

RESTORING AND MONITORING MIGRATORY FISH POPULATIONS IN THE PIE WATERSHEDS

PIE ANNUAL MEETING

TUESDAY DECEMBER 5, 2017

BEN GAHAGAN, MASSACHUSETTS
DIVISION OF MARINE FISHERIES

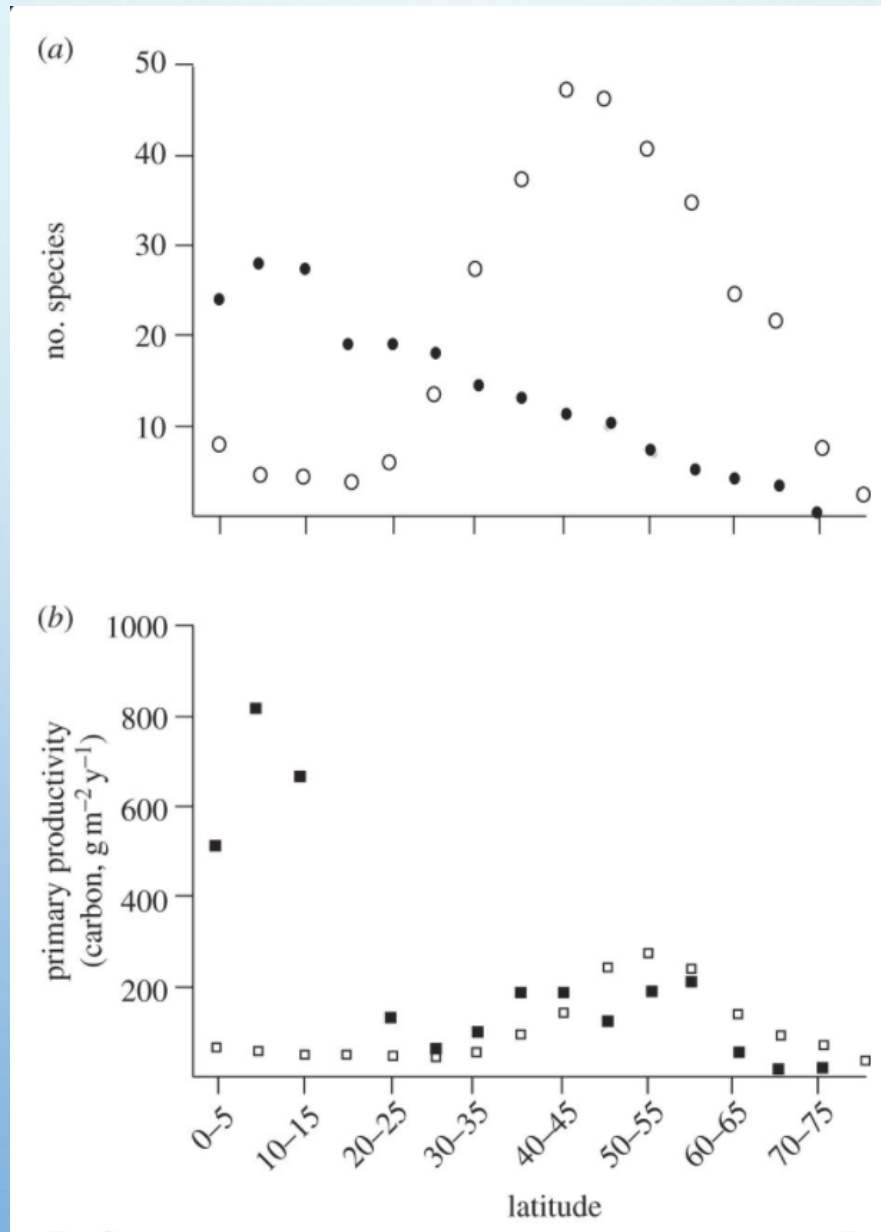
MarineFisheries
Commonwealth of Massachusetts

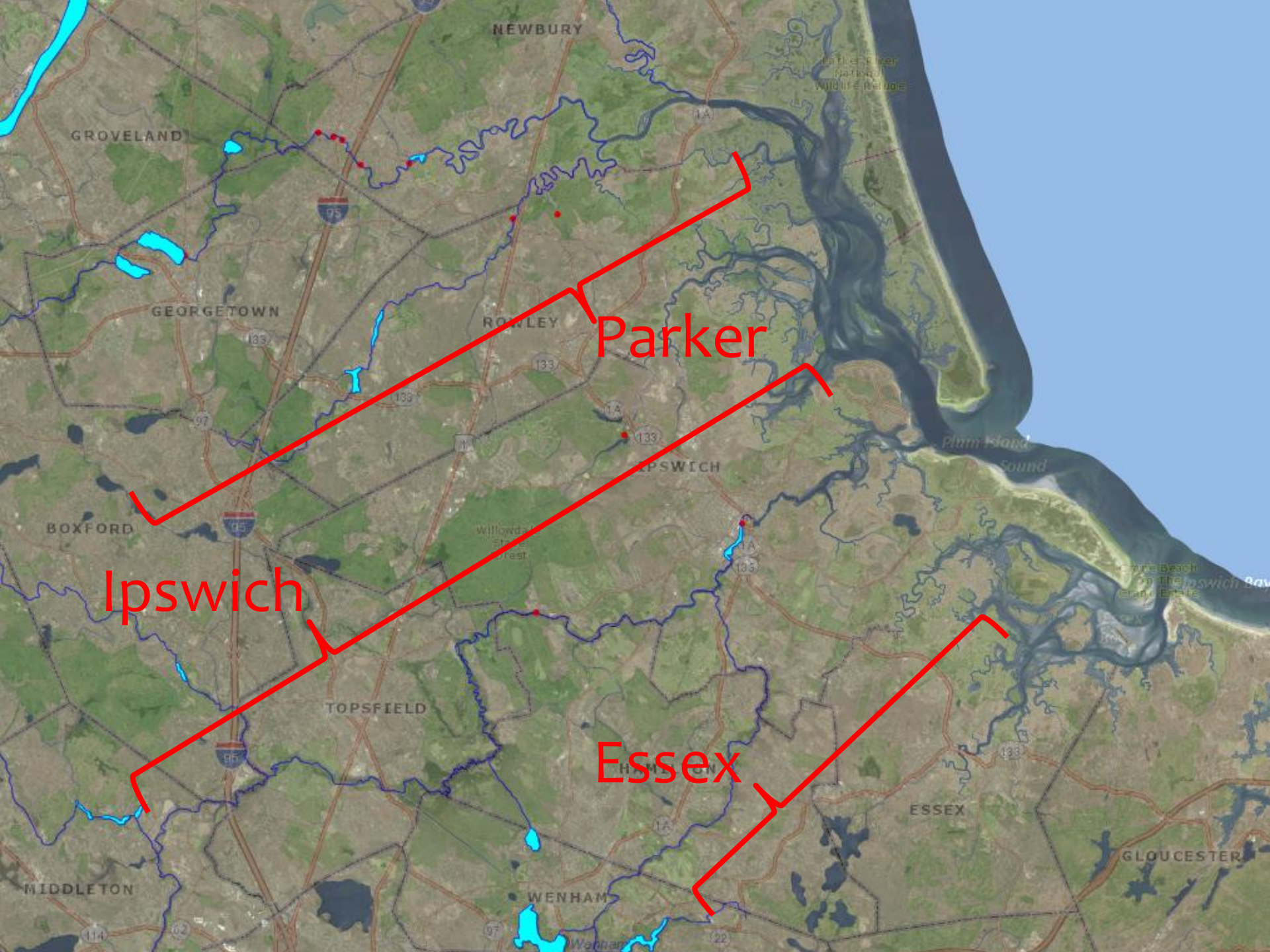


DIADROMY

- DIADROMY IS AN UMBRELLA TERM FOR ORGANISMS THAT MOVE BETWEEN FRESH AND SALT WATER TO COMPLETE THEIR LIFE CYCLE.
 - ANADROMY: SPAWN IN FRESH, LIVE MAJORITY OF LIFE IN MARINE (RIVER HERRING, SHAD, SALMON, SMELT)
 - CATADROMY: SPAWN IN MARINE, LIVE MAJORITY OF LIFE IN FRESH (AMERICAN EEL)

WHY DIADROMY?



