



# Road Crossing Barriers and Systemic Solutions

State of Maine USA

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The Nature Conservancy in Maine

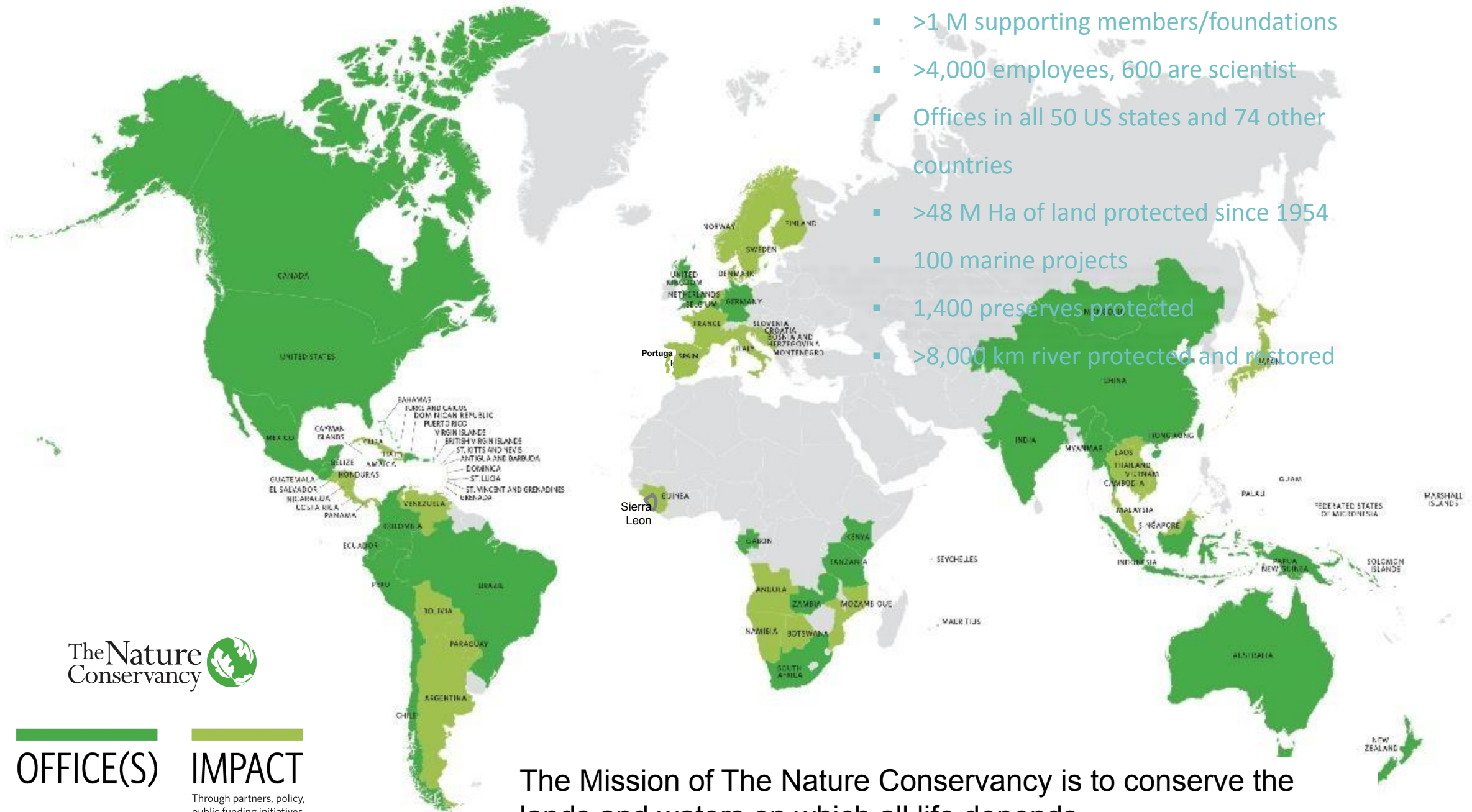
Phoebe Chandler photo

The Nature  
Conservancy  
Maine





**OUR MISSION IS TO CONSERVE  
THE LANDS AND WATERS ON  
WHICH ALL LIFE DEPENDS.**



- >1 M supporting members/foundations
- >4,000 employees, 600 are scientist
- Offices in all 50 US states and 74 other countries
- >48 M Ha of land protected since 1954
- 100 marine projects
- 1,400 preserves protected
- >8,000 km river protected and restored

The Nature Conservancy



OFFICE(S)

