



PARTNER WORKSHOP

Fish Passage Opportunities through
the Bipartisan Infrastructure Law

VOLUME 2: JULY 2022 PRESENTATIONS

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Panel: Perspectives on the
Challenge and Opportunity of
Fish Passage

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022



FISH PASSAGE

PARTNER WORKSHOP

Iron Gate Dam, Klamath River, CA

The questions



- How do barriers impact fish populations, historically and currently?
- What are the main types of barriers encountered?
- What is the scale, severity and distribution of these barriers?
- What are the fish benefits of removing barriers and restoring access?
- Which species would most benefit ...
- What are the overarching key messages about habitat and ecosystem services, socioeconomic and economic value of barrier removal?

How do barriers impact fish populations?



British Columbia,
Canada

Washington, Idaho,
Montana, & Nevada

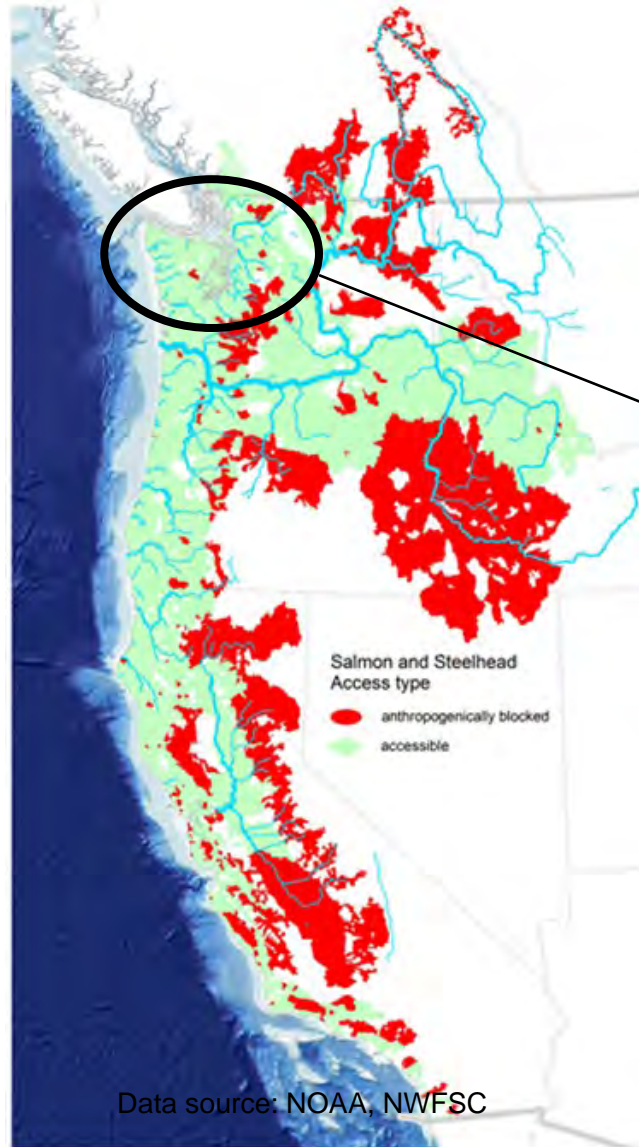
California



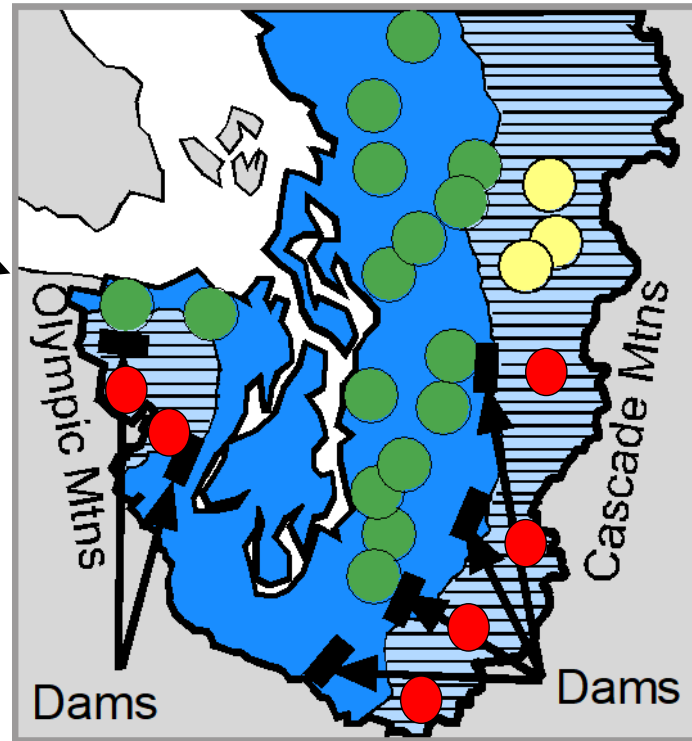
Data source: NOAA, NWFSC

Barriers limit fish access to important habitats for specific life stages, life histories, and have led to reductions in fish population abundance over time

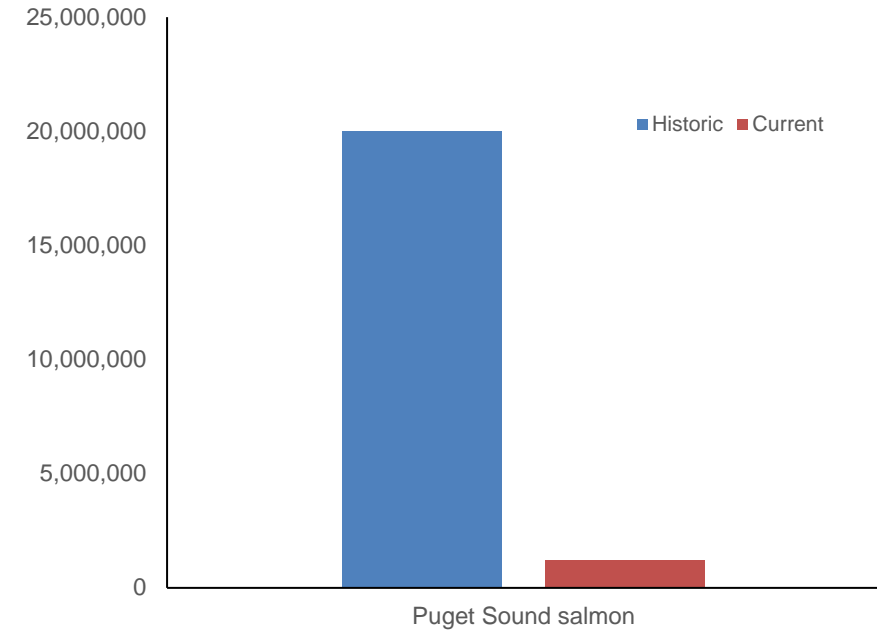
How do barriers impact fish populations?



Data source: NOAA, NWFSC



- = existing Spring Chinook salmon populations
- = existing ocean type Chinook salmon populations
- = extirpated Spring Chinook salmon populations



Barriers are a major factor in the decline in Puget Sound salmon stocks over the last 100 plus years



How do barriers impact fish populations?

- The Penobscot River is New England's second largest river
- Home to 11 migratory fish species
- Three are listed under the Endangered Species Act
- The river also hosts the largest run of Atlantic salmon remaining in the United States
- The population is less than 1% of historical population
- Dams, other barriers, and water pollution have severely reduced migratory fish populations in the Penobscot Basin



What are the main types of barriers?

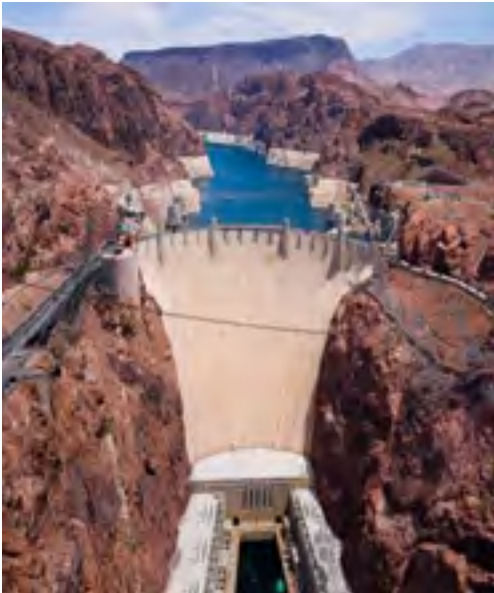


Dams

Culverts

Levees

Tidegates

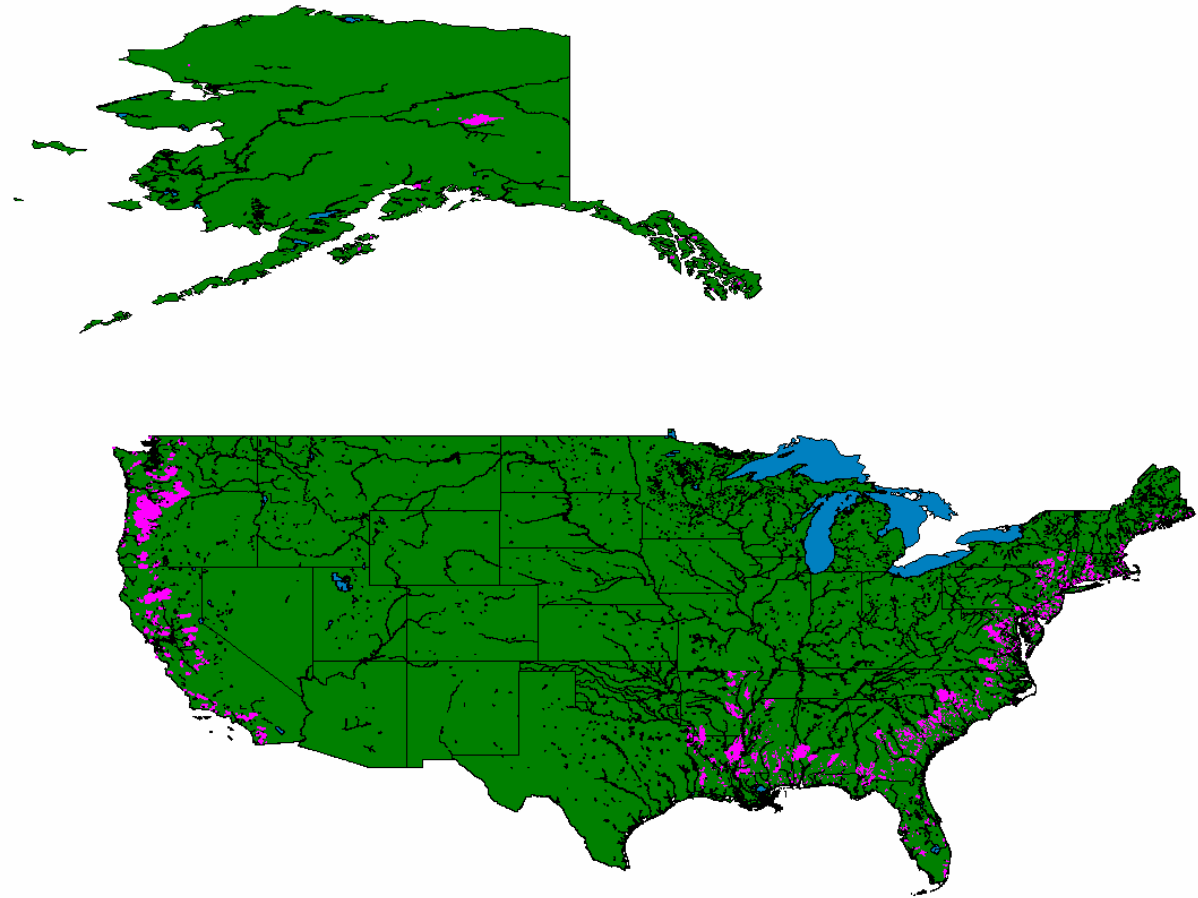


There is an estimated **2.5 million** barriers to fish migration in the United States alone. These barriers typically consist of small to large size dams, culverts, and other structures. (USGS 2018)

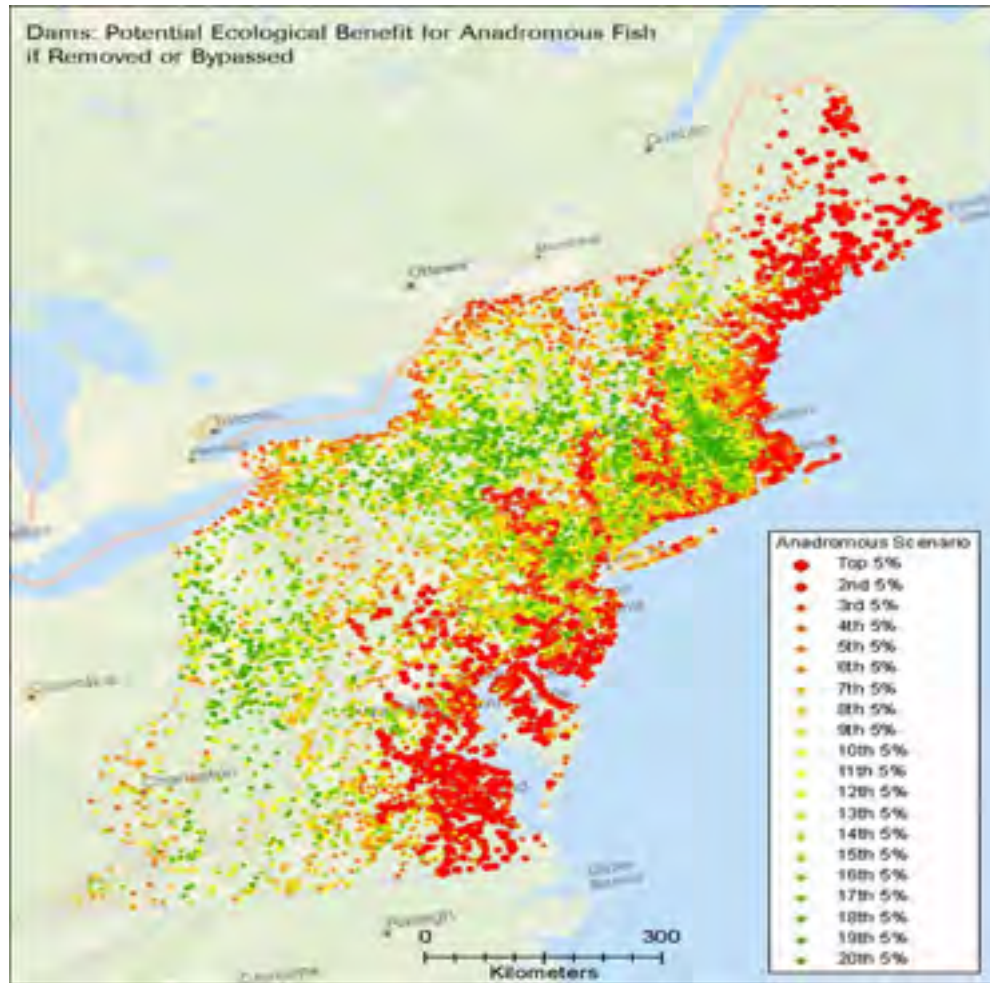
What is the scale, severity and distribution of these barriers?



Fish access to more than 70,000 km of streams and lakes is impeded by terminal dams across the Gulf of Mexico and Atlantic and Pacific coasts (Patrick, 2005)



What is the scale, severity and distribution of these barriers?



- There are a large number of dams in the Northeast region
- The ~ 14,000 dams shown make up roughly half of the nearly 28,000 total dams estimated to exist in the region (The Nature Conservancy & Northeast Association of Fish and Wildlife Agencies)
- Each dam was assessed for the benefits it would provide for migratory species (i.e. river herring, striped bass, & Atlantic sturgeon) if removed
- The largest red dots represent dams that, if removed, would provide the largest potential benefits for migratory fish

What is the scale, severity and distribution of these barriers?

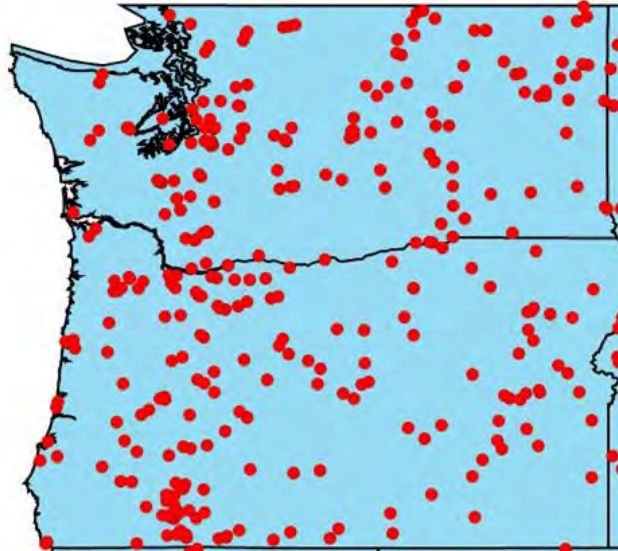


In Oregon and Washington there are ~10,000 culverts on fish-bearing streams on federal lands.

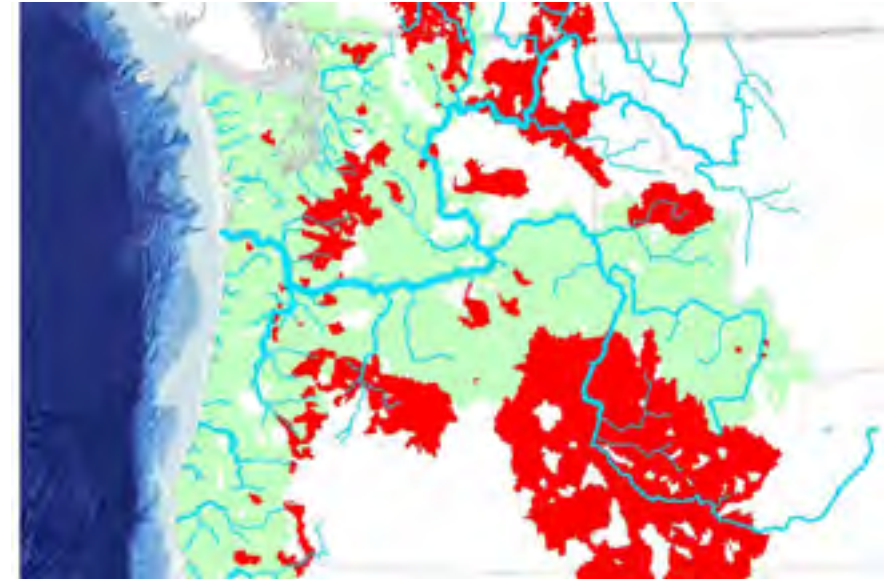
Over 50% of those road crossings are impediments to fish passage (USGAO 2001).

Over the last 20 years, large-scale rehabilitation projects for Pacific salmon have resulted in the removal of thousands of migration barriers

This has restored access to more than 15,000 km of streams (NOAA 2020).



Data source: National Inventory of Dams,
US Army Corps Engineers

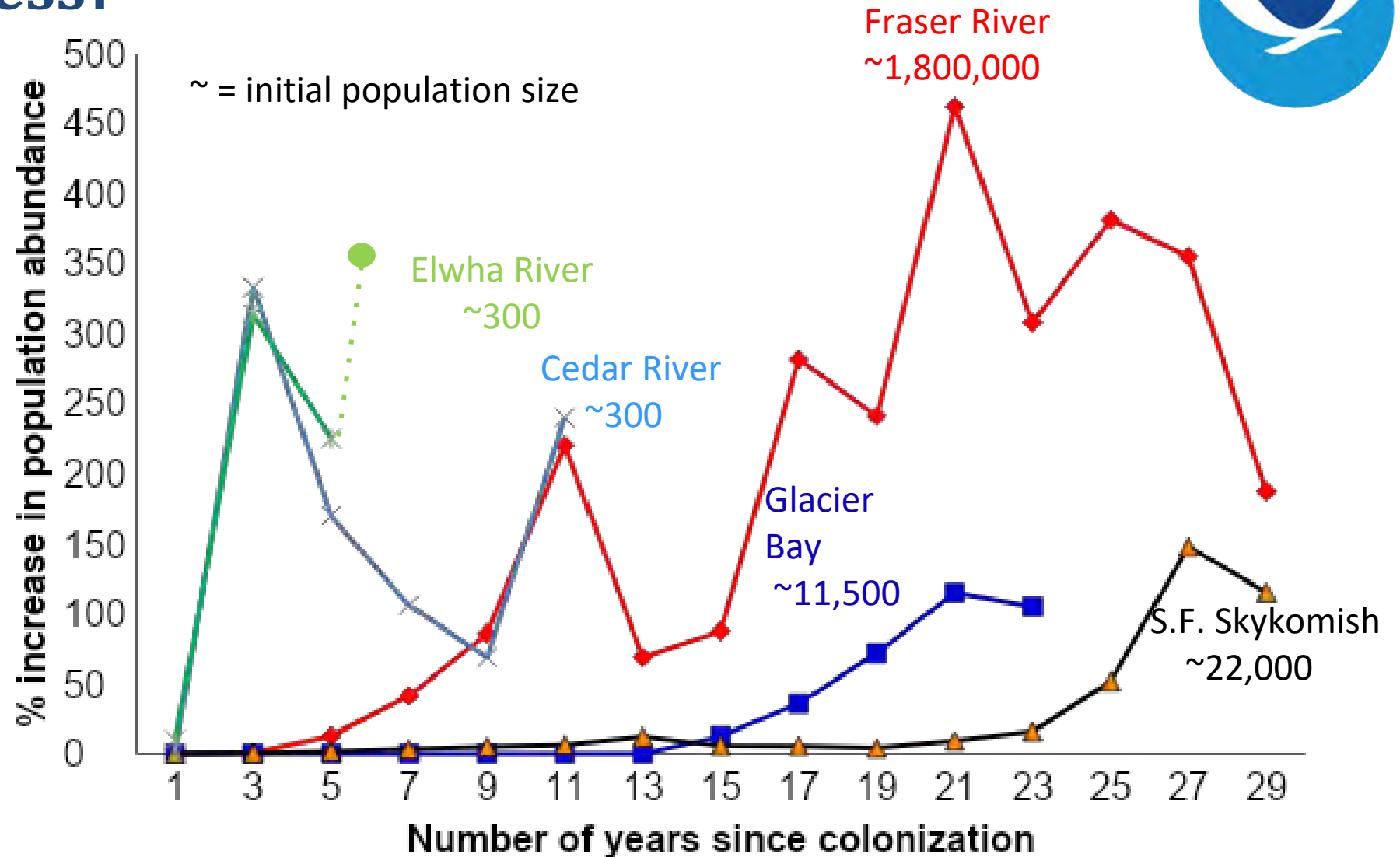


Data source: NOAA, NWFSC

What are the fish benefits of removing barriers & restoring access?



Fish populations can increase 100% to 400% in one to two decades following the removal of barriers

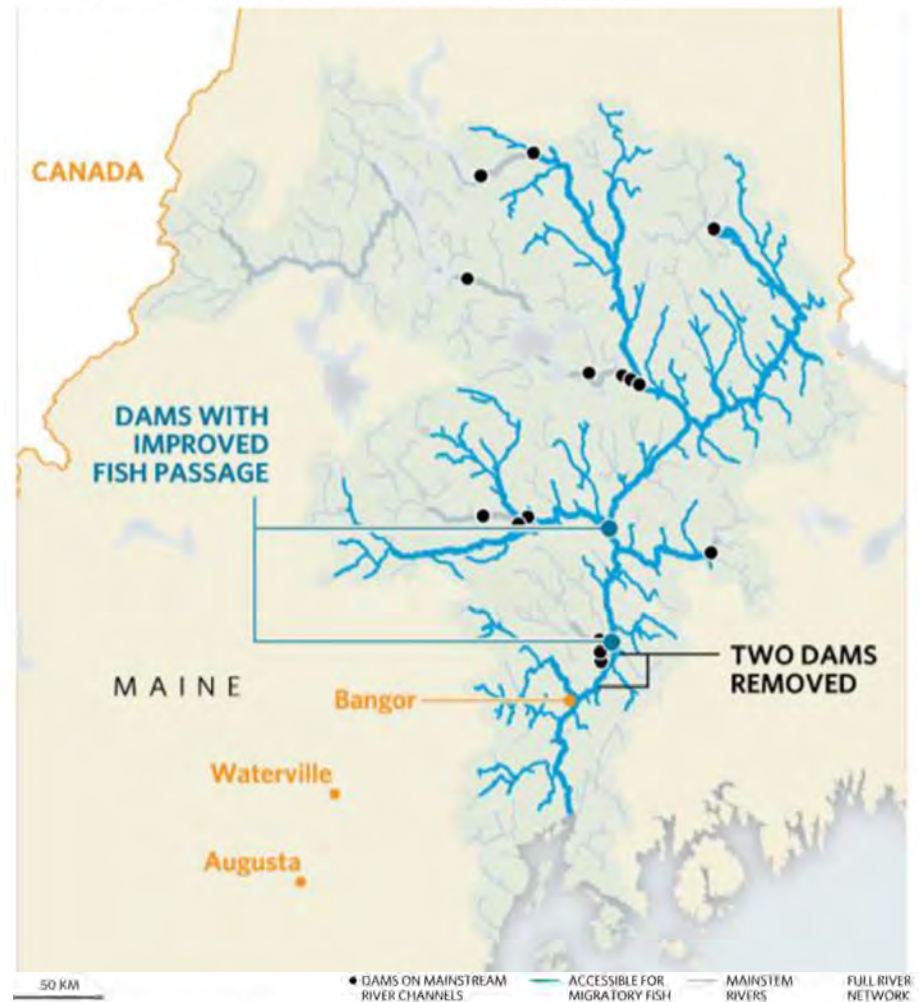


Pess et al. 2014



What are the fish benefits of removing barriers & restoring access?

- Back to the Penobscot..
- In 2015, endangered shortnose sturgeon reached portions of Penobscot River that had been blocked by dams for more than a century
- More than 500,000 river herring, 45 times more than in 2013, were counted at a former dam site
- Atlantic salmon numbers are the highest since 2011.



Opperman et al 2019

What are the fish benefits of removing barriers & restoring access?



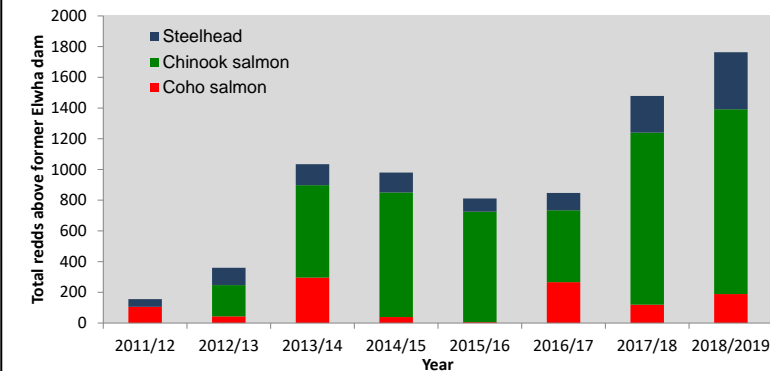
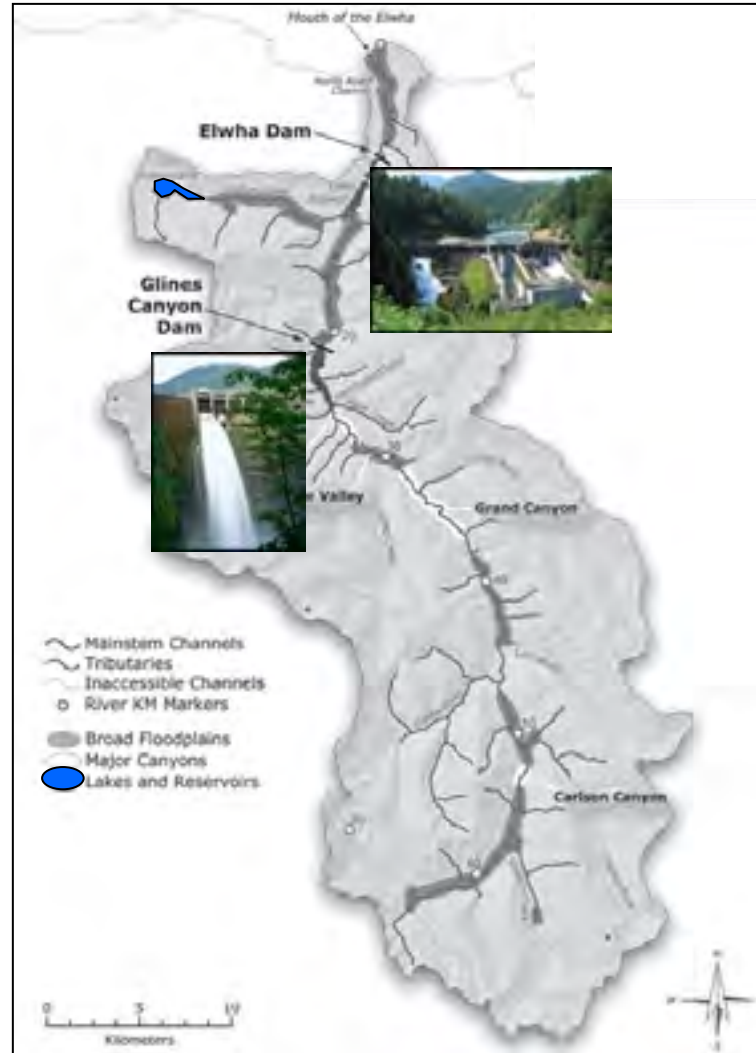
Two dams removed from the Elwha River, Washington State opened over 100km of habitat (Duda et al, 2021)

A dramatic increase in sediment resulted the creation of an river delta/estuary (Ritchie et al, 2018)

Adult salmon making it above former dams and spawning in the hundreds to thousands (Pess et al, in review)

Pacific lamprey have had a 12-fold increase in the three years following dam removal (Hess et al, 2021)

'Re-awakening' of summer steelhead, likely owing to the harboring of alleles for run timing in up-river populations (Pess et al, in review)



What species benefit the most?



Species which have a tendency to expand into new habitats or colonize newly accessible streams benefit the most from barrier removal

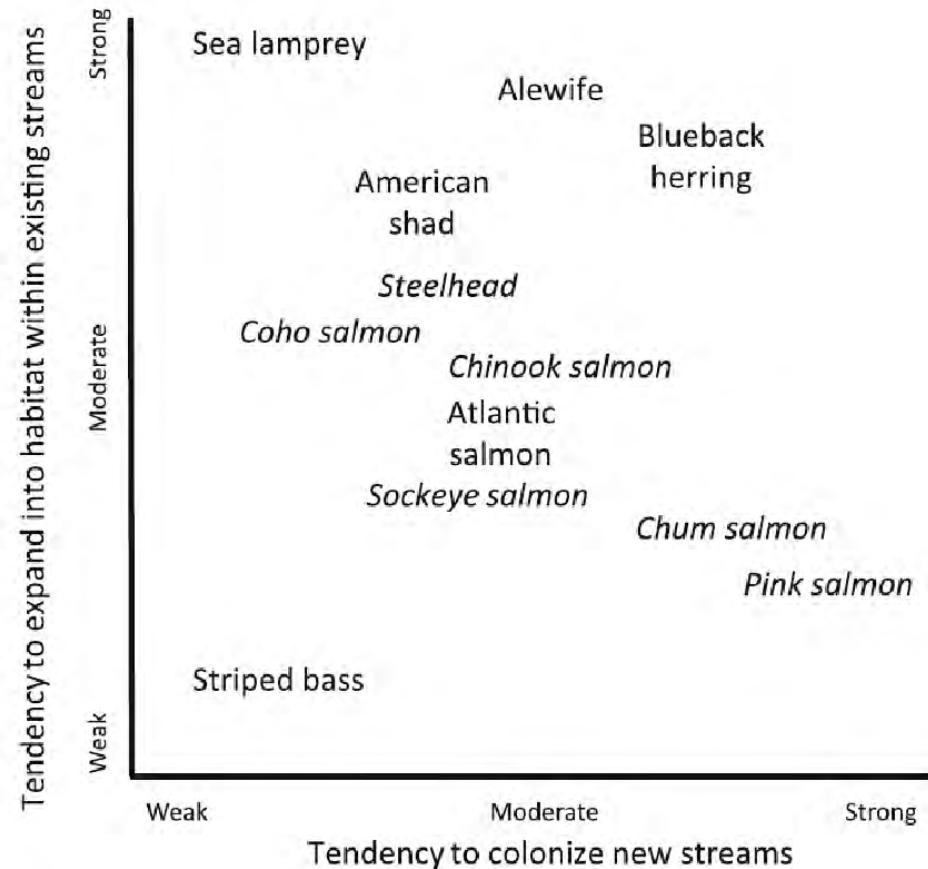


Fig. 6 A conceptual model of the potential for recolonization by East and West Coast of North America diadromous fish species. Italicized species are West Coast salmonids

What are the overarching key messages about habitat and ecosystem services, socioeconomic and economic value of barrier removal?



- Longitudinal and lateral connectivity are a fundamental component to the use of habitats by migratory fishes
- Migratory fishes provide an essential ecosystem service to watersheds
- There are social, economic, and cultural benefits that include but are not limited to ecosystem services and environmental tourism

References



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- Ritchie, A.C., Warrick, J.A., East, A.E., Magirl, C.S., Stevens, A.W., Bountry, J.A., Randle, T.J., Curran, C.A., Hildale, R.C., Duda, J.J. and Gelfenbaum, G.R., 2018. Morphodynamic evolution following sediment release from the world's largest dam removal. *Scientific reports*, 8(1), pp.1-13.
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Thank you!



John McMillan

The Columbia River Inter-Tribal Fish Commission (CRITFC)





Video: Land of the Yakamas

<https://www.facebook.com/YakamaNationFisheries/videos/944395809676630/?t=0>



Treaties of 1855



*Tribes retain “...the right of taking fish at all usual and accustomed places, in common with the citizens of the Territory, and of erecting temporary buildings for curing them: **together with the privilege of hunting, gathering roots and berries....**”*

—1855 Treaty with Yakama



The Columbia River Basin



Columbia River Treaty Fishing Tribes



First Foods

Wiwnu
Huckleberries



Wy-Kan-Ush
Salmon



Choosh
Water



Camas
Camas



Yamash
Deer

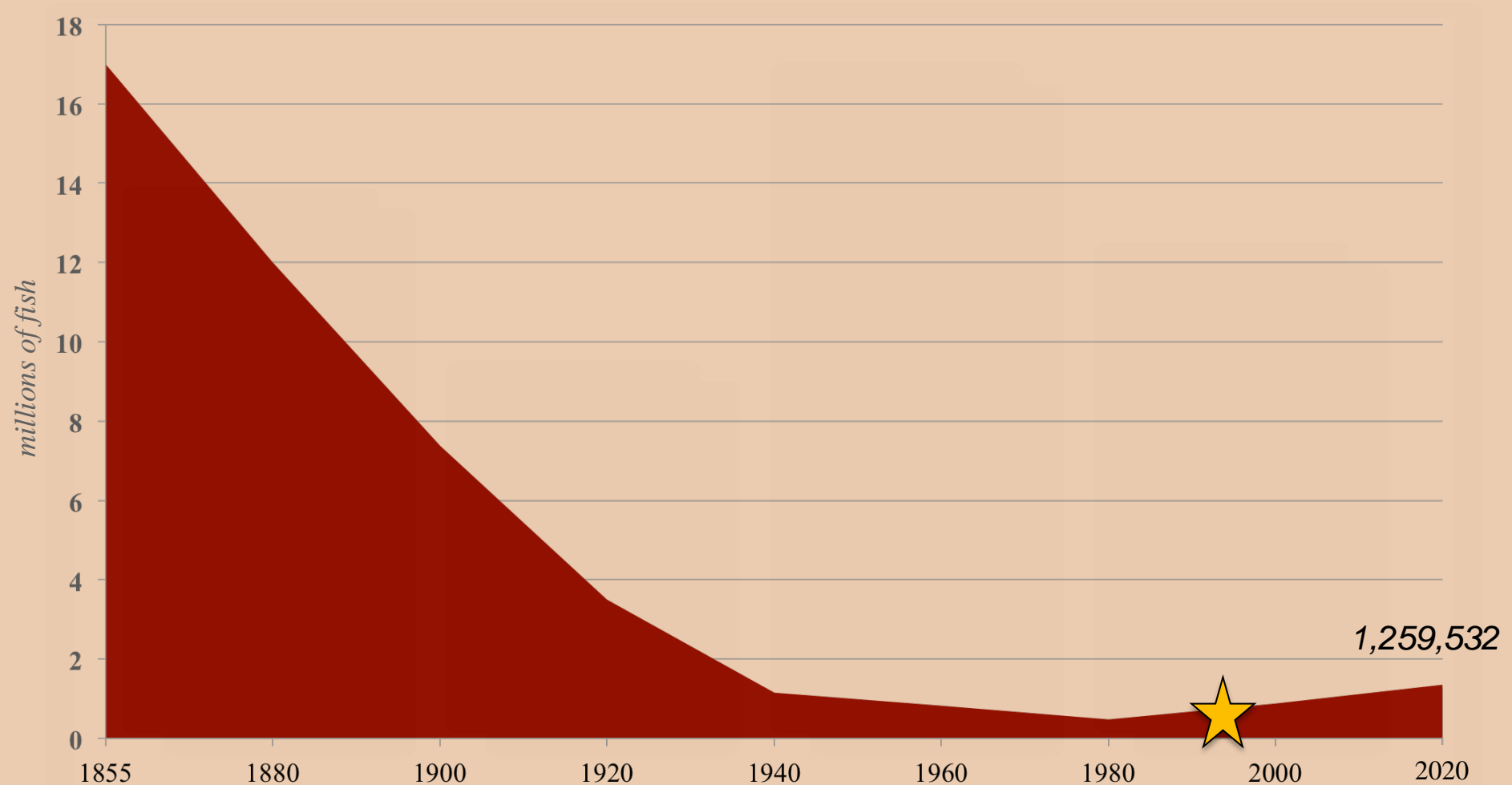


Culture based on and defined by salmon



Salmon Decline

Returning Columbia River salmon (chinook, steelhead, sockeye, coho)



1855: NPCC historical run extrapolation estimate; 1880-1920 data points extrapolated from Columbia River cannery output; 1940-present: dam counts and river mouth estimates

Columbia River Inter-Tribal Fish Commission



Unifying our efforts to protect salmon and rights

- Founded in 1977
- At the time:
 - Heightened efforts to assert tribal self-determination
 - Multiple Columbia Basin salmon runs edging toward extinction
 - Heightened national awareness of environmental and natural resources protection



“To ensure a unified voice in the overall management of the fishery resources, and as managers, to protect reserved treaty rights through the exercise of the inherent sovereign powers of the tribes.”





Confederated Tribes of the Warm Springs Indian Reservation of Oregon

Confederated Tribes of the Warm Springs Reservation of Oregon
Fish & Wildlife Committee



Confederated Tribes and Bands of the Yakama Nation
Fish, Wildlife and Law & Order Committee



Nez Perce Tribe
Natural Resources Subcommittee
Fish & Wildlife Commission



Confederated Tribes of the Umatilla Indian Reservation
Fish & Wildlife Commission



Executive Director

Fisheries Management

Policy Development
Litigation Support

Fishery Science

Fishing Site Maintenance

Fisheries Enforcement

Finance and Operations

Watershed

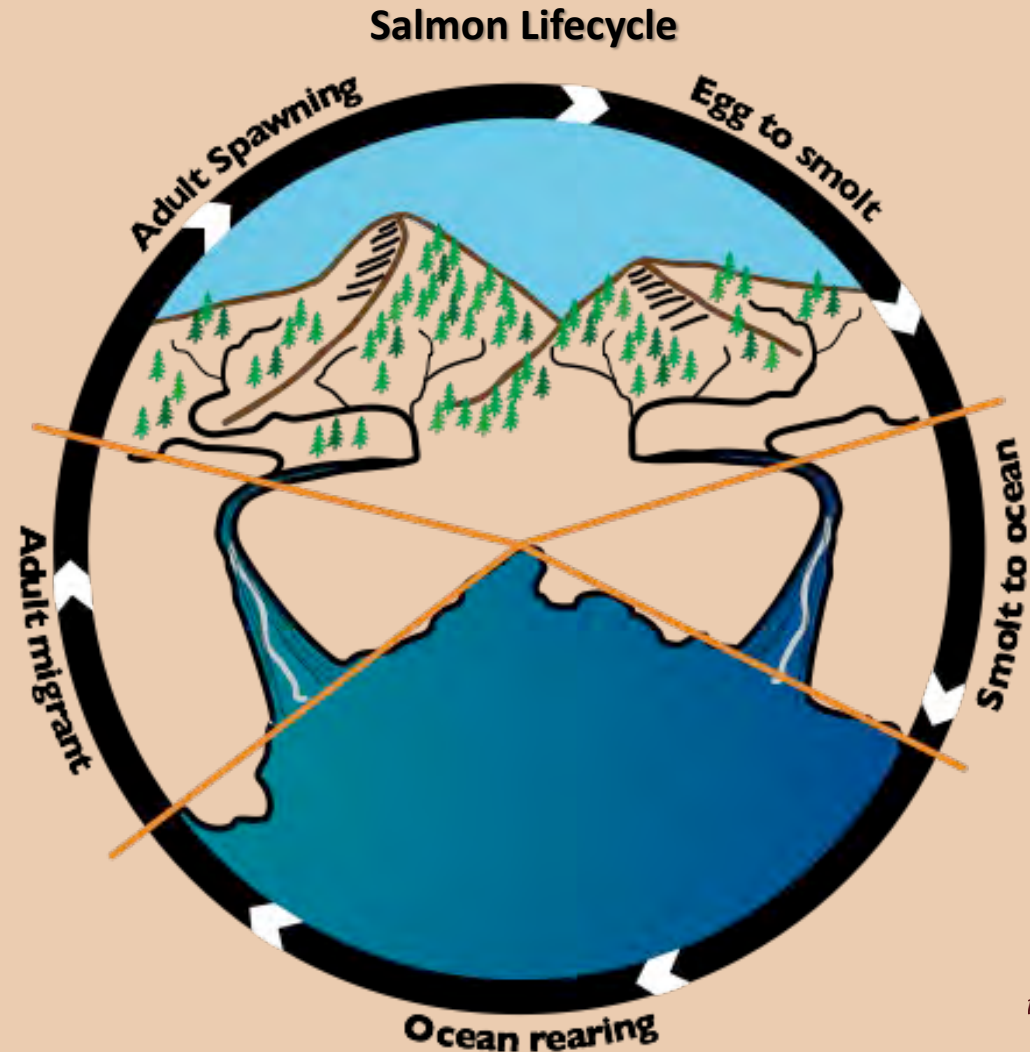
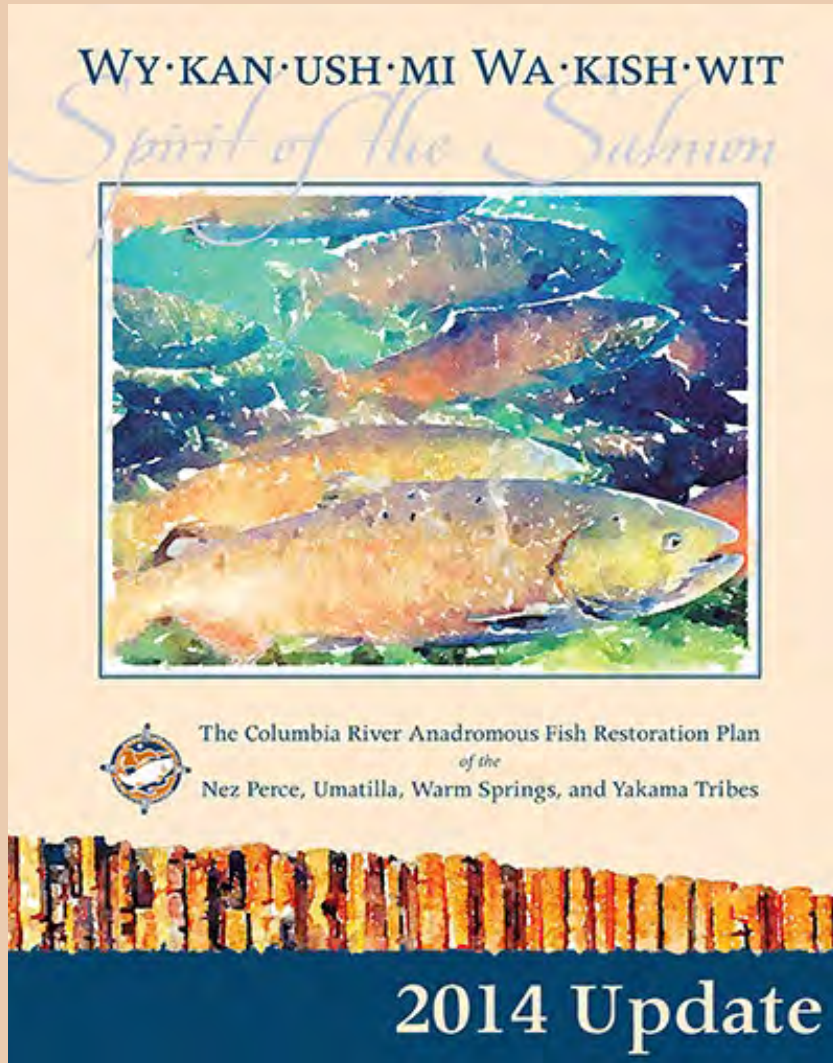
Human Resources

CRITFC goals

1. Put fish back in the rivers
2. Protect treaty fishing rights and sovereignty
3. Share salmon culture
4. Provide fisher services



Tribal Cultural and Natural Resource Management



MULTI-BENEFIT PROJECTS AND THE UNCOMMON DIALOGUE

Brian Graber
American Rivers

IIJA Fish Passage Workshop

July 2022



American Rivers
Rivers Connect Us



American Rivers
RIVERS CONNECT US®

...and we reconnect rivers



MULTIPLE BENEFITS: ECOLOGICAL RESTORATION



- Migratory fish like salmon, herring, shad, sturgeon, and smelt have all suffered population declines to levels less than 5% of historic levels and many rivers lost these species completely
- Non-migratory species: Only 5% of intact brook trout populations remain
- Dams and pollution are the most significant causes of decline of freshwater mussel populations (National Biological Service)



MULTIPLE BENEFITS: PUBLIC SAFETY



Since 1980, 24 dams on average have failed each year (Stanford NPDP)



BYU has tracked 555 drownings in lowhead dam hydraulics



Dam safety is the most common incentive for dam removal

MULTIPLE BENEFITS: TRIBAL JUSTICE



Iron Gate Dam



credit: Michael Wier CalTrout

Copco 1 Dam



credit: Tom O'Keefe AW

Copco 2 Dam



credit: Tom O'Keefe AW

JC Boyle Dam



credit: Anna Murveit KRRC

MULTIPLE BENEFITS: JOBS

UNCOMMON DIALOGUE: NEGOTIATING DAMS

Executive Summary

U.S. Hydropower: Climate Solution and Conservation Challenge

Stanford University Uncommon Dialogue

October 13, 2020

The “*Joint Statement of Collaboration on U.S. Hydropower: Climate Solution and Conservation Challenge*” (Joint Statement), represents an important step to help address climate change by both advancing the renewable energy and storage benefits of hydropower and the environmental and economic benefits of healthy rivers.