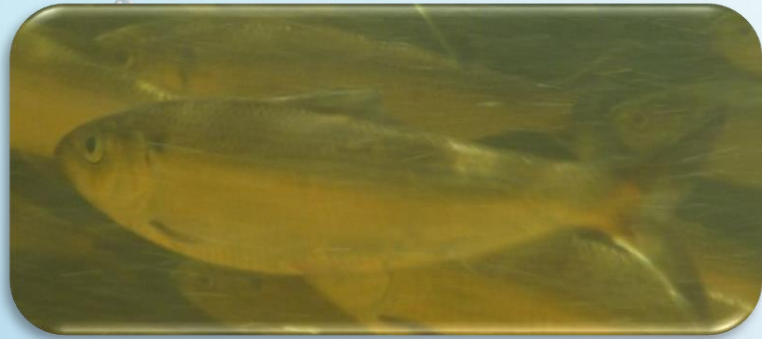


Parker

Ipswich

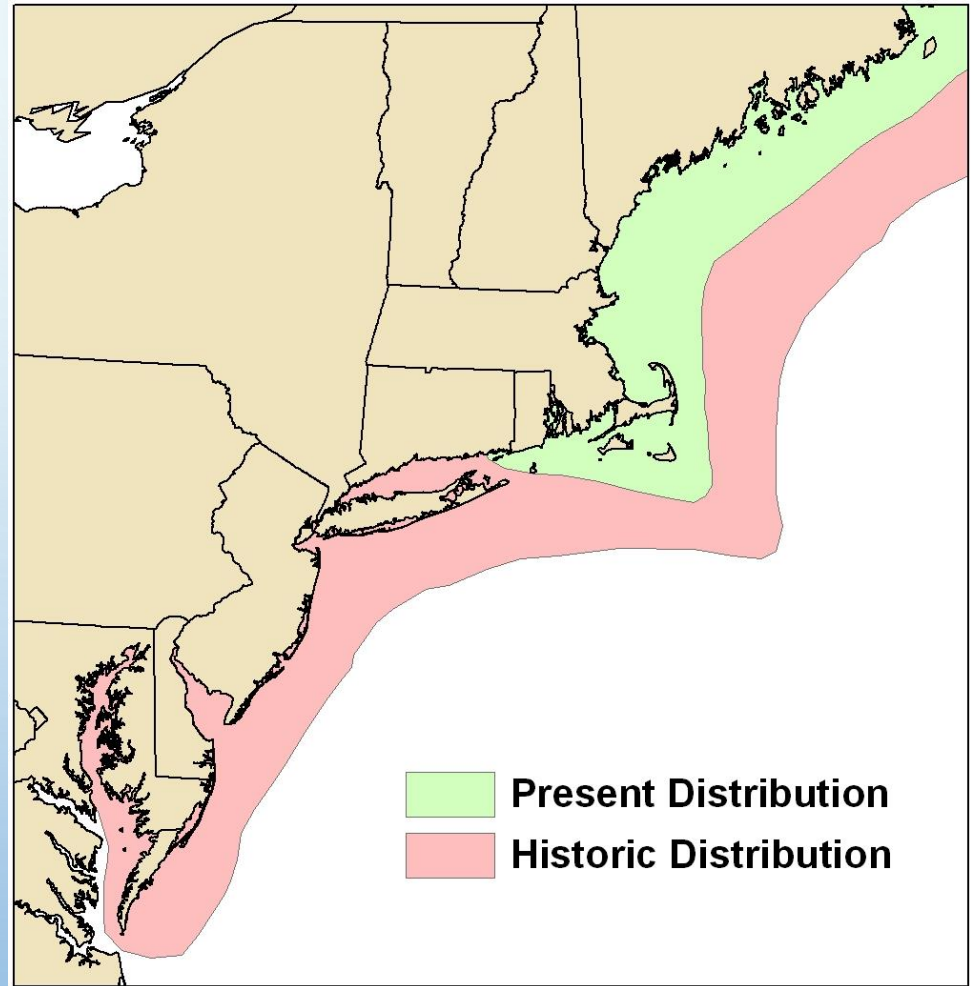
Essex

THE USUAL SUSPECTS

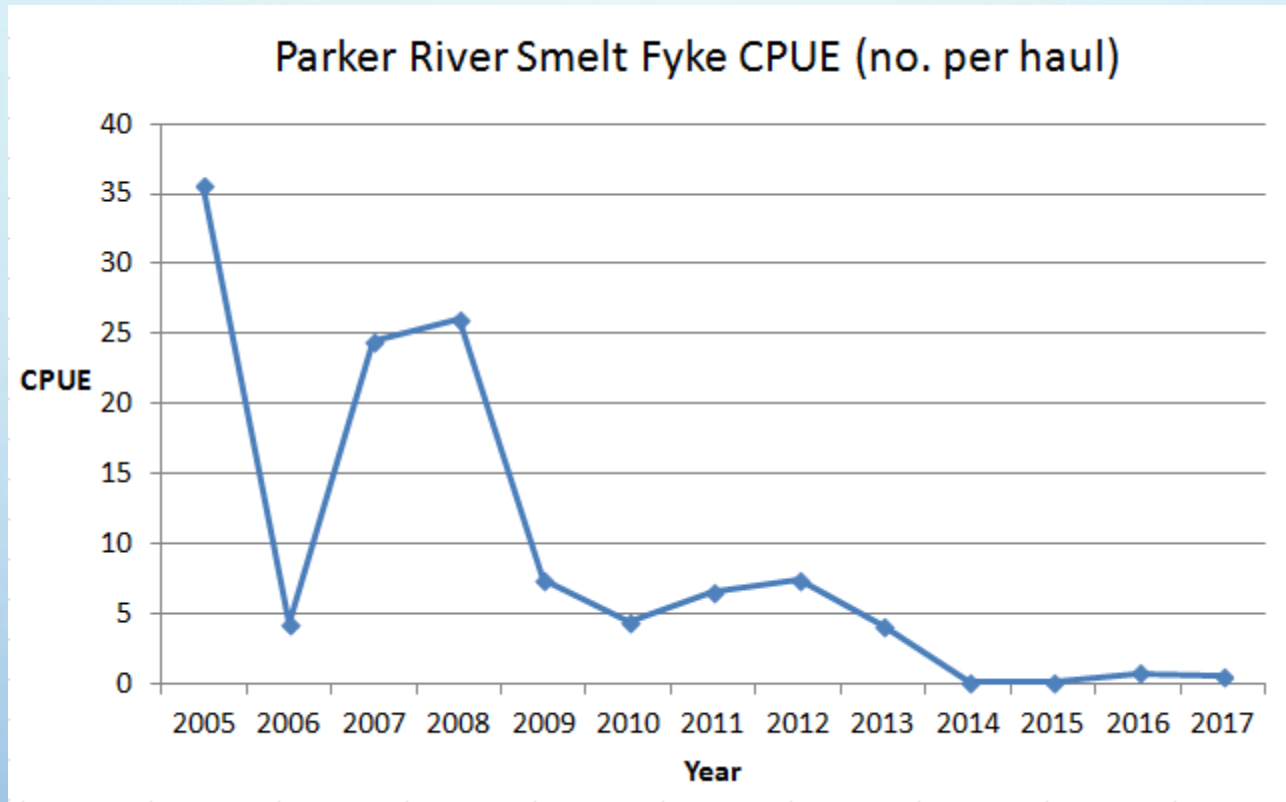


RAINBOW SMELT

- Remarkable range contraction in the past century
 - Catches in MA, NH, and ME greatly reduced in last 20 years
- Likely strongly tied to climate change, future of species in US is uncertain



