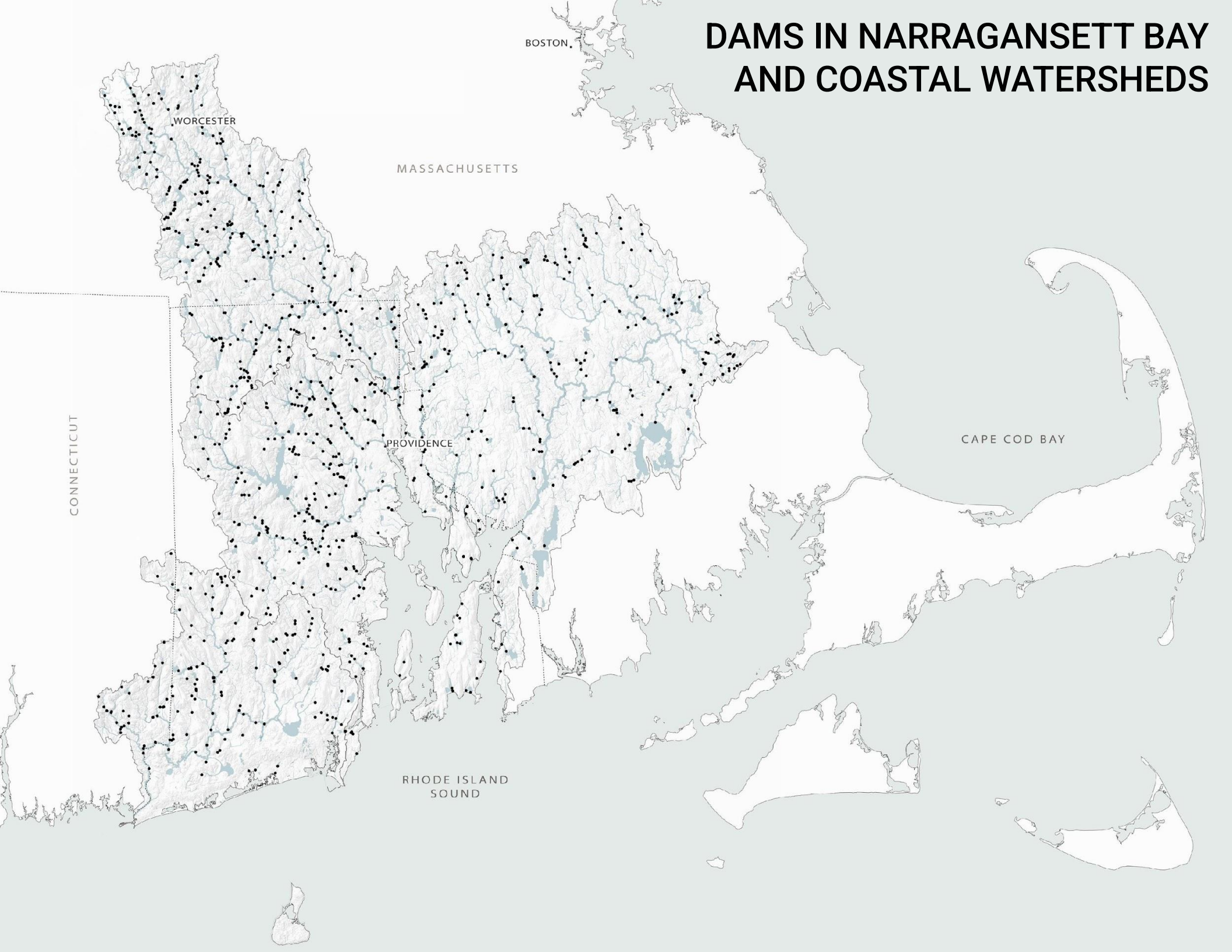


Essex Dam
Merrimack River

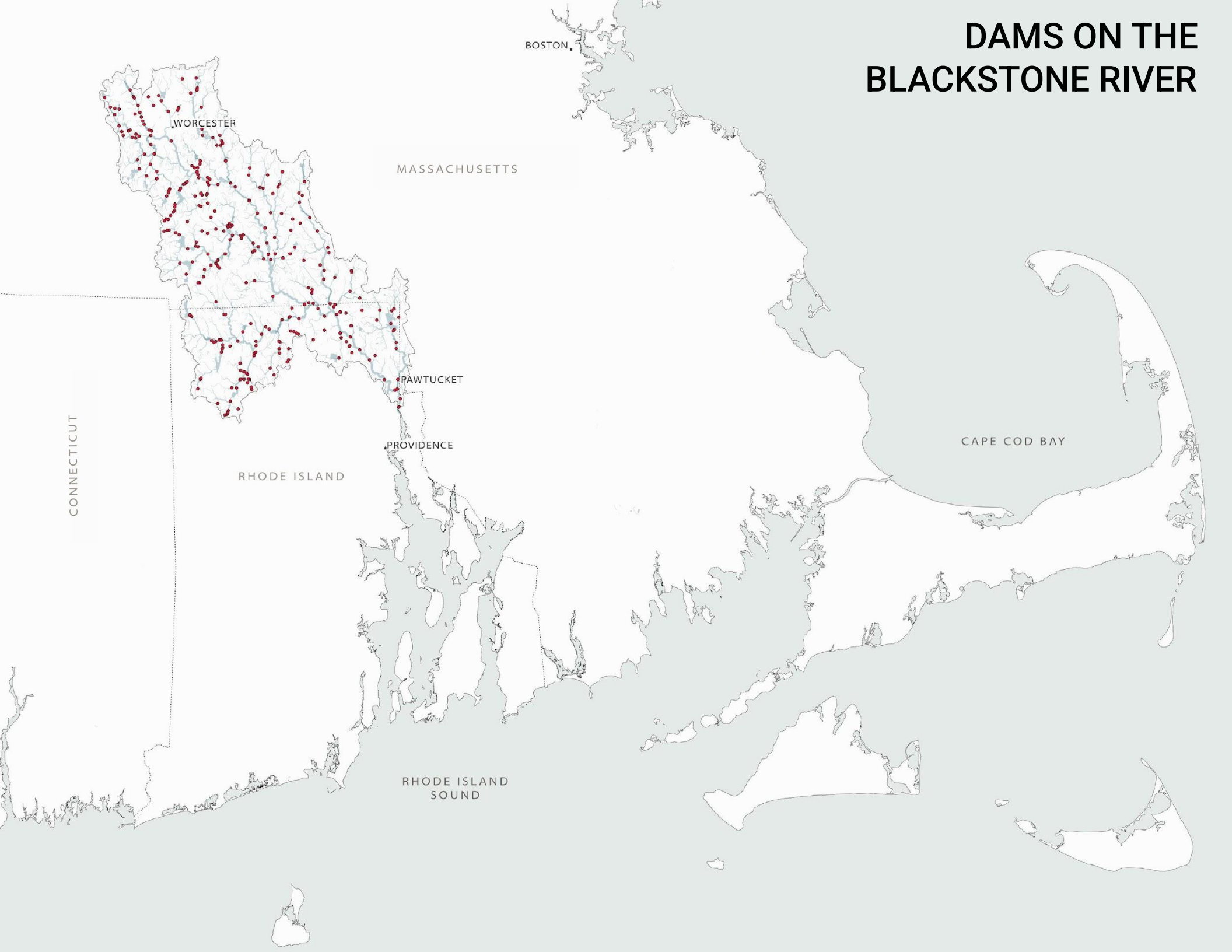


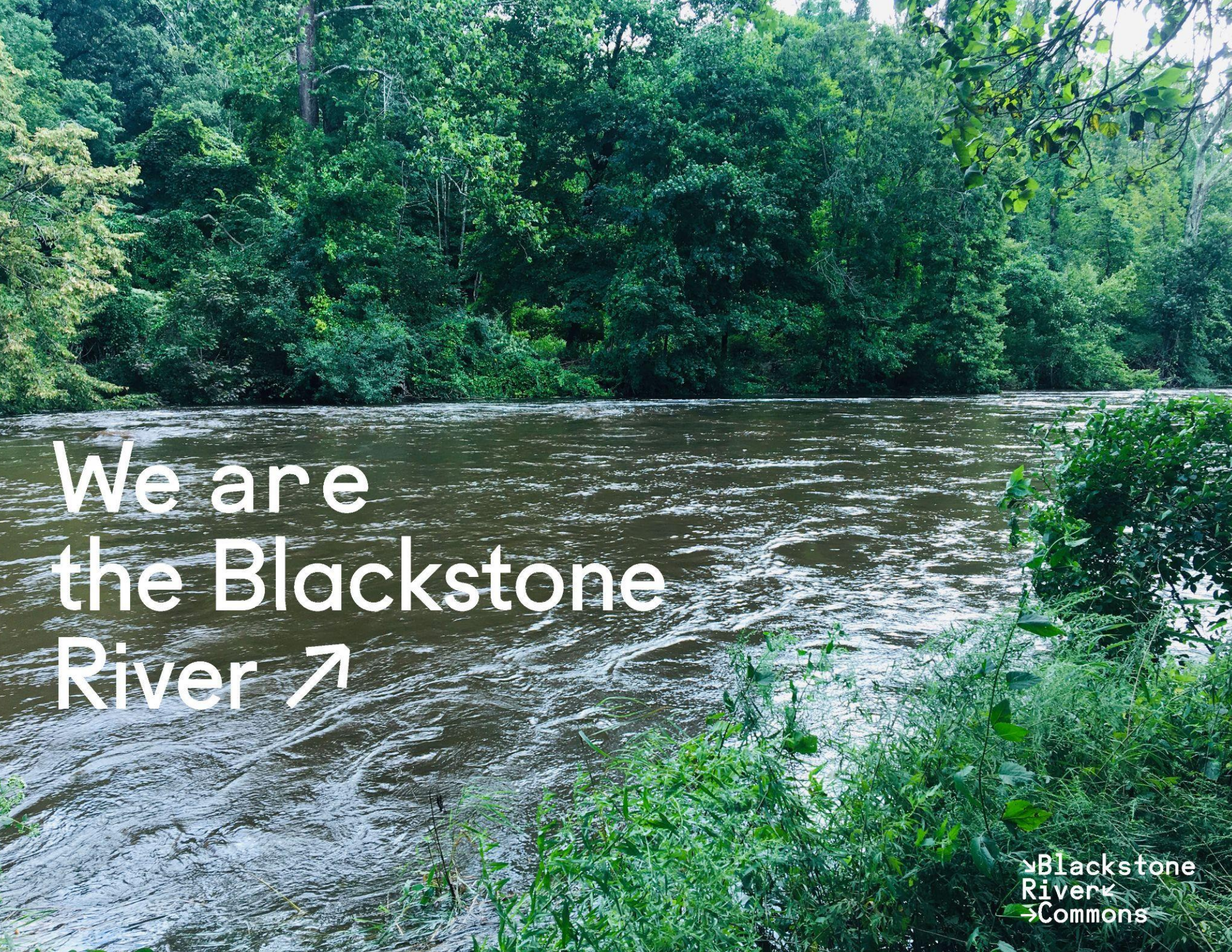