IMPACT

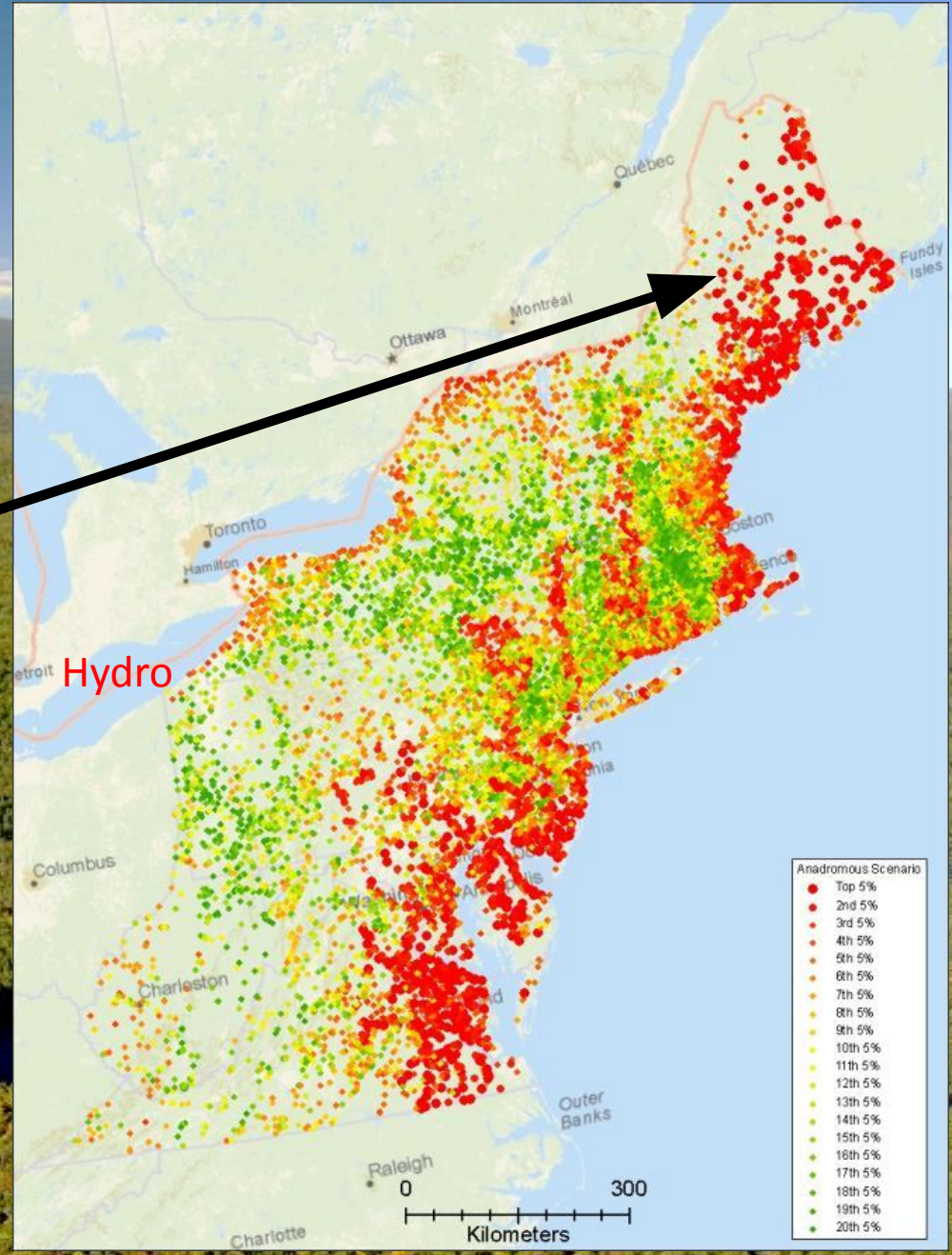
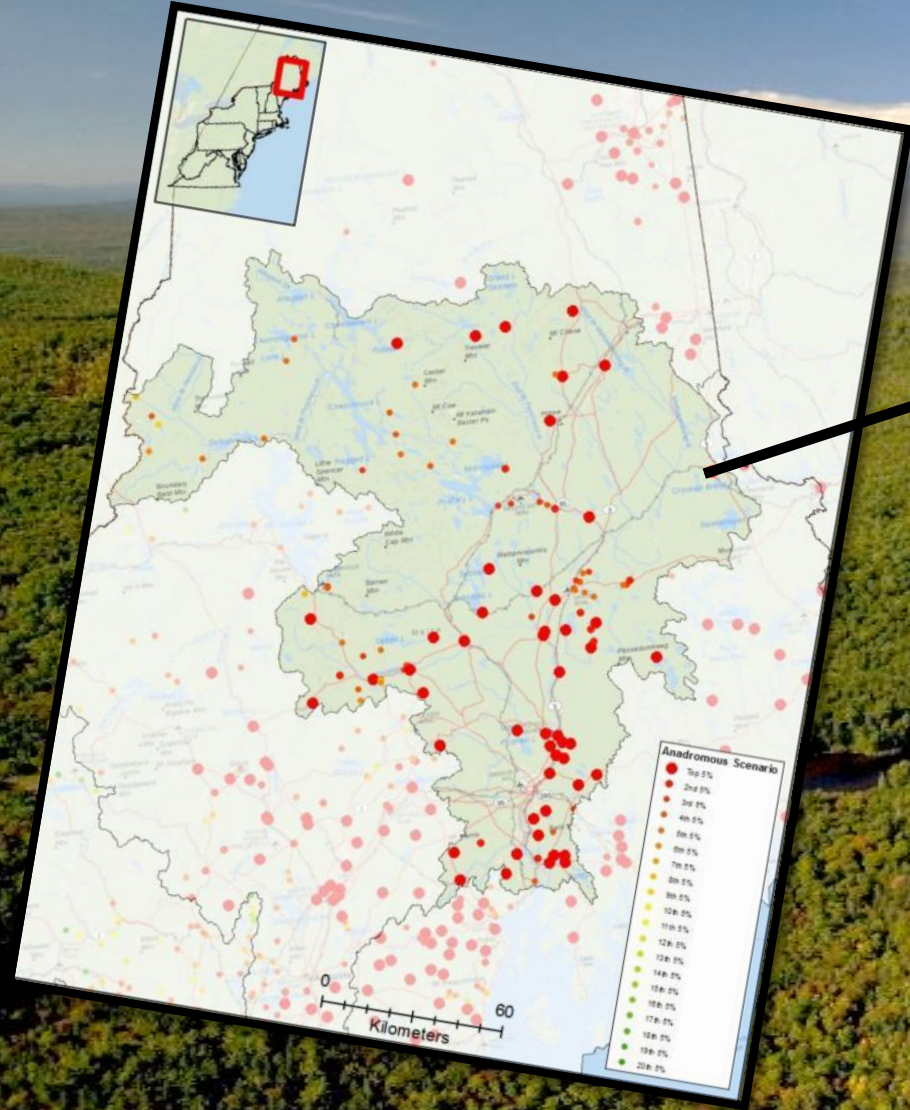
Through partners, policy,  
public funding initiatives  
or legacy programs

The Mission of The Nature Conservancy is to conserve the  
lands and waters on which all life depends.

