Monitoring Passage of Alewife & American Shad through Pawcatuck River Restoration Sites, RI

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Alewife (*Alosa pseudoharengus*)

Alewives (*Alosa pseudoharengus*) are small herring that have a dark bluish to greenish back and light sides with horizontal darker stripes. Alewives also have a distinct dark round spot directly behind the gills and can be easily identified by their sharp belly consisting of serrated or saw-toothed scales.

American Shad (*Alosa sapidissima*)

American shad can be distinguished by their elongated silver body, broad triangular shaped head, and deeply forked tail. Their brown-black backs and silvery-bronze sides darken as they migrate into freshwater systems to spawn. They have a series of dark spots that begin behind the gill and stop mid-body. They have serrated, or saw-like, scales that line their underbelly. Adult American shad can live between five to seven years and make the journey from the ocean to their natal rivers--where they were born--after two to five years in the ocean and can grow up to fifteen inches in length.

RI Collaborators: USGS, RIDEM, USFWS, URI

Funding has been provided by USFWS & the Future of Dams project. Study has been designed by Alex Haro (USGS) & graduate students at URI have been working directly with Haro & state-federal personnel to complete fieldwork.

A) B. Still capturing American shad in the Potter Hill fish trap. **B**) S. Anderson & B. Still transporting tagged A. shad across the street to release location. **C**) C. Pelletier releasing tagged A. shad upstream of dam – upstream telemetry antenna visible.

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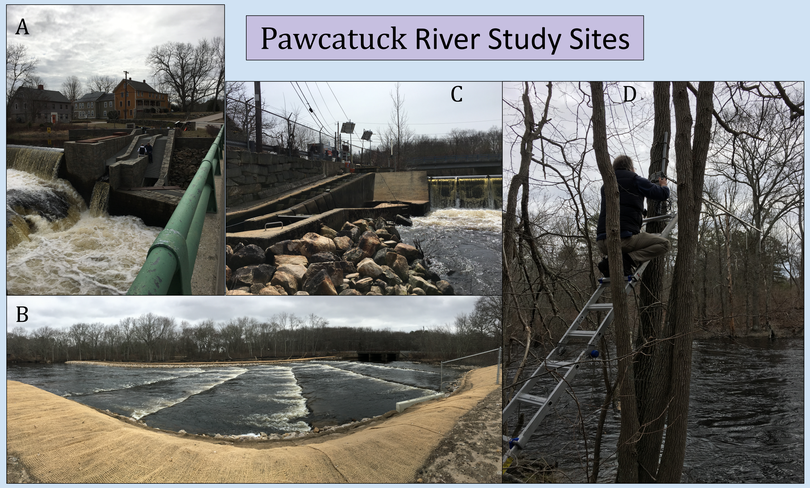
Pawcatuck River Study Sites



White Rock
- Full dam removal
- Radio-telemetry

Potter Hill Dam
- Denil fishway
- Radio-telemetry & PIT system (RFID)

Bradford Dam
- Nature-like-fishway
- Radio-telemetry
- Hobo water-level logger

Cronin Landing
- USGS gaging station
- Radio-telemetry
- Hobo water-level logger

Lower Shannock Falls
- Nature-like-fishway
- Radio-telemetry
- Hobo water-level logger