Bascule Dam
Nemasket River

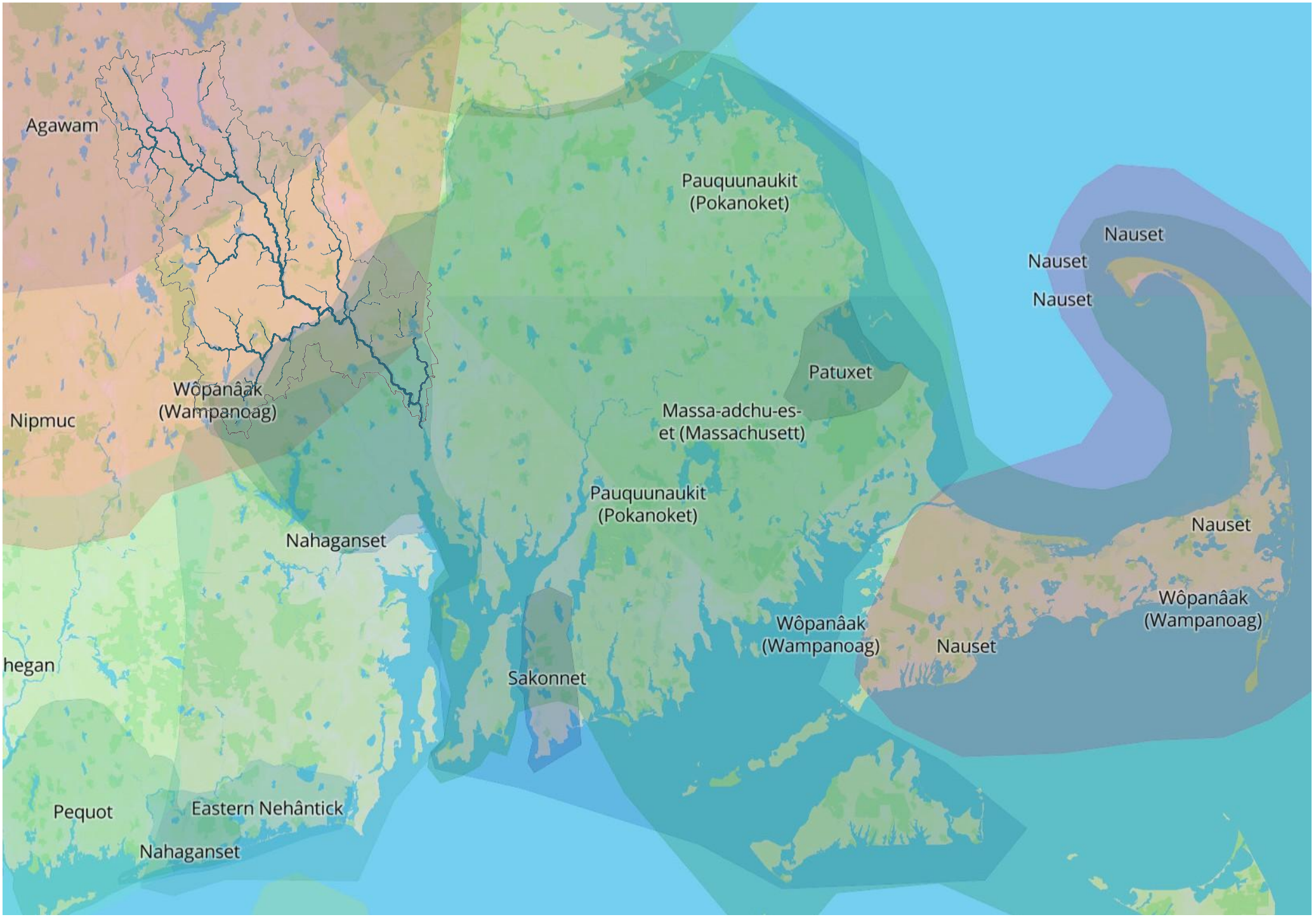
DAMS IN NARRAGANSETT BAY AND COASTAL WATERSHEDS