# Rivers Connect Us:

Our forests, our towns,  
our fish, energy, and  
ocean fisheries

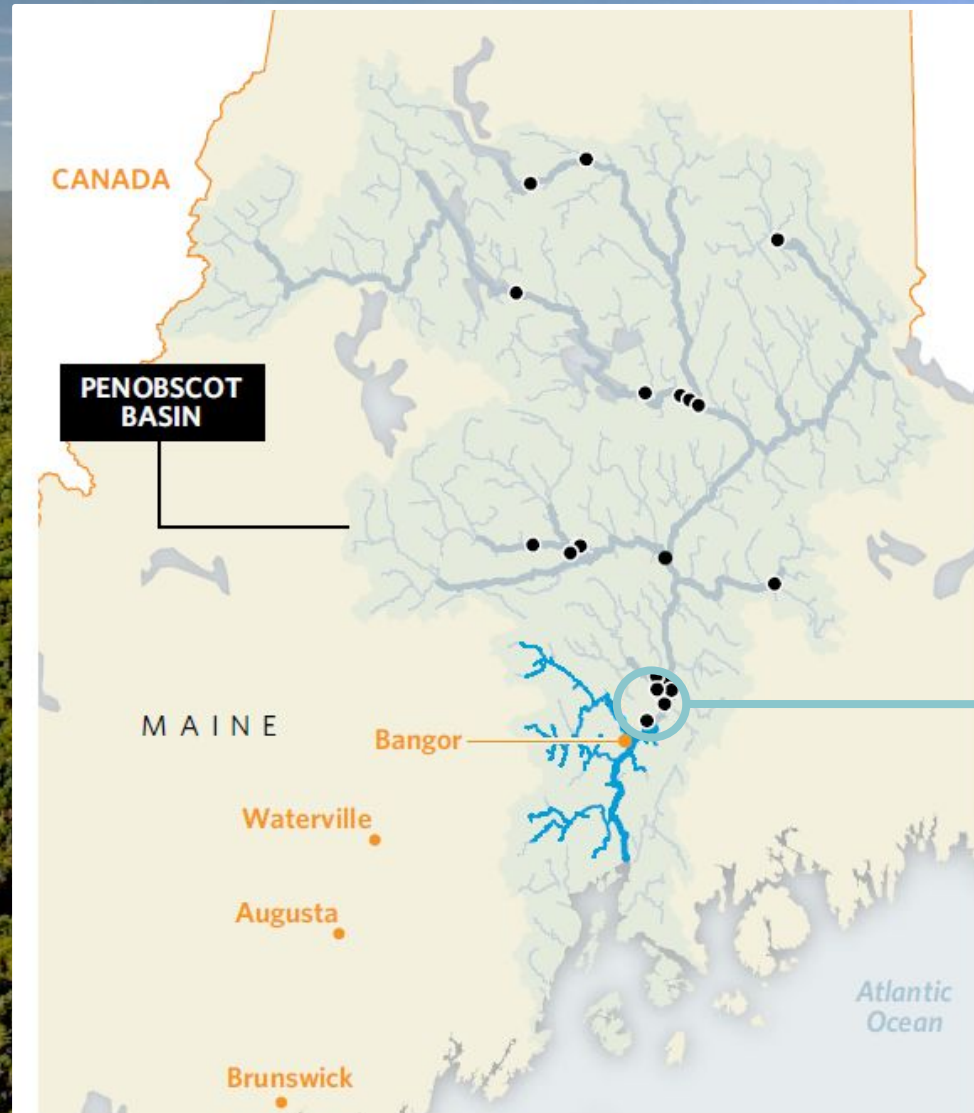




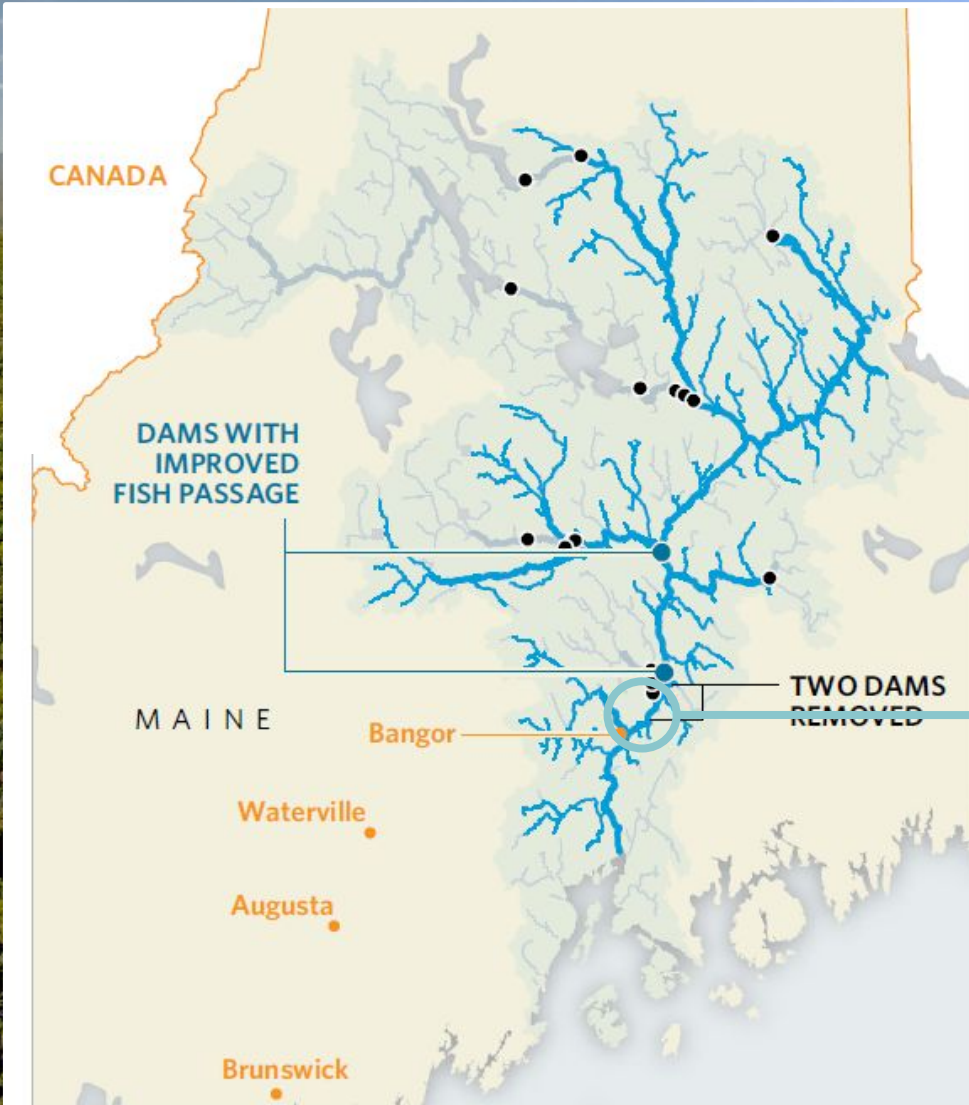
Hydro

# Penobscot River Restoration Begins, June 2012

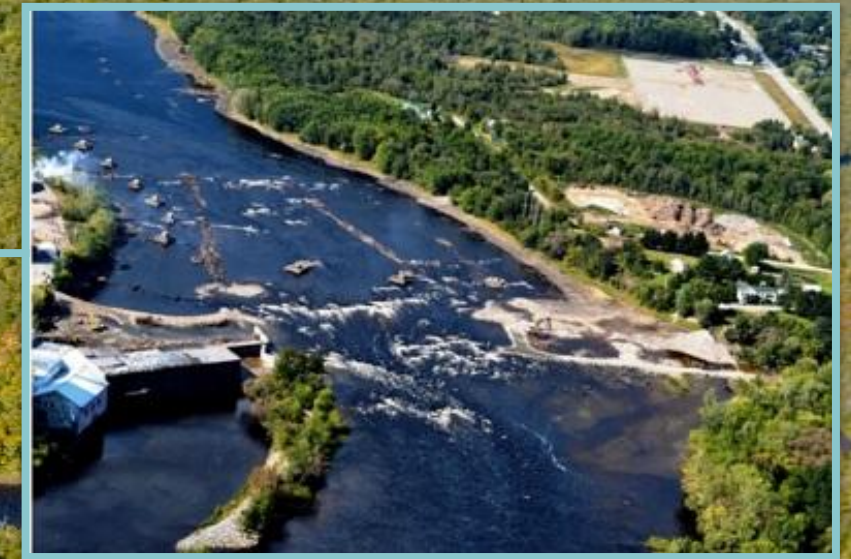
Largest remaining run of Atlantic salmon in the US