The *Joint Statement* is the result of a two-and-a-half-year dialogue, co-convened by Stanford University’s Woods Institute for the Environment, through its Uncommon Dialogue process, Stanford’s Steyer-Taylor Center for Energy Policy and Finance, and the Energy Futures Initiative, to bring together the U.S. hydropower industry and the environmental and river conservation communities. The parties, listed on page three of this executive summary, are motivated by two urgent challenges. To rapidly and substantially decarbonize the nation’s electricity system, the parties recognize the role that U.S. hydropower plays as an important renewable energy resource and for integrating variable solar and wind power into the U.S. electric grid. At the same time, our nation’s waterways, and the biodiversity and ecosystem services they sustain, are vulnerable to the compounding factors of a changing climate, habitat loss, and alteration of river processes. Our shared task is to chart hydropower’s role in a clean energy future in a way that also supports healthy rivers.

Uncommon Dialogue:

Forum of hydropower, dam safety, and conservation organizations to find common ground on the 3 R’s of dams: removal, rehabilitation, retrofitting

RESULTED IN 21ST CENTURY DAMS ACT

(INTRODUCED 2021, HAS NOT BEEN VOTED ON)

117TH CONGRESS
1ST SESSION

S. 2356

To provide funding to rehabilitate, retrofit, and remove the Nation's dams to improve the health of the Nation's rivers, improve public safety, and increase clean energy production, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JULY 15, 2021

Mrs. FEINSTEIN (for herself, Mr. PADILLA, Mr. WYDEN, Ms. STABENOW, Mr. PETERS, Mrs. GILLIBRAND, and Mr. BENNET) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To provide funding to rehabilitate, retrofit, and remove the

\$2.4 billion for dam safety programs plus \$15 billion for dam safety loan programs

\$4.7 billion in investment tax credits for existing hydro dams to upgrade safety, environmental improvements, grid flexibility, and remove dams

\$7.5 billion for dam removals

\$11 billion for federal dams to improve safety, retrofit hydro, or remove dams

RESULTED IN IIJA FUNDS FOR DAMS



NOAA Community Based Restoration Grant Program: \$400 million

- 15% set aside for Tribes

US Fish & Wildlife Service National Fish Passage Program: \$200 million

FEMA High Hazard Dams Program: \$75 million

USACE Section 206 Aquatic Ecosystem Restoration Program: \$115 million

US Forest Service for removal of non-hydropower federal dams: \$10 million

\$800 million for Dam Safety Programs

\$800 million for Hydropower Incentive Programs including \$554 million grant program

MULTIPLE BENEFITS: TAXPAYER SAVINGS



Transformational

Fish Passage Data and Tool Overview

*IIJA Fish Passage Workshop
July 18, 2022*



Photo Credit: Jeff Duda - USGS



Photo Credit: Kat Hoenke - SARP

Daniel Wieferich – U.S. Geological Survey and NFHP Science and Data Committee Co-Chair
Shannon Boyle – U.S. Fish and Wildlife Service, Fish Passage Program

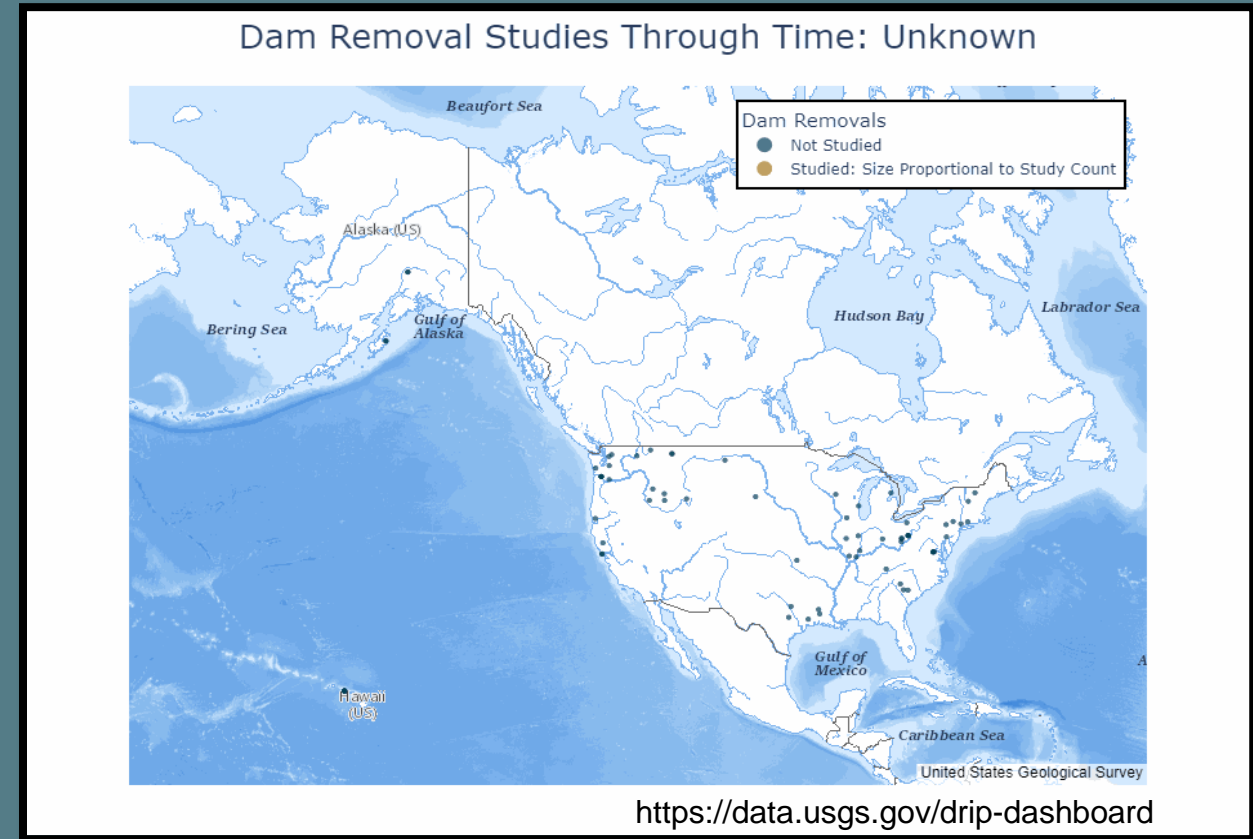
Passage Datasets – Common Information

Potential barriers (features)

- > Location
- > Hydrography dataset (network context)
- > Structure type

Time specific observations

- > Passage condition
- > Structure condition
- > Stream condition



Dam Removal Information Portal (DRIP)

Barrier Inventories - Examples

Effort	Lead	Geo Focus	Method	Type
AK Fish Passage Inventory Database	ADF&G	Alaska	In-Field	Culverts
CA Passage Assessment Database	CDFW	California	In-Field	Multiple
National Inventory of Dams	ACOE	United States	Aggregation	Large Dams
WA State Fish Passage	WDFW	Washington		
Fishway Structure Data	USGS/ASMFC	Eastern US	Aggregation	Fishways - Dams
Database of Stream Crossings	USGS	United States	CPU	Crossings, Bridges
Waterfalls and Rapids	USGS	US (not AK)	Aggregation	Natural
SARP Aquatic Barrier Data	SARP (NFHP)	Multi-Region	Mix	Multiple
Barrier to Tidal Connectivity	PSMFC (NFHP)	West Coast	Aggregation	Multiple
OR Fish Passage Barriers	OR DFW	Oregon		Multiple
VT ANR Natural Resources Atlas	VT ANR	Vermont	Mix	Culverts, Bridges
MI Stream Crossing Dashboard	MI DNR	Michigan	In-Field	Culverts
National Inventory of Low Head Dams	ASCE	United States	Aggregation	Low Head Dams
National Bridge Inventory	USDOT	United States	In-Field	Bridge

Barrier Inventories - Examples

Effort	Lead	Geo Focus	Method	Type
AK Fish Passage Inventory Database	ADF&G	Alaska	In-Field	Culverts
CA Passage Assessment Database	CDFW	California	In-Field	Multiple
National Inventory of Low Head Dams				Dams
WA State Fish Passage Inventory				
Fishway Structure Inventory				Fishways - Dams
Database of Fish Passage Barriers				Fishways, Bridges
Waterfalls and Stream Obstructions				
SARP Aquatic Barrier Inventory				
Barrier to Trout Passage				
OR Fish Passage Inventory				
VT ANR National Inventory				Fishways, Bridges
MI Stream Crossing Dashboard	MI DNR	Michigan	In-Field	Culverts
National Inventory of Low Head Dams	ASCE	United States	Aggregation	Low Head Dams

Methods: in-field sampling (most precise) vs. CPU (larger coverages)

Geographic focus: multiple spatial scales, many of which are overlapping (opportunity for leveraging multi-effort knowledge)

Barrier types: culverts, dams (small, low head, large), diversions, bridges, fishways, dikes, weir, natural barriers...

Barrier Inventory – Funded Project Examples

Effort	Lead	Geo Focus	Barrier Types
American Rivers Dam Removal Database	AR	United States	Dams
BIL Funding through the National Fish Passage Program	USFWS	United States	Multiple
NFHP Project Tracking System	NFHP (PSMFC)	United States	Multiple

[NOAA Restoration Atlas](#)

[WY Stream Restoration and Fish Passage Projects](#)

[Dam Removal Information Portal \(DRIP\)](#)

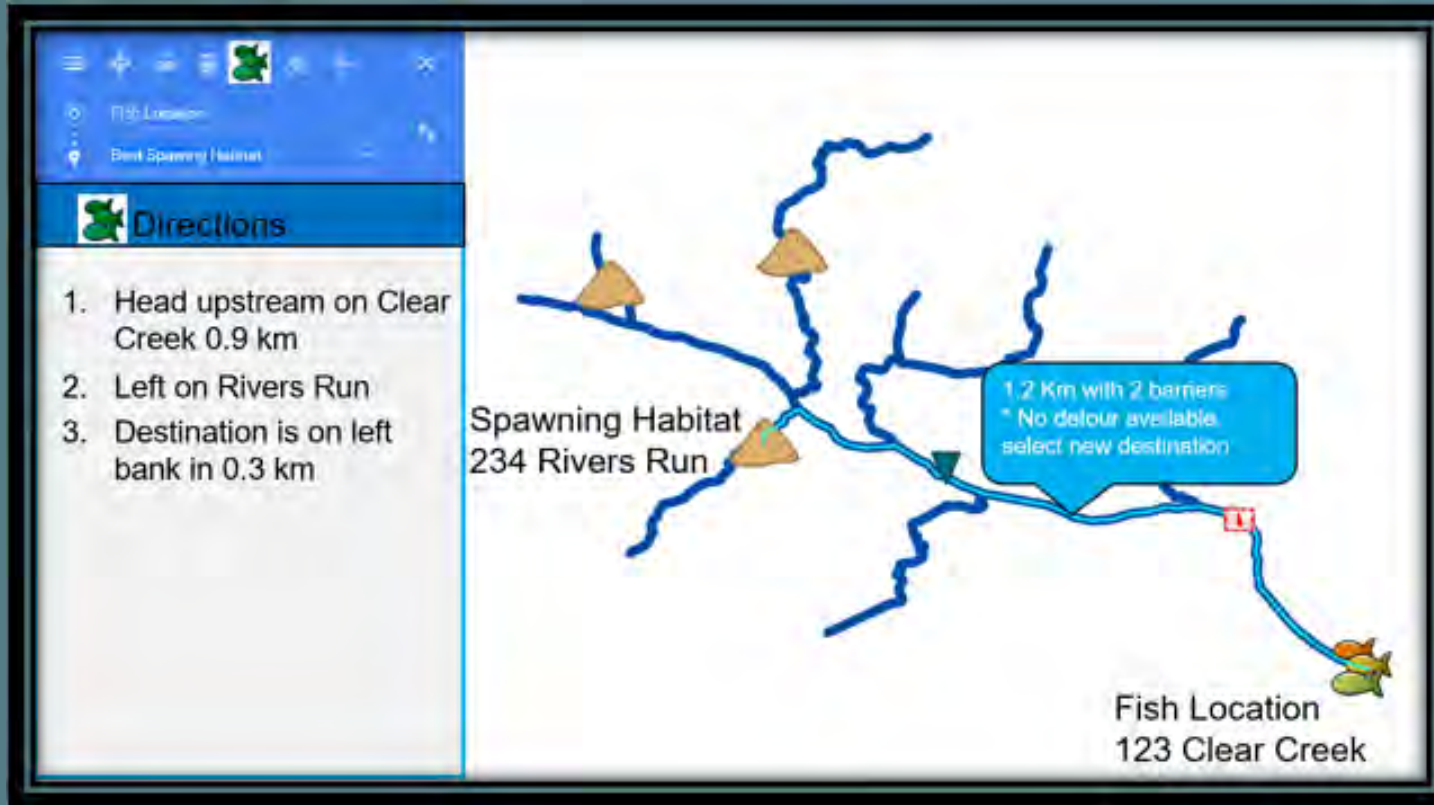
Query of dam removals in the USGS DRIP dashboard that contain studies on fish passage. Currently 54 dam removals with 60 studies.

The screenshot displays the 'Visualize Selected Data' interface of the Dam Removal Information Portal. It features a map of the United States with several dam removal locations marked by yellow dots. To the right of the map is a table titled 'Explore and Download Selected Dams' with the following columns: Dam Name, Stream Name, Year Removed, Year Built, Height (ft), and Science. Below the table is a button labeled 'Download Selected Dams with Added Fields (CSV)'. At the bottom, there is another table titled 'Explore and Download Selected Studies' with columns for Title, DOI, and Authors.

Dam Name	Stream Name	Year Removed	Year Built	Height (ft)	Science
appleton dam	pomme de terre river	1999	1872	17	Studied
basewood dam	west branch apt river	2013			Studied
big spring dam	big spring creek	2008	1900	11	Studied
cherry hospital dam	little river	1988	1945	8	Studied
chipewah dam 1	chipewah stream	2011		54	Studied
chipewah dam 2	chipewah stream	2004			Studied
chinquan dam	springue river	2008	1914	11	Studied
condit dam	white salmon river	2012	1913	124	Studied
edwards dam	kennecob river	1999	1837	39	Studied
alena dam	alena river	2012	1912	104	Studied

Title	DOI	Authors
Successful Spawning of <i>Anodonta petersoni</i> in a Restored Stream Channel Following Dam Removal	https://doi.org/10.1009/045.024.0306	Livemore, J., Trainor, M. & Bednarski, M. S.
Aerial insect responses to non-halter Chinook salmon spawning in a Great Lakes tributary	https://doi.org/10.1216/jgr.2016.02.010	Collins, S. F., Marshall, B. & Mooka, A.

Passage Tools – Common Considerations



- **Hydrography network (network context – spatial framework)**
- **Species information (range, distributions, habitat...)**
- **Societal influences and benefits (cost, water supply, ownership...)**
- **Optimization vs. prioritization vs. communication**

Decision Support - Examples

Effort	Lead	Geo Focus	Method	Barrier Types
<u>Chesapeake Fish Passage Prioritization Tool</u>	TNC	Chesapeake	Prioritization	Culverts
<u>FishWerks</u>	UW-Madison	Great Lakes	Optimization	Multiple
<u>FISHPASS</u>	CFPF (NFHP)		Optimization	Multiple
<u>Maine Aquatic Barrier Prioritization Tool</u>	TNC	Maine	Prioritization	Dams, Crossings
<u>Northeast Aquatic Barrier Prioritization Tool</u>	TNC	Northeast	Prioritization	Dams, Crossings

Data Collection and Design - Examples

Effort	Lead	Focus	Method	Barrier Types
RoadStr – In Development w/ SARP collaboration	USGS	Data Collection / Inventory	Survey123	Culverts
Fish Xing	USFS	Design	Specialized	Culverts

Offline Data Management

SARP (NAACCC) Survey Apps



Photo Credit: Kat Hoenke - SARP



Upcoming Opportunity

- American Conservation and Stewardship Atlas - An opportunity to highlight BIL projects and potentially more fish passage projects
- Atlas interagency working group is refining a framework to represent a continuum of conservation

U.S. Department of the Interior
U.S. Geological Survey



The screenshot shows the U.S. Department of the Interior website. The header includes the department's logo, name, and social media icons. The main content area features a navigation menu with 'Press Releases' selected. The headline of the press release is 'Biden-Harris Administration Invites Public Comment on Development of New Conservation and Stewardship Tool'. The date is listed as 1/3/2022, with a note that it was last edited on 2/15/2022. A 'Share' button is visible in the top right corner of the article content. At the bottom right, the date is confirmed as Monday, January 3, 2022, and the contact email is Interior_Press@ios.doi.gov. The footer text states that the Department of the Interior, in coordination with the Departments of Agriculture and Commerce and the Council on Environmental Quality, invited public comment and announced listening sessions regarding the development of the tool.

U.S. Department of the Interior

Press Releases

Newsroom Press Releases Video Photos Blog Archive

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Biden-Harris Administration Invites Public Comment on Development of New Conservation and Stewardship Tool

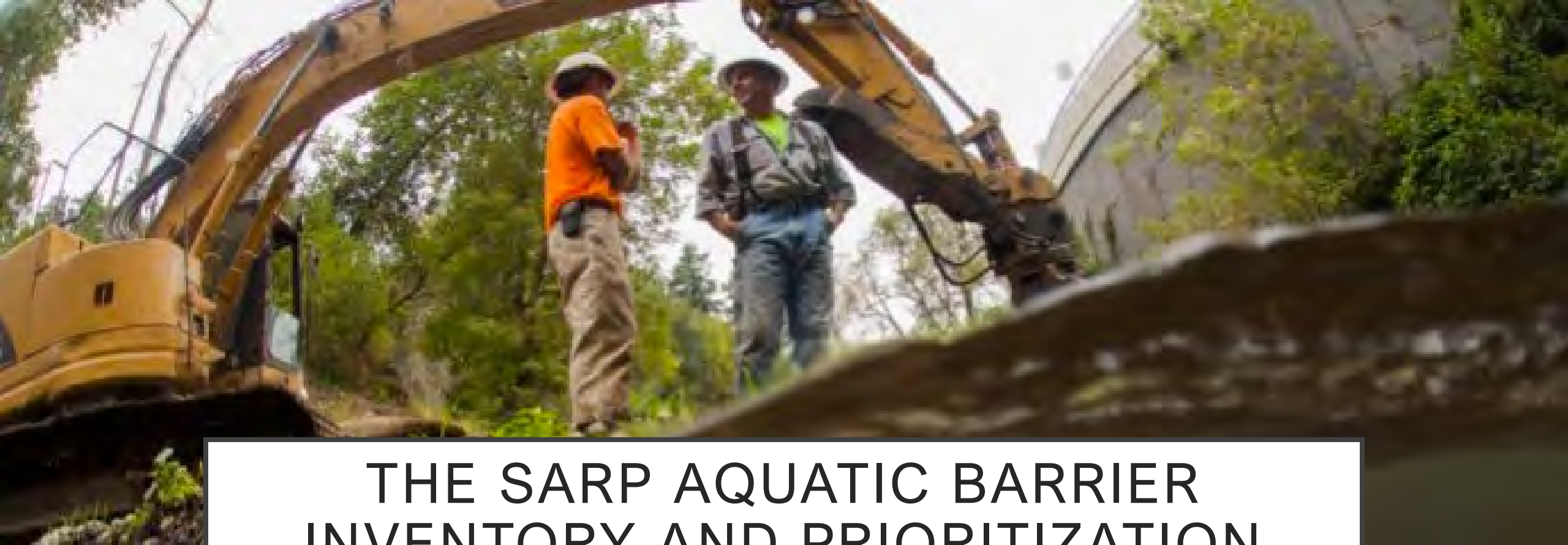
1/3/2022
Last edited 2/15/2022

Date: Monday, January 3, 2022
Contact: Interior_Press@ios.doi.gov

WASHINGTON — The Department of the Interior today, in coordination with the Departments of Agriculture and Commerce and the Council on Environmental Quality, invited public comment and announced listening sessions regarding the development of the

Strategies to Build on Current and Past Efforts

- Use common reference datasets (potential barriers and hydrography)
- Common data standards and terminology
- Understanding shared or supporting priorities for decision support
- Shared resources (e.g., data collection application code, decision support application code, database documentation)



THE SARP AQUATIC BARRIER INVENTORY AND PRIORITIZATION TOOL



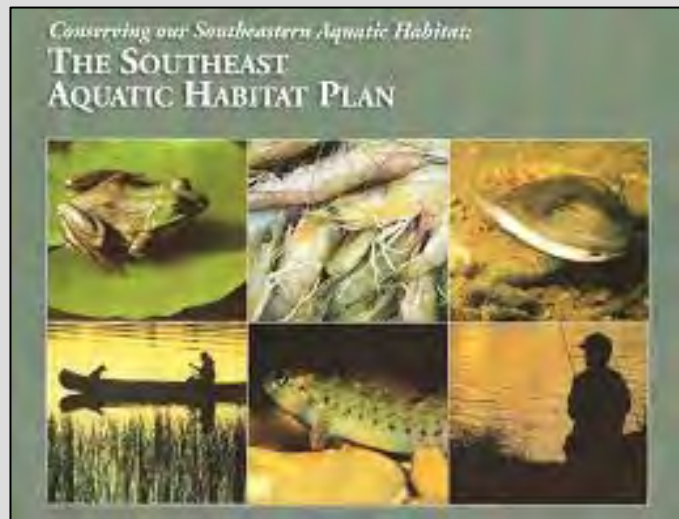
Kat Hoenke
GIS Coordinator
Southeast Aquatic Resources Partnership



SOUTHEAST AQUATIC RESOURCES PARTNERSHIP

Mission

SARP will, with partners, protect, conserve and restore aquatic resources including habitats throughout the Southeast for the continuing benefit, use and enjoyment of the American people.



SARP CONNECTIVITY PROGRAM

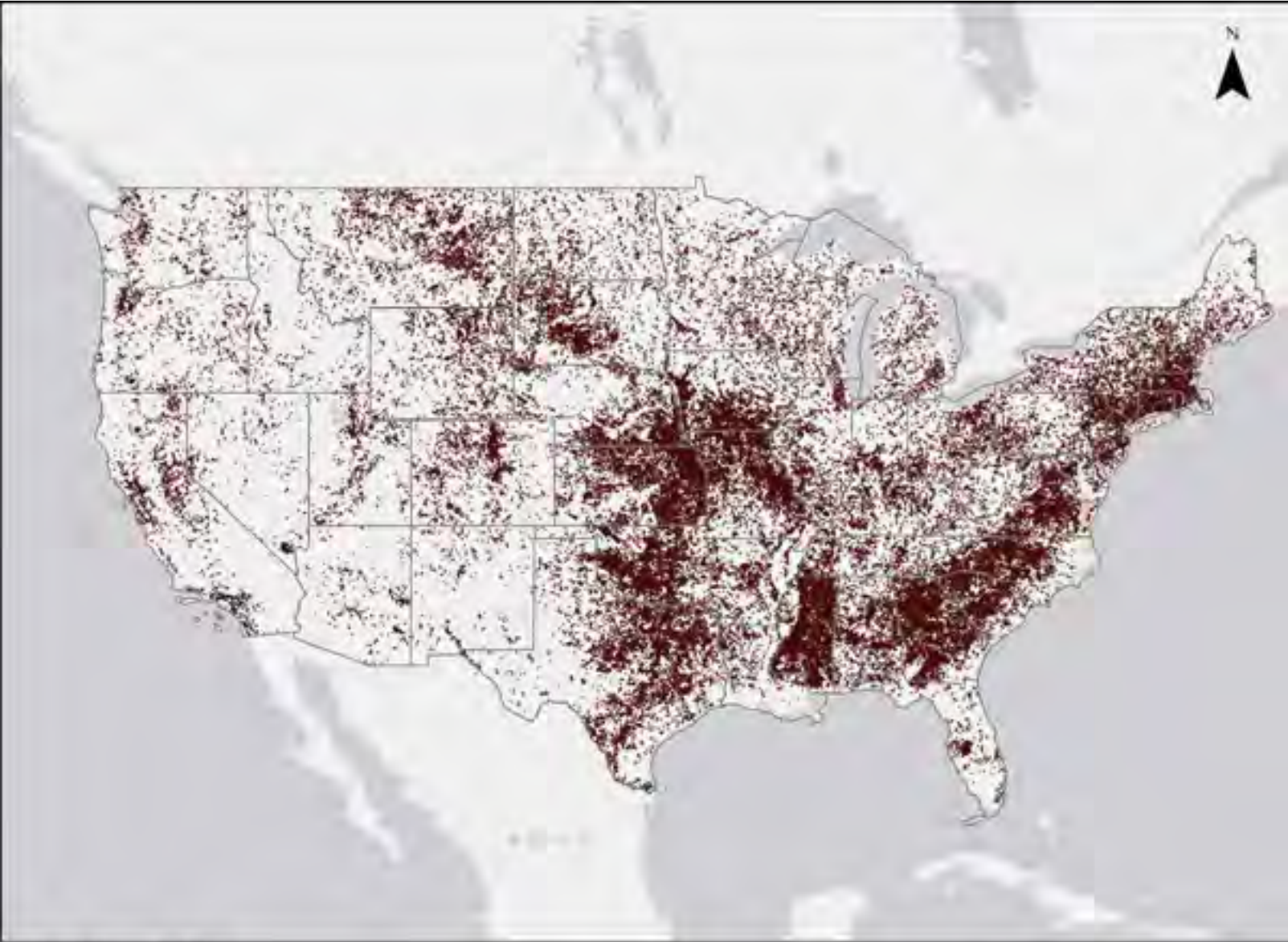
Inventory

Prioritization

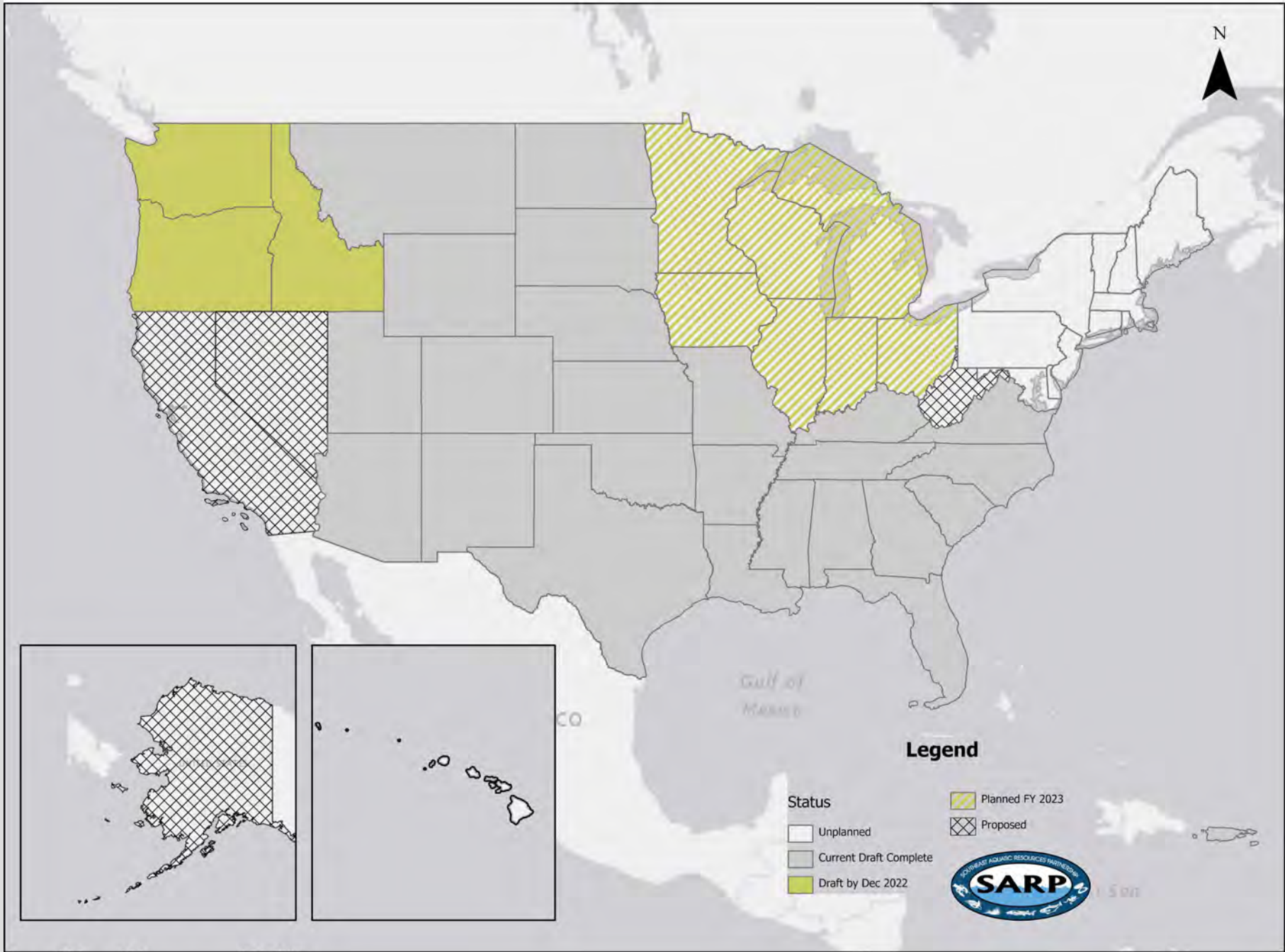
**Connectivity
Teams**

National Inventory of Dams

91,000 dams tracked nationally



0 140 280 560 Miles



0 225 450 900 Miles

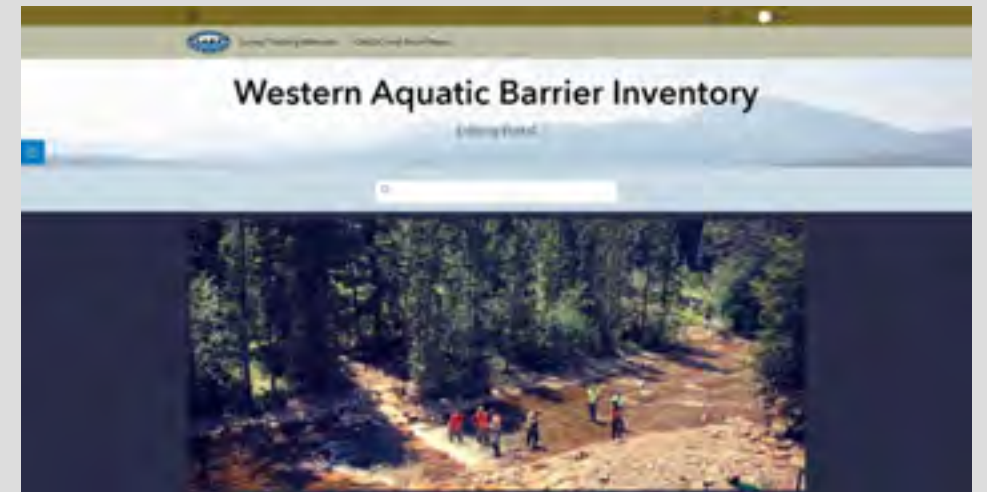
SARP CONNECTIVITY PROGRAM

Inventory

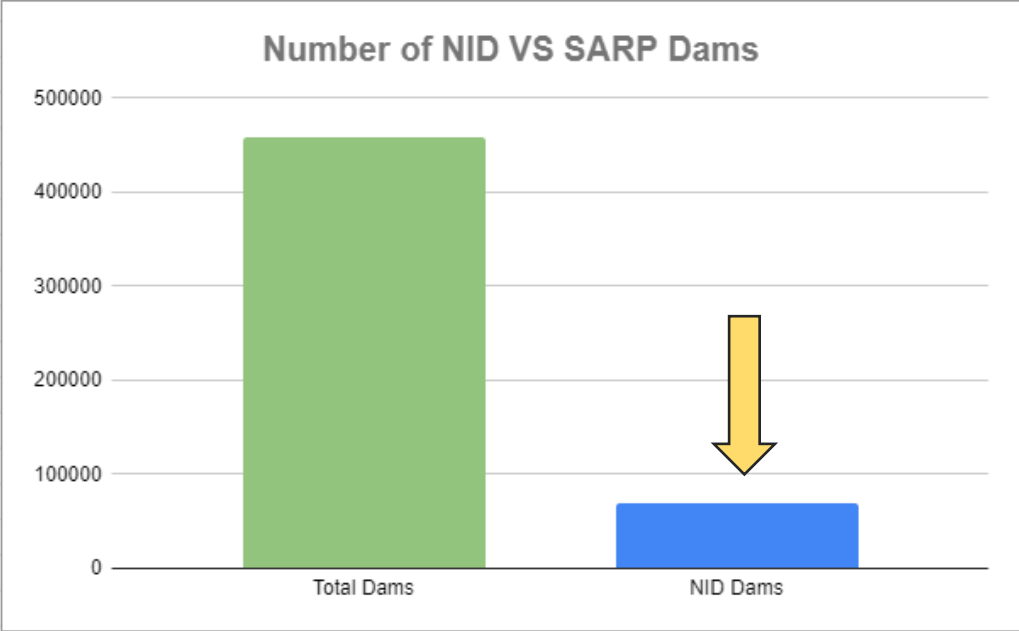
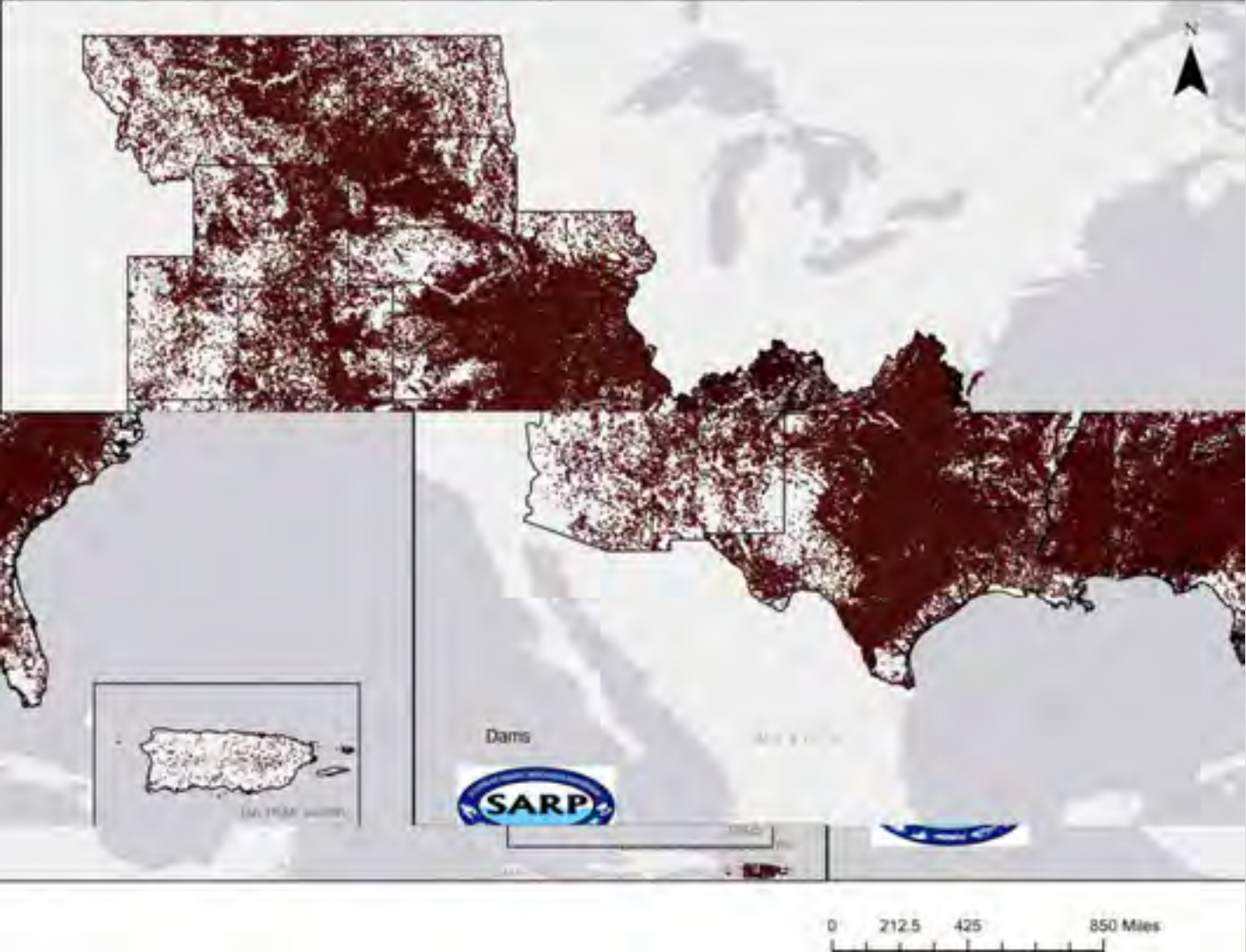
Dams

Road Crossings

Waterfalls



Dams



A Collaborative Effort

Working within FHPS has resulted in the inclusion of datasets from State wildlife agencies, federal agencies, NGO partners, and more!

Organization	Dataset
Utah DWR	BAIT
WY GFD	WY Fish Passage Dataset
MT FWP	MT Fish Barrier Database
WA DFW	WA Fish Passage Barrier Database
OR	OR Fish Passage Barrier Inventory
TU	Cutthroat Trout Working Groups Inventory
USFS	Regional AOP Surveys
AZ GFD	AZ aquatic passage barriers
CO Parks and Wildlife	CO Lowhead Dam Inventory
ID DFG	Fish Barrier Database

.....And many more!

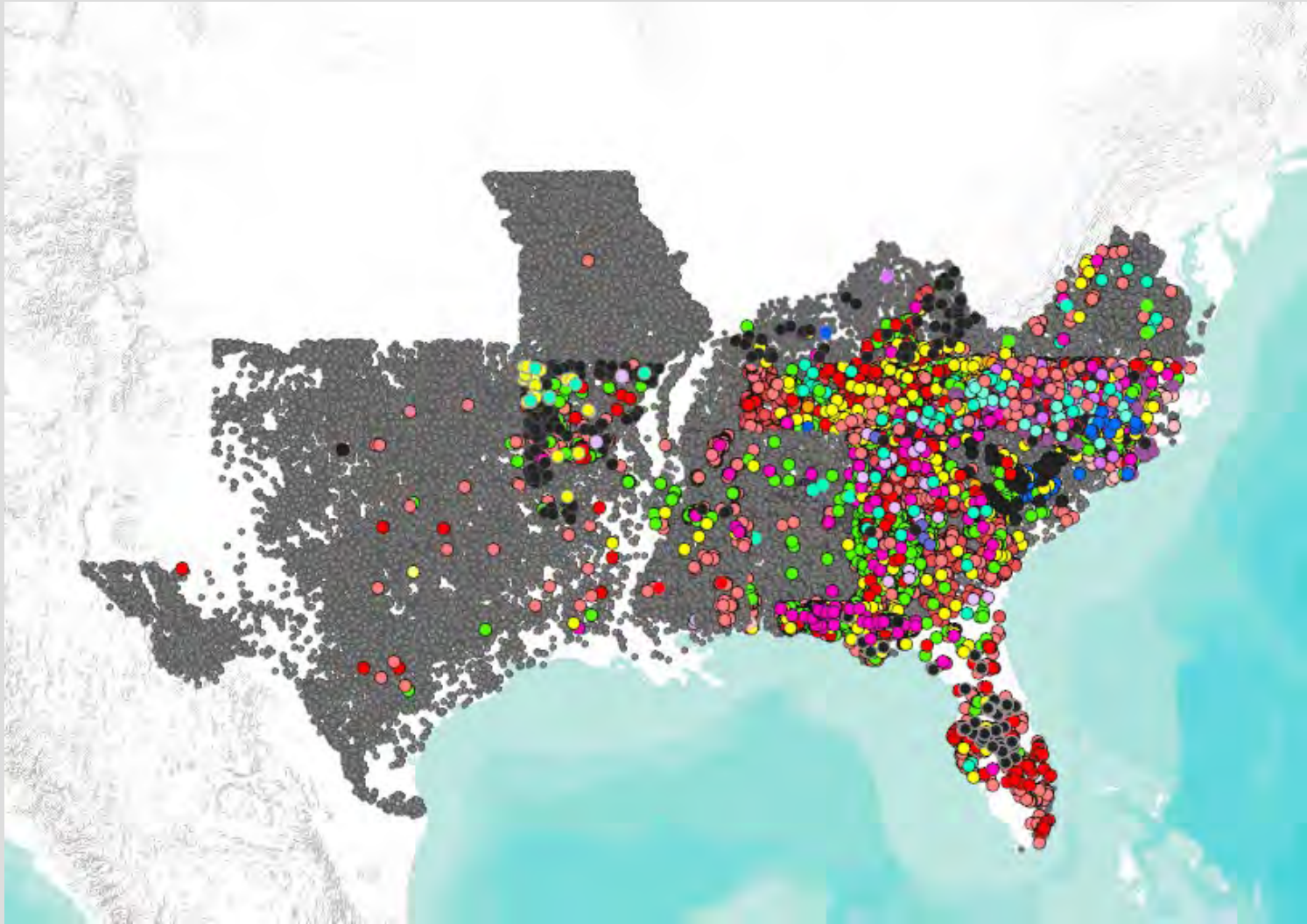


State Wildlife Agencies

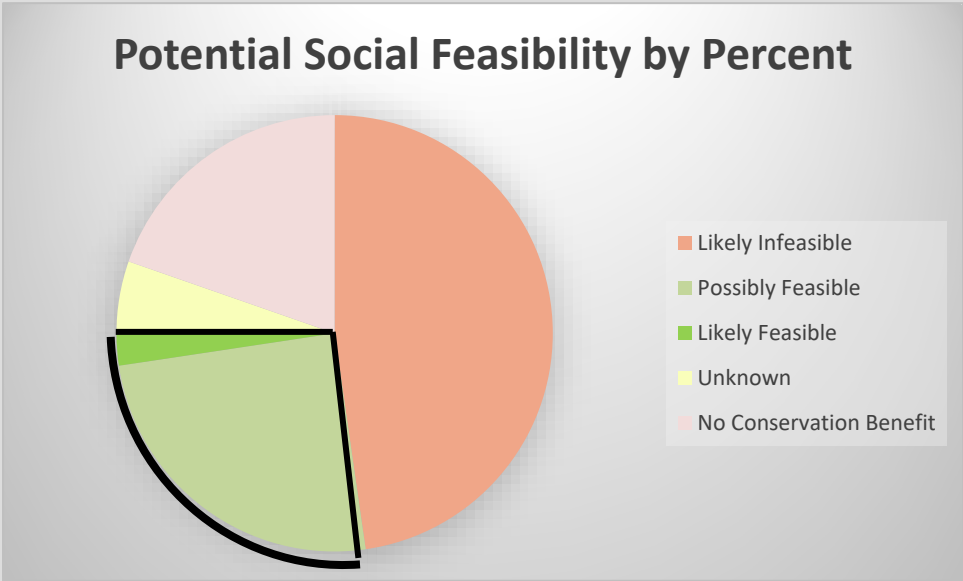
Federal/NGO Partners



REGIONAL RECON: ~20,000



-30% of reconned are potentially feasible

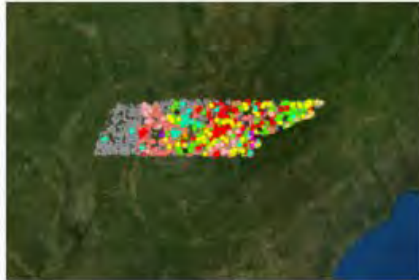




Aquatic Barrier Identification Tool

Instructions to Edit Barriers in Each Webmap: 1) Click on the appropriate box below. 2) When the map opens, select "I want to use this." 3) Then, click "Open in ArcGIS online." 4) Now, you will be able to edit individual points. If performing social feasibility reconnaissance, click below to read instructions.

