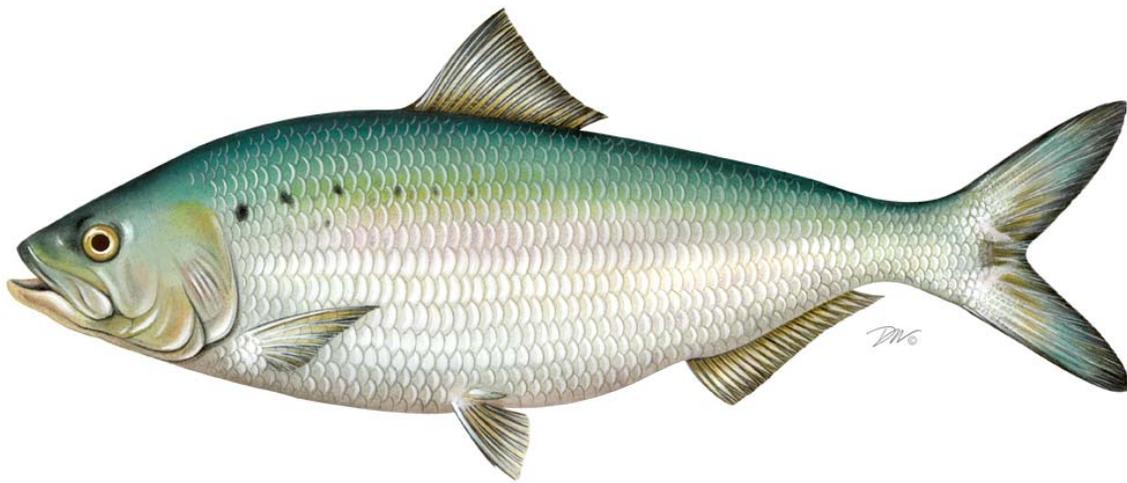


**Rhode Island Department of Environmental Management  
Division of Fish and Wildlife  
American Shad Habitat Plan for the  
Pawcatuck River**

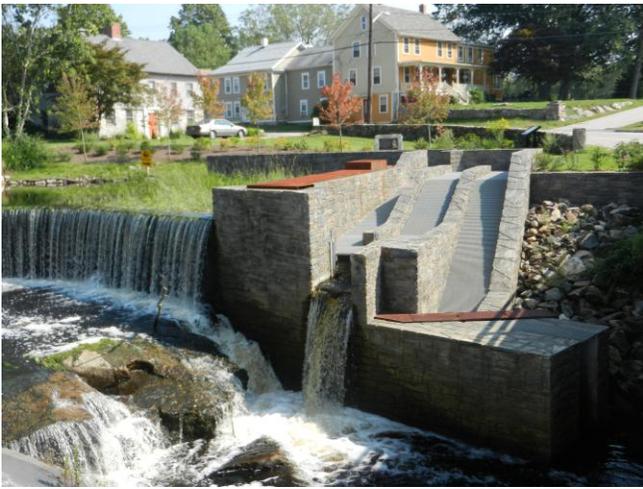


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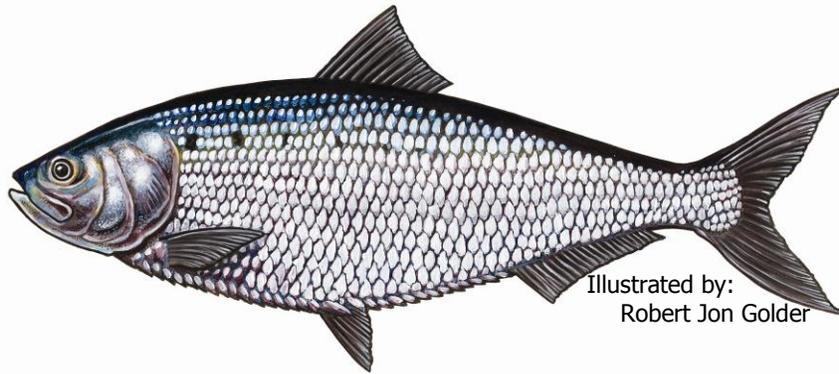
Phil Edwards, Rhode Island Department of Environmental Management,  
Division of Fish and Wildlife

Submitted to the Atlantic States Marine Fisheries Commission as a requirement of Amendment  
3 to the Interstate Management Plan for Shad and River Herring

