

Diadromous Fish Updates - 2023



Brad Chase, Mass. Div. of Marine Fisheries,
Orleans Town Hall, November 1, 2023
River Herring Network



Diadromous Fish Monitoring and Restoration Updates

- **River Herring Counting**
- **DMF Fishway Crew** – Stocking and Fishway jobs
- **Large Watershed Restoration Projects**
- **Taunton River Shad Stocking and Monitoring**



Diadromous Fish Management Activities

Stream Maintenance Policy – New DMF / DEP policy for stream work and small fishways

GIS Datalayer – Completed GIS datalayer that integrates fish passage survey and DMF Diadromous Restoration Priority List

Fish Passage Survey - Updating coast-wide survey last done in 2000-2002

ASMFC Stock Assessment – Eel completed and river herring underway

River Herring SFMP – Updated MA plan for ASMFC in 2022



Fore River, Braintree



Monument River, Bourne

River Herring Stocking

- Bourne Pond, Falmouth
- Tom Matthews Pond, Yarmouth
- Little Sandy Pond, Yarmouth
- Mill Pond, Barnstable
- Island Creek Pond, Duxbury



Stream Channel Maintenance

- Increasing problem of low-flow plant encroachment in addition to natural debris jams
- DMF prepared guidelines in 2016
- MassDEP/DMF policy in 2022 (BWR/WP 22-1) to guide actions under Wetlands Protection Act
- 13 Town maintenance plans have been approved
- <https://www.mass.gov/service-details/diadromous-fisheries-project>



Native and Invasive Plant Encroachment



Swamp Loosestrife
Herring River, Harwich



Water Willow
Weir River, Hingham



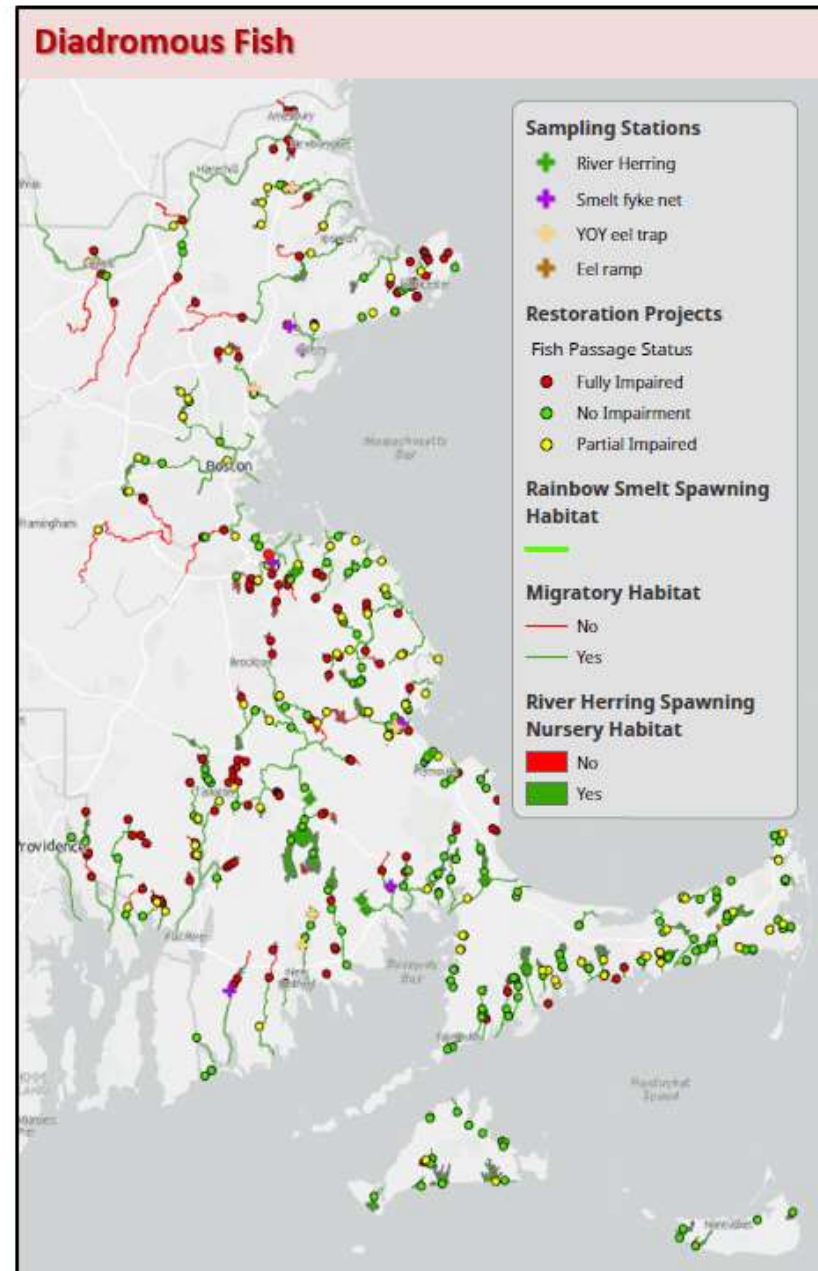
Phragmites
Island Creek, Duxbury

Diadromous Fish GIS Data Layer

- Data on 490 fish passage locations in coastal Massachusetts
- Each *Restoration Project* has species presence, passage status, and restoration priority ranking
- Includes Time-of-Year recommendations for river reaches based on species presence
- Location data on river herring, eel and smelt sampling stations

Published by MassGIS, January 2023

[MassGIS Data: Diadromous Fish | Mass.gov](https://www.mass.gov/info-details/massgis-data-diadromous-fish)



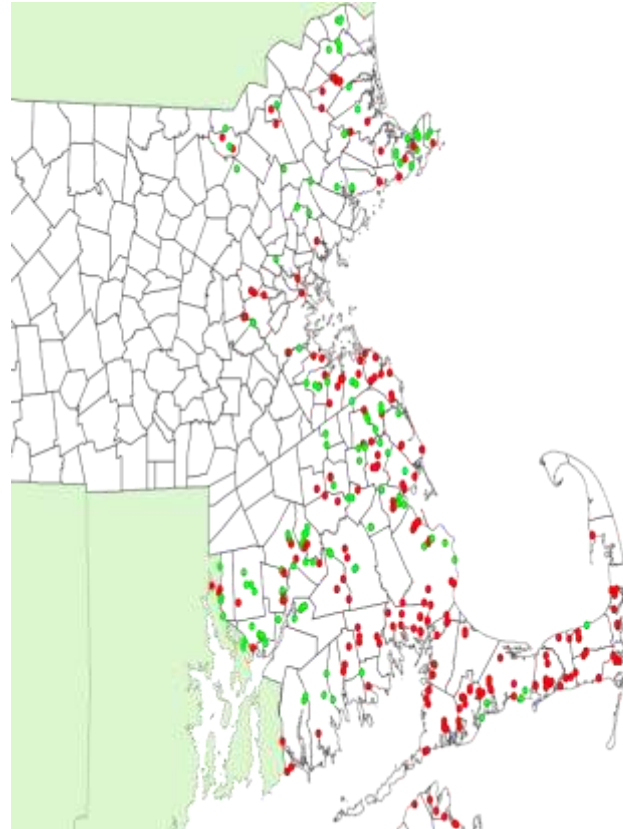
Diadromous Fish
Passage Survey



DMF Diadromous
Fish GIS Datalayer



DMF Diadromous Fish
Restoration Priority List



GIS Data layer integrates fish passage site data from DMF survey and Restoration Priority List. The 1st priority list was prepared in 2005 directly from the 2000-2001 survey.

Diadromous Fish Monitoring

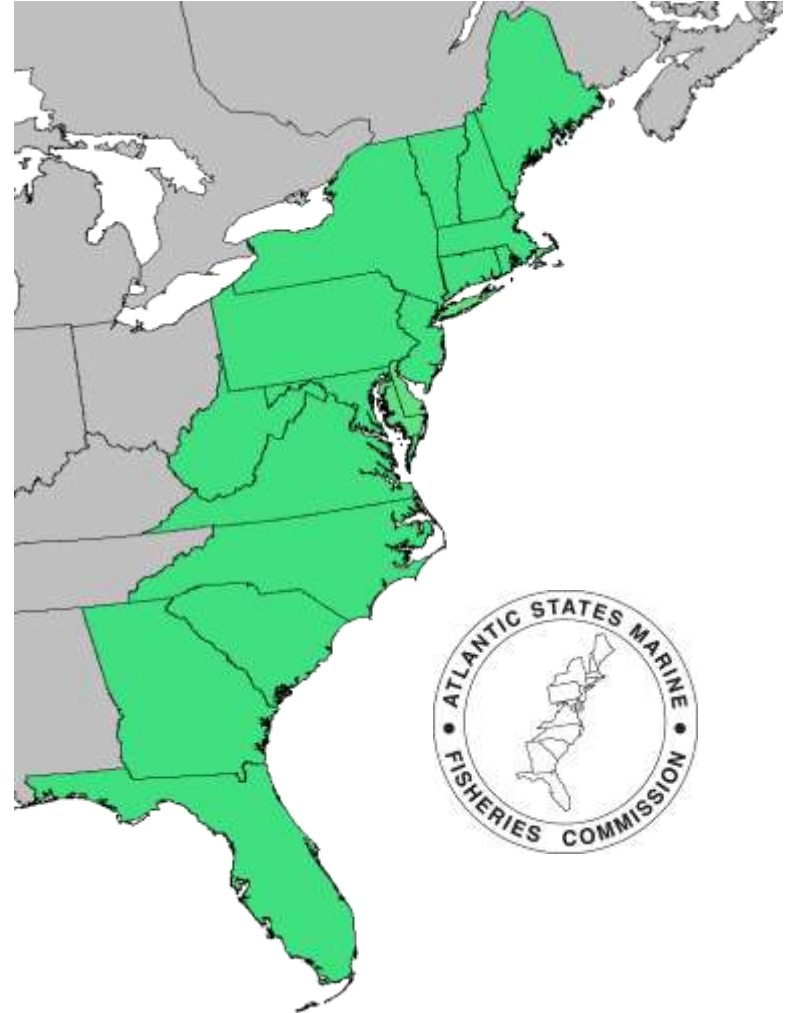
1. **River herring** - counting and biological sampling
2. **American shad** - tagging, lift counts, electrofishing
3. **Rainbow smelt** - fyke net stations
4. **American eel** - trap and ramp stations

