



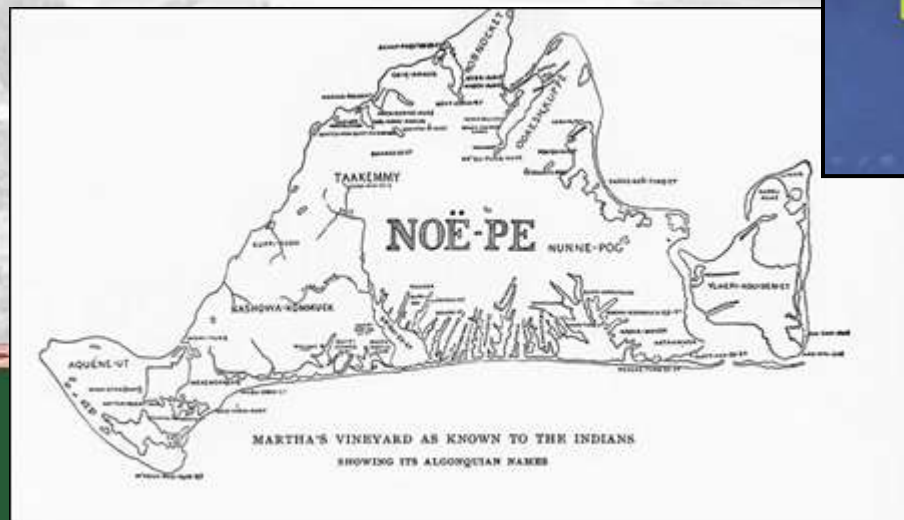
# Wampanoag Tribe of Gay Head (Aquinnah)

## Herring Monitoring and Restoration





# Aquinnah Herring Monitoring and Restoration







# Aquinnah Herring Monitoring and Restoration



## Project Overview:

- Species of Cultural Importance
- Indigenous knowledge, habitat use, biodiversity
- Ability to restore Tribal Herring Fishery

## Restoration effectiveness and system recovery:

- Effects of climate change
- Cultural and subsistence species of importance
- Movement and migration
- Dredging
- Biodiversity assessments
- Habitat and health
- Water quality
- Characterize predation





# River Herring



Blueback Herring (*Alosa aestivalis*)  
Alewife (*Alosa pseudoharengus*)

Anadromous fish species: can live in both  
fresh and saltwater

Important forage species local for birds,  
mammals and fish

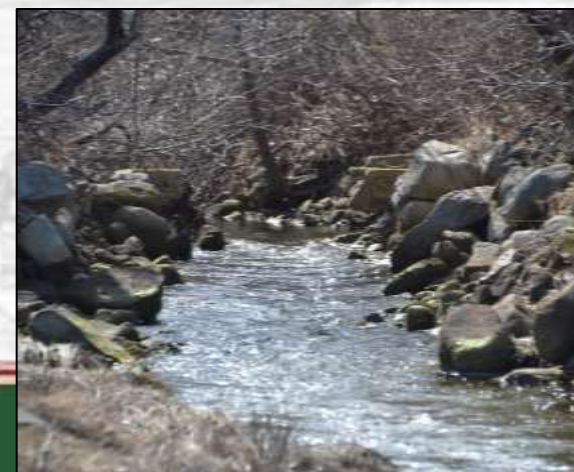
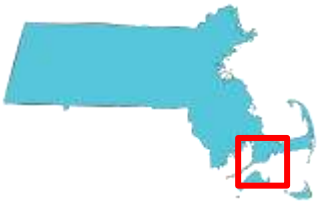
Significant cultural and sustenance resource







# Herring Creek







# History



Harvesting from the Aquinnah herring run 1990's



Aquinnah Herring Creek 1917

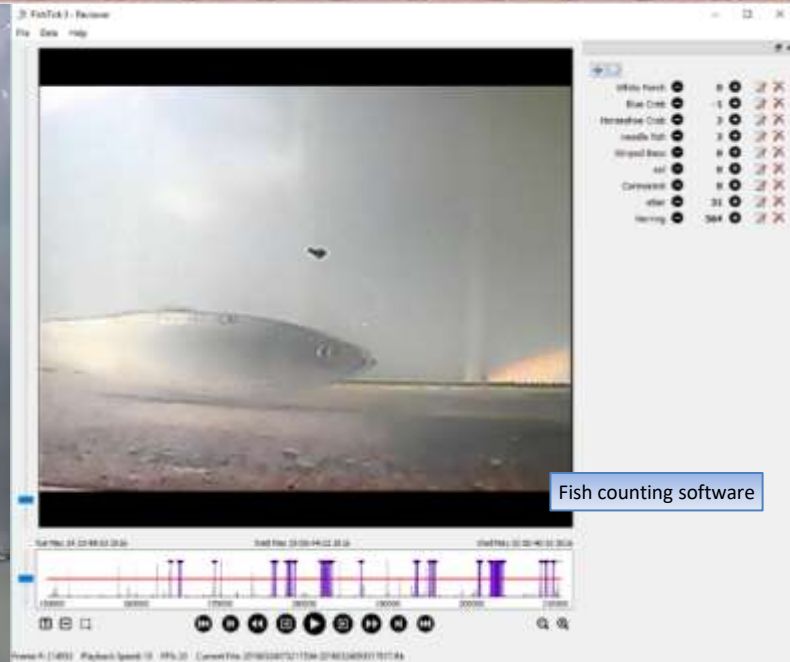


Other island herring runs were also abundant.  
Mattakesett Herring Run 1925





# Population Assessments



Installation of herring monitoring weir





# Biodiversity



Over 40 different species have been identified on camera utilizing the herring run

