

La restauration de la continuité écologique: la réglementation et les actions de préservation du saumon atlantique aux États-Unis

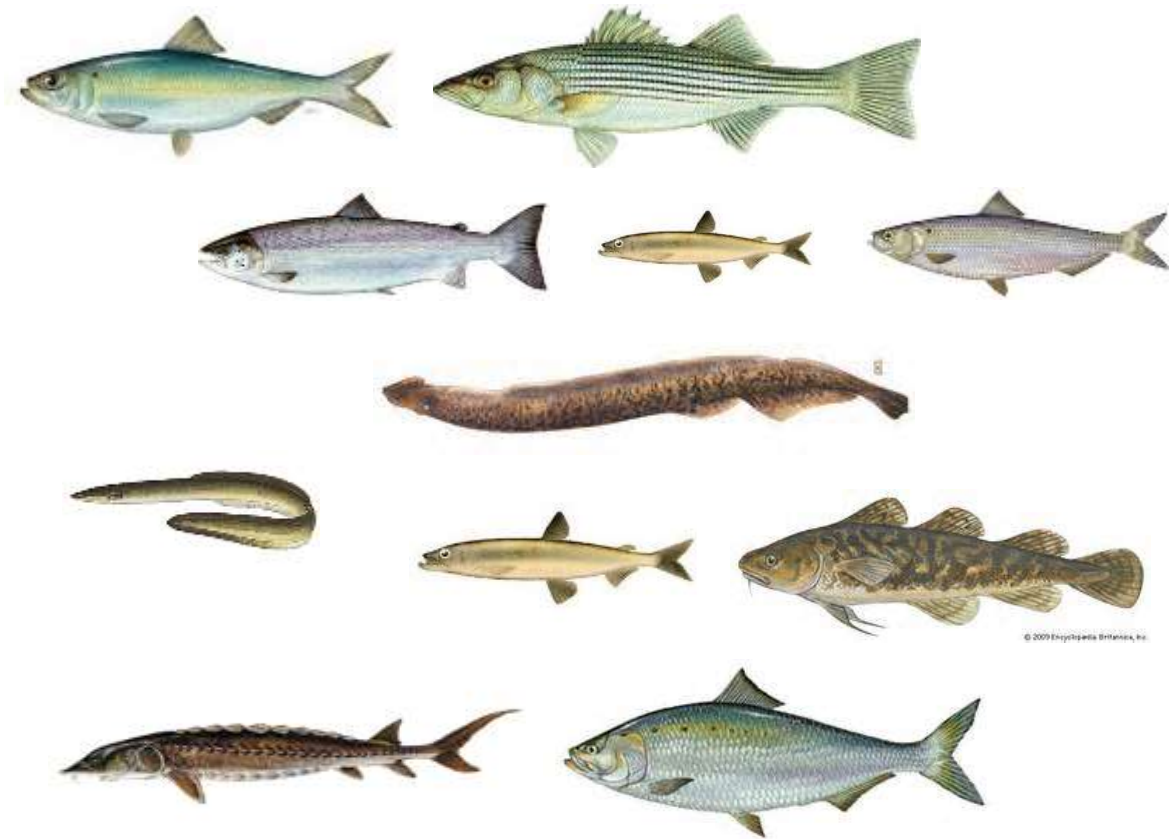
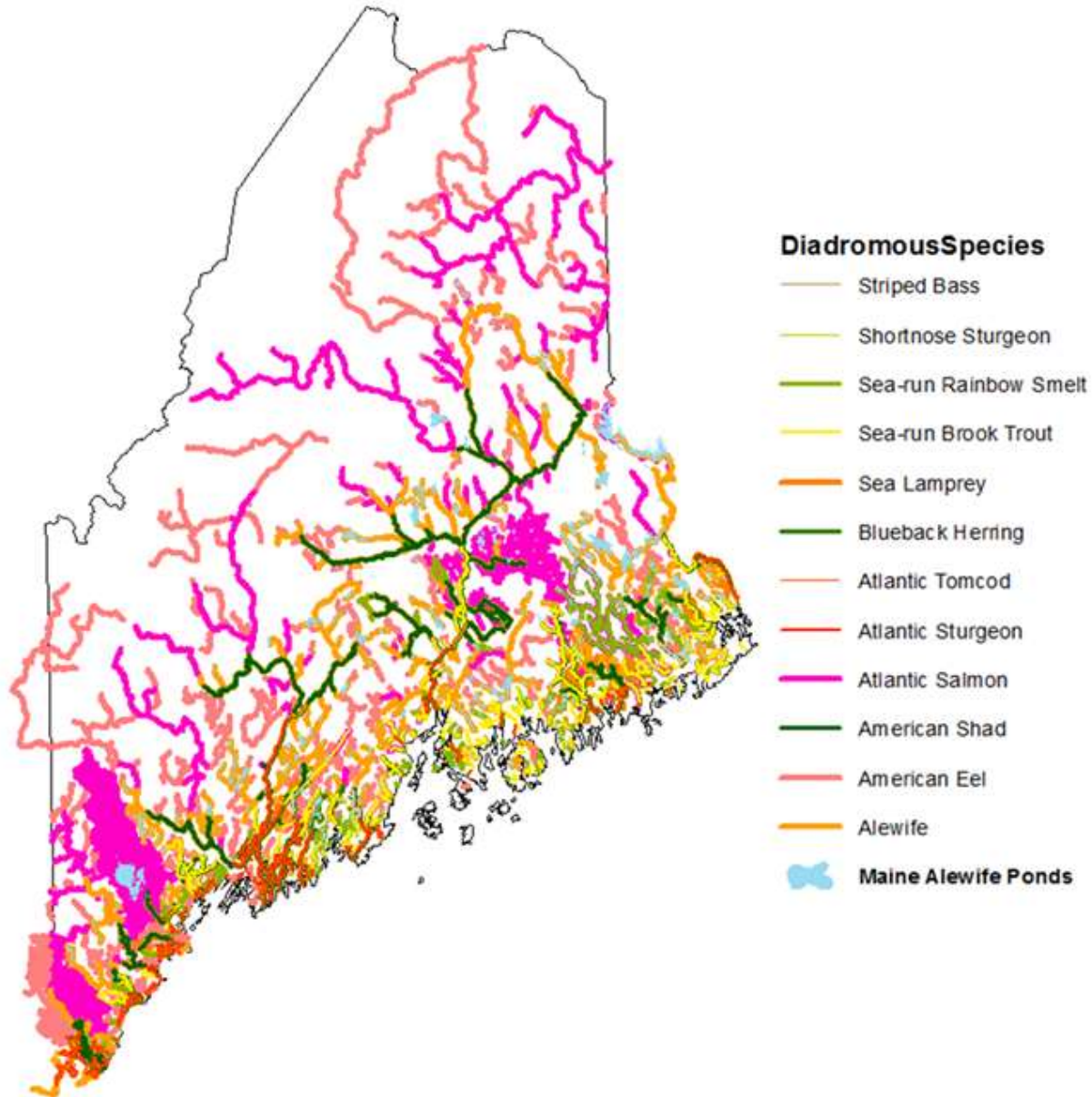
Casey Clark, Département des ressources marines du Maine
Hadley Couraud, The Nature Conservancy in Maine