# A More Connected Penobscot: May 2016



3.200 km additional  
accessible habitat



● DAMS ON MAINSTREAM  
RIVER CHANNELS

— ACCESSIBLE FOR  
MIGRATORY FISH

— MAINSTEM  
RIVERS

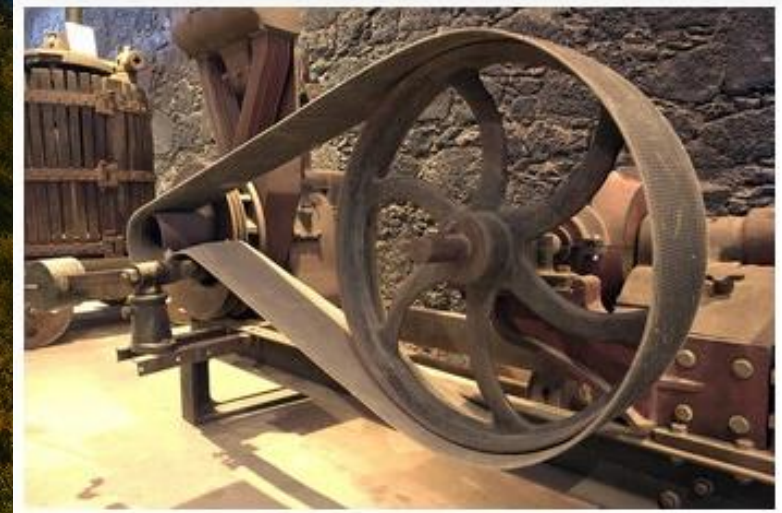
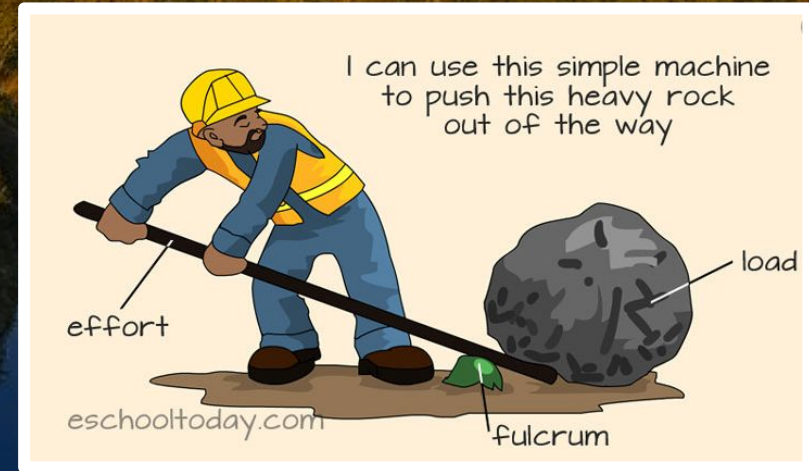
— FULL RIVER  
NETWORK



How can we increase the amount, rate and quality of river restoration globally?