RAINBOW SMELT

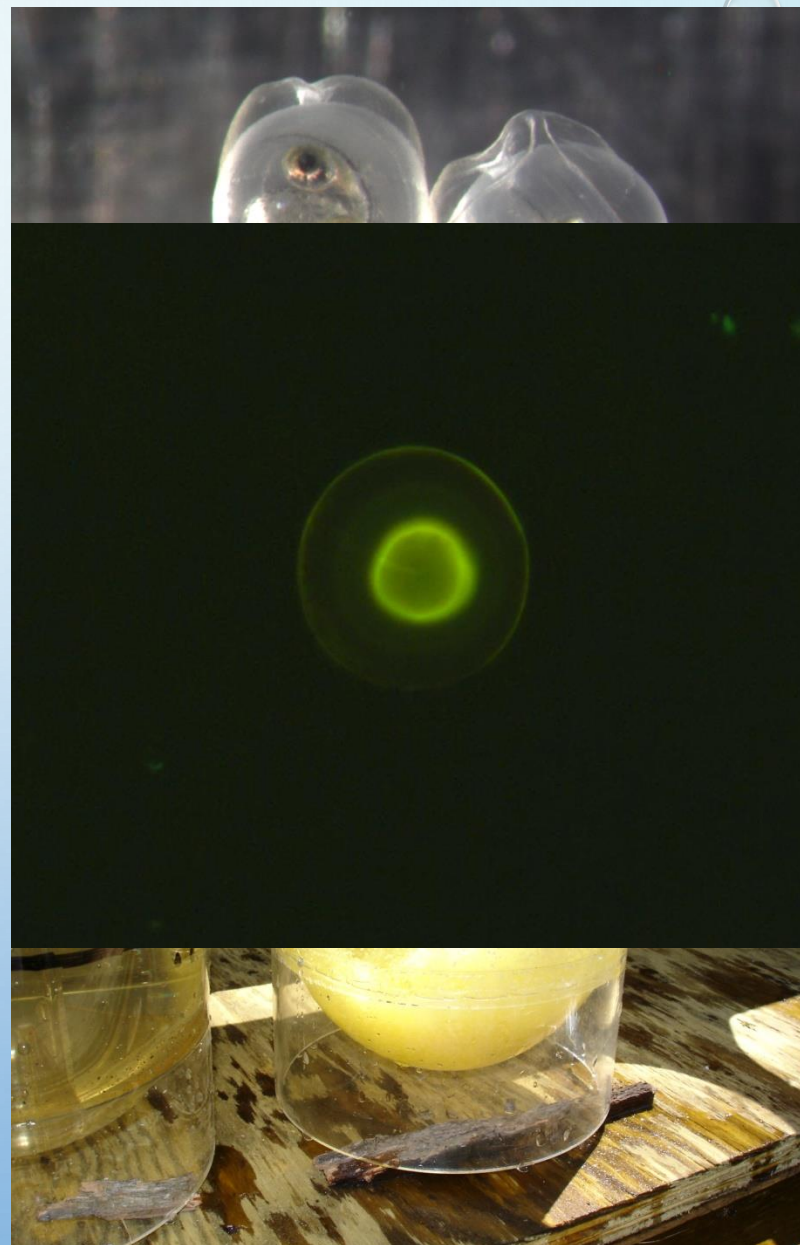


RAINBOW SMELT

- Restoration effort 2007-2013 in the North, Saugus, Crane, and Essex rivers

Year	Larvae Stocked
2007	1,619,221
2008	1,378,395
2009	4,251,555
2010	2,792,397
Total	10,041,568

- Total of 35 marked fish recovered through 2010



AMERICAN EEL



AMERICAN EEL

- Multiple petitions for ESA status have reached negative determinations
- Coastwide abundance is considered depleted but relatively stable at a low level

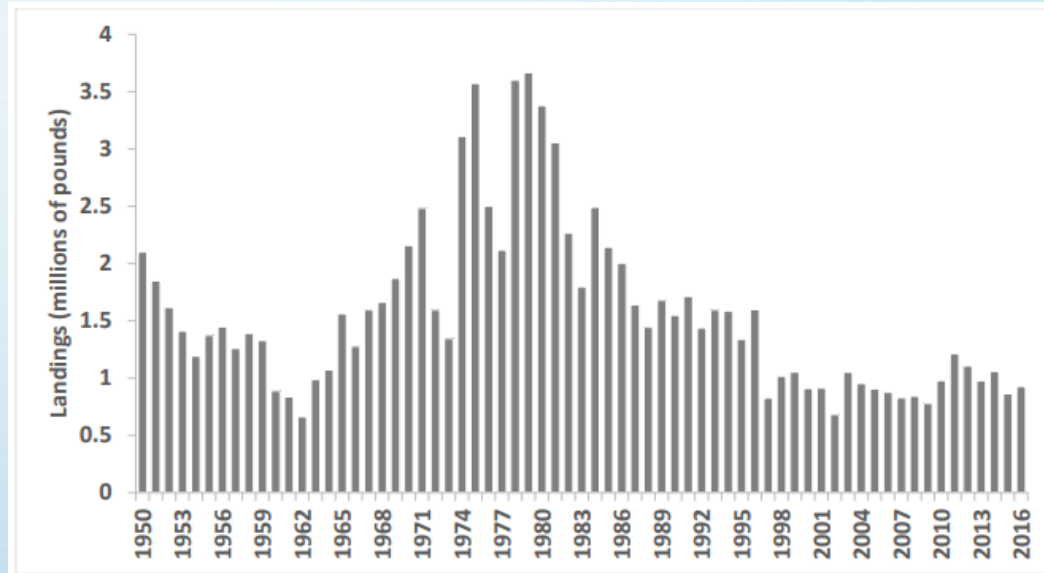
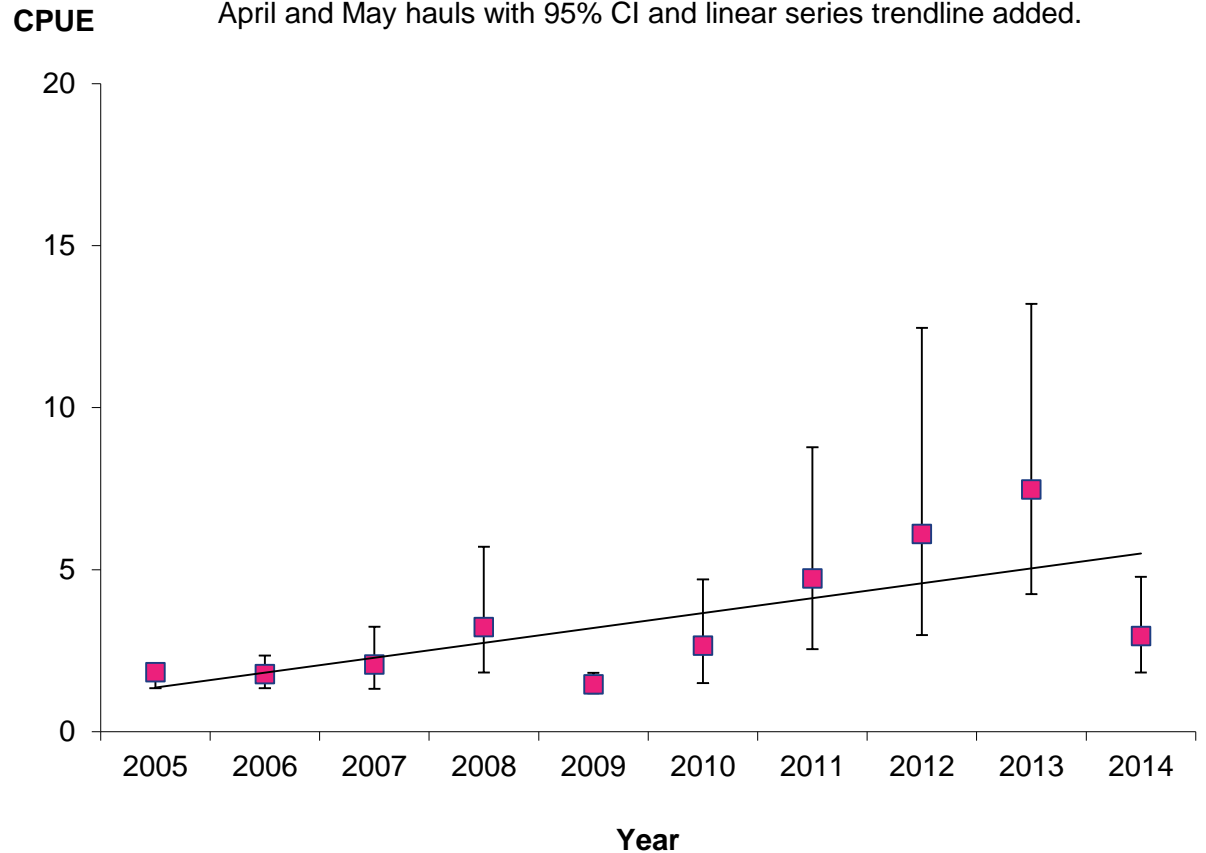


