



Sustainable Rivers Program (SRP)

Planning COP Webinar
10 August 2023

The Sustainable Rivers Program:

Working with water managers, operators, planners, scientists, and stakeholders to formulate alternative management strategies, modernize strategies for operating purposes related to the environment, and deliver more benefits from already built USACE water resources infrastructure.



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The Nature
Conservancy 

Presentation Outline



Michelle Mattson, IWR
Wetlands Ecologist



Jim Howe, TNC No. Am
Senior Policy Advisor



Lane Richter, MVS
Wildlife Biologist

- SRP Overview
- History of SRP
- St. Louis Case Studies
- RFP Process (open now)



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**The Mission of the
Sustainable Rivers Program:**

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

Bill Williams River, Arizona



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Sustainable Rivers Program

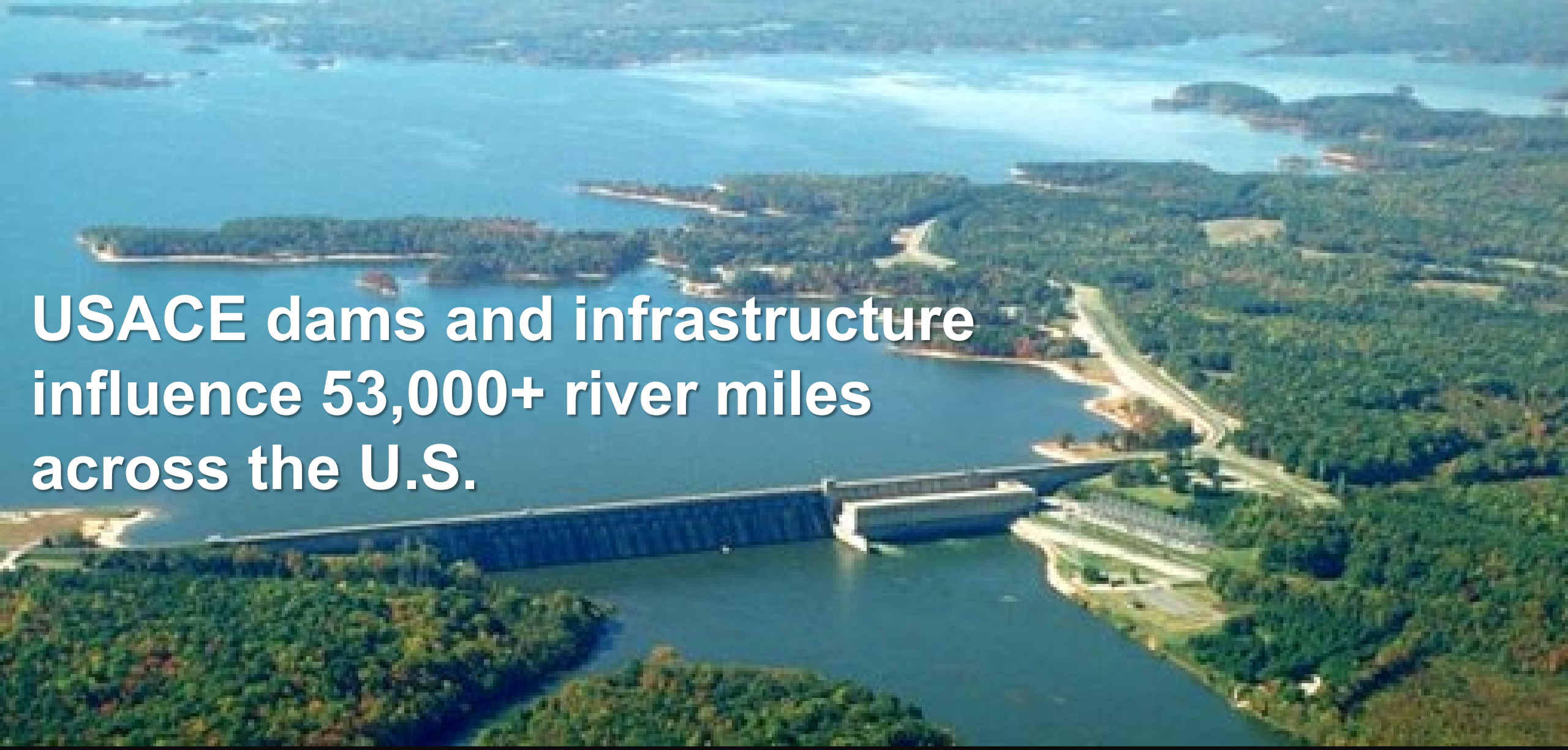


SRP works with water managers, operators, planners, scientists, and stakeholders to:

- Formulate science based alternative management strategies for rivers and ecosystems associated with USACE infrastructure
- Modernize strategies for operating purposes related to the environment at water resources infrastructure
- Align with TNC's 2030 goals and USACE's charge to deliver multiple benefits from infrastructure

Advance, Implement, and Incorporate e-strategies





**USACE dams and infrastructure
influence 53,000+ river miles
across the U.S.**

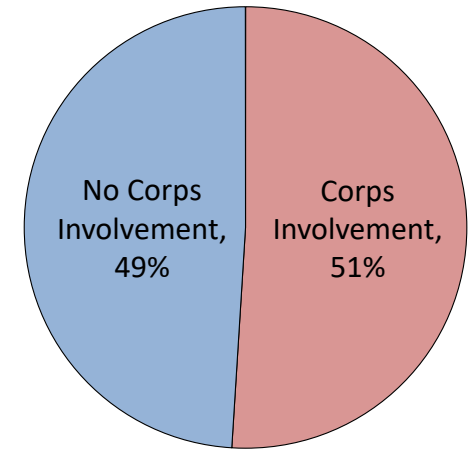


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Reservoirs

by Storage (795 MAF)



- Count = 0.5%
NID = 89,028 (dams);
Corps FRM = 465 (reservoirs)
- Storage (NID_Storage) = 51.0%
NID = 795 million ac-ft
Corps FRM = 405 million ac-ft

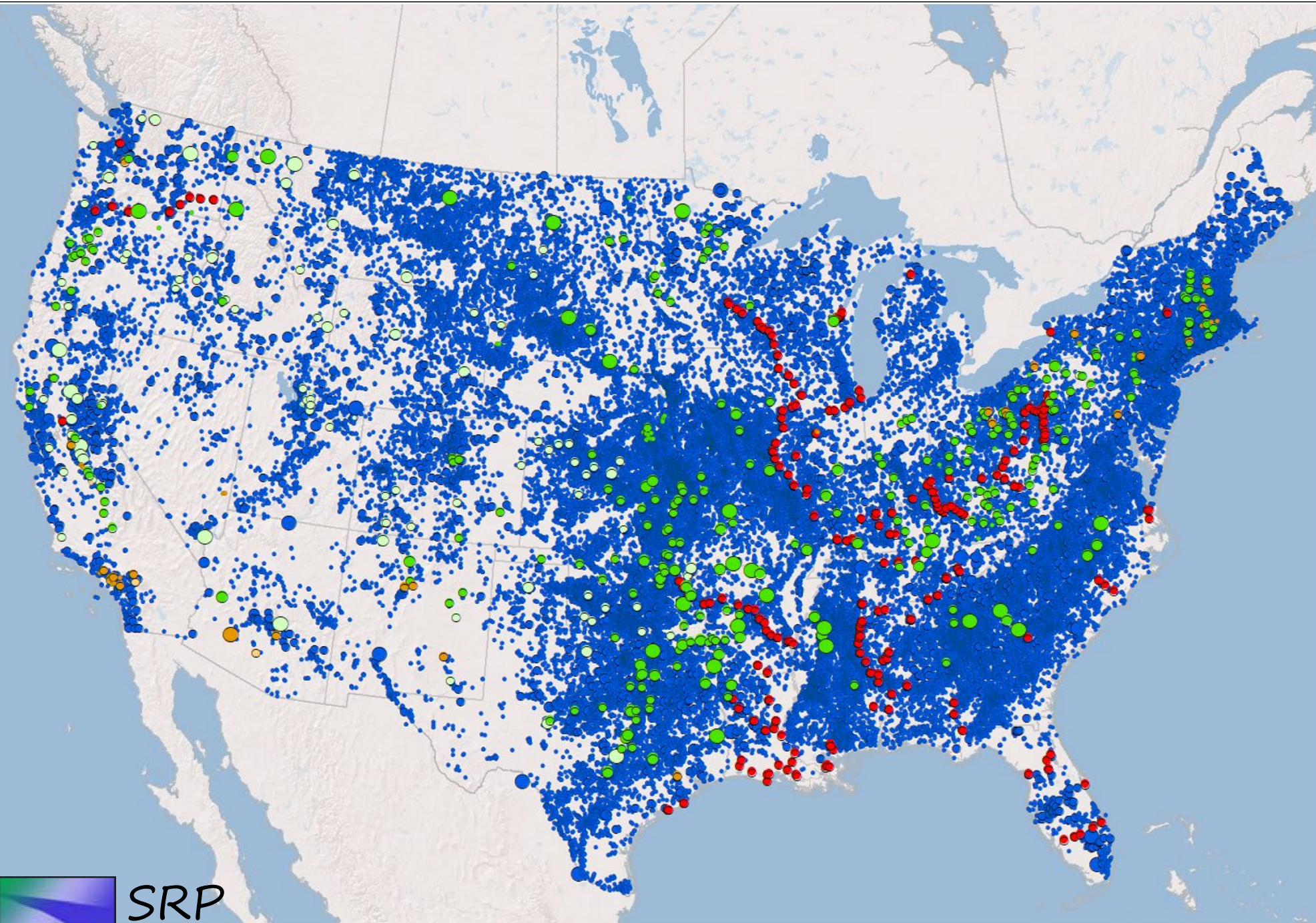
Type:
[National Inventory of Dams \(2016\)](#)

General Reservoirs (FRM)

Dry Dams (FRM)

Locks and Dams

Corps Owned / Section 7





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The Goal of the *Sustainable Rivers Program*

Advance, Implement, and Incorporate
environmental strategies at existing USACE water
resources infrastructure.