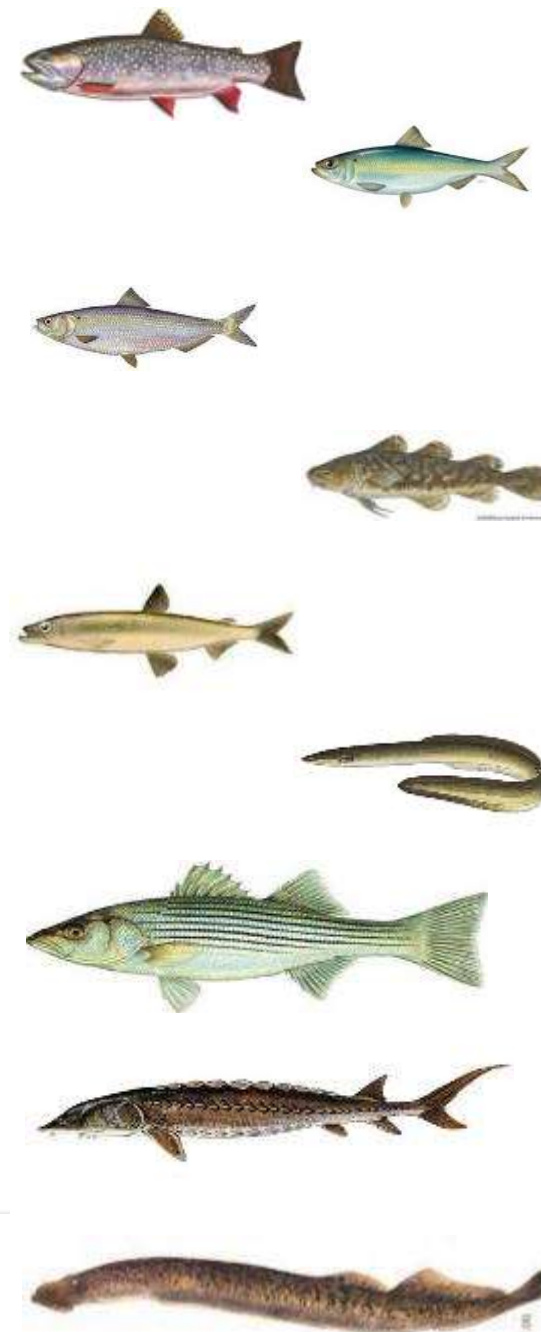
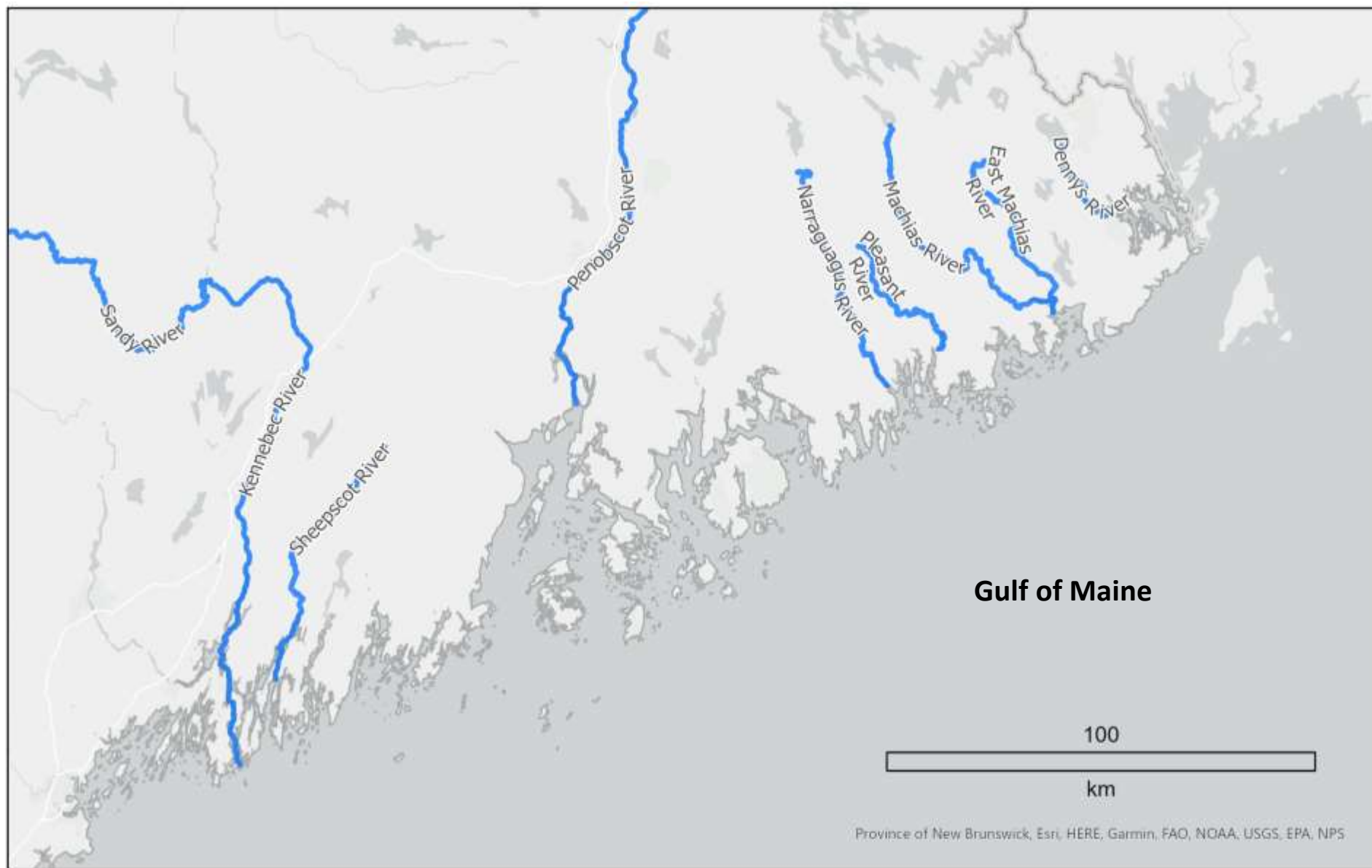
Colloque International des Saumon et des Hommes 3
Brioud, France // 20 octobre 2023