Atlantic States Marine Fisheries Commission

- Interstate Coast-Wide management of migratory species
- **Sustainable Fishery Management Plans** for diadromous fish

River Herring – Stock assessment update in 2017 and new benchmark due in 2024

American Eel – Benchmark stock assessment issued in 2023. Stock remains depleted with need to reduce yellow eel harvest



Spring 2023 – Large Run of Glass Eels

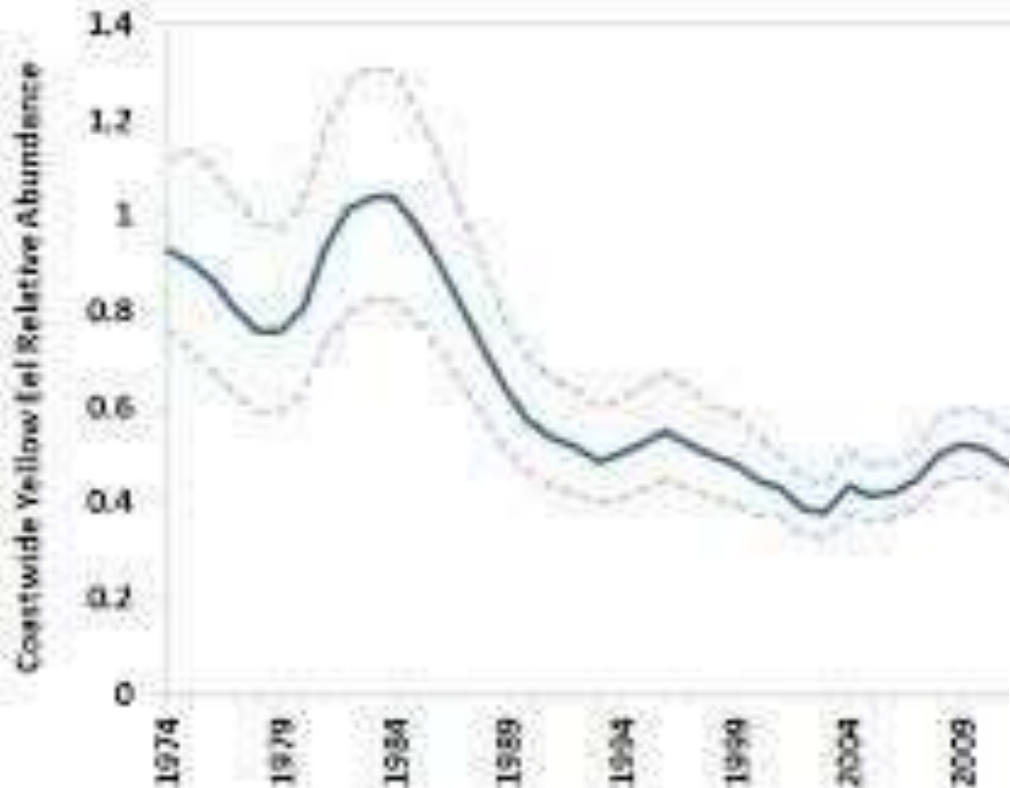
- Large numbers of glass eels seen in 2022 repeated this year in some rivers
- Some monitored MA runs were well above average



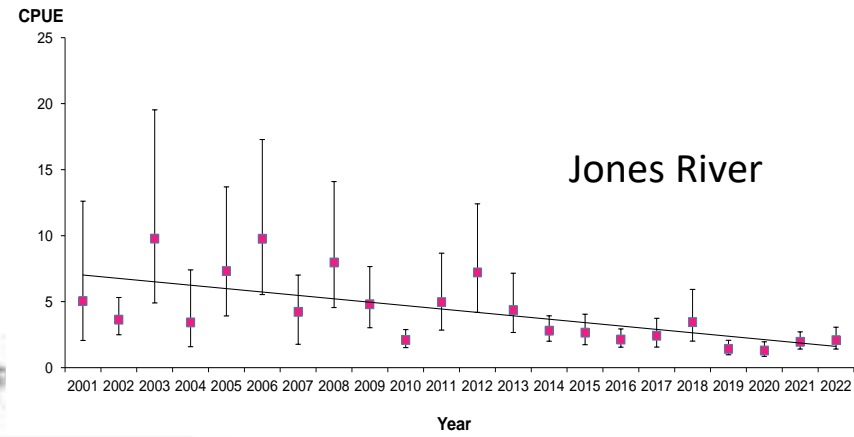
ASMFC Eel Stock Assessment - 2023

Coastwide Yellow Eel Relative Abundance Index

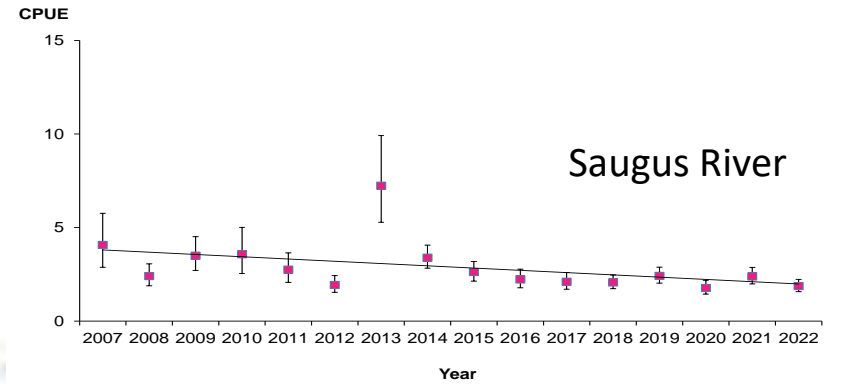
Source: ASMFC American Eel Benchmark Stock Assessment Report



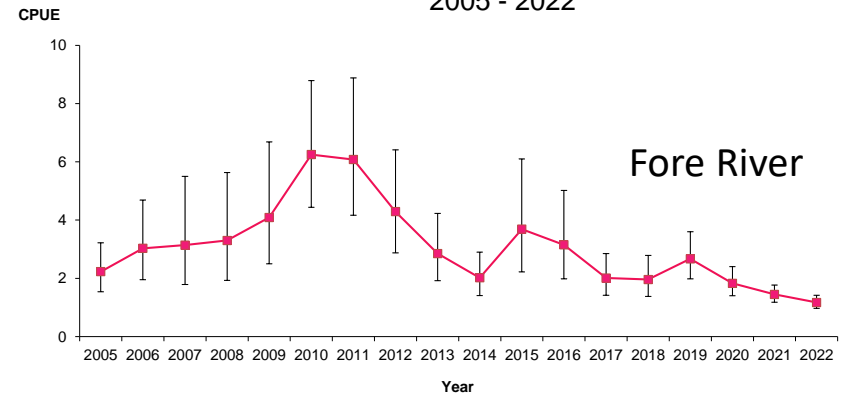
Jones River Sheldon Trap Young-of-Year Index 2001-2022



Saugus River Eel Ramp Elver Index 2007 - 2022



Fore River Smelt Fyke Net, Yellow Eel Bycatch Index 2005 - 2022



River Herring Counting Locations



- 45 rivers with river herring counting
- 14 with 'census' level quality
- 8 stations sample biological data

Massachusetts River Herring Count Summary - 2023

Stream	Drainage	Method	Count
CT	CT	Lift	2,173
Merrimack	Merrimack	Video	6,129
Shawsheen	Merrimack	Visual	2,585
Concord	Merrimack	Visual	0
Parker	North Coast	Video	88,334*
Little	North Coast	Visual	99
Ipswich	North Coast	Visual	733
Essex	North Coast	Counter	33,562
Mystic	Boston HBR	Visual	469,922
Horn Pond (Aberjona R.)	Boston HBR	Visual	12,059
Back	Boston HBR	Counter	254,111
Charles	Boston HBR	Visual	43,587
Monument	South Coast	Counter	181,041
Jones	South Coast	Visual	79
Town Brook	South Coast	Visual	235,291*
Herring Brook (Pembroke)	South Coast	Visual	190,177*
Beaver Dam Brook	South Coast	Visual	2,390
Furnace	South Coast	Visual	24
Mill Creek	Cape Cod N	Visual	532
Herring R (Wellfleet)	Cape Cod N	Visual	65,529*
Herring R (Eastham)	Cape Cod N	Visual	3,476
Herring B (Eastham)	Cape Cod N	Visual	1,769
Stony	Cape Cod N	Visual	132,389
Boat Cove Creek	Cape Cod N	Visual	0
Marstons Mills (Mill)	Cape Cod S	Visual	92,723*
Marstons Mills (Middle)	Cape Cod S	Visual	55,926*
Herring R (Harwich, West)	Cape Cod S	Counter	527,000(P)
Herring R (Harwich, Hinkleys)	Cape Cod S	Visual	161,962
Mashpee	Cape Cod S	Visual	75,348
Coonamessett	Cape Cod S	Visual	3,032
Centerville	Cape Cod S	Visual	7,100
Santuit	Cape Cod S	Visual	44,757
Quashnet	Cape Cod S	Visual	4,377
Red Lily Pond	Cape Cod S	Visual	22
Pilgrim Lake	Cape Cod S	Visual	15,348
Trunk	Cape Cod S	Visual	40,250
Herring Creek	Cape Cod S	Video	20,908
Nemasket	Taunton	Visual	137,304
Town River	Taunton	Counter	6,155
Mattapoissett	Buzzards Bay	Counter	4,050
Agawam	Buzzards Bay	Counter	68,716
Wankinco	Buzzards Bay	Counter	4,050
Acushnet	Buzzards Bay	Counter	713
Sippican	Buzzards Bay	Counter	53
Cedar Lake	Buzzards Bay	Counter	428

