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Connecting rivers in the Penobscot Watershed

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A BLUEPRINT FOR THE PENOBSCOT RIVER WATERSHED

CONNECTING RIVERS

#2

for a healthy Penobscot watershed

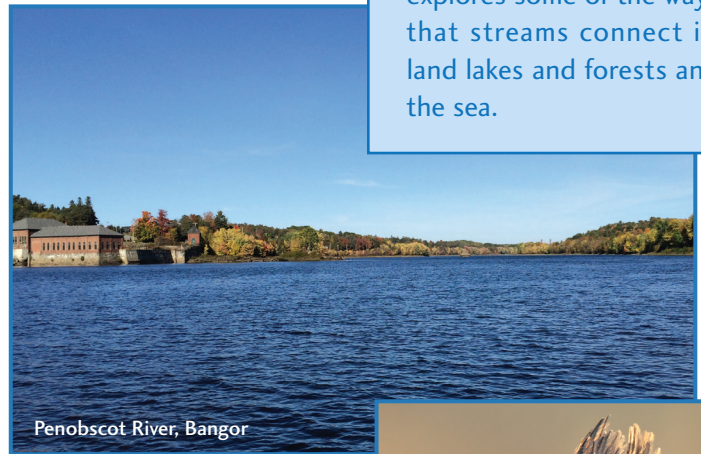
Maine rivers used to be full of fish swimming upstream from the ocean every year on their spawning migrations, providing food for people and wildlife and supplying a major trade in exported fish. The Penobscot River is one of few rivers in the United States that still contains populations of all 12 native species sea-run fish: alewife, American eel, American shad, Atlantic salmon, Atlantic sturgeon, Atlantic tomcod, blueback herring, rainbow smelt, sea lamprey, sea-run brook trout, shortnose sturgeon, and striped bass.

Three of these fish are listed as threatened or endangered under the federal Endangered Species Act: Atlantic salmon (endangered), shortnose sturgeon (endangered), and Atlantic sturgeon (threatened). Rainbow smelt, blueback herring, and alewives are considered species of special concern. Habitat loss from the construction of dams, roads, and other barriers is a primary factor in the decline of these fish populations. Dams and culverts also affect other fish and wildlife that depend on streams.

Many birds and mammals rely on the river for some or all of their life cycle: eagles, osprey, kingfishers, otters, seals, etc. Sea-run fish contain ocean nutrients and are a preferred food for osprey and eagles; if sea-run fish are available, birds will eat them, and will congregate in areas where fish runs concentrate. Schools of both young and adult alewives, blueback herring, and shad provide food for larger marine fish like cod, which have disappeared from Penobscot Bay and nearshore areas.

About this series

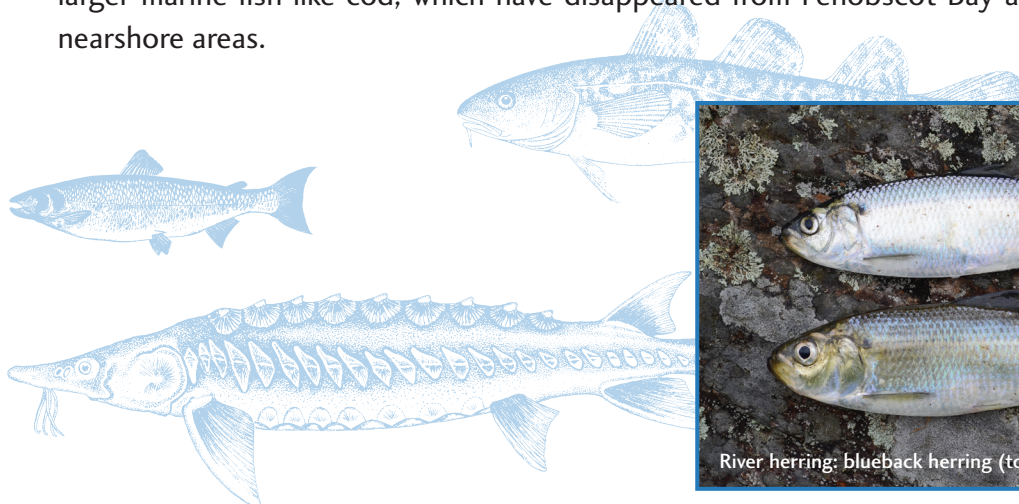
Across Maine, communities and land owners are reconnecting rivers and streams by improving road crossings, fixing broken culverts, and removing dams and other barriers. There are many reasons for doing this work, including preventing costly repairs associated with flooding and washouts, enhancing water quality, increasing wildlife habitat, and restoring fish populations. *Connecting Rivers* explores some of the ways that streams connect inland lakes and forests and the sea.