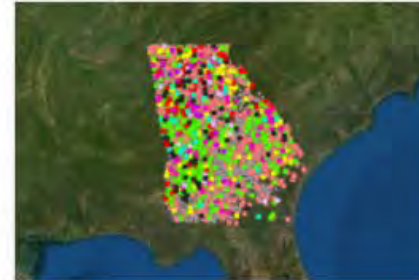
[Read Dam Recon Instruction Manual](#)



01 Tennessee Aquatic Connectivity Team Map



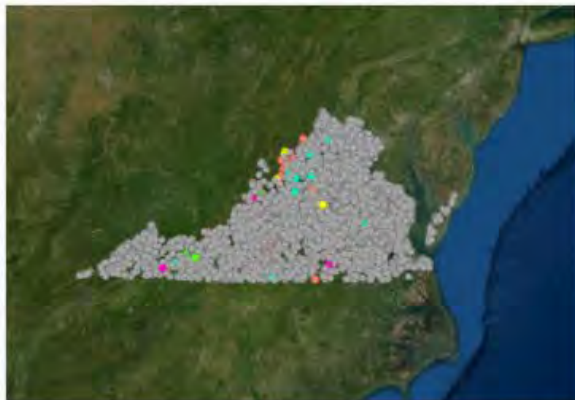
02 North Carolina Aquatic Connectivity Team Map



03 Georgia Aquatic Connectivity Team Map

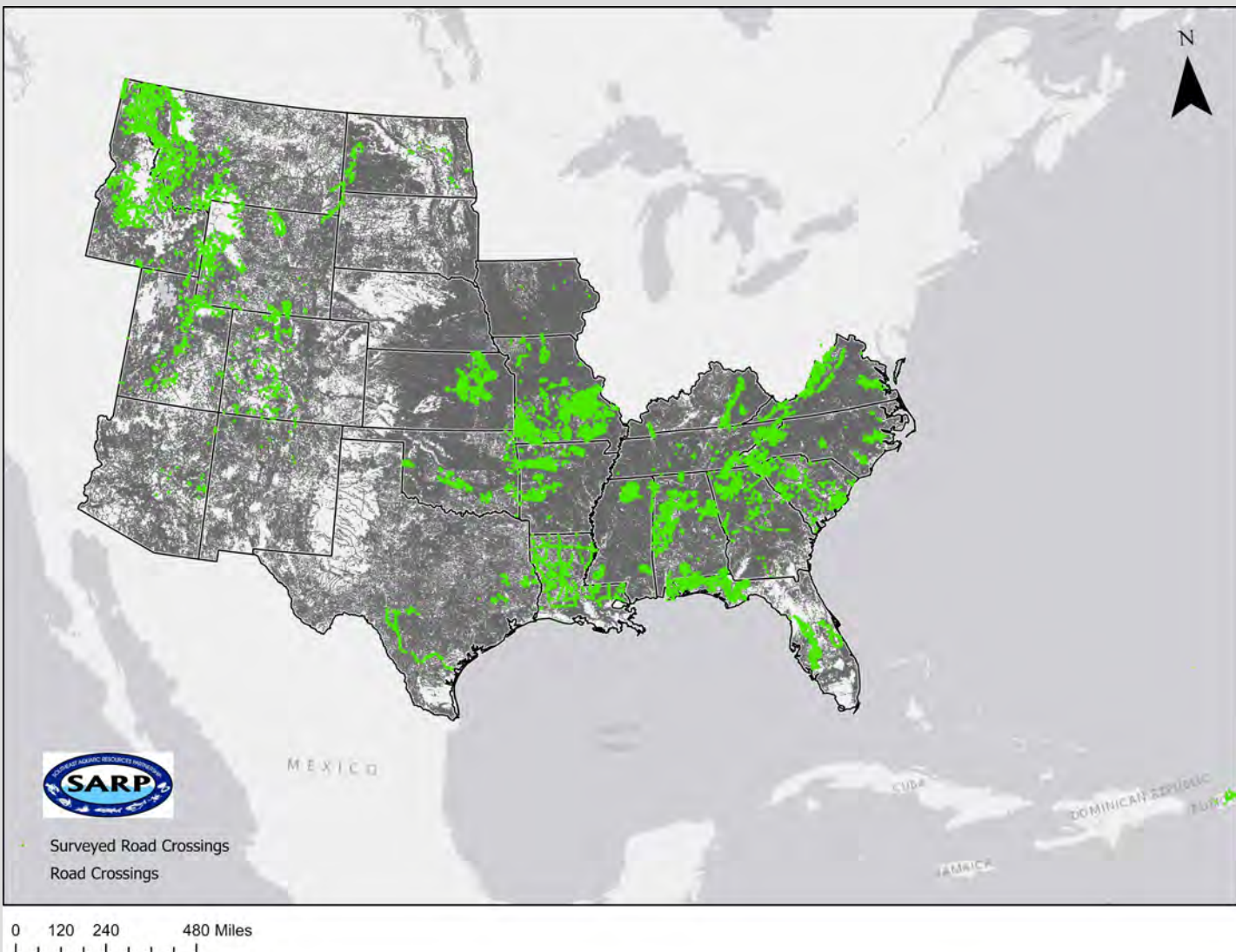


04 Arkansas Stream Heritage Partnership...

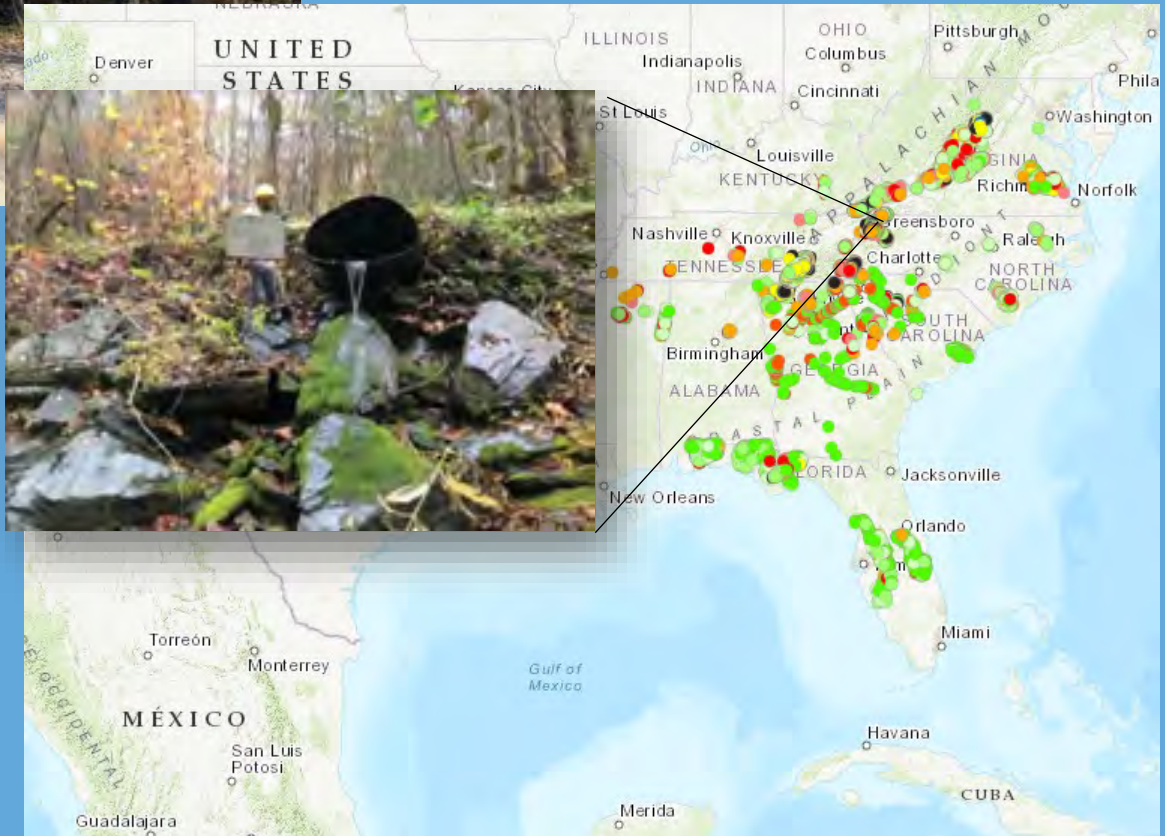


Road Crossings

- 37,801 assessed
- 46% are barriers



Severity	Number	Percent
No Barrier	20222	53%
Moderate Barrier	1536	4%
Barrier Non-Specific	11784	31%
Major Barrier	4259	11%



SARP AQUATIC CONNECTIVITY Stream Crossing Survey DATA FORM

DATE OBSERVED: _____ LEAD OBSERVER: _____

TOWN/COUNTY: _____ STREAM: _____

ROAD TYPE: MULTILANE PAVED UNPAVED DRIVEWAY TRAIL RAILROAD

GPS COORDINATES: N Latitude _____ W Longitude _____

CROSSING DATA

Crossing Type: BRIDGE CULVERT MULTIPLE CULVERT FORD NO CROSSING REMOVED CROSSING Number of Culverts/Bridge Cells: _____

Flow Condition: NO FLOW TYPICAL LOW MODERATE HIGH Crossing Condition: OK POOR NEW UNKNOWN FAILING

Tidal Site: YES NO UNKNOWN Alignment: FLOW-ALIGNED SKEWED (1-45°) Road Fill Height: _____

Stream Measurement: Active Channel Wetted Channel Bankfull Width Confidence: HIGH LOW/ESTIMATED

Tailwater Scour Pool: NONE SMALL LARGE Inlet Scour Pool: NONE SMALL LARGE

Riparian Vegetation: Overstory Understory Ground level High Low High Low High Low High Low

Construction: SEVERE MODERATE SPANS ONLY BANKFULL/ACTIVE CHANNEL SPANS FULL CHANNEL & BANKS

Crossing Comments: _____


BATS PRESENT? Y N



SARP CONNECTIVITY PROGRAM

Inventory

Prioritization



Southeast Aquatic Barrier Prioritization Tool

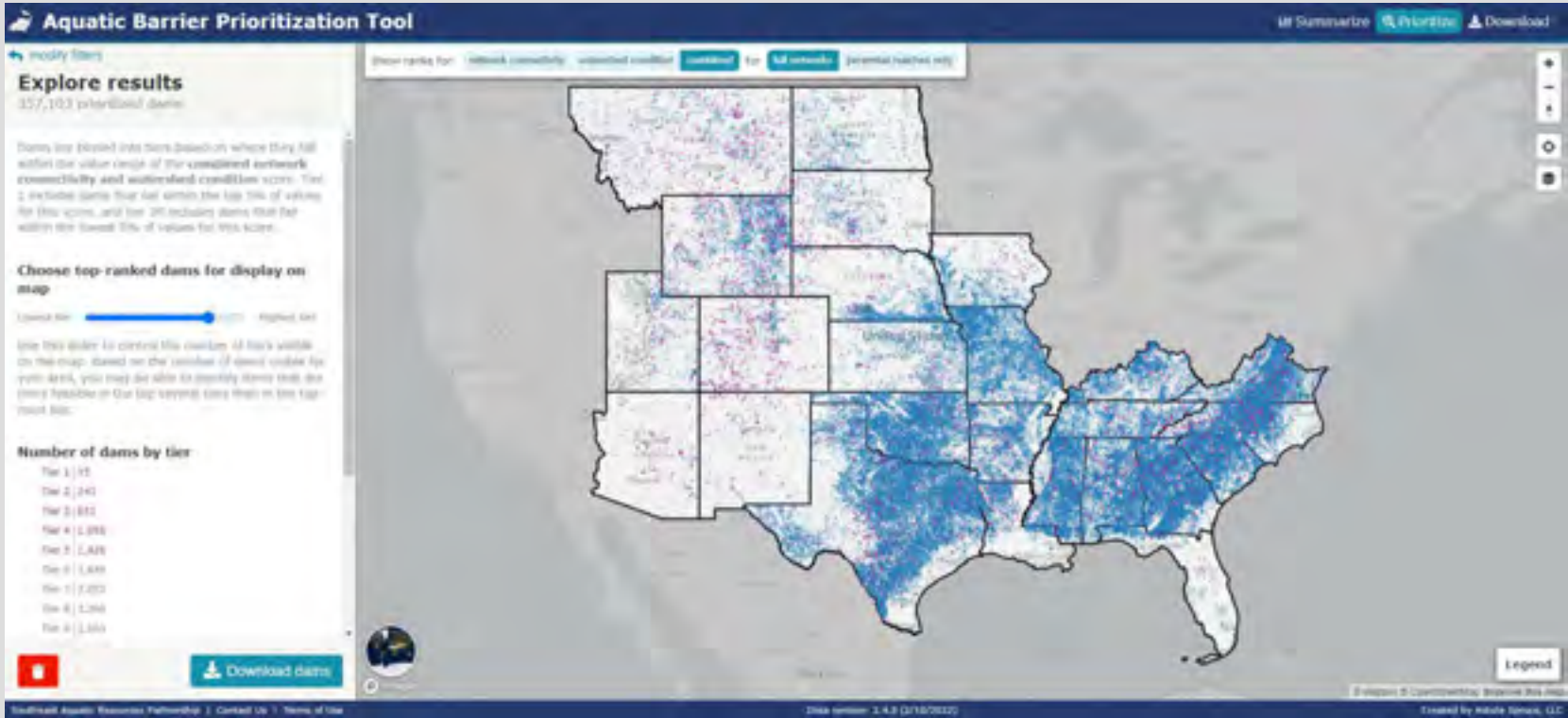
Improve aquatic connectivity by prioritizing aquatic barriers for removal using the best available data.

Aquatic connectivity is essential. Fish and other aquatic organisms depend on high quality, connected river networks. A legacy of human use of river networks have left them fragmented by barriers such as dams and culverts. Fragmentation prevents species from dispersing and accessing habitats required for their persistence through changing conditions.

Recently improved inventories of aquatic barriers enable us to describe, understand, and prioritize them for removal, restoration, and mitigation. Through this tool and others, we empower you by providing information on documented barriers and standardized methods by which to prioritize barriers of interest for restoration efforts.

PRIORITIZATION

- Improve or maintain watershed connectivity
- Move from opportunistic to a strategic approach to barrier removal fish passage improvement
- Support management decisions



INDICATORS



Network Length

Network length measures the amount of connected aquatic network length that would be added to the network by removing the barrier. Longer connected networks may provide more overall aquatic habitat for a wider variety of organisms and better support dispersal and migration.

[Read more...](#)



Network Complexity

Network complexity measures the number of unique upstream size classes that would be added to the network by removing the barrier. A barrier that has upstream tributaries of different size classes, such as small streams, small rivers, and large rivers, would contribute a more complex connected aquatic network if it was removed.

[Read more...](#)



Channel Alteration

Altered river and stream reaches are those that are specifically identified as canals or ditches. These represent areas where the hydrography, flow, and water quality may be highly altered compared to natural conditions.

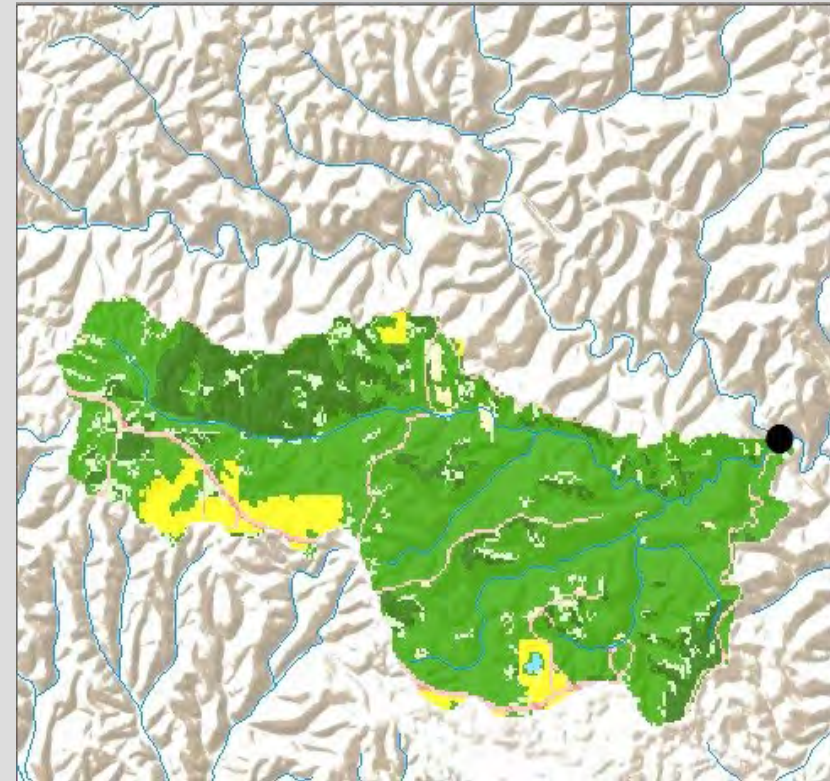
[Read more...](#)



Natural Landcover

Natural landcover measures the amount of area within the floodplain of the upstream aquatic network that is in natural landcover. Rivers and streams that have a greater amount of natural landcover in their floodplain are more likely to have higher quality aquatic habitat.

[Read more...](#)



The landcover types present in a contributing watershed of a dam on the Ozark National Forest.

PRIORITIZATION

Aquatic Barrier Prioritization Tool Summarize Prioritize Download

[modify area of interest](#)

Filter dams

45,984 selected reset filters

[OPTIONAL] Use the filters below to select the dams that meet your needs. Click on a bar to select dams with that value. Show more ...

Feasibility & Conservation Benefit

Not assessed	44,104
Possibly feasible	1,732
Likely feasible	148

Note: feasibility is based on further reconnaissance to evaluate individual barriers. Values are provided only for those that have been evaluated. There may be more feasible or infeasible dams than are indicated above.

Miles Gained

Dam Height

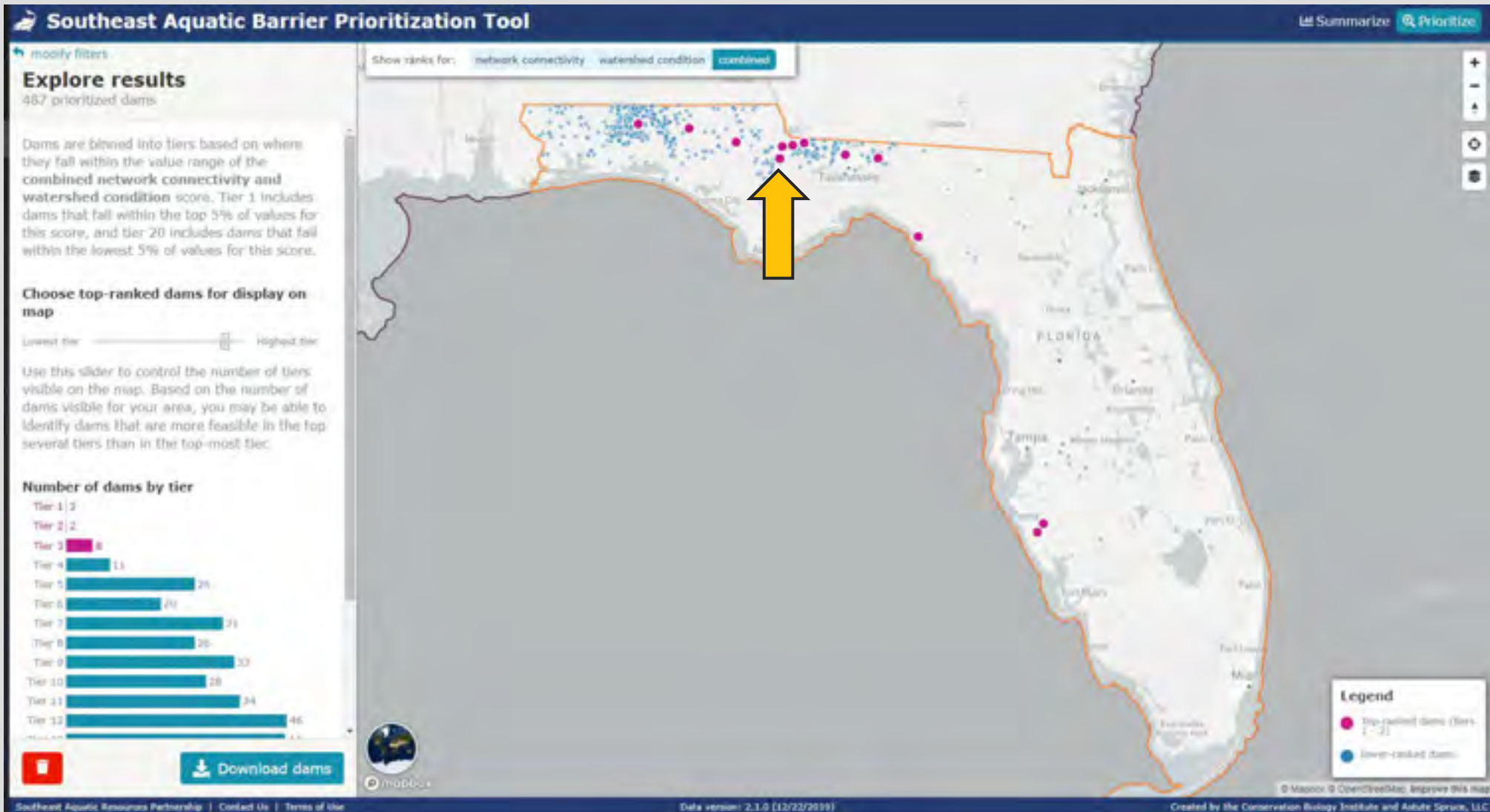
Prioritize dams

United States

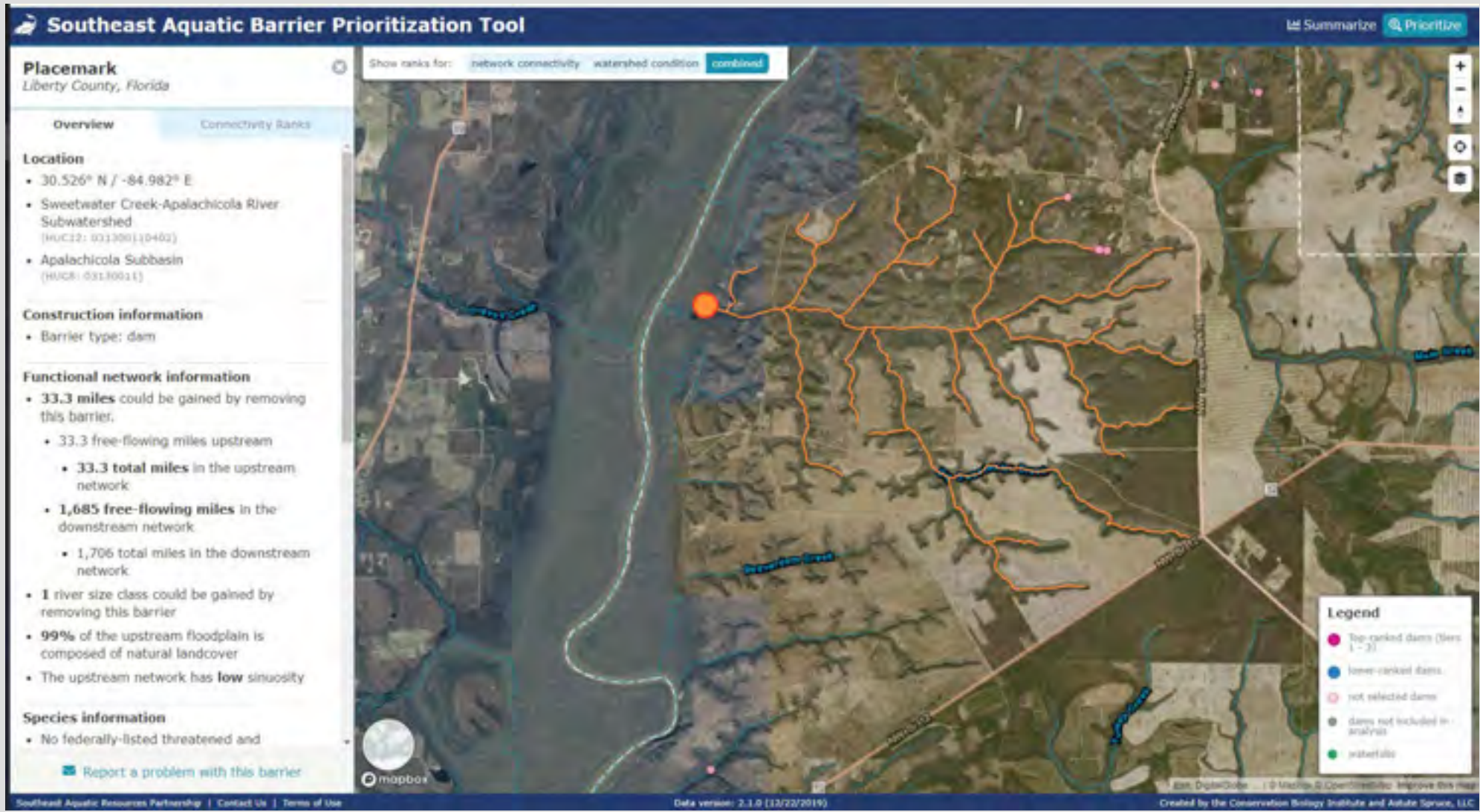
Legend

© Mapbox © OpenStreetMap Improve this map

POTENTIALLY FEASIBLE IN FLORIDA: 487



SWEETWATER CREEK DAM





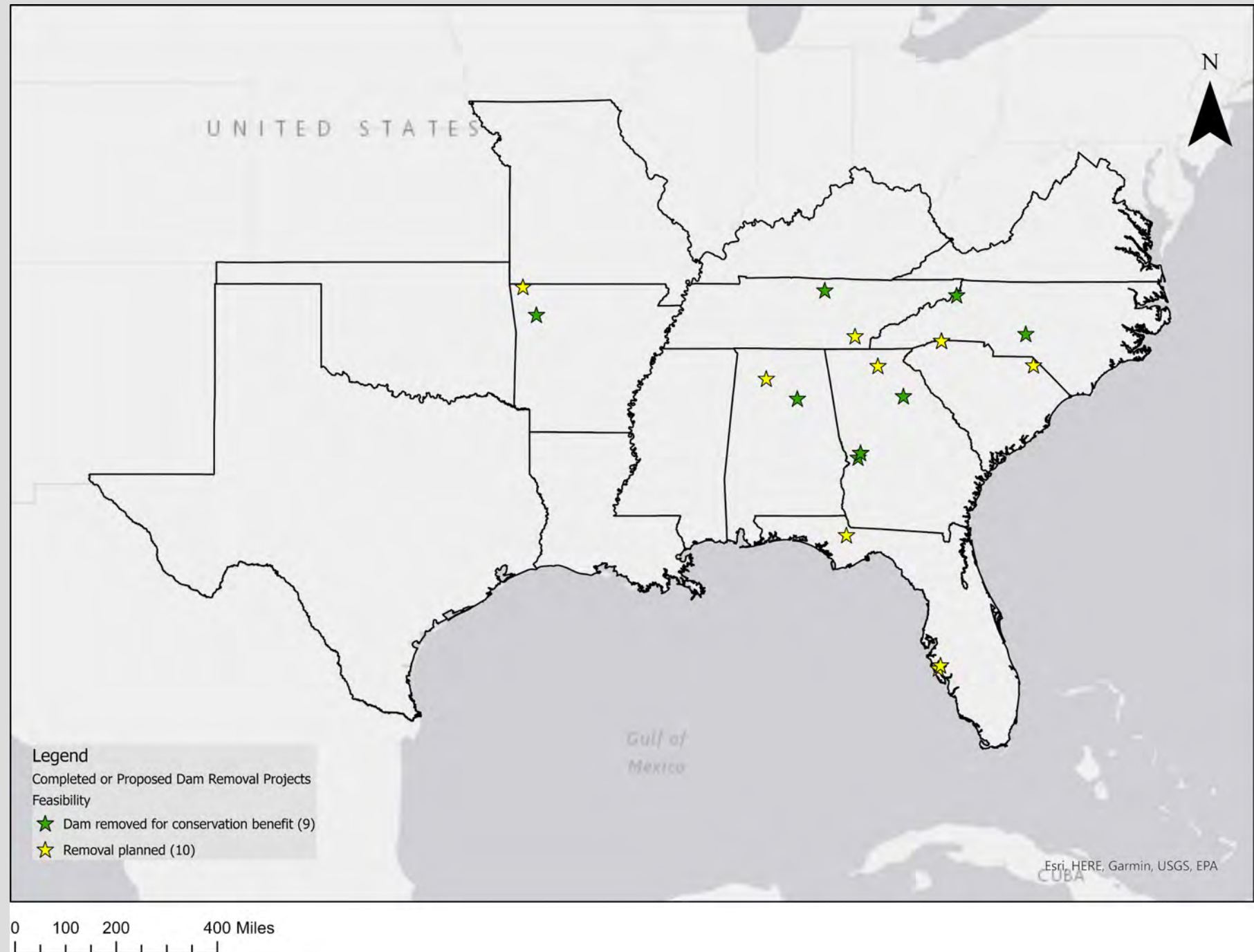
MINE CREEK DAM,
AR

- Ouachita National Forest
- Reconnected Mine creek to Cossatot River
- Removed Jan 2021

DAM REMOVALS

- **228** completed or proposed

- **19** of these influenced by inventory and tool



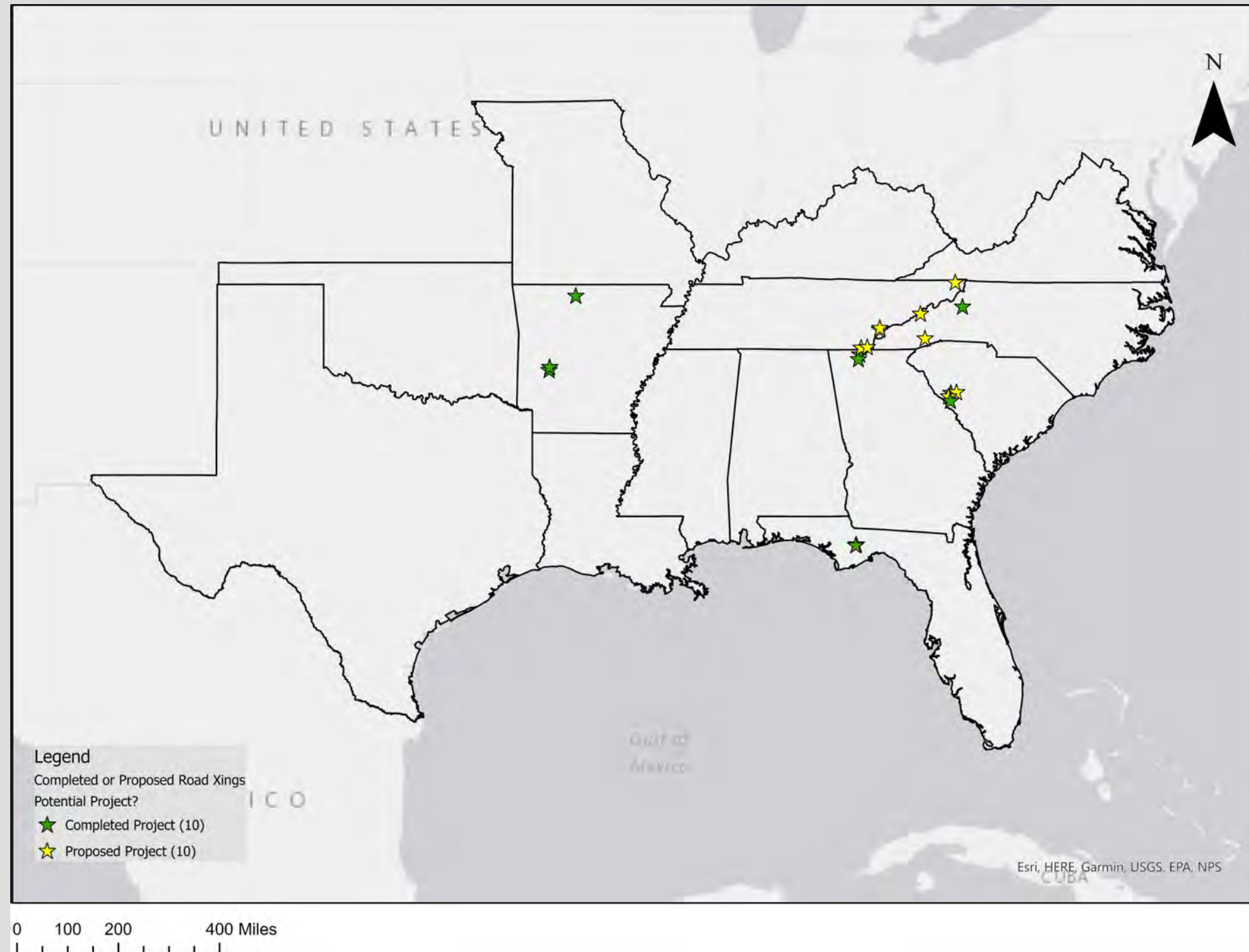
HOLLY CREEK, GA EARTH DAY 2021



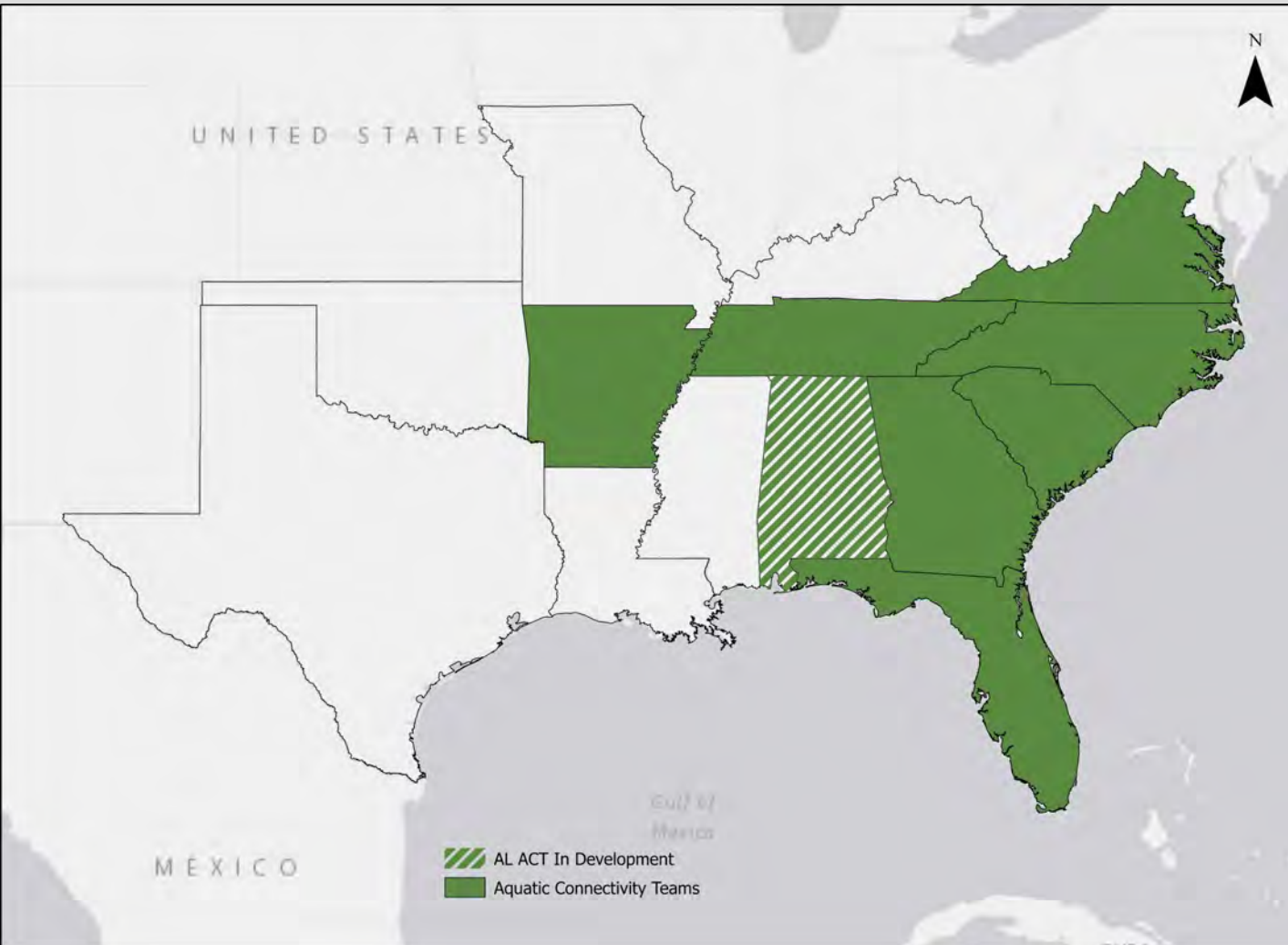
ROAD XING REPLACEMENTS

- **275** completed or proposed

- **20** of these influenced by inventory and tool



CONNECTIVITY TEAMS



- Composed of partners from all sectors.
- Work together to tackle aquatic connectivity.
- Prioritization results fed to Connectivity Teams for collaborative efforts.



Aquatic Connectivity Teams

Aquatic Connectivity Teams exist in the Northeast, Southeast, and Wyoming. State agencies in the west could begin to create these teams to build capacity and community around this inventory and tool in order to take advantage of it in light of new Infrastructure Bill Funding.

A person wearing a blue jacket, a yellow safety vest, and a grey beanie is wading through a stream in a forest. They are holding a yellow and orange tool, possibly a water sampling device, near a tree trunk. The background shows a stream flowing through a wooded area with trees and a bridge in the distance.

QUESTIONS?

Contact:

Kat Hoenke

SARP GIS Coordinator

Kat@Southeastaquatics.net

Tool URL: <https://connectivity.sarpdata.com>



Prioritizing Fish Passage Projects

commonly considered criteria

Cathy Bozek

US Fish and Wildlife Service

How do we identify, prioritize, and select the best projects for support?

- Inventories and decision support tools
 - Identify and locate barriers
 - Distill large datasets
 - Accessible and standardized
- Need to take a holistic look at the projects – many parameters commonly assessed, on-the-ground knowledge needed



Commonly considered criteria:

- Ecological importance
- Community importance
- Quality and sustainability of design
- Logistics: Project support and readiness



Ecological Importance

Ecological Importance:

Species benefits

- Priority species
- Number of species
- Population benefits

Habitat reconnection

- Quantity
- Quality
- Watershed condition

Habitat improvement

- Water quality
- Sediment transport



Ecological Importance:

Watershed context and need

- Priority watershed
- Part of larger watershed strategy
- Need/ barrier severity
- Other barriers in system

Build ecosystem resiliency

- Climate change impacts
- Development impacts

Invasive species

- Potential impacts/ risk assessment
- Ways to mitigate

Cost effectiveness



Community Importance



Community importance:

- Community resilience to climate hazards and other co-benefits
- Public safety
 - High hazard dam
 - Drowning hazard
 - Hazardous road-stream crossings
 - Flood risk
- Other social & economic factors
 - Subsistence fishing
 - Commercial fishing
 - Recreational fishing
 - Safe access
 - Water quality
 - Tourism
 - Jobs

Community importance:

- Tribal Nations
- Disadvantaged & underserved communities
 - Community engagement
 - Benefits to community
- Project outreach
 - Build understanding
 - Build support
- Cost effectiveness



A person wearing a light-colored shirt and dark overalls stands in a field, holding a tablet and a long metal rod. They are positioned next to a structure made of corrugated metal sheets. The background is filled with dense green foliage and trees. The overall scene suggests an outdoor field study or construction site.

Quality and Sustainability of the Project Design



Quality and Sustainability of the Project Design:

- Design standards
 - Ensure fish passage
 - Public safety
 - Consider other impacts
- Design resilient to impacts of climate change and other changes in watershed, design for future state
- Self-sustaining



Logistics: Project Support and Readiness

Support and readiness:

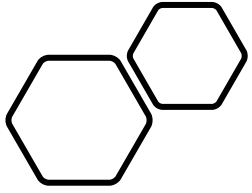
- Feasibility study and design timeline
- Permitting, environmental compliance, consultations
 - Potential roadblocks or delays
 - Concerns addressed





Support and readiness:

- Owner willingness
- Community support
- Partner support
 - Buy in
 - Financial
 - Technical/ logistics
- Project management support



Prioritization

- Common Criteria:
 - Ecological Importance
 - Community Importance
 - Quality and Sustainability
 - Logistics: Support and Readiness
- Not "one size fits all" approach
- Many sources of information about projects







Panel: What Does a High Quality Barrier Removal Look Like?