Approved February 6, 2014

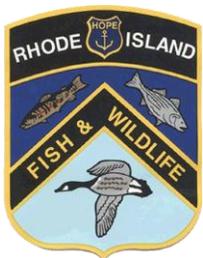


# Rhode Island American Shad Habitat Plan Pawcatuck River



Illustrated by:  
Robert Jon Golder

Submitted to ASMFC  
September 2013  
By  
Phil Edwards  
RI DEM Fish & Wildlife



# Rhode Island American Shad Habitat Plan

## Pawcatuck River

### Habitat Assessment:

Since the 1970s, RIDEM has accomplished substantial progress in the restoration of diadromous fish to the 308-mi<sup>2</sup> Pawcatuck River watershed. RIDEM has been successful to date at re-establishing low-levels of self-sustaining American shad and river herring populations in the lower reach of the Pawcatuck River watershed. This work has included installation of structural fishways (1970s), limited structural fishway improvements, broodstock enhancement, and monitoring of both adult returns and juvenile recruitment (e.g., fish trap counts, juvenile seine surveys, electrofishing, and radio telemetry). Although the Pawcatuck River has historic diadromous fish runs, each of the lower three dams (White Rock, Potter Hill, and Bradford) and poorly functioning structural fishways greatly reduce the passage efficiency of anadromous fish from accessing valuable spawning and nursery habitat. Currently, the State of Rhode Island Department of Environmental Management (RIDEM), Division of Fish and Wildlife (DF&W) has committed funds and has initiated a process to assess specific passage problems at each dam (via U.S. Army Corps of Engineers (ACOE) Section 22 of the Water Resources Development Act) to document passage deficiencies and passage restoration alternatives at each of the first three dams on the Lower Pawcatuck River.

Over the past several years there has been a substantial effort to improve fish passage at dams located upstream of the three dams described above that are on the lower portion of the Pawcatuck River. This three phase upper Pawcatuck River fish passage restoration project was awarded a multi-million dollar NOAA American Recovery and Reinvestment Act and involves numerous funding and project partners. The first of the three phase project was the 2010 removal of the Lower Shannock Falls which included the installation of rock weirs and bank stabilization. In 2012, a Denil fishway and state-of-the-art eel pass was constructed at the Horseshoe Falls Dam and currently at the sixth obstruction, construction is underway for a rock ramp fishway at the Kenyon Mill Dam. The proposed fish passage restoration improvements at the first three fishways will complement the new fish passage restoration projects recently completed on the upper Pawcatuck River watershed.

The six fish passage projects described below will enhance diadromous fish passage to over 22 miles of the main stem Pawcatuck River, 48 miles of tributaries, and access to over 1,967 acres of ponds providing critical spawning and rearing habitats. The goal is to improve river connectivity for target fish species and provide passage between Little Narragansett Bay and the high-quality waters of upper Pawcatuck River. An increase in abundance of the target diadromous species, to be monitored and documented by RIDEM and partners over time, will ultimately serve as the metrics for performance of the proposed restoration projects. The long-term goal of the project is to restore self-sustaining populations of anadromous and catadromous fish species. The unimpeded access to riverine and lacustrine habitats is expected to potentially result in an annual shad run in the thousands and river herring runs in the hundreds of thousands in the watershed.

### Threat: Barriers to Migration on the Pawcatuck River

#### Action 1: Fish Passage Efficiency Evaluation on the Lower Pawcatuck River

##### 1) White Rock Dam

**Description of Work:** Each of the three lowermost dams on the Pawcatuck River has a bypass system (breached canal and fish ladders) to provide fish passage for diadromous fish species including river herring and American shad. However at each of these dams are known, but undocumented problems with the by-pass systems and this could be impacting fish passage efficiency. Currently, the State of Rhode Island Department of Environmental Management, Division of Fish and Wildlife has requested that the US Army Corps of Engineers (ACOE) provide planning assistance (Section 22 of the Water Resources Development Act of 1974) to determine the fish passage efficiency for species of diadromous fish at the three dam sites located on the lower Pawcatuck River. The study will produce a detailed report that identifies and documents the current conditions at each of the sites and determine the impact these current conditions may have on fish passage. Recommendations and preliminary plans for improving fish passage efficiency at each site will be included in the report. The study will evaluate the White Rock Dam by-pass channel, which currently allows for fish passage and the water flows at the existing dam which may attract anadromous fish towards a dead-end channel.