**Leverage:** Use our efforts to increase the scope and size of projects

**Flywheel:** Create the momentum that will continue to work into the future



# Multi-faceted Solutions

To solve road crossing problem



Barriers & habitat data



Policies/rules for repair  
and new crossing



Analysis tools to focus work

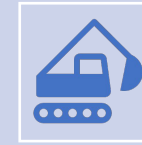


Outreach/Education

Engineers, managers, advocates



Funding Mechanisms



Implement/Monitor



# Barrier & Habitat Data



Nearly 27,000 data points



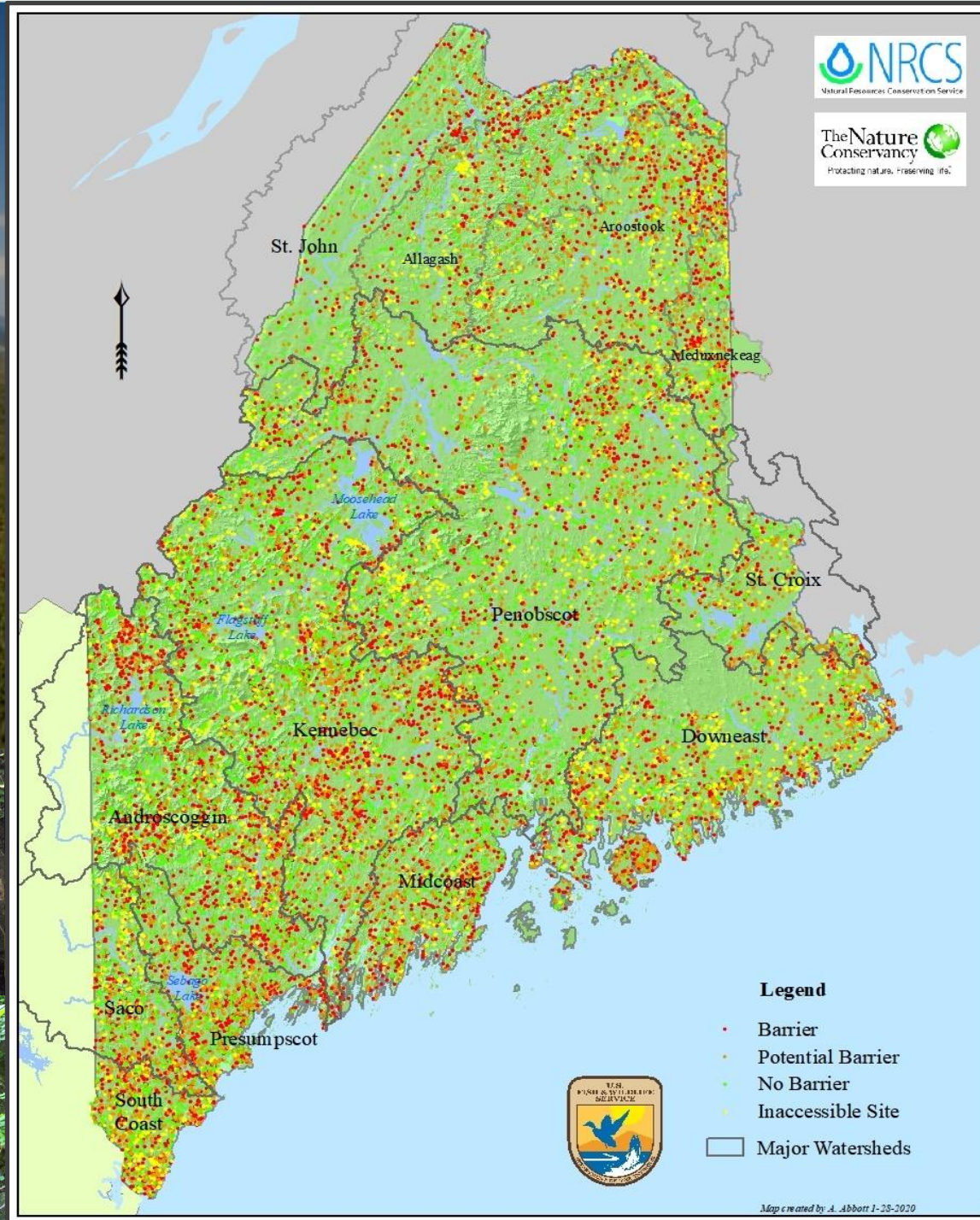
70,000 photographs



90% of Maine's crossings



30-50% of all crossings are barriers to fish passage

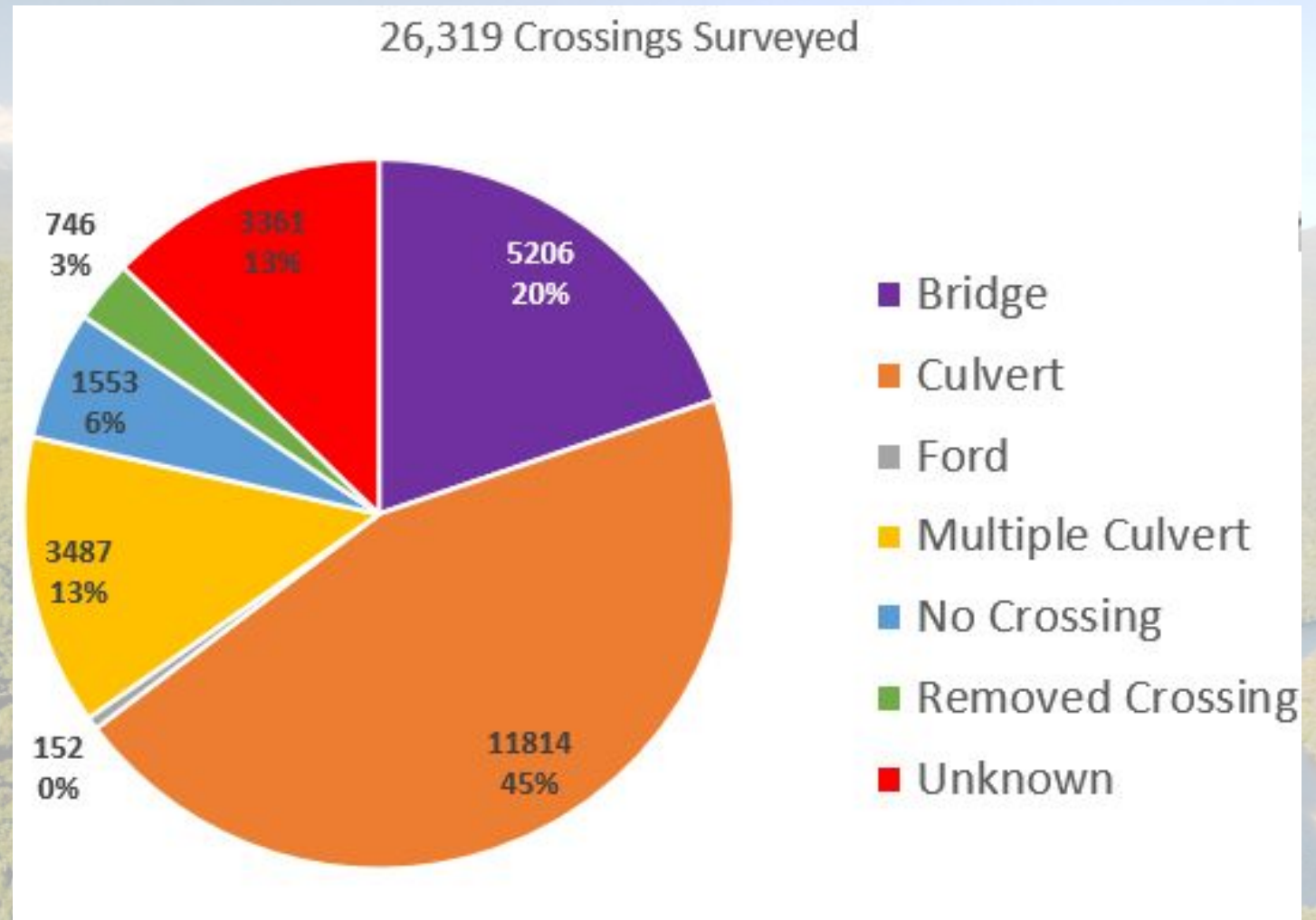


## Barrier & Habitat Data

11,814 Crossings are Culverts

5,393 are definite barriers

5,634 more potential barriers



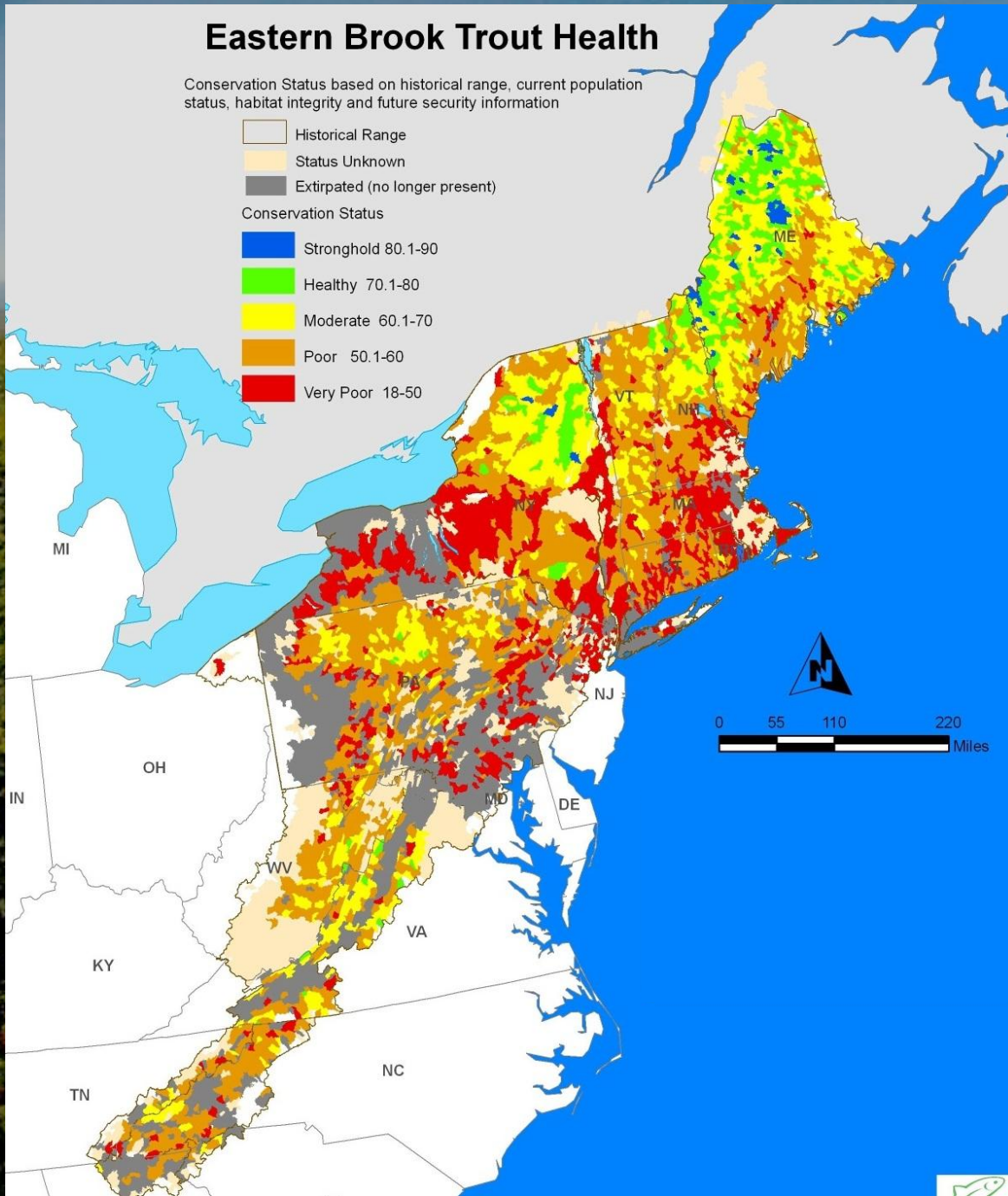
## Eastern Brook Trout Health

Conservation Status based on historical range, current population status, habitat integrity and future security information