Total streams counted = 45

Total streams (drainage area):

CT = 1 *Cape Cod (North) = 6*
Merrimack = 3 *Cape Cod (South) = 11*
North Coast = 4 *Buzzards Bay = 6*
Boston Harbor = 4 *Taunton = 2*
South Coast = 6

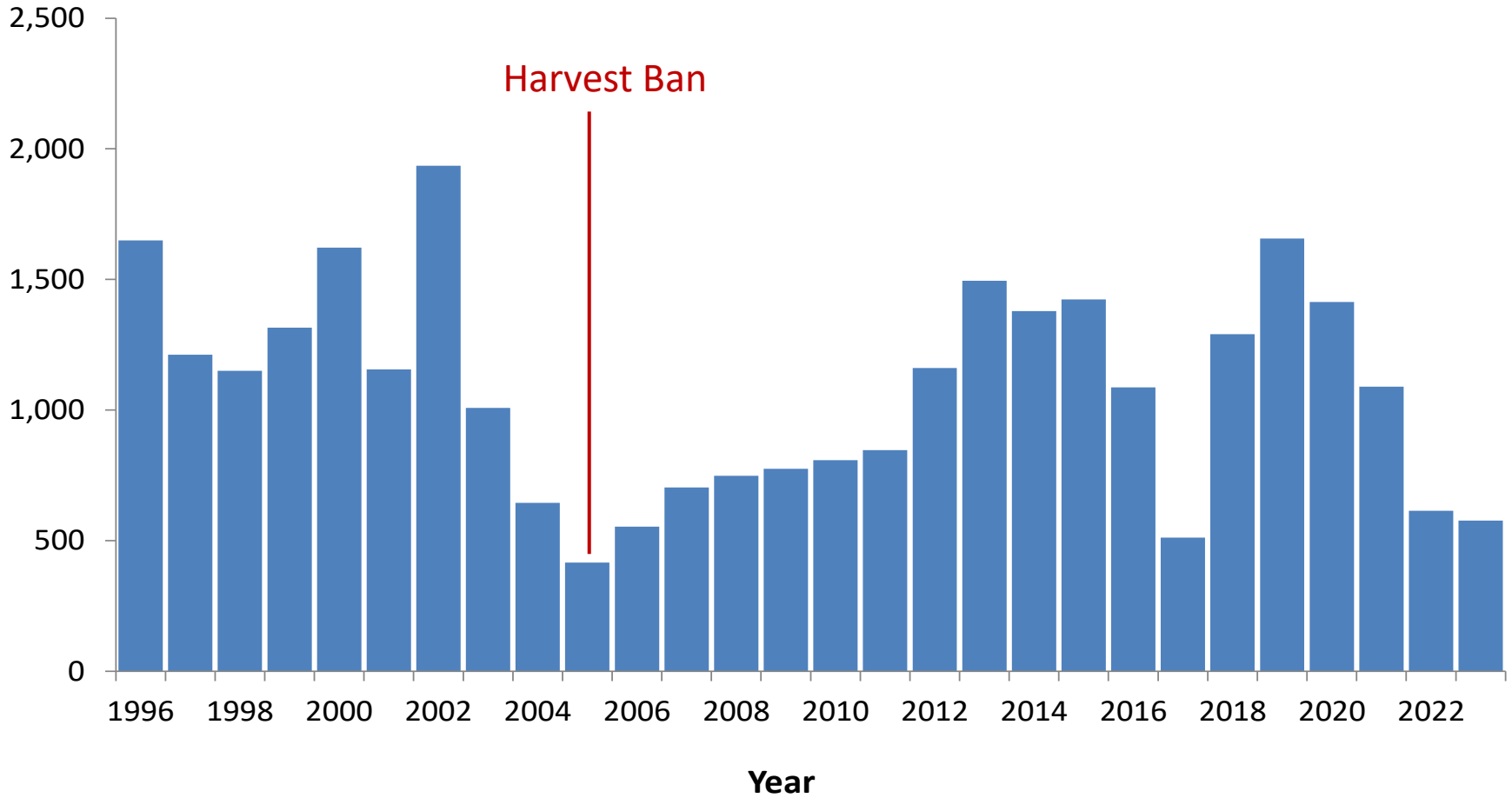
Counts omitted (insufficient data) = 3

*Time-series highs:

*Parker River, Town Brook, Herring Brook,
Pembroke, Herring River, Wellfleet, and
Marstons Mills*

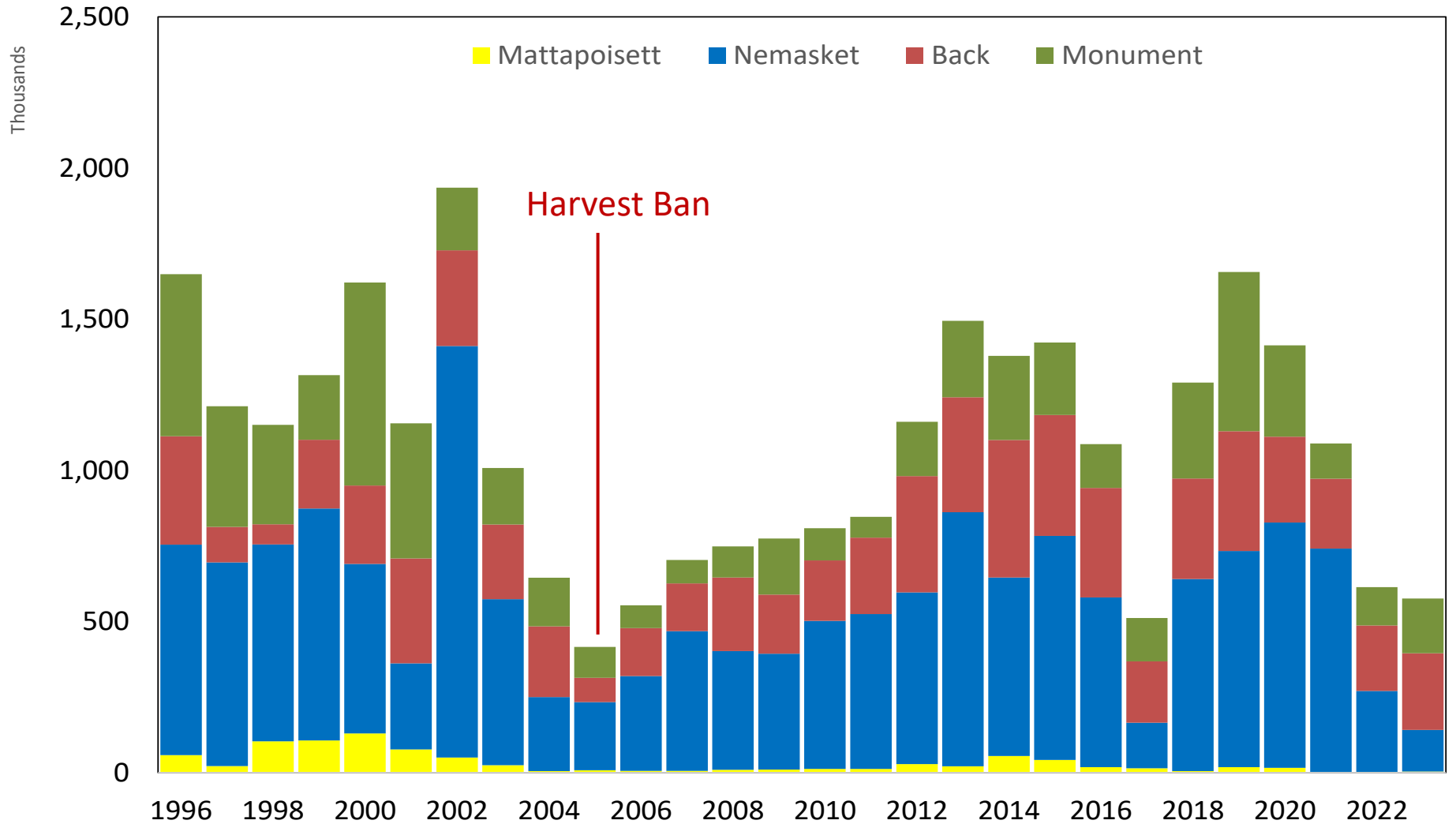
Massachusetts River Herring 20-Year Count Index 1996 - 2023

Counts (1,000s)