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022





NOAA
FISHERIES

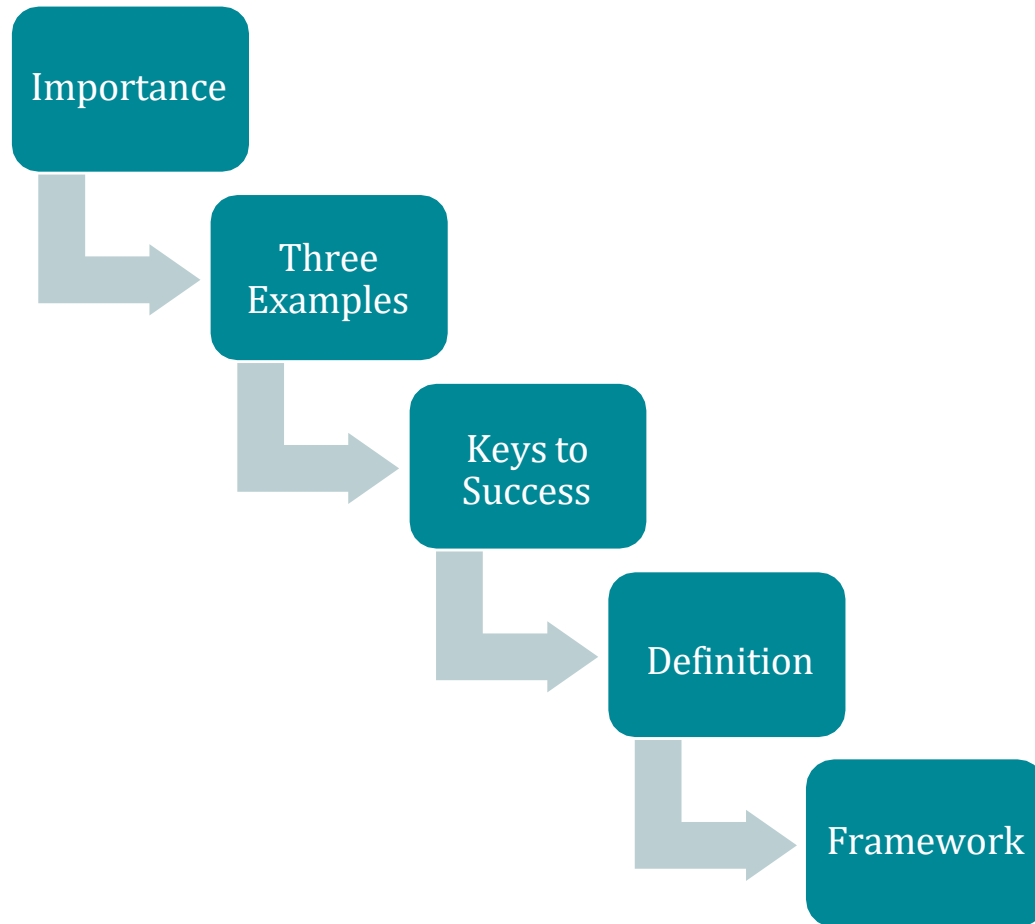
A Watershed Approach to Fish Passage

Bjorn Lake

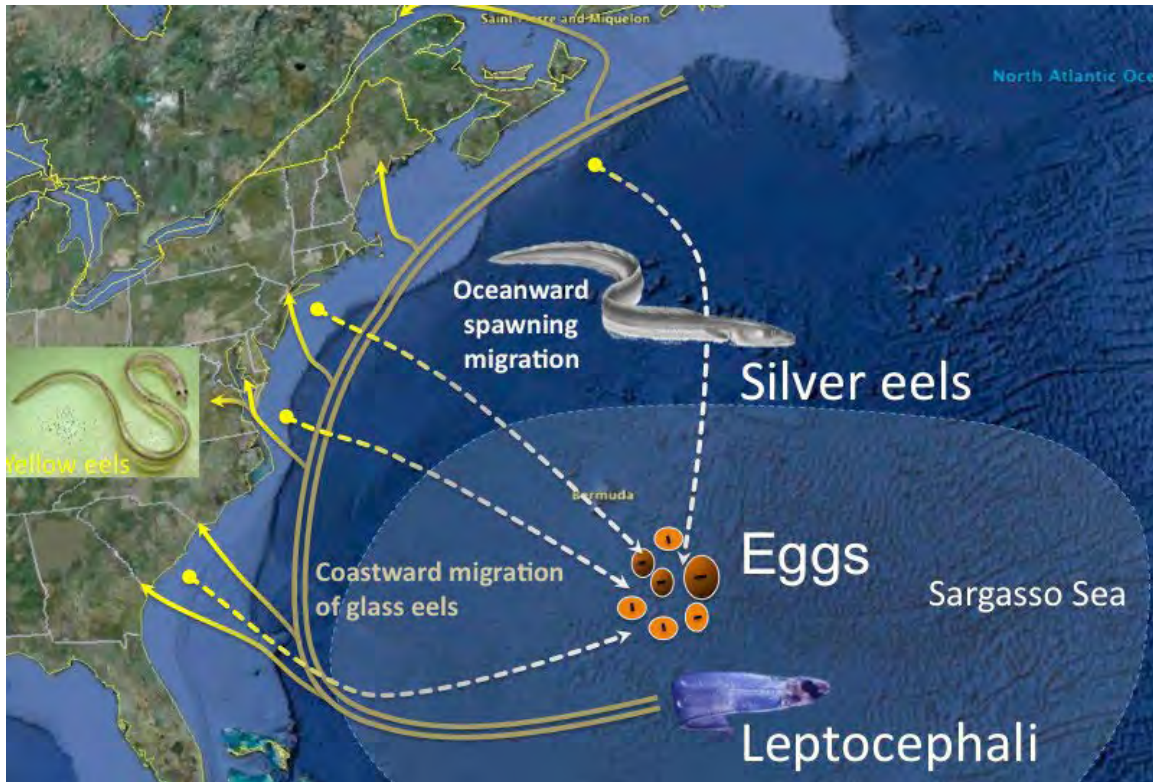
Office of Habitat

NOAA Fisheries

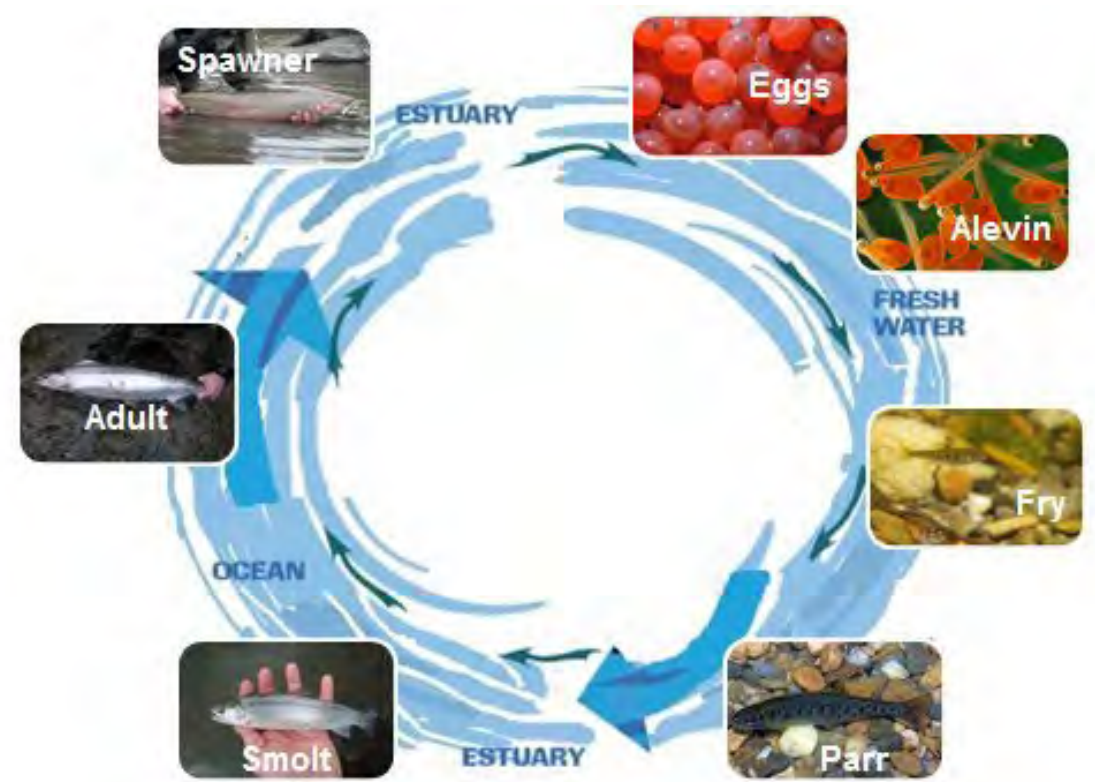
Presentation Outline



Importance of a Watershed Approach



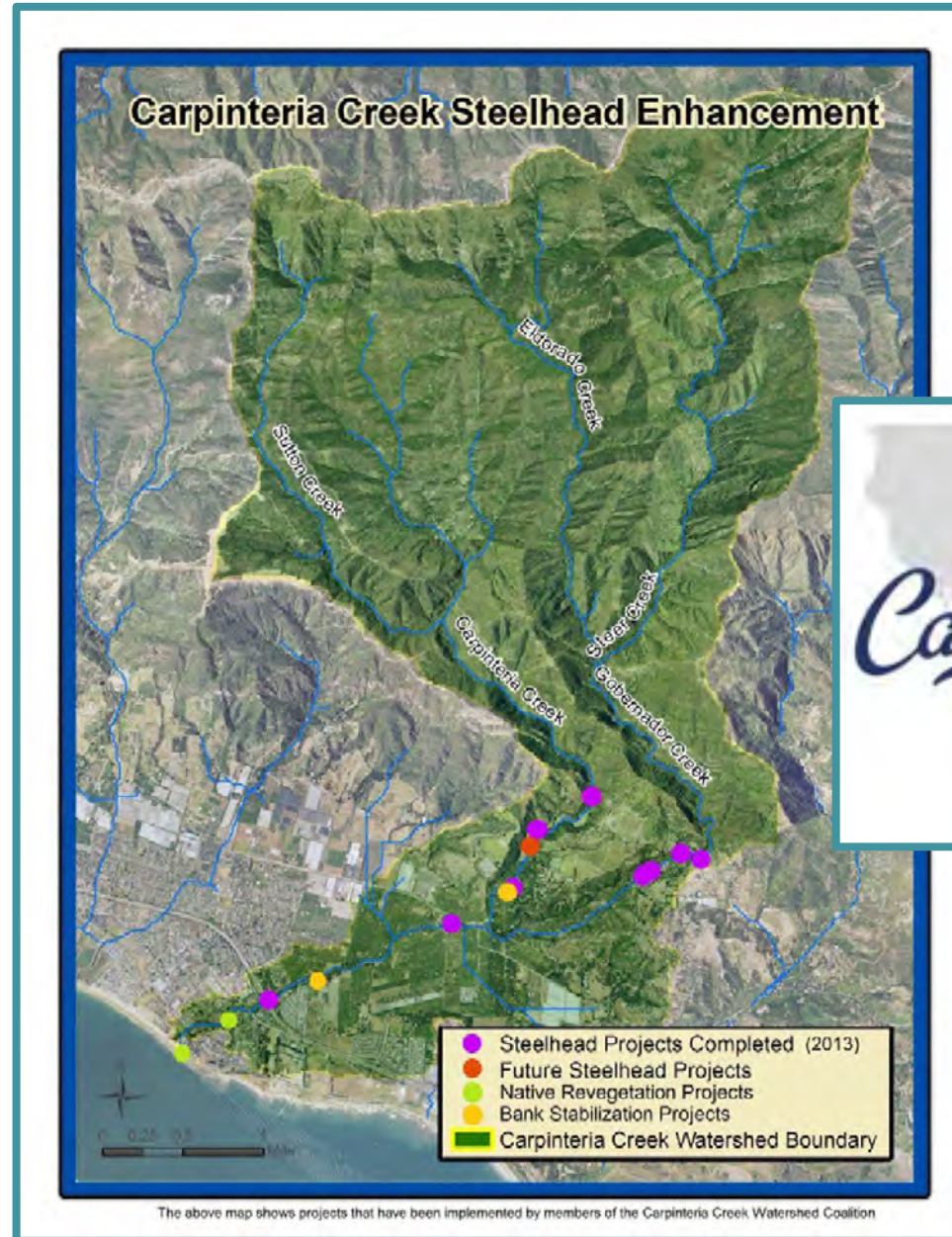
Graphic Courtesy of VIMS



Lifecycles not shown: sturgeon, shad, herring, smelt, tomcod, lamprey, sea trout, and striped bass

Carpinteria Creek

- Southern Steelhead Recovery Plan
- 10 Barriers Removed (2005-2016)
- Opened 15 miles of habitat



Carpinteria Creek Watershed Approach



Southern Steelhead population status



Public roadways and infrastructure



Multiple Owners



Non-Sequential Actions

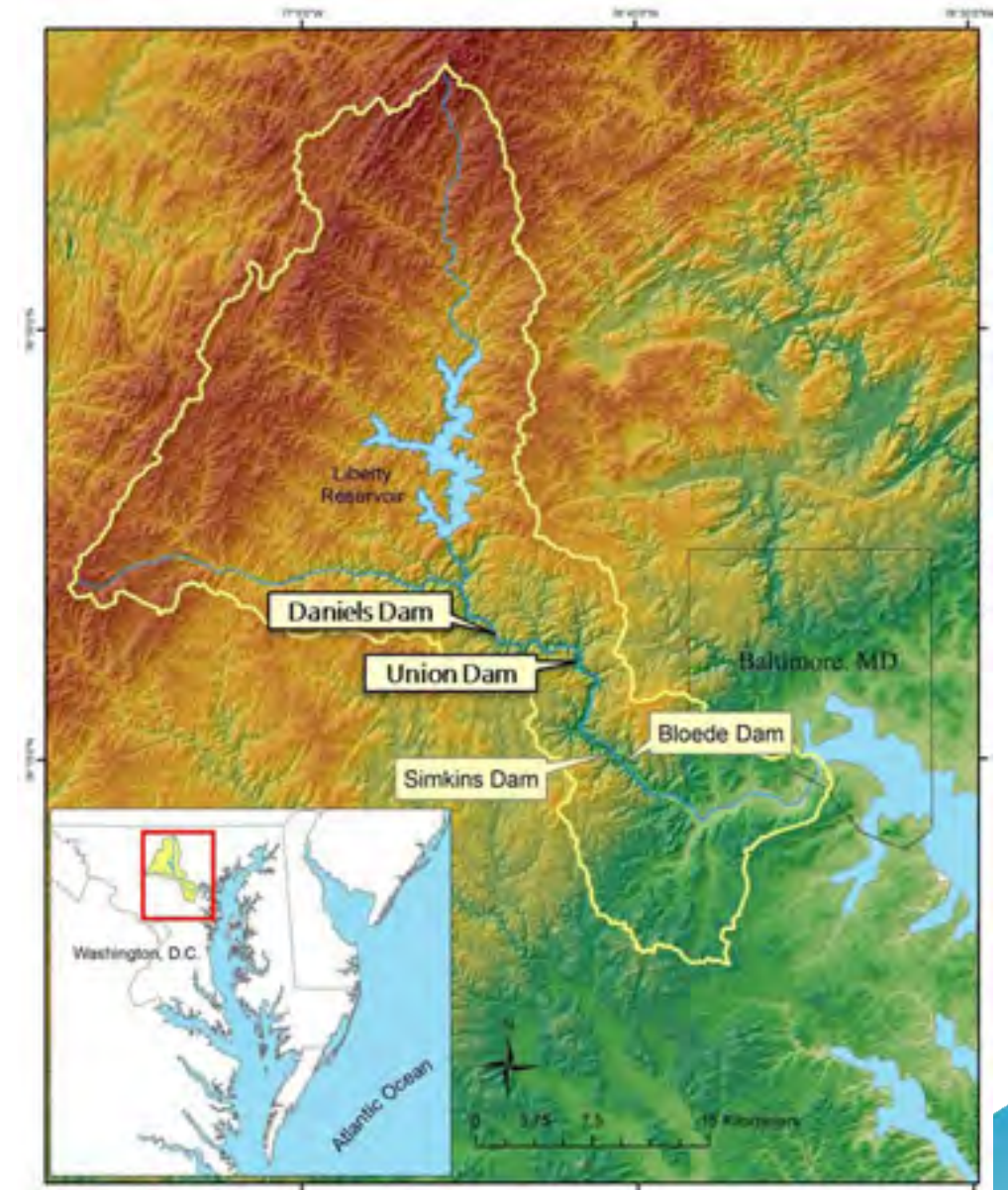
BEFORE

AFTER



Patapsco River

- Target species are shad, herring, and American eel
- 3 dams removed (2009 – 2018) and one with technical fishways
- Opened 65 miles of alosine and 183 miles of eel habitat



Patapsco River Watershed Approach



Dam Safety Concerns



Public infrastructure



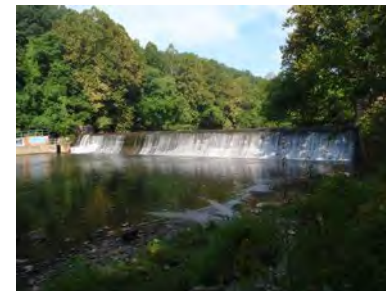
Multiple Owners



Non-Sequential Actions

BEFORE

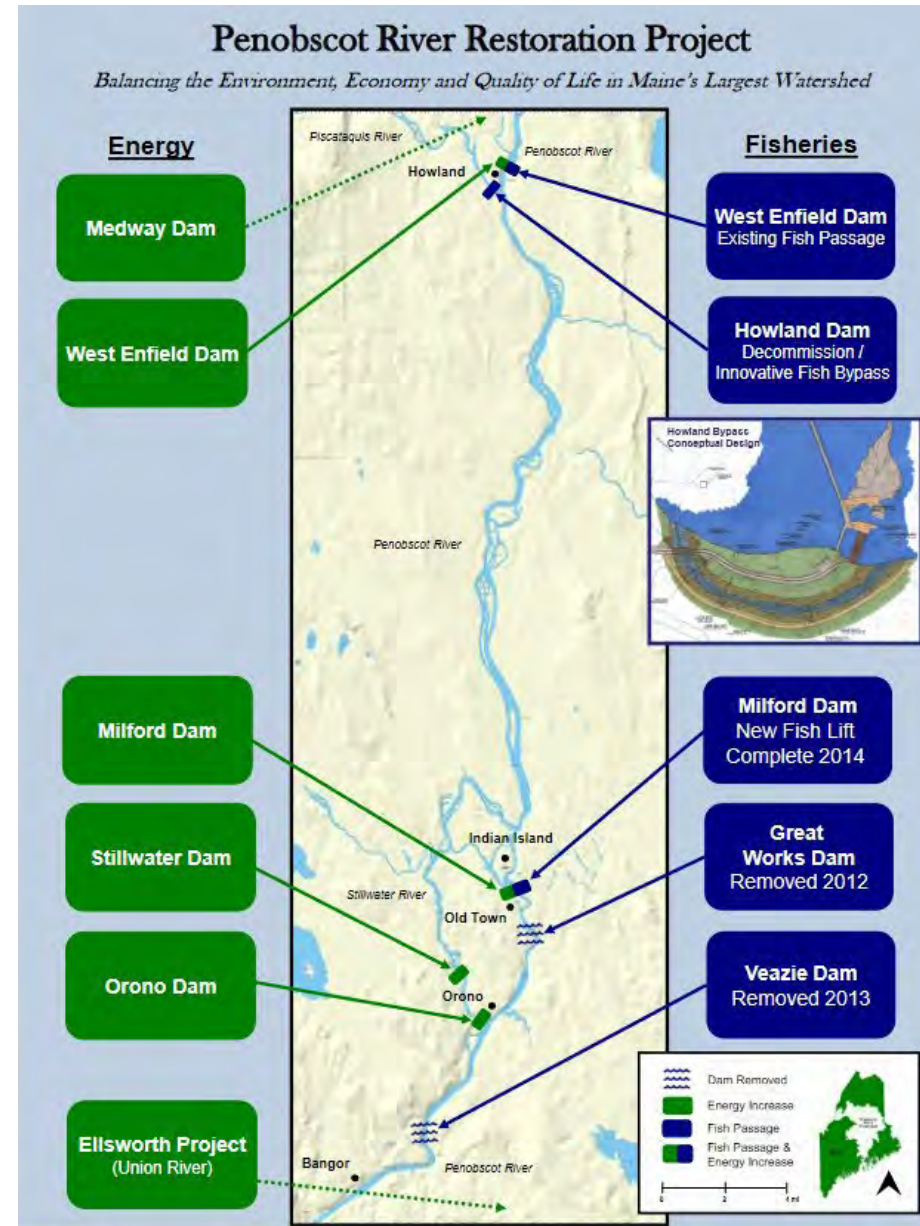
AFTER



NOAA
FISHERIES

Penobscot River

- Full suite of diadromous species benefited
- Two dam removals, three improved technical fishways, and one NLF
- Significantly improved access to nearly 1,000 miles of habitat



Penobscot River Watershed Approach



Hydro Licensing



Private infrastructure



Penobscot Nation



Sequential Actions

BEFORE

AFTER



NOAA
FISHERIES

What made these watershed approaches work?

- Funding
- Partnerships
- Calculated Risk
- Patience
- Flexibility
- Momentum



Carpinteria Creek

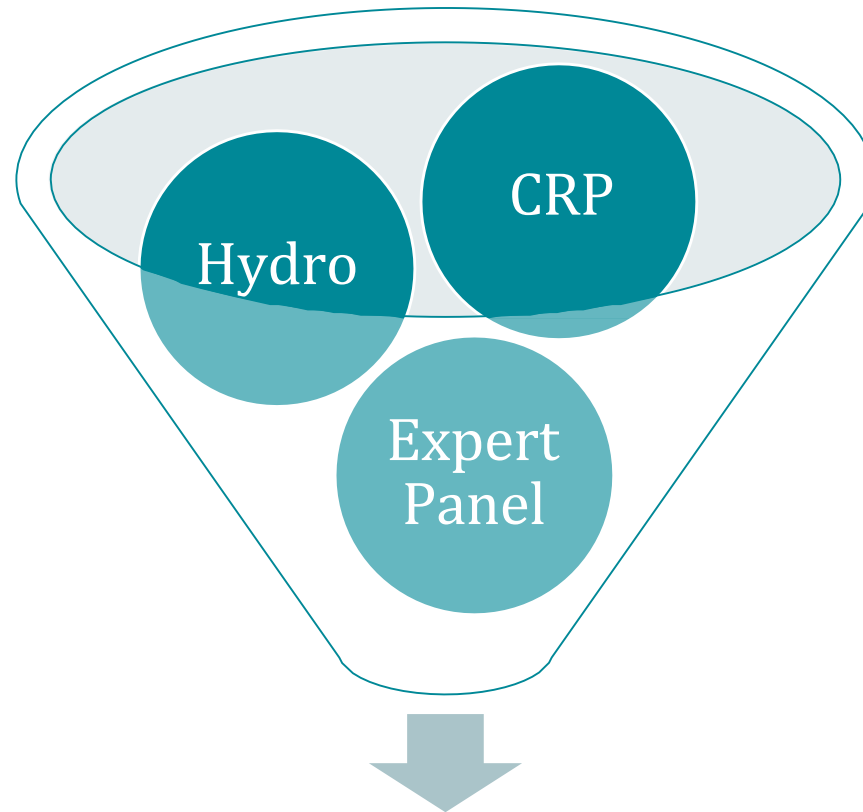


Patapsco River



Penobscot River

Fish Passage Program Review



Key Recommendation: **Formalize a Watershed Approach**

Unified Federal Policy for Ensuring a Watershed Approach to Federal Land and Resource Management (65 FR 62565)

A framework to guide watershed management that:

- (1) uses watershed assessments to determine existing and reference conditions;
- (2) incorporates assessment results into resource management planning; and
- (3) fosters collaboration with all landowners in the watershed.

The framework considers both ground and surface water flow within a hydrologically defined geographical area.



Our Watershed Approach Definition

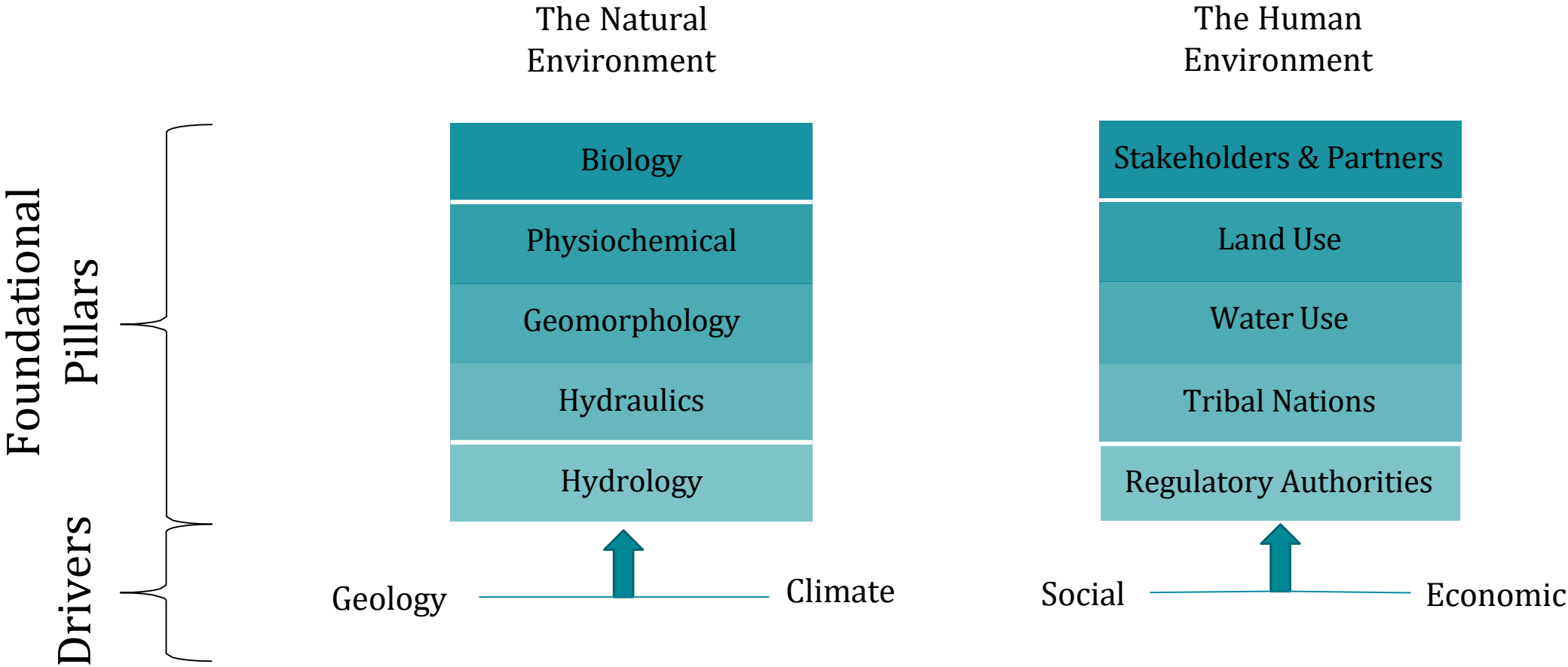
A framework to guide NOAA Fisheries fish passage-related activities in a watershed, that where possible and when appropriate,

- (1) uses watershed assessments to determine existing and reference conditions;
- (2) incorporates assessment results into resource management planning;
- (3) fosters collaboration with all stakeholders and tribes in the watershed;
- (4) uses a holistic view (e.g., headwaters to ocean) for fish passage;
- (5) considers future environmental conditions based on climate change and watershed development potential; and
- (6) optimizes how NOAA Fisheries applies its full suite of authorities and programs to achieve recovery, conservation, and sustainability of NOAA Fisheries trust resources.

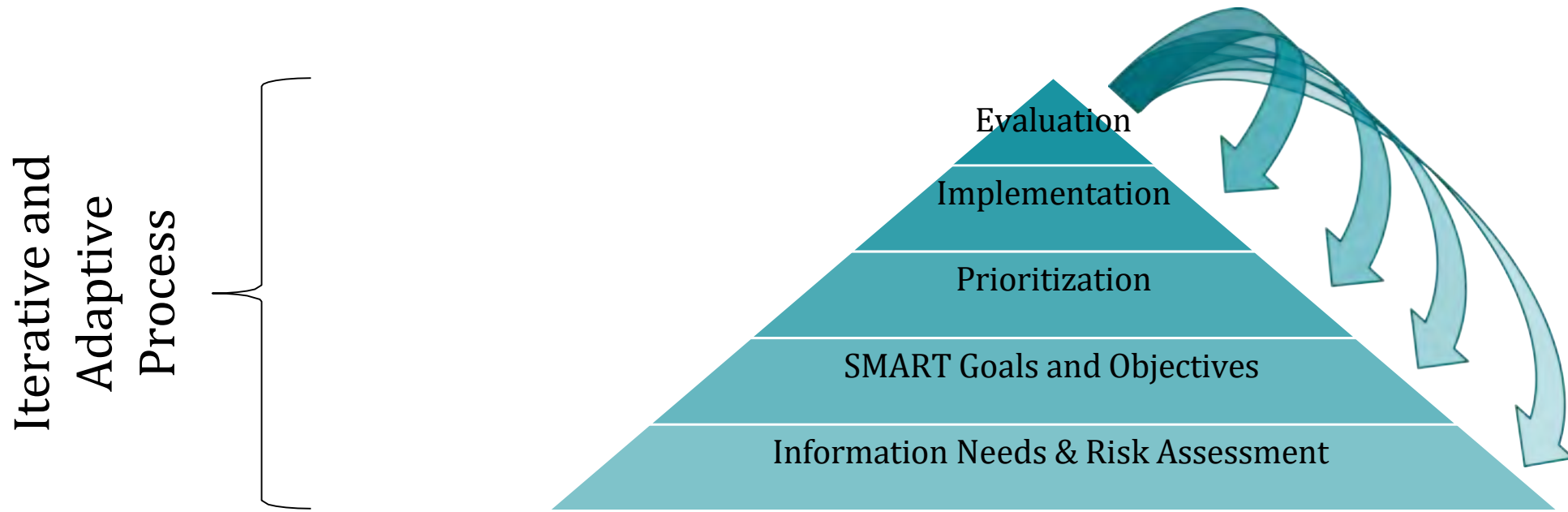
This framework considers both ground and surface water flow within a hydrologically defined geographical area.



Watershed Assessments

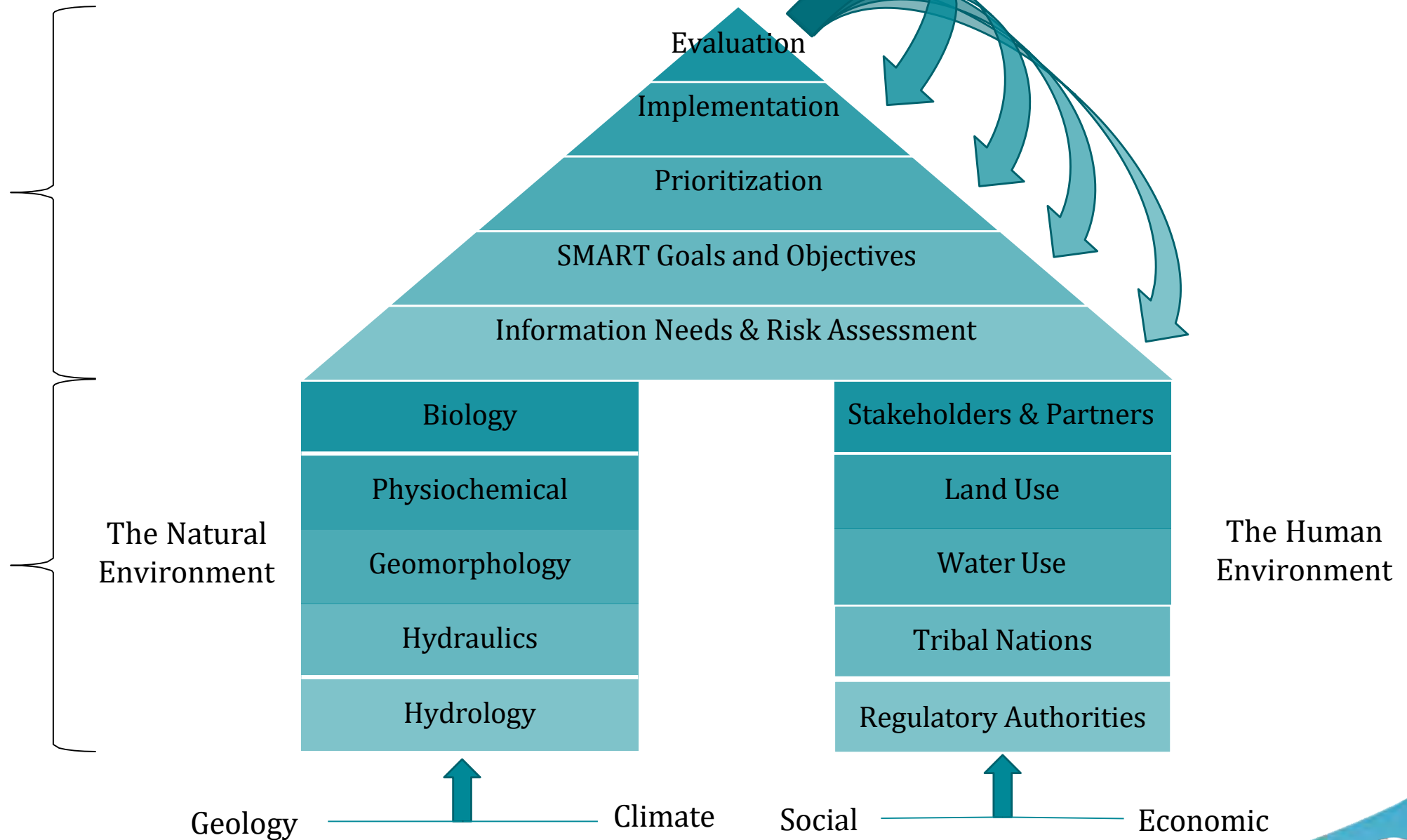


Resource Planning and Implementation



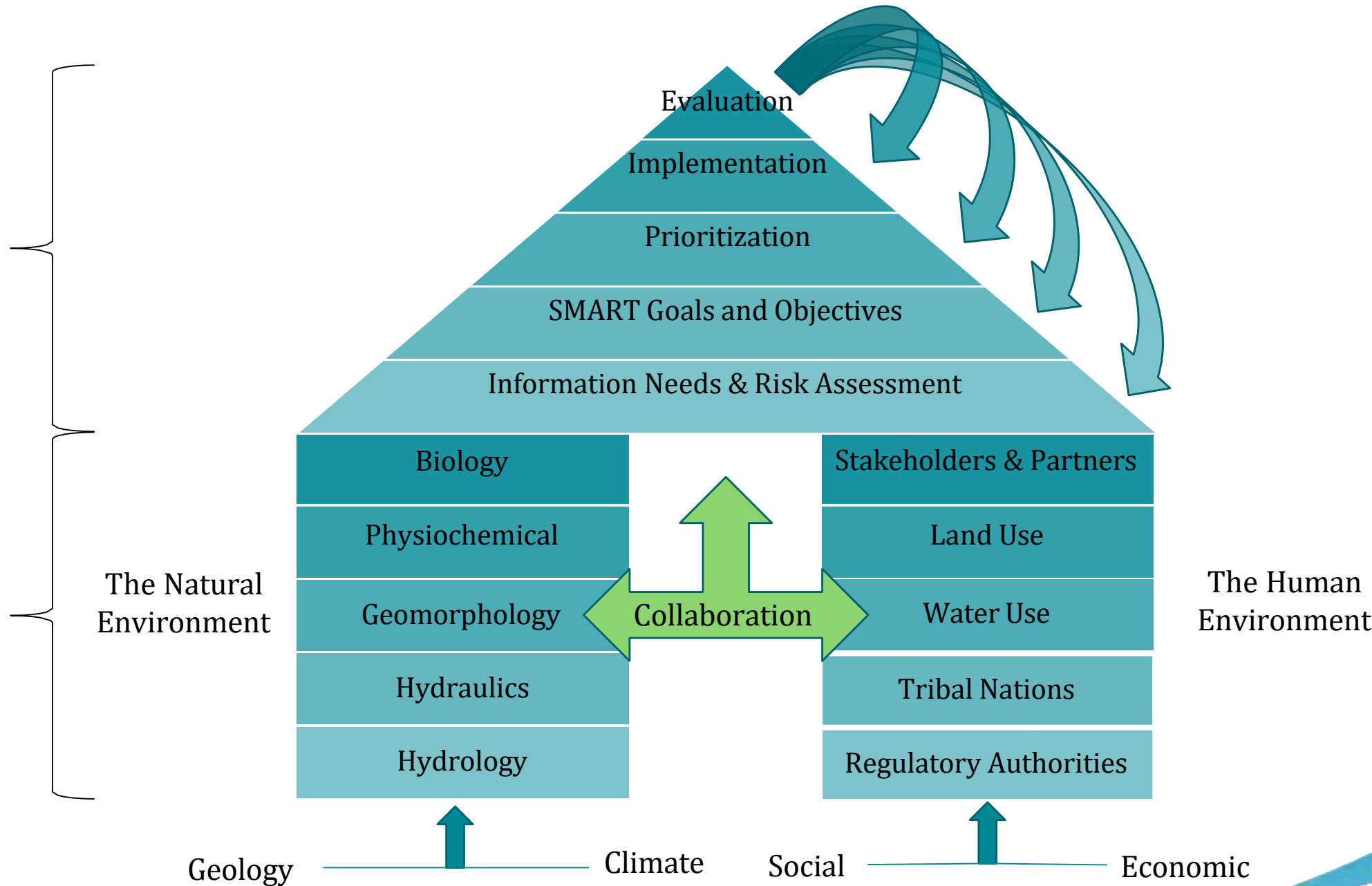
Iterative and Adaptive Process

Foundational Assessments (Pillars)



Iterative and Adaptive Process

Foundational Assessments (Pillars)



Collaboration



Feedback & Questions



MDC Resource Science

Priority Ranking Process for Improving Low Water Crossings to Benefit the Niangua Darter and Fish Passage Statewide

Science Notes



BEFORE: June 2004



AFTER: May 2006

Priority Ranking Process for Improving Low Water Crossings to Benefit the Niangua Darter and Fish Passage Statewide

By Doug Novinger, MDC Resource Scientist



SUMMARY

During 2005, a cooperative effort was begun by MDC and USFWS to document, survey, and prioritize low water crossings within the range of the endangered Niangua darter for improvement. Poorly designed low water crossings are barriers to the passage of aquatic organisms, sediment and woody debris. Some of the negative effects include fragmenting populations, limiting movement, restricting gene flow, and obstructing recolonization when isolated populations are reduced or eliminated. Degraded habitat conditions for stream bottom fish species like the Niangua darter occur around the crossings, created by impoundment and sediment deposition upstream combined with erosion and scour holes downstream.

A project team assembled by Craig Fuller, state Recovery Team Leader for Niangua darter included Ange Corson, John Fantz and Doug Novinger (MDC) and Joanne Grady, USFWS. The team's goal was to develop a strategy for ranking crossings for priority of improvement based on field measurements that described the degree of obstruction the crossing might pose to movement of small, bottom-dwelling fish like the Niangua darter.



Fig. 1. Road crossings in the watersheds inhabited by Niangua darter including those ranked by degree of obstruction to fish passage.

The first step involved using existing GIS stream and road data to identify the 1,791 road crossings within watersheds occupied by Niangua darter (Fig. 1). The team selected a subset of 75 crossings that were located on mainstems and larger tributaries that could offer habitat for Niangua darters. Next, the 75

crossings were surveyed by USFWS staff to collect information describing structure type, location, dimensions, and condition: measurements at each opening such as length, width, elevation above the stream bottom, water depth, and % blockage, and to take several digital photos. The surveys revealed that 32 of the 75 crossings were types that could be barriers. Next, summary values were calculated from the field measurements to quantify characteristics of the crossings that might interact with the Niangua darter's ecology to restrict passage. For example, openings raised above the stream bottom or elevated above the water's surface would pose perch or jump barriers to a Niangua darter (they can't jump like salmon). Also considered were the number of stream miles restricted if a crossing were improved, distance from the crossing to the nearest Niangua darter record, and the percentage of a crossing's length that was passable by a Niangua darter by combining information on opening sizes and the amount of blockage to each opening.

The final step, completed during May, 2006, involved calculating a Passage Quality Index score (PQI), a number arrived at by combining the various summary values. The PQI allowed for ranking each crossing as a priority for replacement and was a timely product given the expected availability of various state and federal funds for improving low water crossings (Fig. 2). In addition, the process focused attention on some particularly poor crossings and fostered excellent cooperative relationships between state, federal, and county governments. More recently, Julie Fleming and Doug Novinger collaborated to create a computer program in Microsoft Access that automates the process of calculating the summary values, PQI, and ranks the crossings. This flexible tool is now being used as part of a statewide program to inventory and prioritize road crossings that are barriers to passage.



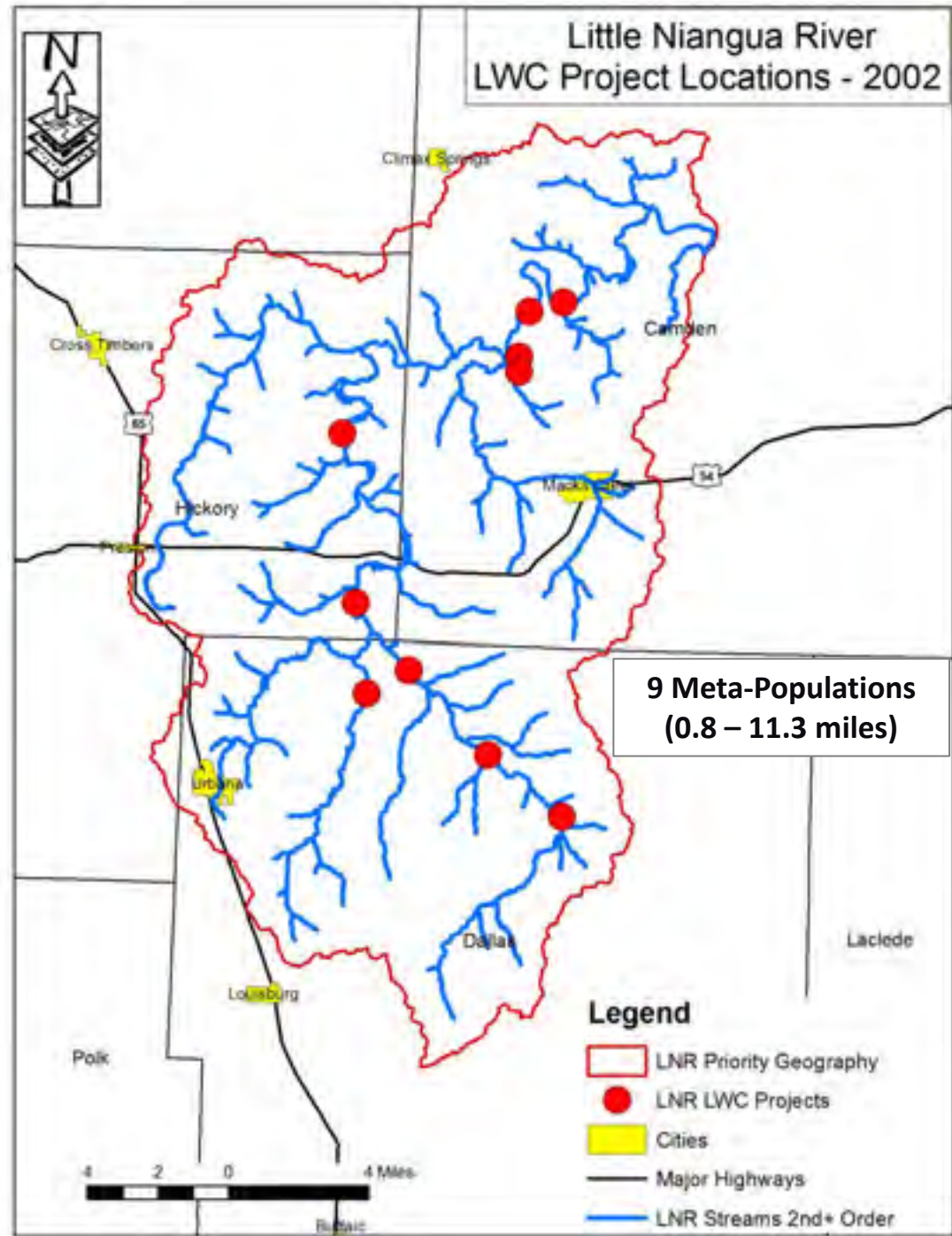
Fig. 2. Bannister Ford over Little Niangua River is a significant barrier to fish passage and a priority for replacement.

For more information, contact:
Missouri Department of Conservation
Resource Science Center
1120 S College
Columbia, MO 65201
573/882-9904ext. 3318
Doug.Novinger@mdc.mo.gov

Keywords: Niangua darter, movement, barrier, bridge, stream fish, conservation priority

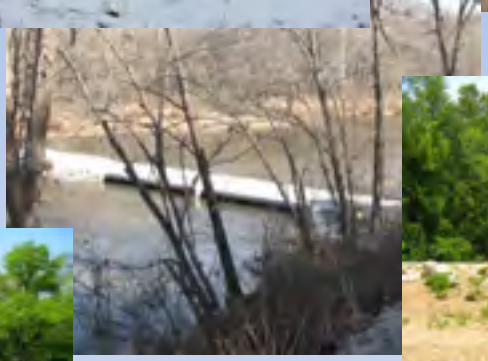
Little Niangua River

- Low Water Crossing Project



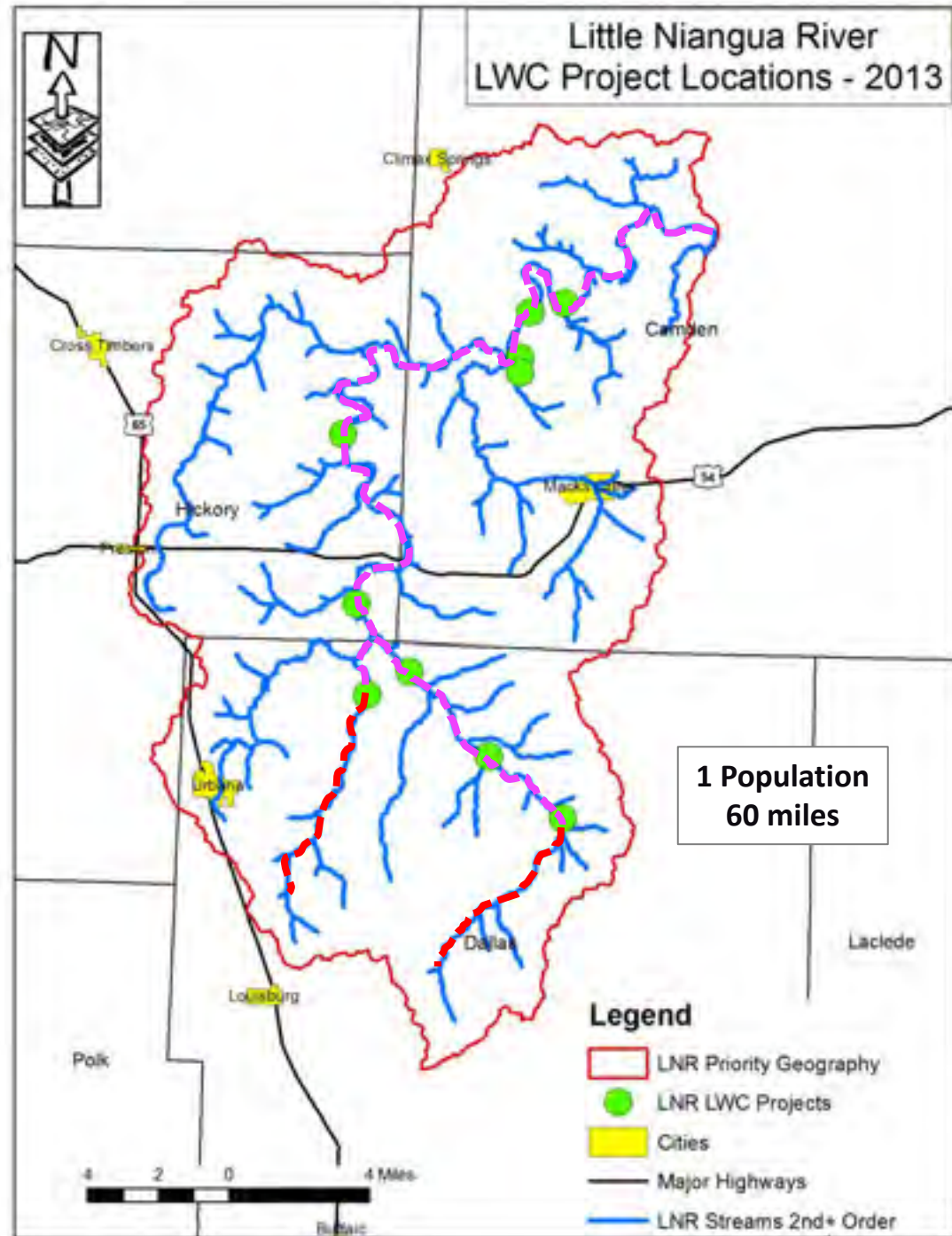
Aquatic Organism Passage





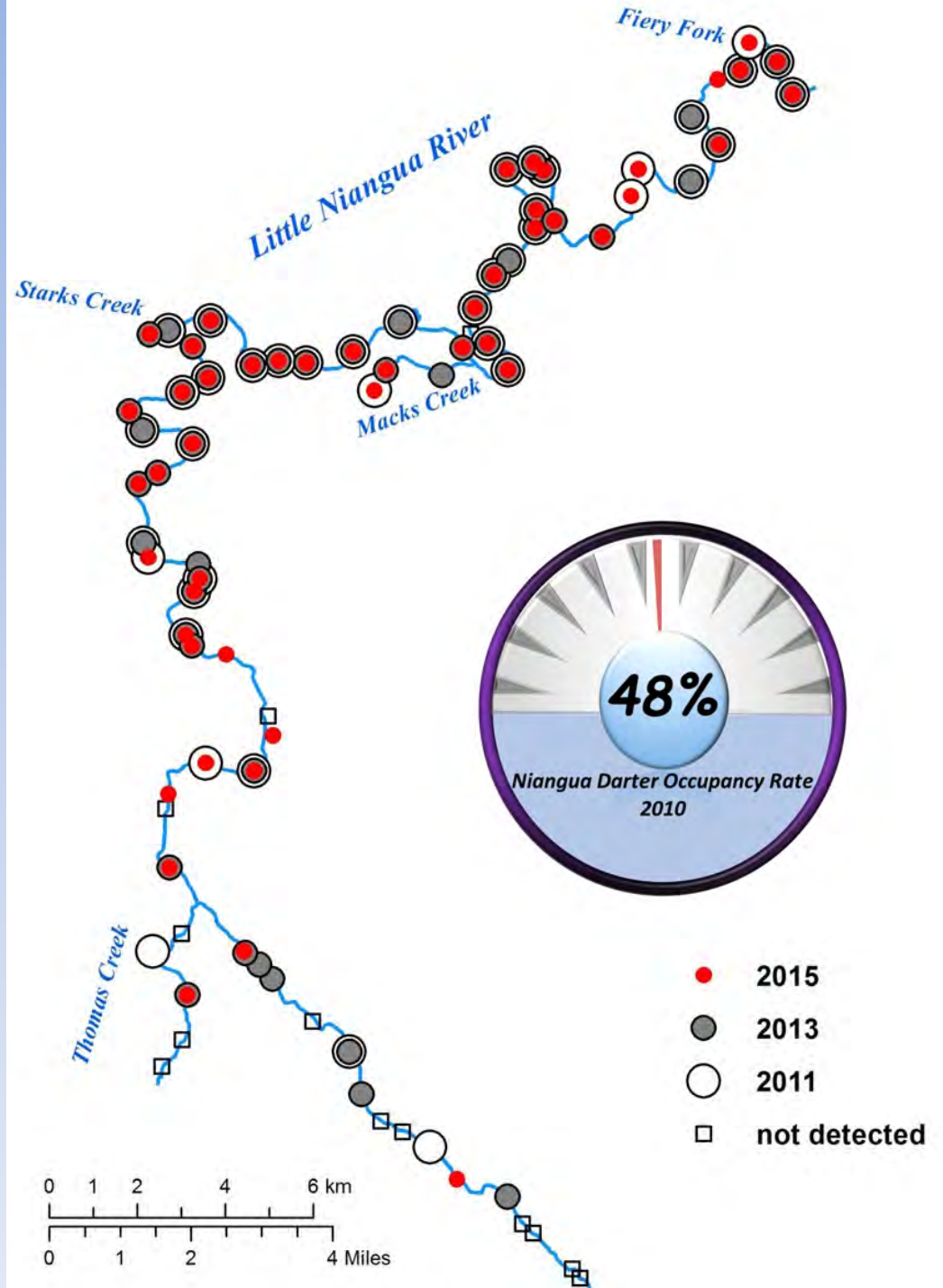
Little Niangua River

- Low Water Crossing Project



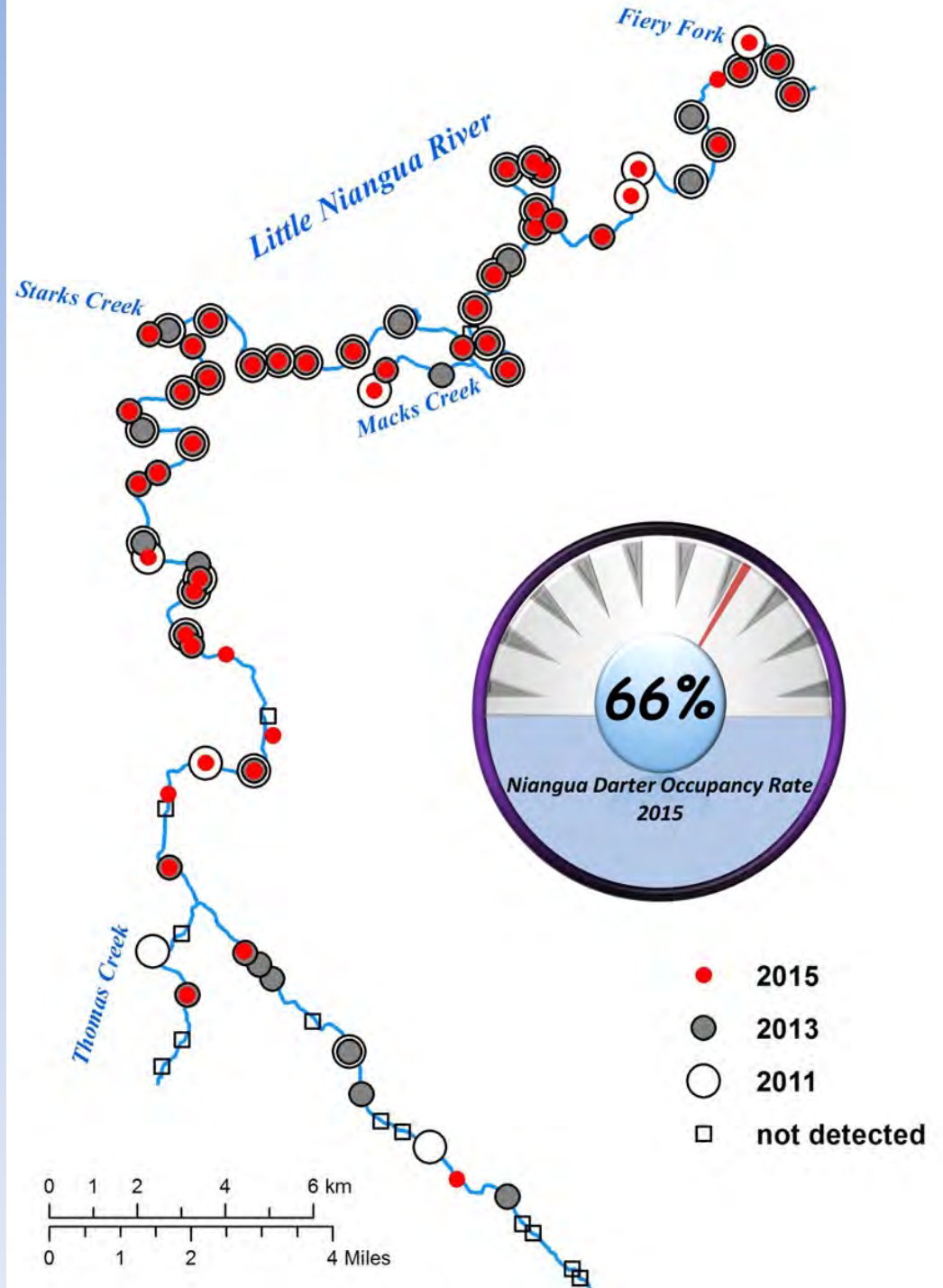
Little Niangua River

- Low Water Crossing Project



Little Niangua River

- Low Water Crossing Project





U.S. Fish & Wildlife Service

Fisheries and Aquatic Resource Conservation

Conserving America's Fisheries

Search the Fisheries Program Site



National Fish Passage Program



More Habitat



Partners	Amount	Percentage
Missouri Conservation Heritage Foundation (SSTF)	\$265,428.00	12.3%
U.S. Fish and Wildlife Service (Osage Basin State Wildlife Grant)	\$101,709.00	4.7%
U.S. Fish and Wildlife Service (Fish Passage Program)	\$427,240.53	19.8%
U.S. Fish and Wildlife Service (Administrative Cost)	\$21,857.14	1.0%
MoDOT LNR Stream Mitigation Bank – Camden Co.	\$985,760.00	45.7%
Missouri Department of Conservation (Fish Kill Grant)	\$10,000.00	0.5%
Missouri Department of Conservation (In-Kind)	\$118,024.00	5.5%
Great River Associates	\$12,900.00	0.6%
FEMA/SEMA	\$32,076.13	1.5%
Dallas County Commission	\$132,666.94	6.1%
Hickory County Commission	\$51,368.73	2.4%
Total	\$2,159,030.47	100.0%



