Massachusetts Division of Marine Fisheries
Diadromous Fish Update

Brad Chase - MA Division of Marine Fisheries

February 15, 2022 - *River Herring Network*

Presentation Outline

1. Recent Activities
2. Restoration Updates
3. River Herring Monitoring and Trends
4. American Eel update

Commonwealth of Massachusetts
Department of Fish & Game

MarineFisheries
Commonwealth of Massachusetts

Diadromous Fish in Massachusetts

- rainbow smelt
- American eel
- alewife
- blueback herring
- American shad
- white perch
- sea lamprey
- Atlantic tomcod
- sea-run trout
- striped bass


MAR 21 2012

Recreational and Diadromous Fisheries Program

- Diadromous Fish Passage and Habitat Restoration
- Diadromous Fish Biology and Management

Diadromous Fish Project Staff

Brad Chase , AB III - project leader

John Sheppard , AB II - river herring monitoring

Ben Gahagan, AB II - river herring monitoring

Vacant, AB II - river herring monitoring

Ed Clark, Fishway Crew - fish passage construction

Jim Rossignol, Fishway Crew - fish passage construction

DMF Project Objectives
(1970s)

1. Maintain and enhance existing runs
2. Restore historically important runs
3. Create new runs where feasible
4. Conduct population monitoring and research
5. Participate in ASMFC coast-wide management

Since we last met……

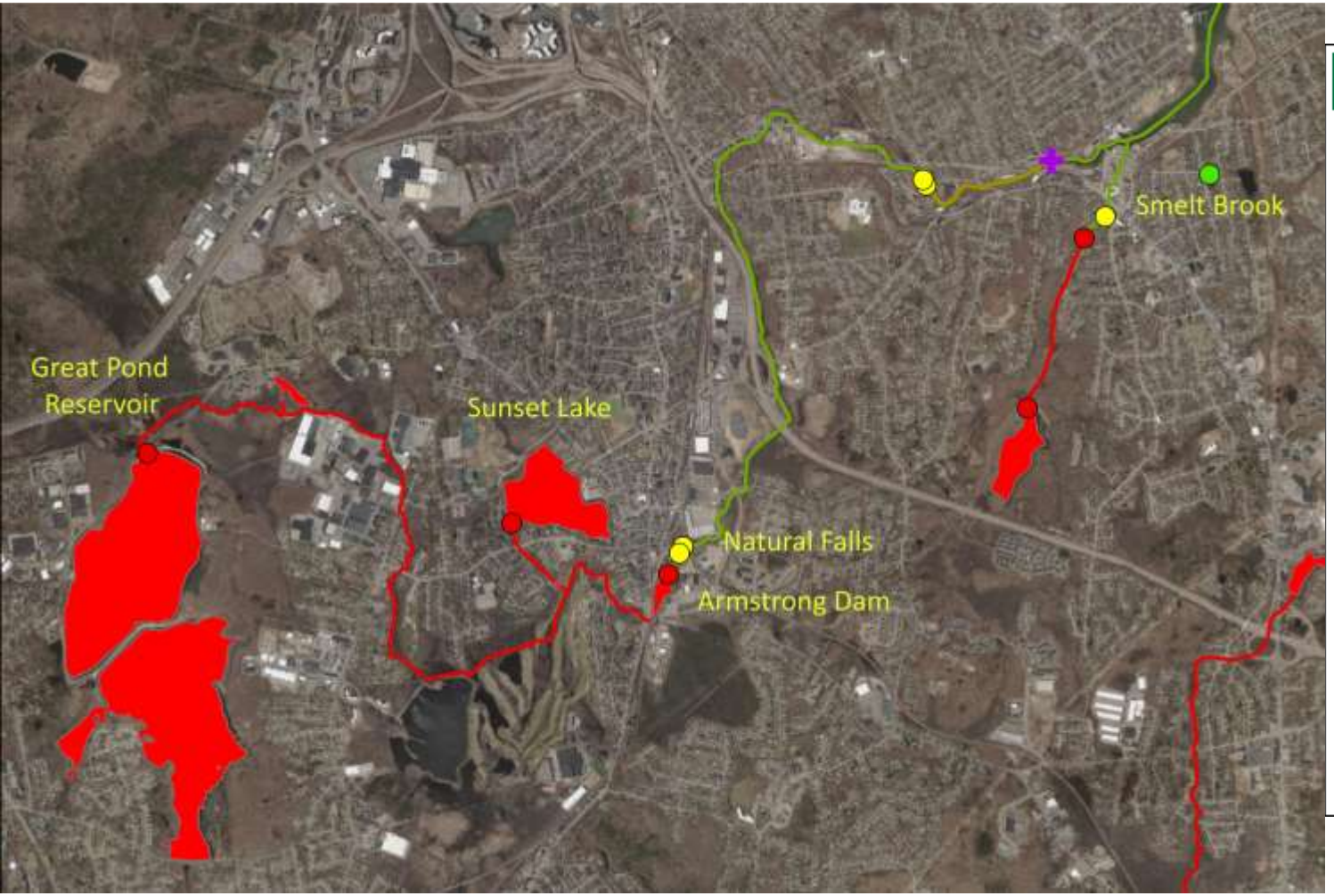
Elm St. Dam, Jones River, Kingston

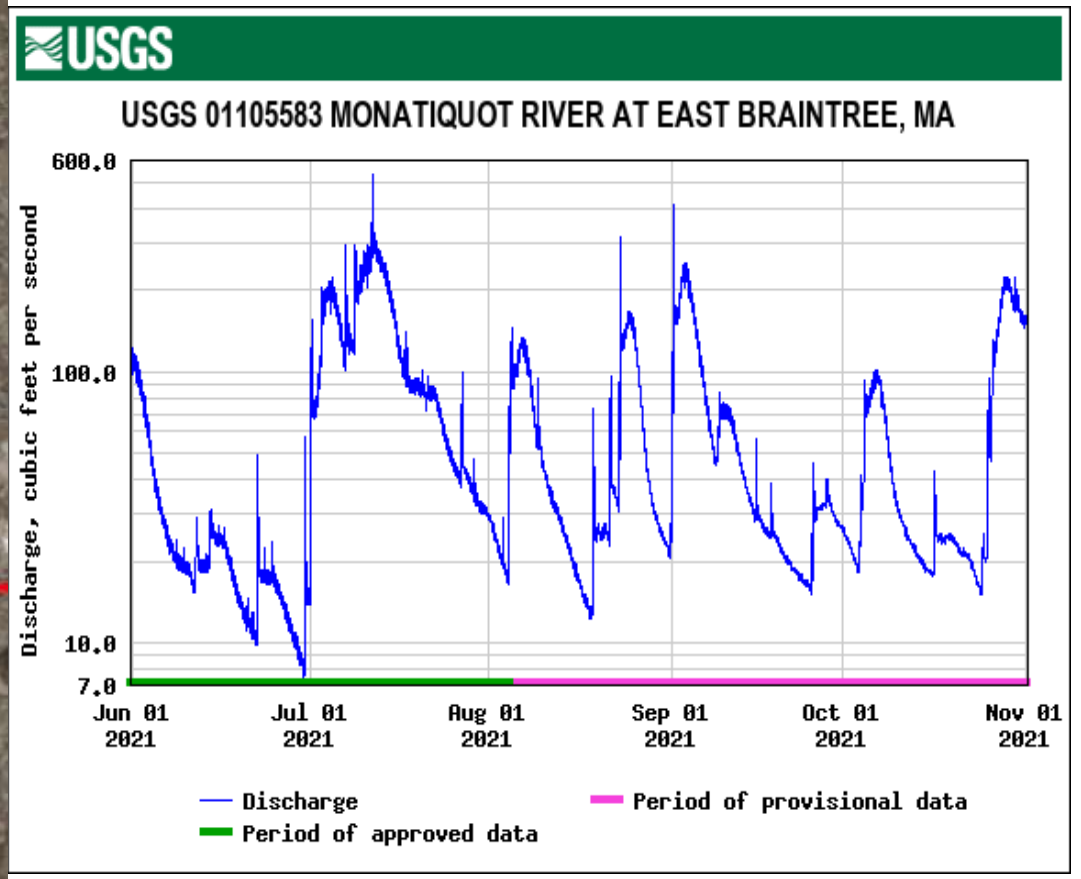
Coonamessett River, Falmouth

Weweantic River, Wareham

Back River, Weymouth

Fore River Watershed, Braintree





Diadromous Fish Passage Survey

- Coastwide surveys reported in 1921 (Belding), 1972 (Reback and DiCarlo), and 2004 (Reback et al.)
- Many changes in past 20 years
- Present survey expanded to include more diadromous species, broader restoration goals, and integrate with other restoration tools