SRP Location-Based Projects
follow a Multi-Step Process of

Advance

Implement

Incorporate



SRP's Multi-Step Process

Step 1 – Advance

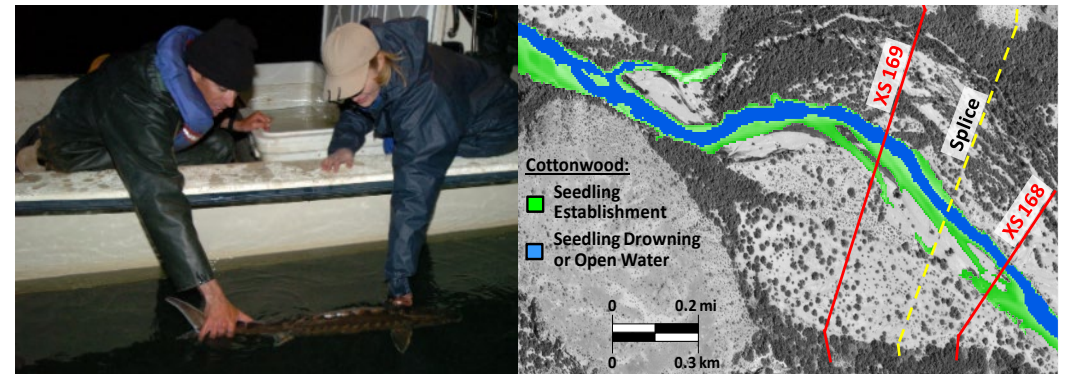
Engaging partners in a science-based process to review current conditions to define potentially beneficial environmental strategies



SRP's Multi-Step Process

Step 2 – Implement

Test effectiveness and feasibility of the defined strategies.



SRP's Multi-Step Process

Step 3 – Incorporate

Include reviewed strategies in policies that guide infrastructure operations.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, PORTLAND DISTRICT
PO BOX 2946
PORTLAND OR 97208-2946

CENWD-PDW

1 OCT 2015

MEMORANDUM THRU Laurie Nicholas, Chief, Reservoir Regulation and Water Quality
Section (CENWP-EC-HR)

FOR Lance Helwig, Chief, Engineering and Construction Division (CENWP-EC)

SUBJECT: Response to Request for Review and Approval for Incorporation of the
Environmental Flow Recommendations Memo into the Water Control Manuals for Willamette
Valley Projects



The SRP Process In Action: The Cape Fear River

Combined efforts by Corps Wilmington District and the TNC North Carolina Chapter

ADVANCE

IMPLEMENT

INCORPORATE



2017

2019

2020

2021

2022

2023...

- Launch Meeting

- Literature Review
- eFlows Workshop

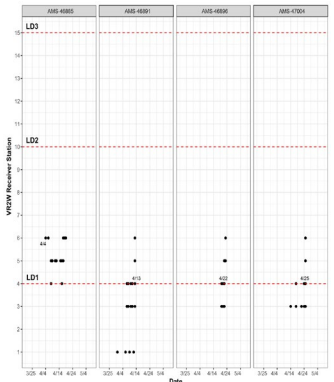
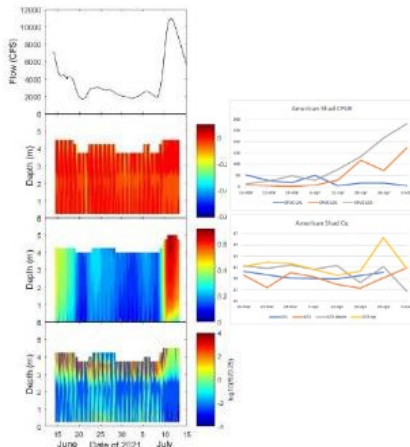
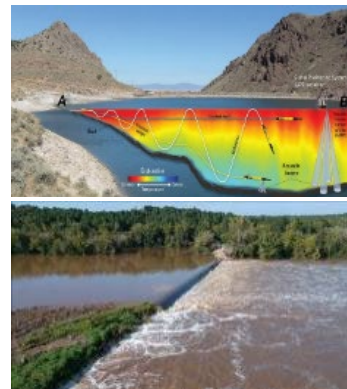
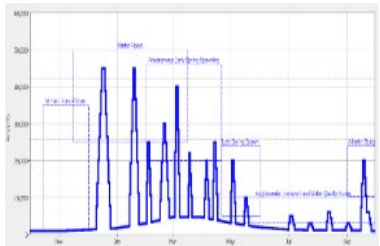
- Develop/Implement Monitoring Plan

- Continued/expanded eFlows and monitoring

- Continued/expanded eFlows and monitoring

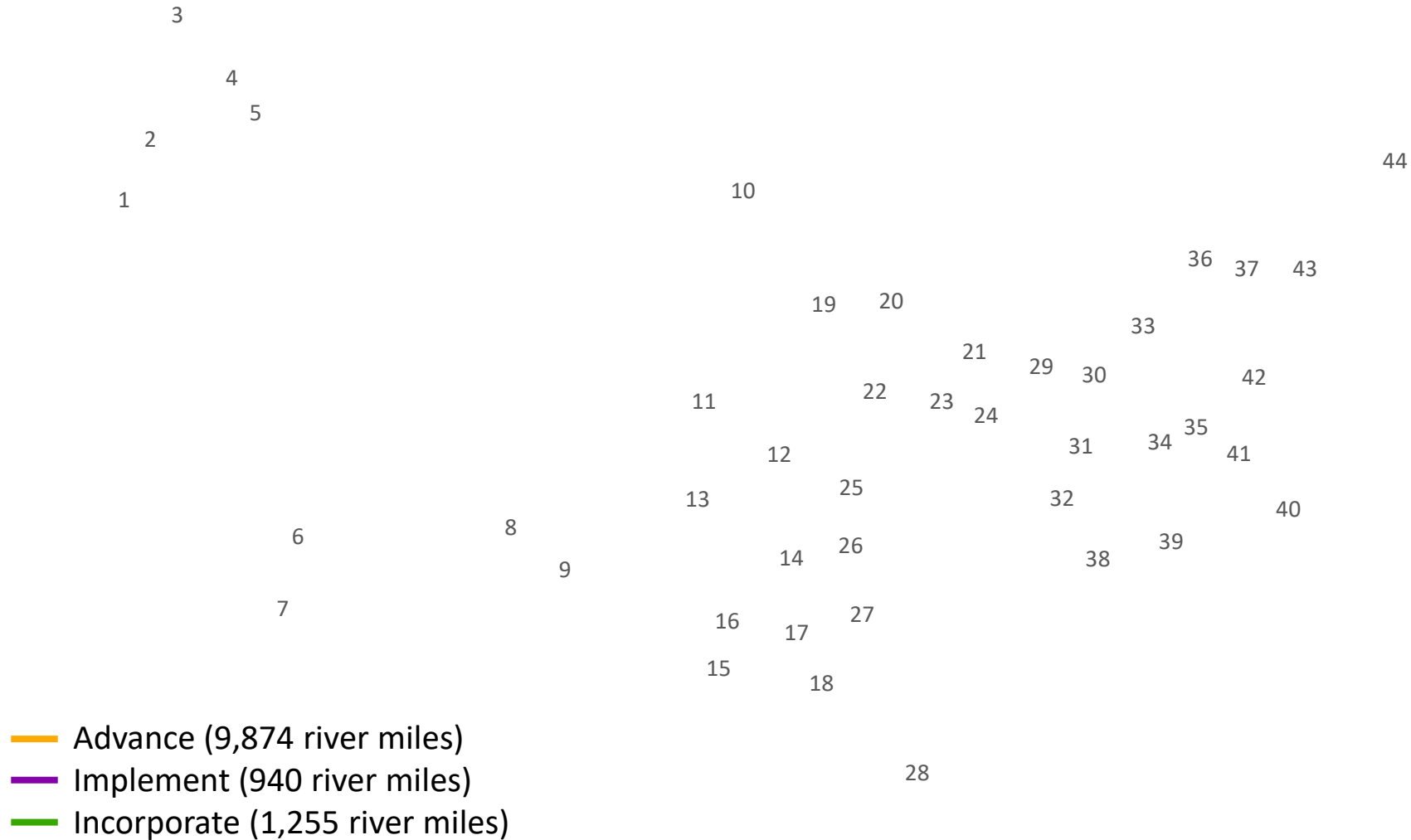
- Temporary Deviation?
- Water Control Plan?
- Drought Contingency Plan?

- Re-engage Stakeholders



Sustainable Rivers Program

(Site Status - Advance - Implement - Incorporate - 2022)



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. Gila River
8. Galisteo Creek
9. Pecos River
10. Bois de Sioux River
11. Kansas River
12. Osage River
13. Salt Fork Arkansas River
14. Kiamichi River
15. Brazos River
16. Trinity River
17. Big Cypress Bayou
18. Neches River
19. Des Moines River
20. Iowa River
21. Farm Creek
22. Salt River
23. Mississippi River
24. Kaskaskia River
25. White/Black/Little Red Rivers
26. Fourche LaFave River
27. Cossatot River
28. Atchafalaya River
29. Wabash River
30. Ohio River
31. Green River
32. Barren River
33. Sugar Creek
34. Twelve Pole Creek
35. Kanawha River
36. French Creek
37. Upper Ohio River
38. Chattahoochee River
39. Savannah River
40. Cape Fear River
41. Roanoke River
42. Potomac River
43. Lehigh River
44. Connecticut River



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Sustainable Rivers Program



(Types of Infrastructure and Environmental Actions)

General Reservoirs:

Environmental flows & pool mgmt.