Camden County

Low-Water Crossing Mitigation

Missouri Department of Transportation



June 2008

**Modifications To Low-Water Crossings Planned
As Part of Federal Stream Mitigation Requirements**

Aquatic Organism Passage Guide Sheet:

Stream C

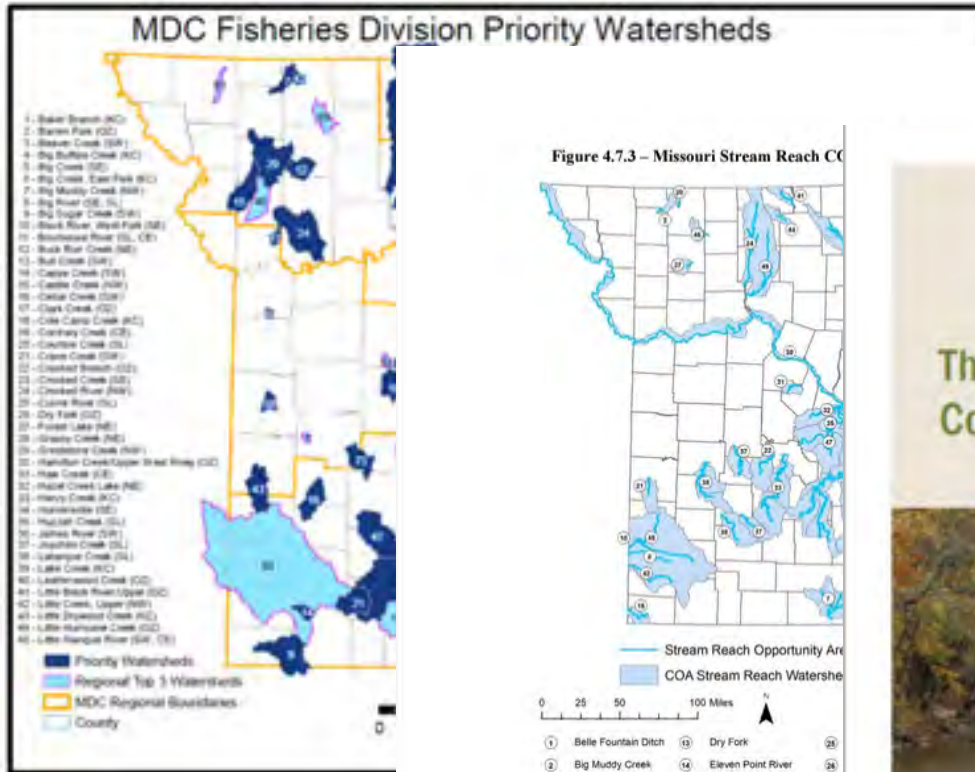


Figure 4.7.3 – Missouri Stream Reach CO



Missouri Comprehensive Cons

The Missouri Comprehensive Conservation Strategy



Responsibly Addressing the Challenges and Opportunities of Modern Conservation Through an Integrated Strategic Approach



WESTERN
NATIVE
TROUT
INITIATIVE



Between 1999-2006: a work group of the Fisheries Administrators of the western state fish and wildlife agencies

Became an Initiative of Western Association of Fish and Wildlife agencies (WAFWA) in 2008

Also in 2008, became a public-private Fish Habitat Partnership under the National Fish Habitat Partnership Program (NFHP)

Covers over 1.75 million miles of public and privately managed lands over 12 western states

21 focal species of western native trout and char



WESTERN
NATIVE
TROUT
INITIATIVE



WNTI focal species:

Alaskan Kokanee
Alaskan Lake Trout
Apache Trout
Arctic Char
Arctic Grayling
Bonneville Cutthroat Trout
Bull Trout
California Golden Trout
Coastal Cutthroat Trout
Colorado River Cutthroat Trout
Dolly Varden
Gila Trout
Greenback Cutthroat Trout
Lahontan Cutthroat Trout
Little Kern Golden Trout
Paiute Cutthroat Trout
Redband Trout
Rio Grande Cutthroat Trout
Westslope Cutthroat Trout
Yellowstone Cutthroat Trout

Regional Fish Habitat Partnerships



Geographic / Species Based Partnerships

- 1 Atlantic Coast FHP
- 2 California Fish Passage Forum
- 3 Desert FHP
- 4 Driftless Area Restoration Network
- 5 Eastern Brook Trout Joint Venture
- 6 Fishers and Farmers Partnership
- 7 Great Lakes Basin FHP
- 8 Great Plains FHP
- 9 Hawaii FHP
- 10 Kenai Peninsula FHP
- 11 Matanuska-Sustina Basin Salmon Habitat Partnership
- 12 Midwest Glacial Lakes Partnership
- 13 Ohio River Basin FHP
- 14 Pacific Lamprey Conservation Initiative
- 15 Pacific Marine and Estuarine FHP
- 16 Southeast Alaska FHP
- 17 Southeast Aquatic Resources FHP
- 18 Southwest Alaska Salmon Habitat Partnership
- 19 Western Native Trout Initiative

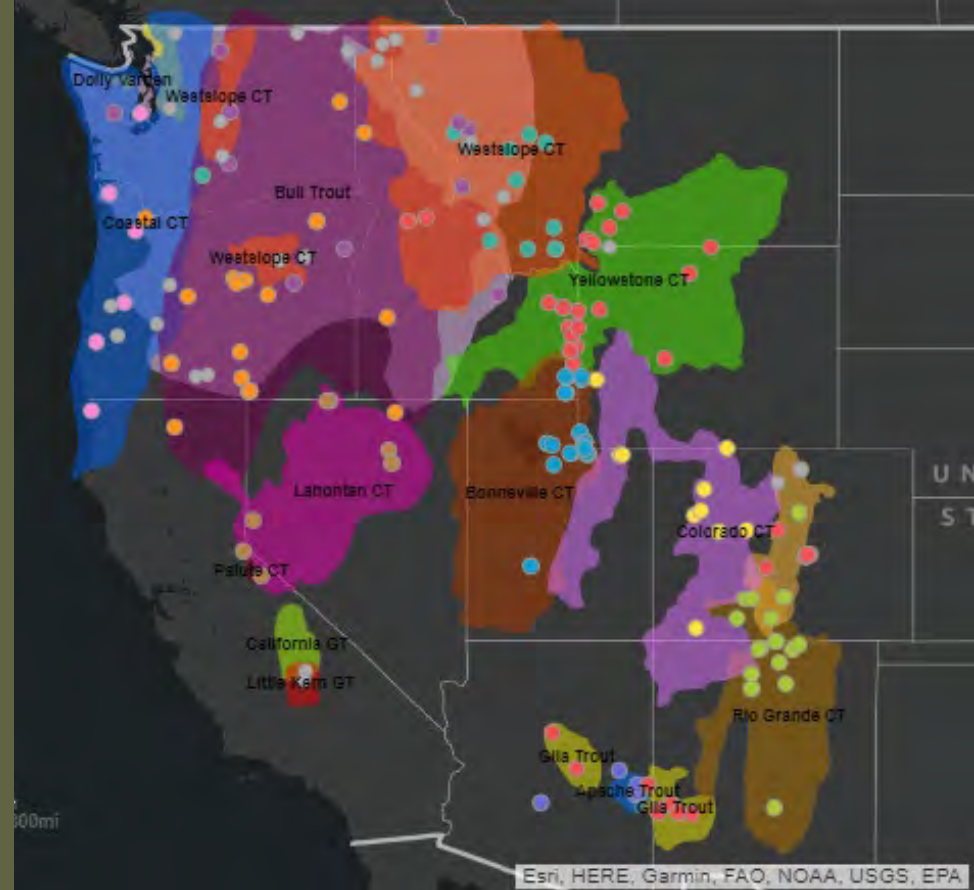
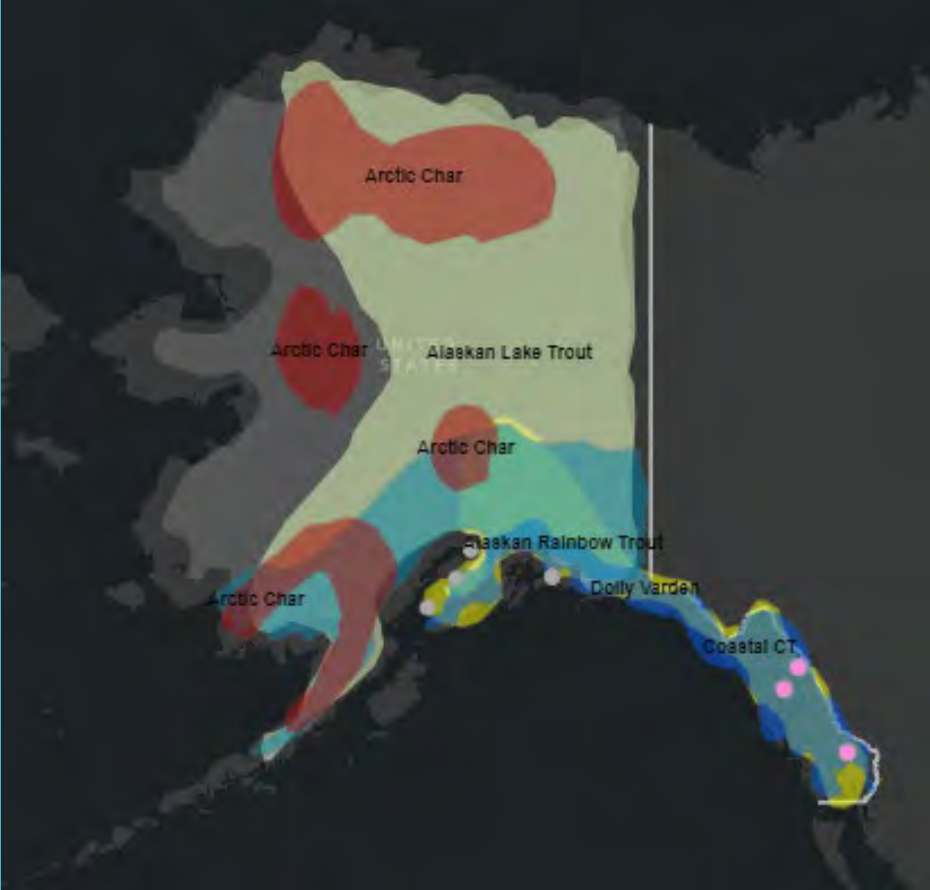
System Based Partnership

- 20 Reservoir FHP*
- *The Reservoir FHP is a system based partnership that covers reservoirs across the country.

Note: Alaska and islands not to scale
Includes current fish habitat partnerships, approved by the NFHP Board, June 2016.

- 20 Fish Habitat Partnerships covering all 50 U.S. states
- Some are species focused, some are focused on certain aquatic habitats, others are geographically focused

www.fishhabitat.org



Western Native Trout Initiative

WNTI Projects Map updated through 2021
<https://westernnativetrout.org/projects-map/>



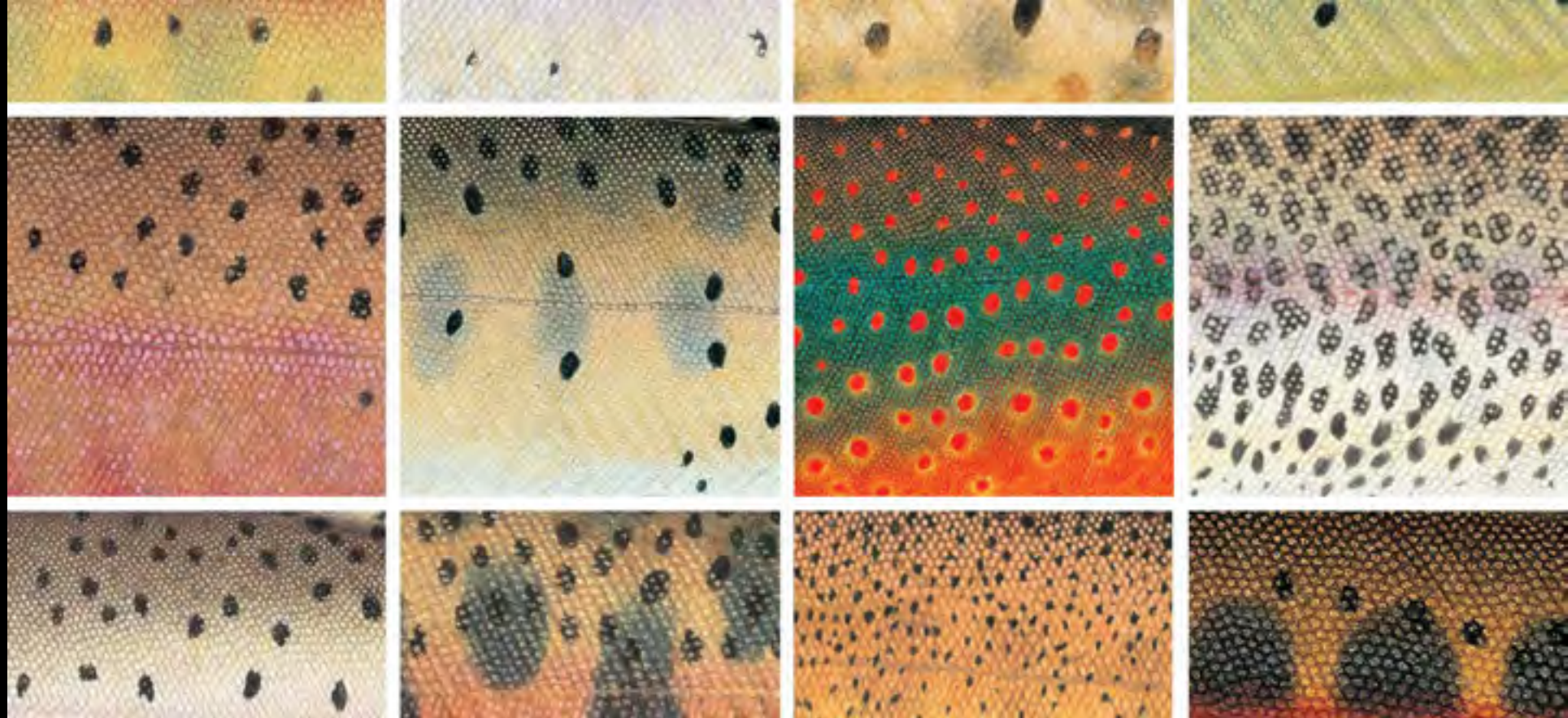
Alaska Department of Fish and Game
Arizona Game and Fish Department
California Department of Fish and Wildlife
Colorado Parks and Wildlife
Idaho Department of Fish and Game
Montana Fish Wildlife and Parks
Nevada Department of Wildlife
New Mexico Department of Fish and Game
Oregon Department of Fish and Wildlife
Utah Division of Wildlife Resources
Washington Department of Fish and Wildlife
Wyoming Game and Fish Department
Trout Unlimited
U.S. Bureau of Land Management
U.S. Fish and Wildlife Service
U.S. Forest Service

Western Native Trout Initiative

Mission: “To serve as a key catalyst for the implementation of conservation or management actions, through partnerships and cooperative efforts, resulting in improved species status, improved aquatic habitats, and improved recreational opportunities for native trout anglers across western states”.

What does WNTI do?

- Provide a forum for partners to coordinate and invest their collective assets and capacity toward completing the highest-priority, native trout conservation efforts across the West.
- Support partners with funding to implement on-the-ground projects. Accelerate/catalyze.
- Support science assessments where there is a knowledge gap.
- Outreach and education through our Campaign for Western Native Trout
- Creation of the 12 state Western Native Trout Challenge in 2019



WNTI Approach & Strategy to Fund Projects

Leverage funding provided by the National Fish Habitat Partnership and other funding sources, and match these funds with partner dollars, to fund projects to improve the status of western native trout populations in 12 western states, including Alaska.

OUR SUCCESS BY THE NUMBERS 2006-2021

- 138** Fish Passage Barriers removed
- 1,741** Stream miles reconnected, restored, or improved
- 41** Barriers constructed to conserve and protect priority populations
- 685** Miles of habitat protected above barriers
- 1,123** Watersheds or populations surveyed or assessed



2021 ANNUAL REPORT

OUR ENEMIES

Thank you for being a part of the Western Native Trout Initiative (WNTI) in 2021. As the unprecedented pandemic unfolded early into 2021, WNTI was able to continue our work with only minimal delays due to COVID-related restrictions. We could not accomplish all that we do without the continued support and dedication of our partners and donors.

In 2021, WNTI and our partners funded 13 habitat projects benefiting WNTI focus species with a total of \$258,223 National Fish Habitat Partnership Funds and \$302,000 in other grants, leveraged with \$1,070,275 in partner contributions for a total projects value of \$4,330,528.

An ongoing partnership with the Resources Legacy Fund (RLF) through their Open Waters Fund, continued to support our ongoing work on seven projects in the Upper Bear River in Idaho, Utah, and Wyoming to benefit Bonneville Cutthroat Trout, recreational fishing, and local communities and ranchers who depend on the river. RLF also continued to support WNTI's portfolio of projects in the Warner Lakes Basin in southwest Oregon to benefit Warner Lakes Reddout Trout, State Sensitive and Endemic Species of Concern, stream success (rated as Threatened) under the Endangered Species Act, recreational fishing, ranches, and job seekers.

The National Oceanic and Atmospheric Administration (NOAA) Office of Habitat Conservation and the International Fisheries Initiative (IFI) funded a three-phase project benefiting Coastal Cutthroat Trout in Prince William Sound in Alaska, the western and northernmost distribution of the species. The project includes professional fish biologists, recreational expert kayak guides and citizen scientists to monitor watersheds, Coastal Cutthroat Trout streams, host fishing forums and outreach presentations to local fishing organizations, conduct field sampling and sharing project results through presentations, an informational brochure, social media, and a video. Data collected will help fill gaps in the range-wide Coastal Cutthroat Trout Assessment, co-funded by WNTI and completed in 2020, and generate recommendations to the Alaska Department of Water Conservation.

Collectively, the 13 projects funded in 2021 will remove or bypass 13 barriers to restore access to 376 miles of stream for fish passage, restore 2.5 miles of riparian habitat, complete 177 habitat assessments, and assess 501 fish populations and 1,041 stream miles.

Work continued in 2021 by the National Fish Habitat Partnership program (NFHP) Board of Directors and the 20 nationally recognized Fish Habitat Partnerships, including WNTI, to transition the NFHP program to meet the requirements of the 2005 American Conservation Enhancement (ACE) Act. The ACE Act reauthorized the North American Wetlands Conservation Act (NAWCA) and codified NFHP, two of the most successful voluntary conservation efforts in the nation. <https://www.fishbase.org/>

Thank you for making 2021 another successful year for WNTI. We are looking forward to continued success in 2022!

Sincerely,

Julie Meka Carter
JULIE MEKA CARTER
 Chair, WNTI Steering Committee

Theresa Thompson
THERESA THOMPSON
 Executive Director

OUR SUCCESS BY THE NUMBERS 2006-2021

- 138** Fish Passage Barriers removed
- 1,741** Stream miles reconnected, restored, or improved
- 41** Barriers constructed to conserve and protect priority populations
- 685** Miles of habitat protected above barriers
- 1,123** Watersheds or populations surveyed or assessed

From 2006-2021, WNTI has directed \$6.2 million in federal fish habitat funds leveraged with over \$47.6 million public and private matching dollars for 223 priority native trout conservation projects.

Over 355 partners to date implementing projects on the ground

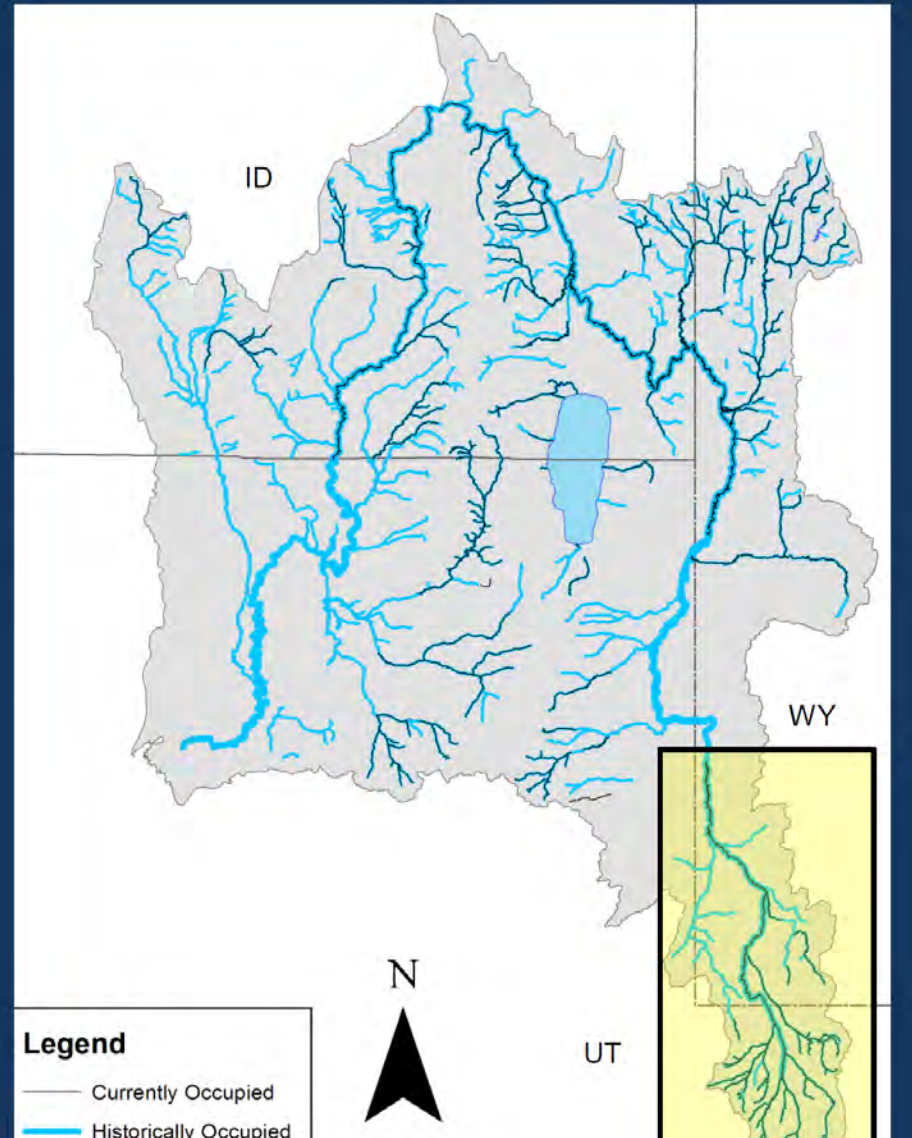
<https://westernnativetrout.org/annual-report/>



2018-2020: Interior Redband Trout, Bonneville Cutthroat Trout, Rio Grande Cutthroat
2021-2024: Colorado River Cutthroat, Lahontan Cutthroat, Yellowstone Cutthroat
2025-2027 (not on map): Gila Trout, Bull Trout, Golden Trout as a species group
(California Golden Trout, Little Kern Golden Trout)

Bear River Watershed

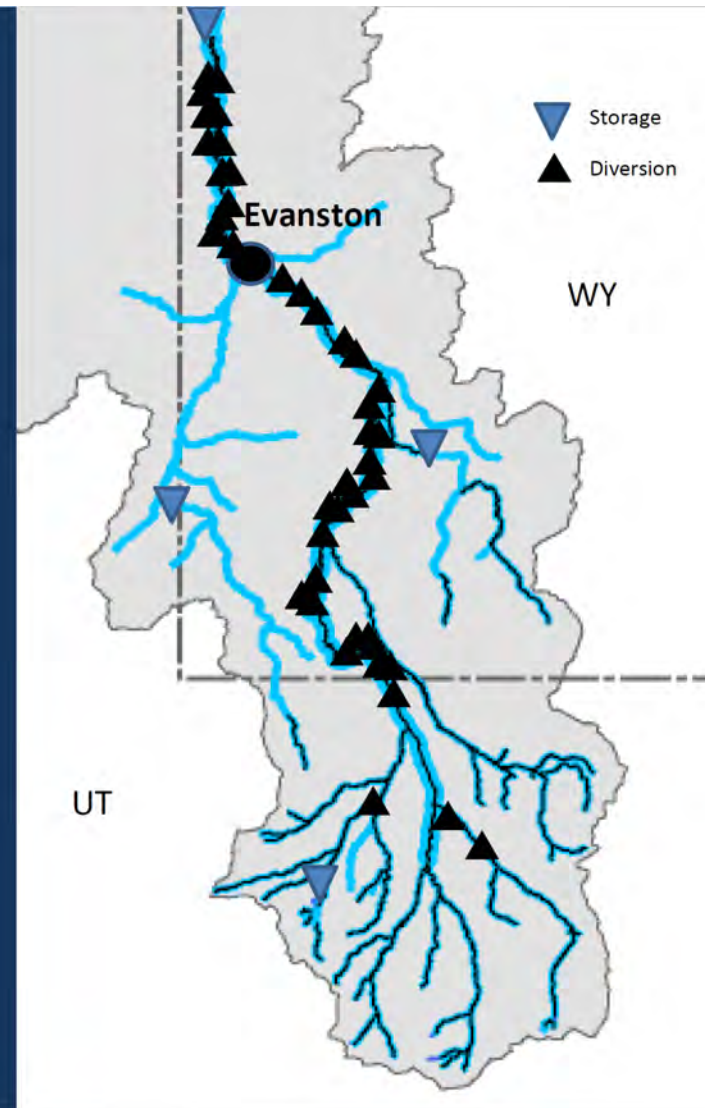
- 7,500 square miles
- Mainstem ~500 miles
- 3 National Forests
- 3 USFWS Refuges
- “Working river”
- Cutthroat Trout distribution
 - Historic: 2,788 miles
 - Current: 1,416 miles (51%)



Upper Bear River

Water storage and diversion

- 4 storage reservoirs
- 23 mainstem diversions (WYSEO)
- Tributary diversions



Fish passage issues:

- Dams (concrete and earthen)
- Push up dams
- Agricultural diversions, canals
- Perched culverts, undersized culverts
- Road crossings

Restoration techniques:

- Channel reshaping
- Rock cross-vane for diversion
- Rock barbs, j-hooks, and constructed riffles
- Toe wood





Between 2006-2018, WNTI contributed \$333,150 in NFHP funding toward nine projects

19 additional projects funded since 2018

Removing 24 different diversion structures (10 complete, 14 ongoing)

Opening 144 miles of river/stream

Since 2018, total projects value of 5.283M; 1.51M brought in by WNTI

[2022: 4 additional projects have not been added to the map yet]

April 2022: U.S. Fish and Wildlife Service announced \$38 million for 40 projects across 23 states and Puerto Rico through the U.S. Fish and Wildlife Service Fisheries National Fish Passage Program (NFPP).

In Fall 2021, WNTI worked closely with US Fish and Wildlife Service Legacy Region 6 staff to include some of our “shovel ready” projects on the list for BIL (enhanced) National Fish Passage Program FY22 funding.

\$1.3 million approved for the “[Upper Bear River Fish Passage for Native Bear River Cutthroat](#)” which is a group of four high priority projects included in the Upper Bear River portfolio described in the previous slides.

Project leaders:

- US Fish and Wildlife Service, Partners for Fish and Wildlife Program
- US Forest Service (3 National forests: Bridger-Teton, Caribou-Targhee, Uinta-Wasatch-Cache)
- Trout Unlimited
- Idaho Department of Fish and Game
- Utah Division of Wildlife Resources
- Wyoming Game and Fish Department



Funding sources:

US Fish and Wildlife Service Partners for Fish and Wildlife Program

US Forest Service (3 National Forests)

Idaho Department of Fish and Game

NRCS RCPP = 19 partners

Resources Legacy Fund

Trout Unlimited

Uinta County Conservation District

Upper Bear River Conservancy

Utah DNR/Division of Wildlife Resources

Utah Department of Environmental Quality

Utah's Watershed Restoration Initiative

Western Native Trout Initiative

Funding sources, cont.

Wyoming Game and Fish Department

Wyoming Department of Environmental Quality

Wyoming Wildlife and Natural Resources Trust

Outreach

Bear River Working Watershed film: Produced on our behalf by the Resources Legacy Fund Open Rivers Fund hosted on WNTI's You Tube channel:

<https://www.youtube.com/watch?v=JhjE1Ad9DdI&t=4s>



Site visit tour August 2021



SLC Tribune October 2021 Op Ed:
<https://www.sltrib.com/opinion/commentary/2021/10/07/shara-sparks-therese/>

Shara Sparks and Therese Thompson: Western resilience seen along the Bear River

Ranchers find new, more sustainable ways to draw water from the river.



By Shara Sparks and Therese Thompson | Special to The Tribune | Oct. 7, 2021, 10:44 am

All along the Bear River, there is evidence of Western resilience. In the face of daunting water challenges in Utah and neighboring states, ranchers, environmentalists, and staff from state and federal agencies are coming together to protect ranches and communities, while bolstering the long-term health of the river.

Intermountain
West Joint
Venture article:
<https://iwjv.org/partnership-shines-in-bear-river-rcpp/>

Trout Unlimited article
(102,000 views):
<https://www.tu.org/magazine/american-places-2/five-hundred-miles-of-river-memories-in-three-states/>



For more information:

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westernnativetrout.org

Facebook: [/westernnativetrout](https://www.facebook.com/westernnativetrout)
Instagram: [@westernnativetrout](https://www.instagram.com/westernnativetrout)
Twitter: [@WNativeTrout](https://twitter.com/WNativeTrout)



WESTERN
NATIVE
TROUT
INITIATIVE



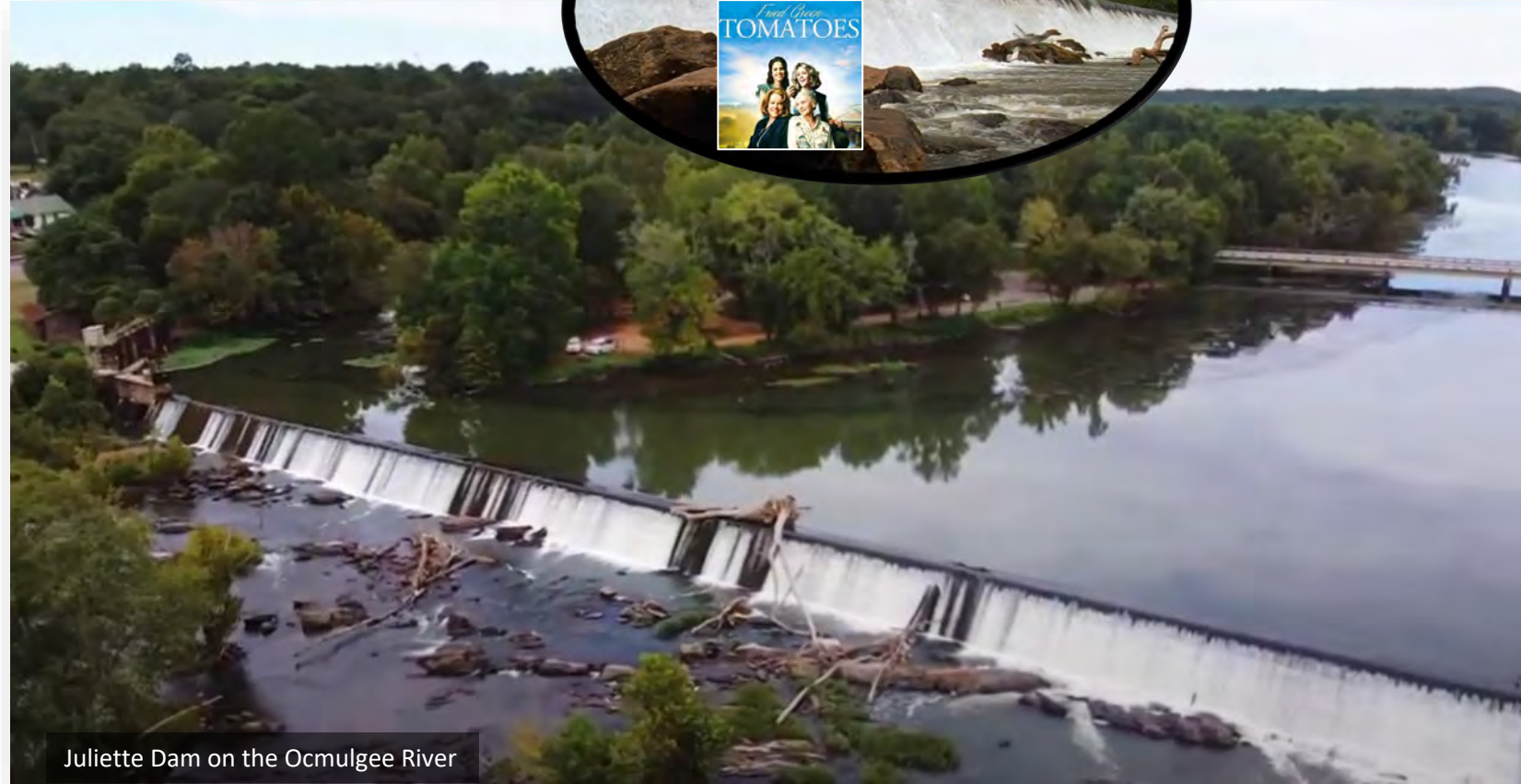
Best Practices for Dam Removal as a Tool for Fish Passage



Sara Gottlieb
TNC-GA
Director of Freshwater Science & Strategy

GA-ACT Co-Lead

Fish Passage Workshop
NCTC
July 18, 2022



Juliette Dam on the Ocmulgee River

REMOVING SMALL DAMS

A Basic Guide for Project Managers



Removal or Modification of Obsolete Dams in Georgia

*A Handbook for Project Managers
and Dam Owners*

The Georgia Aquatic Connectivity Team

June 2020



American Rivers Handbook

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EAGLE & PHOENIX MILLS AND DAM

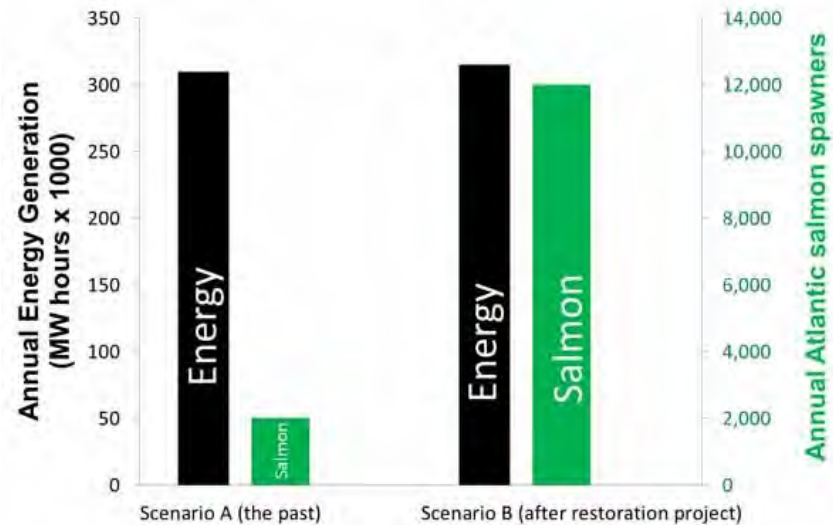


Chattahoochee River, Columbus, GA
Eagle & Phoenix and City Mills Dam removal 2012
Total Economic Impact: >\$36 Million





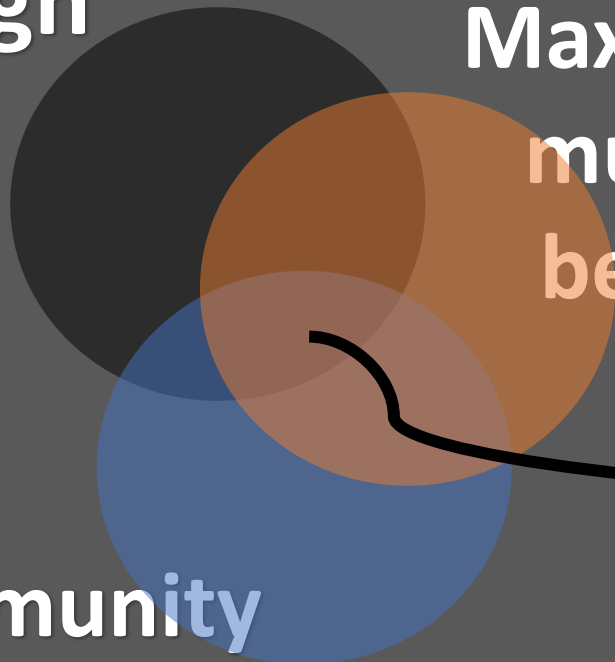
Penobscot River, Maine
Removal of 2 Hydropower Dams
2012-15



Design

**Maximizing
multiple
benefits**

**Community
Engagement**



Flood mitigation

Water supply

Dam safety

Water quality

Fish passage

Habitat restoration

Recreation

Property values

Power generation

Fishing access

Historic preservation

Community identity

Economic development

New Savannah Bluff Lock and Dam



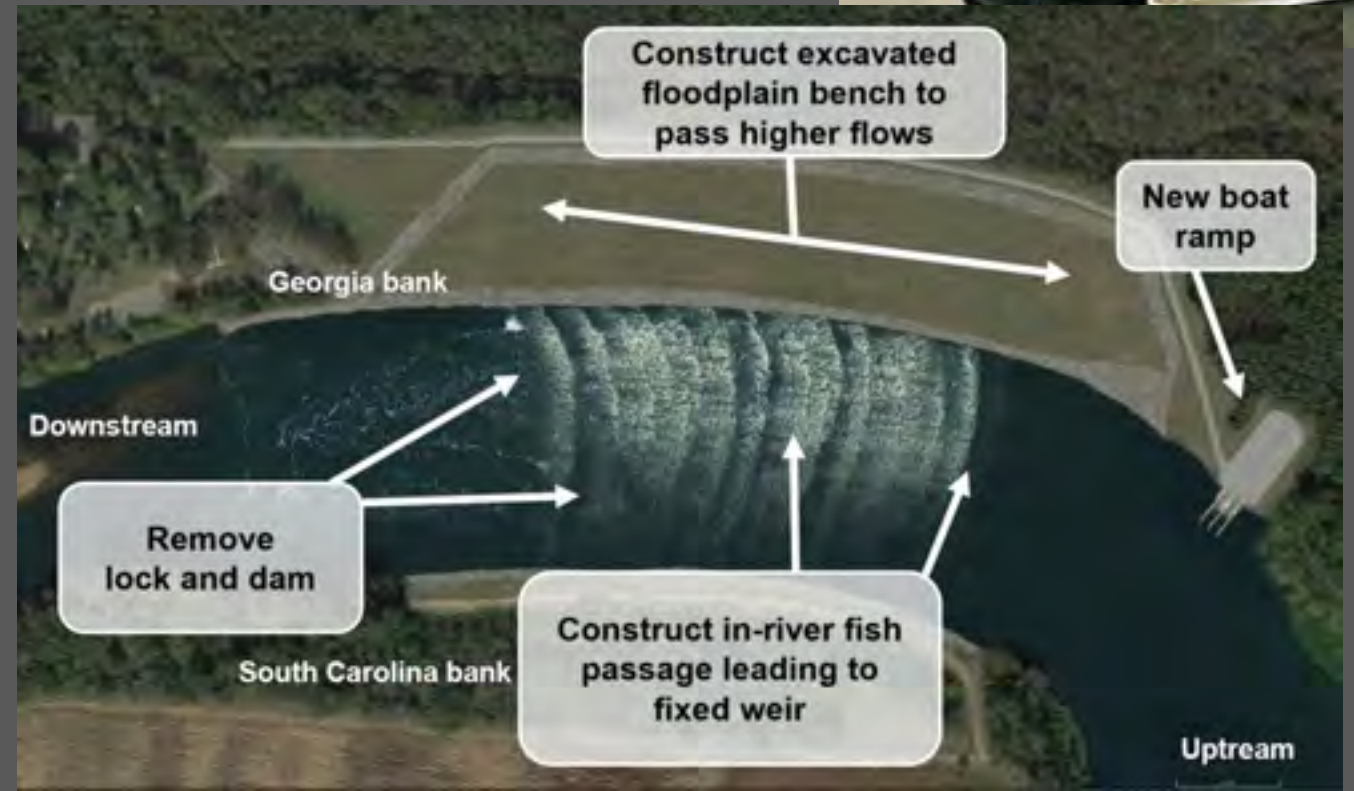
Savannah District, U.S. Army Corps of Engineers

2 hrs · 🌐

As a reminder, we're accepting input through June 3



Corps seeks input on future of New Savannah Bluff Lock and Dam |
Studies are underway to determine a solution for the future of the New Savannah B...
[balancingthebasin.armylive.dodlive.mil](https://www.army.mil/balancingthebasin.armylive.dodlive.mil)



U.S. Army Corps of Engineers addresses Lock and Dam situation at workshop

BY LINDSEY WOODS | LWOODS@BANKERSLANDAM.COM
MAR 6, 2019 | UPDATED AUG 21, 2020



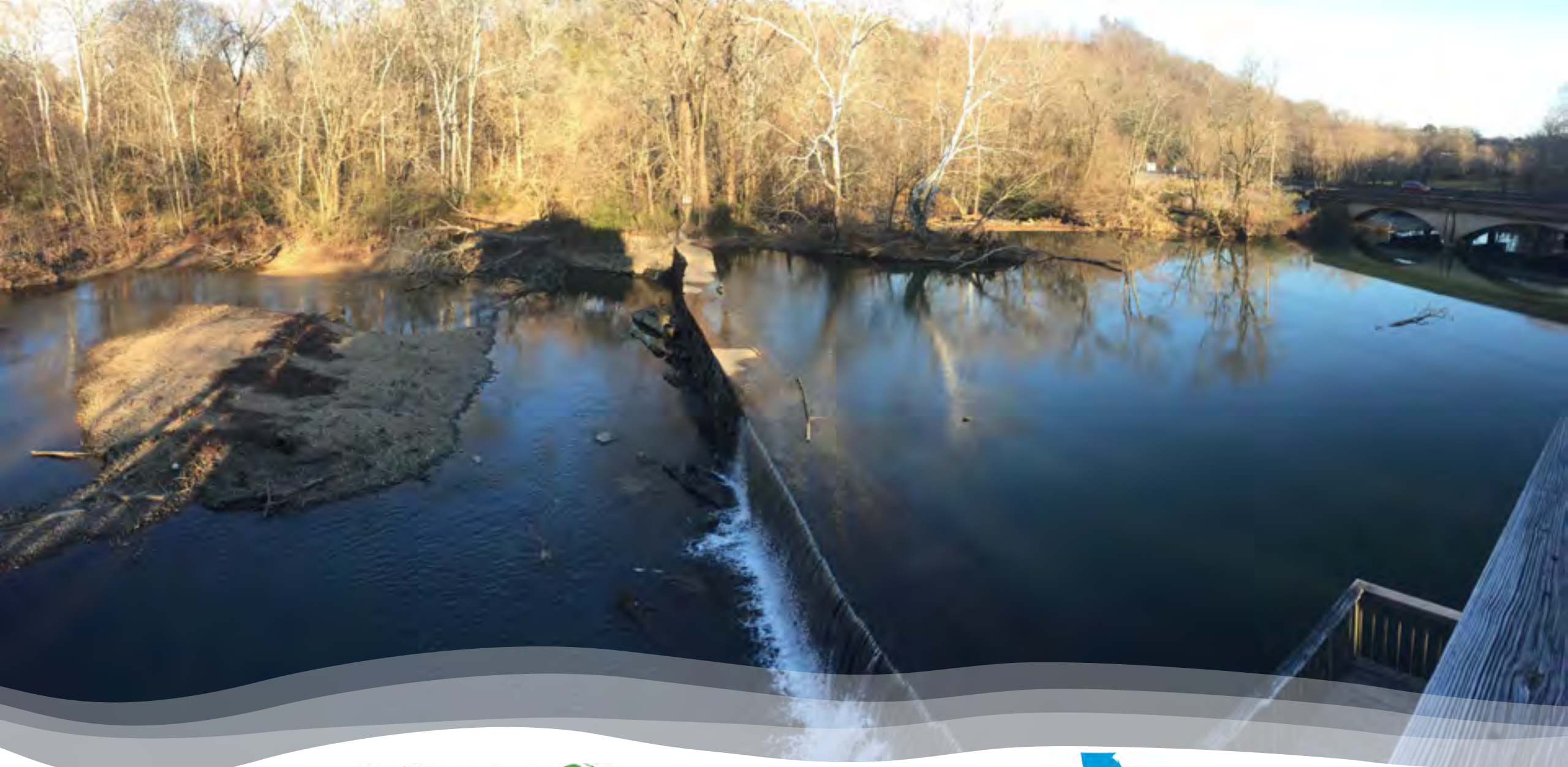
The Augusta Chronicle

City Ink: City joins SC suit over lock and dam

By Sylvia Cooper

Posted Dec 7, 2019 at 8:52 PM


After having shallow water splashed in its face by the Georgia Ports Authority and the U.S. Corps of Engineers, Augusta finally woke up and joined in the South Carolina lawsuit to stop the Corps from tearing down the lock and dam.