Maine's Searun Fish









© Bridget Besaw



© Josh Royte/TNC

Commercial Value

Lobster

Approximately 400,000,000 euros per year

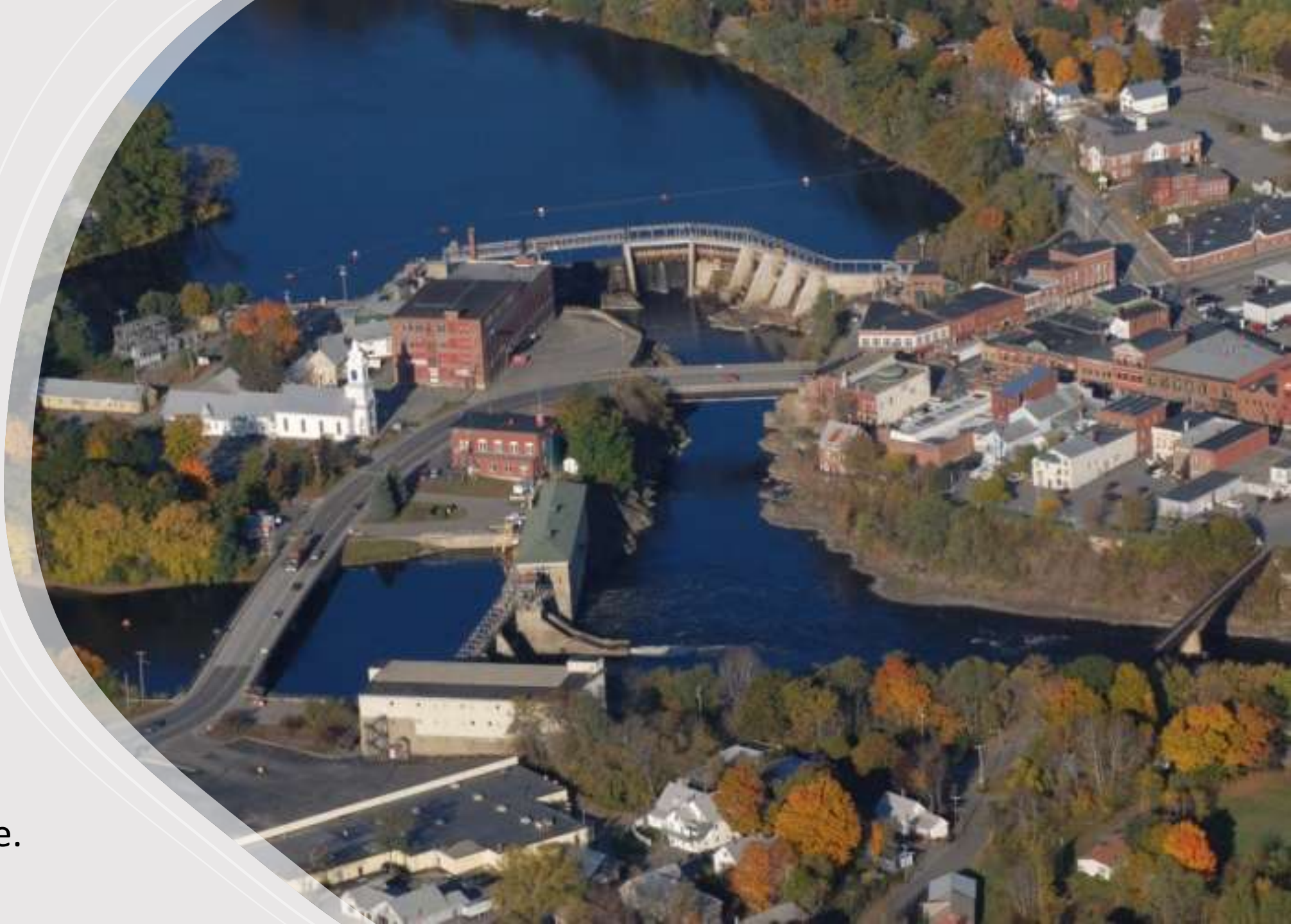
Juvenile Eels

Approximately 20,000,000 euros per year

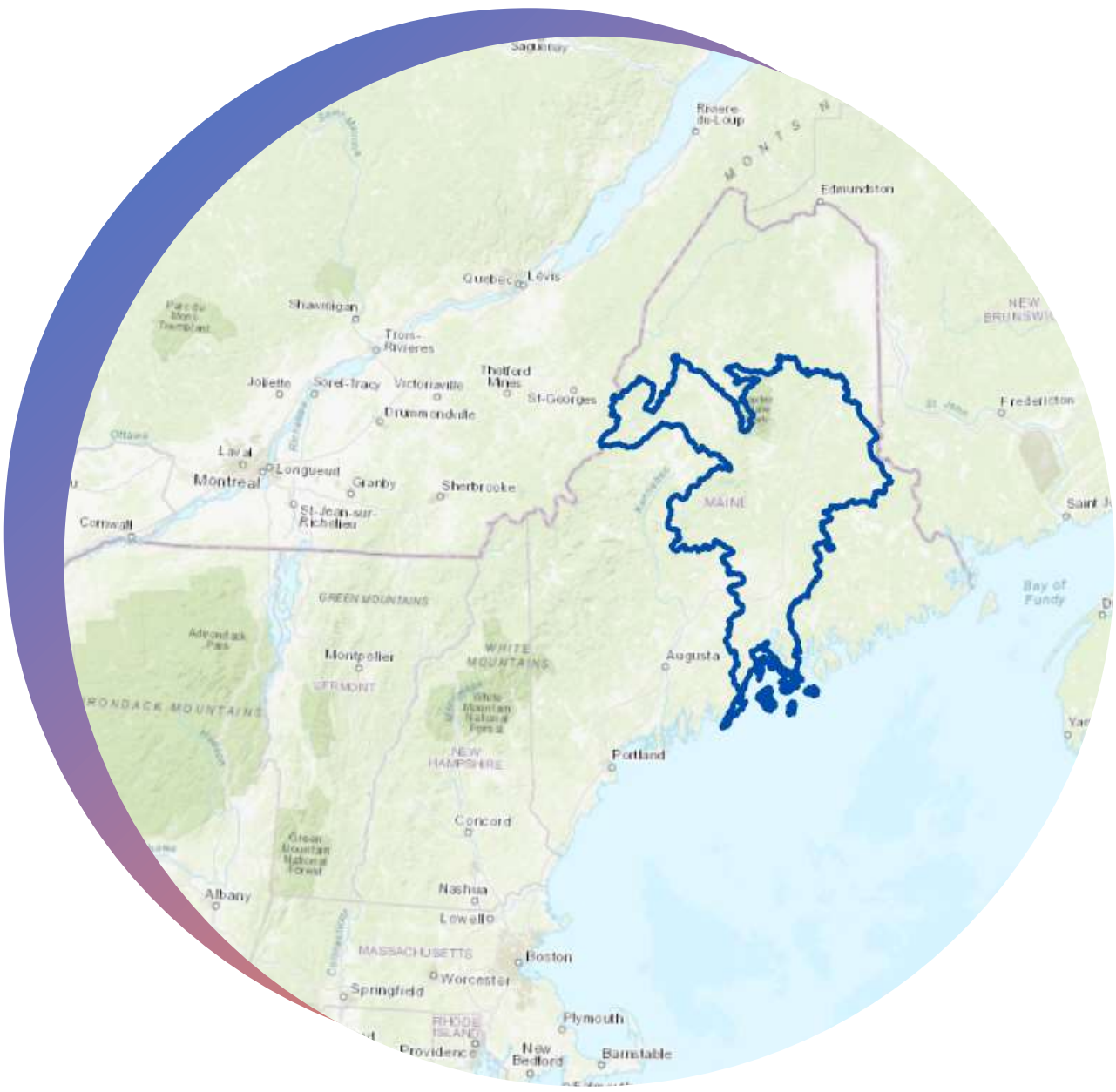


© David Hills

Today there are
179 hydro-electric
dams in Maine.



On average one
dam every 9km on
large rivers in Maine.



Penobscot River Waterbasin

- Area: ~13,000 square kilometers
 - 85% of which is forested
- More than 20,900 river kilometers
 - From 1830-2013 only 4% was accessible
- Contains Maine's 3rd largest city

Energy

Fish Passage

Penobscot River Restoration Project

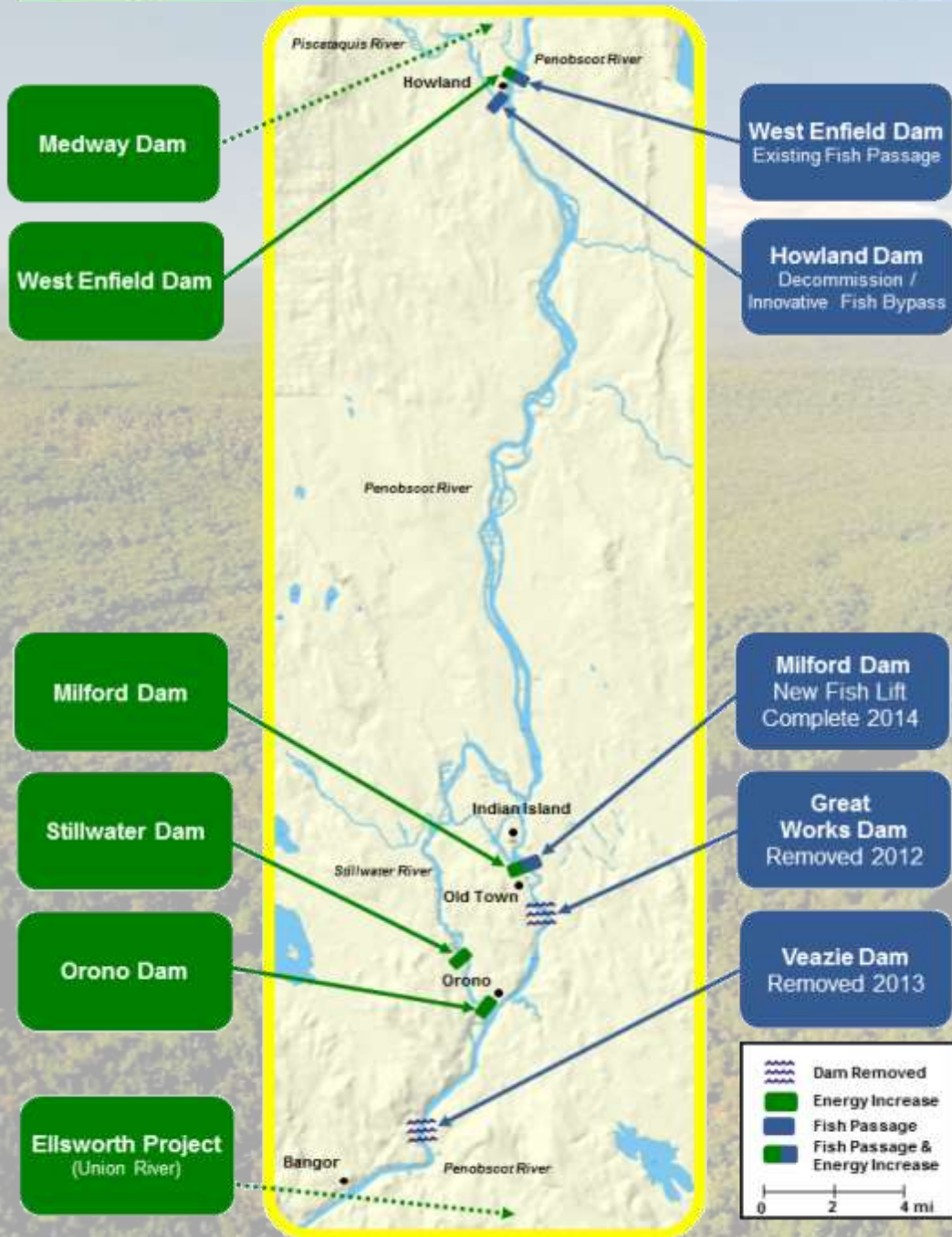
→ **Removal of Two Mainstem Dams**
closest to sea: Veazie & Great Works