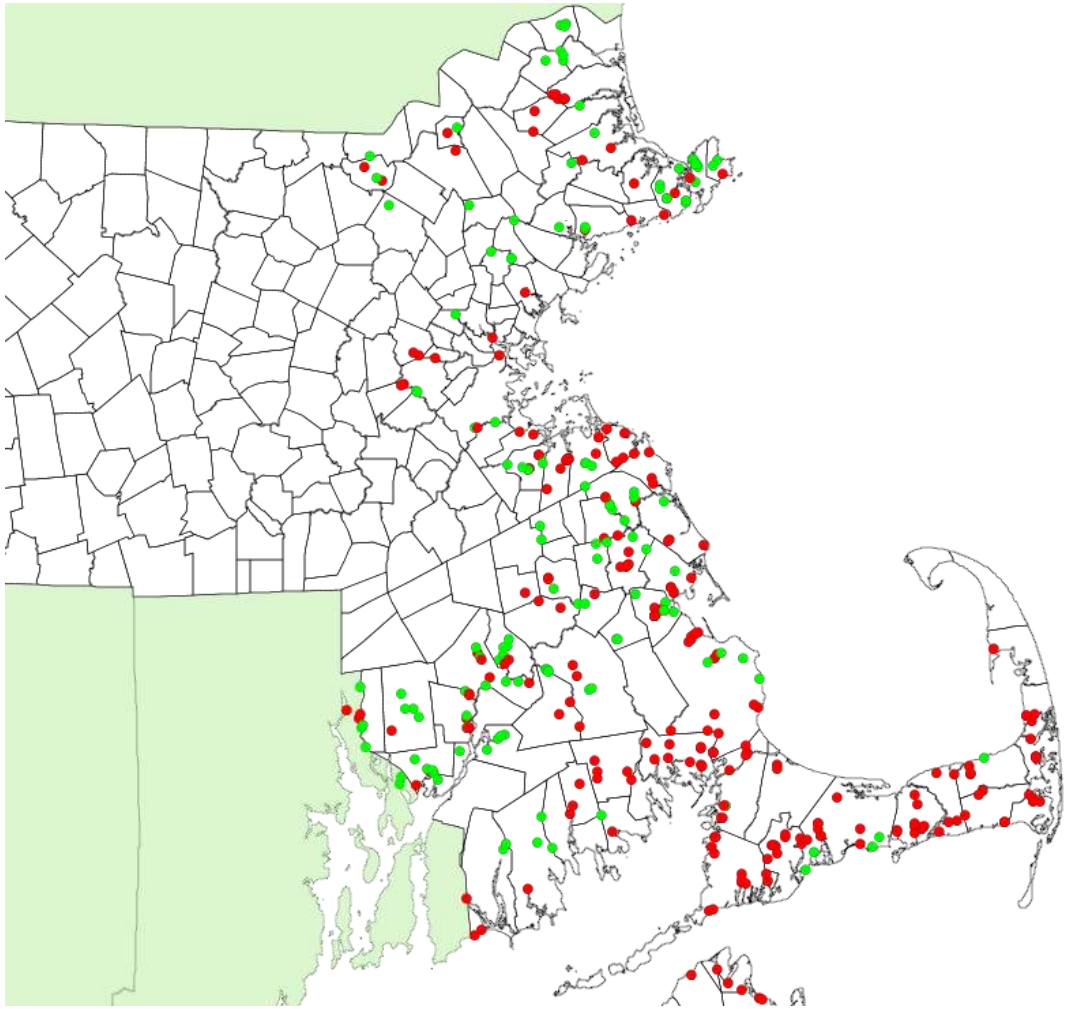
Diadromous Fish Passage Survey




Completed first round of visits to Cape Cod, South Shore and SE Massachusetts in 2021

Survey will be integrated to DMF Diadromous Fish Restoration Priority List and Diadromous Fish GIS Datalayer. These tools are presently used by MassDEP and MassDOT

DMF Diadromous Fish Restoration Priority List



Fishway sites in red need some work

- Ranks restoration priorities at over 450 sites
- Integrated to MassDOT GIS datalayer with species presence and TOY data
- Useful tool for restoration, transportation and watershed assessment planning
- Presently used by MA DEP and MassDOT

Stream Channel Maintenance

- Working with MassDEP on policy under Wetlands Protection Act
- DMF prepared guidelines in 2016

https://www.mass.gov/service-details/diadromous-fisheries-project

- Stony Brook, Brewster - maintenance plan approved
- Ongoing work:

  Jones River, Kingston

  Fore River, Braintree

  Acushnet River, Acushnet

  Island Creek, Duxbury

Native and Invasive Plant Encroachment

Swamp Loosestrife
Herring River, Harwich

Water Willow
Weir River, Hingham

Phragmites
Island Creek, Duxbury

Fore River Watershed, Braintree

Large watershed-wide effort since 2016

Fore River Watershed, Braintree

Large watershed-wide effort since 2016

Bring on the machines……..