The Nature
Conservancy 
Protecting nature. Preserving life.

Sara Gottlieb
sgottlieb@tnc.org


Georgia
Aquatic Connectivity Team



Best Practices in Culvert Design For Aquatic Organism Passage

Nathaniel Gillespie
U.S. Forest Service
Biological & Physical Resources
Washington, DC Headquarters

WEMAYFLY.ORG

© FRESHWATERS ILLUSTRATED

What is a culvert?



Culverts can be all shapes and sizes



Most road-stream crossings use a hydraulic design



Culverts can change over time



Impacts to recreational economies and community resilience



WEMAYFLY.ORG

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USDA FOREST SERVICE

Caring for the land and serving people



Culverts can reduce biodiversity



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Aquatic barriers impact many other organisms

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Aquatic barriers can impact infrastructure



Aquatic barriers can impact climate resilience



Our Multiple Use Mission

- Provide a safe, reliable, transportation network for the public and communities
- Ecological habitat connectivity
- Access for multiple use, including increasing recreational demand
- Cost-effective infrastructure under changing climatic conditions



Credit:
Freshwaters Illustrated

Our Solution: Stream Simulation Design approach



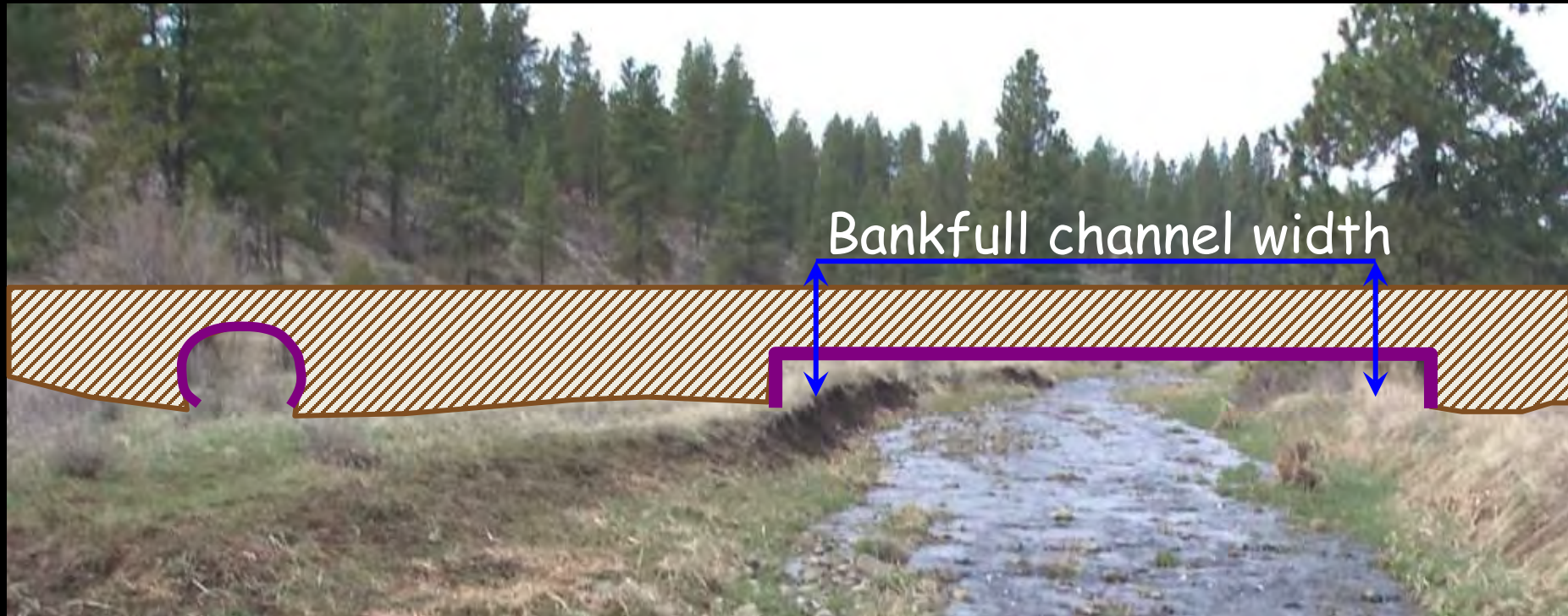
Traditional Design Method

Perspective View on a Road-Stream Crossing Site

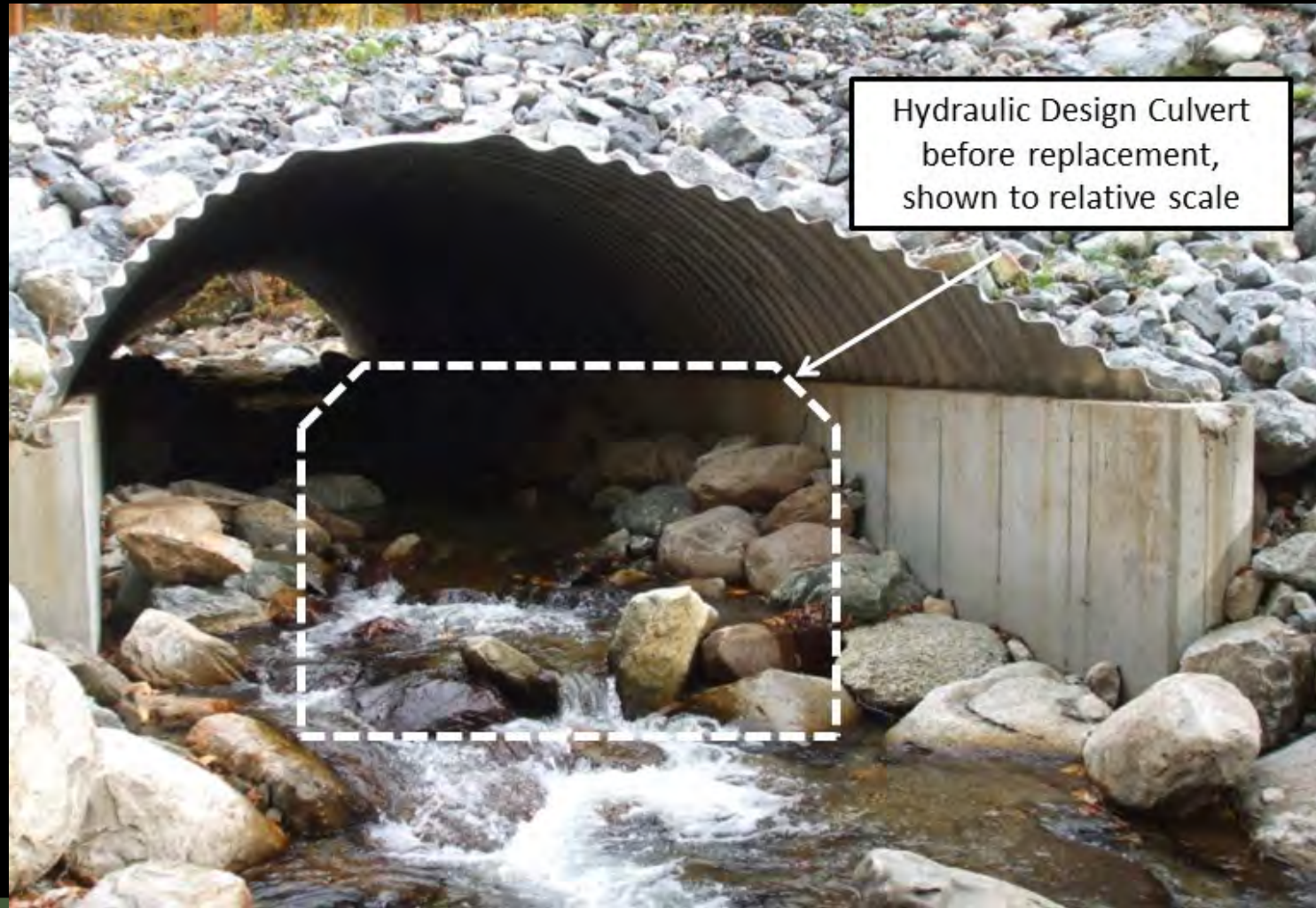


Stream Simulation Design Method

Perspective View on a Road Crossing Site



Aquatic Organism Passage at All Flow Levels



Stream Simulation Design Approach: Ecological, Transportation & Community Resilience



2012 Tropical Storm Irene
Green Mountain & Finger Lakes National Forest
Culvert Survival

Stream Simulation Design Components

- A minimum of bankfull width
- Accommodate 100-year flood recurrence interval with room for debris
- Natural stream bottom based on reference reach
- Location considers stream channel and valley geometry
- Life span 50-75 years



Siuslaw National Forest,
Oregon

Outcomes for Culvert Best Practices

- Ecological connectivity for all aquatic organisms
- Sustainable transportation infrastructure
- Safe, reliable access
- Climate change adaptation



Questions?



Integrating Fish Passage into U.S. Army Corps of Engineers' Mission Areas

Mindy Simmons

Senior Policy Advisor

Mindy.M.Simmons@usace.army.mil

Planning & Policy Division, HQUSACE

18 JUL 2022

Working Today to Build a Better Tomorrow



US Army Corps
of Engineers®





U.S. ARMY CORPS OF ENGINEERS CIVIL WORKS MISSIONS



370 + Million Visits Annually
Generate \$16B in Economic Activity



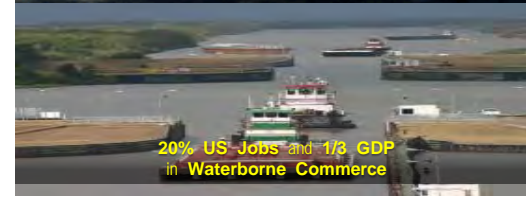
2003-2012, Prevented
\$361B in Total Damages



50% of Americans Live
w/in 50 Miles of Coast



404 Lakes / Rivers
in 43 States



20% US Jobs and 1/3 GDP
in Waterborne Commerce

Navigation - Inland and Coastal

USACE Operates 24,000 miles of Commercial Waterways; Generates \$18 B / 500,000 Jobs Annually;

Flood and Disaster Risk Reduction

USACE Prevents > \$9 in Flood Damages per \$1 Invested;
14,700 Miles Levee → 12,700 Miles = Local O&M;
700+ USACE Dams vs 87,000 National Inventory of Dams

Environment - Aquatic Ecosystem Restoration and Environmental Stewardship

Hydropower

USACE is the Nation's Largest Renewable Energy Producer
25% of US Hydropower, 3% of Total US Electricity

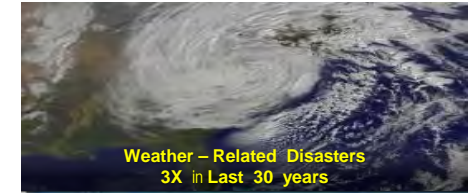
Water Supply - drinking water

USACE Produces 6.5 Billion Gallons per Day

Recreation - 12 M acres land/water managed
USACE is the No. 1 Federal Provider of Outdoor Recreation

Disaster Preparation/Response

Regulatory
permitting of non-Corps actions



Weather - Related Disasters
3X in Last 30 years



Move 98% US Imports and Exports @ \$2T / Year



Drinking Water for
96 Million People



25% US Hydropower and
3% Total US Electricity



AQUATIC ECOSYSTEM RESTORATION (AER) IS A PRIMARY USACE CIVIL WORKS MISSION



- The AER mission is to restore degraded ecosystem **structure, function, and/or dynamic processes** to a more natural condition
- The emphasis is on **restoration of nationally or regionally significant ecosystems** where the solution primarily **involves modifying the hydrology and/or geomorphology**
- Typically \$400-600M per year
- IIJA: +\$1.9B, half to multi-purpose projects



*Puget Sound Nearshore Restoration-
Duckabush Estuary, WA*



AQUATIC ECOSYSTEM RESTORATION THROUGHOUT THE NATION

Puget Sound

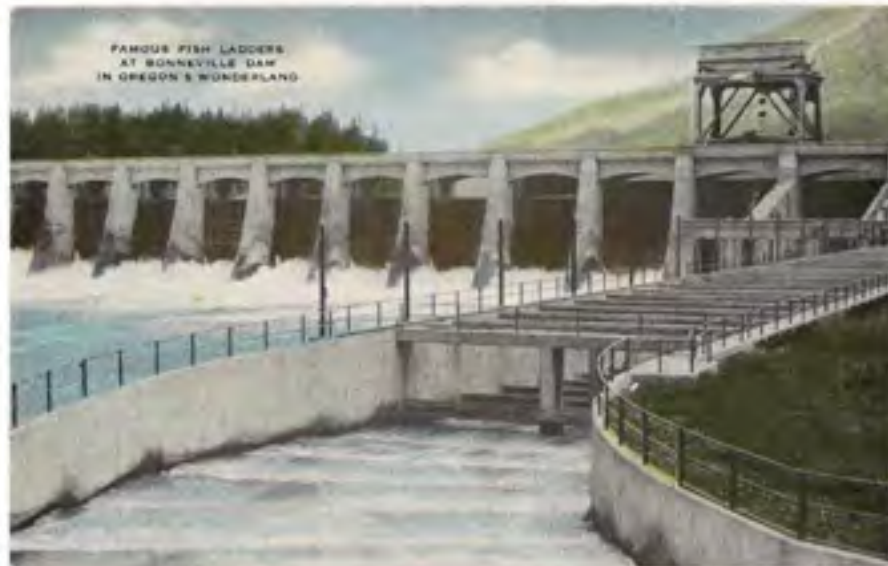
Columbia
River Basin



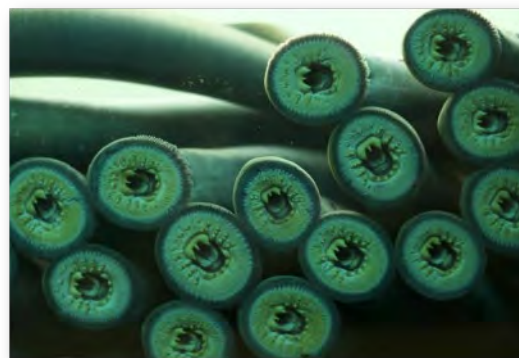
- USACE is not a granting agency
- Funding appropriated by project/program
- Projects require a non-Federal sponsor



COLUMBIA BASIN DAMS- FISH PASSAGE



Bonneville Dam Fish Ladder Artistic Rendering



Pacific Lamprey on viewing window



MEETING MULTIPLE MISSIONS AND FISH PASSAGE...A STORY FROM MY NATAL STREAM



The Willamette River, Oregon...Circa 1980



WILLAMETTE BASIN: MULTIPLE PURPOSES

- 13 Multi-purpose Dams & Reservoirs
 - 2 High-head Dams (93 – 452 ft)
 - Large Pool Fluctuations (100 – 170 ft)
 - 8 Hydropower (~500 MW Cap)
- Authorized Purposes
 - Flood risk management (Primary): ~\$900M in annual benefits on the low end
 - Hydropower: Produce ~\$25M in annual benefits
 - Irrigation
 - Fish and Wildlife
 - Recreation
 - Water Quality
 - Water Supply

Bonneville Power Administration; Bureau of Reclamation



US Army Corps
of Engineers
Portland District





WILLAMETTE BASIN SPECIES

- ESA-listed anadromous salmonids:
 - Chinook salmon
 - Coho salmon
 - Winter Steelhead
- ESA-listed resident fish
 - Bull trout
 - Oregon chub (de-listed!!)
- Pacific Lamprey
- Hatchery mitigation program
 - Salmon & steelhead
 - Resident Trout





MCKENZIE RIVER BASIN- COUGAR DAM



- Blocked access to salmon and bull trout spawning habitat (mostly on USFS land)
- Altered downstream temperature (affects migration and egg development)
- Altered downstream physical habitat



US Army Corps
of Engineers ©
Portland District

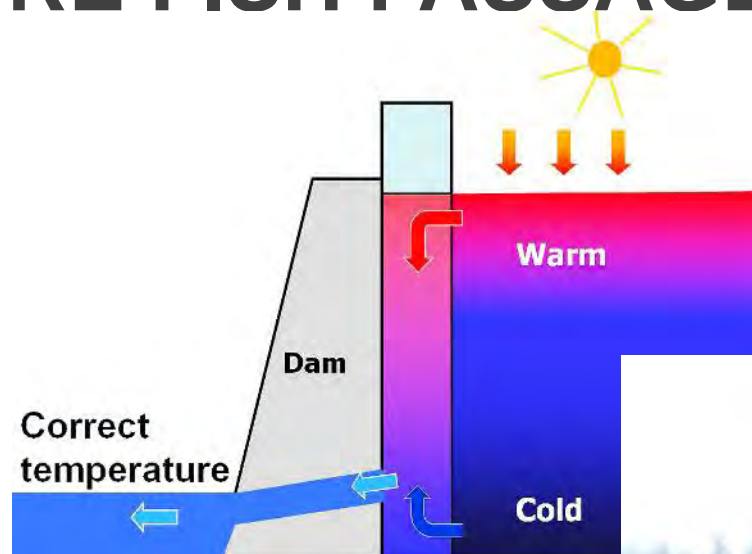




MCKENZIE RIVER BASIN: RESTORING TEMPS: FIRST STEP TO RESTORE FISH PASSAGE



- Temperature Control
 - Cold water from bottom of reservoir prevented upstream migration of adults
 - Needed ability to mix water from various elevations in the reservoir
 - Constructed selective withdrawal tower





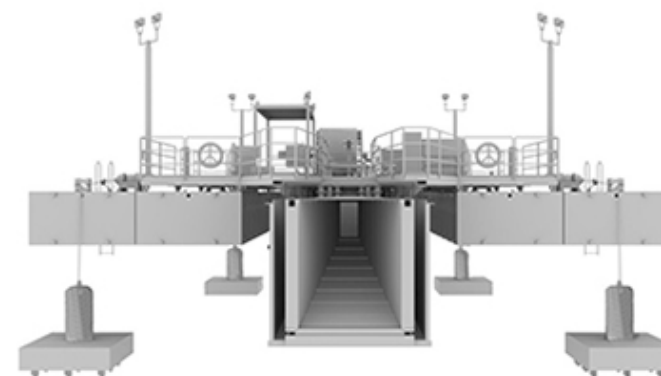
MCKENZIE RIVER BASIN: UPSTREAM AND DOWNSTREAM FISH PASSAGE



- Constructed adult fish collection facility
 - Adults collected and released into high-quality habitat upstream
 - Upstream habitat primarily on Forest Service land
 - Significant opportunities to partner (USFS, Oregon Dept of Fish and Wildlife)
- Downstream passage under design
 - Challenges with reservoir collection
 - Expensive and uncertain



Cougar Dam upstream fish Collection Facility



Portable Floating Fish Collector Design



WILLAMETTE BASIN: IMPROVING FLOWS DOWNSTREAM OF DAMS- FACILITATES FISH PASSAGE AND COMPLEMENTS OTHER RESTORATION EFFORTS



- Appropriate flows facilitate:
 - Fish migration to upstream collection facilities
 - Access to spawning habitat
 - Synergies with habitat enhancement projects completed by others (e.g. McKenzie River Trust)



Salmon Spawning in Finn Rock Reach



*Finn Rock Restoration Project
South Fork McKenzie River downstream of Cougar Dam
McKenzie River Trust*



SUSTAINABLE RIVERS PROGRAM



US Army Corps
of Engineers®

Mission: Improve the health and life of rivers by changing infrastructure operations to restore and protect ecosystems, **while maintaining or enhancing other project benefits**

Goal: Advance, implement, and incorporate environmental strategies at USACE water resources infrastructure

E-Strategies: *Management decisions that manipulate water and land-water interactions to achieve ecological or environmental goals...*

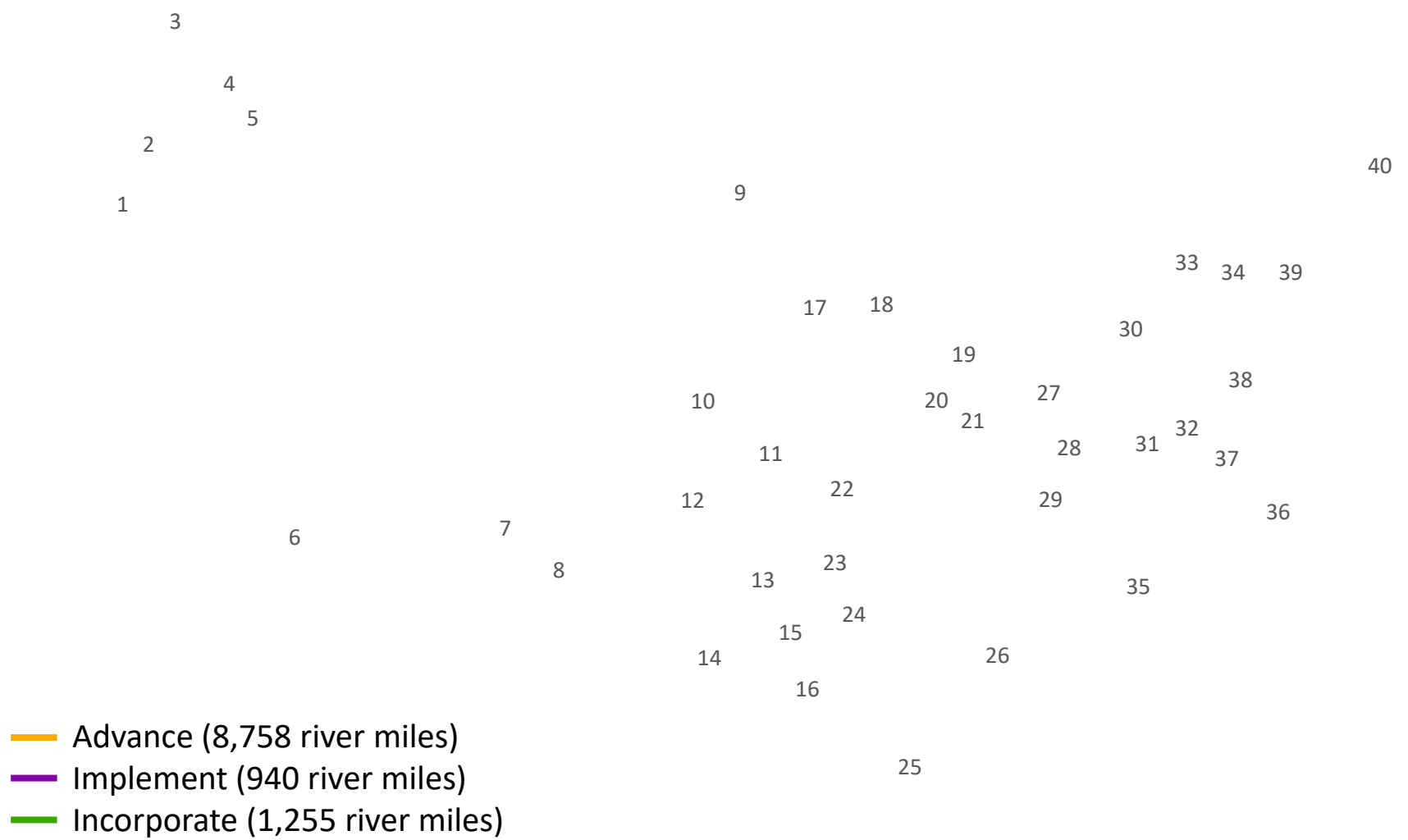
Opportunities for synergy with non-Corps fish passage and barrier removal projects downstream of Corps projects





SUSTAINABLE RIVERS PROGRAM

(Site Status - 2021)



1. Rogue River
2. Willamette River
3. Ballard Locks
4. Yakima River Delta (McNary)
5. Walla Walla River (Mill Creek)
6. Bill Williams River
7. Galisteo Creek
8. Pecos River
9. Bois de Sioux River
10. Kansas River
11. Osage River
12. Salt Fork Arkansas River
13. Kiamichi River
14. Brazos River
15. Big Cypress Bayou
16. Neches River
17. Des Moines River
18. Iowa River
19. Farm Creek
20. Mississippi River
21. Kaskaskia River
22. White/Black/Little Red Rivers
23. Fourche LaFave River
24. Cossatot River
25. Atchafalaya River
26. Alabama River
27. Ohio River
28. Green River
29. Barren River
30. Sugar Creek
31. Twelve Pole Creek
32. Kanawha River
33. French Creek
34. Upper Ohio River
35. Savannah River
36. Cape Fear River
37. Roanoke River
38. Potomac River
39. Lehigh River
40. Connecticut River

The SRP process for environmental work has three phases: “Advance, Implement, and Incorporate”



LOWER WILLAMETTE BASIN- OTHER USACE PARTNERSHIPS AND PROGRAMS FOR IMPROVING FISH PASSAGE

USACE “Continuing Authorities Program (CAP):

- Sec 206: Aquatic Ecosystem Restoration
- Sec 1135: Ecosystem Restoration associated with an existing Corps Project
- Smaller scale (<\$10M Federal)
- NOT grants, partnerships with non-Federal entities
- Received \$465M in IJA funding with \$115M “carved out” for in-stream barrier removal





LOWER WILLAMETTE SMALL-SCALE FISH PASSAGE (CAP 206) COMPLEMENTS LARGE-SCALE FISH PASSAGE IN UPPER BASIN



- Oaks Bottom CAP 206 Project
 - Restored valuable salmonid rearing habitat in urbanized lower Willamette
 - Partner: City of Portland
 - Complements other efforts, including other CAP projects, USFWS culvert replacement in Johnson Creek Watershed



Photo courtesy of U.S. Army Corps of Engineers, Portland District
Aerial view of construction at Oaks Bottom Wildlife Refuge – the largest remaining natural area in the lower Willamette River floodplain.

Oaks Bottom Habitat Restoration

In 2018, the City and the Corps completed the Oaks Bottom Habitat Restoration Project that improved the tidal connection between the Willamette River and the Oaks Bottom Wildlife Refuge. A new salmon-friendly culvert and channels give young salmon access to prime habitat in the wildlife refuge for the first time in over a century. The lower Willamette River is home to 15 threatened fish species, including salmon and trout, which need off-channel areas to find food and shelter during their journey to the Pacific Ocean. Nearly 75 acres of prime habitat is now accessible to these threatened species.



The project replaced an old pipe culvert, pictured here in the front of the new salmon-friendly box culvert.



IIJA RESTORATION PROJECT FUNDING: SIGNIFICANT INVESTMENTS AT HIGH-HEAD DAMS IN PUGET SOUND



Mud Mountain Dam Fish Passage - \$35M



U.S. Army Corps of Engineers

Howard Hanson Dam Downstream Fish Passage - \$220M

- Both projects will improve salmon survival in Puget Sound (also benefits killer whales/orcas)
- Provide drinking water and flood risk management for Seattle/Tacoma area



IIJA AND FY22 APPROPS FUNDING- CHESAPEAKE BAY AND GREAT LAKES



Anacostia Watershed Restoration-
\$30M

Chesapeake Bay Env Protection and
Enhancement- \$3.9M

- Link to Ches Bay Comprehensive Plan

Great Lakes Fisheries and Ecosystem
Restoration - \$2.8M

- Also funded by EPA's Great Lakes Restoration Initiative (GLRI)

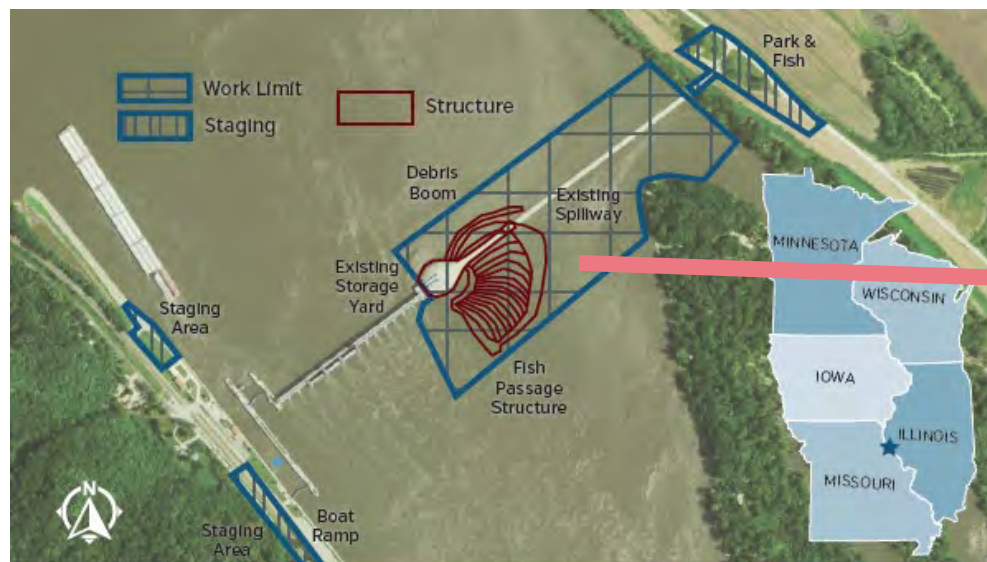




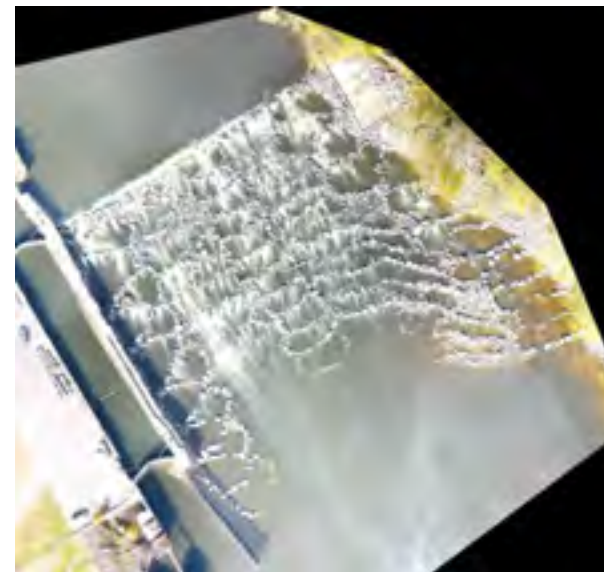
IIJA FUNDING: NAVIGATION-RELATED FISH PASSAGE



Navigation and Ecosystem Sustainability Program (NESP) - \$45M



Plans to construct fish passage at Lock and Dam 22, part of a multi-billion dollar plan to improve both navigation, fish passage, and aquatic habitat on the Upper Mississippi River



Similar to NOAA-constructed fish passage structure on Lock and Dam 1 on the Cape Fear River

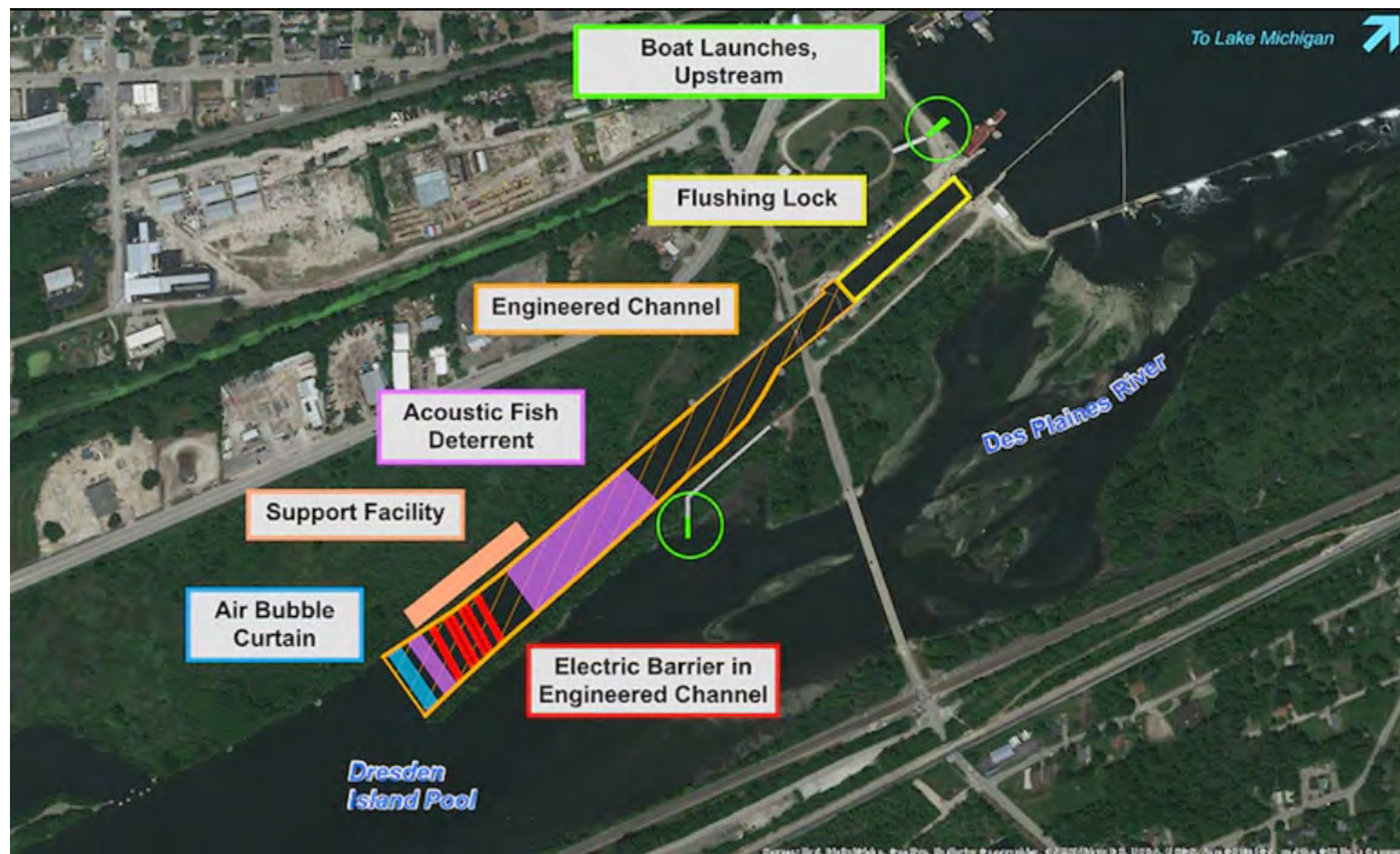


IIJA FUNDING: NAVIGATION-RELATED FISH “NOT-PASSAGE”



Brandon Road Lock and Dam- \$225M

-preventing the upstream migration of Invasive Carp into the Great Lakes system





RESOURCES: CIVIL WORKS INFRASTRUCTURE FINANCING PROGRAM (CWIFP)



What:

-USACE's Federal loan program for non-Federal dam safety projects (similar to EPA's WIFIA)

Current Status:

– USACE anticipates accepting loan applications in Spring 2023 after the program rules are finalized

Eligible Projects:

– Safety project(s) to maintain, upgrade and repair a dam(s) identified in the National Inventory of Dams owned by non-federal entities

Projects must:

- Reduce flood damage,
- Restore aquatic ecosystems, or
- Improve navigation



Corps Water
Infrastructure
Financing Program

<https://www.usace.army.mil/Missions/Civil-Works/Infrastructure/revolutionize/CWIFP/>



RESOURCES: SEC 22 PLANNING ASSISTANCE TO STATES



Cost-shared (50/50) Technical Assistance and Watershed Planning Authority

Who can apply:

- A state; Group of states; Non-federal public bodies;
- Federally-recognized Indian Tribes and specified territories (cost-share waiver- Up to \$484,000, the subject to 50%/50% cost share)
- Not for profits
 - The not for profit entity must provide a letter from the affected local government consenting to the provision of such Section 22 assistance to the nonprofit entity

Sharon Sartor

Planning Assistance to States Program Manager

Sharon.M.Sartor@usace.army.mil



ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER (ERDC): EXPERTISE IN FISH PASSAGE AND BARRIER REMOVAL



<https://ewn.erdcdren.mil/>



<https://emrrp.el.erdcdren.mil/>

Dam removal: sediment mgmt., prioritization, biogeochemical cycling, costs of dam removal, etc.
Many partners, see one-pagers

Dr. Kyle McKay: kyle.mckay@usace.army.mil



ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER (ERDC): EXPERTISE IN FISH PASSAGE AND BARRIER REMOVAL



Fish Passage research from high-head dams, lock passage, electric barriers

Fish Passage/Ecohydraulics lead:

Dr. David Smith

David.L.Smith@usace.army.mil

See additional one-pagers



Physical model of The Dalles Spillway



DISCOVER | DEVELOP | DELIVER



TAKE-AWAYS:



- While not a granting agency, USACE has numerous authorities under which we partner with others to improve fish passage at many scales/applications while still providing other benefits to the public in our other mission areas
- USACE has numerous resources to support others:
 - Sustainable Rivers Program (providing e-flows)
 - Technical support to others via Planning Assistance to States
 - Federal loan program for non-Federal dam safety projects
 - Fish passage and barrier removal expertise via Engineer Research and Development Center



PARTNER WORKSHOP

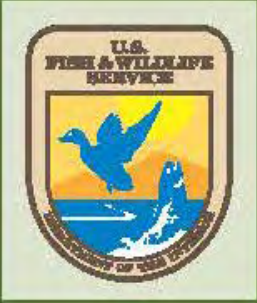
Fish Passage Opportunities through the Bipartisan Infrastructure Law

**National Conservation Training Center
Shepherdstown, WV**

JULY 18-20, 2022



Federal Agency Quick Briefings



PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022



Federal Highway Administration

National Culvert Removal, Replacement, & Restoration Grant Program *Federal Agency Roundup*



U.S. Department of Transportation
Federal Highway Administration

Joe Krolak
Monday, July 18

National Conservation and Training Center
Shepherdstown, WV

PURPOSE & ACTIVITIES

- National Culvert Removal, Replacement, and Restoration Grant Program
 - BIL Section 21203, Title 49 U.S.C § 6703
- Key Areas and Project Types:
 - Grants for the replacement, removal, and repair of culverts or weirs:
 - That would meaningfully improve or restore fish passage for **anadromous** fish; and
 - With respect to weirs, may include infrastructure to facilitate **anadromous fish passage** around or over the weir and weir improvements.
 - Technical assistance to **Indian Tribes** and **underserved communities** to assist in the project design and grant process and procedures.



FUNDING

	Program Funding (BIL § 21203)				
Fiscal Year	2022	2023	2024	2025	2026
Authorized BIL § 21203 [49 USC 6703(i)]	\$800M	\$800M	\$800M	\$800M	\$800M
Appropriated (Division J)	\$200M	\$200M	\$200M	\$200M	\$200M

*Up to 2% of FY22 available funds can be used for administrative expenses

IMPLEMENTATION & CONSULTATION

NOAA and USFWS Consultation

- Develop a process to provide technical assistance to **tribes** and **underserved communities** to assist in the project design and grant process and procedures
- Establish a process for determining criteria for awarding grants
- Establish procedure to prioritize awarding grants



IMPLEMENTATION & CONSULTATION

Prioritization



- Projects that would improve fish passage for anadromous fish that are:
 - Listed as Threatened and Endangered (T&E)
 - Could reasonably become listed as T&E
 - Identified as prey for endangered species, threatened species, or protected species, including Southern resident orcas (*Orcinus orcas*)
 - Identified as climate resilient stocks
- Projects that would open up more than 200 meters of upstream anadromous fish habitat before the end of the natural habitat.
- Other priorities identified during development

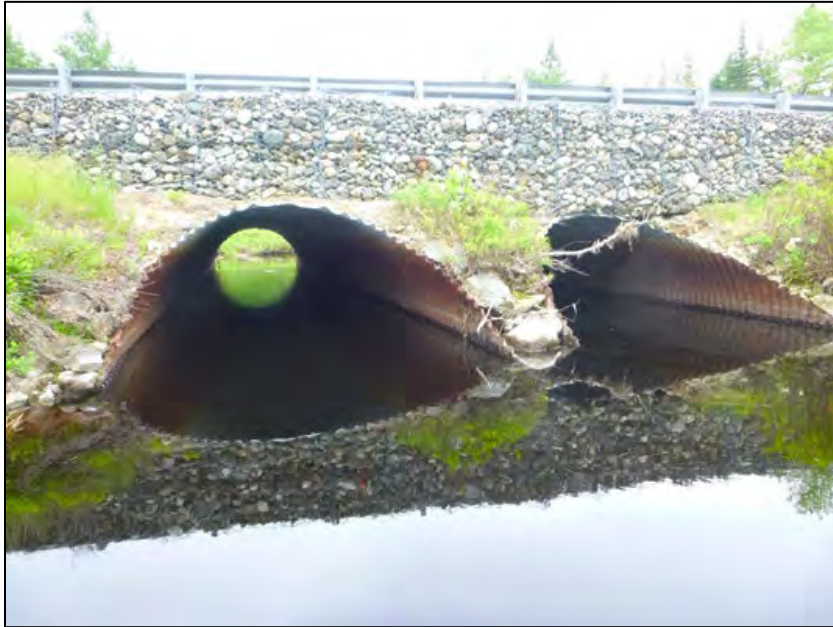
IMPLEMENTATION & CONSULTATION

Other Elements

- Alignment with Administration Policy Criteria
 - Climate Change and resilience
 - Aquatic and Terrestrial passage
 - Equity and Environmental Justice
 - Safety
- Relation to other BIL-related Programs
 - USDOT programs
 - Other Federal AOP programs



TAKEAWAYS



Contact: CulvertAOP@dot.gov

Federal Emergency Management Agency



Fish Passage Opportunities through
the Bipartisan Infrastructure Law
Federal Agency Roundup



FEMA

James Demby
Monday, July 18
National Conservation and Training Center
Shepherdstown, WV

PURPOSE AND ACTIVITIES

National Dam Safety Program

- A partnership of states, federal agencies and other stakeholders to encourage and promote the establishment and maintenance of effective federal and state dam safety programs to reduce the risk to human life, property, and the environment from dam related hazards.
- **FEMA's Role**
 - FEMA works with its federal, state, territorial and private sector partners to develop technologies to help provide for improved dam safety. FEMA also works with the National Dam Safety Review Board (NDSRB), which the Association of State Floodplain Managers (ASFPM) is a member of, and the Interagency Committee on Dam Safety (ICODS) to achieve this.
- **National Dam Safety Review Board**
 - Advises FEMA Administrator in priorities
 - Considers implications of national policy issues
 - Oversees and monitors performance of state dam safety programs
- **Interagency Committee on Dam Safety**
 - Encourages establishment/maintenance of effective federal programs, policies and guidelines
 - Serves as the forum for the coordination of federal activities

FUNDING AND PROHIBITIONS

Dam Safety and Removal program under the Infrastructure Investment and Jobs Act (IIJA): \$800 Million

- \$67.0 Million to Non-Grant O&S available for five years
- \$733.0 Million to Federal Assistance (FA) available until expended
 - Up to 3% for Salaries and Expenses
 - \$148.0 Million is for grants to States pursuant to section 8(e) of the National Dam Safety Act
 - \$585.0 Million is for grants to States pursuant to section 8A of the National Dam Safety Act; of which
 - \$75.0 Million (of the \$585M) is for the removal of dams
- FY22 DHS Appropriations
 - \$9.7 Million one-year NDSP appropriation to O&S
 - \$12 Million one-year HHPD appropriation to FA

IMPLEMENTATION AND COORDINATION

Rehabilitation of High Hazard Potential Dams (HHPD) Grants Program Overview

FEMA's HHPD grants are annual formula grants for the repair, removal or rehabilitation of eligible high hazard potential dams.