→ **Bypass Howland Dam**
for inland habitat access

→ **Increased power production at 4
dams --> Net increase in power**

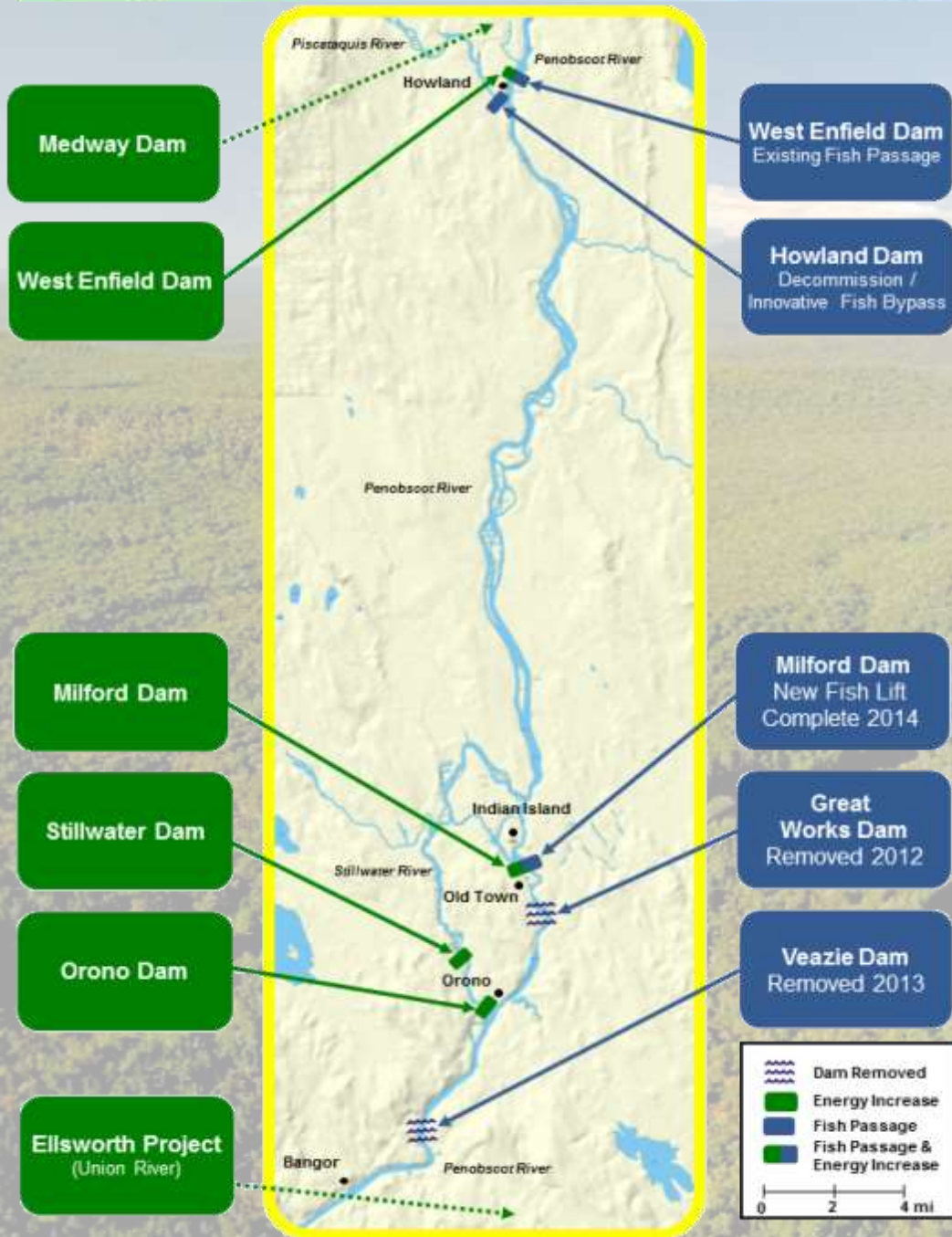
→ **Enhanced Habitat Access**
2,000 miles of mainstem habitat

→ **Help Restore:**
12 species of native sea-run fish,
associated traditions, culture,
and economic opportunities