Locks and Dams:

Pool level management & conservation locking



Dry Dams:

Physical habitat improvements





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Sustainable Rivers Program



(Location-based Efforts - 2022)

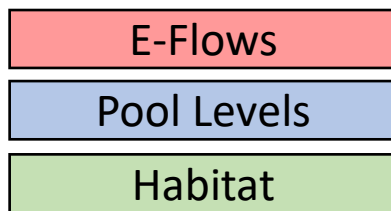
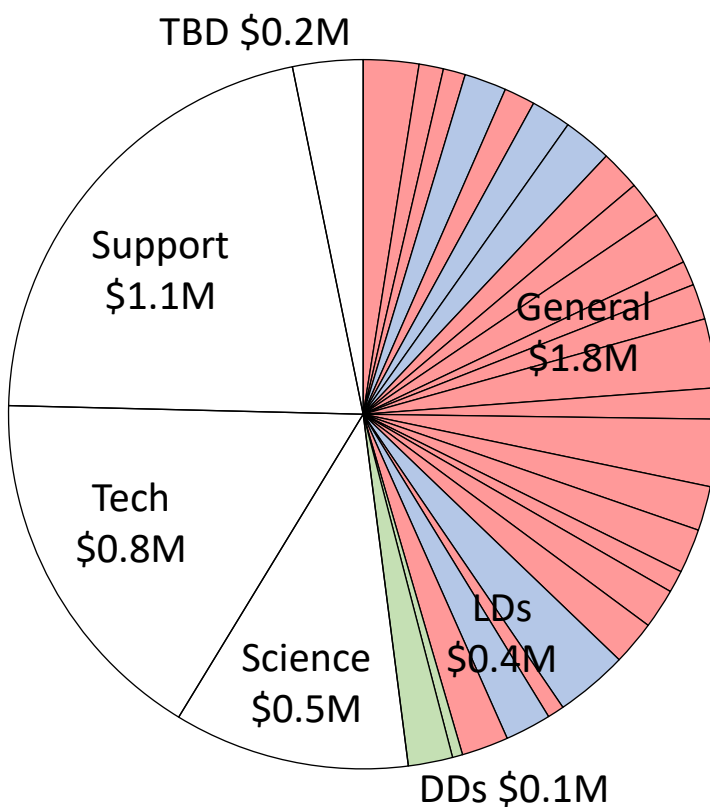
E-Flows



Pool Levels



Habitat Work



Location-based (\$2.4M)

General - Multi-purpose reservoirs

- | | |
|------------------------------|------------------------------|
| 1) LRC - Wabash River | 11) NWK - Osage River |
| 2) LRP - Upper Ohio River | 12) SAM - Chattahoochee R. |
| 3) MVN - Atchafalaya River | 13) SAW - Cape Fear River |
| 4) MVP - Bois de Sioux River | 14) SAW - CF and Roanoke |
| 5) MVR - Iowa River | 15) SAW - Roanoke River |
| 6) MVR - Des Moines River | 16) SWF - Brazos River |
| 7) MVS - Kaskaskia River | 17) SWF - Neches River |
| 8) MVS - Salt River | 18) SWF - Trinity River |
| 9) NAB - NB Potomac River | 19) SWF/ERDC - Trinity River |
| 10) NHP - Hydro and Enviro | 20) TNTCX - Tule |

Locks and Dams - Nav-oriented reservoirs

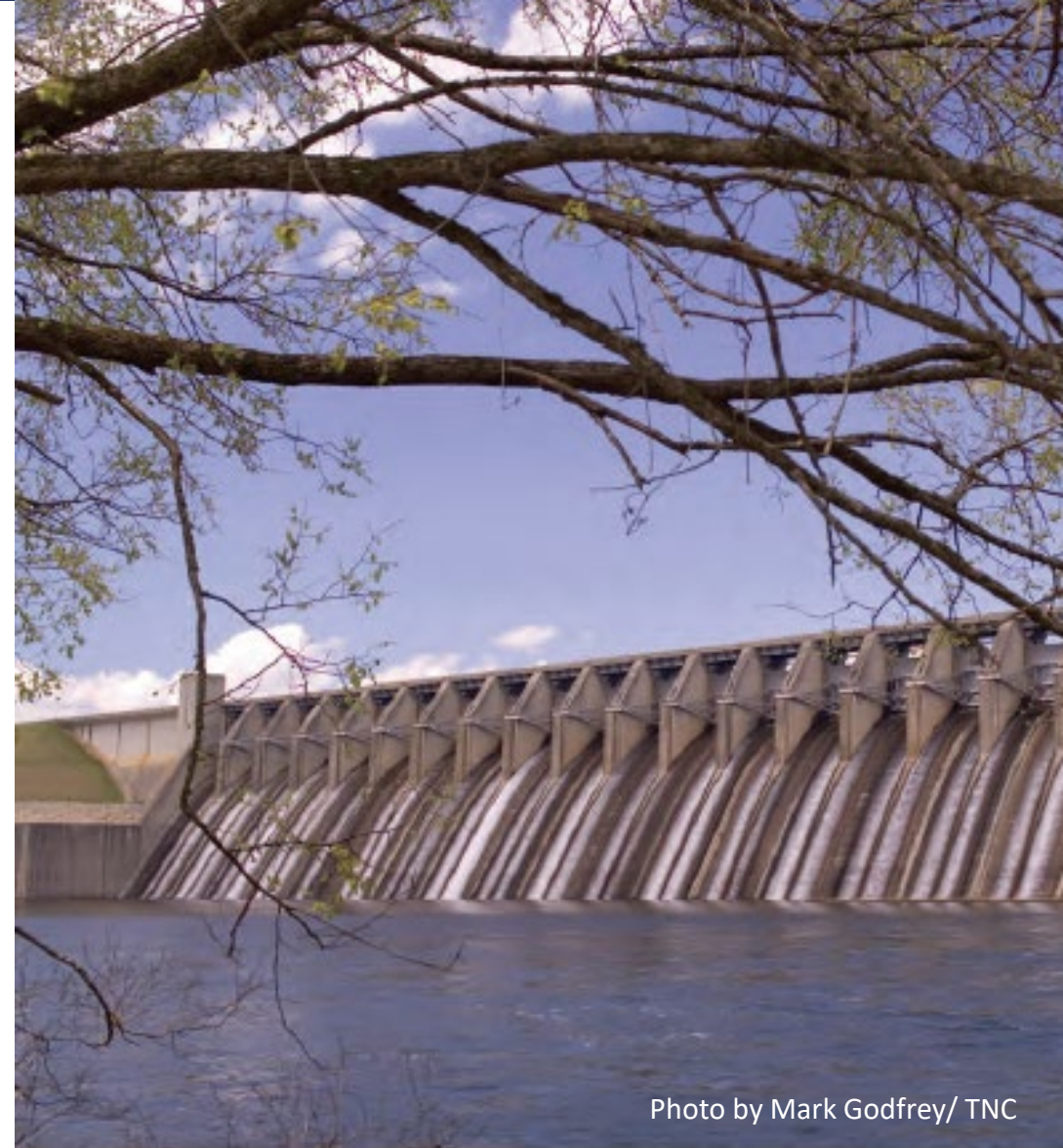
- | | |
|--------------------------|----------------------------|
| 1) LRD - Ohio River | 3) MVS - Mississippi River |
| 2) LRP - Allegheny River | 4) SAW - Cape Fear River |

Dry Dams - Typically no water, passive release

- | |
|--|
| 1) MVR - Farm Creek (Farmdale Reservoir) |
| 2) SPL - Gila River (Painted Rock Reservoir) |

History of the Sustainable Rivers Program (SRP)