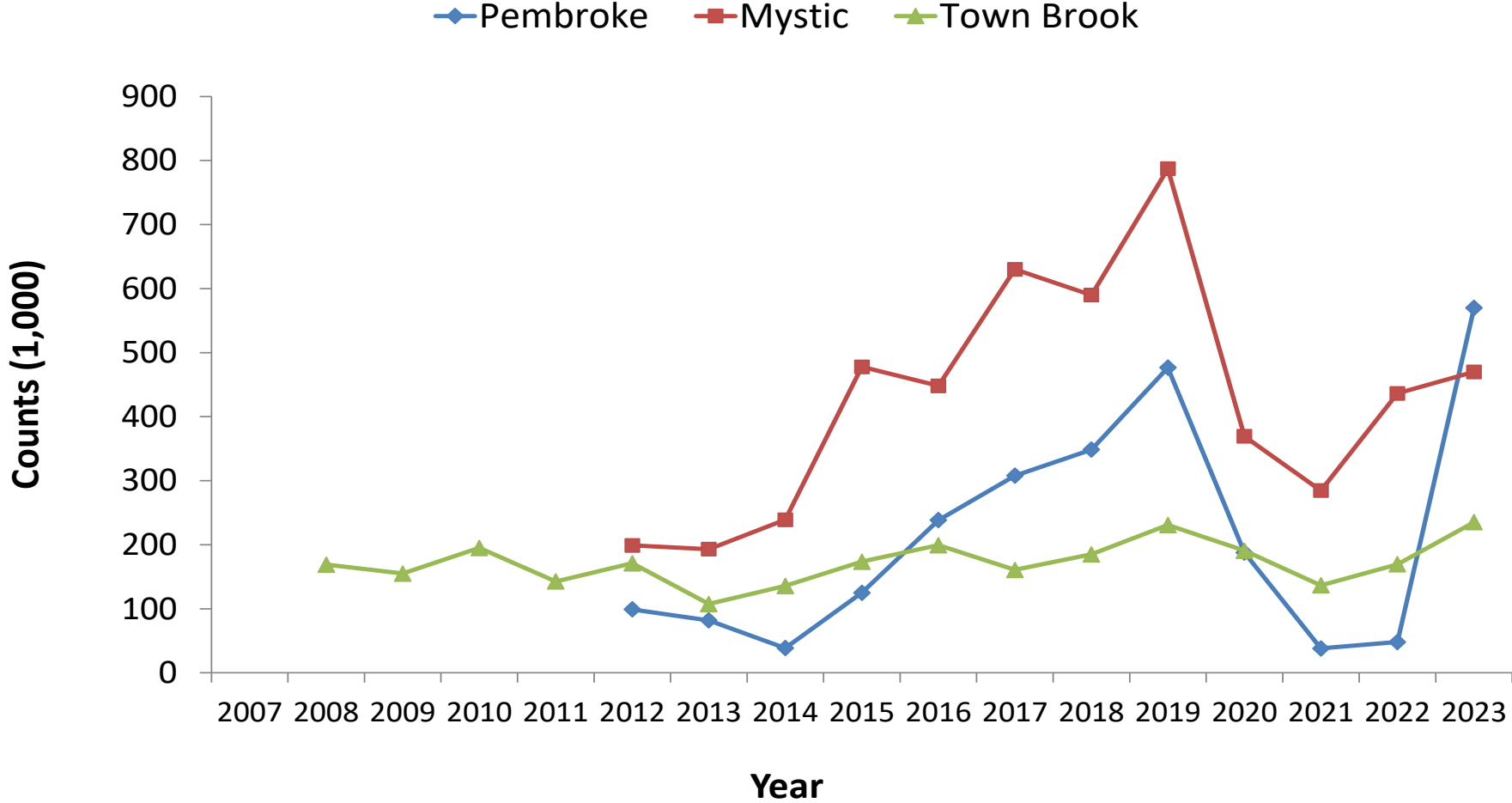


Nemasket River, Mattapoissett River, Monument River and Back River

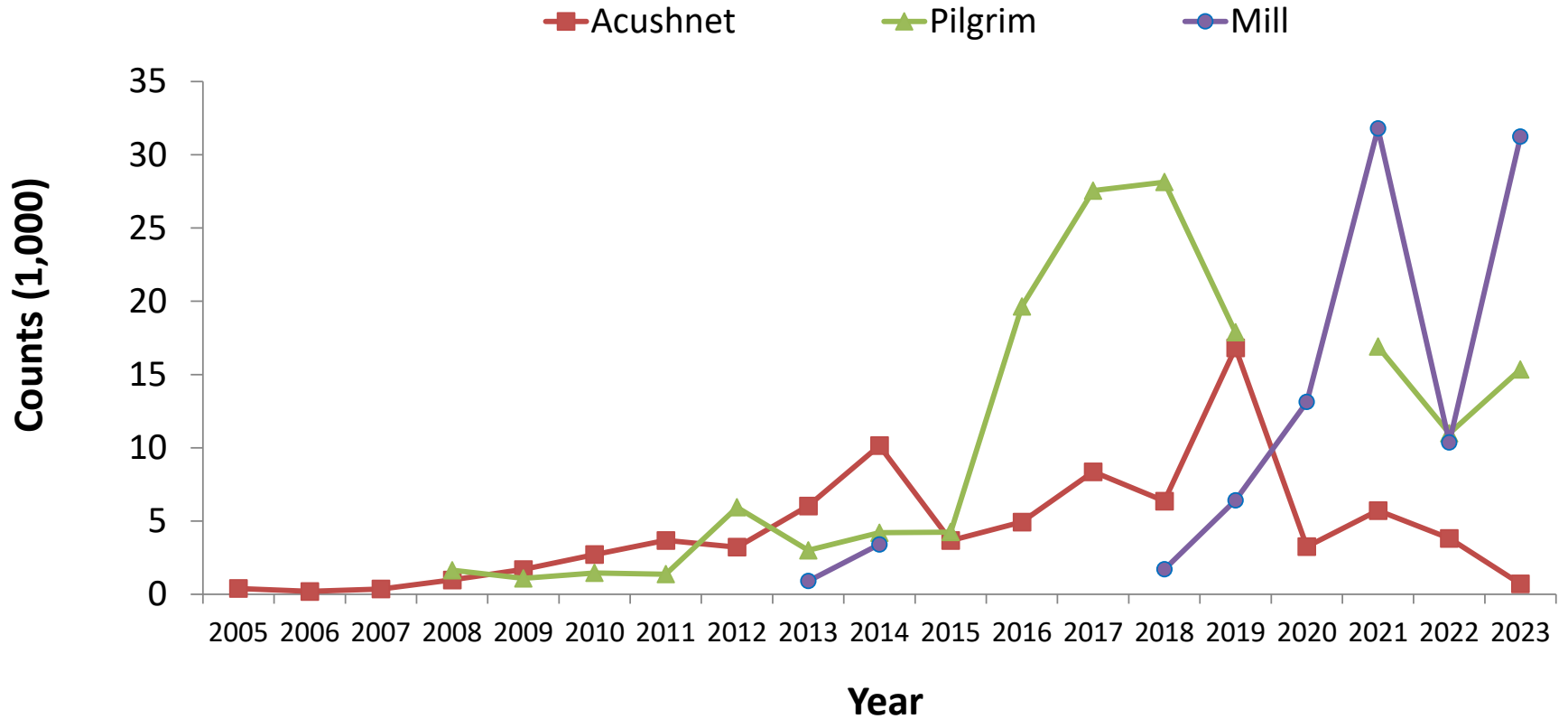
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Restoration Response: Large River Herring Runs

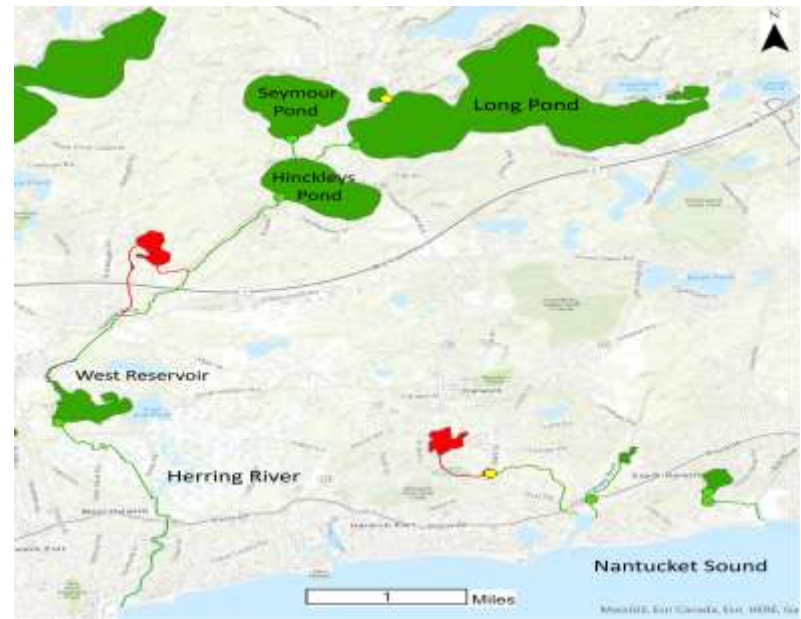
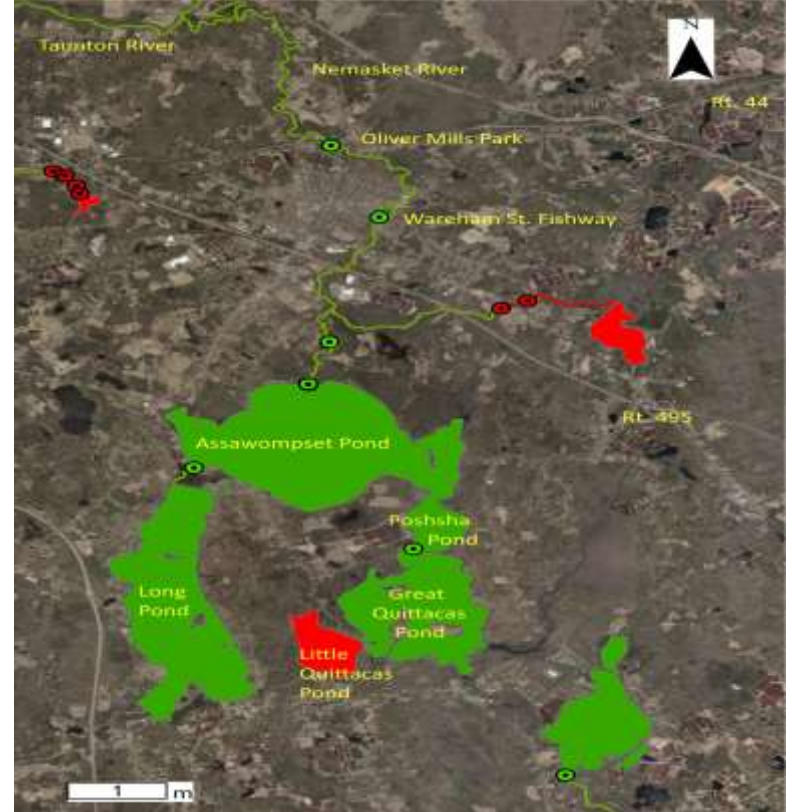