Energy

Fish Passage

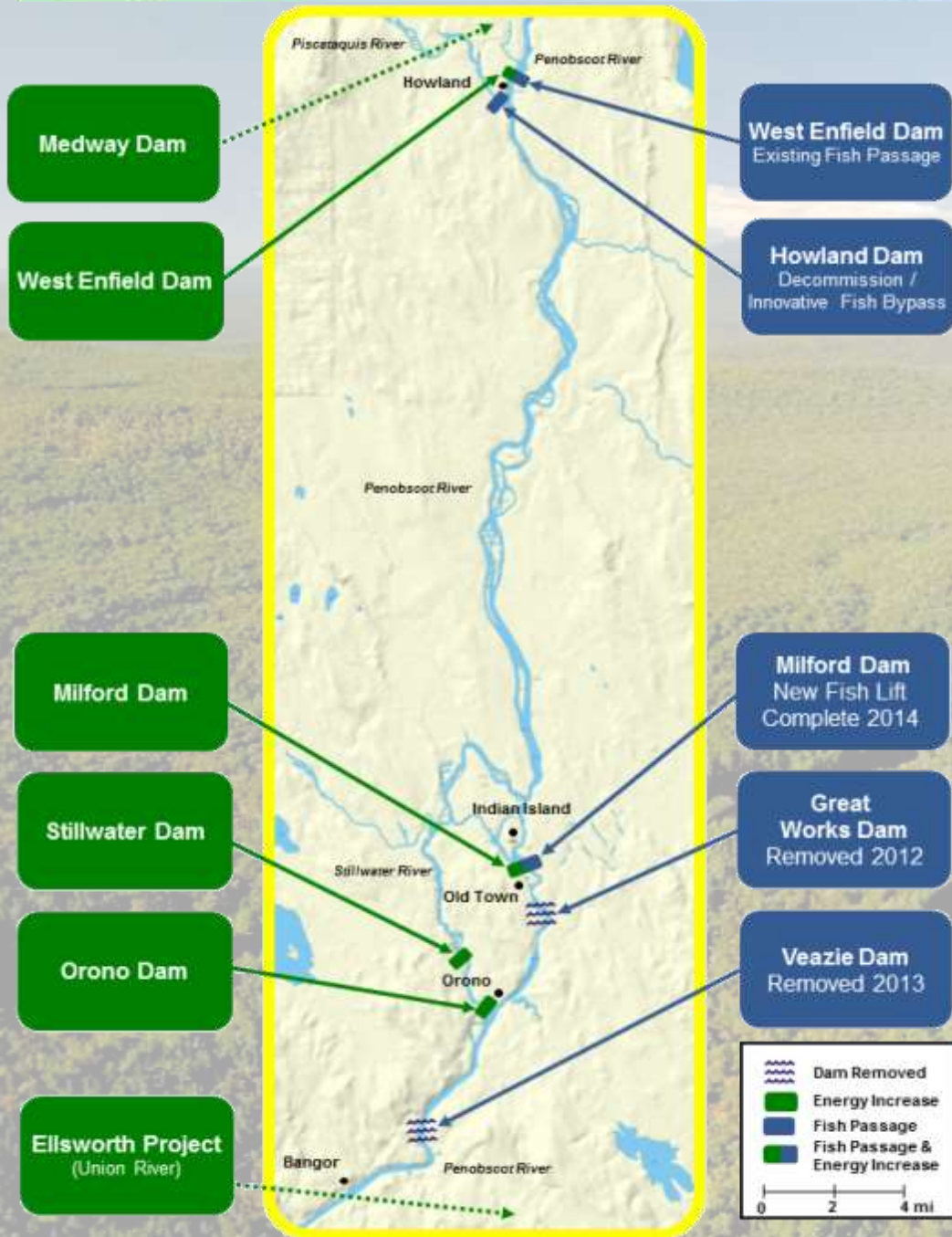


Penobscot River Restoration Enabling Conditions

- Federal Power Act (Dams)
- Pending & final Endangered Species Act Salmon listing
- Tribal Advocacy
- Defeat of Basin Mills
- Patient negotiations and relationship-building

Energy

Fish Passage



Penobscot River Restoration Enabling Conditions

→ Federal Power Act (Dams)

→ Pending & final Endangered
Species Act Salmon listing

→ Tribal Advocacy

→ Defeat of Basin Mills

→ Patient negotiations
and relationship-building

Federal Power Act (FPA)

What is the Federal Power Act

- Enacted in 1920 to coordinate the development on waterways
- Most hydroelectric projects in U.S. have an FPA license
- FPA grants a license for 30-50 years and requires reapplication



Federal Power Act (FPA)

How the FPA helps migratory fish

- License expiration requires assessment of environmental measures
- Several licenses were expiring on the Penobscot River
- Environmental measures outweighed the value of the outdated hydro dams



Federal Power Act (FPA)

What the FPA does poorly for migratory fish

- Rarely requires dam removal
- Requires significant time and resources
- FPA dams are rarely eligible for federal funding for fish passage
- Passage measures cannot cost more than the electricity generation of the project



Endangered Species Act (ESA)

What is the ESA?

- Gulf of Maine Distinct Population Segment
- Critical Habitat for Atlantic salmon (2009)
- Atlantic Salmon Recovery Plan (2019)
- Required reduction of impacts that could cause the species to go extinct



Endangered Species Act (ESA)

How the ESA helps migratory fish

- Cumulative impacts to species (whole riverbasin)
- Passage effectiveness requirements

Lifestage	Upstream	Downstream
Smolt	-	95%
Adult	96%	95%
Delay	<48 hours	<24 hours

- Ongoing research to understand threats

Endangered Species Act (ESA)

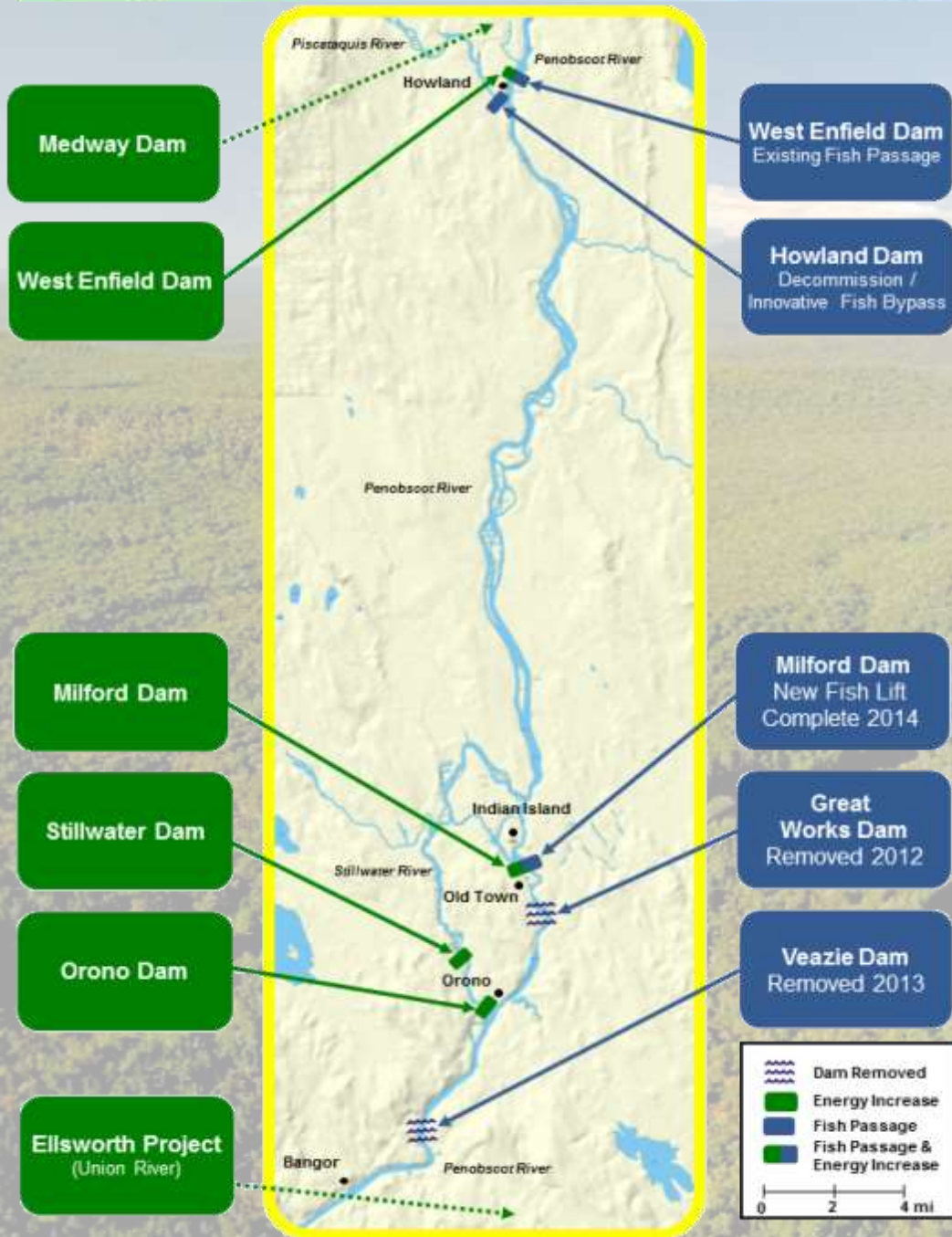
ESA is not perfect

- Critical habitat excludes important habitat
- Public cannot as easily connect to endangered species
- Does not amply fund recovery actions
- Does not act as aggressively as it could