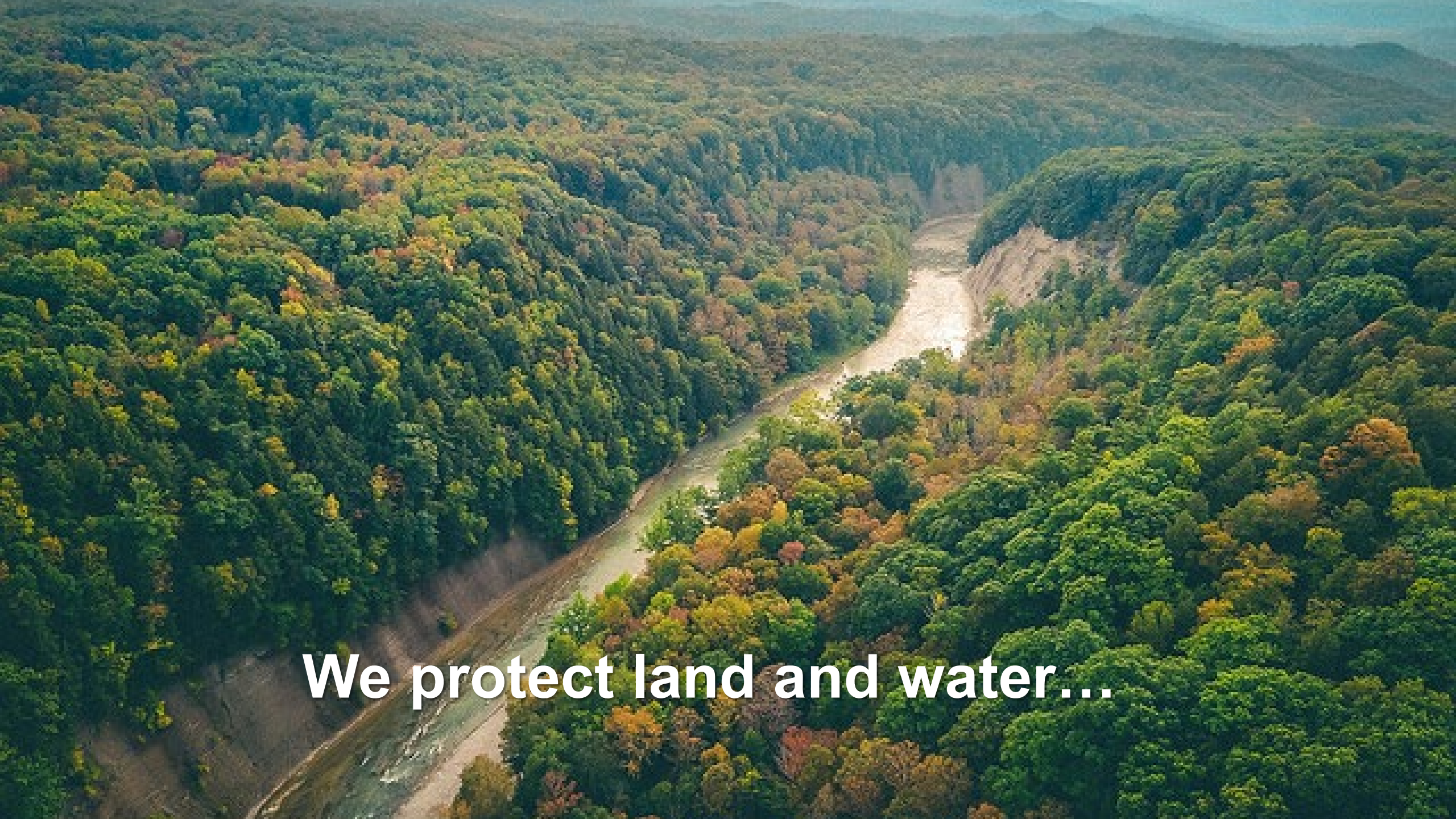
- In the 1990s, The Nature Conservancy approached the U.S. Army Corps of Engineers about modifying flows on the Green River in Kentucky.
- Together, they determined that a new flow regime could enhance fish and mussel populations, maintain flood control, and extend the recreation season.





The mission of The Nature Conservancy

*To conserve the
lands and waters on
which all life depends*



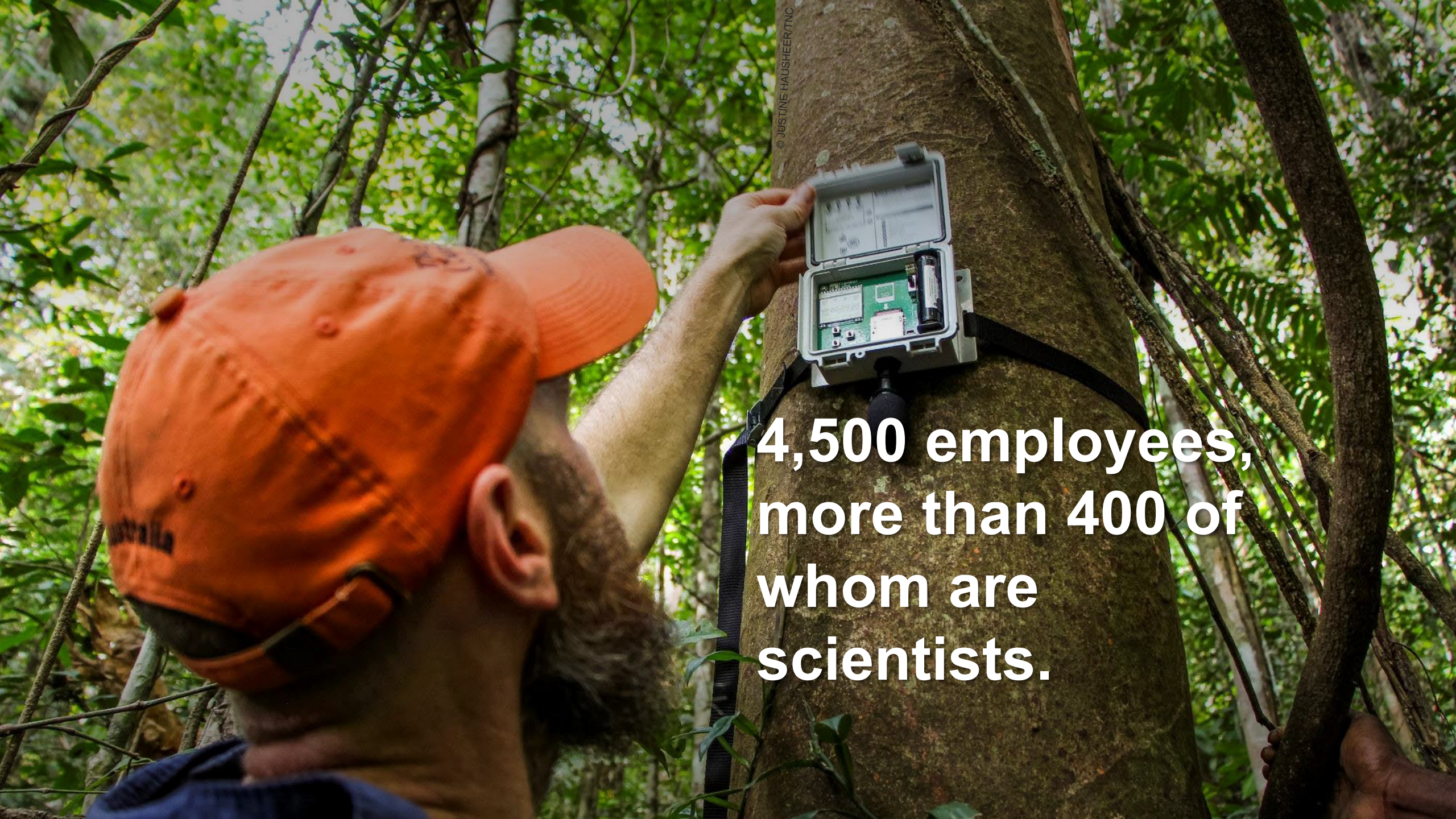
We protect land and water...

A close-up, slightly blurred photograph of a large number of young green seedlings growing in black plastic trays. The seedlings are arranged in neat rows, and their vibrant green leaves contrast with the dark soil and plastic. The background is out of focus, showing more trays extending into the distance.

And we seek to transform the way the world meets its needs for food, energy and water.



**The Nature
Conservancy
has helped protect
more than
125 million
acres of land
worldwide.**

A man wearing an orange baseball cap and a blue shirt is seen from the side, adjusting a grey electronic device mounted on a tree trunk. The device is secured with a black strap and has its lid open, revealing internal components like a battery and a circuit board. The background is a dense forest with green foliage and tree branches.

**4,500 employees,
more than 400 of
whom are
scientists.**

A photograph of two scientists in a field setting. The scientist on the left, with long dark hair, is wearing a blue sweater and is focused on handling a piece of equipment. The scientist on the right, with long blonde hair, is wearing a black t-shirt and is working on a laptop. They are sitting on a blue tarp in a grassy area with trees in the background. The text "We use science and partnerships . . ." is overlaid in white, italicized font across the center of the image.

***We use science and
partnerships . . .***

Scientists working as part of an extensive field study to better understand fire management in the Australian bush ©Mark Godfrey

A group of four people, including an adult and three children, are paddling a green and white canoe on a pond. The water is dark blue with many green lily pads floating on the surface. The canoe has the name "W.E. Saunders" written on its side. The people are wearing red life jackets and are actively paddling. The scene is bright and sunny, with reflections on the water.

**. . . to find solutions to
environmental
challenges.**

Global orientation...