Figure 7. Total commercial landings of American eel along the U.S. Atlantic Coast, 1950–2016. Landings in 2016 are preliminary.

AMERICAN EEL

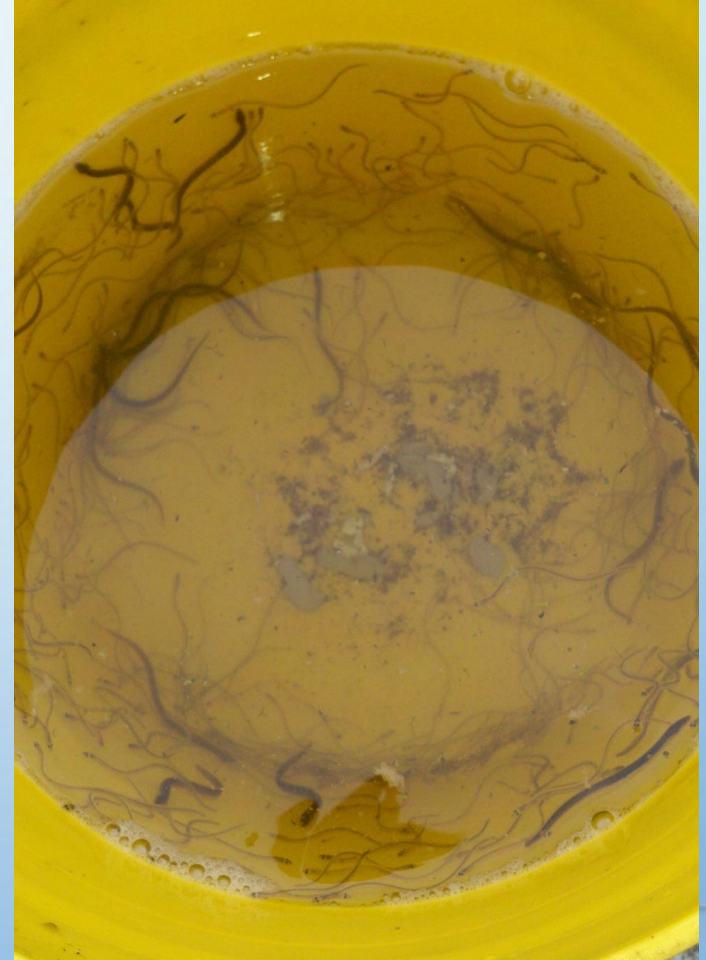
- Parker River
 - Sheldon Trap
 - Discontinued in 2014, moved to Essex River

Figure 4. American eel YOY Sheldon trap catch in the Parker River, Newbury, MA, 2005-2014. Geometric mean catch per haul are shown for April and May hauls with 95% CI and linear series trendline added.

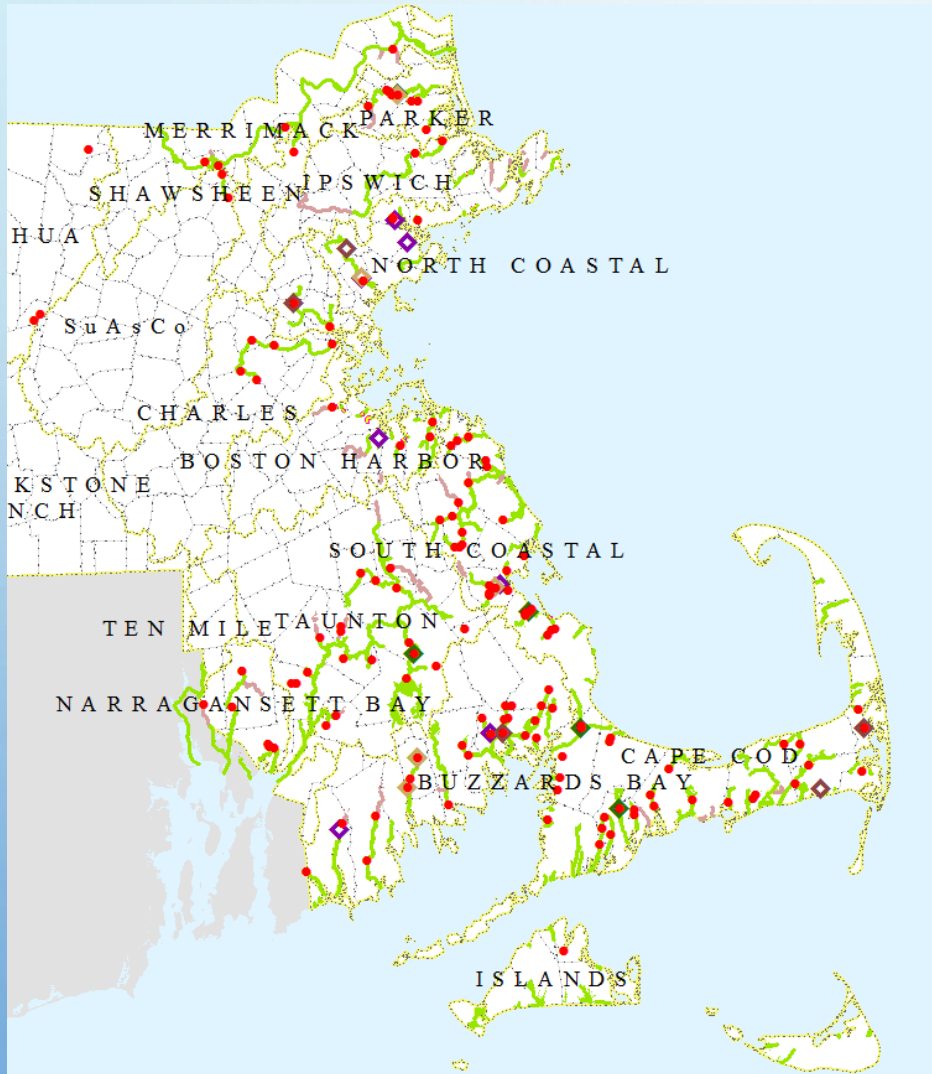


AMERICAN EEL

- Harvest: No glass eels in MA, but yes in ME... led to rampant poaching in past
 - Reforms to system in Maine, along with large-scale enforcement actions, appear to have greatly reduced illegal harvest
 - Yellow eel harvest legal in tidal waters but not in freshwaters
 - Recreational: 25 fish, >9"
 - Commercial permits available