- Historical Range
- Status Unknown
- Extirpated (no longer present)

### Conservation Status

- Stronghold 80.1-90
- Healthy 70.1-80
- Moderate 60.1-70
- Poor 50.1-60
- Very Poor 18-50

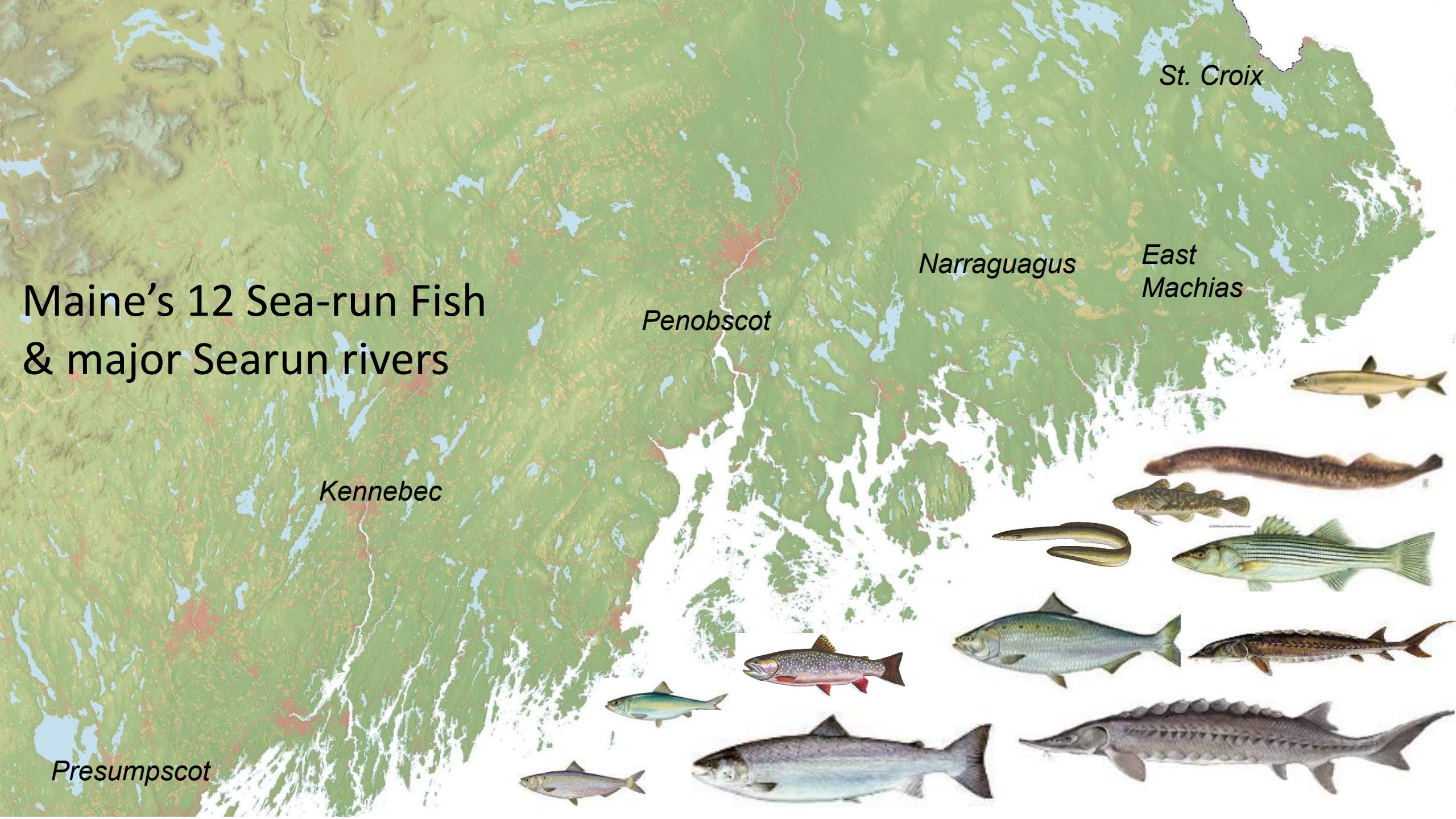


The Last Best Place for protecting thriving populations of Eastern brook trout in the country are in these **Yellow** (need help), **Green**, (ok for now), and **Blue** (great) watersheds.

What are some of the major threats?