DAMS ON THE BLACKSTONE RIVER




We are
the Blackstone
River ↗
↘Blackstone
River↙
→Commons

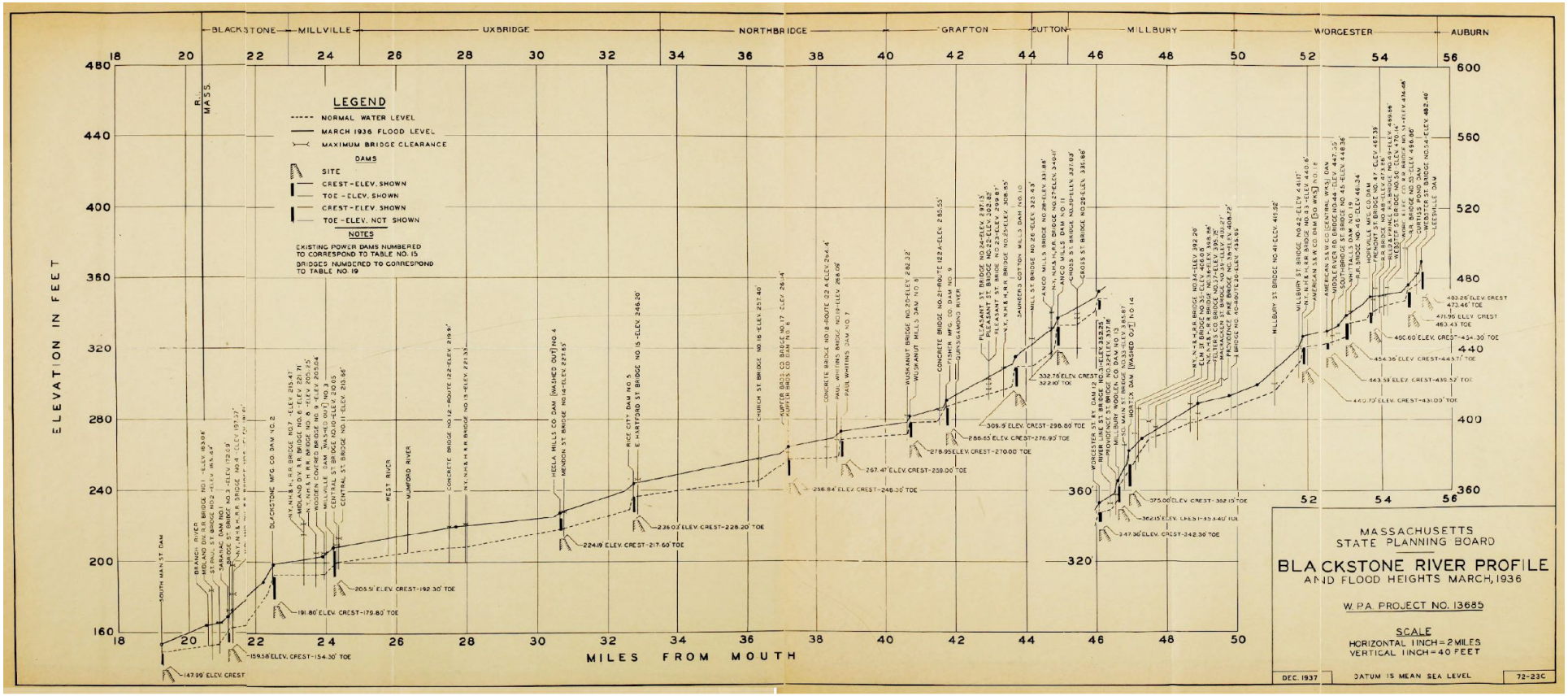


“KITTACUCK/MISHKITTAKOOKSEPE - GREAT TIDAL RIVER”



The Old Slater Mill, Pawtucket, R. I.
The first cotton-spinning mill successfully operated in America

“BIRTHPLACE OF THE AMERICAN INDUSTRIAL REVOLUTION”