RIVER HERRING IN COASTAL MASSACHUSETTS

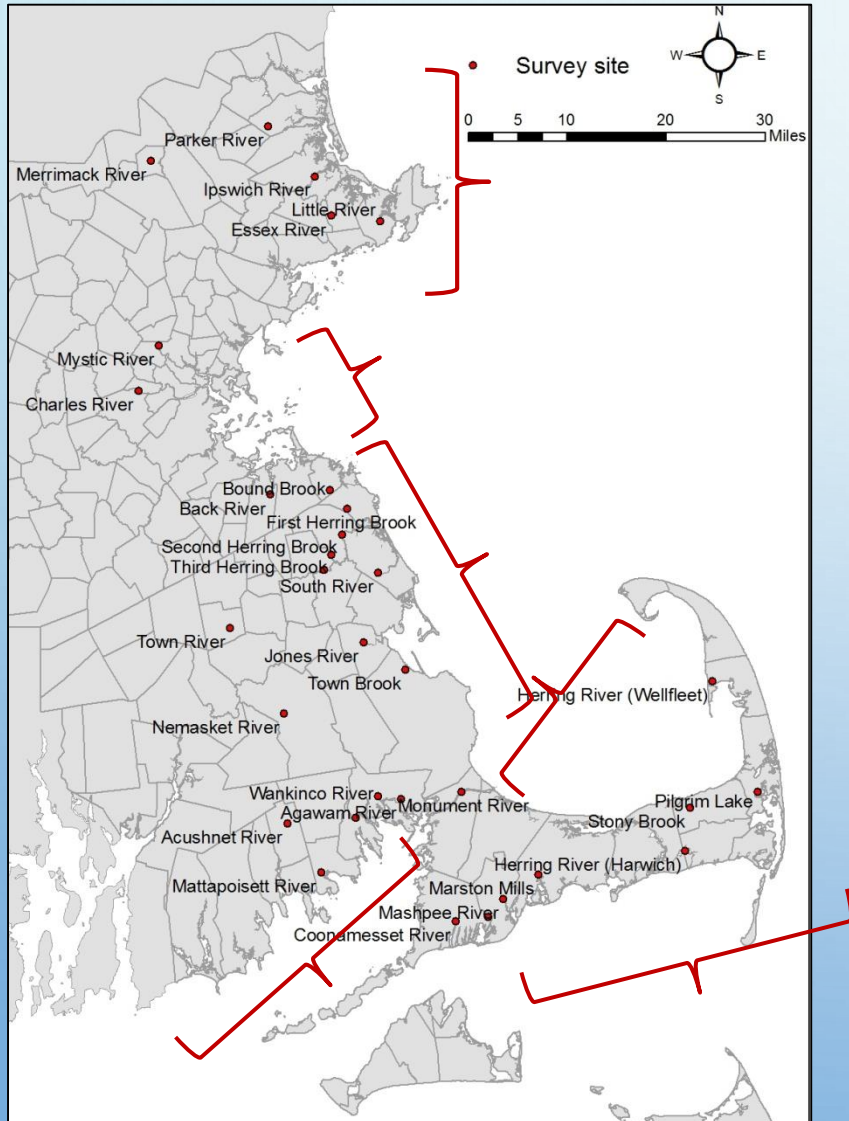


- 48 MA Towns with river herring runs

- 78 river herring runs

- >140 fishways

RIVER HERRING IN COASTAL MASSACHUSETTS



- 33 runs with Abundance Data surveys
 - 14 'census' level quality
- 8 runs with Biological Data surveys

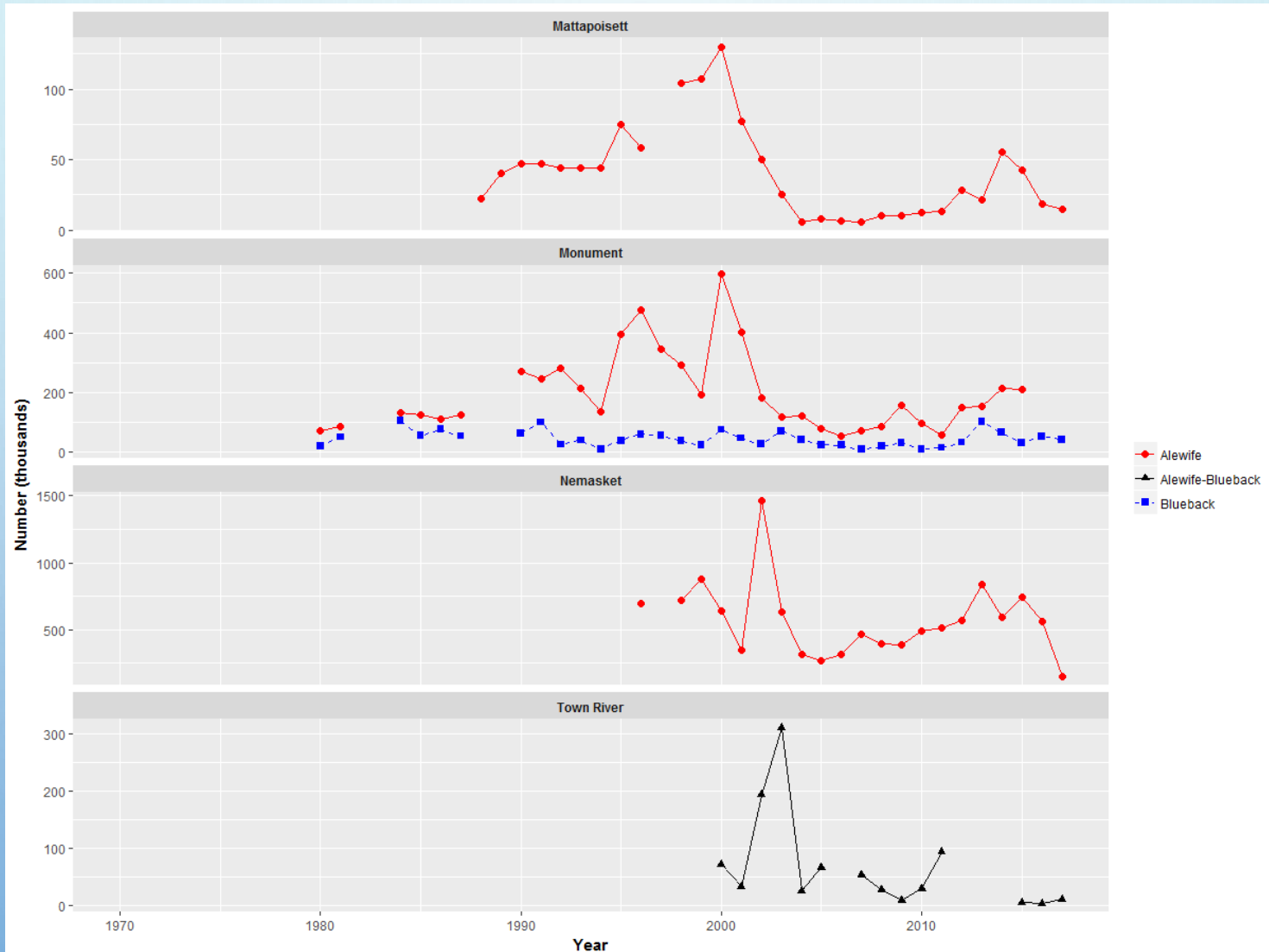
Program Goal: Establish a joint census count/biological data site in each major basin of coastal Massachusetts