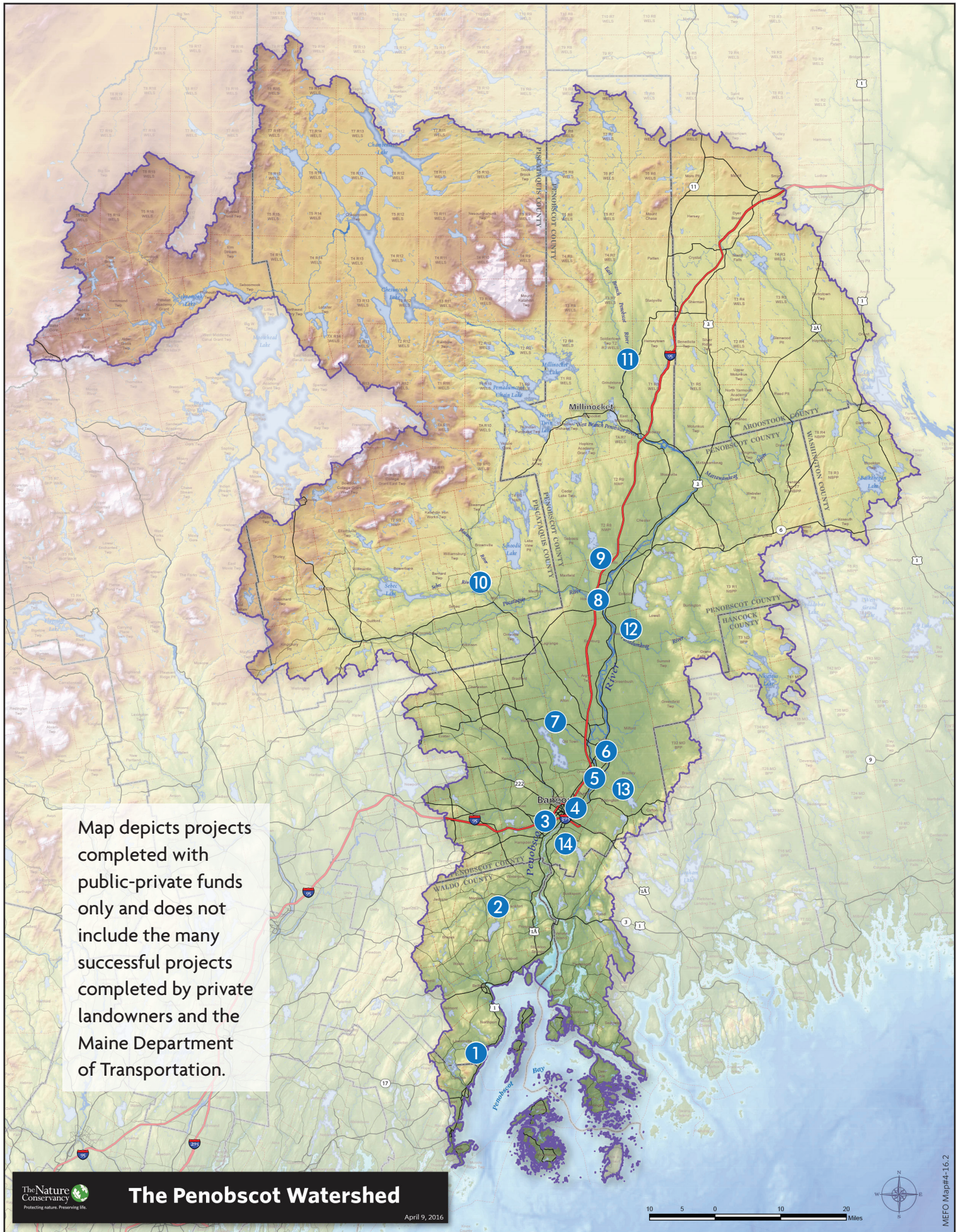
Penobscot River, Bangor



Birds like kingfishers rely on healthy streams.



River herring: blueback herring (top) and alewife (bottom)



Map depicts projects completed with public-private funds only and does not include the many successful projects completed by private landowners and the Maine Department of Transportation.