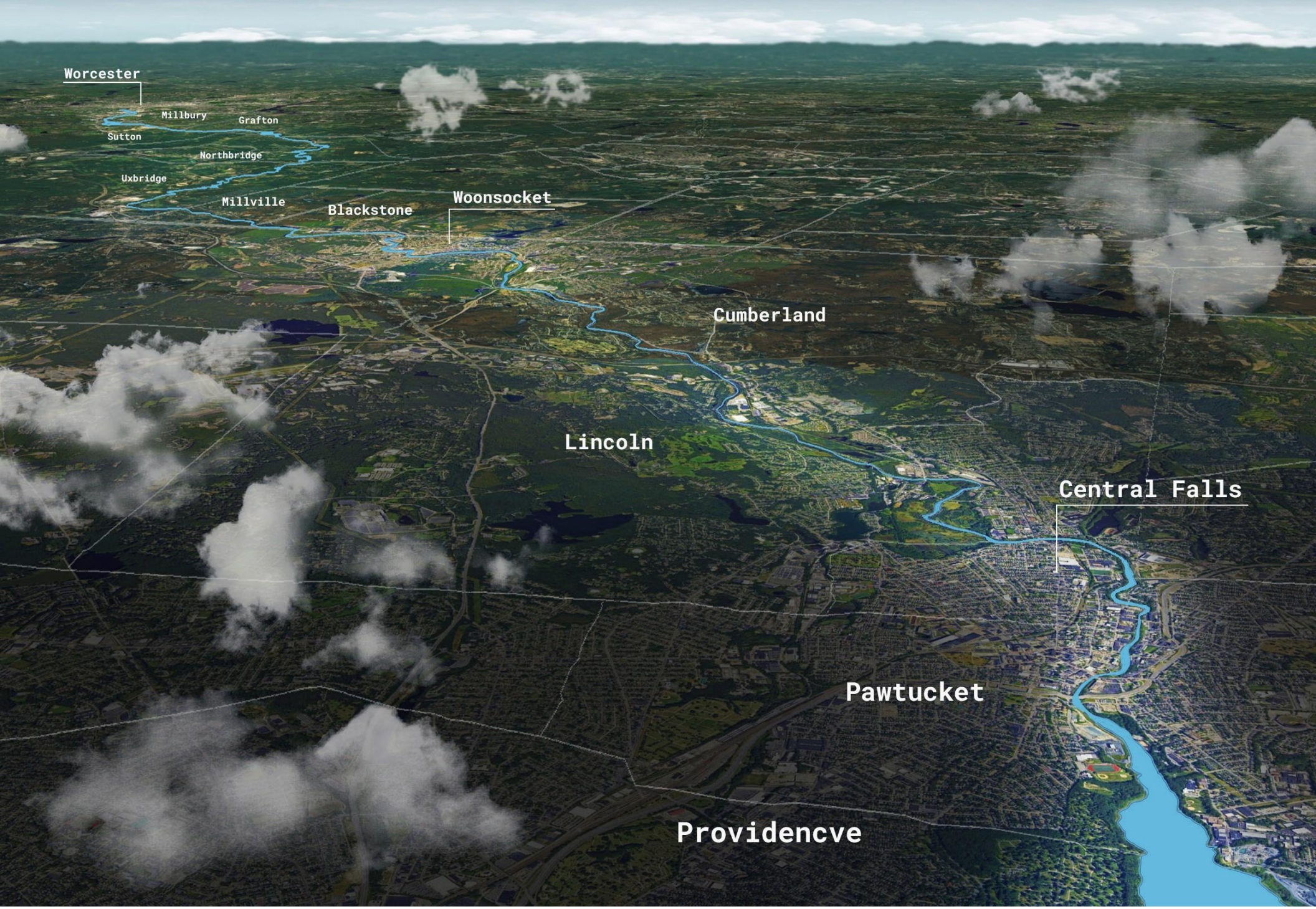
"AMERICA'S HARDEST WORKING RIVER"

- Blackstone River is 48 miles long and drops 438 feet along its length
- At one point there were 38 dams on the mainstem- almost a dam per mile!
- 21 dams remain on the mainstem and there are over 300 throughout the 475 square miles of the watershed
- 2nd largest source of freshwater to Narragansett Bay





“MOST POLLUTED RIVER IN THE UNITED STATES”



“HOME”

COMMONPLACE
Landscape and Planning

Improving Aquatic Connectivity through Culvert Assessments



- 3,000 culverts in the watershed
- 2023-2025: Assessed ~500 culverts & trained 64 people, including 7 trainers
- 20% of watershed is assessed
- Educational webpage: (blackstonecollaborative.org/culverts)
- Pending $ to replace 3 culverts

	Trained (L0)	Trained (L1)	Culverts Assessed
2023	13	1	111
2024	32	5	41
2025	11	1	285





October 2023 Dam Removal Conference



Home Brew Dam
Uxbridge

- permitted
- pending construction $ (MVP)



View of the Home Brew Dam from the right abutment. Note the debris accumulated behind the pipes immediately upstream of the auxiliary spillway and the collapsed left training wall of the auxiliary spillway.



Uxbridge receives grant funding for Whitin Pond, Home Brew dams

BY KIMBERLY PALMUCCI
TRIBUNE CORRESPONDENT

UXBRIDGE — The town has received grant funding to remove two dams.

According to State Rep. Michael Soter, Uxbridge received $185,450 in Action Grant funding from the Municipal Vulnerability Preparedness Program (MVP) for the purpose of "removing the Whitin Pond Dam and the Home Brew Dam."

"The MVP Action Grant program provides funding for municipalities that are seeking to make improvements in order to adapt and minimize vulnerability to climate change impacts," Soter released in a statement. "This program has provided funding for projects designed to address extreme weather, flooding, and rising temperatures."

In the case of the Home Brew Dam and the Whitin Pond Dam, the funding will be used to "conduct research and exploration into the proposal of removing the dams," Soter added.

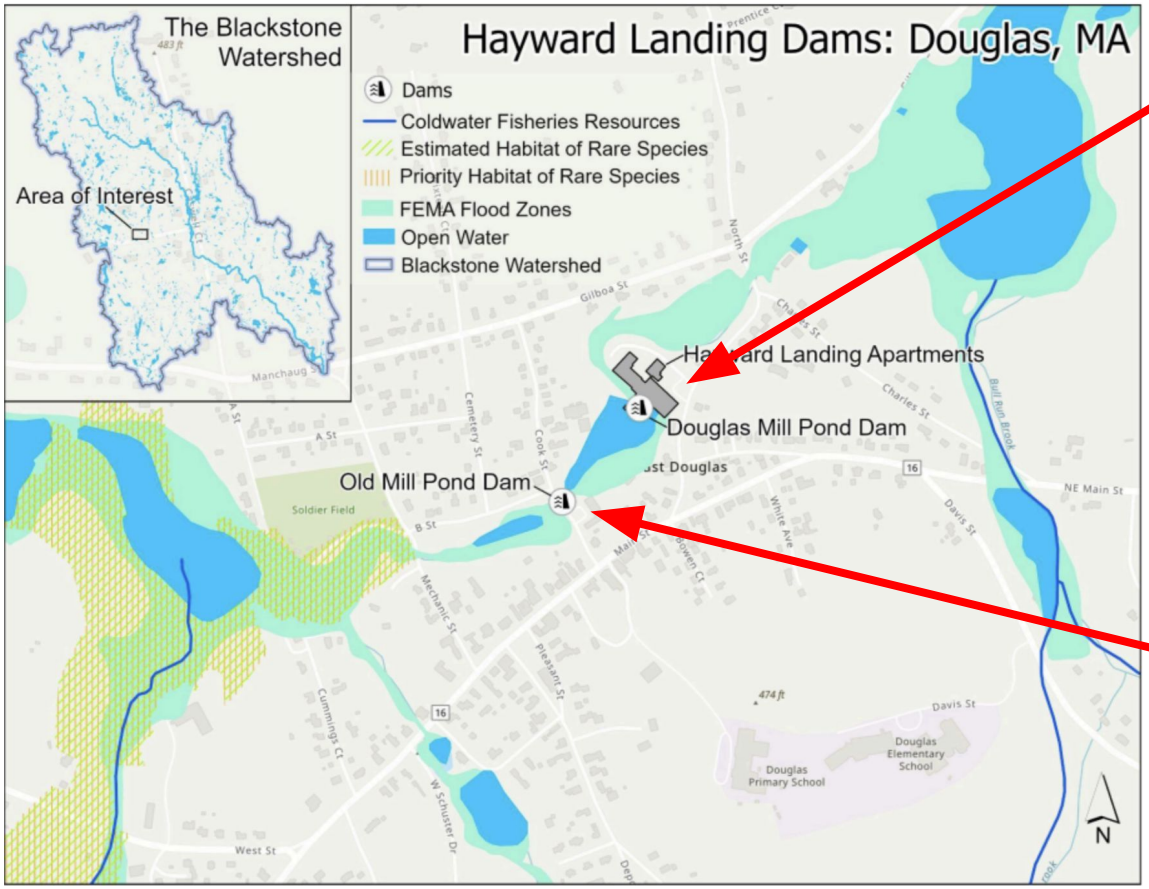
"The proposal for removing these dams indicated that doing so would benefit the town as it would minimize the risk of downstream damage and upstream flooding from a catastrophic weather event," he released.