RIVER HERRING MONITORING

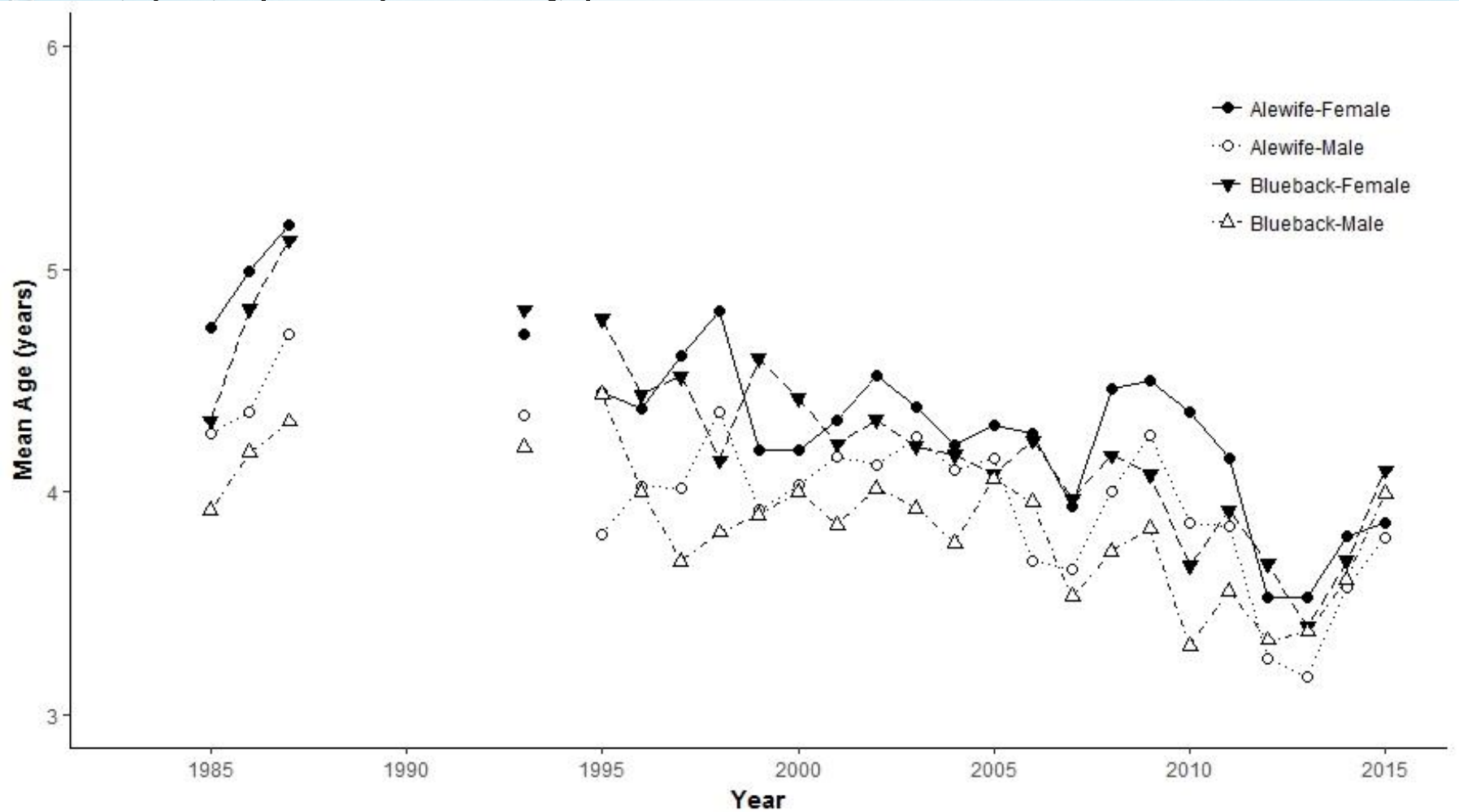
- All the monitoring equipment
-
-
-
- The river has been visually monitored