	Location	Year completed	Type	Species	
1	Ducktrap River	Coleman Pond	2013	pool-and-weir fishway	Atlantic salmon, river herring
2	North Branch Marsh Stream	West Winterport	2010	dam removal	Atlantic salmon, brook trout
3	Souadabscook Stream	Hampden	1999	dam removal (2)	Atlantic salmon, river herring
		Carmel	2014	fishway	Atlantic salmon, river herring, brook trout
4	Bangor Dam	Bangor and Brewer	1995	dam removal	all species
5	Penobscot River	Veazie and Eddington	2013	dam removal	all species
6	Penobscot River (Great Works)	Old Town and Bradley	2012	dam removal	all species
7	Pushaw Stream	Pushaw Lake, Little Pushaw Lake, Mud Pond	2014	fishway	river herring
8	Piscataquis River	Howland	2016	bypass river channel	Atlantic salmon, river herring, brook trout, shad, sea lamprey, eel



	Location	Year completed	Type	Species
9 Mattamiscontis Stream	Mattamiscontis Lake	2012	pool-and-weir fishway	river herring
	Penobscot territory	2015	Stream Smart culverts (3)	river herring
	South Branch Lake	2016	fishway	river herring
10 Pleasant River	Brownville	1999	dam removal	Atlantic salmon, brook trout, eel
	Roaring Brook	2012	dam removal (2)	Atlantic salmon, brook trout, eel
	Blackstone Brook	2012	Stream Smart culvert	Atlantic salmon, brook trout, eel
	Little Houston Brook	2013	Stream Smart crossing	Atlantic salmon, brook trout, eel
11 East Branch Penobscot River	East Branch and Seboeis River	2013	Stream Smart road crossings (4)	Atlantic salmon, brook trout, eel
12 Passadumkeag River	One Mile Brook	2014	Stream Smart culvert	Atlantic salmon, brook trout
13 Blackman Stream	Chemo Pond	2009	pool-and-weir fishway	river herring
	Davis Pond	2013	fishway	river herring
	Route 178	2014	fishway	river herring
14 Sedgeunkedunk Stream	Orrington and Brewer	2009	dam removal and rock-ramp fishway	Atlantic salmon, sea lamprey, river herring



Mattamiscontis Stream



Sedgeunkedunk Stream



Passadumkeag River

It's not just about fish...

There are many reasons why so many people and organizations are working to connect rivers and restore free-flowing stream habitat:

Improving water quality. Dams and undersized culverts that block water flow can degrade water quality, increase water temperatures, and deplete oxygen.

Making roads, bridges, and other structures safer. Culverts that are too small and aging dams are vulnerable to storms and flooding that can cause erosion and structural damage. Precipitation has increased across Maine, with more frequent intense storms. Secure infrastructure improves transportation safety and reduces the need for costly repairs of roads and culverts.



Winkumpagh Brook before ▲ and after ▼ Stream Smart road crossing



Today, a broad group of state, federal, and local agencies and organizations, scientists and citizens collaborate on stream restoration planning and implementation in the Penobscot watershed:

American Rivers
Appalachian Mountain Club
Atlantic Salmon Federation
Baxter State Park
Brookfield Hydropower
Coastal America Partnership
City of Bangor
City of Brewer
Downeast Salmon Federation
Elliotsville Plantation Inc.
Fisheries Improvement Network
Greater Pushaw Lake Association
Gulf of Maine Council on the Marine Environment
Maine Atlantic Salmon Conservation Fund
Maine Audubon
Maine Coast Heritage Trust
Maine Department of Agriculture, Conservation & Forestry
Maine Department of Inland Fisheries & Wildlife
Maine Department of Marine Resources
Maine Department of Transportation
Maine Forest and Logging Museum
Maine Habitat Restoration Partnership
Natural Resources Council of Maine
Penobscot Indian Nation
Project SHARE
The Nature Conservancy
Town of Carmel
Town of Eddington
Town of Hampden
Town of Howland
Town of Orrington
Town of Passadumkeag
Town of Veazie
Trout Unlimited
US Department of Agriculture (NRCS)
US Fish and Wildlife Service
US Department of Commerce (NOAA)

...restoring streams has many benefits

Celebrating history and preserving local heritage. The decline of salmon and other sea-run fish means we have lost commercial and recreational fisheries and their associated cultural traditions. Restoration projects often create an opportunity to highlight a site's local history. In other cases, towns profit from harvesting alewives and selling them for lobster bait; others see an influx of visitors who come for paddling, fishing, bird and wildlife watching, and enjoying the scenic beauty of riverfronts.

Protecting America's natural legacy. Constructed barriers harm both sea-run and river fish that seasonally move up and down rivers. National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service, and the State of Maine share responsibility for implementing effective fish passage under several federal and state laws intended to conserve and manage threatened and endangered species and the ecosystems on which they depend. Stewardship is not the responsibility of government alone—all Americans have a role in restoring and protecting our natural heritage.



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Cover photos: Penobscot River—Catherine Schmitt; kingfisher—Shutterstock; blueback herring and alewife—Chris Bartlett. Inside photos: all—Catherine Schmitt. Back cover photos: fishing girl—Chris Bartlett; all others—Catherine Schmitt.

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