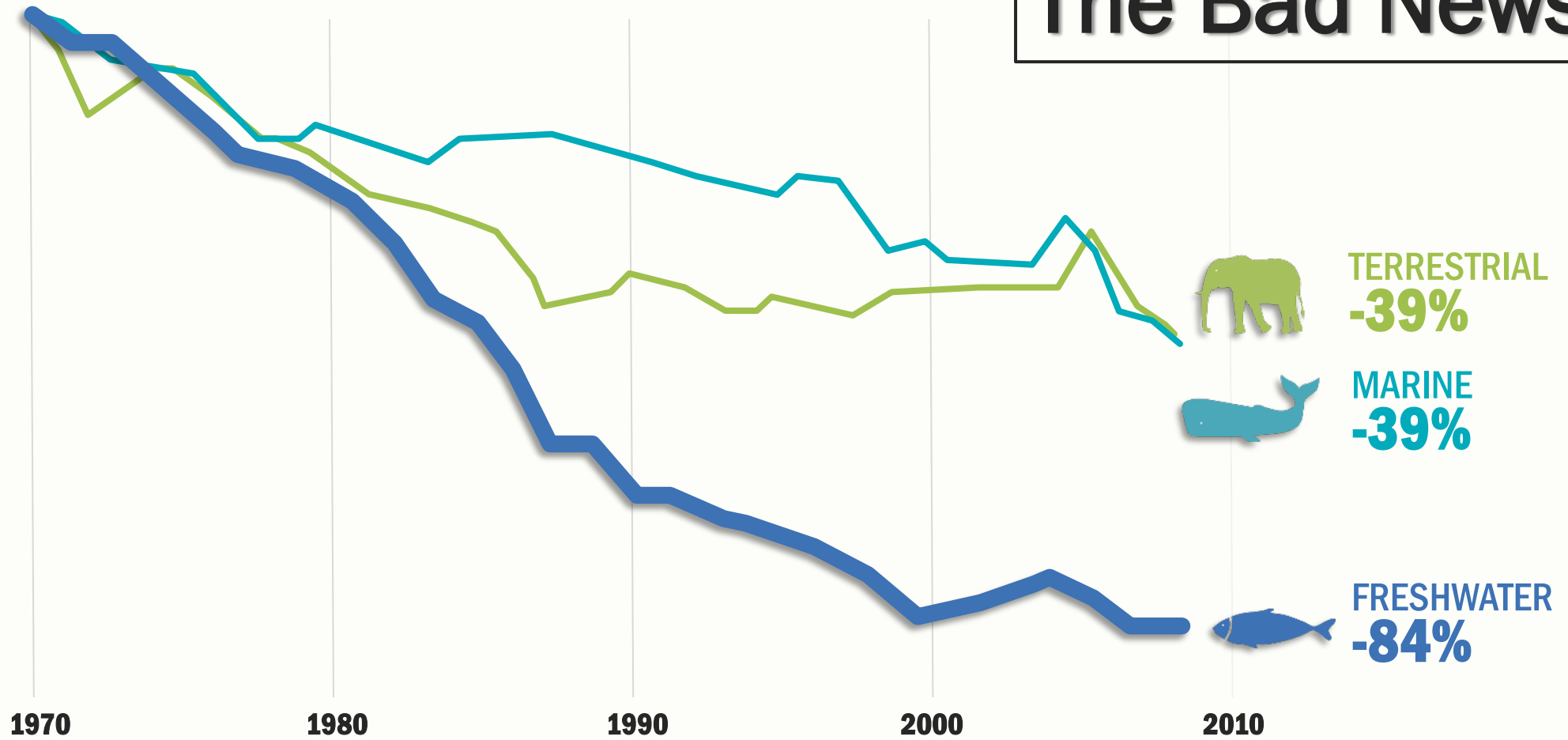
...yet locally based

TNC GOALS
The 2030 Goals
Metrics + Targets

		RECOMMENDED TARGET	TNC GOAL	
CLIMATE	Greenhouse gas mitigation	3 Gt CO ₂ e/yr	3 Gt CO₂e/yr	
	People benefitting from nature to adapt to climate change	100 M people	100 M people	
OCEANS	Ocean area protected	390 M ha	4 B hectares	
	Ocean area with improved management	4 B ha		
	At-risk ocean areas with avoided impact	5 M ha		
ECOSYSTEMS	FRESHWATER: River Systems	River systems protected	500,000 km	1 M km
		River systems with improved management	550,000 km	
		At-risk river systems with avoided impact	75,000 km	
	FRESHWATER: Lakes & Wetlands	Lakes and wetlands protected	6 M ha	30 M hectares
		Lakes and wetlands with improved management	20 M ha	
		At-risk lakes and wetlands with avoided impact	3 M ha	
LANDS	Land area protected	150 M ha	650 M hectares	
	Land area with improved management	400 M ha		
	At-risk natural lands with avoided conversion	100 M ha		
PEOPLE benefitting from healthy Oceans, Freshwater & Lands	People with increased sustainable, place-based economic opportunity	25 M people	45 M people	
	People with increased security of rights to territory or resources	8 M people		
	People with increased ability to meaningfully participate in decision-making about territory or resources	12 M people		

Freshwater Species Decline: 1970-2010

The Bad News



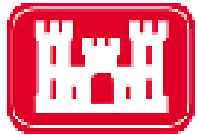


The Good News

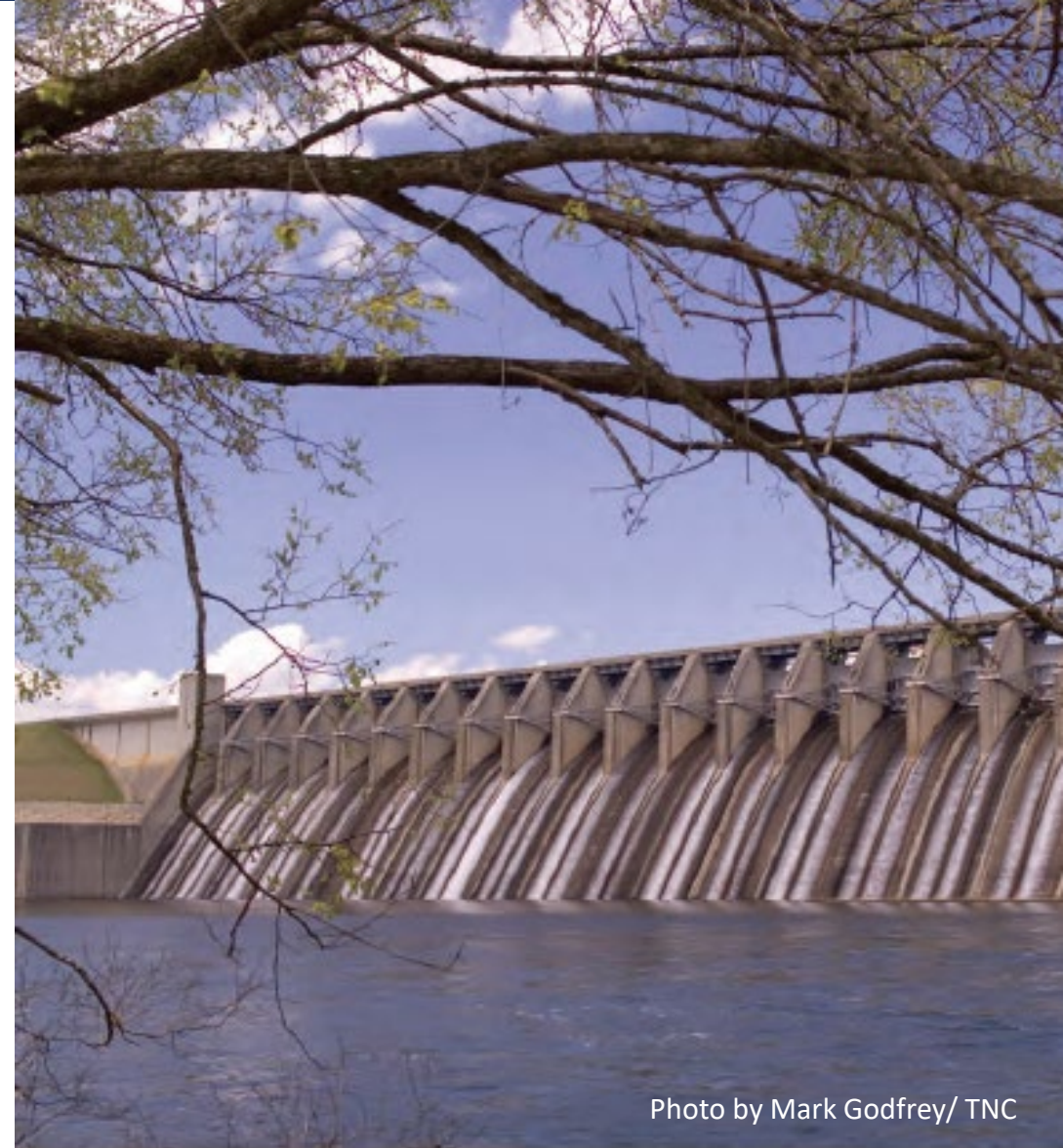
Management of existing dams, locks, and reservoirs can be used as a tool to restore ecosystems.

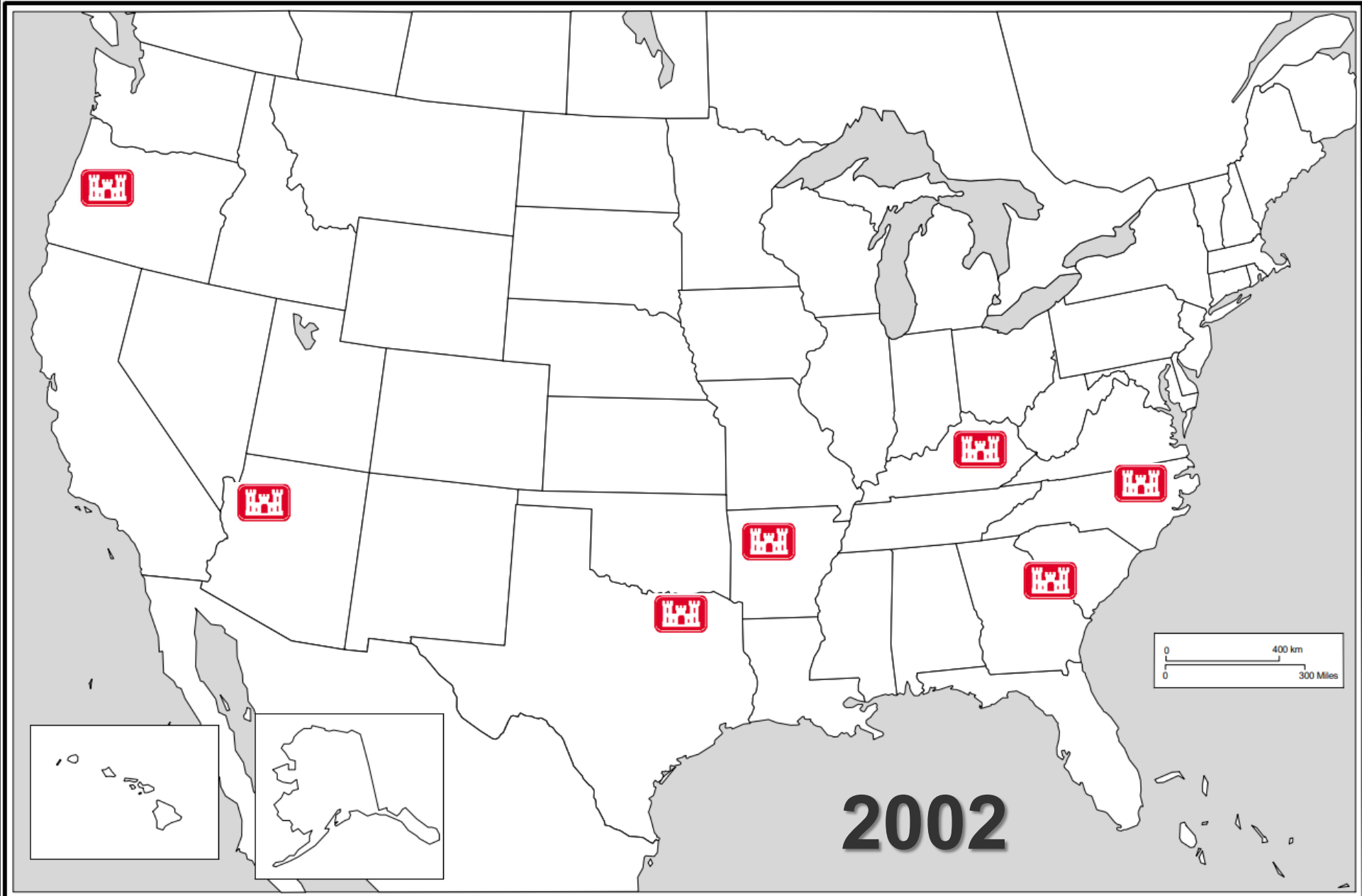
Local Success at the Green River Led to National Partnership