Restoration Response: Small River Herring Runs

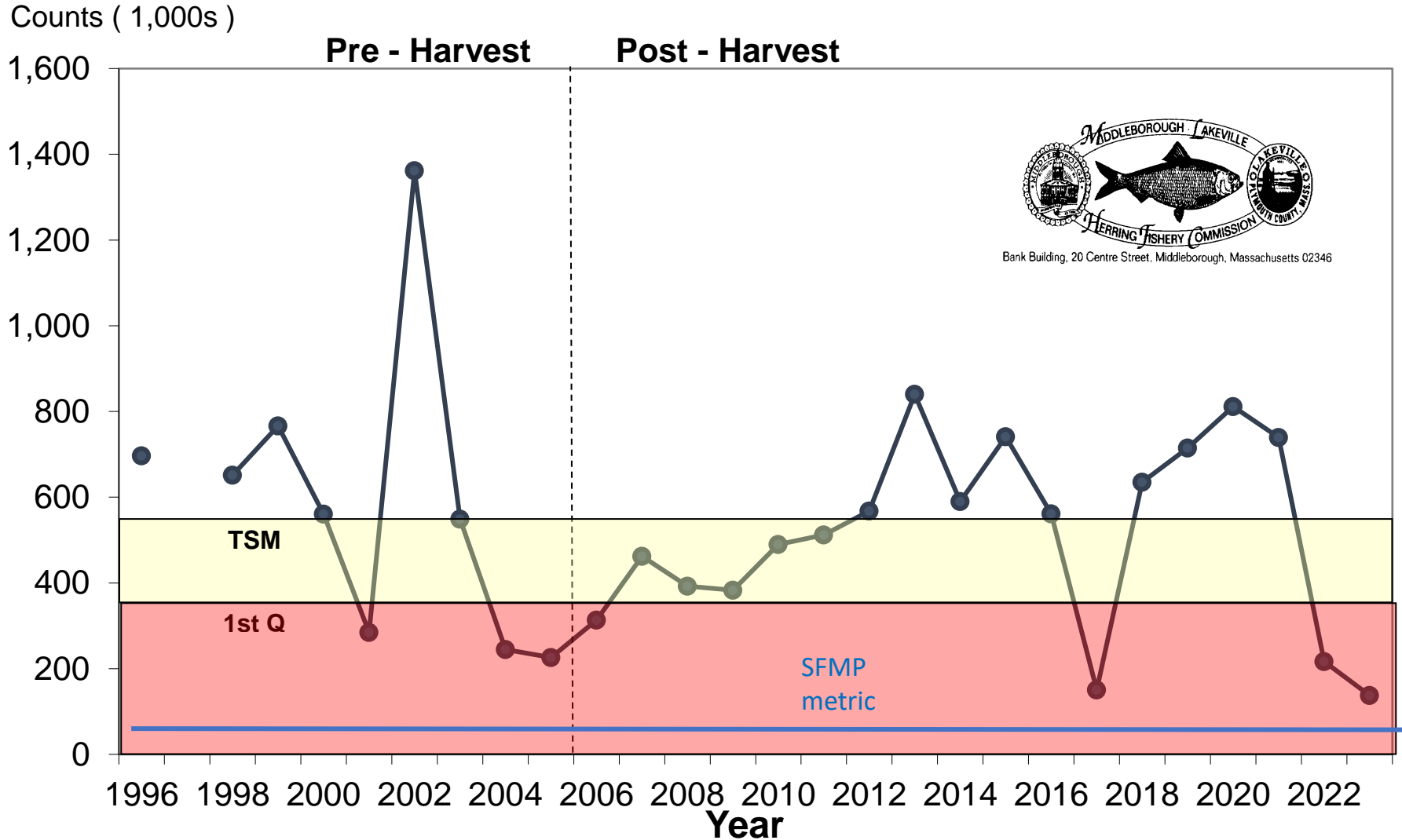


River Herring Harvest ASMFC Sustainable Fishery Mgt Plans

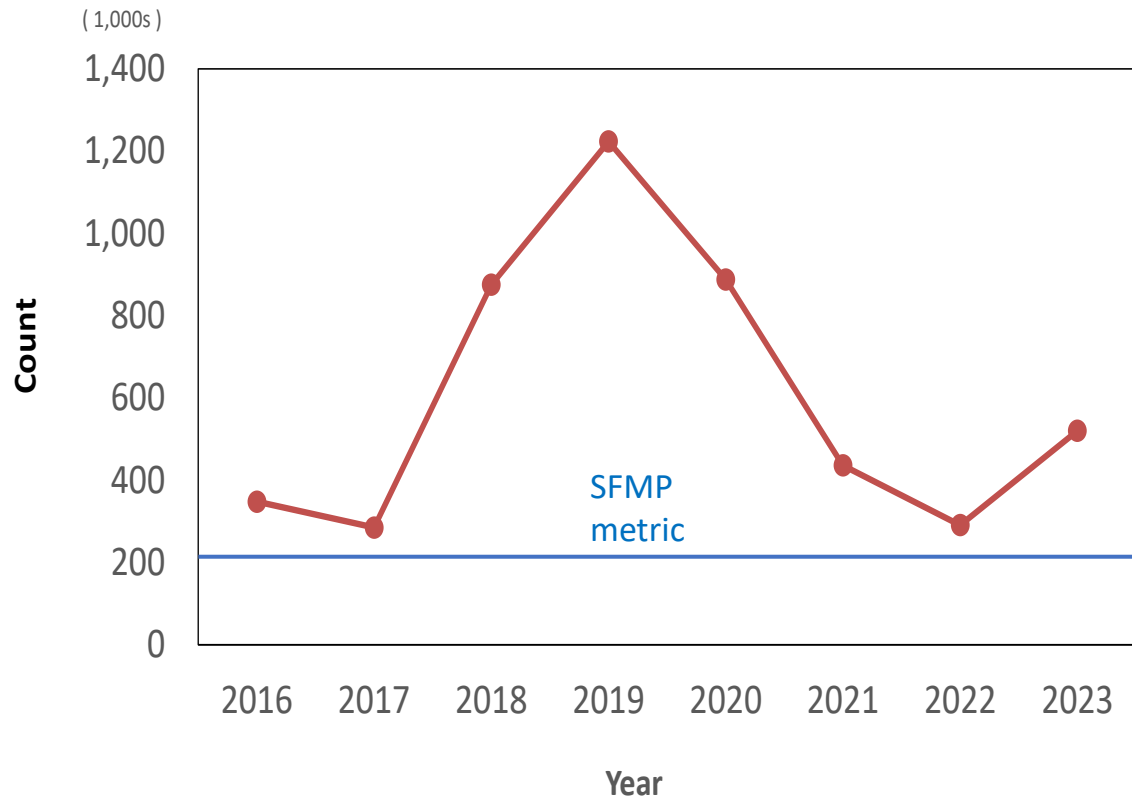
- Four Towns have requested DMF for harvest plans in the last 6 years
- Nemasket River plan renewed in 2022
- Herring River, Harwich, approved in 2022



Nemasket River - Visual Count 1996 - 2023



Herring River, Harwich Electronic Count 2016 - 2023



Pilgrim Lake Orleans

- Herring Brook Road fishway – 2010
- Gravity supply eel ramp – 2011
- Repair 120 ft of fish ladder – 2014/2015
- Pilgrim Lake outlet fishway - 2018

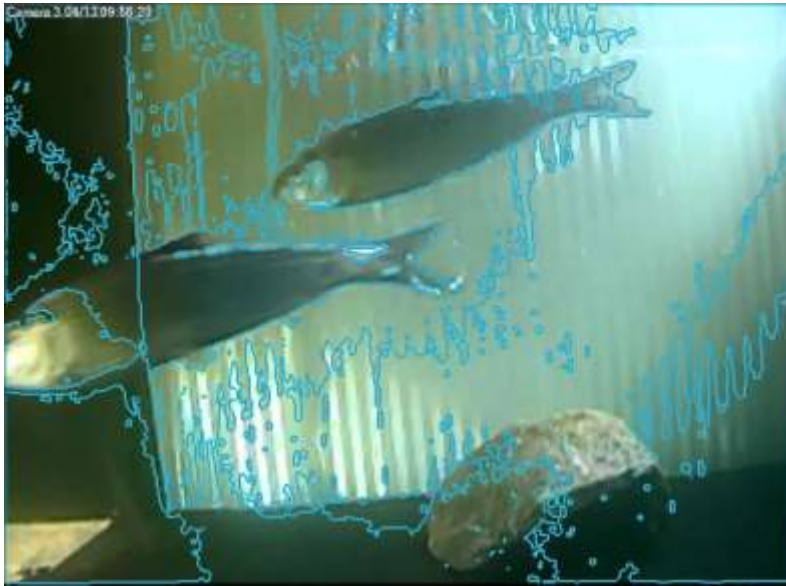


Pilgrim Lake Orleans

- Electronic counting station and new eel ramp installed 2019
- Video counting station installed in 2022
- Town and CC Conservation District preparing for replacement of lower fishway



Pilgrim Lake Video Monitoring



Pilgrim Lake, Orleans



Large Watershed Restoration Projects

- NRCS Cape Cod Watershed Restoration Plan
- Herring River Restoration, Wellfleet
- Talbot Mills Dam removal, Concord River,
- War Memorial Park, fishway, Town River, West Bridgewater
- South River nature-like fishway, Marshfield
- Horn Pond fishway, Aberjona River, Woburn
- Town Brook, Plymouth (multiple sites)
- Ipswich River, Ipswich (multiple sites)
- Forge Pond Dam Fish Passage Improvements, Kingston
- Stump Brook fish passage improvement, East Bridgewater
- High Street Dam removal, Town River, Bridgewater
- Monatiquot River Restoration, Braintree
- Westport River, Westport