Energy

Fish Passage



Penobscot River Restoration Enabling Conditions

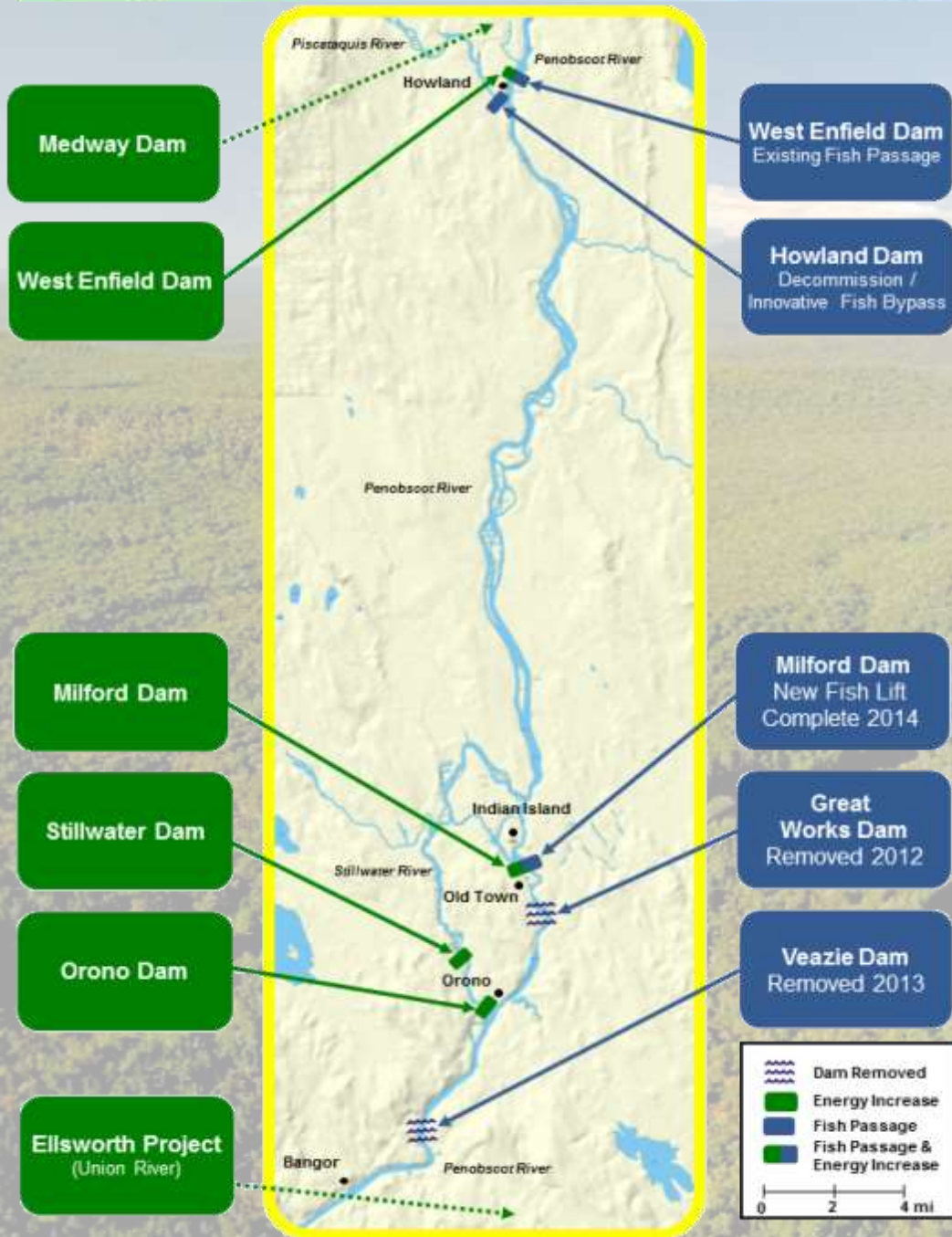
- Federal Power Act (Dams)
- Pending & final ESA Salmon listing
- Tribal Advocacy
- Defeat of Basin Mills
- Patient negotiations and relationship-building

**At the Great Works Dam
removal, 2013**



Energy

Fish Passage



Penobscot River Restoration Enabling Conditions

- Federal Power Act (Dams)
- Pending & final ESA Salmon listing
- Tribal Advocacy
- Defeat of Basin Mills
- Patient negotiations and relationship-building



(Former) Great Works Dam

290m wide, 7.3m tall // 2nd Dam up from Ocean (56 kilometers)



(Former) Great Works Dam
Removed 2012



(Former) Veazie Dam

305m wide, 7.3m tall // 1st Dam up from Ocean (48 kilometers)



