



**NOAA
FISHERIES**

NOAA Habitat Blueprint Penobscot River Habitat Focus Area

<http://www.habitat.noaa.gov/habitatblueprint/>

September 3, 2014



Habitat Focus Areas – Greater Atlantic Region

- Penobscot River (Maine)

<http://www.habitat.noaa.gov/habitatblueprint/penobscot.html>

The Penobscot River is New England's second largest river, draining nearly one-third of the State of Maine with a watershed area of **8,570 square miles**. The Penobscot River is used as a spawning or nursery area by **11 migratory fish species**, including 3 listed under the Endangered Species Act. The river hosts the largest run of Atlantic salmon left in the United States. Historically, fisheries on the Penobscot River were bountiful, with an estimated **14 to 20 million alewives**, 75,000 to 100,000 Atlantic salmon, and 3 to 5 million American shad.

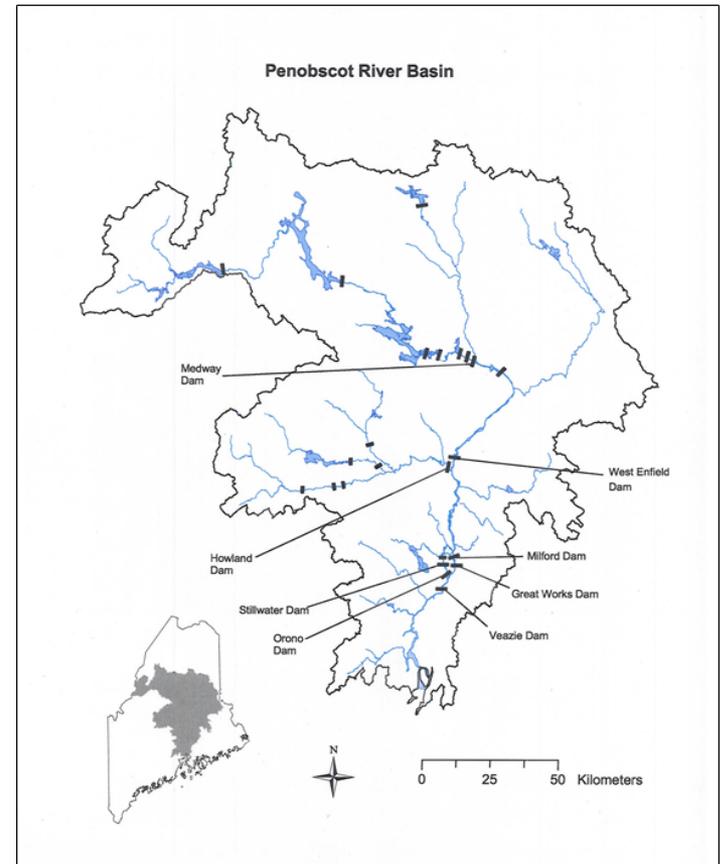
The Penobscot River watershed has a rich cultural history of commercial, recreational and sustenance fishing. It is home to the **Penobscot Indian Nation**, who still occupies part of their ancestral homeland on Indian Island, surrounded by Penobscot waters.





Penobscot Habitat Focus Area Objectives

- Restoration of multiple diadromous species including river herring and ESA listed species: Atlantic salmon, Atlantic sturgeon and shortnose sturgeon
- Improved prey base for multiple offshore species including Gulf of Maine groundfish
- Improvement in water quality
- Improvement in river-based recreational opportunities



Penobscot River Habitat Focus Area

2012 – Great Works Dam Removal



2013 – Veazie Dam Removal



2012 – Pushaw Lake Fishway



2013 – Coleman Pond Fishway



2013 – Davis Pond Fishway



Habitat Focus Area Funding 2014-2016

- Planning
- Communication
- Restoration
- Monitoring

- Year 1 award \$405,340

- Partners:
 - The Nature Conservancy, ME Sea Grant, Penobscot River Restoration Trust