- Alewife
- American Eel
- Atlantic Needlefish
- Atlantic Silverside
- Blueback Herring
- Blue Crab
- Double-crested Cormorant
- Green Crab
- Horseshoe Crab
- Killifish Sp.
- Muskrat
- Otter
- Red-breasted Merganser
- Sand Shrimp
- Striped Bass
- Three-spined Stickleback
- White Perch
- Winter Flounder



American Eel



Otter



Horseshoe Crab



Striped Bass

\* List only reflects species viewed and recorded with the underwater camera. Additional bird and mammal species were documented in and around the run during counting efforts.





# Population Assessments



Wampanoag Tribe Aquinnah Herring Counts

2016-2022



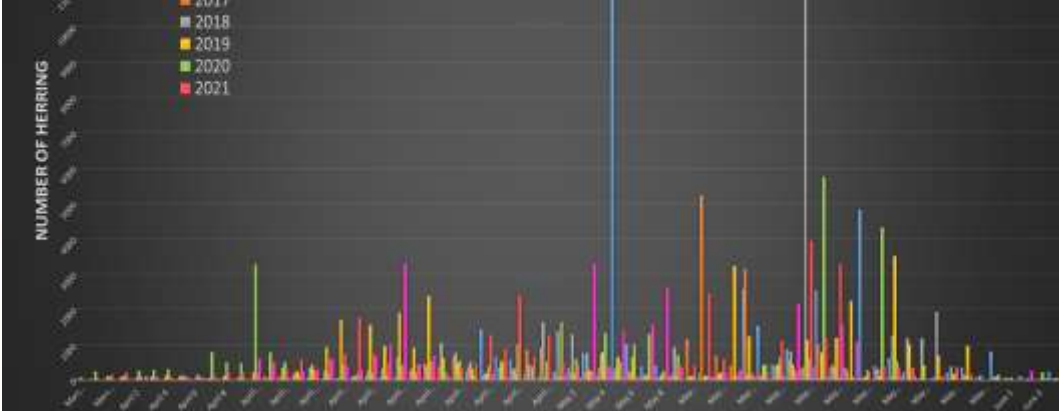
Approximately 37,000 herring migrate through the Aquinnah run each year

## Unique Findings

- Vast majority of Aquinnah herring pass through the run at night.
- Peak of each year's run occurs during a rain event and at the height of a lunar tidal event (very high tides)
- Up to a third of an entire year's population may come through the run in a single day (Highest count for a single day was 13,759 herring during the 2018 run)

Wampanoag Tribe Daily Herring Counts

2016-2021



Year	Total Count
2016	35,173
2017	22,556
2018	37,377
2019	37,182
2020	37,362
2021	34,689
2022	27,435



## Continuing Monitoring and Restoration Efforts

### Goals and Objectives under current Tribal Wildlife Grant:

- Species Movement and Migrations
- Dredging
- Biodiversity
- Habitat and Ecosystem Health Assessments
- Water Quality
- Food Web Dynamics
- Education and outreach







# Movement and Migration



## Movement and Migration

- Fish Tagging
- PIT tag tracking system (Passive Integrated Transponders)
- 521 herring tagged
- Annual repeat spawners identified







# Dredging





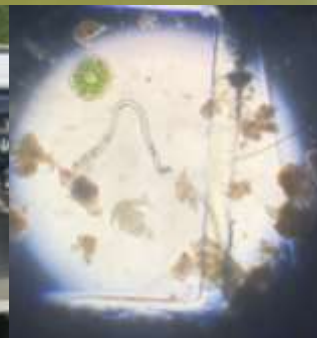


# Biodiversity



## Biodiversity

- eDNA Sampling
  - Vertebrates
  - Invertebrates
  - Aquatic macroinvertebrates
  - Bacteria
- Seine Netting
- Plankton Tows
- Video Counts
- Zooplankton