Veazie Dam removal, in 2013



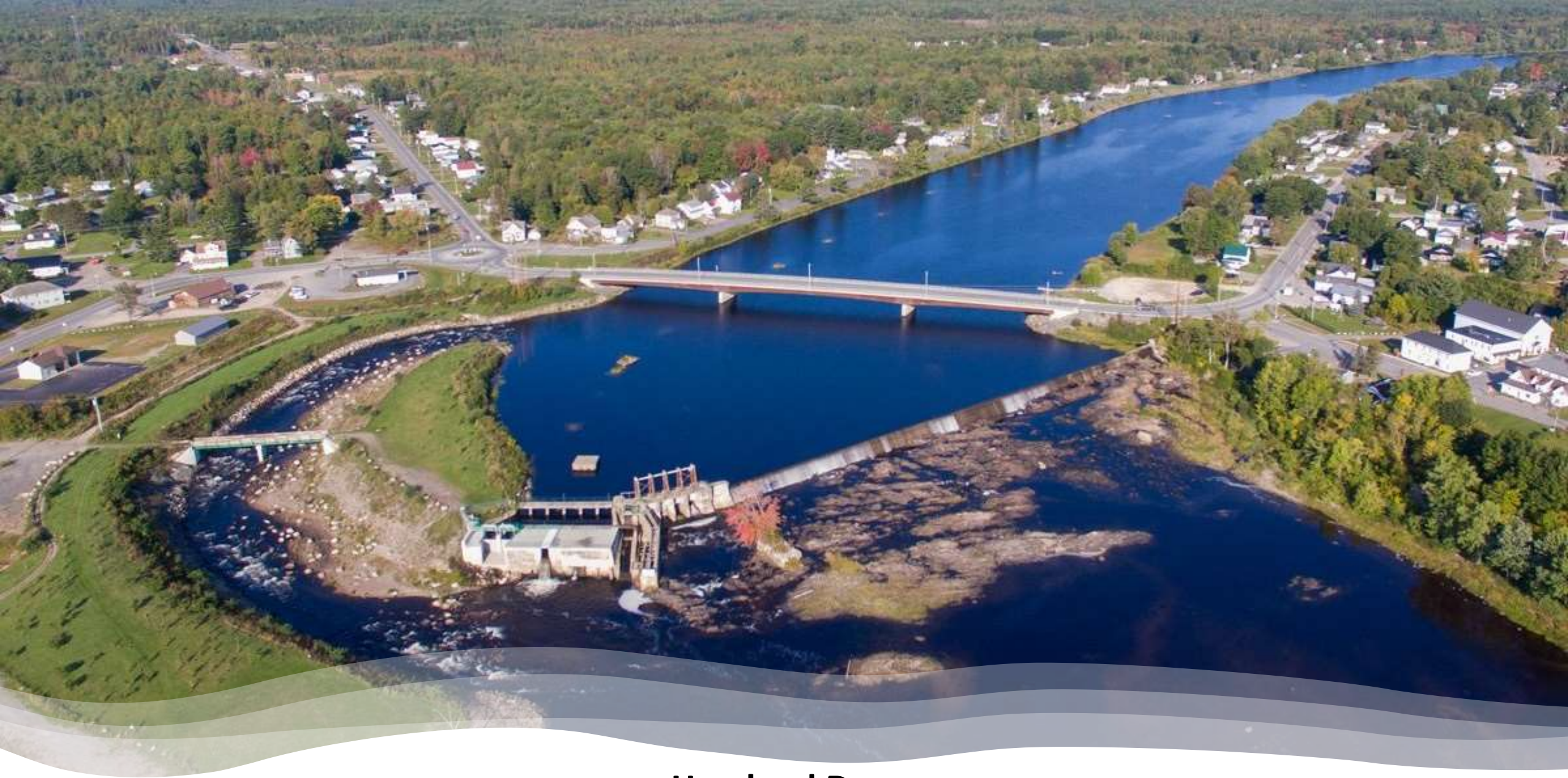
(Former) Veazie Dam

Removed 2013





Howland Dam

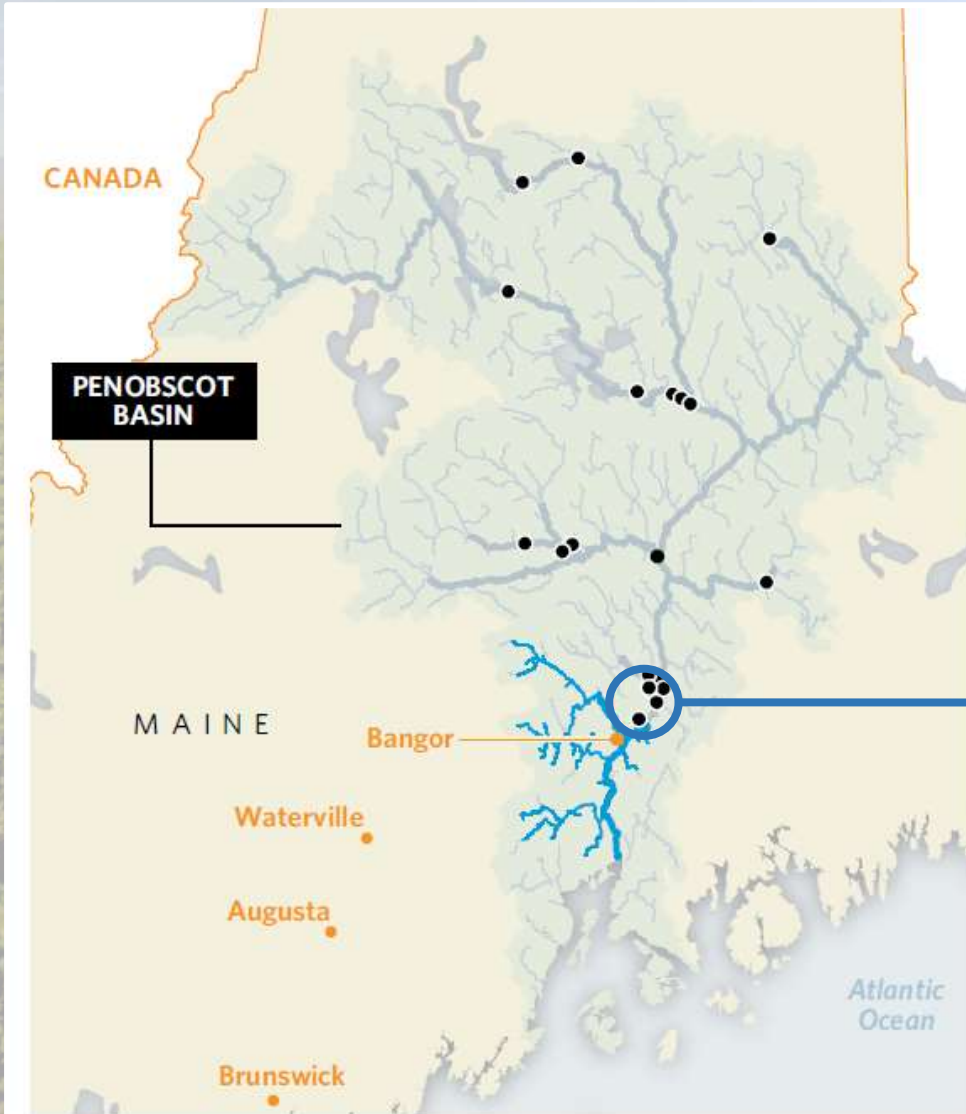


Howland Dam

Decommissioned and nature-life fishway constructed in 2016 (320m long, 33m wide)