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DMF Fishway Crew - 2023



Great Herring
Pond, Bourne

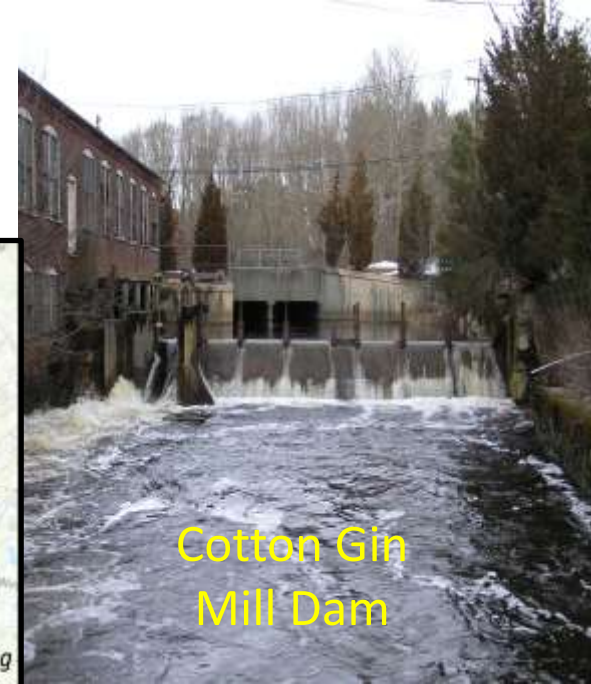
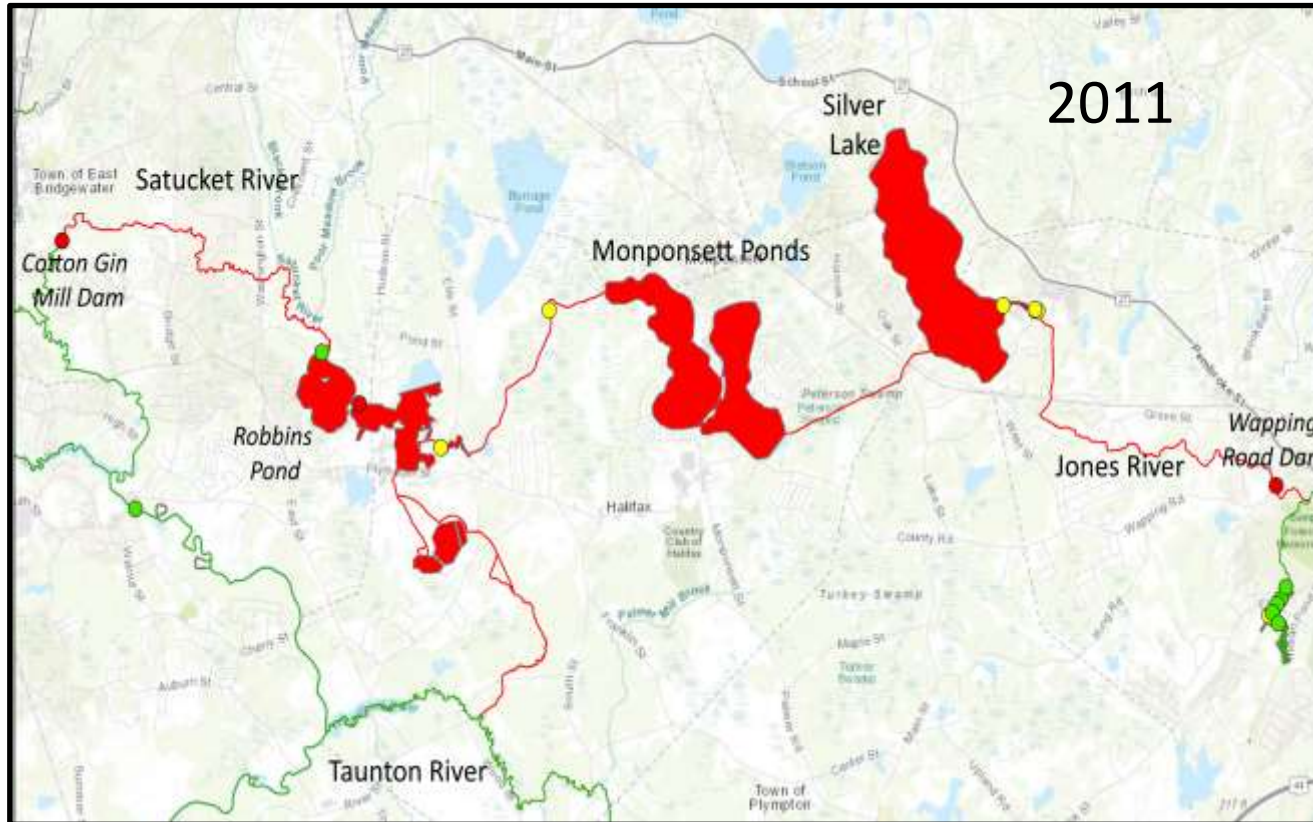


Indian Head River Dam,
Pembroke/Hanover



Soules Pond Dam,
Kingston

Stump Brook Bog Reservoir Dam, East Bridgewater



Cotton Gin
Mill Dam

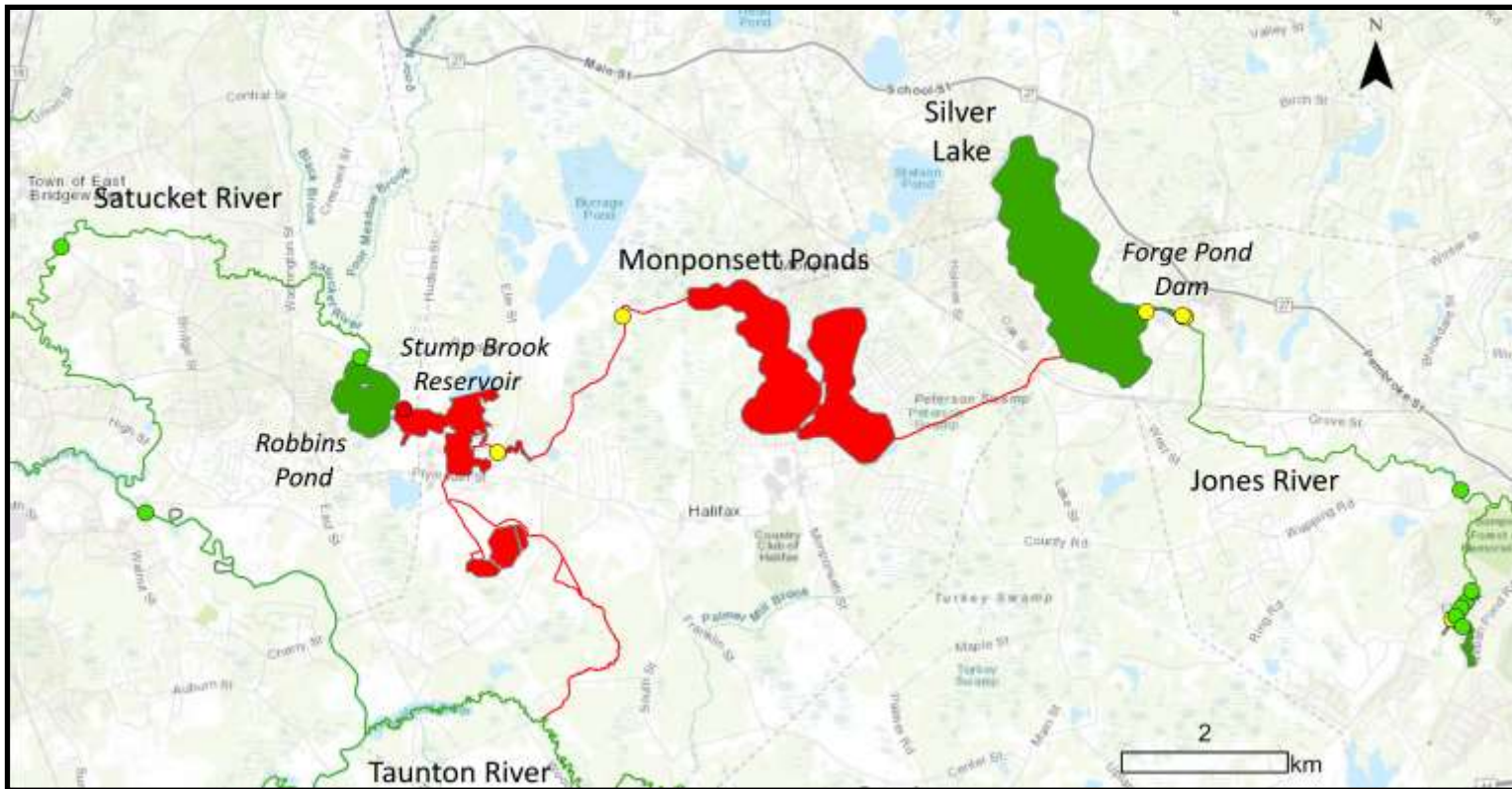


Dam removed -
2017

Cotton Gin Mill Dam removal in 2017 allowed fish passage to 124-acre Robbins Pond

Passage at bog dam gains passage to 168-acre Reservoir and the 528-acre Monponsett Ponds

Reconnect Massachusetts Bay to Narragansett Bay



2019 – fish passage open for 764 acres

Stump Brook Bog Reservoir Dam, East Bridgewater

- DMF survey and scoping design 2019-2021
- Grant from Taunton River Stewardship Council for design/permitting
- DMF contracted GZA for final design and permitting
- Extensive fishway fabrication at DMF Fishway Crew shop