# Maine's 12 Sea-run Fish & major Searun rivers



St. Croix

Narraguagus

East  
Machias

Penobscot

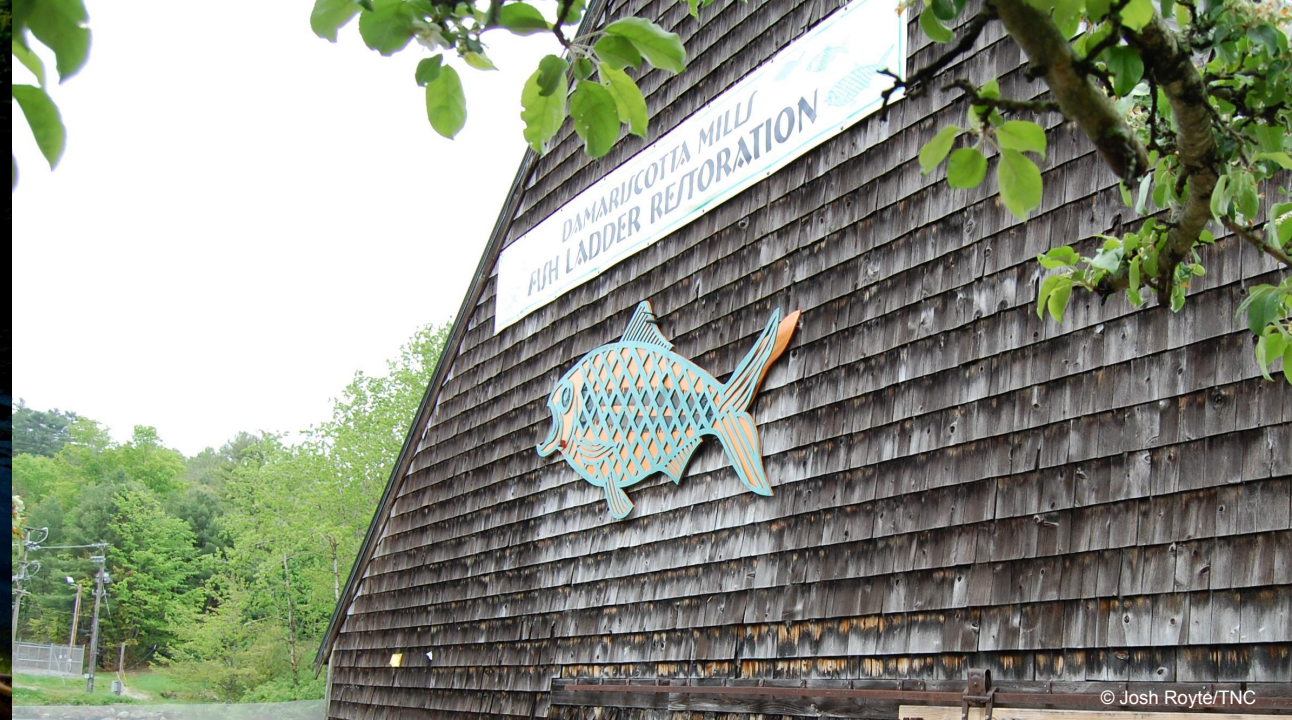
Kennebec

Presumpscot





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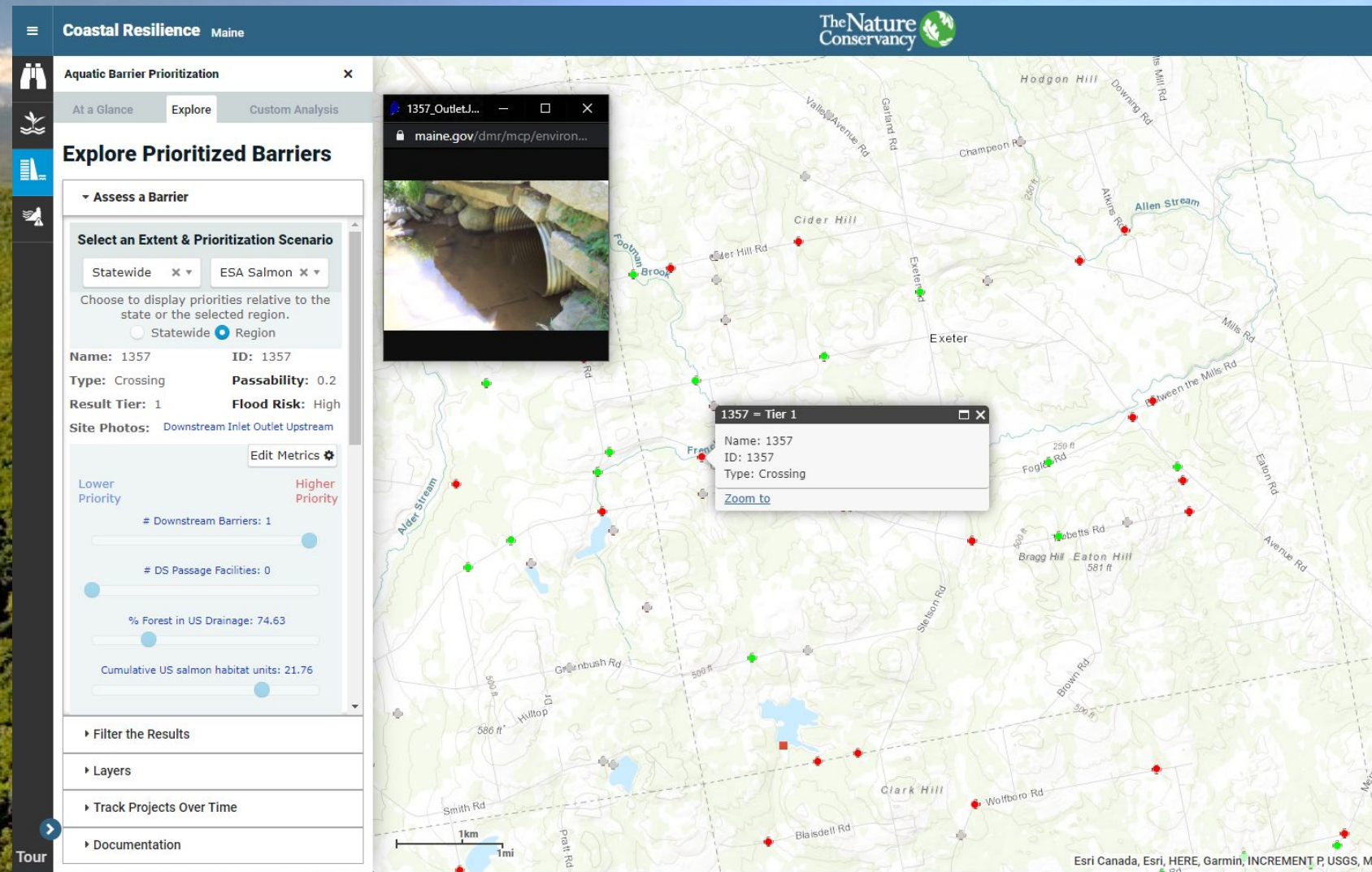


© David McLain

# Tools

To share and Prioritize

- ID/Prioritize Projects
- Kilometers of habitat
- Note: dams & waterfalls
- Critical habitat
- *Risk for people/roads*
- Funding focus
- Partner capacity