**Agencies:** RIDEM, US ACOE, CTDEEP, USFWS, WPWA, TNC and Griswold Textile

**Goals/Target:** Completion of a detailed fish passage efficiency study and recommendations for improvements at each site via dam removal, by-pass improvements, or construction of a new fishway. Improvements at the three lower most dams will enhance anadromous fish passage to over 22 miles of main stem Pawcatuck River habitat and over 1,900 acres of freshwater impoundments. The target goal for returning American shad on the Pawcatuck River is 5,000.

**Timeline/Progress:** Active, report completion date scheduled for July 1, 2014.

**Costs:** \$100,000 for current feasibility study. Prior to final submission (October 2013), over two million dollars were awarded to USFWS for future restoration work at the first three obstructions on the lower Pawcatuck River from the US Department of Interior, Hurricane Sandy Relief Funds.

**Concerns/Setbacks:** Securing additional funding for recommended improvements if dam removal is selected.

## **Action 2: Fish Passage Efficiency Evaluation on the Lower Pawcatuck River 2) Potter Hill Dam**

**Description of Work:** Feasibility study described above to determine the efficiency of the 1970's constructed Potter Hill Denil fishway with current dam and false attraction flow conditions.

**Agencies:** RIDEM, US ACOE, TNC and WPWA

**Goals/Target:** Same as above

**Timeline/Progress:** Start date 2014, pending funding availability following completion of the White Rock Dam assessment.

**Costs:** Not to exceed \$100,000 for the three phase study. USFWS has received US DOI funds for future restoration improvements.

**Concerns/Setbacks:** Secure additional funds for the study and for recommended improvements if dam removal or a new fish passage alternative is selected.

## **Action 3: Fish Passage Efficiency Evaluation on the Lower Pawcatuck River 3) Bradford Dam**

**Description of Work:** Feasibility study described above to determine efficiency of the 1970's Denil fishway with new modifications and current dam and false attraction flow conditions. Recent modifications were made to the Bradford fishway to enhance American shad passage. Modifications included an extended fishway entrance and a decrease in the slope at the lower fishway section.

**Agencies:** Feasibility study by RIDEM, ACOE, TNC and WPWA. Fishway modifications by numerous partners.

**Goals/Target:** Same as above

**Timeline/Progress:** Start date 2014, pending funding availability, fishway modifications completed 2008

**Costs:** Not to exceed \$100,000 for three-phase study, \$65,000 for fishway modifications to enhance shad passage. USFWS has received US DOI funds for future restoration improvements.

**Concerns/Setbacks:** Securing additional funding for recommended improvements if dam removal or new fish passage is selected.

## **Action 4: Upper Pawcatuck River Fish Passage Restoration Project**

### **1) Lower Shannock Falls Dam**

**Description of Work:** Over the past several years there has been a substantial effort to improve fish passage at dams located upstream of the three dams described above that are on the lower portion of the Pawcatuck River. This three phase upper Pawcatuck River fish passage restoration project was awarded a multi-million dollar American Recovery and Reinvestment Act grant due to its high level of restoration priority. The first of the three phase project was the removal of the Lower Shannock Falls which included the installation of rock weirs and bank stabilization.

**Agencies:** Wood Pawcatuck Watershed Association (WPWA)-lead, NOAA, RIDEM, CRMC, USFWS, and many others project partners and funding sources.

**Goals/Target:** Complete dam removal. Improvements at the three upper dams on the Pawcatuck River will provide anadromous fish passage to over 3.5 miles of main stem Pawcatuck River habitat and over 1,000 acres of freshwater impoundments. The target goal for returning American shad on the Pawcatuck River is 5,000.

**Timeline/Progress:** Complete, Fall 2010

**Costs:** Feasibility Study= \$86,000 Dam Removal= \$750,000

**Concerns/Setbacks:** Completion of Kenyon Mill rock ramp fishway.

## **Action 5: Upper Pawcatuck River Fish Passage Restoration Project**

### **2) Horseshoe Falls Dam**

**Description of Work:** Construction of a new Denil fishway, juvenile by-pass chute and self-regulating eel ramp.

**Agencies:** Wood Pawcatuck Watershed Association (WPWA)-lead, NOAA, RIDEM, CRMC, USFWS, and many others project partners and funding sources.