Nemasket River

Herring Brook, Pembroke

Island Creek, Duxbury

Forge Pond, Kingston

Central Plymouth County Water District Commission - Hydrodredge

They are back……

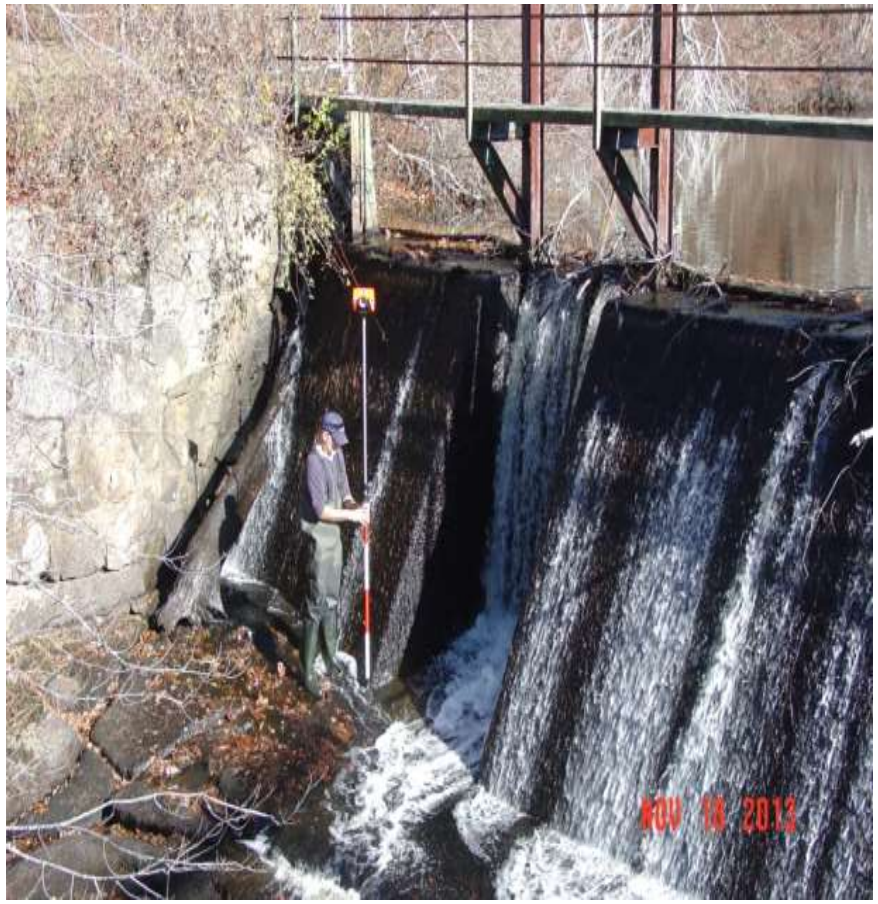
Large Watershed Projects

Westport River

Fore River, Braintree

Jones River, Kingston

Forge Pond Dam, Westport River, Westport

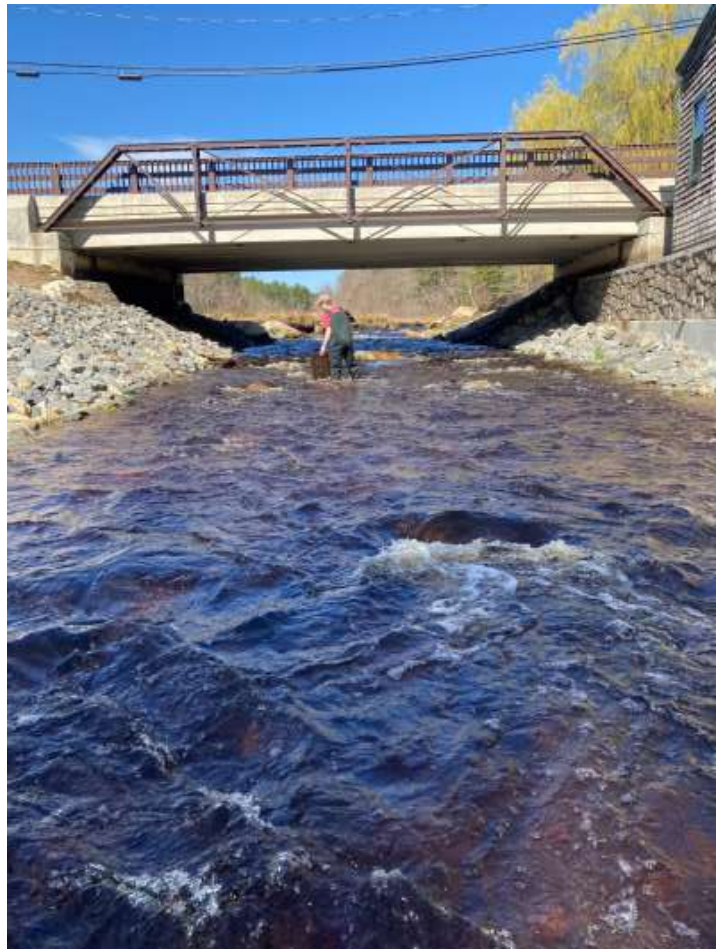


2013 Survey

2021 Survey

Preliminary design contract underway with GZA

Elm Street Dam Removal, Jones River, Kingston

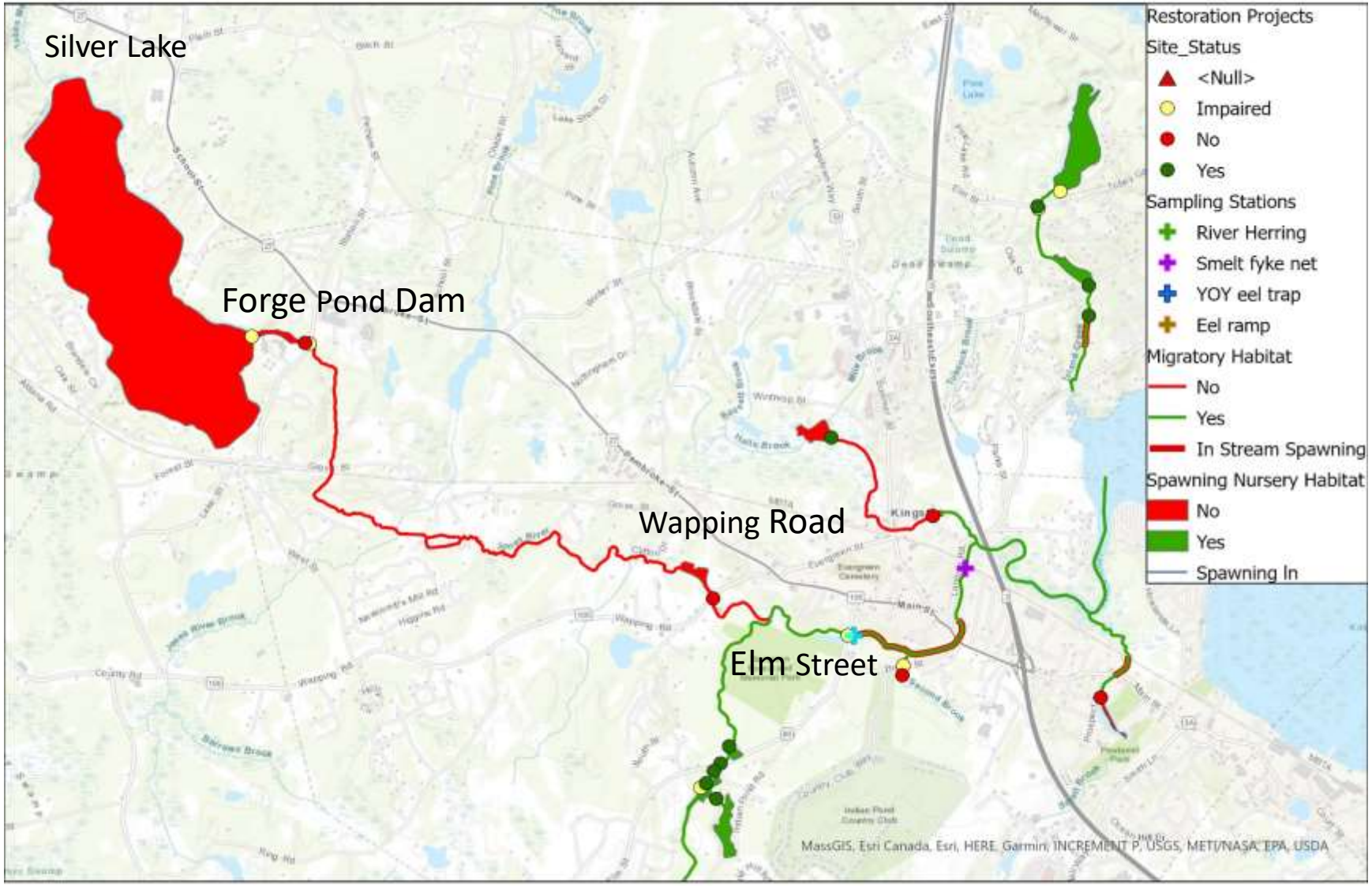


Dam removed in December 2019

Forge Pond Dam - Jones River, Kingston
Fishway and Dredging Design/Permitting

- USFWS Scoping Design for new fishway
- Contract underway for Design/Permitting
- U-Mass Dartmouth MS project on silver eels at Forge Pond Dam

Jones River Watershed Restoration



Jones River Watershed Restoration

2011 - Wapping Road Dam Removal

2019 – Elm Street Dam Removal

2019 – Forge Pond Dam Fishway

Mill River Watershed Restoration

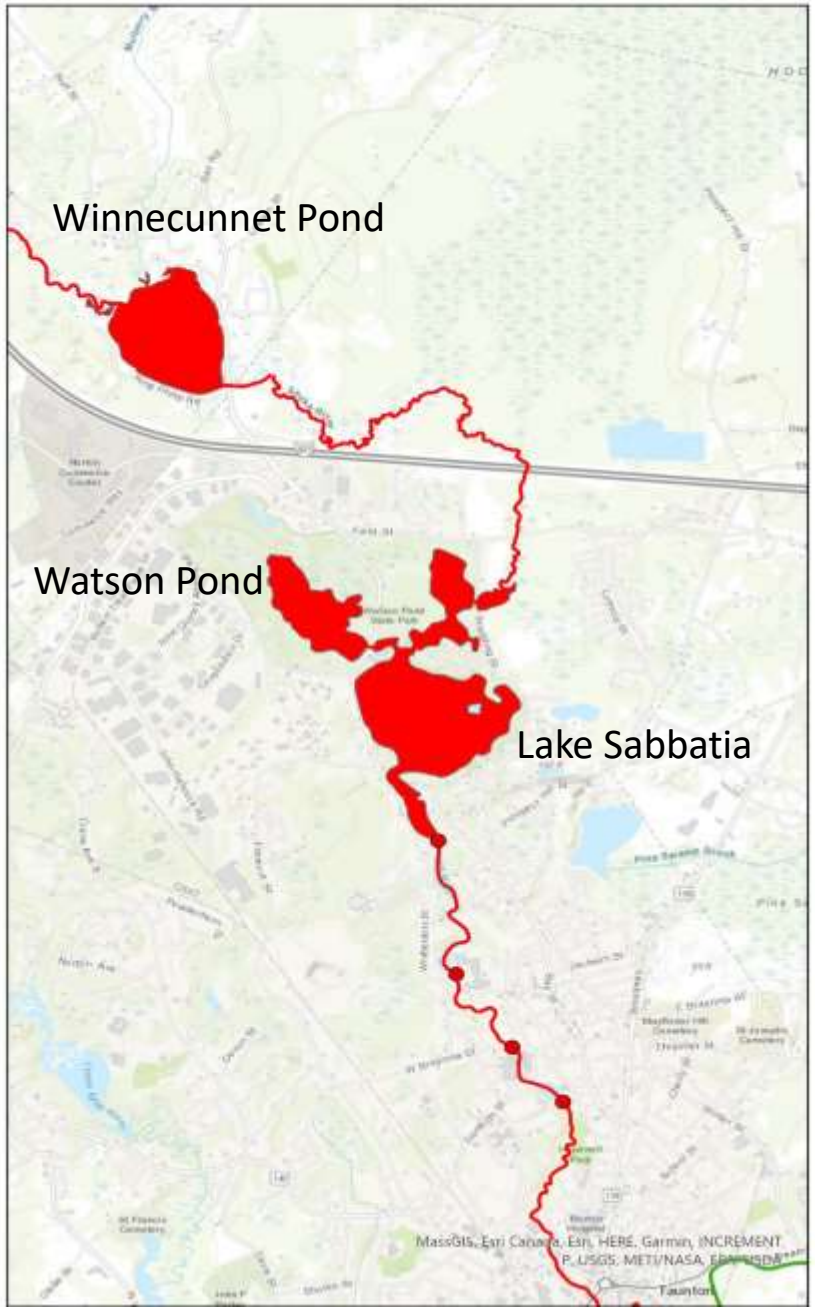
- Four dams with no fish passage limited migratory fish to <10% of historical habitat

- MA Division of Ecological Restoration began restoration effort soon after 2005 flood