- In 2002, TNC & USACE entered into a Memorandum of Understanding to launch a nationwide “Sustainable Rivers Program.”

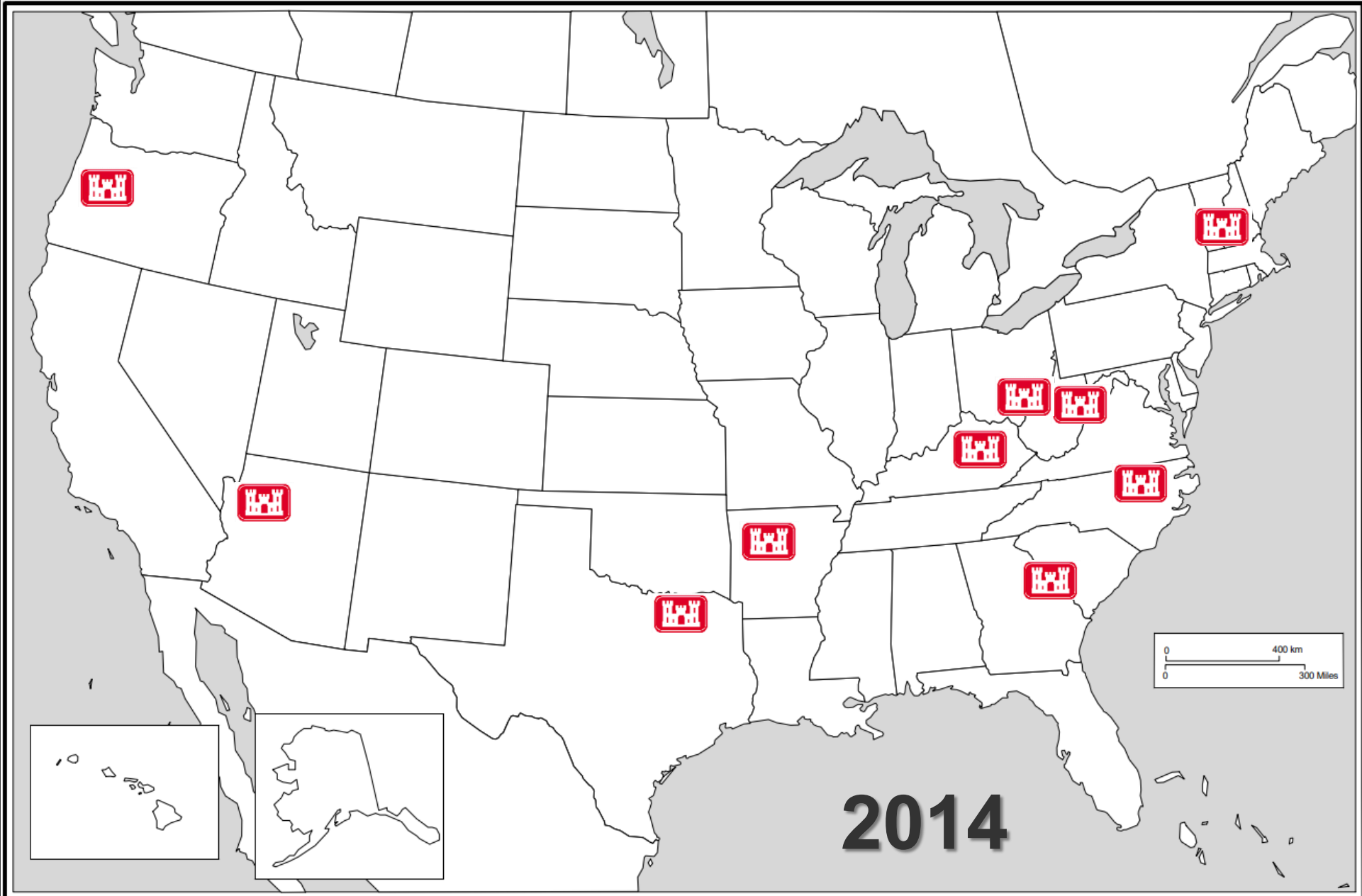


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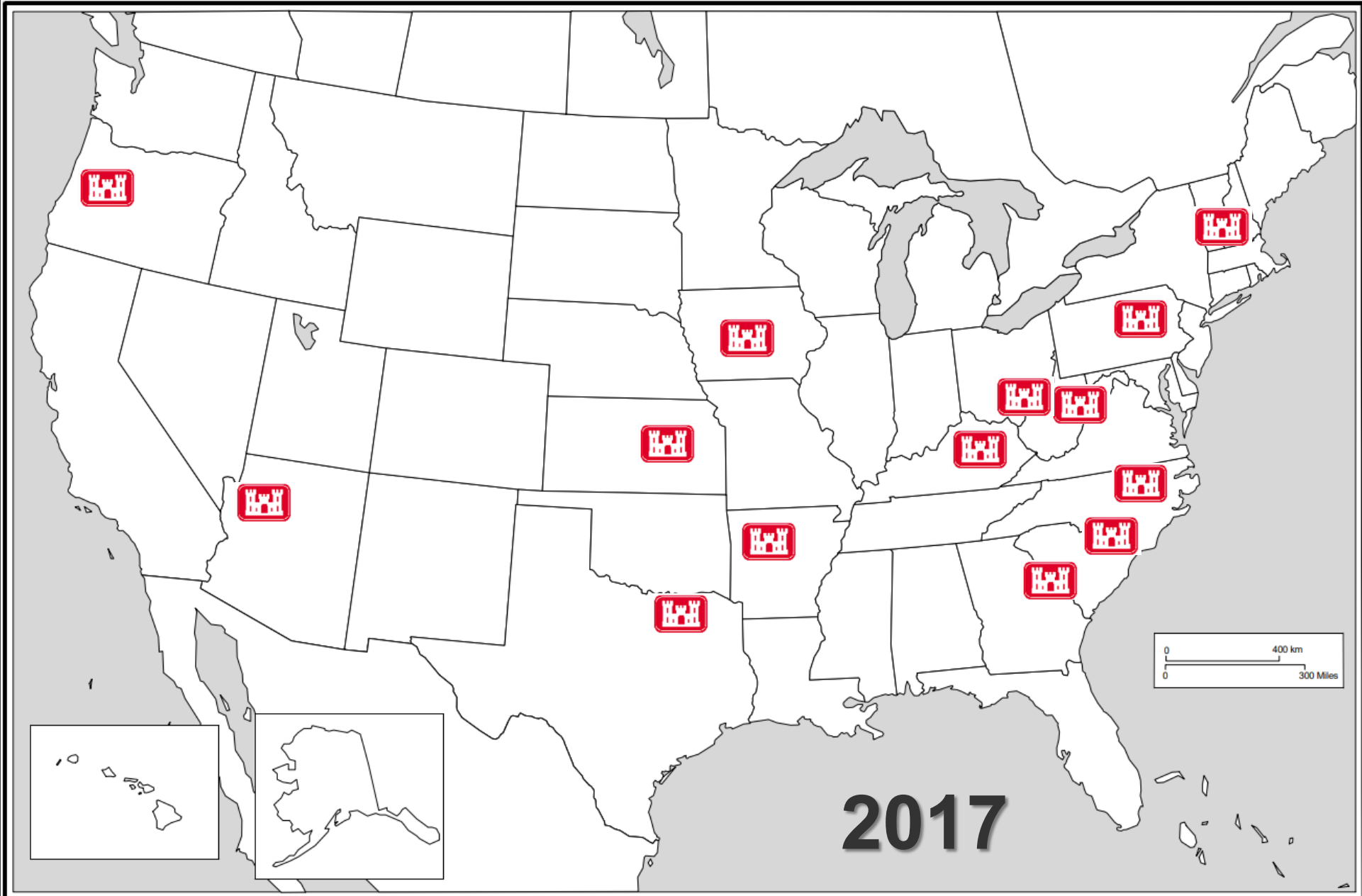