RIVER HERRING MONITORING



RIVER HERRING MONITORING



RIVER HERRING RESTORATION



RIVER HERRING RESTORATION

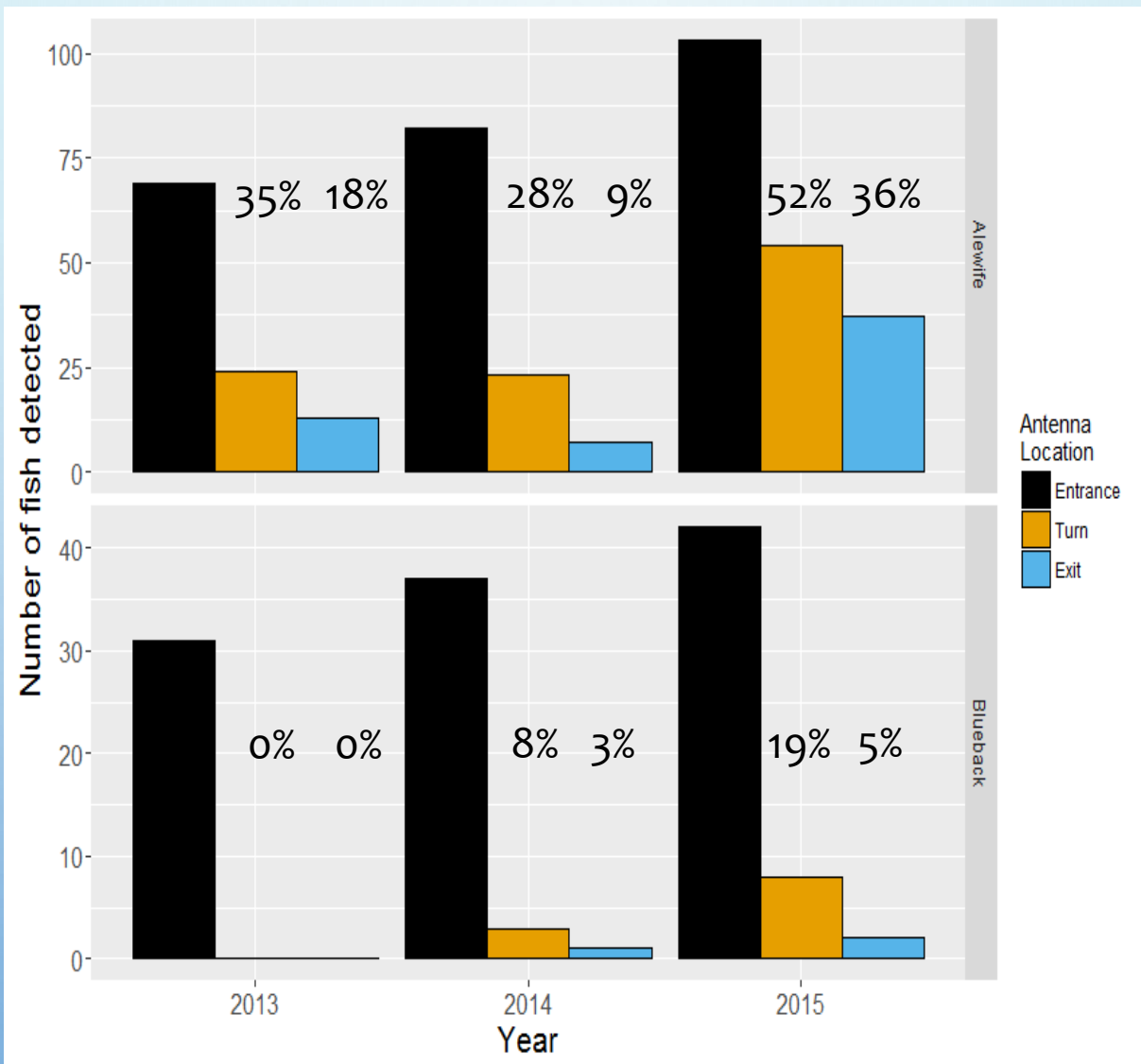
- Parker: Passage efficiency study

RIVER HERRING TAGGED

YEAR	ALEWIFE	BLUEBACK	TOTAL
2013	237	206	443
2014	202	216	418
2015	114	225	339
TOTAL	553	647	1200



PASSAGE RATES



RIVER HERRING RESTORATION

- Parker: Passage improvements, stream maintenance, transport



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FISHWAY OPERATIONS AND MAINTENANCE PLAN

Location: Ipswich Mills Dam, Ipswich, Massachusetts

Latitude and Longitude: 41°40'39.110"N and 70°50'15.572"W

Watershed Information: The Ipswich River runs for approximately 45 miles through a drainage area of 155 mi² to discharge in Plum Island Sound. Despite the contemporary absence of access to large impoundments for river herring spawning and nursery habitat, the Ipswich River is considered to have high potential for diadromous fish restoration due to the large amount of main

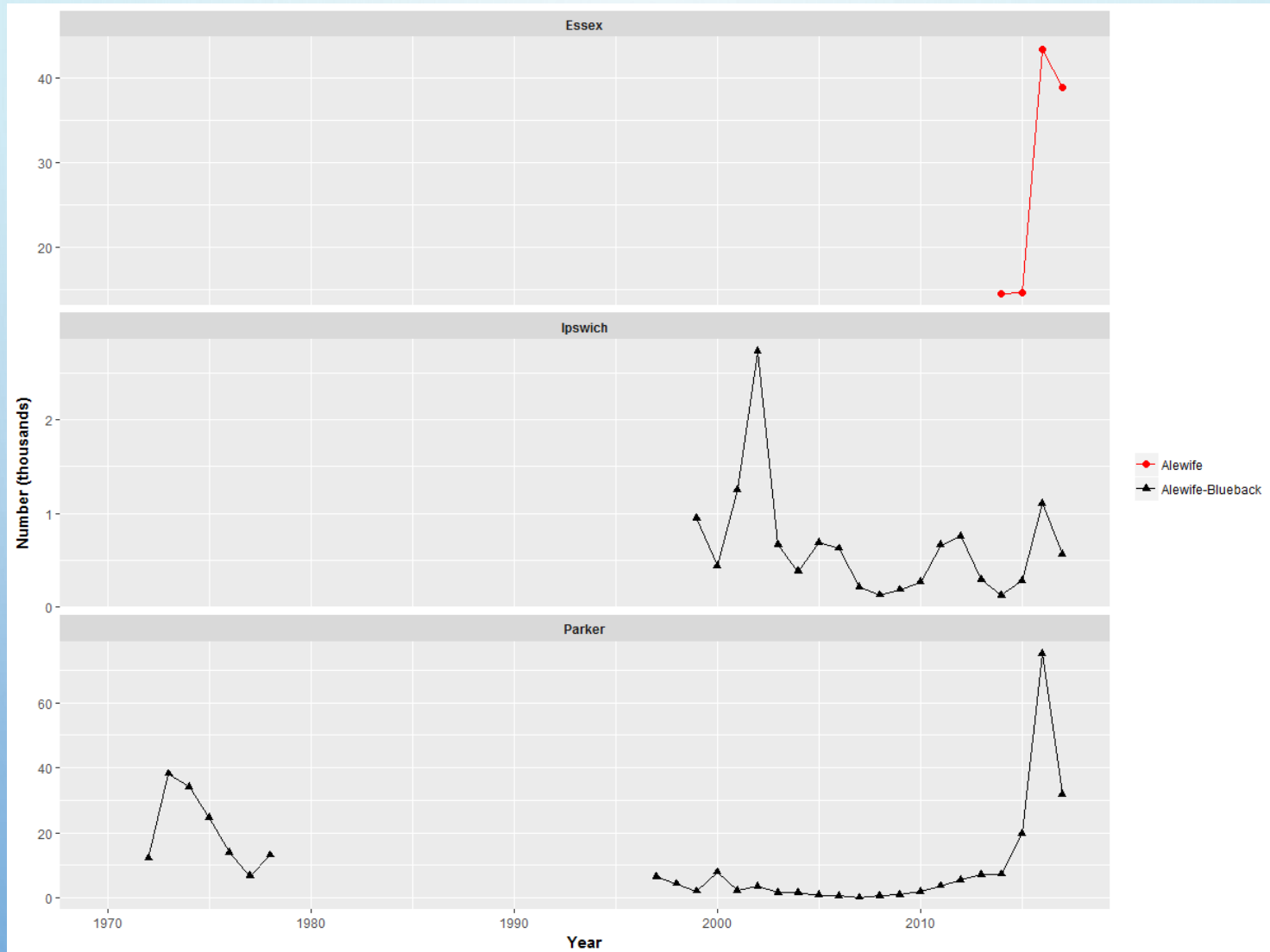
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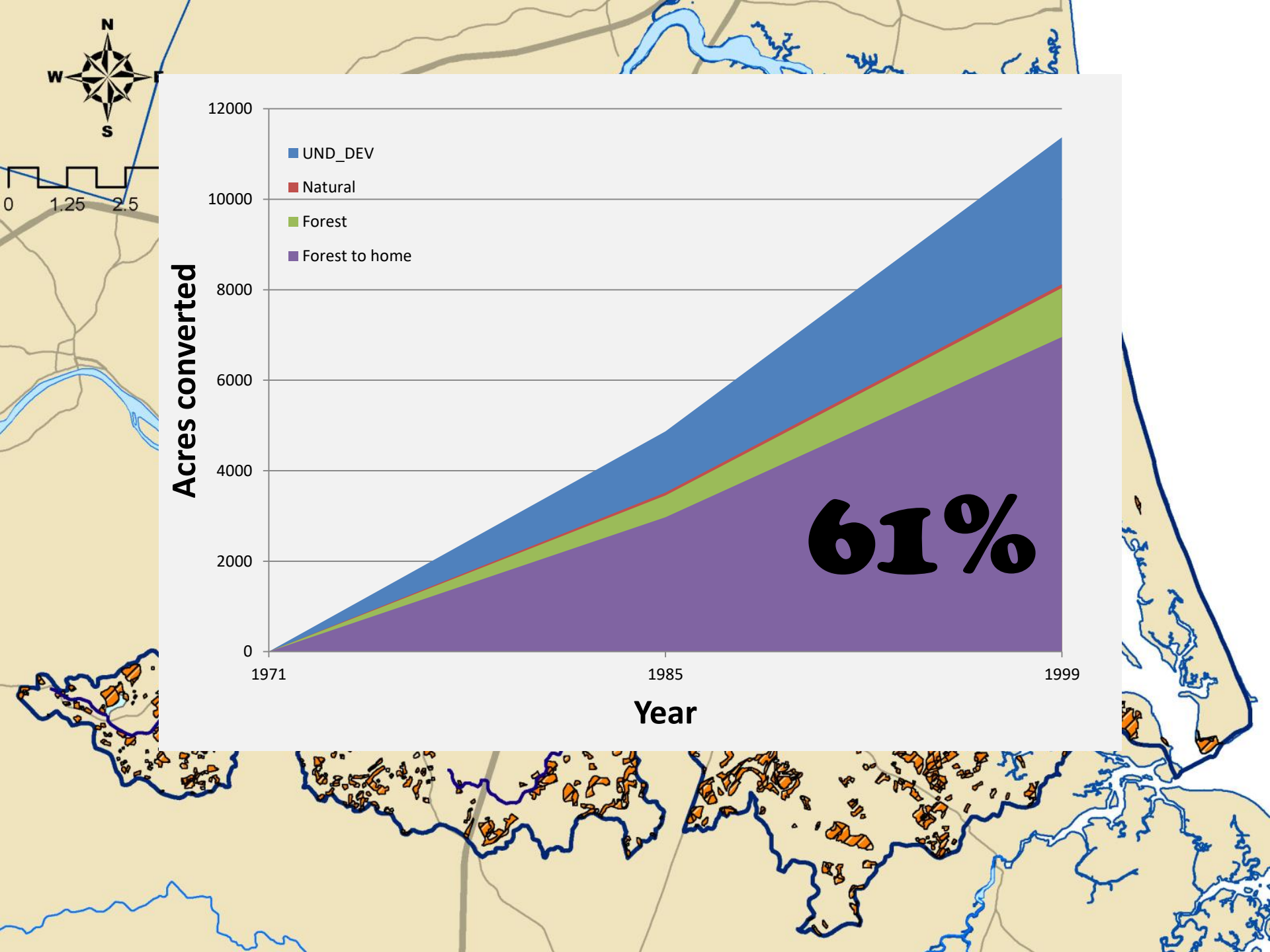
RIVER HERRING RESTORATION