Lake Sabbatia – 265 acres

Winnecunnet Pond - 152 acres

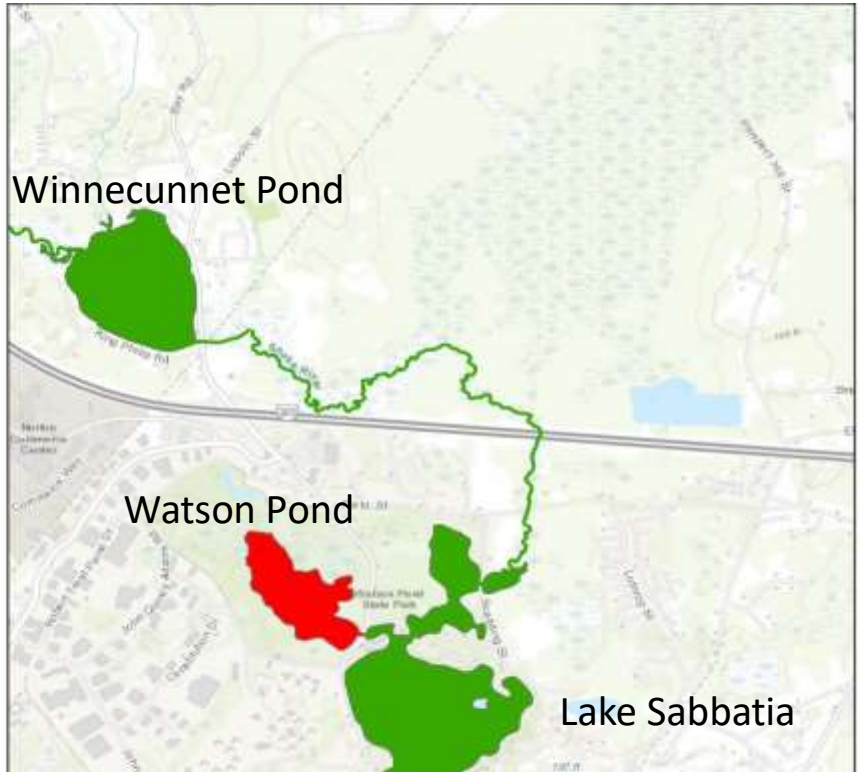
Watson Pond - 78 acres

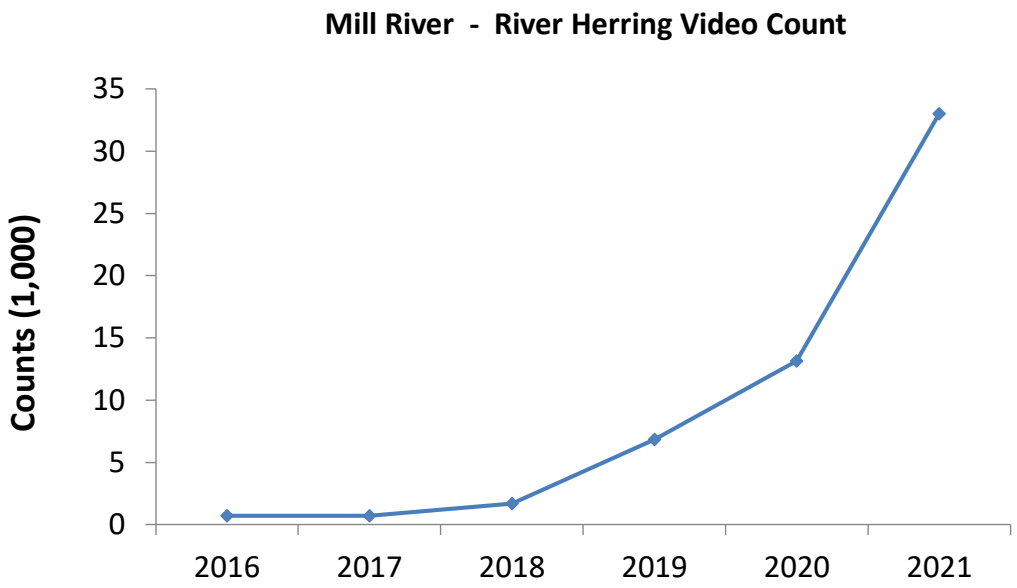


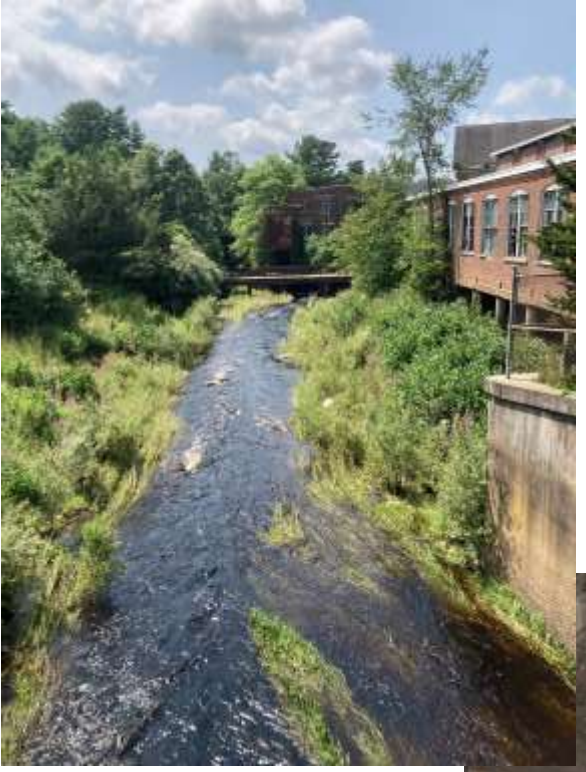
2011

Mill River Watershed Restoration

- Hopewell Mills Dam – 2012 removed
- Morey's Bridge Dam – 2012 fishway and eel ramp
- Whittenton Mills Dam – 2013 removed
- West Britannia Dam – 2018 removed
- Provided access over 18 miles of river and 417 acres of spawning and nursery habitat
- Extensive collaborative monitoring ongoing





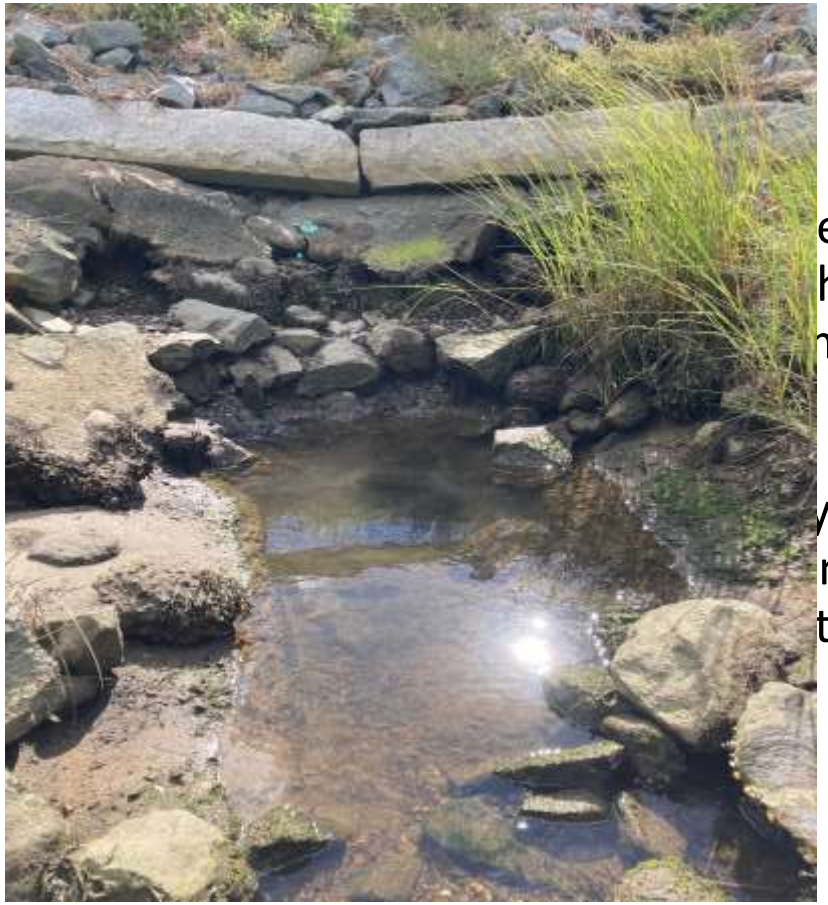


Stump Brook Bog Reservoir Dam, East Bridgewater

Preliminary design contract underway with GZA

NRCS / Cape Cod Conservation District
Cape Cod Water Resources Restoration Project