Strategy

- **Penobscot River Restoration Project** was a great first step
 - Many barriers remain in watershed (108 non-hydro dams, 31 FERC dams, ~2,100 culverts)
- **Strategy** – identify projects in three parts of the watershed
 - lower river habitat, **alewife lakes**, headwaters
 - list of priority barriers on Penobscot Indian Nation land
 - 67,000 acres of land, mostly undeveloped
 - Mattamiscontis Lakes (1,300 acres), East Branch Lake (1,122 acres), South Branch Lake (2,035 acres), Salmon Stream Lake (659 acres)



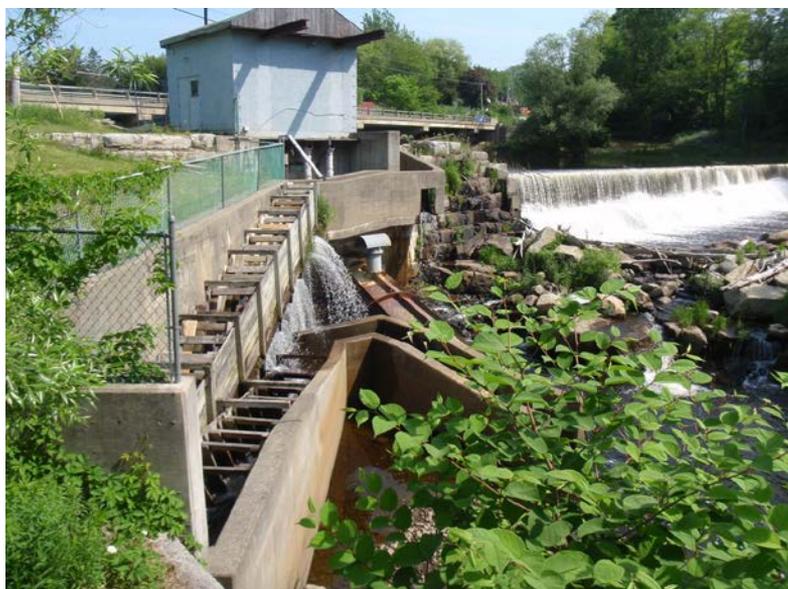
Strategy

- **Strategy** – identify projects in three parts of the watershed
 - lower river habitat, **alewife lakes**, headwaters
 - State of Maine *Operational Plan for the Restoration of Diadromous Fishes to the Penobscot River* (2009)
 - 56 “Phase 1, 2 and 3” alewife lakes and ponds
 - 74,605 acres (17.5 million adults at 235 adults/acre)
 - Special attention to municipally-owned infrastructure (dams, culverts)
 - Infrastructure vulnerable to climate change effects (increased flooding, sea level rise)
 - Examples: Orland Village Dam and Frankfort Dam (lower Penobscot)



Frankfort Dam, Marsh Stream

Head-of-tide dam blocking 117 miles of stream and tributaries



Orland Village Dam, Orland River

2.5 miles of river, 90 acres of tidal wetlands; access to 3,120 acres of alewife spawning habitat





Monitoring

- Request to support ongoing monitoring program:
 - Ten complementary ecological studies designed to evaluate ecosystem response to large-scale restoration
 - Five years of data collection to date and over \$2M invested
 - Fish migration and habitat use
 - Fish community structure (freshwater and estuarine)
 - Riverine and marine ecosystem response
 - Water quality and benthic macroinvertebrates
 - Channel and floodplain physical response



Impact/Results

- **Long-term impact**

- Substantially increased access to spawning and rearing habitat in the watershed for numerous species of migratory fish
- **Increased populations of river herring** and other diadromous species
- Improved prey base for estuarine and Gulf of Maine fisheries
- Improved opportunities for boaters, recreational and commercial fisheries
- Restoration of the cultural heritage of the Penobscot Indian Nation
- Resiliency to climate change (sea level rise, storms, coldwater refugia)

- **Results 3 to 5 years**

- Completion of multiple barrier removals/fish passage projects
- Measuring the trajectory towards increased fish populations
- Implementation of NWS recreational forecast for Penobscot watershed