Penobscot River Restoration Begins, June 2012

Largest remaining
run of Atlantic
salmon in the US



50 KM

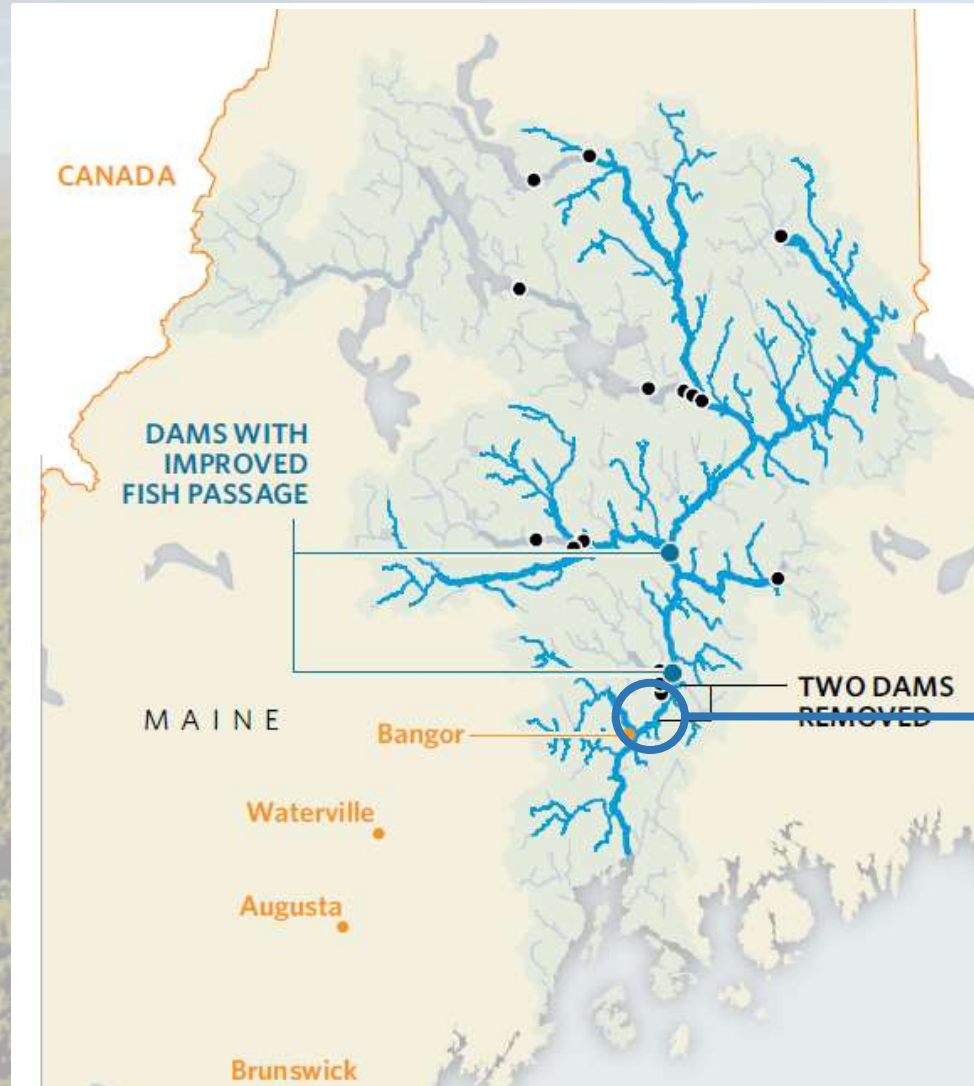
● DAMS ON MAINSTREAM
RIVER CHANNELS

— ACCESSIBLE FOR
MIGRATORY FISH

— MAINSTEM
RIVERS

— FULL RIVER
NETWORK

A More Connected Penobscot, May 2016



2,000 mi. of additional
accessible mainstem habitat

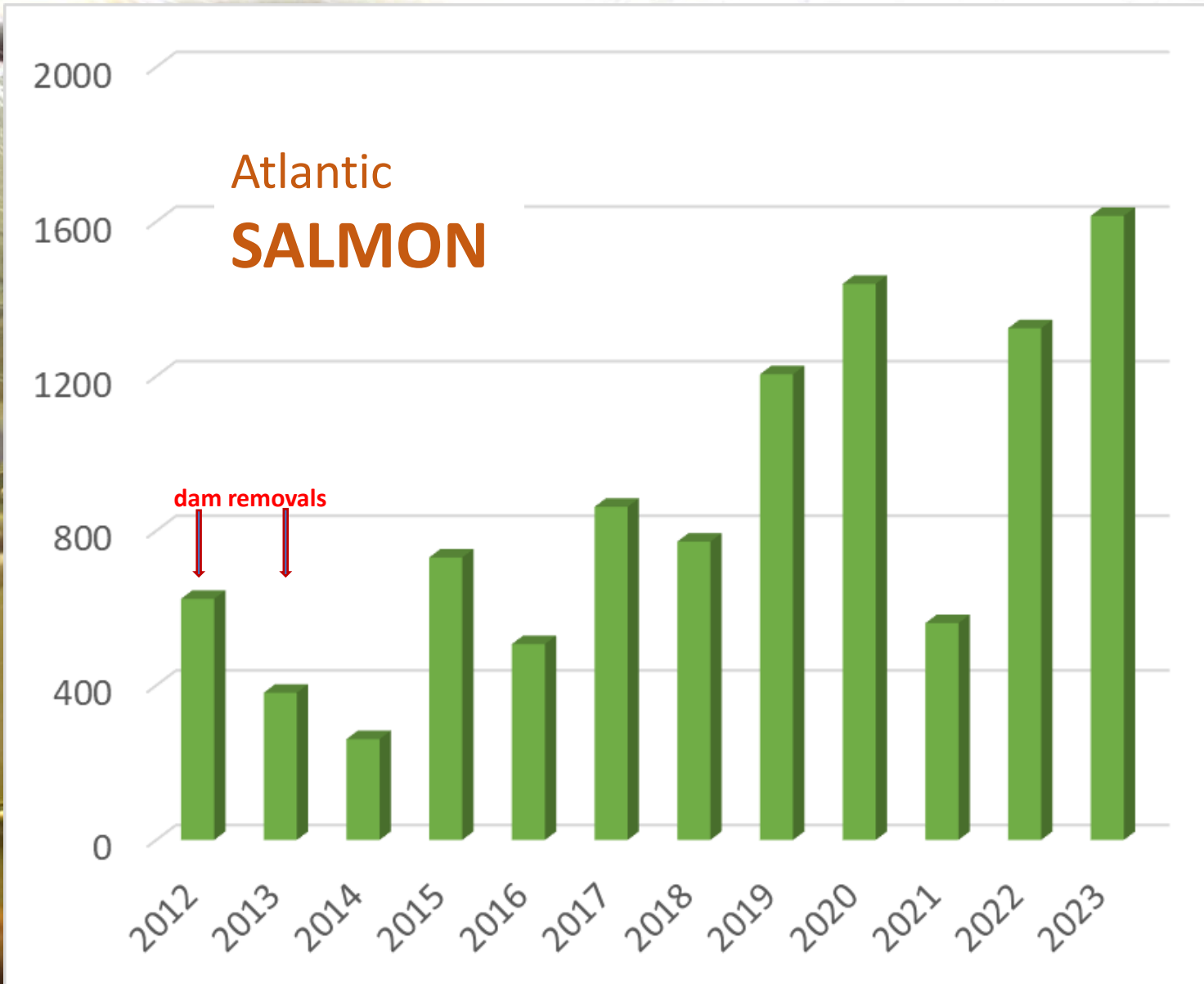


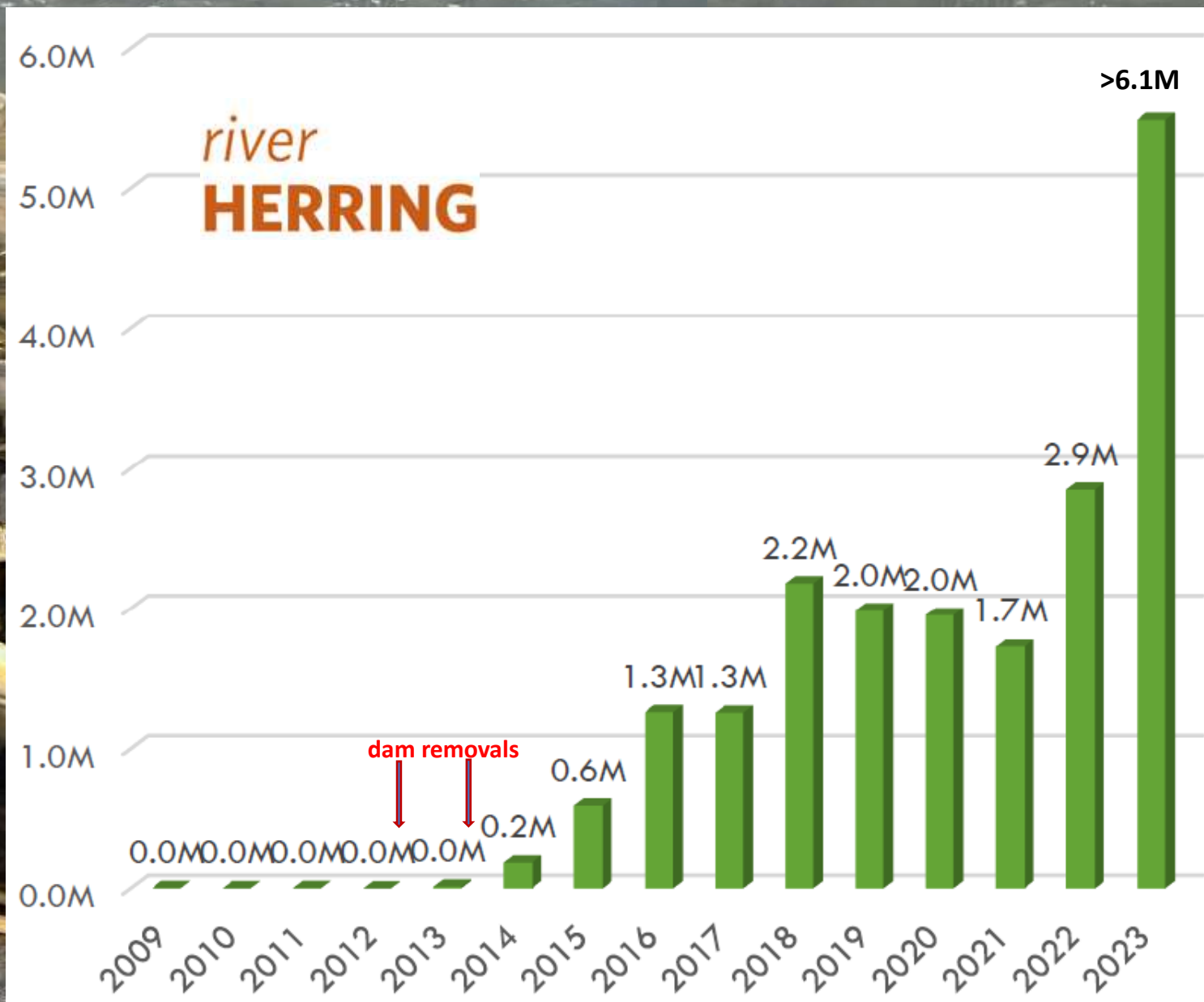
● DAMS ON MAINSTREAM
RIVER CHANNELS

— ACCESSIBLE FOR
MIGRATORY FISH

— MAINSTEM
RIVERS

— FULL RIVER
NETWORK





Multitude of benefits

- Terrestrial, avian, marine wildlife benefiting from increased fish populations.
- Marine and freshwater ecosystems improved and reconnected.
- Steps toward restoring cultural connection of the Penobscot Nation to their river.
- Revitalize tourism, recreation, and economic opportunities for riverside communities.

Fish Assemblages in the Penobscot River: A Decade after Dam Removal

Kory A. Whittum  Joseph D. Zydlewski, Stephen M. Coghlan Jr, Daniel B. Hayes, Jonathan Watson, Ian Kiraly

First published: 27 February 2023 | <https://doi.org/10.1002/mcf2.10227> | Citations: 1

 SECTIONS

 PDF  TOOLS  SHARE

Abstract

The Penobscot River Restoration Project in that culminated in the removal of the two passage on several remaining dams. Fish a rehabilitation, 3 years after rehabilitation,

The New York Times

Hopes for a Fish Revival as a Dam Is Demolished

 Share full article  



The dismantling of the Veazie Dam will help give 11 species of fish better access to 1,000 miles of spawning habitat. Craig Dilger for The New York Times

By Jess Bidgood

July 25, 2013

An underwater photograph showing several fish swimming in clear, greenish-blue water. In the foreground, there are large, smooth, light-colored rocks. A large fish, possibly a salmon, is swimming towards the left in the upper half of the frame. Another large fish is swimming towards the right in the upper right. Several smaller fish are scattered throughout the water. The bottom of the frame shows a sandy or silty seabed.

Merci beaucoup!

Casey Clark, Département des ressources marines du Maine
casey.clark@maine.gov

Hadley Couraud, The Nature Conservancy in Maine
hadley.couraud@tnc.org



The next slides are photos
we could use as/if needed.