Baxter Grist Mill, Yarmouth
2020



Lover's Lake, Chatham

Stony Brook, Brewster

Town River, Bridgewater

Dam removal project at the High Street Dam, Bridgewater

Fishway reconstruction at War Memorial Park, West Bridgewater

Ipswich River, Ipswich and Topsfield
Howlett Brook and Willowdale Dam

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

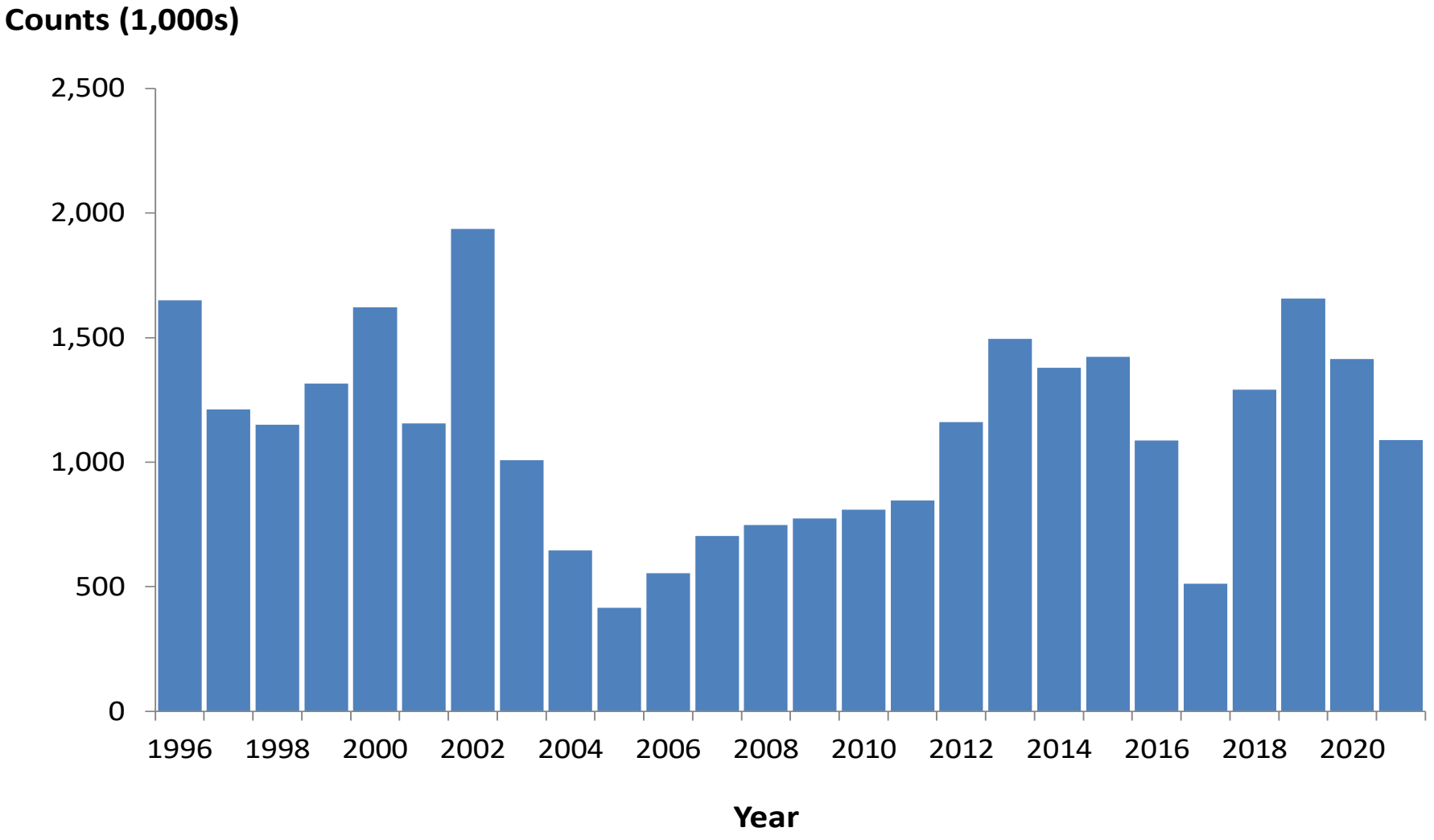