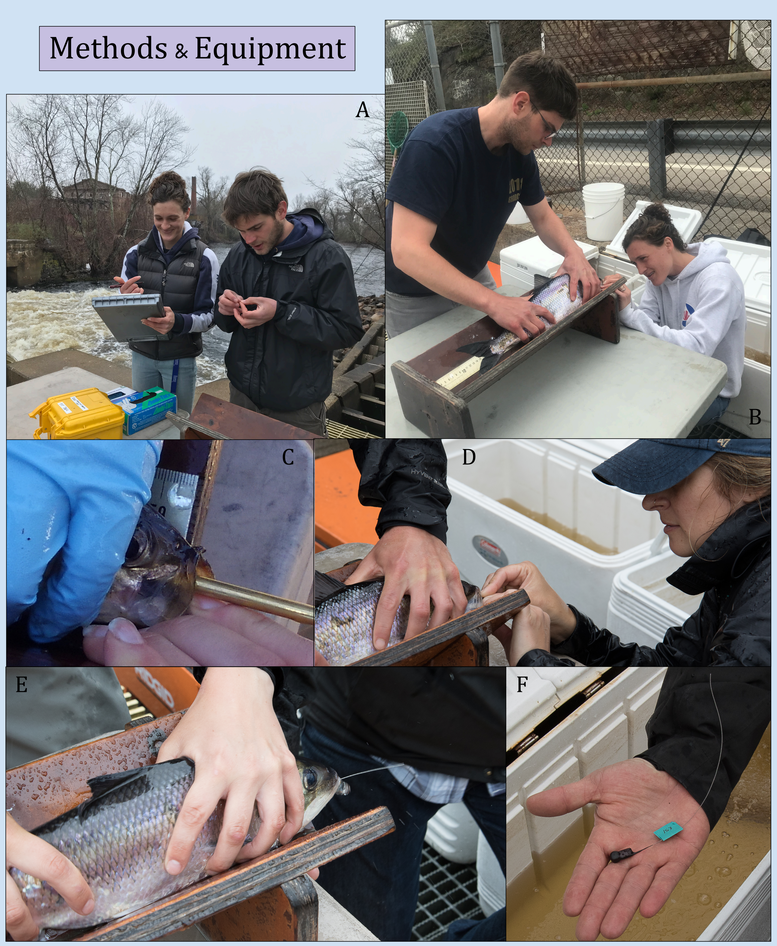
Horseshoe Falls
- Denil fishway
- Radio-telemetry & PIT system (RFID)

Kenyon Mills
- Nature-like-fishway
- Radio-telemetry
- Hobo water-level logger

A) Horseshoe Falls Denil fishway. **B**) Bradford nature-like-fishway, completed spring 2018. **C**) Potter Hill Dam Denil fishway, location of fish trap where tagging occurs. **D**) A. Haro installing telemetry equipment at Cronin Landing.

A) Installing telemetry antenna & amplifier at Horseshoe. **B**) Inside look at equipment boxes. **C**) Mobile tracking, attached telemetry antenna. **D**) Installation of monitoring equipment at Cronin Landing.

Methods & Equipment



Radio-telemetry
- Seven 2018 study sites
  - Potential for additional 2019 sites
- River restoration & fish passage monitoring of two species

Passive Integrated Transponders (PIT)
- Located on baffles inside technical fishways (two site locations)

A) A. Ragan and S. Anderson preparing for a tagging event. **B**) A. Ragan implanting telemetry tag into an American shad. S. Anderson holding individual. **C**) Close-up of tube inserted through the mouth of an alewife (see diagram below). **D**) E. Lundberg implanting telemetry tag into American shad. **E**) Telemetry tag antenna visible. **F**) Shad telemetry tag in B. Still's hand.

PIT tags (1).
Implanted PIT tag (2).

Photo credit: Providence Journal

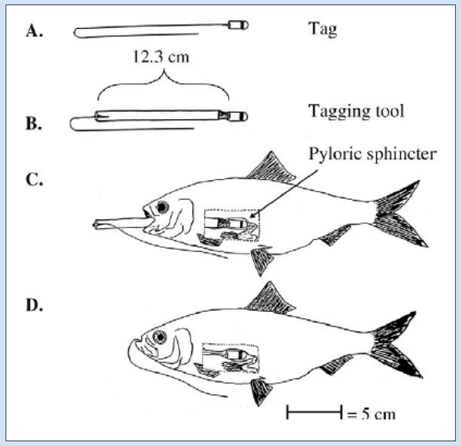


Illustration of river herring esophageal tagging process and tag gastric-location (Smith et al., 2009).