The MVP grant program provides support for cities and towns in the Commonwealth to begin the process of "planning for climate change resiliency and implementing priority projects," according to the state's Executive Office of Energy and Environmental Affairs.

"The state awards communities with funding to complete vulnerability assessments and develop action-oriented resiliency plans," the office released. "Communities who complete the MVP program become certified as an MVP community and are eligible for MVP Action Grant funding and other opportunities."

Turn To UXBRIDGE page A11

Removing Douglas Mill Pond Dams on the Mumford River





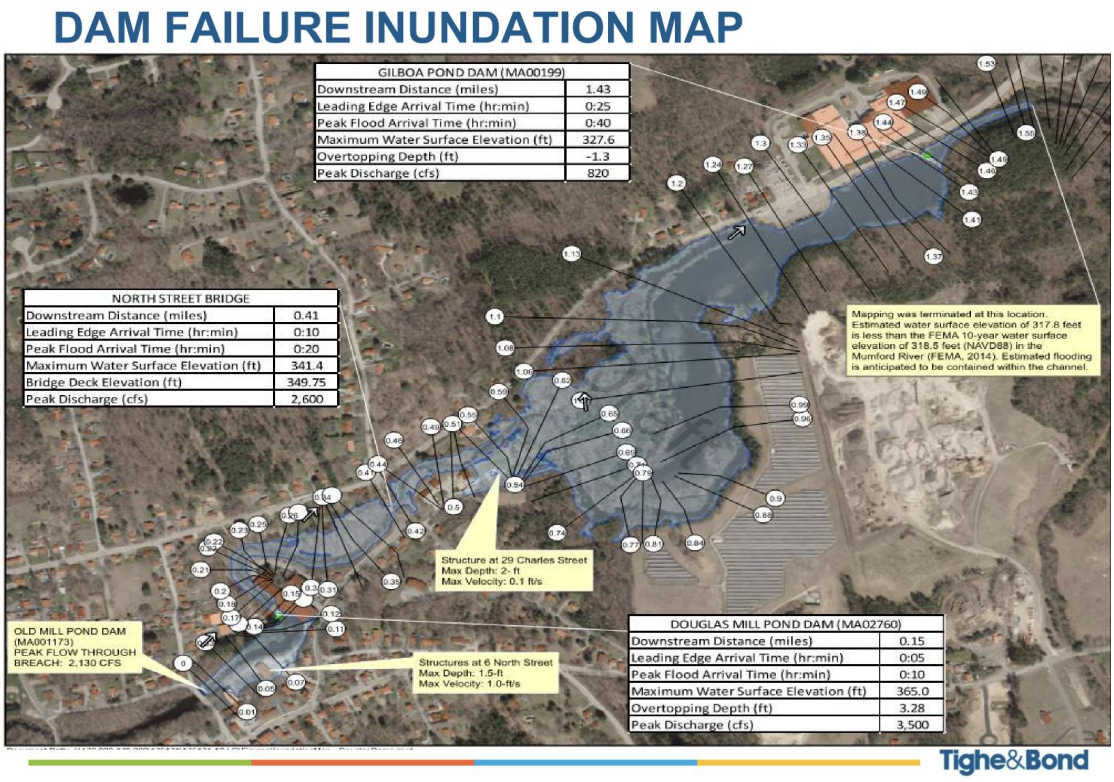
Significant Hazard & Poor Condition



Tighe&Bond

Douglas Mill Pond Dams: Benefits

- Opens 7.6 connected river miles
- Expands CFR habitat and water quality for Eastern Brook Trout & other species
- Reduces liability & ongoing maintenance costs
- Addresses local resilience & hazard mitigation goals
- Improves public safety



Douglas Mill Pond Dams: Status

NARRAGANSETT BAY ESTUARY PROGRAM

Funded (NBEP): QAPP, H&H, data collection & site assessment, 60% permit-ready design, local engagement & outreach

→ *through Jan 2027*

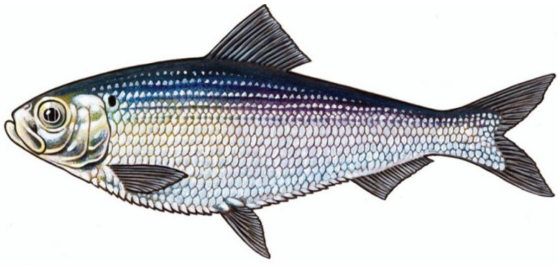




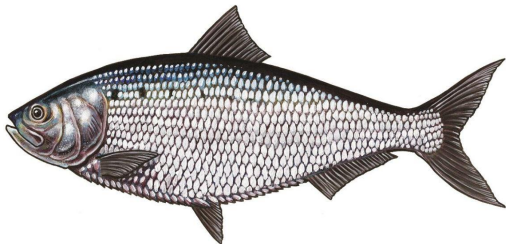
EXECUTIVE OFFICE of ENERGY & ENVIRONMENTAL AFFAIRS

Pending: 100% design and permitting (EEA Dam & Seawall)

Restoring Migratory Fish on the Great Tidal River: **Bringing our Relatives Home**