River Herring Counting

Herring River, Harwich

Herring Creek, Aquinnah

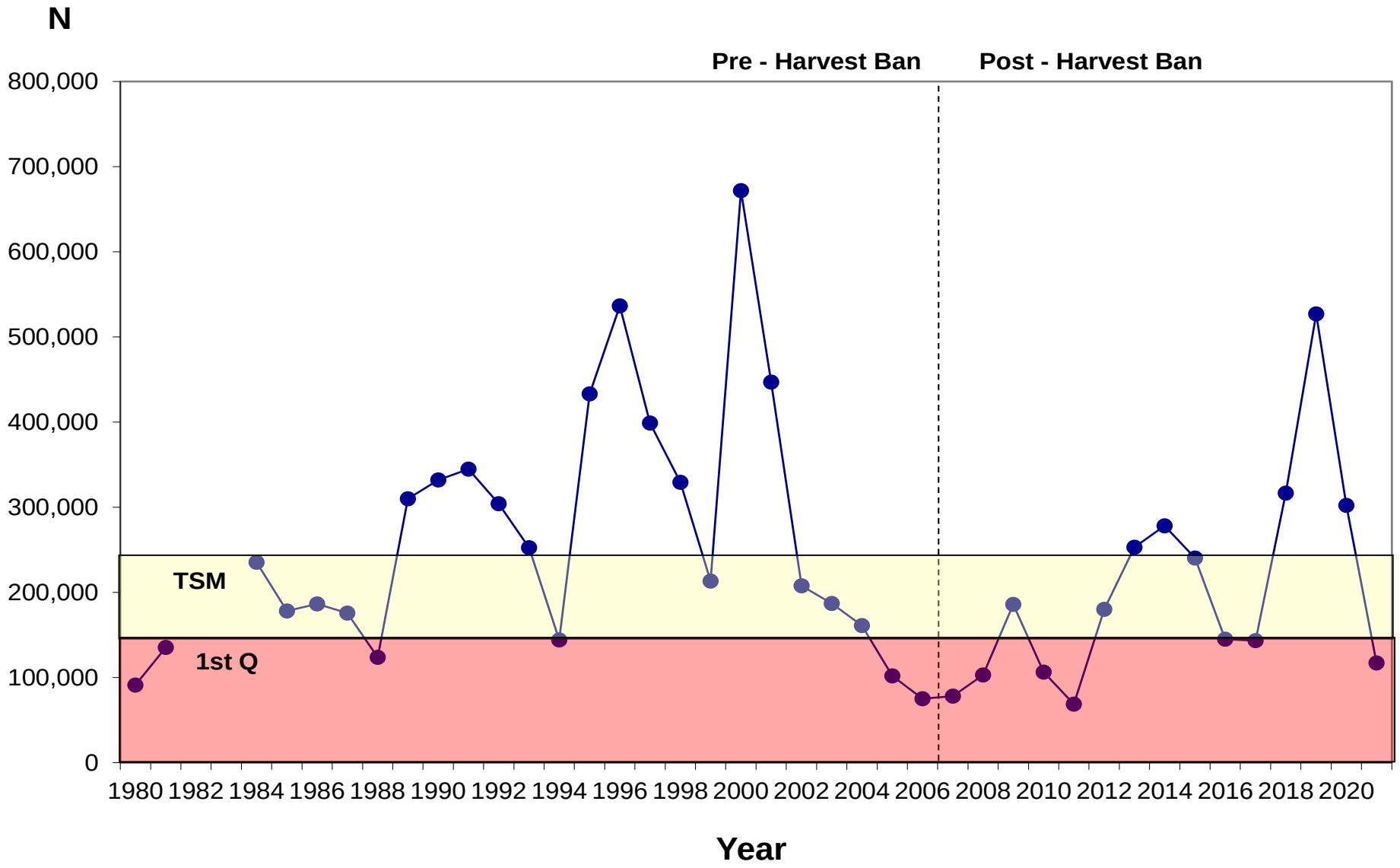
8- channel Smith Root counter

Massachusetts River Herring 20-Year Count Index 1996 - 2021

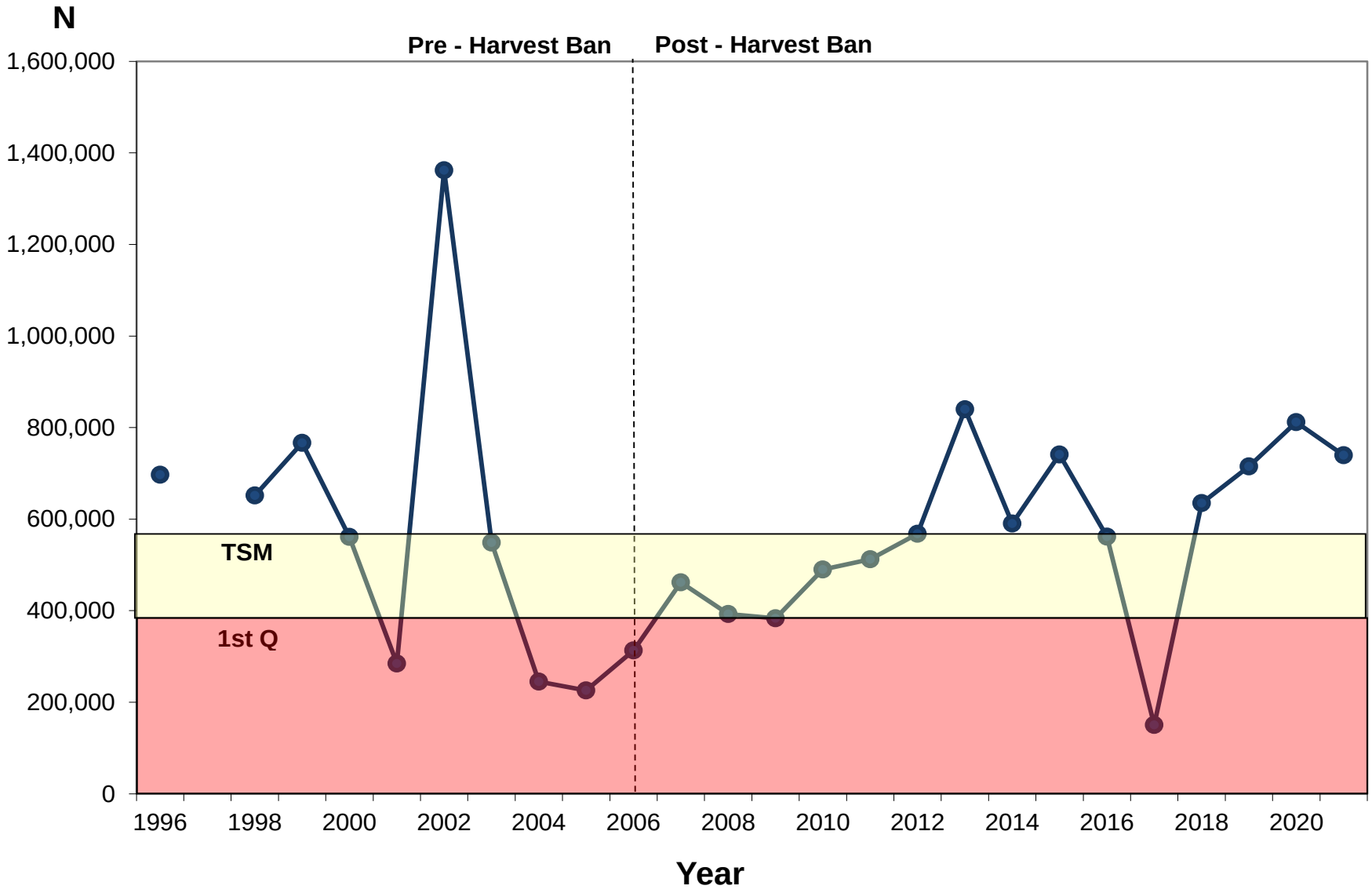


Nemasket River, Mattapoisett River, Monument River and Back River

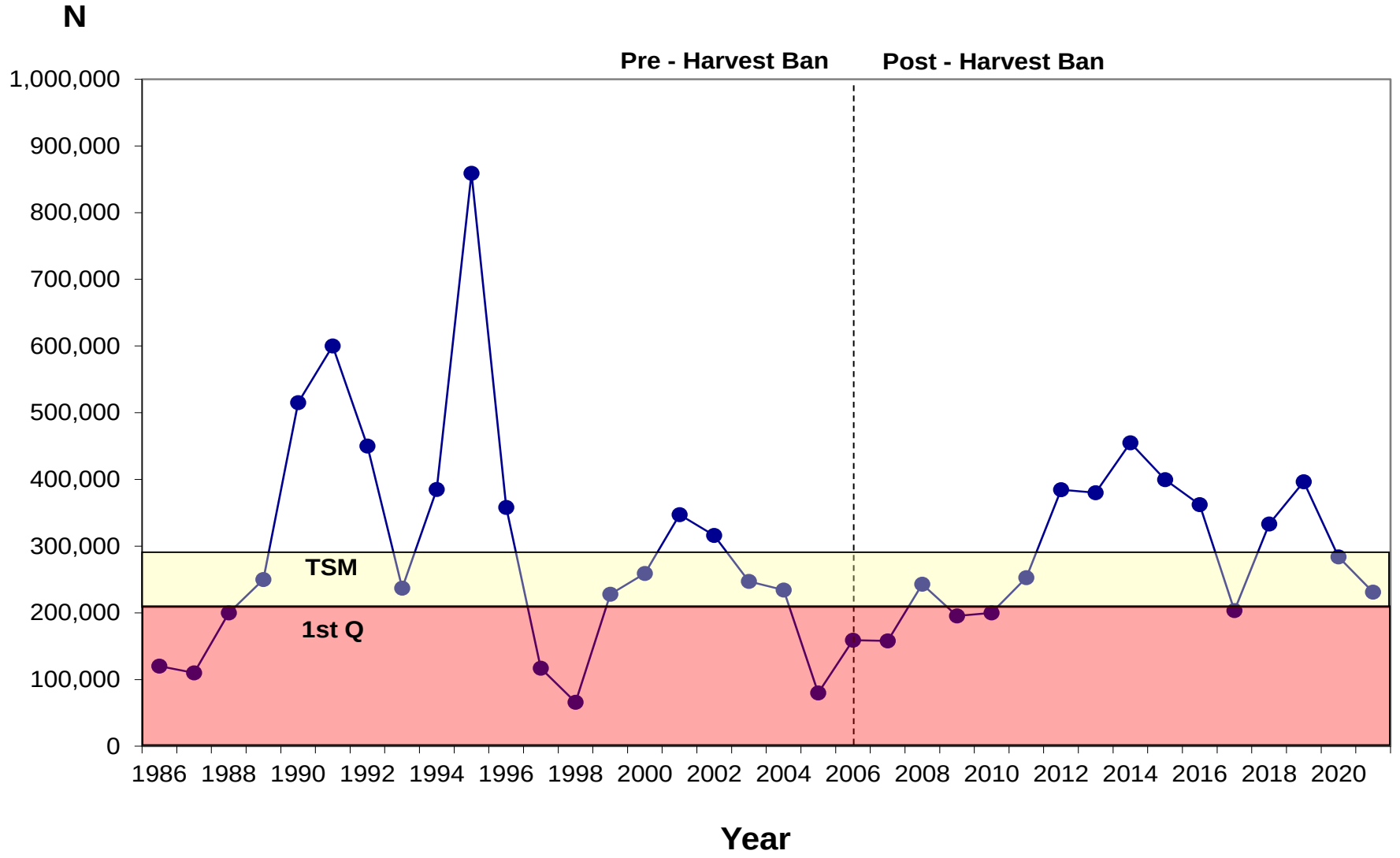
Monument River – Electric Count
1980 - 2021