**Goals/Target:** Construction of new Denil fishway, juvenile by-pass channel and a self-regulating eel ramp. Improvements at the three upper dams on the Pawcatuck River will provide anadromous fish passage to over 3.5 miles of main stem Pawcatuck River habitat and over 1,000 acres of freshwater impoundments. The target goal for returning American shad on the Pawcatuck River is 5,000.

**Timeline/Progress:** Complete Fall 2012, RIDEM/Fish and Wildlife is currently operating and maintaining the Denil fishway and eel ramp.

**Costs:** Denil and juvenile by-pass chute=\$1,580,000 Eel ramp=\$100,000

**Concerns/Setbacks:** Completion of Kenyon Mill rock ramp fishway.

## **Action 6: Upper Pawcatuck River Fish Passage Restoration Project**

### **3) Kenyon Mill Dam**

**Description of Work:** Removal of existing dam and installation of a new rock ramp fishway. The rock ramp fishway will feature a series of pools, constructed of natural stones weirs to facilitate fish passage.

**Agencies:** Wood Pawcatuck Watershed Association (WPWA)-lead, NOAA, RIDEM, CRMC, USFWS, Kenyon Mill Industries and many others project partners and funding sources.

**Goals/Target:** Construction of a new rock ramp fishway. Improvements at the three upper dams on the Pawcatuck River will provide anadromous fish passage to over 3.5 miles of main stem Pawcatuck River habitat and over 1,000 acres of freshwater impoundments. The target goal for returning American shad on the Pawcatuck River is 5,000.

**Timeline/Progress:** Active, all permits received, construction started July 1, 2013. Completion date March 2014.

**Costs:** Rock ramp and engineering design costs estimated at \$1,400,000.

**Concerns/Setbacks:** Construction delays preventing completion prior to 2014 spring fish migration.

## Habitat Restoration Programs

### Barrier removal:

In its *2002 Strategic Plan for the Restoration of Anadromous Fishes to Rhode Island's Coastal Streams* (Erkan 2002), the Rhode Island Department of Environmental Management (RIDEM) recognized the potential for significant expansion of river herring and American shad habitat by restoring fish passage to the mainstem Pawcatuck River. The plan identifies the dam barriers in the Pawcatuck River watershed in Rhode Island, including the six dam sites which are addressed in this habitat plan, as barriers to anadromous fish species including shad and river herring. Currently the 2002 plan is scheduled to be updated in 2014. In addition, since 2002, RIDEM/Fish and Wildlife prepares an annual prioritize list of fish passage projects for river systems throughout the state. Since the inception, the Pawcatuck River fish passage projects have been a high priority (Edwards 2012).

**Hatchery product supplementation program:** Over the past several years, RIDEM has partnered with the USFWS North Attleboro Fish Hatchery with the American shad fry stocking program. Each spring adults are delivered to the hatchery where they are allowed to naturally tank spawn and the fry are released throughout the summer into the upper reaches of the Pawcatuck River.

**Water quality improvement program:** RIDEM/Office of Water Resources has a program in place to decrease nitrogen contributions into the Pawcatuck River and increase dissolved oxygen levels (Pawcatuck River TMDL).

**Project permit/licensing review program:** RIDEM has a review program in place for water withdrawals, toxic and thermal discharges, dredging, and land use development, in which permits are issued on a case by case basis (NPDES).

## References

Edwards, P. A. 2012. Restoration and establishment of sea run fisheries. Rhode Island Division of Fish and Wildlife, Freshwater and Anadromous Fisheries Section. Annual performance reports to USFWS, Project F-26-R-47, Washington, D.C. Appendix A. Summary of New Initiatives for Anadromous Habitat Restoration.

Erkan, D.E. 2002. Strategic Plan for the Restoration of Anadromous Fishes to Rhode Island Coastal Streams. RI DEM, Division of Fish and Wildlife. Completion Report in Fulfillment of Federal Aid in Sportfish Restoration, F-55-R.