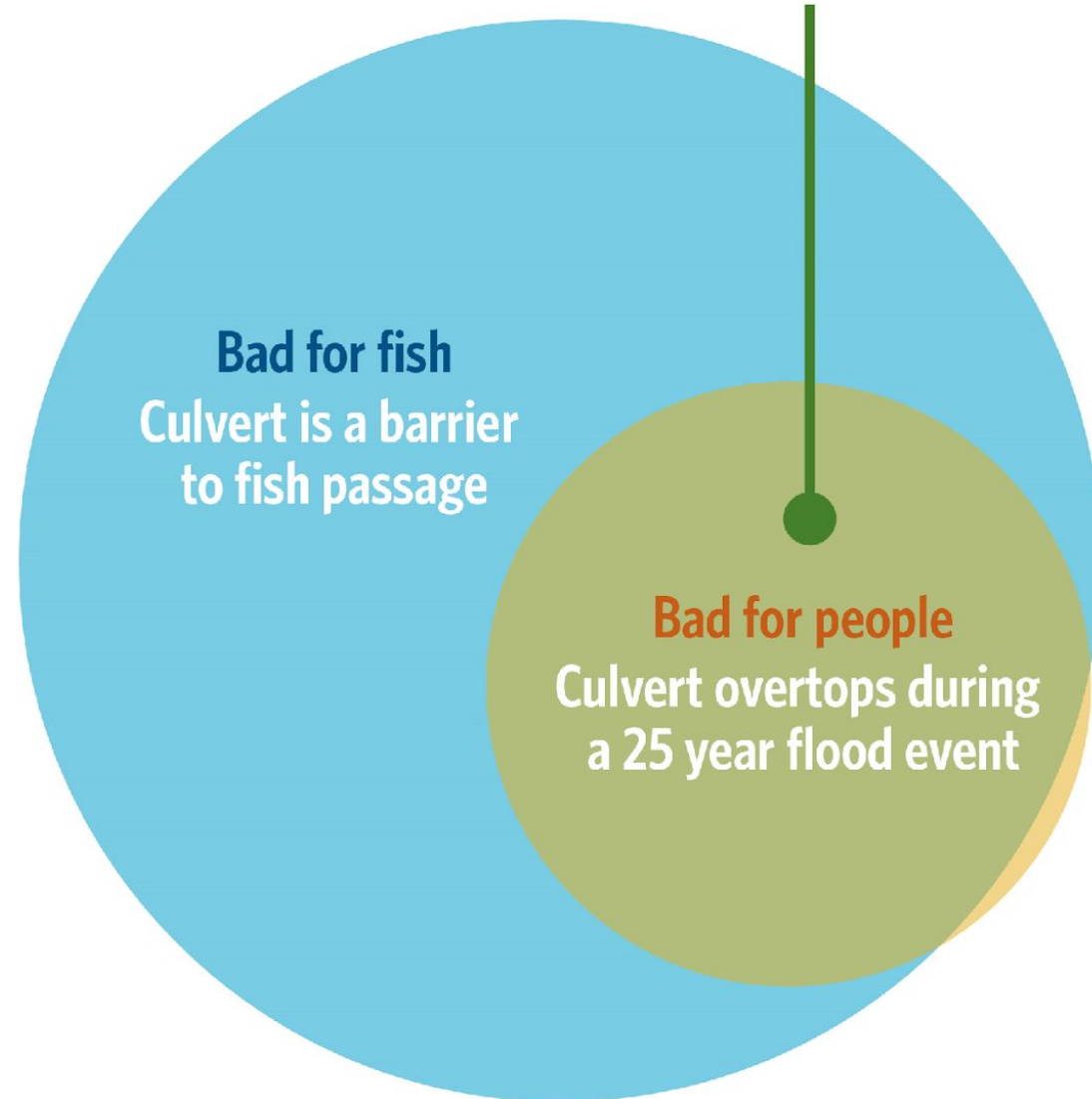




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# CULVERT PROJECTS THAT BENEFIT PEOPLE AND NATURE

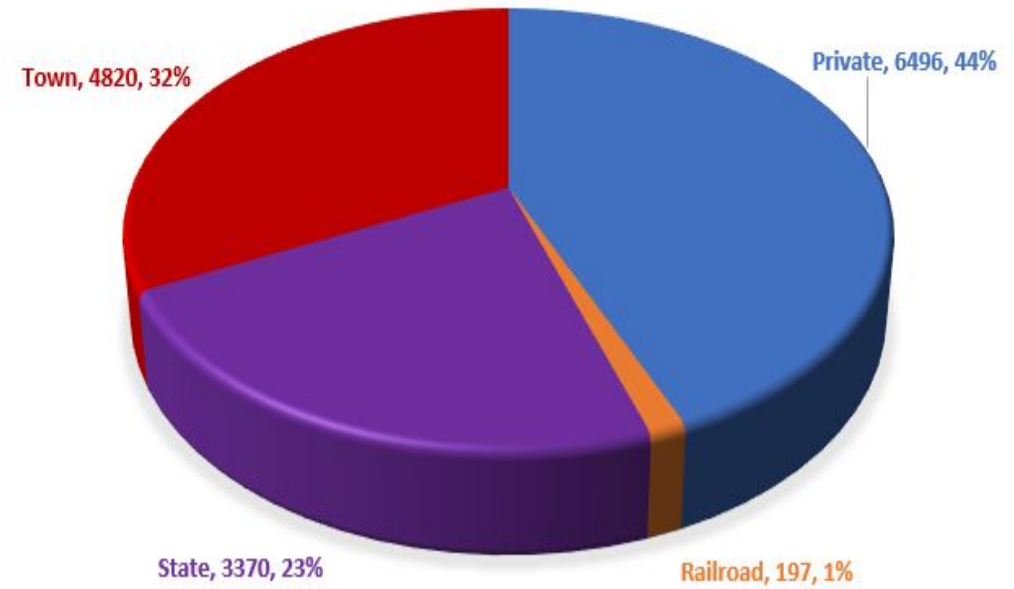


# Funding Mechanisms

- US Department of Agriculture
  - Natural Resources Conservation Service (private some town, in-kind engineering & education)
  - US Forest Service (federal. private and in-kind education)
- National Oceanic and Atmospheric Administration
- US Fish and Wildlife Service (Fish Passage program, in-kind)
- Bureau of Indian Affairs
- State and Federal Highway Funds
- Maine Mitigation/Impact Funding
- Private contributions including in-kind

## BARRIERS

(n= 26,328)



## Policies

New, repair, replace

- Fast-track restoration permitting process – with guidelines
- USFS help adapting Endangered Species rules
- Education on long-term benefit with *controlled* short-term impact
- Ensure Stream Smart fix is easier than Business as Usual
- Rules for new crossings (and >50% repair)
- Adapt Flood Insurance rules to allow for pre-disaster funding
- Other federal funding sources: Farm Bill-NRCS, NOAA, etc.

## Education & Outreach

Inspire, inform, network expertise

### Educate

- Regulators
- Planners
- town road managers
- State highway engineers
- Private land road owners
- Engineering students



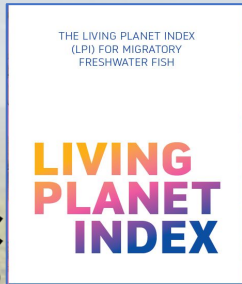
[StreamSmartMaine.org](http://StreamSmartMaine.org)

*Connecting fish  
and wildlife habitat  
while protecting roads  
and public safety.*

# Education & Outreach

Inspire, inform, network expertise





WORLD FISH  
MIGRATION DAY



Outreach and impact numbers

2014 - 2020

**120 Million+**

Engaged through Events, Media Outlets  
and Social Platforms

**1,500 events**

**100**  
countries

**4,000**  
organizations involved

**100,000**  
WFMD event attendees

**10,000 +**  
Connected individuals

# Implement Projects & Monitor



Demonstrate techniques  
Innovate new solutions  
Share lessons good *AND BAD* too!  
Fix Habitat and Reduce Risks!  
Ensure solutions are lasting  
Measure system responses

## Systemic Solutions

To solve road crossing problems

- ☐ Map barriers and habitat
- ☐ Prioritize projects for best, most habitat and flood risks
- ☐ Network among diversity of partners
- ☐ Adapt policy and regulations for repairs, replacement
- ☐ Develop diverse funding sources for multiple end-users
- ☐ Inspire and educate
  - ☐ especially road managers, engineers
  - ☐ Grow the pool of project managers
- ☐ Measure and report back results to inform priorities, adaptation, and celebrate!



Thank you

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