Nemasket River - Visual Count 1996 - 2021

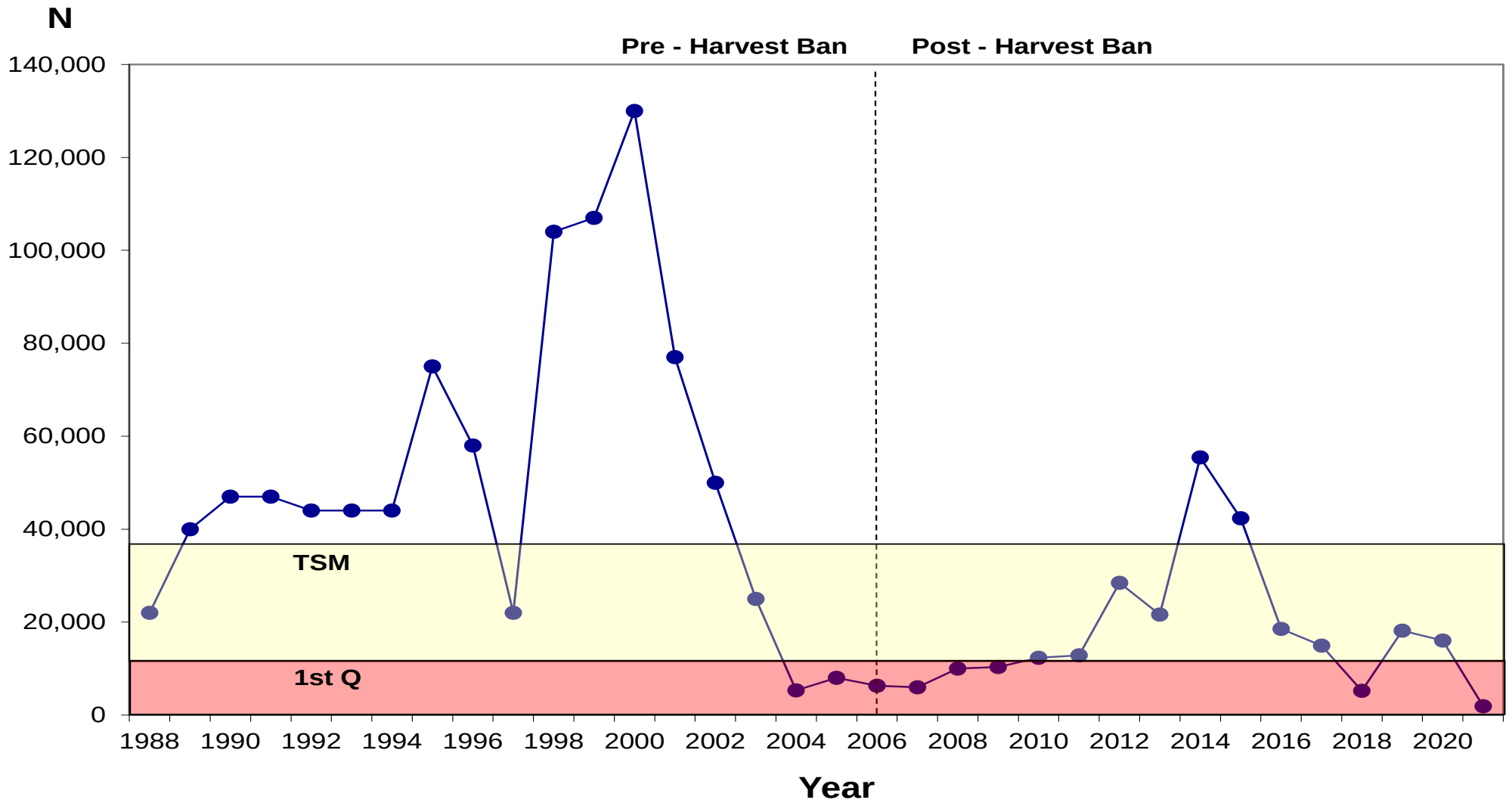


Weymouth Back River – Visual Estimate * 1986 - 2021

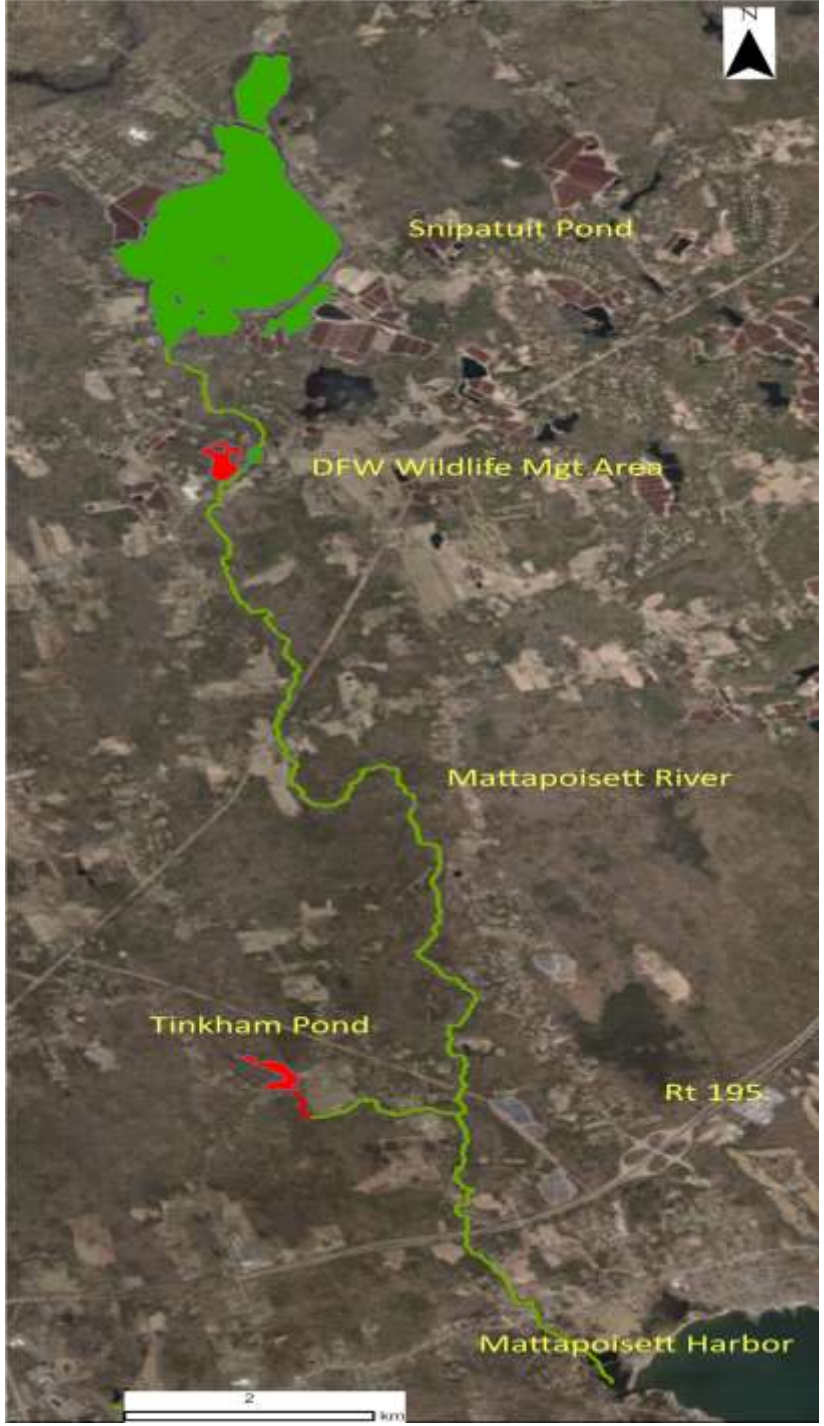


* Reporting electronic counter results since 2015

Mattapoisett River – Electronic Count
1988 - 2021

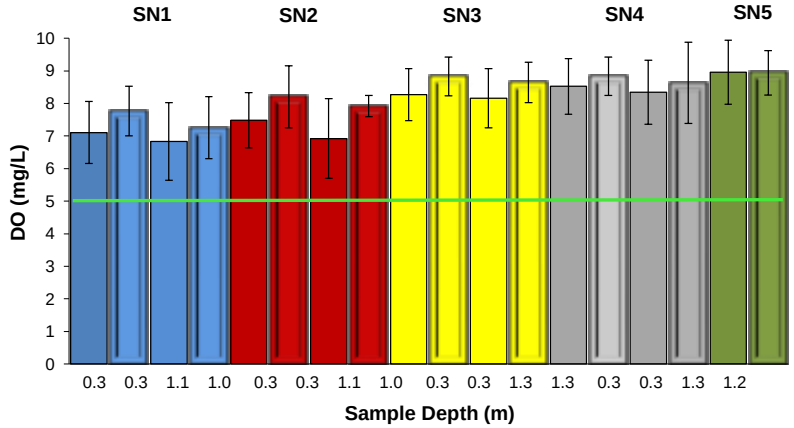


Mattapoisett River



River Herring Spawning and Nursery Habitat Assessment

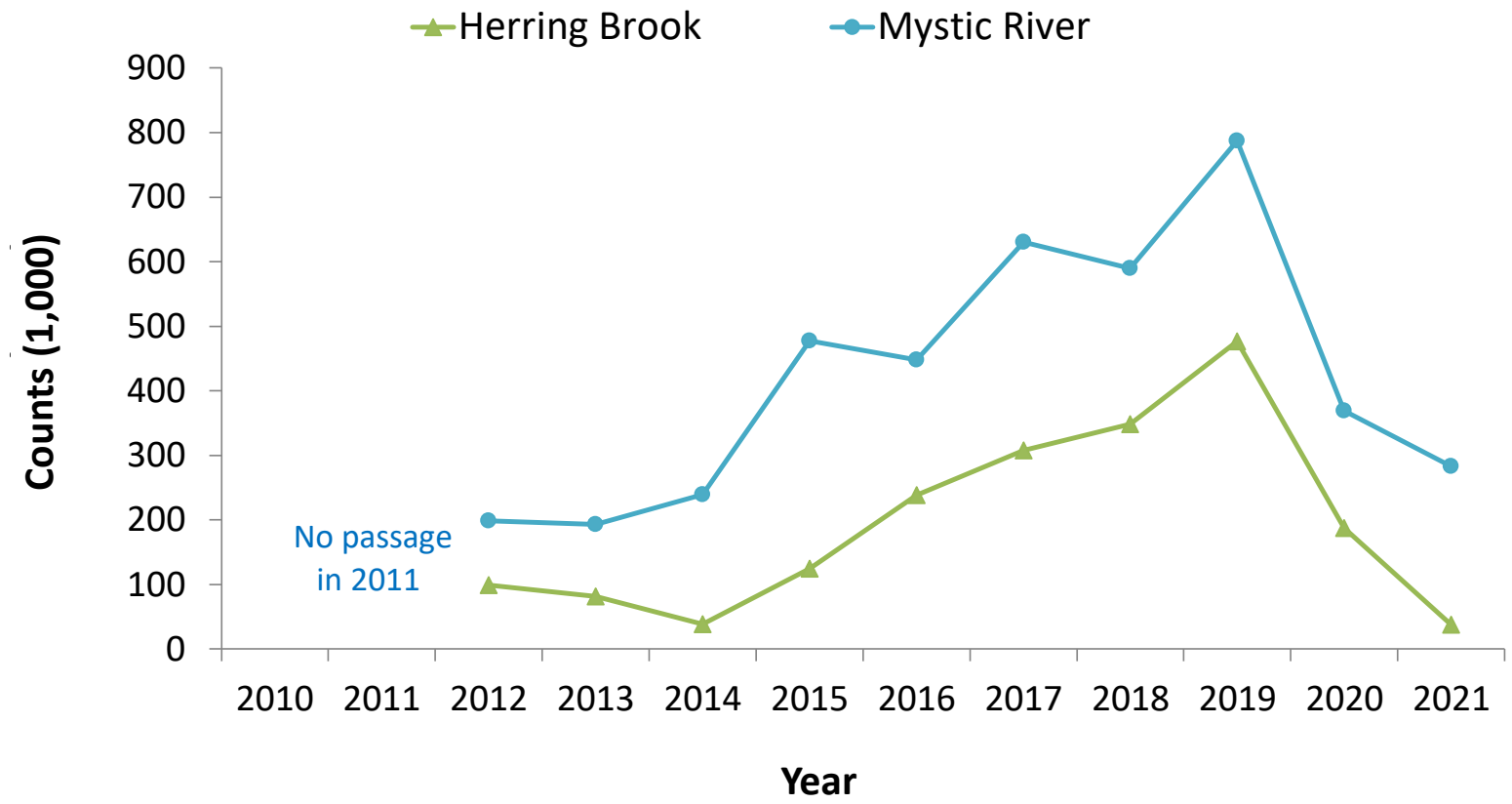
Figure 8. DO (mg/L) measurements taken at Snipatuit Pond, 2013-2014. Station averages are presented (+ for 2013 (blank bars) and 2014 (diagonal stripes). Five samples were made at each depth per year.



Positive conditions for water temperature and DO

Concerns for stream flow, stream channel maintenance and invasive plants

Post-Restoration Spawning Run Improvement



River Herring Stocking

River Herring Status

- Relative low abundance
- Harvest Closed: 2006 to present
- Growing concerns over eutrophication, invasive plants, and water management
- ASMFC Sustainable Fisheries Mgt Plan updated in 2022
- Influence of warming climate
- Habitat Restoration

American Shad Stocking – Taunton River

Collaborative effort with USFWS / DFW / DMF planned for 2022


OCT 27 2015

Massachusetts - Eel Commercial Harvest

Figure 1. Massachusetts commercial American eel harvest reported for 1950 to 2020.