River Herring (Anadromous)
Alosa pseudoharengus / Alosa aestivalis



American Shad (Anadromous)
Alosa sapidissima



American Eel (Catadromous)
Anguilla rostrata

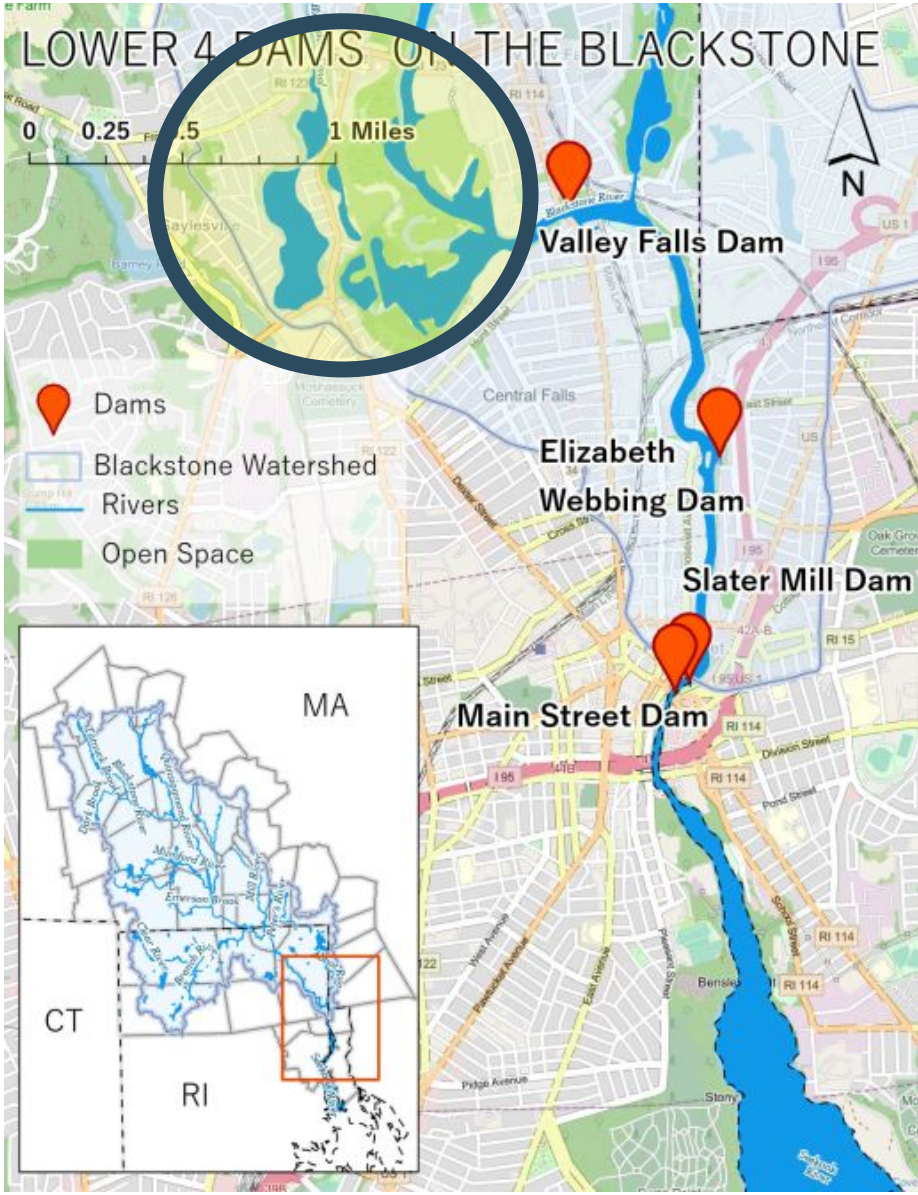






Phase 1: Lower Four to Lonsdale Marsh

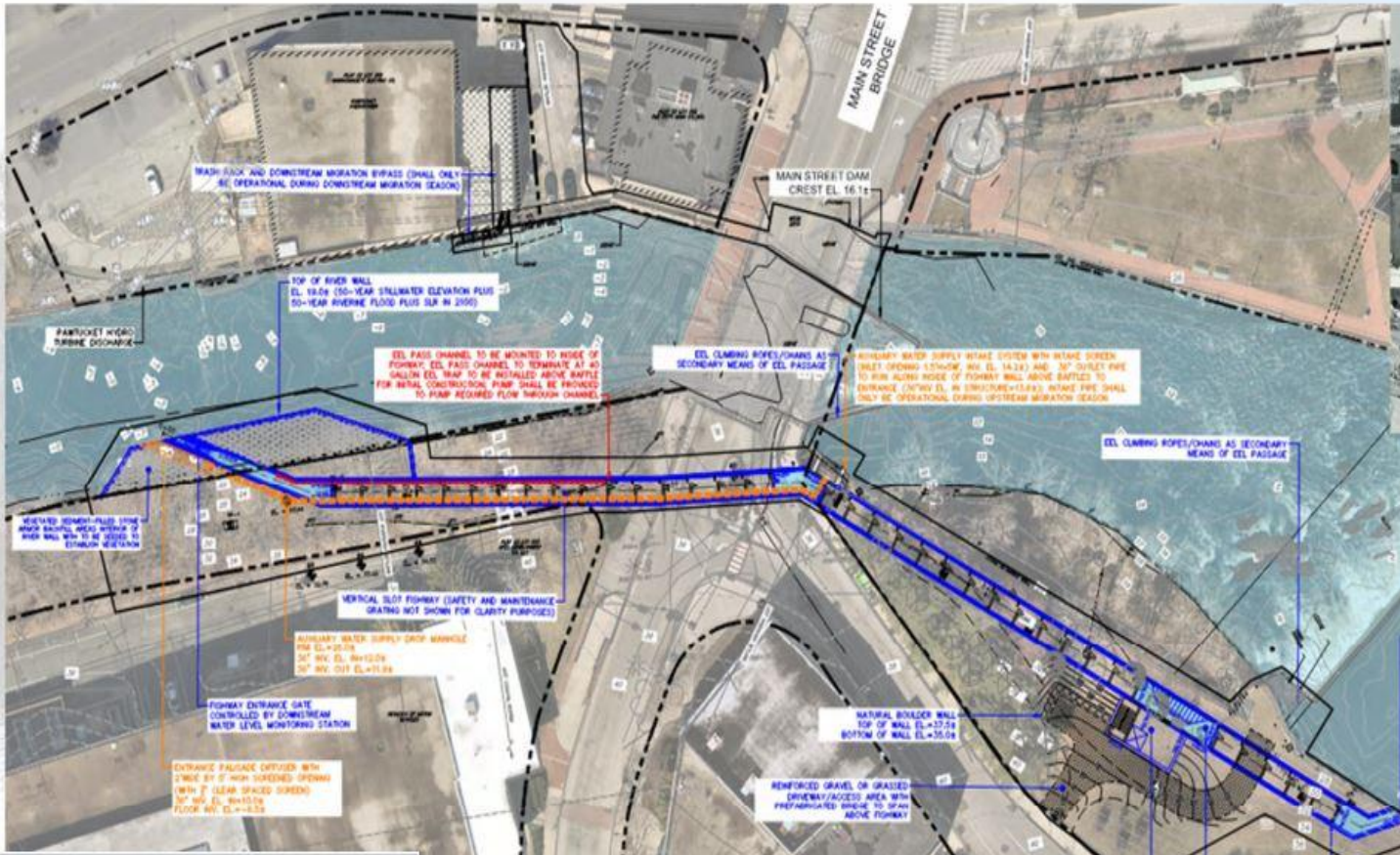


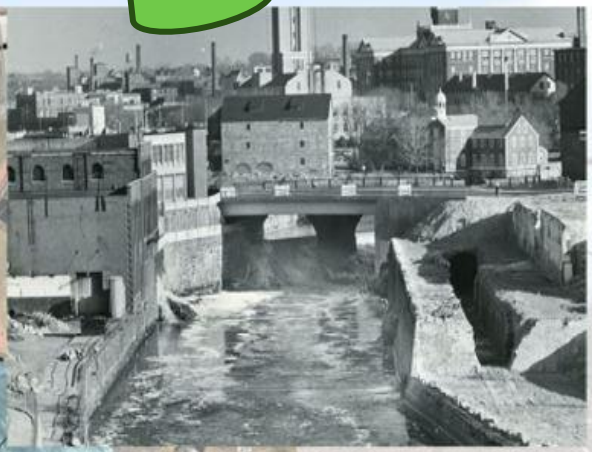


FUSS & O'NEILL

Inland Vertical Slot Fishway Layout

$19.5M







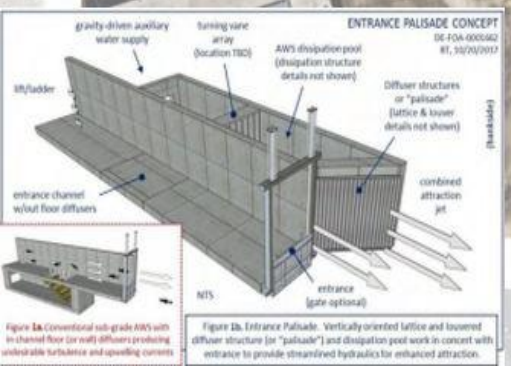


Figure 1a. Conventional sub-grade AWS with in-channel floor (or wall) diffusers producing undesirable turbulence and upwelling currents

Figure 1b. Entrance Palisade. Vertically oriented lattice and louvered diffuser structure (or "palisade") and dissipation pool work in concert with entrance to provide streamlined hydraulics for enhanced attraction.

Breached, passable

Pratt



Design TBD by Valley Falls Hydro, as required by FERC

Valley Falls



Exploration & further design

Elizabeth Webbing



Final design, permitting, & construction

Main St & Slater Mill



Direct benefits

.82 miles of river opened

around 2 dams

13 acres spawning habitat

12,740 River Herring

624 American Shad

Leveraged benefits

4.8 miles of river opened

around 5 dams

206 acres spawning habitat

202,000 River Herring

9,900 American Shad

Community Advisory Committee

- **Improve transparency** and engagement on complex, 30+ year initiative
- **Offer decision support** on 4 submitted NOAA grant applications
- **Highlight indigenous voices** and priorities through fun public events
- **Engage public** through outreach materials, charettes, etc.
- **Facilitated funding** for new connectivity specialist

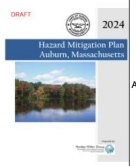
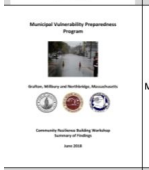


Identifying existing and current priorities

- **Reviewing riverine communities' plans:** resilience, open space, hazard mitigation, and comprehensive
- **Reviewing historic & current** regional goals & plans
- **Meeting** with local officials