- Essex: Stream maintenance



PROGRESS



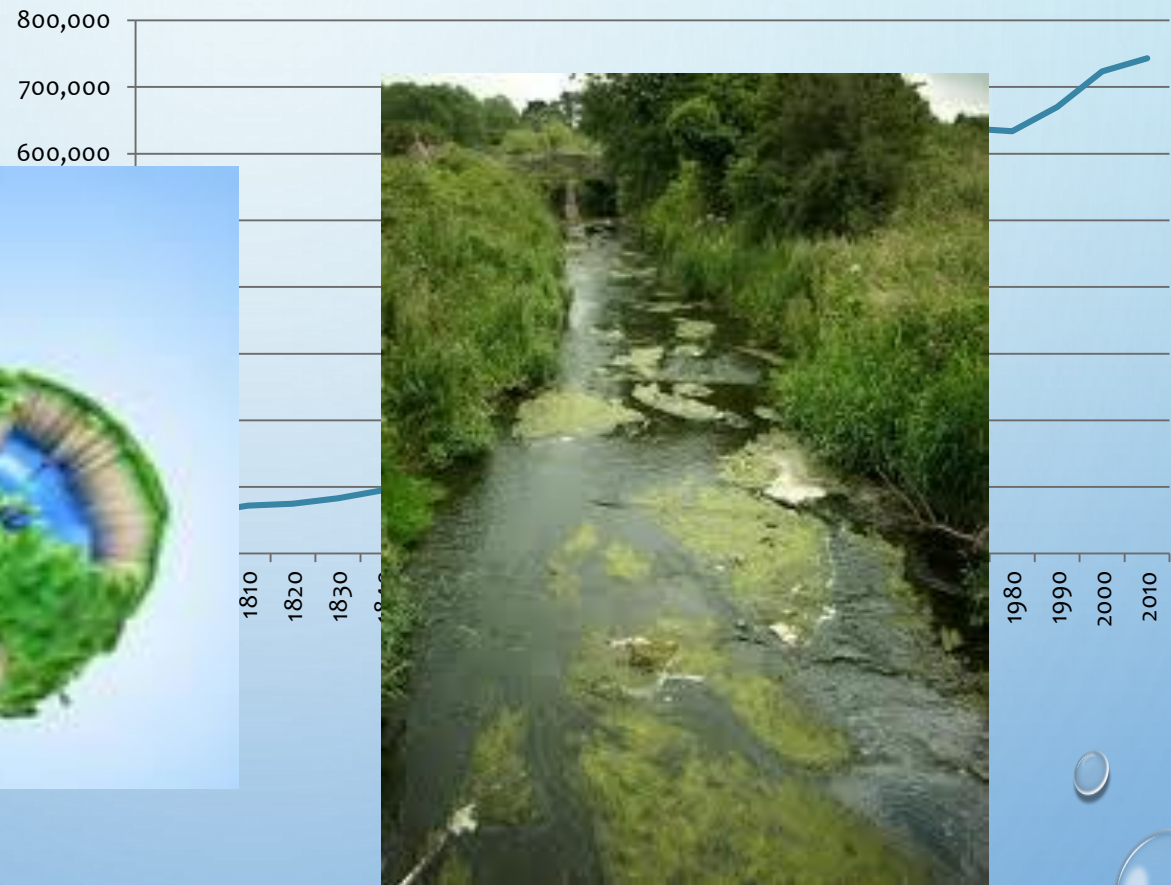


THE FUTURE

- ESSEX COUNTY
 - 743,159 PEOPLE



Essex County Population




WHAT CAN WE DO?

- Water QUANTITY and quality
- Volunteer! Stream maintenance needs far outweigh available resources
- Be an ambassador in your community
- Participate in river restoration efforts locally




CONTACTS AND RESOURCES

- Ben Gahagan, North Shore Diadromous Fish Biology and Restoration
 - Ben.Gahagan@state.ma.us 978-282-0308 x140
- Brad Chase, Diadromous Fish Biology and Restoration Project Lead
 - Brad.Chase@state.ma.us 508-990-2860 X118
- <https://www.mass.gov/service-details/diadromous-fisheries-project>
 - Stream Maintenance protocol
 - River Herring Counting protocol
 - Herring Stocking protocol



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Lieutenant Governor
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Secretary
George N. Peterson, Jr.
Commissioner
Mary-Lee King
Deputy Commissioner

Stream Channel Maintenance Protocols
for Diadromous Fish Passage - 2016

Introduction

The Massachusetts Division of Marine Fisheries (*Marine Fisheries*) is authorized to maintain passageways for diadromous fish in the Commonwealth of Massachusetts, and routinely provides related guidance to property owners and municipalities. This activity includes the construction of fishways, removal of obstructions, and maintenance of stream channels to allow safe and efficient fish passage. The relevant authorities include M.G.L. Chapter 130 §19 on maintaining sea-run fish passage, the Wetlands Protection Act (WPA, M.G.L. Chapter 131 §40), and Massachusetts regulations (principally CMR 310 10.35). With regards to stream channel maintenance, the recommended actions are mainly limited to hand cutting vegetation and debris removal that will offer enough relief from channel obstructions to allow fish passage with no alteration or impendence of wetland functions or WPA performance standards.

QUESTIONS?



DIADROMY

- Anadromous



2-9 months



- Catadromous



10-20 years