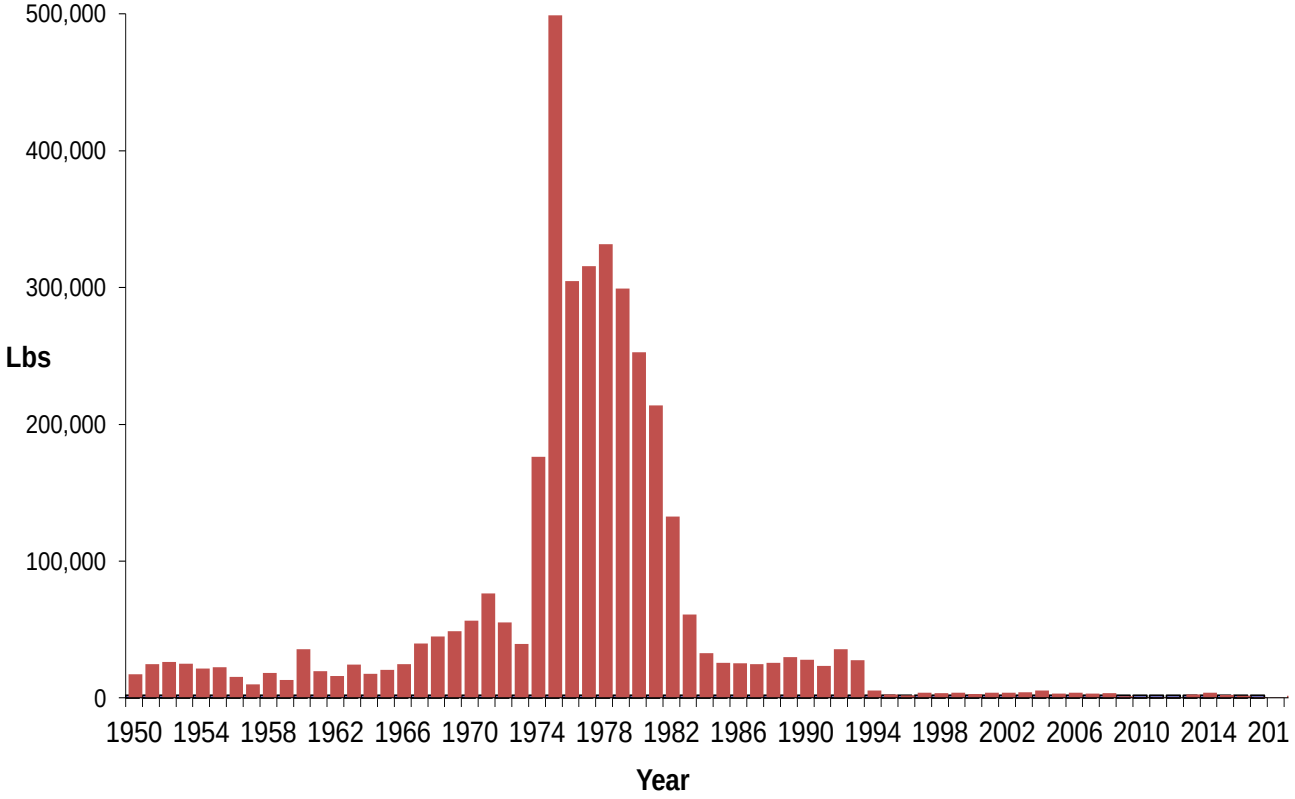
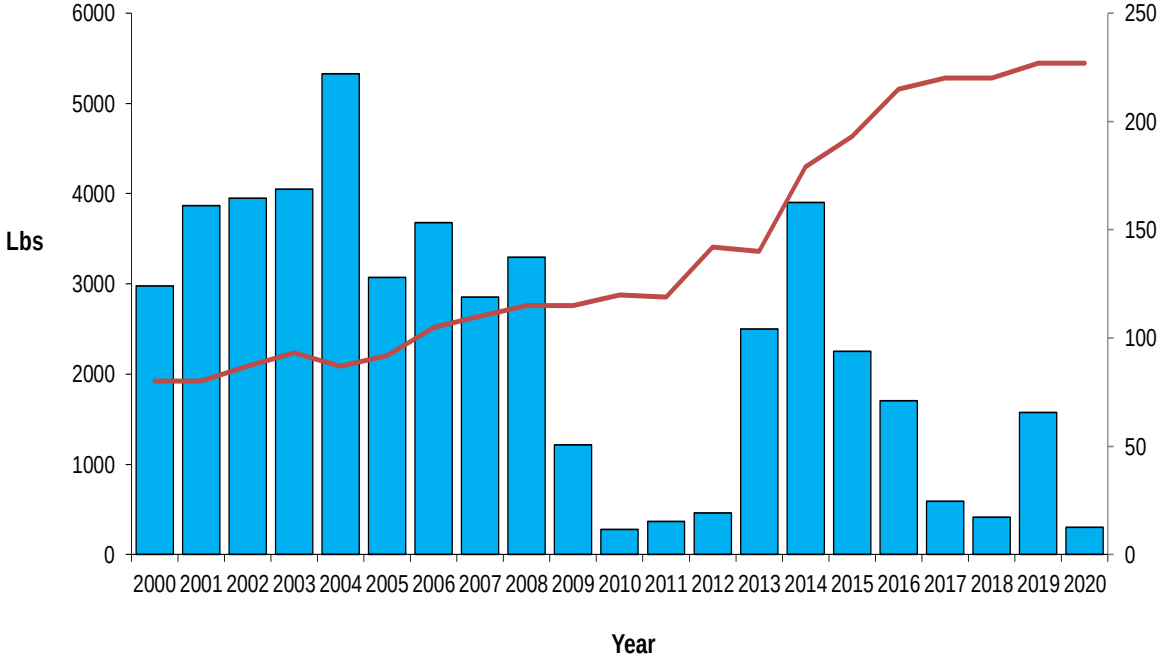
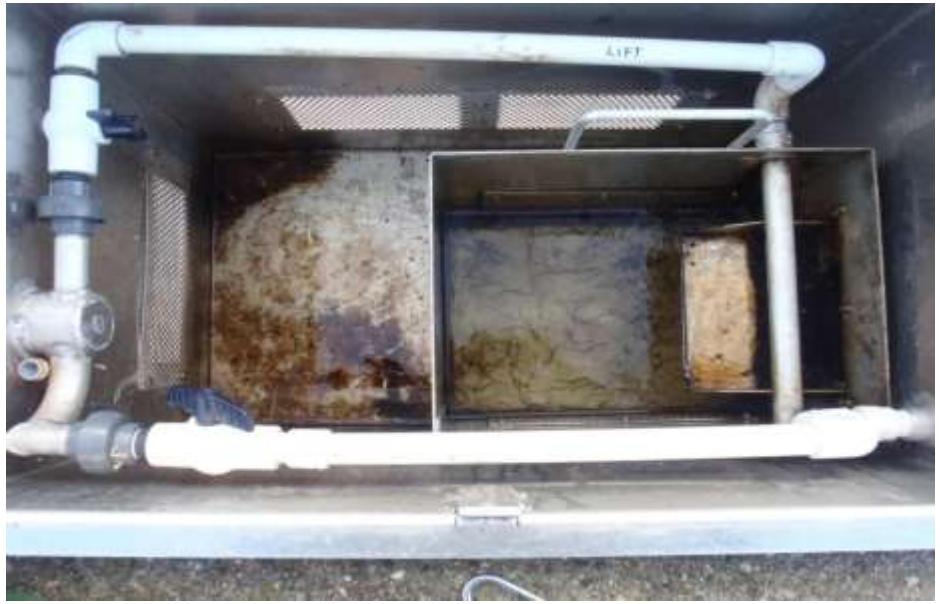


Figure 2. Commercial harvest of American eel reported to MADMF during ASMFC FMP period of 2000-2020; with annual permit numbers in secondary Y-axis.

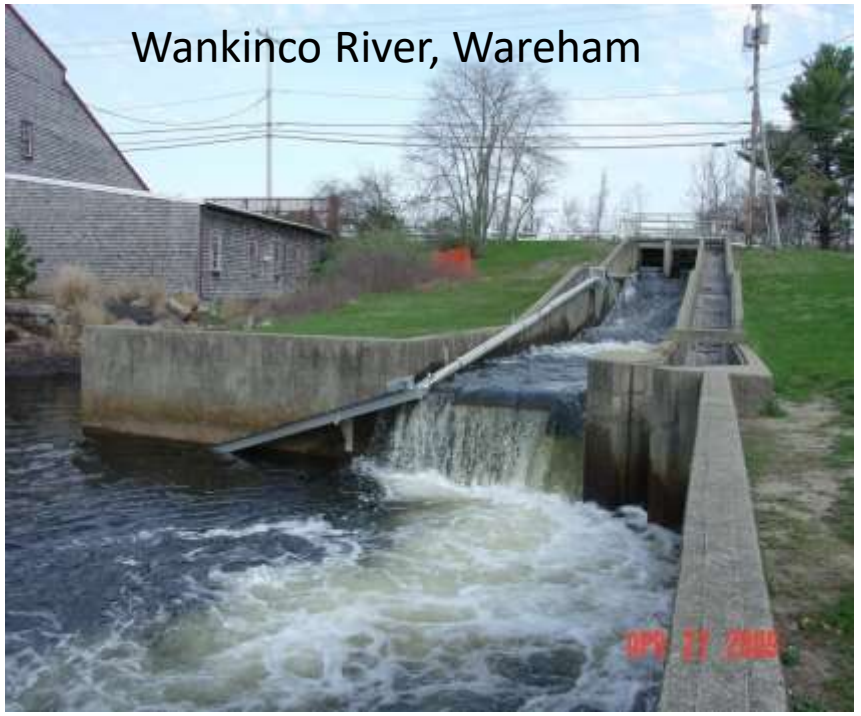


Eel Passage Improvements

- Can climb wet, rough surfaces
- Poor swimming capability against higher velocity
- Installing eel passes in coastal rivers: 12 since 2007
- Dam removals increasing




Grassy Pond, Harwich


Wankinco River, Wareham


Pilgrim Lake, Orleans


Lake Sabbatia, Taunton

American Eel Status

- Raising awareness…..
- Conservation Management taking shape
- Passage improvements are increasing
- Populations remain low with uncertainty over slow response
- World markets put glass eel abundance at risk
- Freshwater habitat concerns
- Ocean warming impact on marine habitat