Blackstone Research

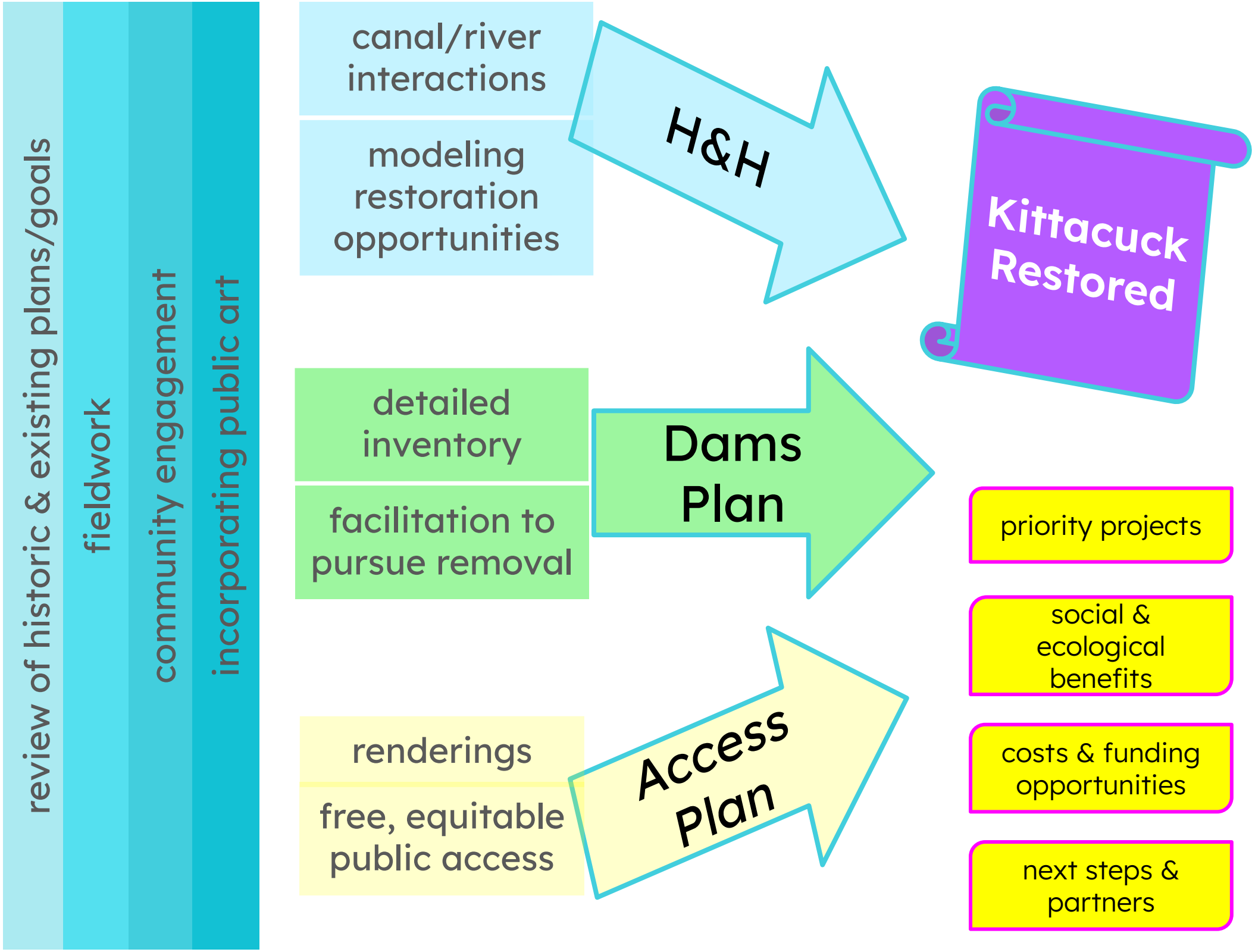
Municipal Recommendations

Document Image	Location	Document Type	Year	Document Title	Description	Recommendation	Category	Priority	Status	Summary	Core Staff	Hyperlink
	Auburn, MA	Open ...	2021	Openspace and Recreation Plan of Auburn, MA	7 year development plan relating to open space and recreational needs of Auburn, MA	reduce amount of water allowed to discharge, protect land in town's watershed	River Managem...	High		Auburn's priorities include 1. protecting and acquiring habitat with a focus on water quality, invasive species management, 2. removal of the Lower Stoneville Pond Dam, and 3. Debris management for riverine flooding	Steven Chambers, Vice Chair Nathan Rand Scott Wrenn Mark Binnall ~~Steve Inferrera~~ Inspectional Services Joe Fahey – Director, School Facilities Ed Kazanovicz – Town Manager Dr. Adam Menard - Town Planner Caleb Moody – Building Commissioner Greg Morin - Captain/Fire Inspector Fire Dept. Eric Otterson – Director, Emergency Management Joanna Paquin – Director DPW/Town Engineer Nick Schwartz – ~~Assistant~~ Town Manager, *Shannon Regan Economic Development, *Stephen Coleman Auburn Fire Chief, *Todd Lemon Auburn Police	https://www.auburnma.gov/DocumentCenter/View/11089/Open-Space-and-Recreation-Plan-Auburn-Massachusetts-2021-PDF
						Protect surface water bodies that have the potential to provide recreation opportunities such as summer swim programs, non-motorized boating, etc.	Public Access	High				
						Protect and Acquire Openspace, increase ecological habitat	Ecological Rest...	High				
	Auburn, MA	Hazard...	2024	Auburn Hazard Mitigation Plan	The goal is to preserve the quality of life, property values, natural, historic, and cultural resources of the community by mitigating existing and future natural hazards impacting the Town to foster a sustainable, resilient future for Auburn.	Maintain Aquatic Weeds program, monitor situation at Leesville and Pondville Ponds. (2018) (p.3)	Ecological Rest...	High				https://www.auburnma.gov/DocumentCenter/View/14542/Auburn-MA-Hazard-Mitigation-Plan-2024-Draft-PDF
						Develop a Debris Management Plan to reduce debris and mitigate stormwater and riverine flooding (2018)	Ecological Rest...	High				
						Develop long range plan for upsizing culverts and other drainage infrastructure for climate change impacts. Continue to monitor the need to upgrade the Town's culverts and stormwater infrastructure as needed. (2018)	River Managem...	High				
						Replace the Sword Street culverts. (2024)	River Managem...	High				
						Install stormwater retrofits at critical areas. (2024)	River Managem...	High				
						Ensure the completion of recommended improvements identified in the most recent Phase 1 Inspection Reports for the following dams: Auburn Pond Dam, Eddy Pond Dam, Dark Brook Reservoir Dam/Dike A/B, Lower Stoneville Pond Dam, and Upper Stoneville Reservoir Dam, ; Mill Pond Dam. (2024)	Dam Removal	High				
						Update the Emergency Action Plan for the following dams: Dark Brook Reservoir Dam and Dike A/B, Lower Stoneville Pond Dam, and Upper Stoneville Reservoir Dam, Mill Pond Dam. (2024)	Dam Removal	High				
						*The Town will coordinate with the Auburn Water District to conduct a full dam removal feasibility study for the Lower Stoneville Pond Dam. (2024)	Dam Removal	High				
						Permanently protect additional land area in the Town's watersheds to protect surface/groundwater 2) Protect potable drinking water to/from current/future growth. (2024)	Ecological Rest...	High				
						Protect forests, wetlands, fields, and ponds from the harmful impacts of invasive species. (2024)	Ecological Rest...	High				
	Auburn, MA	MVP	2019	Community Resilience Building Workshop Summary of Findings	and climate-related hazards of concern, Identify existing and future strengths and vulnerabilities, Develop prioritized actions for the community, Identify immediate opportunities to collaboratively advance actions to increase	Replace the Sword St. Culverts	River Managem...	High				https://www.auburnma.gov/DocumentCenter/View/2586/Municipal-Vulnerability-Preparedness-Summary-of-Findings-04-23-2019-large-file-PDF
						Review water quality bylaws and revise. Create overlay of water bodies and catchment areas. Address salt use in the Illicit Discharge Detection and Elimination Plan.	River Managem...	High				
						Update zoning bylaws to encourage low impact development and green infrastructure based on maps and delineation. Develop rules and regs for existing bylaws including regulations to implement existing stormwater bylaw.	River Managem...	High				
						Hire an engineer to focus on stormwater regulations, enforcement, NPDES permits and coordination with MassDOT to improve drainage on State roads and highways.	River Managem...	High				
	Millbury MA	MVP	2018	Municipal Vulnerability Preparedness Program : Grafton, Millbury and Northbridge, Massachusetts Program	This document includes a Community MVP Workshop Summary, Top Hazards and Vulnerable Areas, Current Concerns Challenges Pres by Hazards, Spe Categories of Concerns and Challenges, Cu Strengths and Top Recomme to Improve Re	Brierly Pond Dam, an earthen dam, ownership is in question. Conduct study to determine ownership. Repair/replace dam, the integrity of the dam is compromised. Coordinate communication with Worcester Diversion Tunnel personnel. (53)	Dam Removal	High			Laurie Connors, David Marciello, Steven M. Kosiba, Donald Desorcy, Richard Hamilton	https://www.mass.gov/doc/2017-2018-mvp-planning-grant-report-northbridge-grafton-millbury/download
						New drainage needed at McCracken road and Auburn Road, none currently present.	River Managem...	High				
						...ds and drainage infrastructure for climate change	River Managem...	High				
							...ical Rest...	Medium				
							...ical Rest...	Medium				
					This plan ider natural hazar		...Managem...	High			Steven Kosiba Emergency Management	

“Kittacuck Restored”: $1M award



hydrology → dams → access


review of historic & existing plans/goals
fieldwork
community engagement
incorporating public art
canal/river interactions
modeling restoration opportunities
H&H
Kittacuck Restored
detailed inventory
facilitation to pursue removal
Dams Plan
priority projects
social & ecological benefits
costs & funding opportunities
next steps & partners
renderings
free, equitable public access
Access Plan



Blackstone Watershed Collaborative

Stefanie Covino
Executive Director
Blackstone Watershed Collaborative
stefanie@blackstonecollaborative.org

COMMONPLACE
Landscape and Planning

Emily Vogler
Principal + Associate Professor
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evogler@risd.edu