2013 RIDEM Total Maximum Daily Load (TMDL) Program Website:  
<http://www.dem.ri.gov/programs/benviron/water/quality/rest/index.htm>

2013 RIDEM National Pollutant Discharge Elimination System (NPDES) Website:  
<http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/>

Figure 1: Location of the Three Lower Pawcatuck River Passage Restoration Sites and Recently Completed Upper Pawcatuck River Passage Restoration Sites

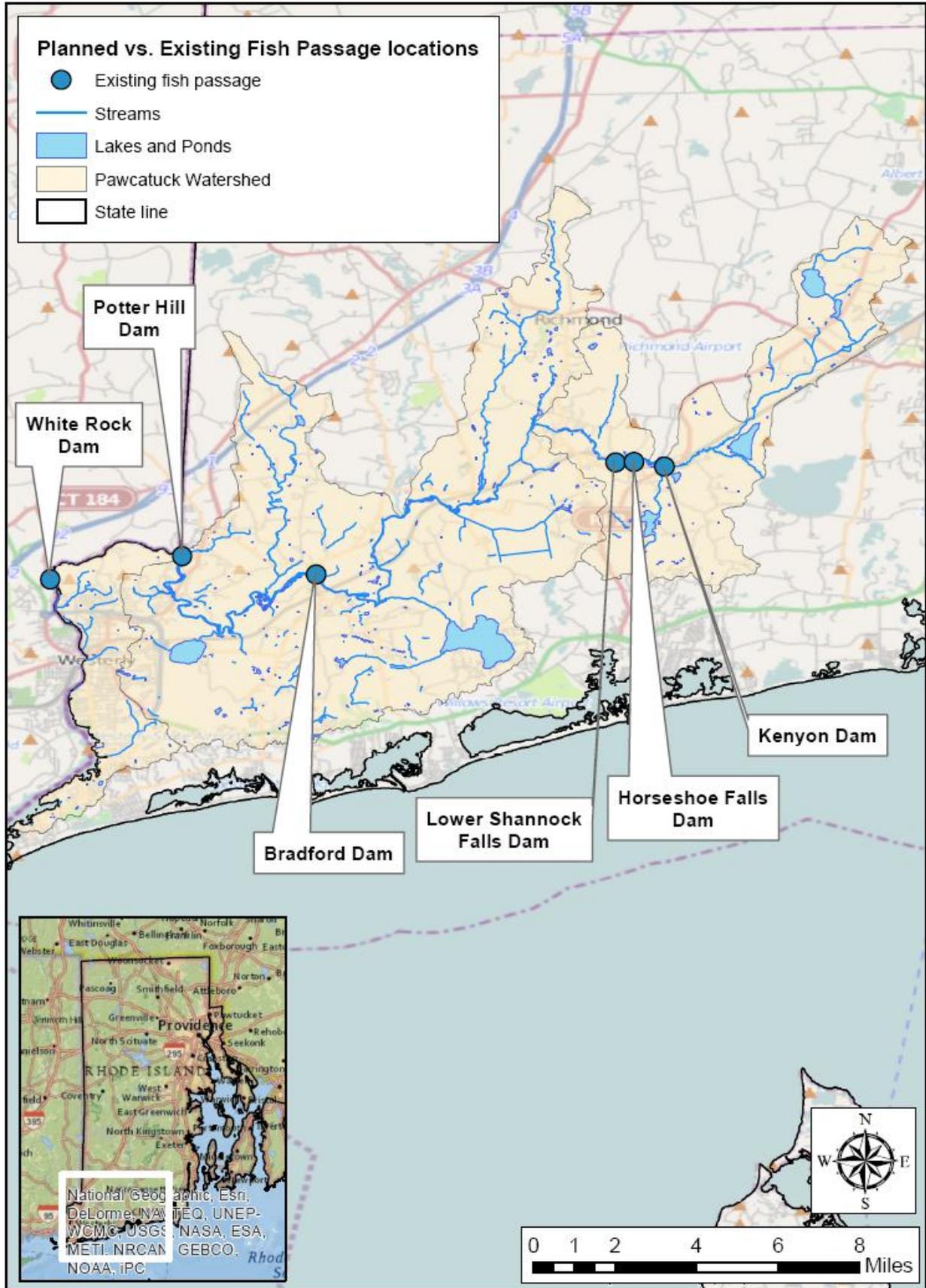


Figure 2: Photograph of the White Rock Dam, Dead End Channel at Low Flow Conditions



Figure 3: Photograph of the Potter Hill Dam and 1970's Constructed Denil Fishway with Fish Trap



Figure 4: Photograph of the Bradford Dam and 1970's Denil Fishway



Figure 5: Photograph of Dam Removal and Rock Weirs at Lower Shannock Falls



Figure 6: Photograph of the Horseshoe Falls Dam and Denil Fishway with Eel Ramp



Figure 7: Photograph of the Kenyon Mill Dam prior to construction of Rock Ramp Fishway



Figure 8: Construction of Rock Ramp Fishway at Kenyon Mill Dam