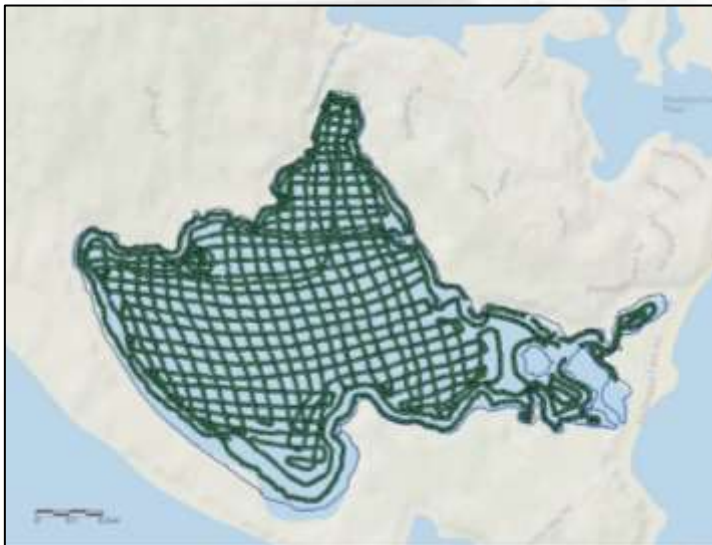
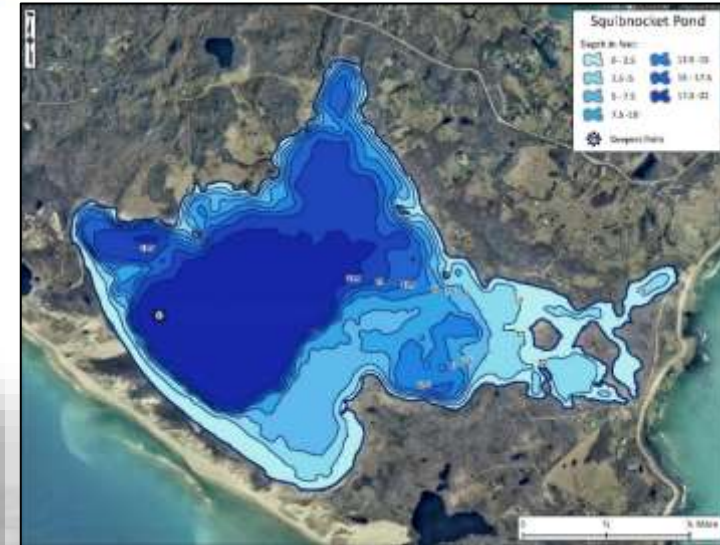


# Habitat Study



## Habitat Surveys

- Bathymetry
- Benthic Habitats
- Sediment Surveys
- Water Quality







# Water Quality Monitoring

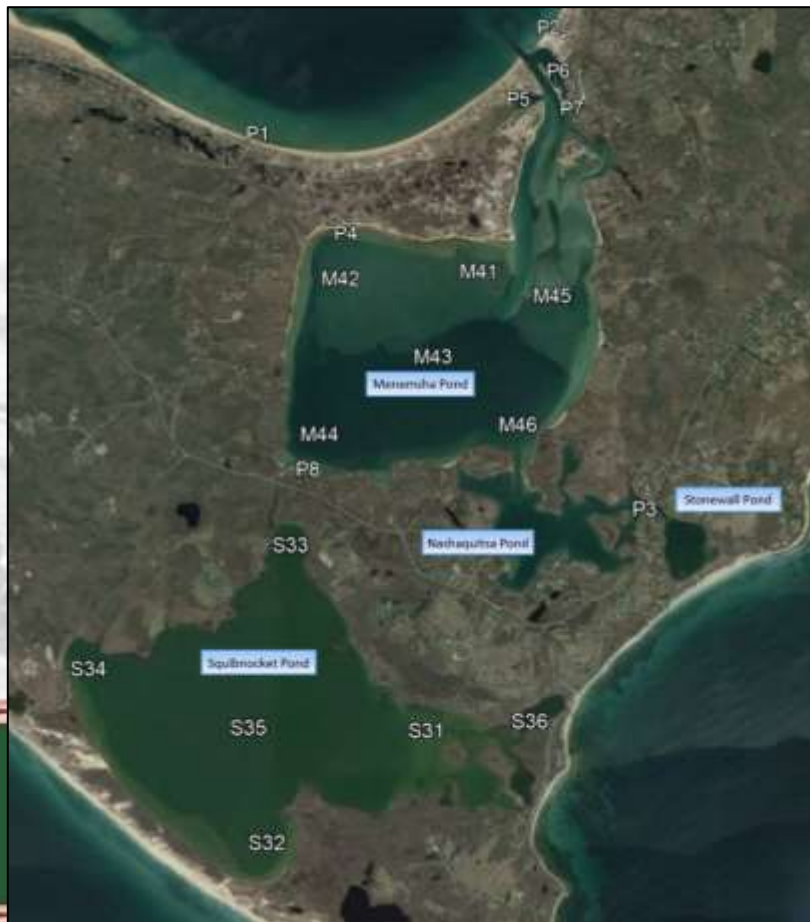


EPA approved water monitoring program

20 sampling sites in and around the Menemsha Pond Complex

Collection and analysis of over 700 samples yearly

Monitor watershed health; enhance, protect, and restore water quality





## Outcomes and Benefits

- Restoration of Tribally significant fishery and sustenance resource
- Effective fishery management plans
- Expansive understanding of ecosystem and species interactions through habitat assessments
- Identification of herring spawning grounds
- Biodiversity inventory of species on and around tribal trust lands and waters
- Recommendations for habitat improvements to restore a functioning herring and eel fishery and food supplies
- Tribal and Community Outreach Engagements
- Develop long-term monitoring and management activities that increase the viability of a sustainable fishery and plan for climate change





# Thank You

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