Stump Brook Bog Reservoir Dam, East Bridgewater



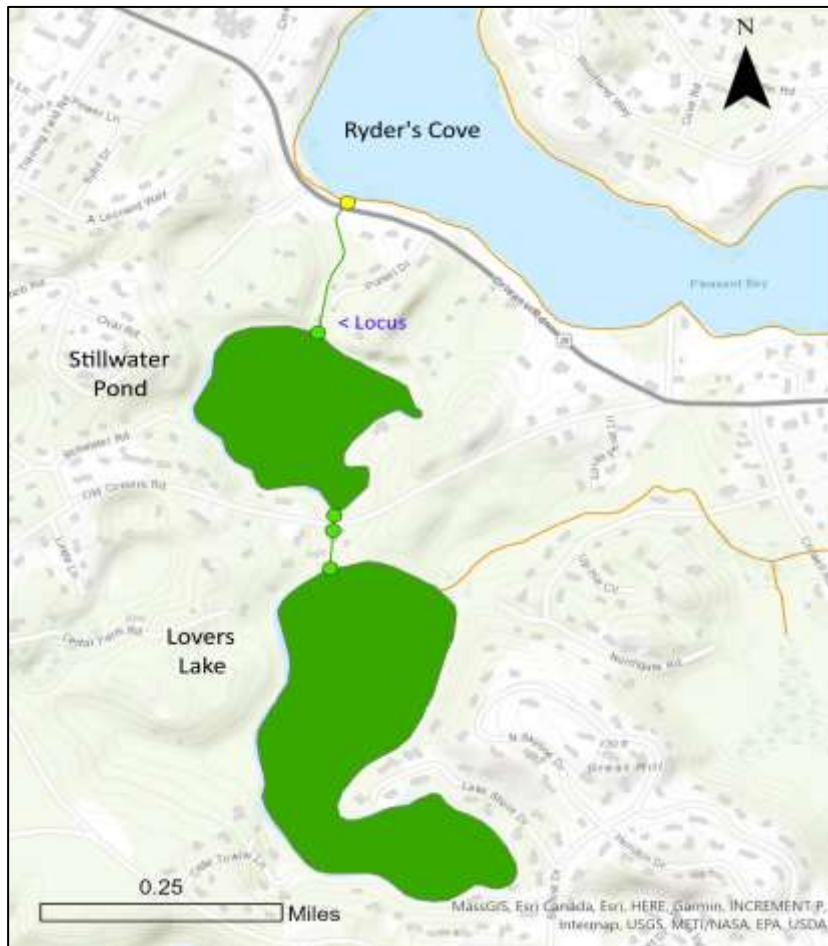
Cooperative project with DMF and cranberry bog farmer to install Alaskan Steeppass fishway. Recycled from Elm Street Dam removal project in Kingston

Gorham Mill Pond, Herring Brook, Pembroke



DMF and Pembroke Herring Fisheries Commission install Alaskan Steeppass fishway. Recycled from Elm Street Dam removal project in Kingston

Stillwater Pond Fishway Channel Repair, Chatham



Cooperative project with DMF and the Town of Chatham to repair 4 concrete fishway channel weirs

Stillwater Pond Fishway Channel Repair, Chatham



Howlett Brook, Topsfield



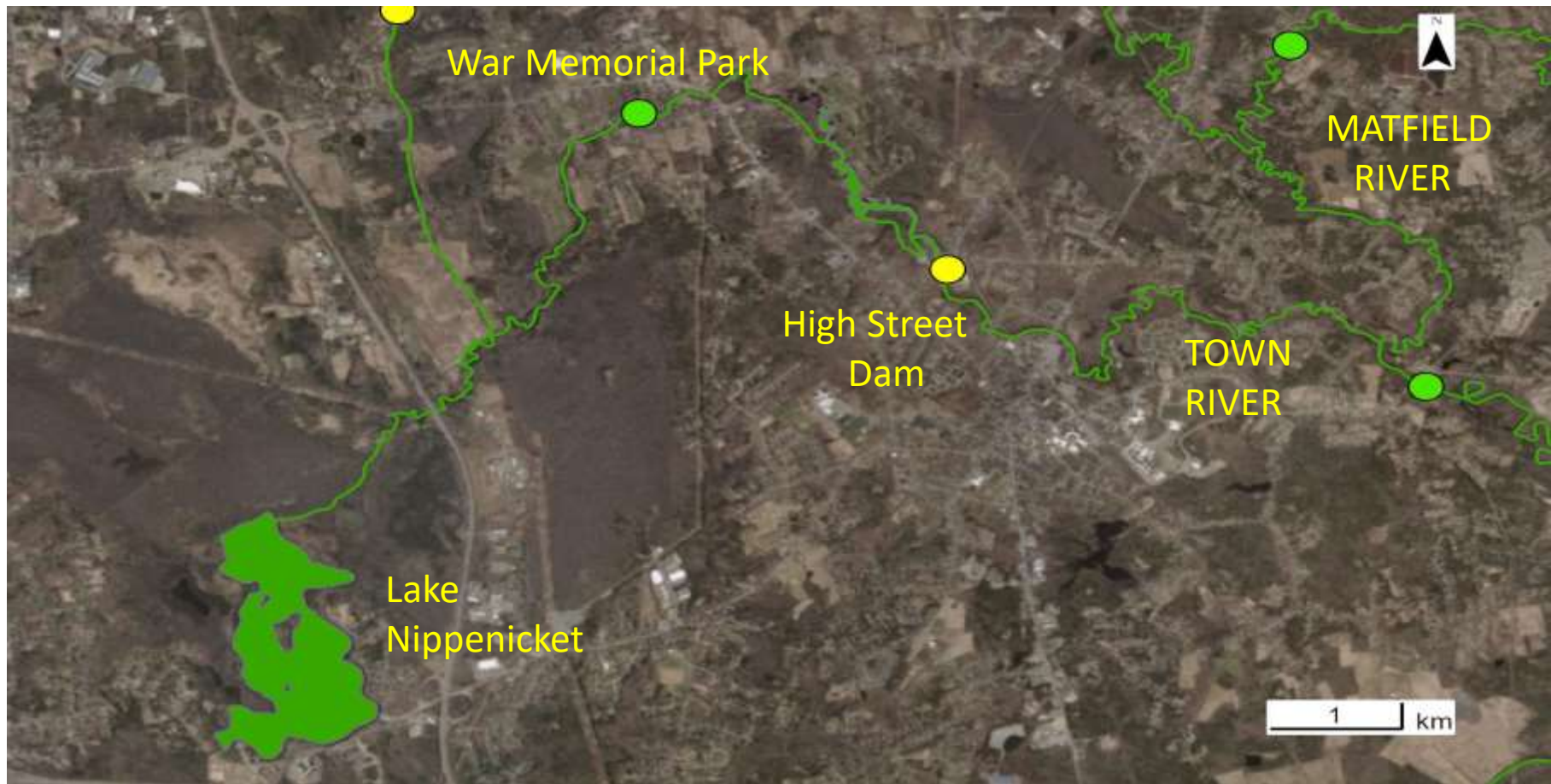
Cooperative project with DMF development, NOAA funding, and IRWA leading contract with SumCo

Sesuit Creek Culvert Replacement, Dennis



Mass DOT project contracted now to Robert Our Co. to replace two problematic culverts on Route 6A. Reoccurring passage blockages have caused significant impingement and predation mortality

High Street Dam, Town River, Bridgewater



- The dam and 212 ft concrete fishway built in 1919 were in disrepair
- DMF communications with dam owner during 2013-2015 led to approval letter to investigate dam removal feasibility

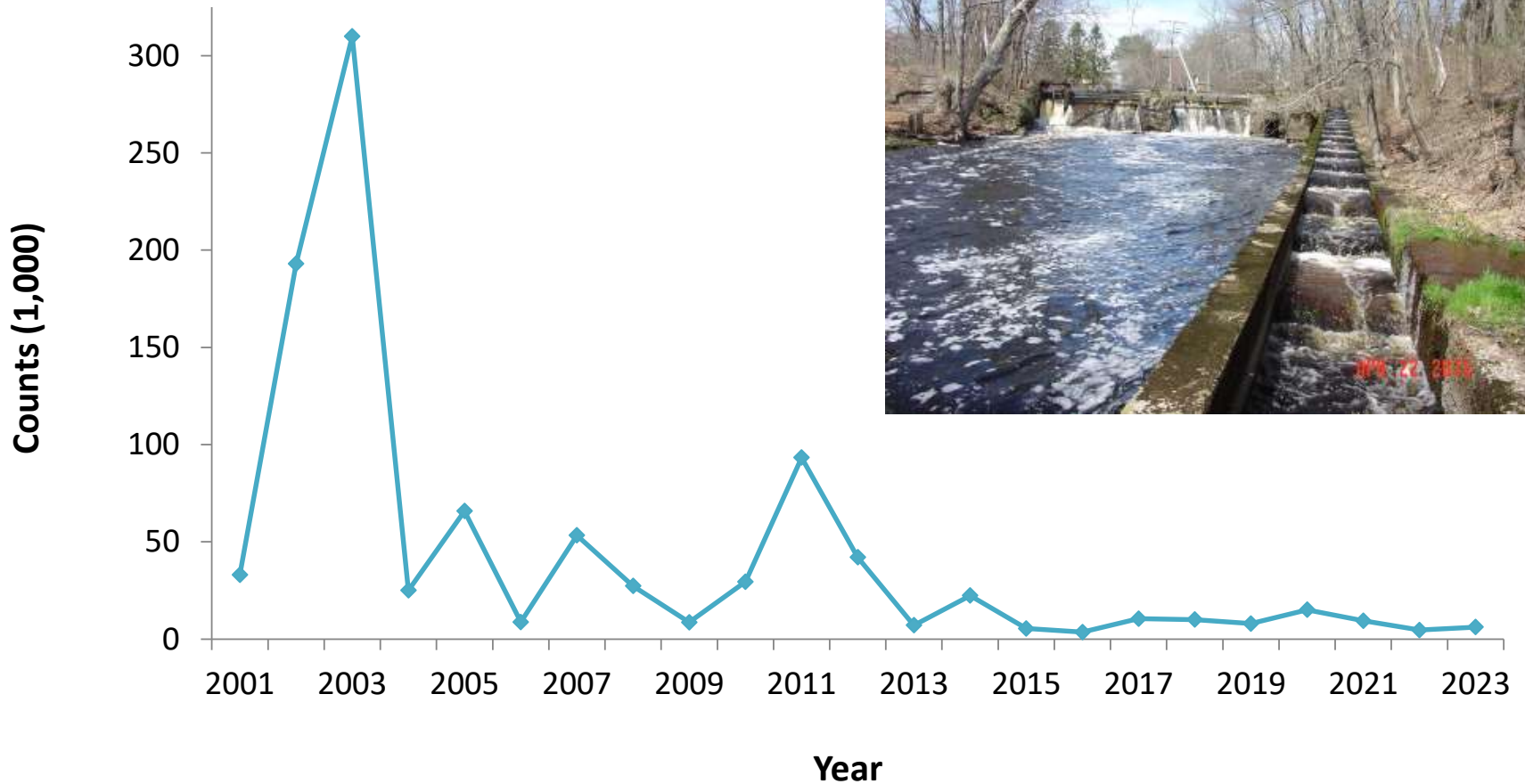
High Street Dam Removal, Town River, Bridgewater