Eligible Applicants can be states or territories with an enacted dam safety program. Currently, this includes 49 States and Puerto Rico. **Subapplicants** can be non-federal governments and Non-Profit Organizations.



Eligible Rehabilitation Projects include technical, planning, design, and construction activities toward the Repair, Removal, or Structural or Nonstructural rehabilitation of eligible high hazard potential dams.



A FEMA-approved **Hazard Mitigation Plan** that addresses all dam risks is required for the state and for the local or tribal jurisdiction in which the dam is located.



Eligible Dams include non-federal high hazard potential dams that fail to meet minimum dam safety standards, pose unacceptable risk to life and property, and have an Emergency Action Plan (EAP).

National Oceanic and Atmospheric Administration



Fish Passage Opportunities Through the Bipartisan Infrastructure Law *Federal Agency Roundup*

Janine Harris, NOAA Fisheries

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV

PURPOSE AND ACTIVITIES - NOAA's Fish Passage /Tribal Fish Passage

Fish Passage (NOAA's Restoring Fish Passage Through Barrier Removal)

- Objectives: support fish passage for native migratory and sea-run fish in coastal ecosystems, including the Great Lakes.
- Key Project Types: Primary activities will be projects and technical assistance through cooperative agreements. Specifically, dam, culvert and fish passage barrier removal, including project development and feasibility studies; engineering, design and permitting; implementation monitoring; stakeholder engagement, education and outreach; and building capacity of new and existing restoration partners.

Tribal Fish Passage (Restoring Tribal Priority Fish Passage Through Barrier Removal)

- Objectives: provide federal financial and technical assistance to Indian tribes and tribal commissions or consortia to remove barriers to fish passage
- Key Project Types: Primary activities will be projects and technical assistance through cooperative agreements. Specifically, building tribal organization capacity; culvert and fish passage barrier removal, including project development and feasibility studies; engineering, design and permitting; implementation monitoring; and stakeholder engagement, education and outreach.

FUNDING AND PROHIBITIONS

NOAA's Fish Passage / Tribal Fish Passage

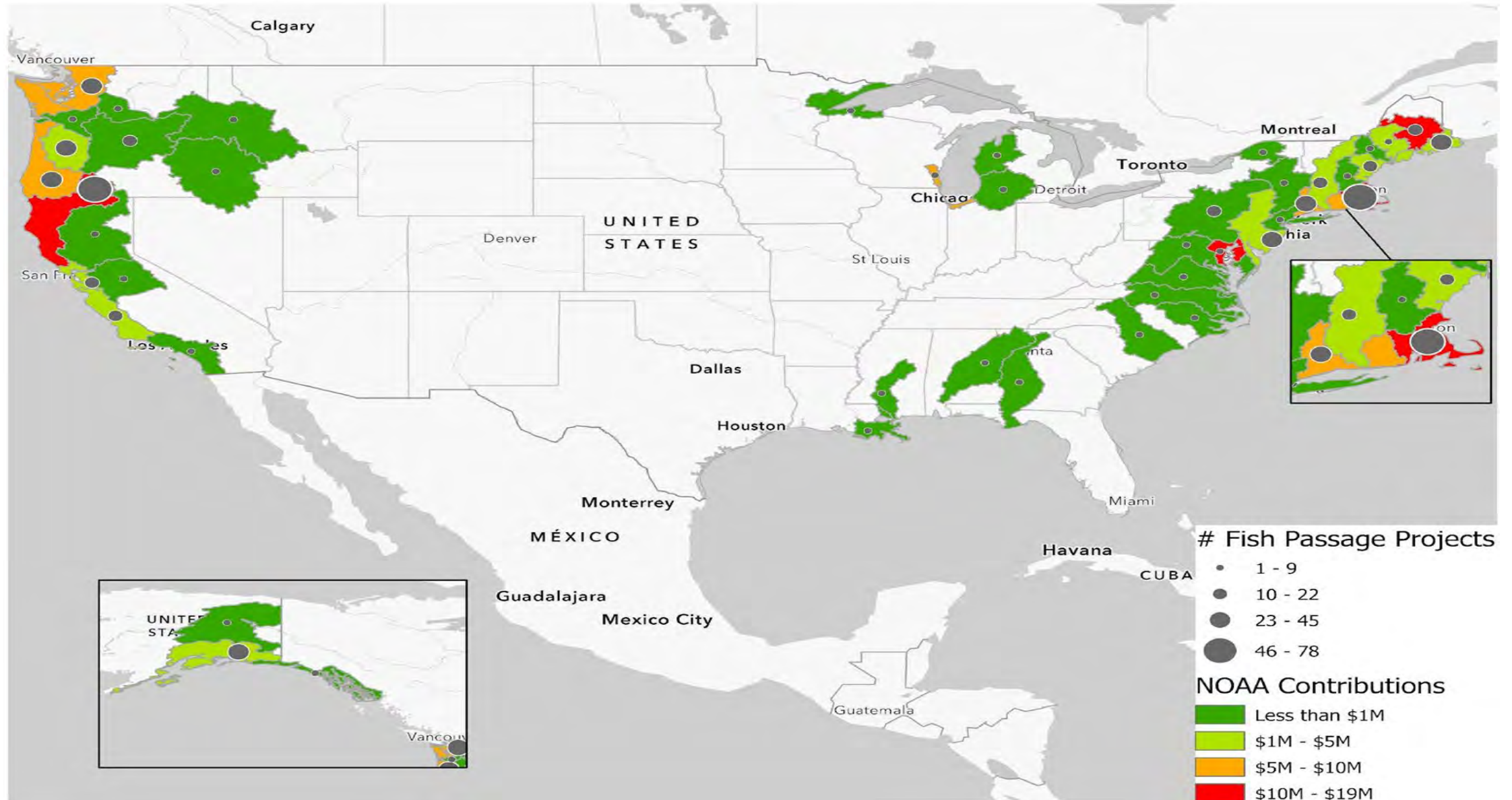
- Bipartisan Infrastructure Law Funding:
 - \$400 million over 5 years for restoring fish passage by removing in-stream barriers ; Up to 15 percent reserved for Indian tribes

FY22 Competition	Competition Number	Funding Levels	Range of Funding	Deadline	Contact
Fish Passage	NOAA-NMFS-HCPO-2022-2007209	up to \$65M	\$1M to \$15M over the award period	August 15	fish.passage.grants@noaa.gov
Tribal Fish Passage	NOAA-NMFS-HCPO-2022-2007193	up to \$12M	\$300K to \$5M over the award period	August 29	infrastructure.tribal@noaa.gov

- Prohibitions

- No match requirements (*Note: cost share is included in the Fish Passage evaluation criteria*)
- Current ineligible project types include activities required by a local, state, or federal consent decree, court order, license condition, statute, or regulation; and effectiveness monitoring and research.

Community-based Restoration Program Fish Passage Funding Allocation (1997-present)



PURPOSE AND ACTIVITIES - NOAA's Pacific Coastal Salmon Recovery Fund (PCSRF)

PCSRF Objective and Key Project Types

- Objective: Supplement State and Tribal programs for Pacific salmon and steelhead recovery and conservation.
- Key Project Types: Habitat restoration and acquisition; restoration planning & assessments; research, monitoring, and evaluation; hatcheries and harvest management; public outreach, education, and landowner recruitment
- FY 22 Funding Opportunity: NOAA-NMFS-WCRO-2022-2007156 (closed March 21, 2022 contact: jennie.franks@noaa.gov)

FUNDING AND PROHIBITIONS

NOAA Pacific Coastal Salmon Recovery Fund (PCSRF)

- Bipartisan Infrastructure Law Funding:
 - \$172 million over 5 years to supplement the PCSRF program
- Appropriated Funding - Consolidated Appropriations Act, 2022
 - \$65 million
- Prohibitions in FY22 Funding Opportunity
 - 33% cost share requirement (States Only)
 - 10% Monitoring Requirement (States and Tribal Commissions/Consortia Only)
 - 3% Maximum for direct administrative expenses (States and Tribal Commissions/Consortia Only)
 - No prohibitions for individual tribe applicants

PCSRF Program Funding Allocation (2000-present)

Since 2000, PCSRF has:

**Awarded
\$73.0 million
(average/year)**



**Protected,
restored, and
created 1,168,765
acres of salmon
habitat**

**Received
\$1.6 billion in
appropriations**



**Assisted
partners to
leverage resources to
implement 15,060 projects**

**Leveraged \$1.8
billion non-PCSRF
contributions**

**Made 11,694 stream
miles accessible**



[PCSRF Web Map](#)

IMPLEMENTATION AND COORDINATION

- Implementation is through existing programs
 - Fish Passage and Fish Passage Tribal through the Community-based Restoration Program (CRP)
 - Pacific Coastal Salmon Recovery Fund is an existing program
- Coordination with Other Parts of NOAA
 - Coordinated with Restoration and Resilience Funding (<https://www.fisheries.noaa.gov/feature-story/two-habitat-restoration-and-coastal-resilience-funding-opportunities-open-under>)
 - Coordinated Tribal Engagement (<https://www.noaa.gov/sites/default/files/2022-05/IIJATribalProvisionsNOAAExecutiveSummaryandResponse.pdf>)
- Coordination with other Federal Agencies
 - *NEW* Anadromous Salmonid Fish Passage Guidance
<https://www.fisheries.noaa.gov/resource/document/anadromous-salmonid-passage-facility-design>
 - Programmatic environmental compliance (e.g. MSA, ESA, NEPA)
 - Regional coordination (e.g. Klamath Basin Infrastructure Funding)
 - Bureau of Indian Affairs (BIA) Communications
- Coordination with external entities
 - Communicating funding opportunities to prospective applicants across networks

FEEDBACK

What are you most enthusiastic about regarding these efforts.....

- The ability we have as federal agencies to work closer together and strategically to support our restoration partners in implementing major strides for fish recovery.
- The resources and collaboration opportunities to implement fish passage restoration at a more impactful scale.



U.S. Army Corps of Engineers

Fish Passage Opportunities Through
the Bipartisan Infrastructure Law
Federal Agency Roundup

Amy Babey

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV

PURPOSE AND ACTIVITIES

- AER mission: restore degraded ecosystem structure, function, and/or dynamic processes to a more natural condition
- Emphasis is on restoration of nationally or regionally significant ecosystems where the solution primarily involves modifying the hydrology and/or geomorphology
- IJA funding
 - Restore fish and wildlife passage by removing in-stream barriers
 - Feasibility and/or design & implementation/construction
 - Provide technical assistance to non-Federal interests carrying out such activities
 - Projects must have an identified non-Federal partner

FUNDING AND PROHIBITIONS

- \$115M of non-expiring funds (IIJA/BIL only) – periodic allocation of funds to projects
- 100% Federal funding * - not a grant
- No per-project cost limit nor annual program limit
- Does not provide authority to remove, breach, or otherwise alter operations of a Federal hydropower dam
- Implementation policy (not Law)
 - Must involve man-made obstructions that affect the natural flow of the channel
 - Barriers to be considered: low-head dams, culverts, low-water crossings, road/rail crossings, pipes, and weirs
 - Must be a physical barrier and not a life-stage barrier
 - Must not be naturally occurring such as debris, sediment, boulders, trees
 - Must meet requirements of CAP Section 206

IMPLEMENTATION AND COORDINATION

- Use of existing CAP Section 206 program to implement specific project purpose (in-stream barrier removal)
- No additional Congressional authorization needed for study or design/implementation phase
- While 100% Federally funded, non-federal partner must
 - Submit letter of intent (LOI)
 - Sign cost share agreements for study and design/implementation
 - Acquire/purchase Lands, Easements, Rights of way, Relocations, and Disposal areas (LERRDS)
 - Address any HTRW issues
 - Fund Operations and Maintenance of the project
- External entities will have opportunity to participate in project scoping and review of recommended plans

IMPLEMENTATION AND COORDINATION

Green River, KY L&D 6 – Post Removal, 2017



Green River, KY L&D 5 – Mid Removal, 2021

FEEDBACK

IJA Instream barrier removal carve out provided relatively broad authority allows for USACE to complement other barrier removal programs and leverage other investments

Seek synergies with other restoration programs and other USACE programs

- Planning Assistance to States*
- Civil Works Infrastructure Financing Program (CWIFP, similar to WIFIA) for non-federal dam safety projects*

<https://www.usace.army.mil/Missions/Civil-Works/Infrastructure/revolutionize/CWIFP/>

Greater regional ecological “lift” than what could be accomplished with USACE program alone



U.S. Fish and Wildlife Service

Fish Passage Opportunities Through the Bipartisan Infrastructure Law *Federal Agency Roundup*

Mike Bailey

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV

PURPOSE AND ACTIVITIES

The **National Fish Passage Program** (NFPP) works with local communities on a voluntary basis to restore rivers and conserve our nation's aquatic resources by removing or bypassing in-stream barriers.

NFPP provides technical and financial assistance as well as coordination and on-the-ground support to complete aquatic ecosystem restoration.

Eligible Projects – Eligible projects include those that eliminate a barrier so that fish and other aquatic species have better access to historic habitats. Barriers include but are not limited to dams, culverts, inefficient fishways, water diversions, ineffective screens, and inadequate flows.

FUNDING AND PROHIBITIONS

Bipartisan Infrastructure Law NFPP

The Bipartisan Infrastructure Law (BIL) provided \$200 million over 5 years to the NFPP. In FY 2022, FWS distributed \$38 million to 40 NFPP BIL projects across 23 states and Puerto Rico.

Prohibitions

The BIL does not provide NFPP any new authority to remove, breach, or otherwise alter the operations of a Federal hydropower dam and dam removal projects under BIL must include written consent of the dam owner if ownership is established.

IMPLEMENTATION AND COORDINATION

- Are you implementing through an existing program or effort? Are you standing up something new?
 - NFPP is an existing program.
- Are you coordinating with/plan to coordinate with other parts of your agency to implement or otherwise improve fish passage?
 - Yes, NFPP has historically and continues to coordinate across FWS programs to implement fish passage projects. With BIL funds, NFPP intends to further improve coordination and cross-programmatic implementation to improve fish passage, public safety, infrastructure and climate resiliency on and off FWS lands.
- Are you coordinating with/plan to coordinate with external entities (e.g., other federal agencies, non-profits, private sector, etc.) to implement or improve fish passage?
 - Yes. NFPP relies on a vast network of partners including other federal and state agencies, non-profits, etc. FWS intends to engage with new partners while continuing to coordinate with existing partners to strategically implement NFPP projects across the landscape.

FEEDBACK

What are you most enthusiastic about regarding this effort.....



U.S. Environmental Protection Agency

Fish Passage Opportunities Through
the Bipartisan Infrastructure Law
Federal Agency Roundup

Richard Mitchell

Monday, July 18
National Conservation and Training Center
Shepherdstown, WV

PURPOSE AND ACTIVITIES

Main Purpose: Water quality and Clean Water Act Implementation which can include support for living resources.

Key Activities: Grants to State and other partnership programs. Technical Assistance. Forums for coordination at watershed levels.

- **Place-based programs**
 - 12 Geographic Programs (Great Lakes, Chesapeake Bay, Puget Sound, etc.)
 - 28 National Estuary Programs
- **Support to States and Tribes**
 - Nonpoint source programs
 - State Revolving Funds (SRFs)
- **Data, tools and monitoring**
 - National Aquatic Resource Surveys - Lakes and Streams Assessments
 - Healthy Watersheds Assessment
 - Recovery Potential Screening Tool

FUNDING AND PROHIBITIONS

- EPA received no **new** authorities under BIL for fish passage
- Existing programs/authorities have flexibilities to support fish passage (antidegradation, temperature, nonpoint source, etc.)
- IJA funds:
 - National Estuary Programs - \$132 million
 - Geographic Programs - \$1.7 billion
 - State Revolving Funds - \$48 billion
- Nonpoint source CWA Section 319 grants (no new IJA funds) - ~\$180 million/yr.

IMPLEMENTATION AND COORDINATION

- EPA works on fish passage through existing programs
 - NPS CWA 319 grants: 47 dam removal/fish passage projects since 2012 (\$7.8M/\$19M Total)
- Many existing EPA partnerships are already working on fish passage
 - NEP partnerships: 365 fish passage projects since 2006 (\$2.7M/\$885M Total)
 - Geographic Programs are typically partnerships with states, feds, and others
- Partnerships are key and collaboration is happening in many watersheds – thanks to our federal partners!

FEEDBACK

EPA sees this as an opportunity to coordinate through existing programs to accelerate the recovery and protection of waterways and watersheds through fish passage projects.



National Fish and Wildlife Foundation

Fish Passage Opportunities Through
the Bipartisan Infrastructure Law
Federal Agency (and friends) Roundup*

Amanda Bassow

Monday, July 18

National Conservation and Training Center
Shepherdstown, WV



**NFWF is a 501(c)3 nonprofit, created by Congress to pool and leverage Federal funds*

About the National Fish and Wildlife Foundation

Who We Are

- Chartered by Congress in 1984
- Independent 501(c)(3) organization
- 30-member Board appointed by Secretary of the Interior
 - Includes FWS Director and NOAA Administrator

What We Do

- Sustain, restore and enhance wildlife
- Bring collaboration among federal agencies and private sector

How We Do It

- Leverage public funding with private money – average 3:1



NFWF does

- Fund implementation – we fund projects

NFWF does not

- Fund or engage in advocacy, lobbying or litigation

PURPOSE AND ACTIVITIES

IIJA Funding for AOP Available through NFWF					
		America the Beautiful Challenge	National Coastal Resilience Fund	Chesapeake SWG and WILD	Delaware Watershed Conservation Fund
2022 Timeline	RFP Issued	early May	March	early Feb	early Feb
	Pre-Proposals Due		21-Apr		
	Full Proposals Due	21-Jul	30-Jun	mid April	1-Apr
	Awards Announced	Tentative - Nov	November	August	August
Where		Nationwide, Tribal Lands and U.S. Territories	Coastal HUC 8's nationwide	Chesapeake Bay watershed	Delaware River watershed
What		at-risk species; habitat connectivity, corridors, migrations; ecosystem services; resilience; public access; community engagement	nature-based coastal resilience projects that reduce exposure for communities and enhance habitat for fish and wildlife	water quality improvement, restoration of key Chesapeake Bay species and their habitats, community engagement	habitat restoration and protection, public access, water quality improvement, community engagement
Website		nfwf.org/programs/america-beautiful-challenge	nfwf.org/programs/national-coastal-resilience-fund	nfwf.org/chesapeake	nfwf.org/delaware
Funders		DOI, USDA, DOD, Native Americans in Philanthropy	NOAA, DOD, Occidental, Shell, TransRe	EPA, USFWS, USFS, NRCS, Altria	USFWS, William Penn Foundation, AstraZeneca
NFWF Contact		rachel.dawson@nfwf.org	jessica.grannis@nfwf.org	jake.reilly@nfwf.org	stephanie.heidbreder@nfwf.org

FUNDING AND PROHIBITIONS

IIJA Funding for AOP Available through NFWF				
	America the Beautiful Challenge	National Coastal Resilience Fund	Chesapeake SWG and WILD	Delaware Watershed Conservation Fund
Grant Size	\$200k - \$5 million	\$100k - \$10 million+	\$50k - \$500k	\$75k - \$1.5 million
Funds Available in 2021	n/a	\$40 million	\$10.3 million	\$11.5 million
Funds Available in 2022	est. \$85 million	est. \$140 million	\$38.5 million	\$16 million
Funded Activities	planning, collaboration, design, implementation	planning, design, implementation	capacity building, planning, design, implementation	capacity building, planning, design, implementation
Funding Nuance	eligibility primarily (but not exclusively) restricted to state agencies, tribes and U.S. territories; projects support implementation of a landscape conservation plan	must have resilience benefit to communities (esp., flood risk reduction)	consistent with Chesapeake Bay Watershed Agreement; esp. to benefit eastern brook trout, river herring and other at-risk or listed species in SWAPs	consistent with Delaware River Basin Restoration Partnership and Program Framework
Matching Requirements	Variable, ranging from zero to 50%	encouraged but not required	encouraged but not required in 2022	20% for capacity building, 50% for implementation
NFWF Contact	rachel.dawson@nfwf.org	jessica.grannis@nfwf.org	jake.reilly@nfwf.org	stephanie.heidbreder@nfwf.org

Note: Many other NFWF grant programs support AOP, but have not received IIJA funds this year (e.g., Sustain our Great Lakes, Long Island Sound Futures Fund, New England Forests and Rivers, Central Appalachia, Cumberland Plateau)

IMPLEMENTATION AND COORDINATION

- America the Beautiful Challenge is a new program launched with IJA funding pooled from range of sources
- National Coastal Resilience, Chesapeake Bay and Delaware River are longstanding programs administered by NFWF with new, dedicated IJA funding appropriated
- Funds are competitively awarded to a range of applicants including Federal, tribal, territorial, state and local governments, nonprofits, academics, etc.
- NFWF engages our Federal agency funding partners in grant reviews, as well as other stakeholders and third party technical experts
- NFWF encourages applicants to use decision support tools and resources developed through Federal-state collaboratives (e.g., EBTJV, NAACC)
- We are interested in more direct coordination esp. re: training/capacity building for design, prioritization for multi-species benefit, technical reviews of designs, species response monitoring

FEEDBACK – Most Enthusiastic About

Tremendous opportunities throughout the mid-Atlantic and northeast to dramatically scale up AOP work with benefits for species, ecosystems and communities

Getting designs “right” with the wave of new funding

Growing capacity to design AOP especially in the face of changing precipitation patterns

Bureau of Land Management



Fish Passage Opportunities Through
the Bipartisan Infrastructure Law
Federal Agency Roundup

Sharmila Premdas

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV

PURPOSE AND ACTIVITIES

IIJA funding for Ecosystem Restoration (Sec. 40804)

Focus of the DOI Ecosystem Restoration Working Group

- Build climate adaptation and resilience for ecosystems and communities
- Restore or improve core habitat and connectivity
- Build and leverage partnerships for restoration at scale

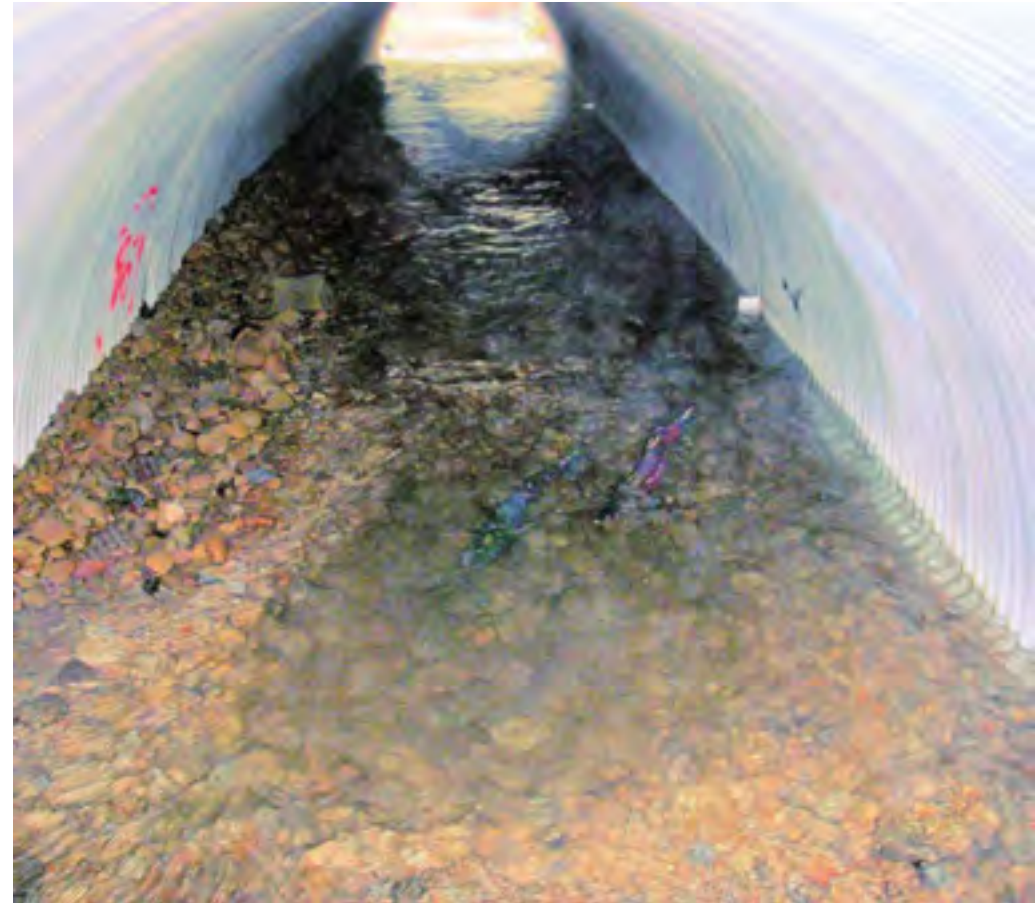
Activities relevant to fish passage structures

- Activity 1a: Contracts to Restore Ecological Health
- Activity 2: Good Neighbor Authority
- Activity 10: USDA Collaborative Aquatic Landscape Restoration



FUNDING AND PROHIBITIONS

- Activity 1a: Contracts to Restore Ecological Health
 - Federal Lands, and Tribal Forests and Rangelands
 - No funding was received in FY 2022
 - Funding has been moved out to FY 2023, we expect ~\$4.7M
- Activity 2: Good Neighbor Authority
 - Federal Lands
 - Received \$4,770,645 in FY 2022
 - \$1,374,645 funded fish passage projects in FY 2022
- Activity 10: USDA Aquatic Restoration
 - Federal Lands, and Tribal Forests and Rangelands
 - No funds have been received by BLM in FY 2022



IMPLEMENTATION AND COORDINATION

Primary methods of procurement for inventories and fish passage structure replacements

- Contracts
- Cooperative Agreements

BLM Programs coordinating this effort

- Aquatic Resources Program
- Engineering Program

Coordinate with all other DOI agencies, Tribes, USFS, Federal Highway Administration, NOAA, FEMA, and USACOE

- FLMA MOU (BLM, NPS, USFS, USFWS)

Coordinate with non-profit organizations, states, and counties



FEEDBACK

What are you most enthusiastic about regarding this effort.....

Working with other agencies and partners to restore connectivity across the landscape.



Bureau of Reclamation

**Fish Passage Opportunities Through
the Bipartisan Infrastructure Law**
Federal Agency Roundup

Genevieve Johnson

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV

PURPOSE AND ACTIVITIES

- Grant programs for on-the-ground restoration projects
- Compliment existing river restoration programs that address specific impacts to fish in key river basins throughout the West
- Technical assistance for river restoration through Technical Service Center (funded through service agreements)
- Research funding through Science and Technology program to promote new scientific tools and research for improved restoration (requires a Reclamation principal investigator)

FUNDING AND PROHIBITIONS

Grant programs

- Aquatic Ecosystems Restoration and Protection Projects
 - Aquatic ecosystem restoration and protection projects to improve habitat, including improving fish passage (\$250 million)
- Environmental Water Resources Projects
 - Water conservation and efficiency projects that increase reliability for ecological values or improve the condition of a natural feature (\$400 million which includes all WaterSMART grants)
- Multi-Benefit Projects to Improve Watershed Health
 - Habitat restoration projects to improve watershed health (\$100 million)
- Cooperative Watershed Management Program
 - Watershed planning and restoration projects for watershed groups (\$100 million)
- Programs require cost-share, appropriate eligible entities, and have varying requirements. More information available at: [WaterSMART | Bureau of Reclamation \(usbr.gov\)](#)
- Opportunities to partner with existing Bureau of Reclamation river restoration programs

IMPLEMENTATION AND COORDINATION

- Combination of existing and new programs
- For the new Aquatic Ecosystem Restoration Program, a Reclamation-wide team developing program criteria that will guide how projects are selected
 - Includes representation from multiple programs and regions
 - Includes conversations with outside organizations, such as US Army Corps of Engineers
- Existing river restoration programs throughout the West that specifically address fish passage needs (Ex. Columbia/Snake Rivers-WA&ID, San Joaquin and Trinity Rivers-CA, Middle Rio Grande-NM, Gila River-AZ, Upper Colorado River – CO/UT/NM/AZ/WY, Lower Yellowstone River-MT, and others)
 - These programs involve partnerships with other Federal, State and local agencies, Tribes, Non-profits and local water districts

FEEDBACK

What are you most enthusiastic about regarding this effort?

Opportunity to promote multiple objectives in collaboration with other entities and achieve tangible, meaningful outcomes

Integration of nature-based solutions into “grey infrastructure” planning and project design



Department of Energy

Fish Passage Opportunities Through the Bipartisan Infrastructure Law *Federal Agency Roundup*



Brian Bellgraph

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV



Natural Resources Conservation Service

Fish Passage Opportunities Through the Bipartisan Infrastructure Law *Federal Agency Roundup*

Gene W. Kim (NRCS Science and Technology) and Ben Naumann (Maine NRCS)

Monday, July 18
National Conservation and Training Center
Shepherdstown, WV



PURPOSE AND ACTIVITIES

- Natural Resources Conservation Service (NRCS) provides technical expertise, conservation planning, and financial assistance for farmers, ranchers and forest landowners wanting to make conservation improvements to their land.
- Supports technical and financial assistance to agricultural producers to address natural resource concerns.

- Helping People Help the Land.



Natural Resources Conservation Service



Photo Credit: Maine NRCS

PURPOSE AND ACTIVITIES



Natural Resources Conservation Service

NRCS works locally

- State Technical Advisory Committee
- Local Working Groups
- Local Service Centers

- Helping People Help the Land.



Photo Credit: Maine Audubon

PURPOSE AND ACTIVITIES



Conservation Planning

NRCS uses a nine-step planning process to identify the customer's objectives, analyze the natural resources issues on the land related to soil, water, animals, plants, air, energy, and human interaction and develop alternatives to address the customer's problems.



Natural Resources Conservation Service



FUNDING AND PROHIBITIONS

- **NRCS financial assistance for aquatic habitat restoration can be provided through a variety of programs, including:**
 - [Environmental Quality Incentives Program \(EQIP\)](#) provides financial and technical assistance to agricultural producers to address resource concerns and assists implementing conservation practices
 - [Conservation Innovation Grants \(CIG\)](#) are competitive grants that drive public and private sector innovation in resource conservation
 - [Regional Conservation Partnership Program \(RCPP\)](#) promotes coordination of NRCS conservation activities with partners that offer value-added contributions to expand our collective ability to address on-farm, watershed, and regional natural resource concerns.
 - [PL-566 Watershed Protection and Flood Prevention Program](#) (Public Law 83-566) includes fish and wildlife enhancement among its purposes



Natural Resources Conservation Service



Photo Credit: Maine NRCS

IMPLEMENTATION AND COORDINATION



Natural Resources Conservation Service

- **NRCS has National Conservation Practice Standards (CPS) that apply to aquatic habitat restoration, including:**

- Aquatic Organism Passage (CPS 396)
- Stream Habitat Improvement & Management (CPS 395)
- Riparian Forest Buffer (CPS 391)
- Stream Crossing (CPS 578)
- Streambank and Shoreline Protection (CPS 580)
- Access Road (CPS 560)
- Obstruction Removal (CPS 500)

- NRCS maintains and reviews CPS to incorporate best science and new technology



Photo Caption: Collaborative project with many partners

IMPLEMENTATION AND COORDINATION



Natural Resources Conservation Service

Cooperative Conservation

- NRCS works with many partners, including conservation NGOs, federal and state agencies
- For example:
 - The Maine Aquatic Connectivity Restoration Project
 - Watershed-scale Approach to Restoring Stream Systems (WATRSS) Project



Photo Credit TNC



FEEDBACK and THANK YOU

Contact:

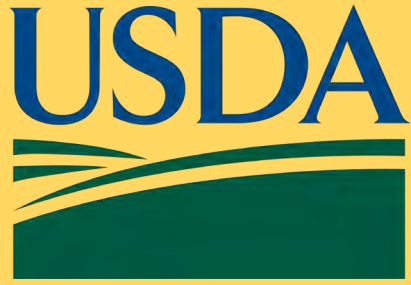
Gene W. Kim, PhD

USDA NRCS

National Water Quality Specialist/Aquatic Ecologist

Phone: (202) 779-0054

Email: Gene.W.Kim@usda.gov



U.S. Forest Service

Fish Passage Opportunities Through the Bipartisan Infrastructure Law *Federal Agency Roundup*

Kimberly Conley

Monday, July 18

National Conservation and Training Center

Shepherdstown, WV

PURPOSE AND ACTIVITIES



- Legacy Roads & Trails Remediation (LRT)
 - Purpose: Improve aquatic passage, reduce sedimentation, climate resiliency, and Source Water Protection
 - Project types: AOPs, road decommissioning, road and trail relocation
- Collaborative-based Aquatic-focused Landscape-scale Restoration (CALR)
 - Purpose: Improving fish passage and water quality
 - Project types: dam removals, irrigation weir retrofits, culverts, habitat or water quality barriers, stream restoration
- Dam Decommissioning
 - Purpose: removing USFS-owned, non-hydropower, high-hazard dams

FUNDING AND PROHIBITIONS



- Legacy Roads & Trails Remediation (LRT)
 - \$250 million over 5 years
 - USFS roads, culverts, and trails
- Collaborative-based Aquatic-focused Landscape-scale Restoration (CALR)
 - \$80 million over 5 years
 - Federal and non-Federal lands, including Tribal lands
- Dam Decommissioning
 - \$10 million over 5 years
 - Non-hydropower Federal dams on USFS-managed lands

IMPLEMENTATION AND COORDINATION



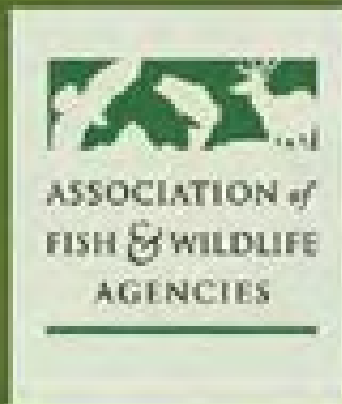
- Legacy Roads & Trails Remediation (LRT)
 - New program, but similar to previous Legacy Roads program (2008-2018)
 - USFS National Engineering program is lead
- Collaborative-based Aquatic-focused Landscape-scale Restoration (CALR)
 - New program
 - USFS National Biological & Physical Resources program is lead
 - \$10 million to NFWF America the Beautiful Challenge
- Dam Decommissioning
 - New program
 - USFS National Engineering program is lead



Already funding is being put to work on the ground.....

...as the Forest Service works to reduce the number of priority fish passage projects across National Forests and Grasslands.

- 357 projects, over \$100 million, identified.*



Tuesday Opening: Kregg Smith

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022



Kregg Smith
Oregon Department of Fish and Wildlife
kregg.m.smith@odfw.oregon.gov

WHAT INVESTMENT LOOKS LIKE

WE CAN MAKE A DIFFERENCE

There is a lot we can do to benefit both fish and wildlife, our communities, and our economy. Funds from the IJA are a once in a lifetime opportunity to do the work but the time is short. We have just 5 years to make the most of this chance.

RESILIENT FORESTS

- Reduce fire fuel loads
- Plant resilient seed lines
- Develop market approaches to balance harvest and ecosystem services

RESILIENT COAST

- Restore eelgrass
- Replace tidegates
- Planting for erosion control

OUTCOMES

- Clean air & water
- Ensure access to the outdoors
- Protected property and infrastructure
- Healthy fish and wildlife
- Healthy economy

RESILIENT RIVERS

- Upgrade culverts
- Shade our streams (tree planting)
- River restoration to reduce flood damage

RESILIENT LANDSCAPES

- Invest in highway overpasses for wildlife
- Invest in water conservation technology
- Control non-native plants on rangeland

FOCUSING ACTION

ODFW IS FOCUSING EFFORTS IN A FEW KEY PLACES WHERE ADDITIONAL FUNDING IS NEEDED TO GET US OVER THE FINISH LINE—ACHIEVING GREAT OUTCOMES FOR FISH AND WILDLIFE AND FOR OREGON'S COMMUNITIES



BRING BACK SOCKEYE

The bright red runs of sockeye salmon disappeared from Wallowa Lake over 100 years ago. A partnership of Tribes, the State, and farmers, with backing from the Governor and legislature is focused on rehabilitating Wallowa dam and providing fish passage and so that sockeye can make that journey again. Investments to address passage barriers, improve instream flows, and enhance habitat would be the final piece of this puzzle



DELIST OREGON COAST COHO

Coast coho have come a long way since they were listed in the 90's. On the backs of a strong return in 2021, a final push for strategic investments in habitat restoration and passage through the IJA will put us in great shape to delist this species and achieve the vision created by the Oregon Plan



FISH AND FARMERS IN THE KLAMATH

The largest restoration project in the world will be happening right here in Oregon when the four dams on the Klamath are removed. Funds from the IJA will help ensure the success of this project and address ongoing challenges to fish and farming that are exacerbated by drought in this region.



SECURING THE ROGUE

From Cascades to Coast, the Rogue river is the lifeblood of SW Oregon. The watershed supports some of the healthiest spring Chinook and winter steelhead populations in the state. But it is also vulnerable. Drought and illegal water use, barriers, and fires threaten both fish and communities but solutions exist and funding from the IIJA could help secure a more resilient future for all in the basin.



CROSSING TO THE OTHER SIDE

Oregon's wildlife has been on the move for millenia. Their ability to move freely is critical to find food, shelter, and opportunities to reproduce, as well as adapt to a changing climate. Each year thousands of animals perish on our roads as they attempt to find their way. Investments in wildlife crossing structures at strategic points allow wildlife to move freely across the landscape



HEALTHY FORESTS

Federal forests make up 60% of the total forest lands in Oregon with habitat vital to deer, elk, salmon, and many Oregon Conservation Strategy species. Many of these forests are at high risk of drought, disease, and extreme wildfire. Funds from IIJA combined with the Good Neighbor Authority and collaboration with partners will provide Oregon with an unprecedented opportunity to improve forest health and habitat conditions on federal land.

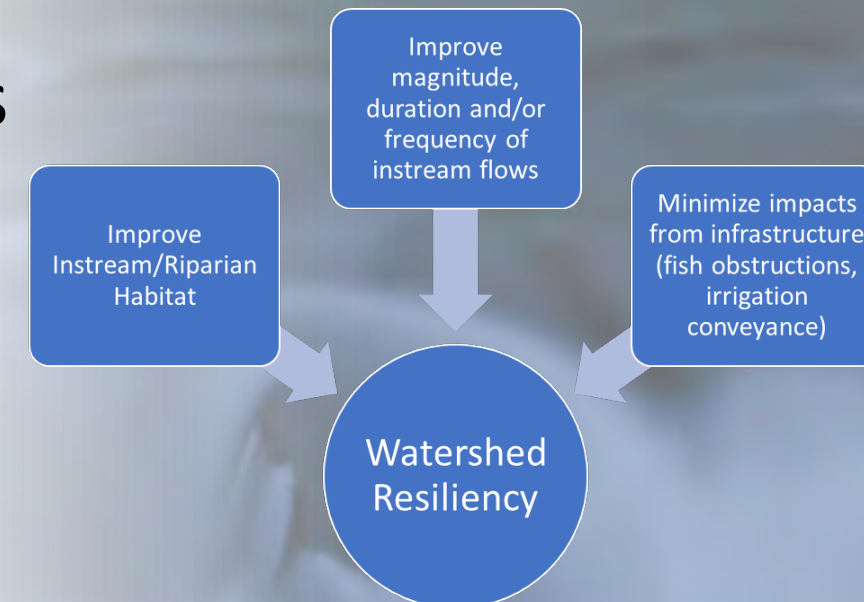


Watershed Resiliency

Goal: To help ensure watershed, fish, and wildlife resiliency into the future to mitigate the impacts of climate change, drought, and population growth

Plan: Advance investments in priority watersheds that will:

- Improve instream habitat
- Restore water quantity/quality conditions
- Upgrade infrastructure to promote fish passage and modernization of water management systems





Wallowa River Fish Passage & Flow Restoration

Wallowa Lake Dam:

- Fish Passage

Consolidated Ditch:

- Major passage barrier
- Unscreened

Wilson Ditch:

- Partial passage barrier

Cross Country Canal:

- Automated headgates in need of repair or replacement

Farmers Diversion:

- Conveys water to lower Wallowa Valley; remove and consolidate





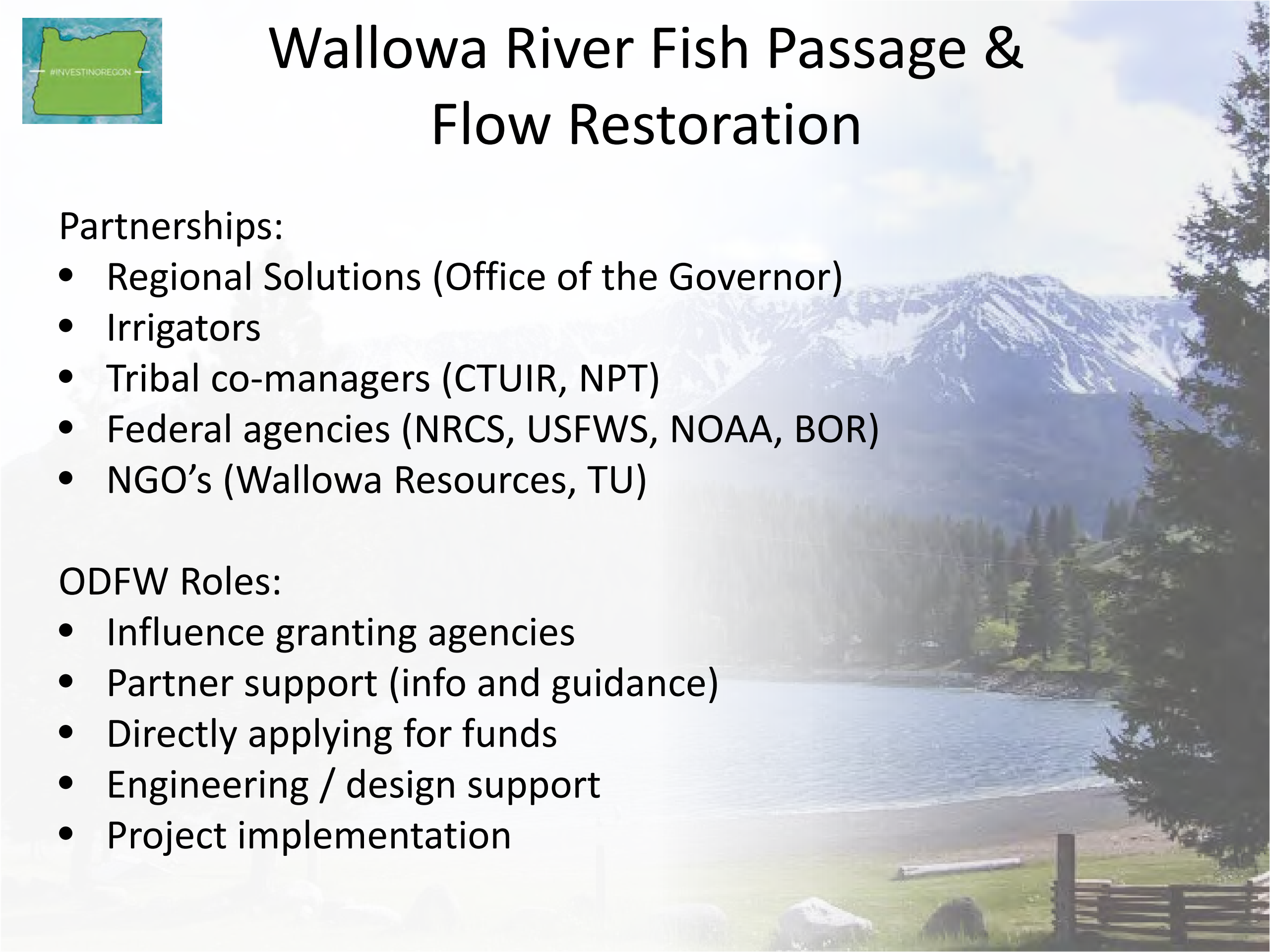
Wallowa River Fish Passage & Flow Restoration

Partnerships:

- Regional Solutions (Office of the Governor)
- Irrigators
- Tribal co-managers (CTUIR, NPT)
- Federal agencies (NRCS, USFWS, NOAA, BOR)
- NGO's (Wallowa Resources, TU)

ODFW Roles:

- Influence granting agencies
- Partner support (info and guidance)
- Directly applying for funds
- Engineering / design support
- Project implementation





Oregon Coast Coho Recovery

OC Coho Salmon have shown resilience during recent challenges in ocean and freshwater conditions.

2016 Oregon Coast Coho Salmon Recovery Plan

Final ESA Recovery Plan for Oregon Coast Coho Salmon (NMFS 2016) and are being implemented in the ESU to address primary and secondary limiting factors

Overriding Theme: Protect and restore freshwater & estuarine rearing habitats to support juvenile survival and productivity

2021 Oregon Coast Coho Salmon 5-Year Status Review

Fish passage improvements (e.g., support Salmon SuperHwy).
Habitat restoration actions that increase stream complexity
Priority projects identified in SAPs (Wild Salmon Center)

ODFW Fish Passage Drought Funds GF- HB5202 (\$8M) towards design and fish passage

ODFW 2019 Priority list of artificial obstructions and Barrier Inventory

ODFW 12-year assessment document (OCCCP)

- (1) the habitat limiting factors evaluation, which provides the primary and secondary limiting factors for coho by populations,
- (2) the habitat trend analysis results by stratum and ownership type, and
- (3) climate change.

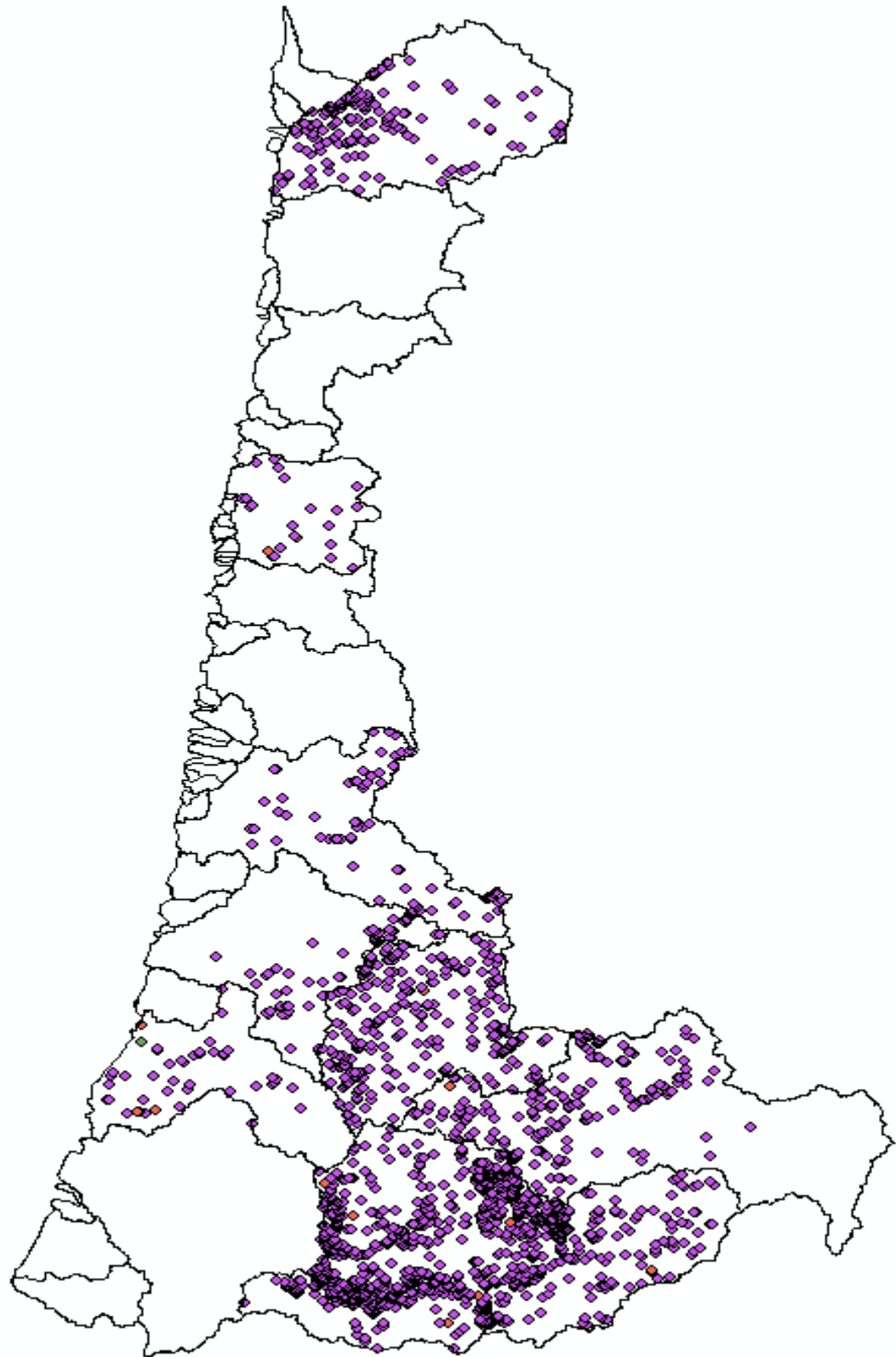


Oregon Coast Coho Recovery

Strata	Populations	OCCCP 2019 12-yr Assessment DSS Sustainability Results	OCCCP 2019 12-yr Assessment PVA results pre-1990	OCCCP 2019 12-yr Assessment PVA results post-1990	Rational	IJA Focal Populations	Strategic Action Plan Completed (*in progress)
North Coast	Necanicum	-0.16	1.00	0.93			
	Nehalem	0.63	0.83	0.94	Population viability	Nehalem	X
	Tillamook Bay	0.51	0.88	0.94			
	Nestucca	0.41	0.95	0.84	Population viability	Nestucca	
Mid-Coast	Salmon	-1.00	N/A	0.13			
	Siletz	0.58	0.99	0.95			X*
	Yaquina	0.74	0.94	1.00			
	Beaver	0.24	0.95	1.00			
	Alsea	0.64	0.99	0.86	Population viability	Alsea	
	Siuslaw	0.80	1.00	0.98			X
Lakes	Siltcoos	0.53	1.00	1.00			
	Tahkenitch	0.64	1.00	1.00			
	Tenmile	0.87	1.00	0.98			
Umpqua	Lower Umpqua	0.87	1.00	1.00			
	Middle Umpqua	0.38	0.99	0.99	Sustainability	Middle Umpqua	
	North Umpqua	-0.41	0.83	0.92			
	South Umpqua	0.14	0.97	0.99	Sustainability	South Umpqua	
Mid-South Coast	Coos	0.82	1.00	0.84	Population viability	Coos	X
	Coquille	0.80	0.99	0.96			X*
	Floras	0.52	N/A	0.99			
	Sixes	-1.00	N/A	0.93			



Oregon Coast Coho Recovery

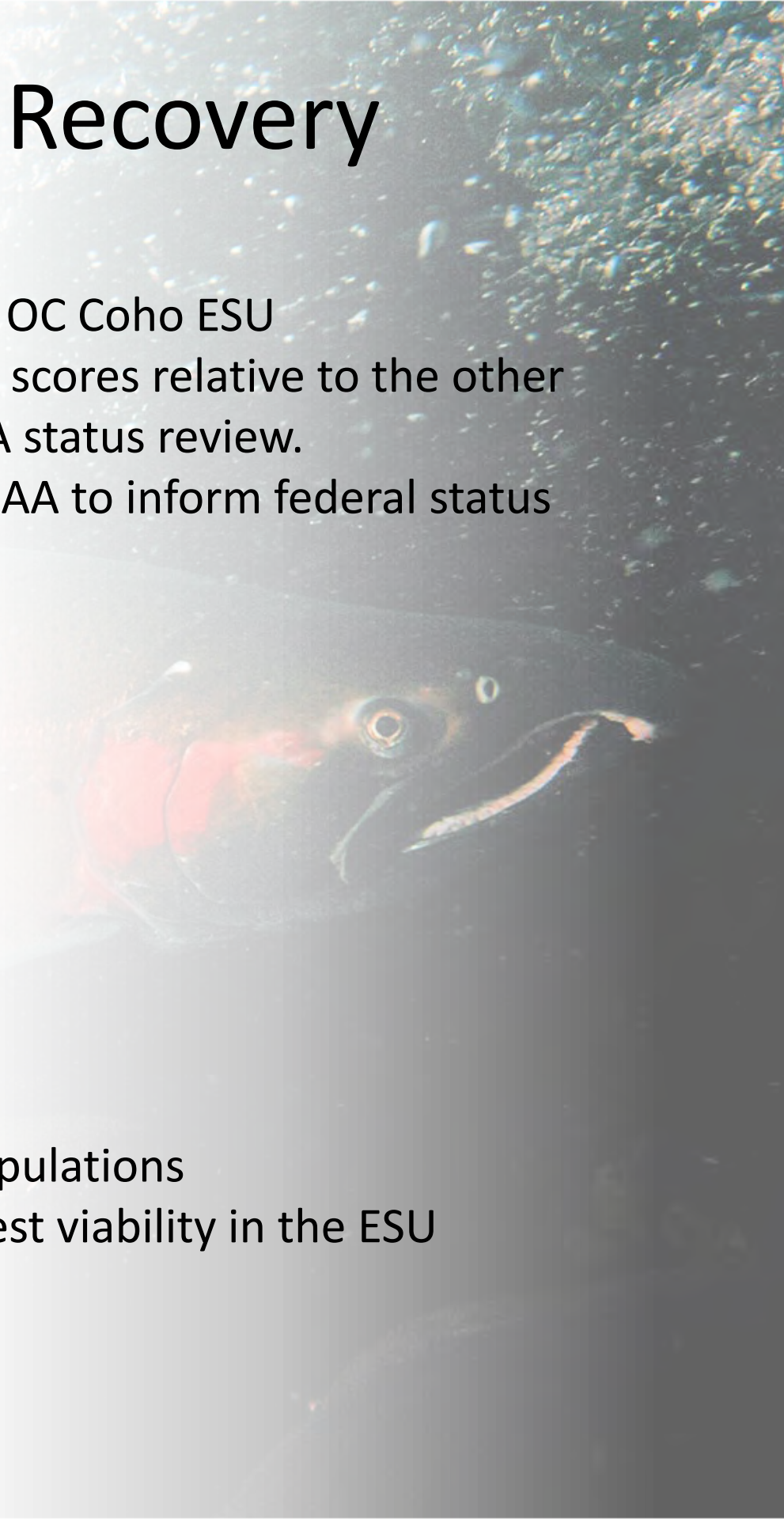


Stratum Specific Priorities within OC Coho ESU

- Decision Support System (DSS) scores relative to the other strata in the current 5-year ESA status review.
- DSS Criteria scores used by NOAA to inform federal status reviews.
- Population scale Criteria
 - Nehalem
 - Nestucca
 - Alsea
 - Middle Umpqua
 - South Umpqua
 - Coos

Protect moderate to high DSS populations

Lakes Strata has the highest viability in the ESU





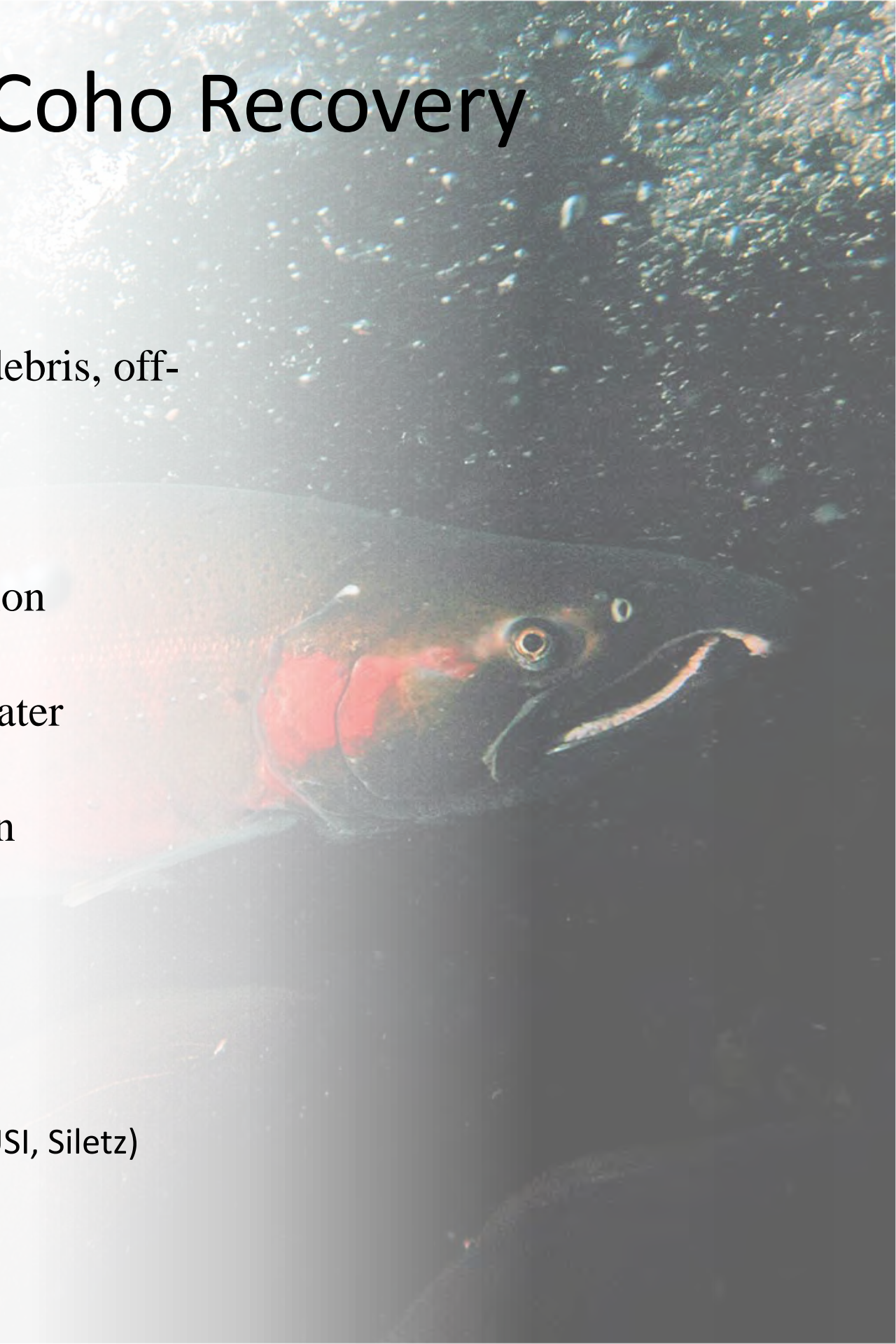
Oregon Coast Coho Recovery

Population Specific Priorities:

- Increase stream complexity (large wood debris, off-channel overwinter rearing habitat)
- Fish Passage and Barrier Removal
- Increase floodplain connectivity
- Restore shade enhancing riparian vegetation
- Access cooler water refuge habitat
- Protect, enhance, restore access to cold water refuges
- Protect and enhance large wood sources in landslide-prone areas

Partnerships:

- Regional Solutions (Office of the Governor)
- NOAA-NMFS
- Tribal co-managers (Cow Creek, Coquille, CTCLUSI, Siletz)
- Federal agencies (USFWS, USFS, BOR)
- NGO's (Wild Salmon Center, TU)





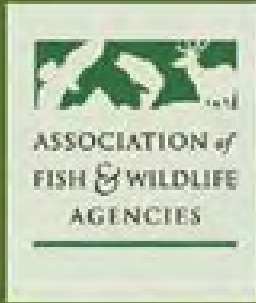
#INVESTINOREGON

Outreach

Storymap

Website:

<https://dfw.state.or.us/IJA/>



Tuesday Closing: Keith Curley

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

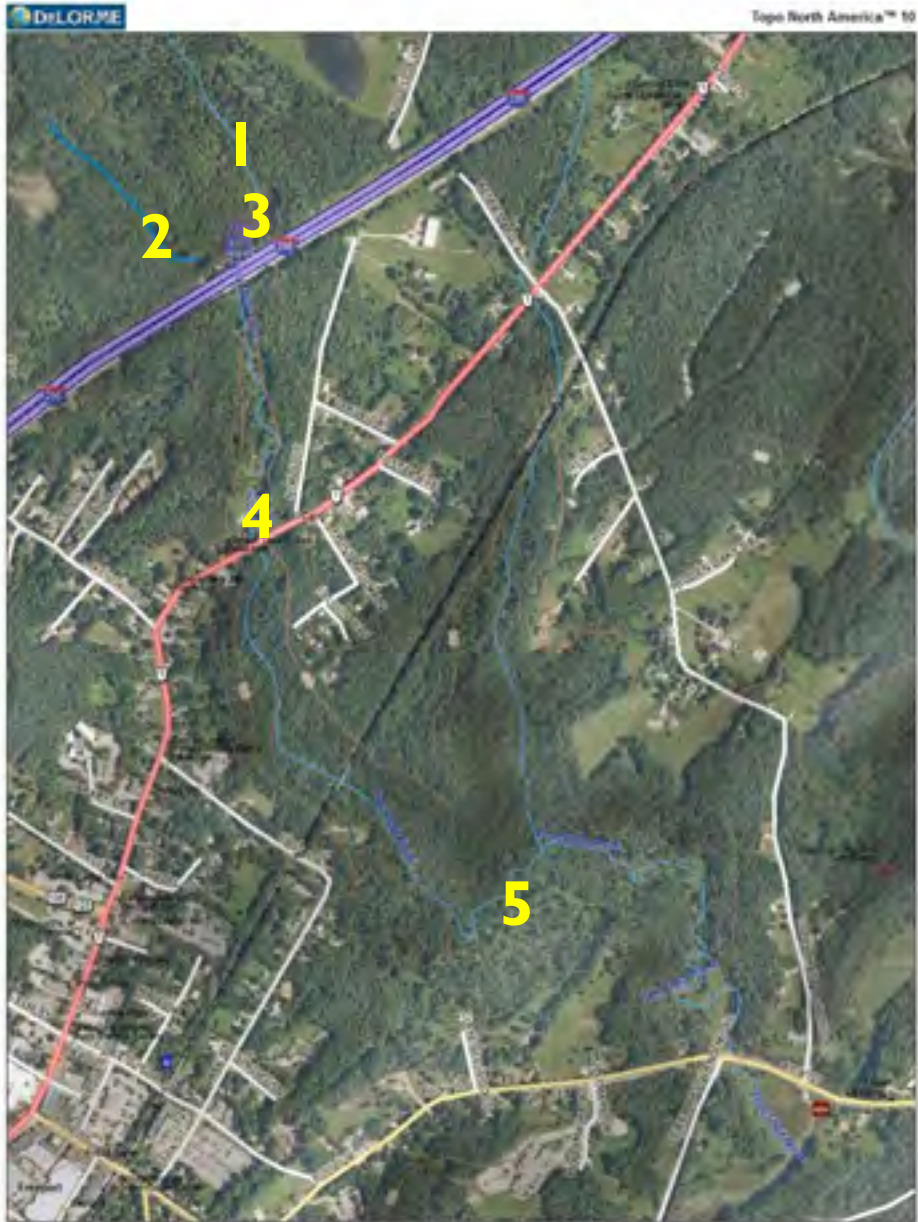
National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022



Fish Passage and Climate Change

7.19.22



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Frost Gully Brook July Water Temperatures

Location	Temp (F)
1. Frost Gully Brook Upper	66.2
2. Unnamed Trib	52.3
3. Upper Impoundment	70.5
4. Lower Impoundment	73.5
5. Frost Gully Brook Near Tidewater	68.7



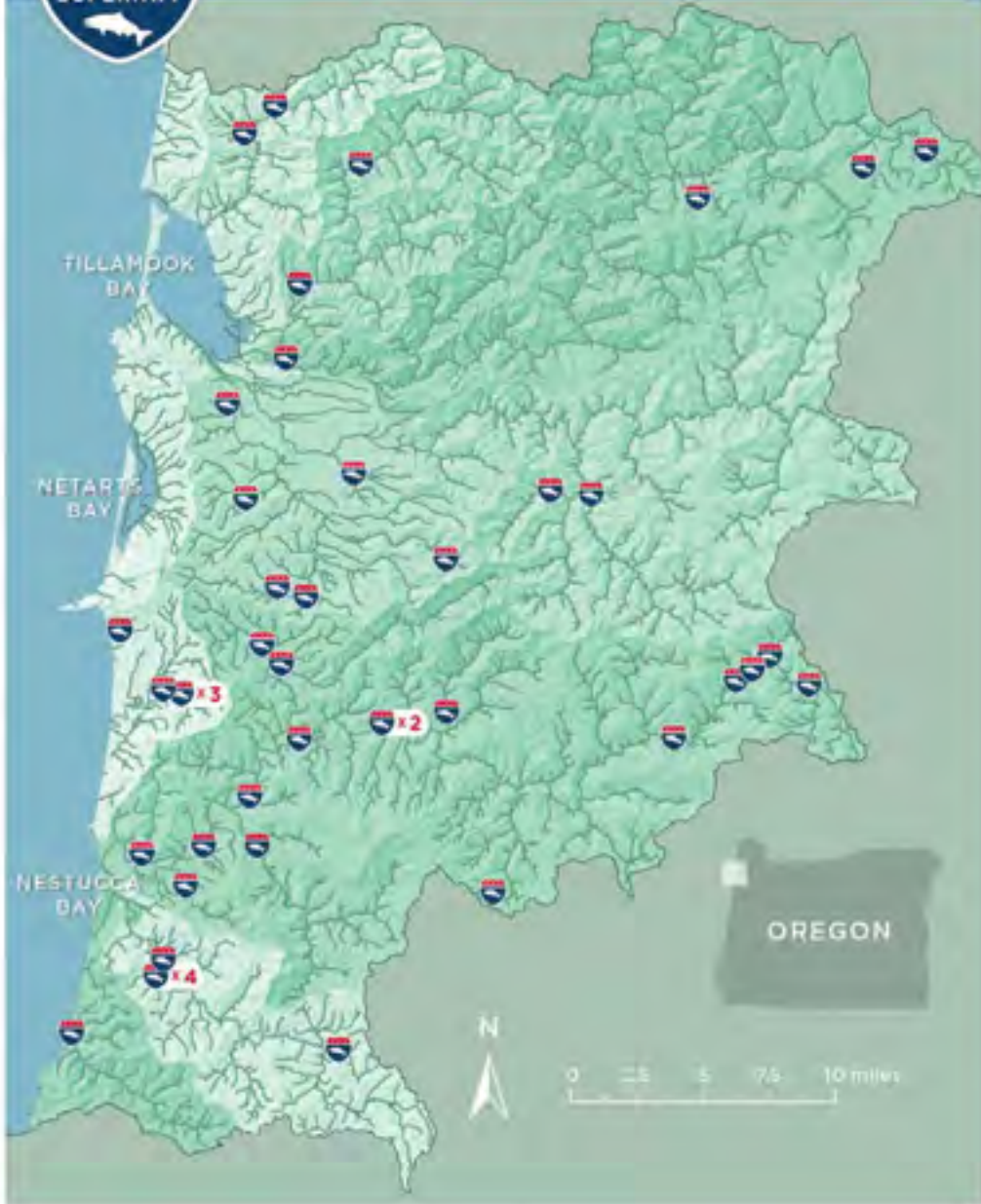
“If feed can’t get in and cows don’t get fed, milk can’t get from farm to the cheese factory and cheese can’t get out. Highway 6 and Highway 22 are very important to all the farms in Tillamook County. If they fail or water is backed up then we have problems.

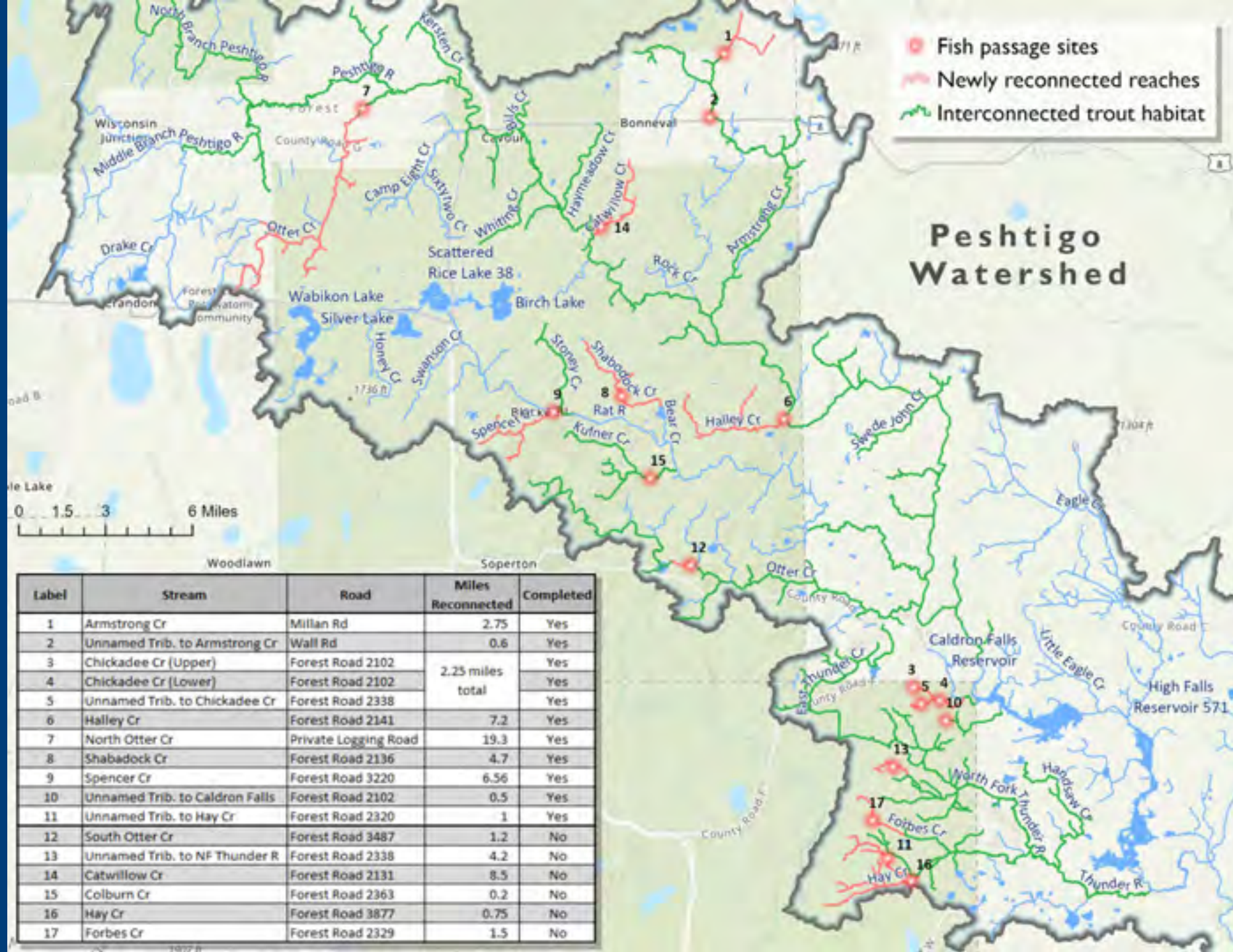
— Mike Trent, Shel-Mi Dairy,
Cloverdale






COMPLETED PROJECTS: 43







Wednesday Opening: Serena
McClain



PARTNER WORKSHOP

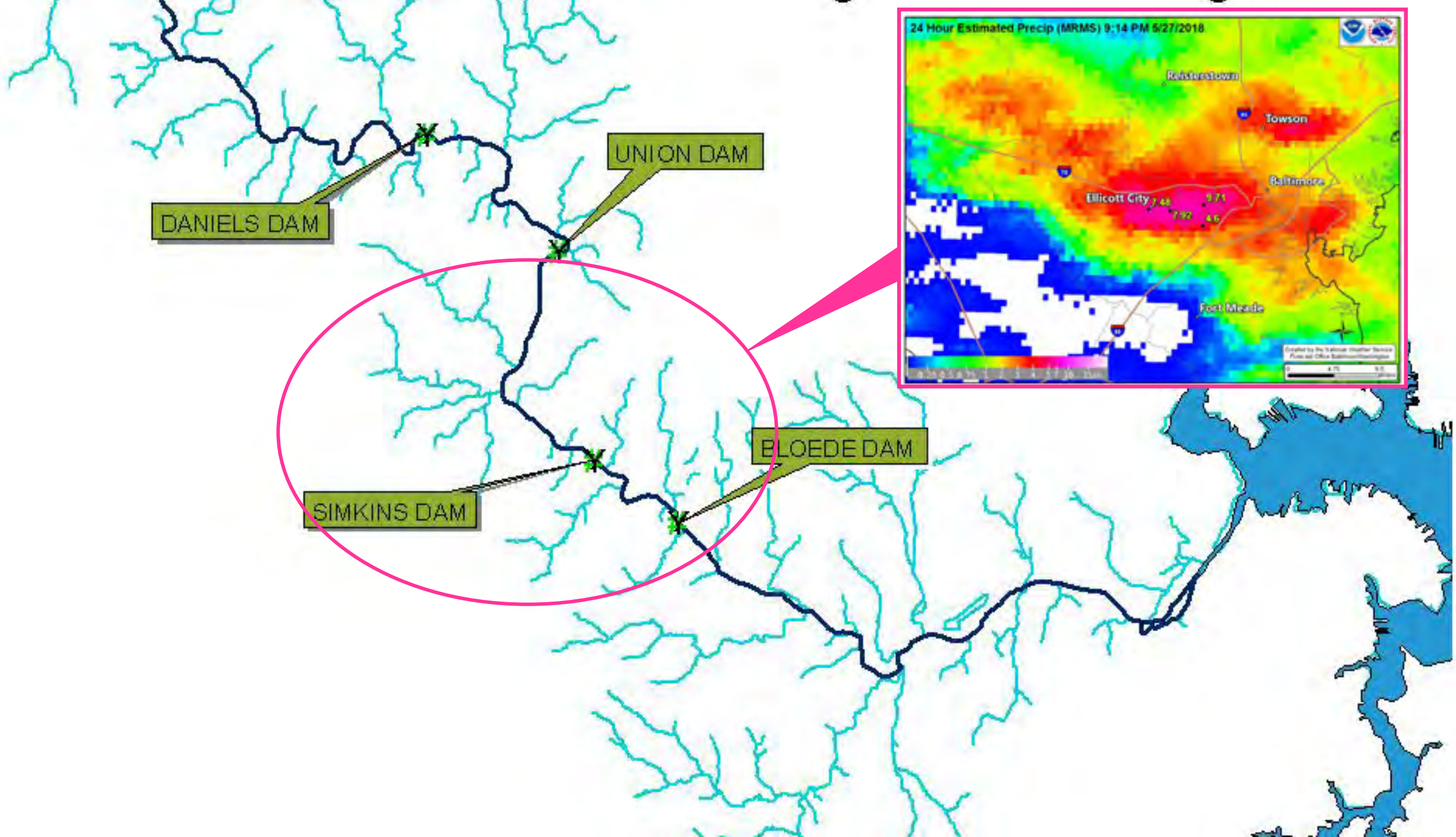
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JULY 18-20, 2022

Bloede Dam Removal Patapsco River, MD









Man missing, presumed drowned, at Bloede Dam

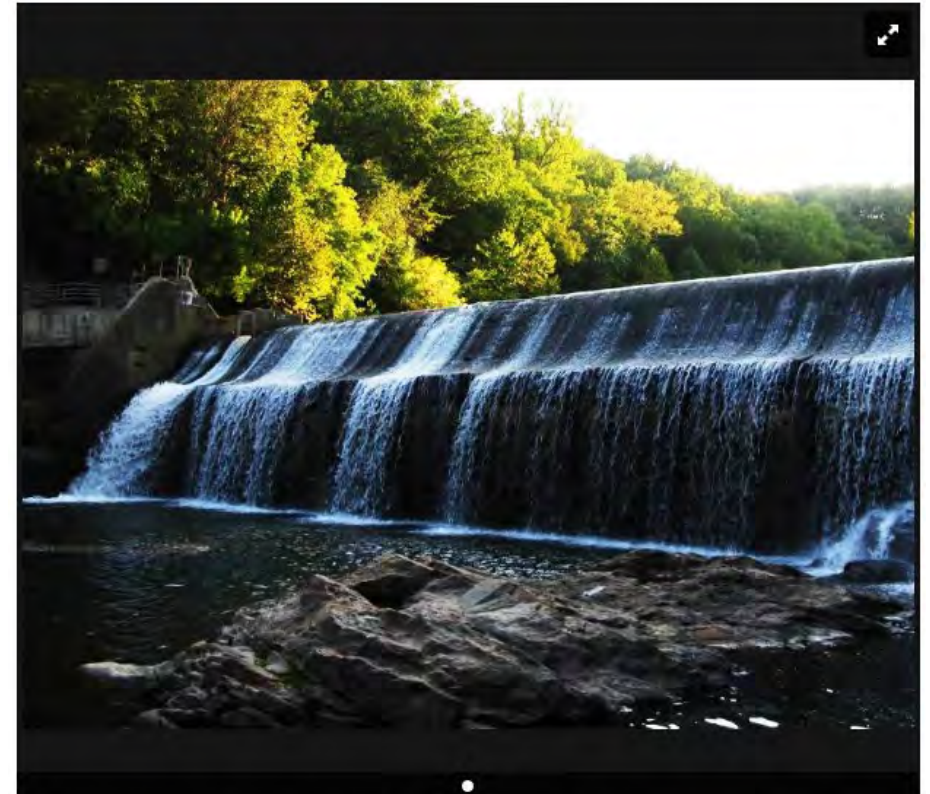
Dam slated for removal is safety hazard, blocks fish passage

By Rona Kobell on June 08, 2015

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[Share on Twitter](#)

Comments are closed for this article. 1



Bloede Dam is planned for removal in 2016. Half a dozen people have drowned at the dam in the past decade. (InterFluve Inc.)



Successfully
breached in 2018



Source	Total Award
NOAA Restoration Center (NOA141)	\$ 4,593,054.00
NOAA Restoration Center (NOA172)	\$ 2,355,768.00
NOAA Coastal Resiliency (NOA173)	\$ 1,000,000.00
USFWS Hurricane Sandy (FWS146)	\$ 1,600,000.00
NFWF Hurricane Sandy (DOI151)	\$ 2,480,000.00
MD DNR (MDN181)	\$ 5,902,085.72
MD DNR SHA Mitigation Funds (MDN182)	\$ 5,000,000.00
Coke (COC172)	\$ 200,000.00
TOTAL	23,130,907.72

Recovery, resiliency and infrastructure funding





Monitoring has spanned 3 removals

- **Union/pre-Simkins (2009-2010)**
- **Post-Simkins (2011-2014)**
- **Pre-Bloede (2015-2018)**
- **Post-Bloede (2019-?)**



Thank you!



Implementation Models of Success

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022

Key Takeaways

Be strategic!

- Nexus of BIL funds and others
- Know your audience and adjust your approach accordingly
- Seek synergies

Be inclusive!

- Who are our stakeholders?
- Acknowledge project-by-project variability
- We need clarity on and targeted approaches for underserved communities and Tribes

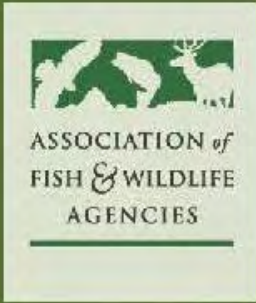
Possible Actions

Utilize and leverage what we have!

- Forums for collaboration, engagement, community support: NFHP, watershed councils, etc.
 - Happen at different scales
 - Opportunities beyond BIL?
- Mechanisms: IPAs, MOUs, IAAs, etc.
- Others: academia, consultants, etc.
- Non-profits

Possible Actions

- Identify BIL nexuses across agencies and communicate this information to stakeholders, potential applicants, partners, etc.
 - Can we create a funding opportunity matrix for BIL fish passage funds?
- Top-line messaging across federal and state agencies to amplify our goals
- Reduce burdens on applicants and agencies
- Prioritize effective engagement and coordination within organizations
 - Create a collaboration framework
 - Establish processes for engagement and agency collaboration
- Proactively identify partners and stakeholders
 - Bring in non-traditional organizations/stakeholders into this effort
 - Incorporate Traditional Ecological Knowledge and consider cultural importance of projects



Project Prioritization and Talking with Communities

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022



Key Takeaways – Barrier Inventories

- Many barrier inventories exist for multiple geographic scales, details of data, barrier types, and purpose.
 - No single barrier inventory is complete.
 - Many overlap and/or build off of each other.
 - Non-fish passage focused inventories.
- Integrated inventories (e.g., SARP) are valuable not only for products but also for methodology and process for expanding coverage.
- Potential to leverage “non-traditional” inventories.
- Is lack of data limiting ability to act and improve aquatic connectivity?

Key Takeaways – Project Prioritization

- Dozens of criteria were identified that are currently used to develop priority project lists at multiple scales.
 - Human health and safety
 - Ecological/Species conservation
 - Synergy with other activities
- Barrier removal may not be best solution (AIS, genetics, contaminants).
- Often multiple sources are combined to determine action plans.
 - Partnerships integrate priorities of multiple organizations to result in target projects.
 - e.g., watershed level priority lists
- Project proposals selected to match specific RFP criteria.

Possible Actions – Inventory and Prioritization

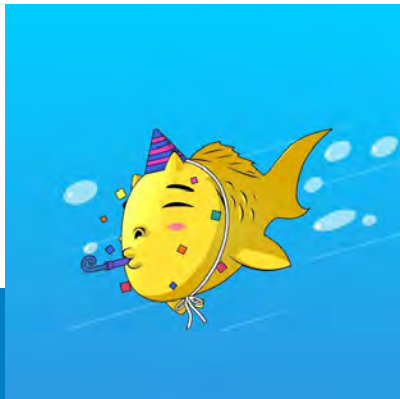
- Continue to develop ways to layer and/or integrate priority areas and criteria.
- Develop and expand partnerships to represent a broad range of benefits and build support.
- Identify and pursue projects/opportunities where AOP may not be the primary benefit, but is a “co-benefit.”
- Funding entities develop and communicate clear priorities for grant programs.

Key Takeaways - Making Fish Passage More Mainstream

- Efficient allocation of all BIL funds, to happy local recipients, resulting in additional funding.
- Barriers are removed, habitat is opened, and species are present upstream.
- Fish (Increased # in self-sustaining fisheries; delisting species (avoid new listings too), temperature sensitive fish remaining, native fish present, invasive fish absent.
- Normalizing fish passage/AOP especially with non-traditional partners—making it the go-to tool in the toolbox.
- Demonstrate greater/sustained collaboration among agency partnerships.

Possible Actions - Making Fish Passage More Mainstream

- **Coordination Mechanism:** Develop interagency level of coordination, resulting in common technical guidance, leveraging of authorities, streamlined permitting, and sharing of agency expertise.
- **Champions:** Identify community-based champions to message the good stories. Use different messengers to reach different audiences.
- **Create a good story:** (e.g., memorable tag line, charismatic species, before and after photos of demonstration projects, showcasing the agency coordination, and including clear economic benefits messages) that focuses on the benefits of fish passage specific to the target audience.
- **Educating early:** Get the message out early in education and early, multi-disciplinary career training. Incorporate AOP in “Engineering 101.”
- **Celebrate:** 2026 World Fish Migration Day Party – recognize the work that has been done and invite Congressional Delegates and elected officials at all levels.





Developing Capacity and Measuring Success

PARTNER WORKSHOP

Fish Passage Opportunities through the Bipartisan Infrastructure Law

National Conservation Training Center
Shepherdstown, WV

JULY 18-20, 2022



Key Takeaways - Observations About Capacity

- Capacity concerns are shared by all entities involved in funding and implementing IJA.
- Capacity issues exist for all phases of barrier removal program development and project implementation.
- Capacity concerns focus on the availability of personnel, funding, and supplies.
- For natural resource entities, capacity concerns focus primarily on scaling up existing efforts, rather than building new skill sets.
 - An overarching concern is balancing scaling up rapidly vs. scaling up effectively.
- An overarching concern is how to hire experienced personnel when faced with time-limited funding and political/bureaucratic constraints.

Key Takeaways – Specific Capacity Concerns

- Ensuring benefits flow to underserved communities.
- Conducting community outreach on barrier removal, especially talking about dam removal.
- Supporting and providing technical assistance to Tribes (esp. DOT culvert program).
- Achieving environmental compliance (balancing efficiency against effectiveness).
- Engaging experienced and effective project managers.
- Growing grant writing and grant management capacity.
- Implementing appropriate project design and conducting design reviews in a timely manner.
- Lack of funding to investigate unresolved and unknown scientific and technical issues.

Possible Actions to Address Capacity Issues

- Leveraging partners' strengths - MOU's, personnel agreements, library of experts, centralized teams, existing guidelines (e.g., design, comms).
- Centralized training, combined with tailored training for underserved entities.
- Maximizing contractor expertise and resources.
- Creating resource-saving efficiencies:
 - For environmental compliance – SOPs, program-level efforts
 - For grants process - single point of application, reducing match requirements, streamlined/ centralized reporting
 - By preparing public works agencies to replace infrastructure with AOP structures post-emergency
- Supporting outreach/ engagement - partnering with community influencers/champions, centralized grant eligibility information.

Next Steps

- Crosswalk IJA authorities pertaining to allowable activities and timeframes to support various proposed efficiencies.
- Ensure the ongoing discussions with the federal family include further discussion on capacity building.
- Convene a workgroup on coordinated personnel training and development.

Key Takeaways - Observations About Monitoring

- Discussions focused on the difference between performance monitoring and effectiveness monitoring.
 - Performance monitoring is conducted to ensure project performance and facilitate adaptive management.
 - Effectiveness monitoring is scalable and can include a broader range of metrics depending on the complexity of the project and the availability of resources.
- Monitoring should include both collection of baseline data as well as post-project monitoring to assess project success
- Participants catalogued various types of monitoring and discussed potential socioeconomic metrics, as well as other ecosystem services.

Key Takeaways – Focus on Effectiveness Monitoring

- Key constituencies: Congress, taxpayers, communities, landowners
- Agencies expected to show a return on the investment (e.g., restore fish populations, delist/downlist T&E species, improve ecosystem health and productivity)
- Monitoring protocols can prioritize different types of effectiveness monitoring for projects
- Leveraging non-fish passage programs to support effectiveness monitoring (NFHAP, NRCS for dam removal, EPA Grants under CWA 319)
- Effectiveness monitoring less necessary:
 - Existing data and ongoing sampling
 - Project types in geographies where data exists (only if there are data gaps)

Unanswered Questions - Effectiveness Monitoring

- Which agency authorities allow award recipients to pay for effectiveness monitoring?
- What is the appropriate time scale to implement effectiveness monitoring?
- How can we identify the projects where effectiveness monitoring should be stipulated?
- Does the literature include monitoring templates for discreet ecosystem types?
- Can Fed agencies coordinate on language in opportunity announcements to ensure that effectiveness monitoring is included?
- Would applicants agree to conduct effectiveness monitoring beyond completion of the project?
- Should effectiveness monitoring be prioritized where watershed level impacts can more readily be observed?

Next Steps

- Develop a crosswalk of all Fed Agencies' authorities to fund effectiveness monitoring.
- Convene an interagency team to discuss the goals for monitoring protocols (beyond performance monitoring) under IJA and how those may differ from goals.
- Explore how to enhance the datasets pertaining to fish passage effectiveness within existing data collection efforts/tools



WORKSHOP WRAP UP

Rick Jacobson

Kurt Theide

PARTNER WORKSHOP

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A Thank You is in Order

- Organizers, facilitators, NCTC staff
- Twelve federal agencies and numerous offices
- 20+ states & state associations
- Tribes, Tribal commissions & associations
- NGOs and other key partners



Reminder to Ourselves

- We do not need to recreate wheel
- A hybrid approach adds value
- Don't let the perfect be the enemy of the good
- Recognize that plan may have to adapt
- Guard against fragmentation of thought
- Insist on strategic and impactful, not just fast or easy

Bigger Tent: Expanded Conservation Community

- Broader appeal is key to momentum (Not Just Fish #1)
- Maintain the Bipartisan vibe
- Want this to live beyond this Administration
- Part of overall conservation objectives (Not Just Fish #2)
- The tent may get bigger yet...

Collaboration will continue to be keys of success

- Partnerships continue to be necessary to on-ground implementation (funding, multiple purposes)
- Opportunity to expand coordination to strategic level, implementation, communication
- This meeting is just the beginning

Must tell the story

- Agree on a key set of success measures
- Recognize that conservation response is not immediate
- Count non-conservation successes
- Across all levels – prioritization, evaluation, coordination (adaptive management loop)

What gives us hope

- Successful on the ground projects
- Enthusiasm of broader federal family
- Passion and engagement from states and NGOs
- Seeing momentum = Salmon Superhighway
- Starting to see local champions

Federal Agency Follow up

- Need a high-level strategic plan
- Making access to funding clearer
- Develop options for prioritization
- Mechanism for federal agency coordination
- Broader input from partners and other stakeholders

Redouble efforts with tribes and disadvantaged communities

- Provide support to disadvantaged communities and tribes to participate in grant programs
- Proactively reach out to tribes re: strategic implementation
- Reduce burden on tribes for consultation (multi-agency approach)
- Urban fish passage improves quality of life for poor communities

What it means to be transformational....

- Focused, long-range plan of funded projects
- Value of a target
- Common set of success measures
- Societal shift in the importance of aquatic ecosystems
- Agency systemic change to consider conservation



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