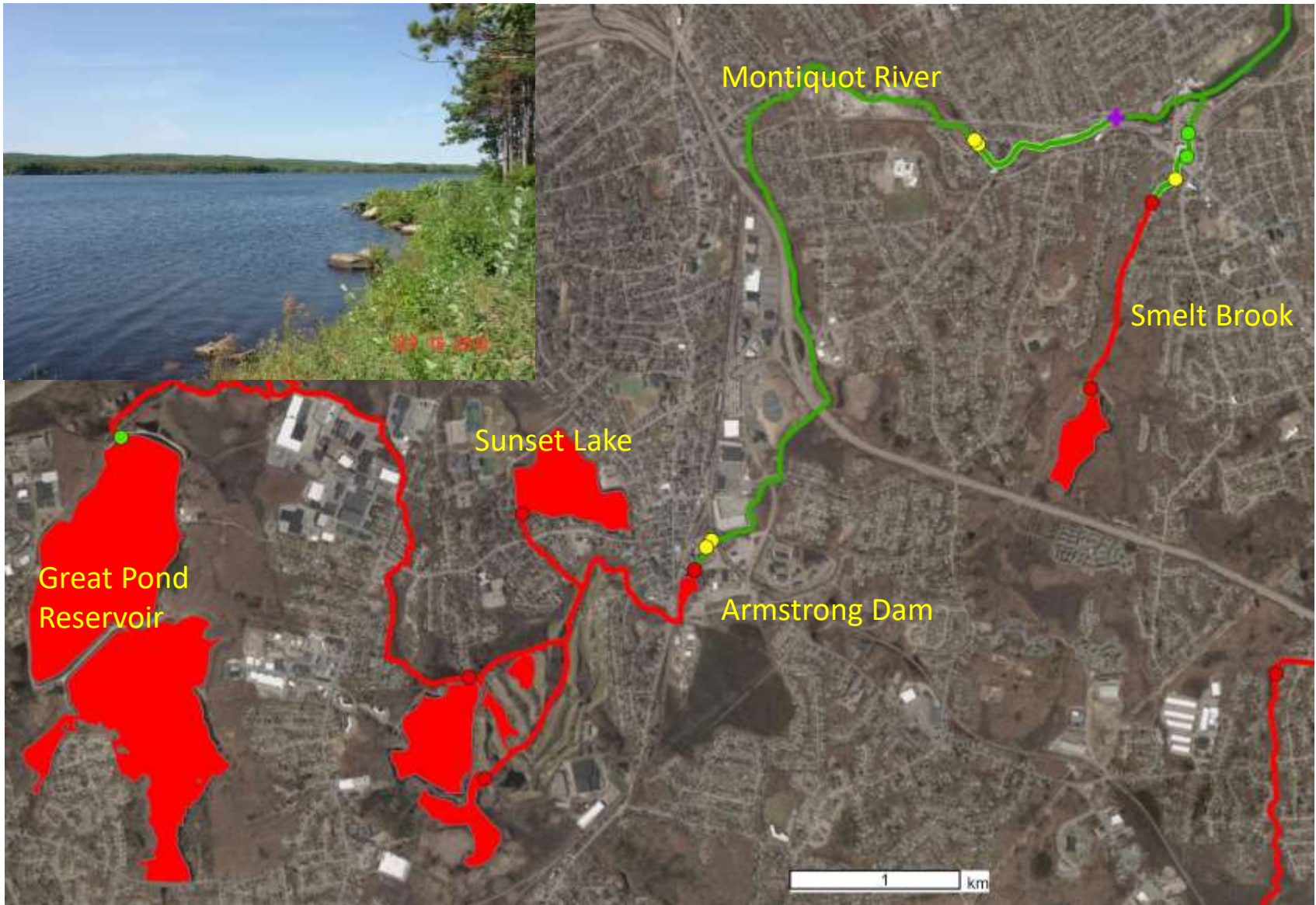
- Dam removal and bridge construction underway by Manafort
- Large cooperative project funded by Bipartisan Infrastructure Act

High Street Dam Fishway River Herring Count 2001-2023

Town River Fisheries Committee



Fore River Watershed, Braintree



Fish Passage Barriers



Armstrong Dam Removal



Fore River Watershed – Stream Maintenance



Westport River, Westport

- Two impassible dams on the Westport River
- 165 acre spawning and nursery habitat at Noquochoke Lake
- Fyke net monitoring found strong diadromous fish presence
- 3rd and 6th ranked projects on DMF Restoration Priority List for region
- 2013-2015 Habitat Assessment and USFWS survey followed by signing MOU with Forge Pond Dam owner



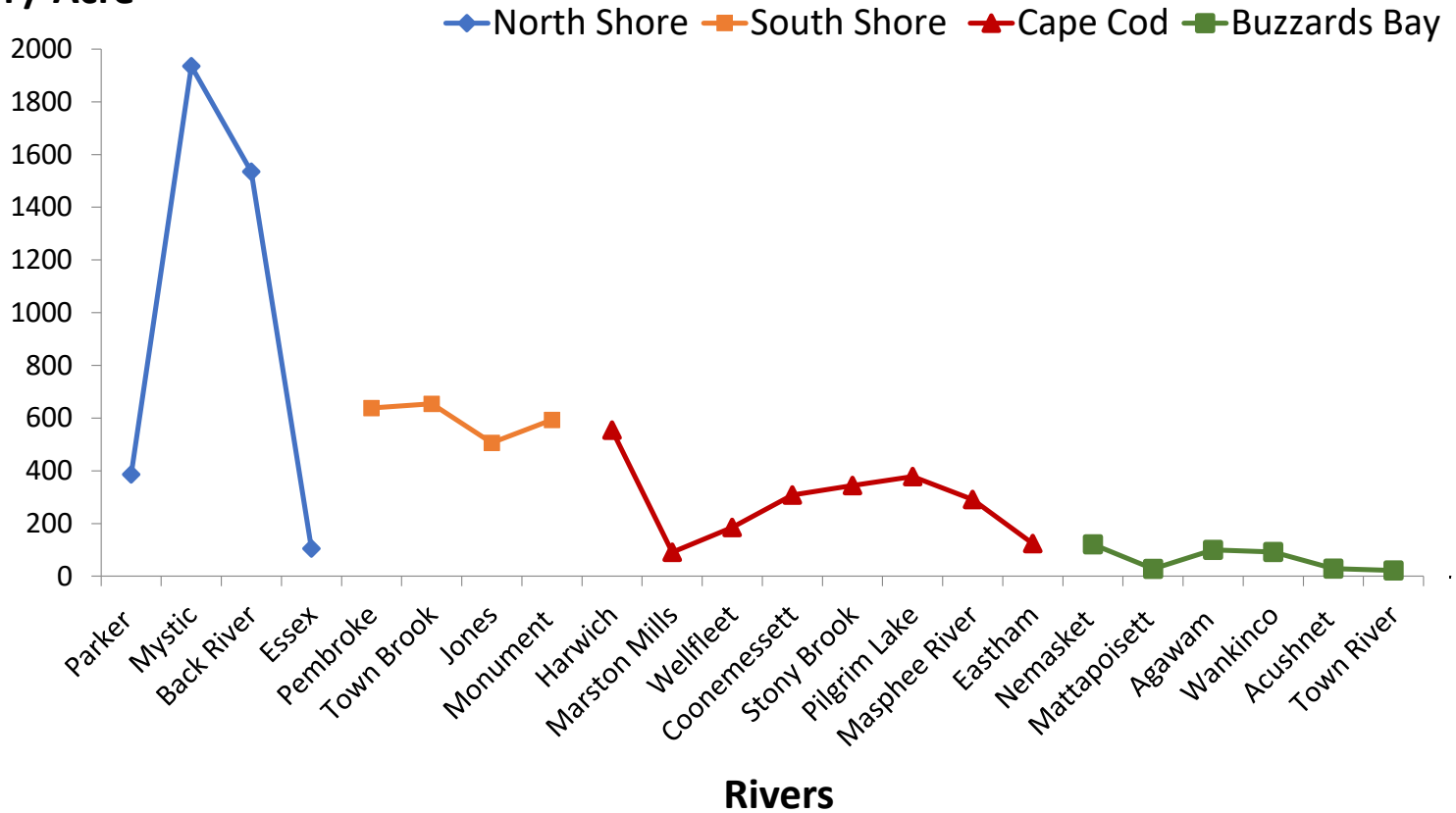
Westport River, Westport



- 2nd USFWS survey and DMF funds feasibility/design study by GZA in 2021
- DMF funds design/permitting project by GZA, October 2023
- Work starts on upstream Noquochoke Lake Dam with USFWS design and draft MOU with City of Fall River

Spawning Run Counts per Acre (2013 – 2022)

Fish / Acre



Positive Drivers for Improved River Herring Stocks

- 1. Clean Water Act**
- 2. Reduced Harvest**
- 3. Fishway Improvements**
- 4. Dam Removals**
- 5. Reduction in Cranberry Bog Production**

Concerns with Early Life Stage Recruitment

1. Warming and Eutrophication impacts on **freshwater spawning and nursery habitats**
2. Warming and Eutrophication impacts on **marine nursery habitats**
3. Natural and Fishing Mortality
4. Reduced outflow for emigration

Management Actions to address Juvenile River Herring Recruitment Concerns

1. Case-by-case watershed management. [Water Management Act and local water use](#)
2. Stream maintenance
3. Apply knowledge of migration cues
4. Pond level management for fish emigration

Thank you for all that you do....