2002

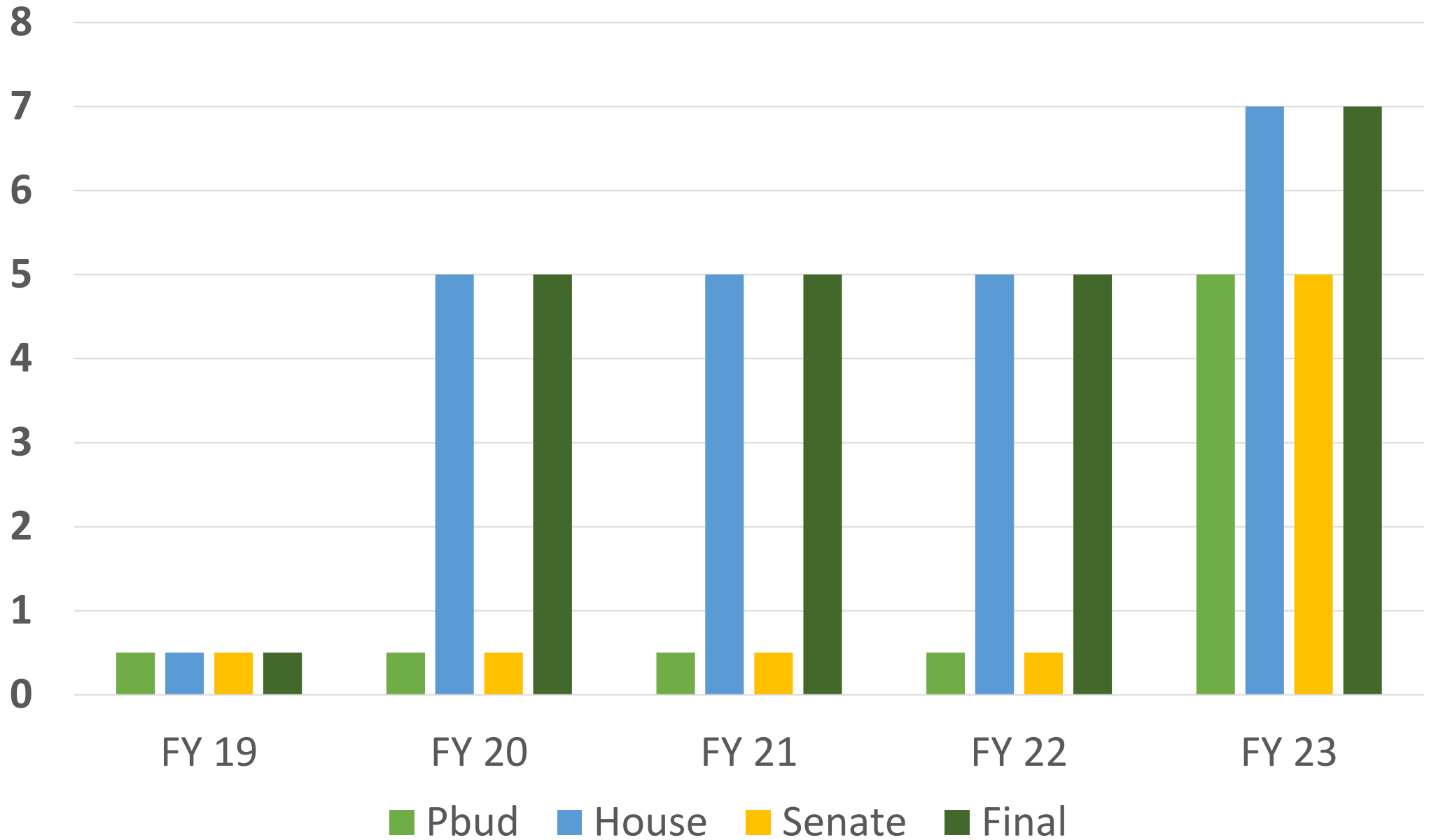


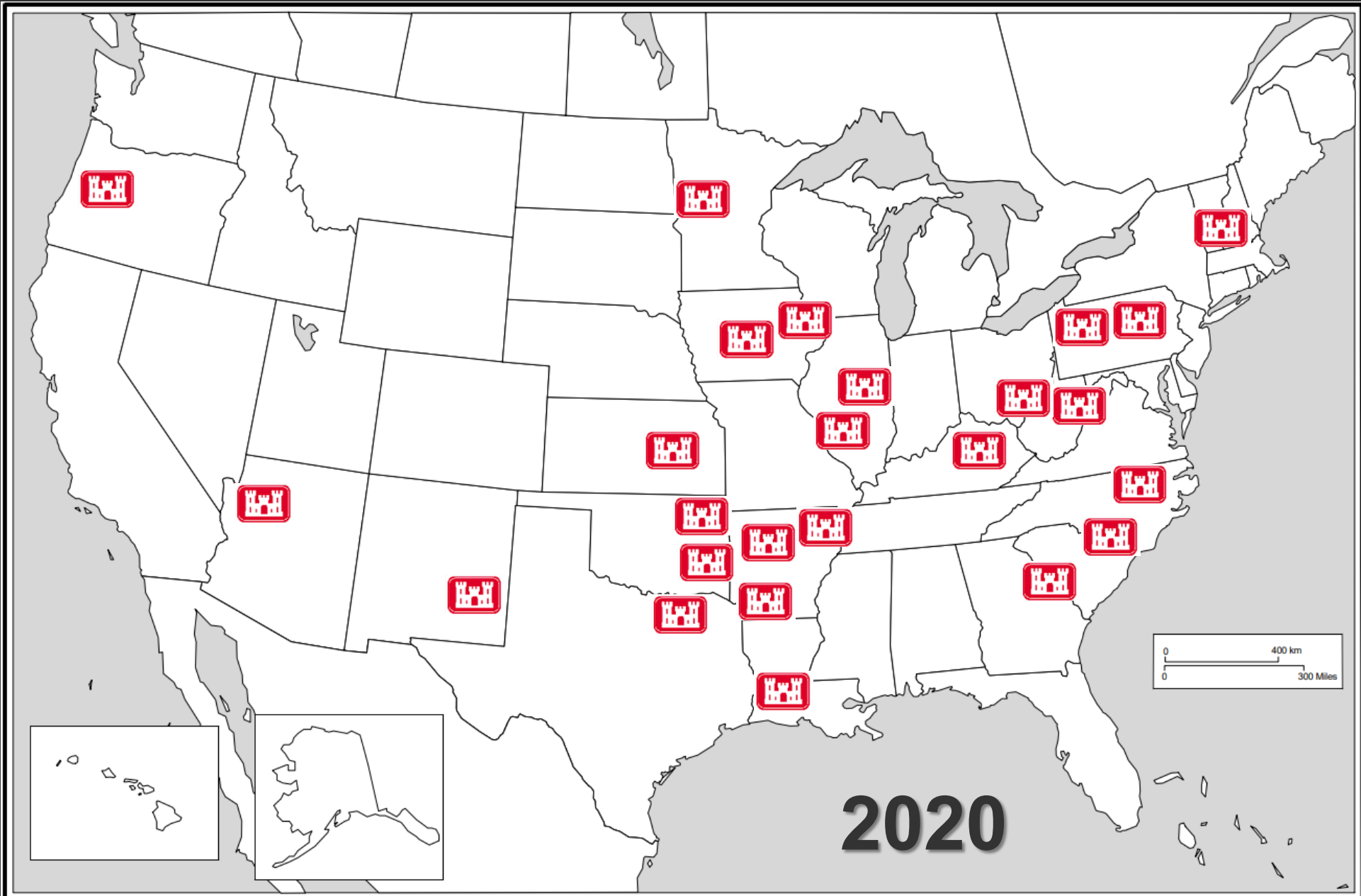
2014

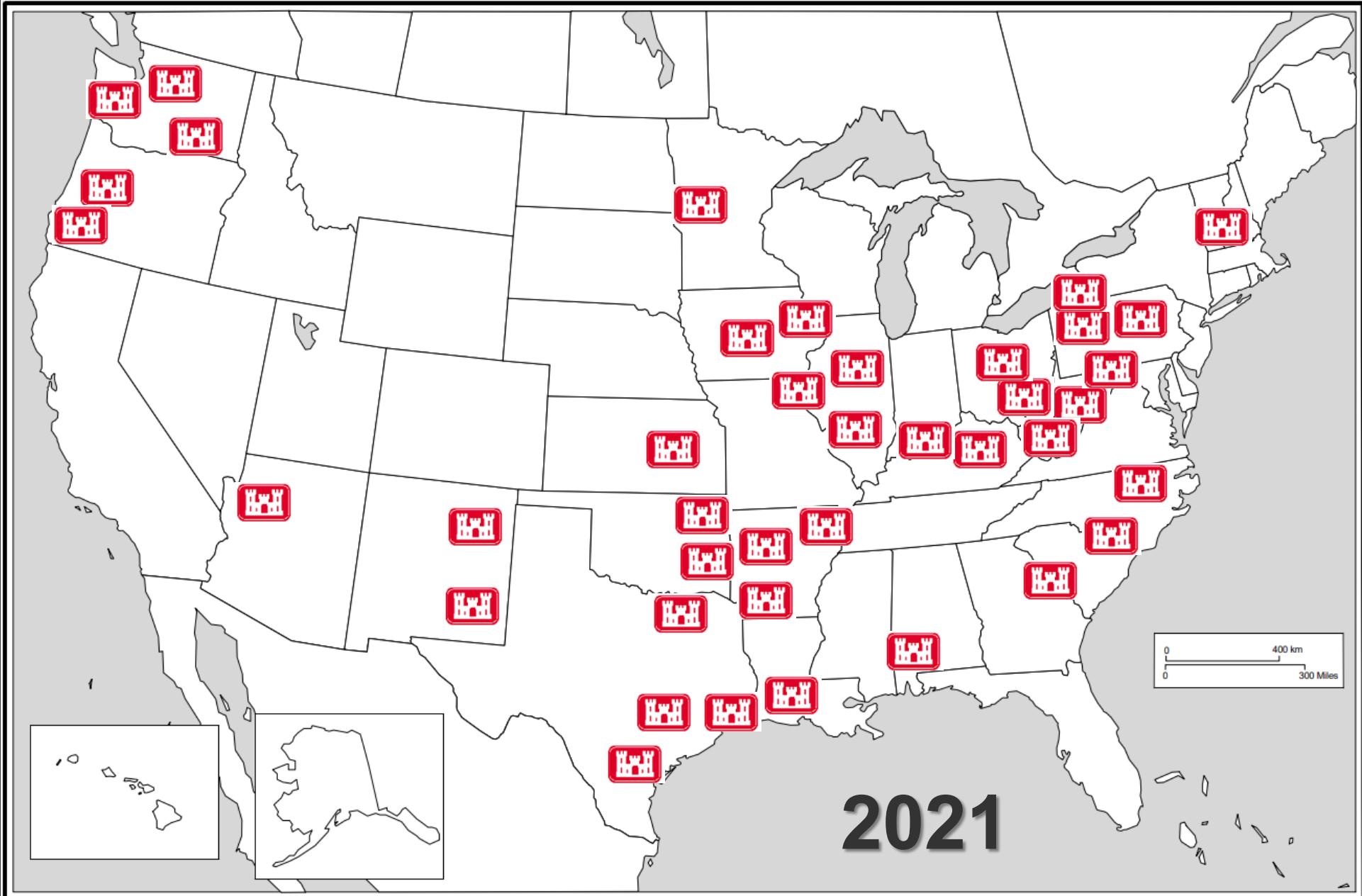


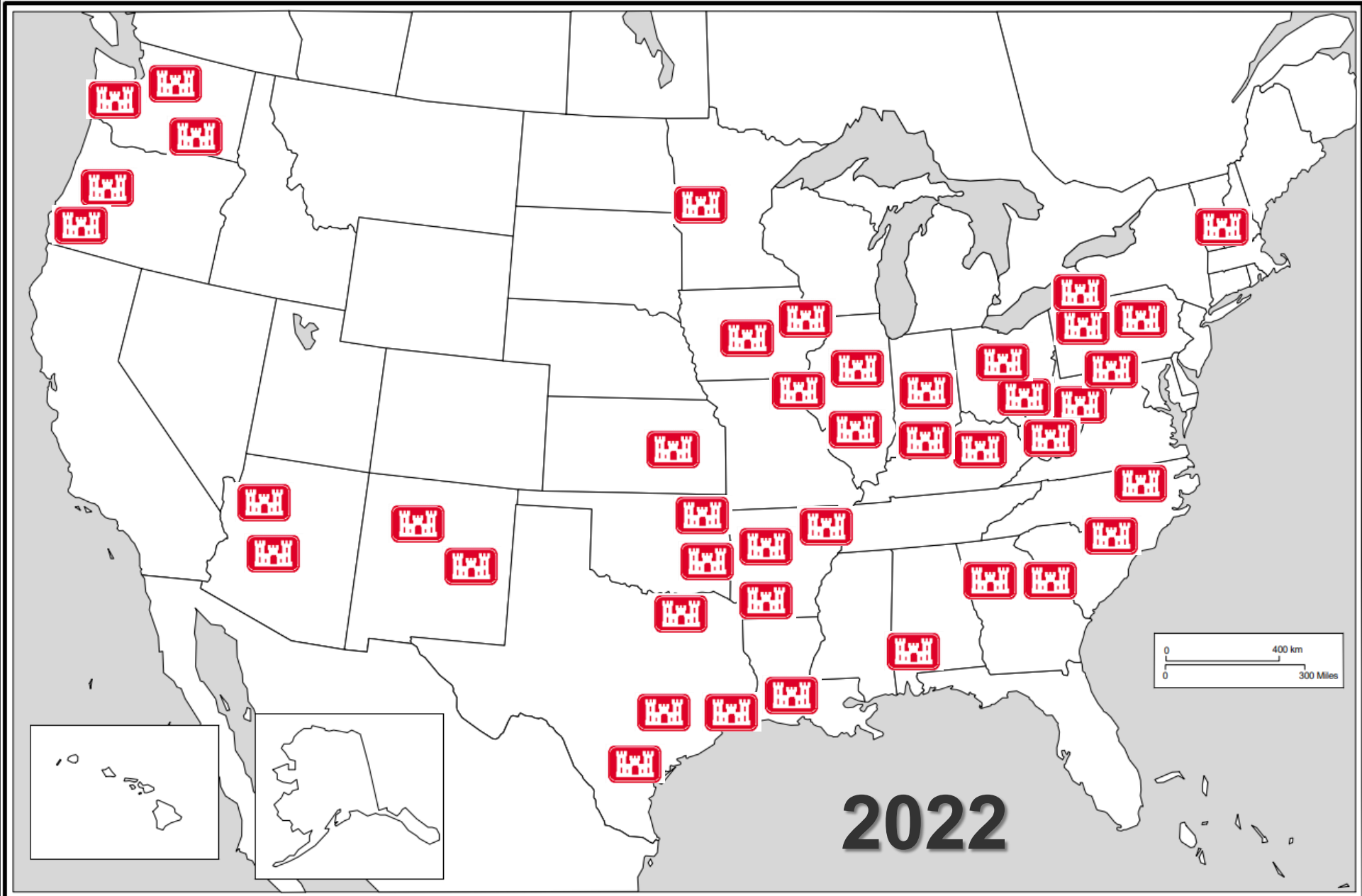
2017

SRP Funding History, FY19 - FY23, in Millions (\$)











Sustainable Rivers Program at 20 yrs

- 44 rivers
- 12,069 miles of rivers – 23% of USACE's portfolio
- 90+ reservoirs,
- 7 lock & dam systems,
- 5 dry dams
- 23 of 38 USACE Districts engaged

SRP Case Studies from St Louis



MVS SRP PROJECTS

- Environmental Pool Management (EPM)- Upper Mississippi River (UMR) Pools 24, 25, and 26
- Pool Level Management on the Kaskaskia River
- Water Level Management of Pool 26 for Migratory Shorebird Habitat
- Management of flows at L&D 26 for Lake Sturgeon
- Management of flows below Mark Twain reregulation pool for Lake Sturgeon



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ENVIRONMENTAL POOL MANAGEMENT ON THE UMR- POOLS 24, 25, & 26





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EPM GOALS

1. A safe and dependable navigation channel in an environmentally sensitive manner





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EMP GOALS

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2. Utilization of the following vegetative growth parameters:

a. Employ pool drawdowns beginning 1st of April, before majority of fish spawn begins. For vegetative growth, continue drawdowns from the 1st of May to the 30th of July, as this period is the most suitable for vegetative growth and seed production.

b. Minimum of 0.5 ft. drawdown for 30 days.





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EPM GOALS

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3. Important Feature: Close coordination with resource managers in the field who provide valuable insight into actual conditions, and at times provide significant suggestions relative to needed adjustments. As with any natural process the vegetative response will vary from year to year (time of year, temp, and precipitation all have an effect)





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LOCKS AND DAMS



L&D 24



Melvin Price Locks & Dam



L&D 25



Kaskaskia L&D





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LOCKS AND DAMS

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Dam Point Control vs Hinge Point Control

–Dam Point Control

- The Navigation Pool is regulated at the Lock and Dam within 0.5 to 1.0 ft band limits

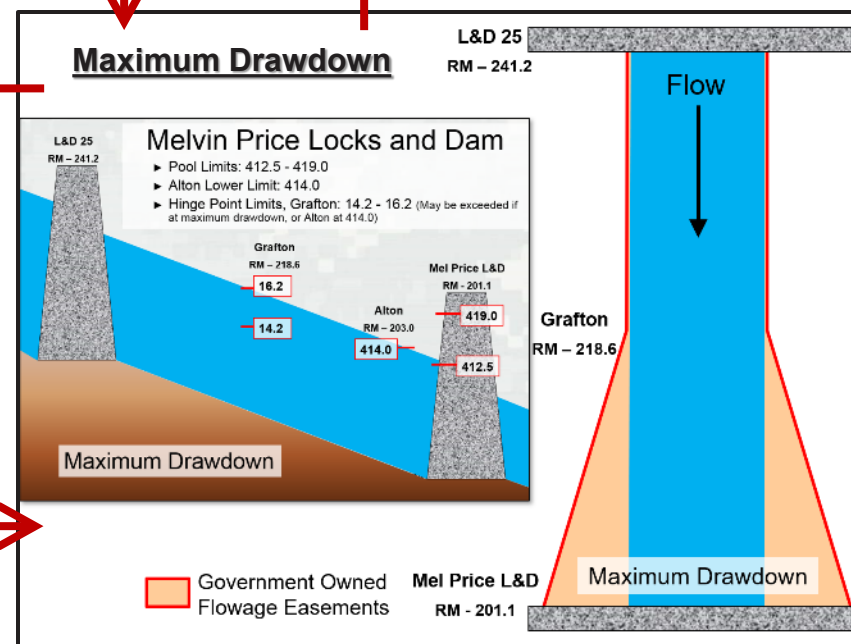
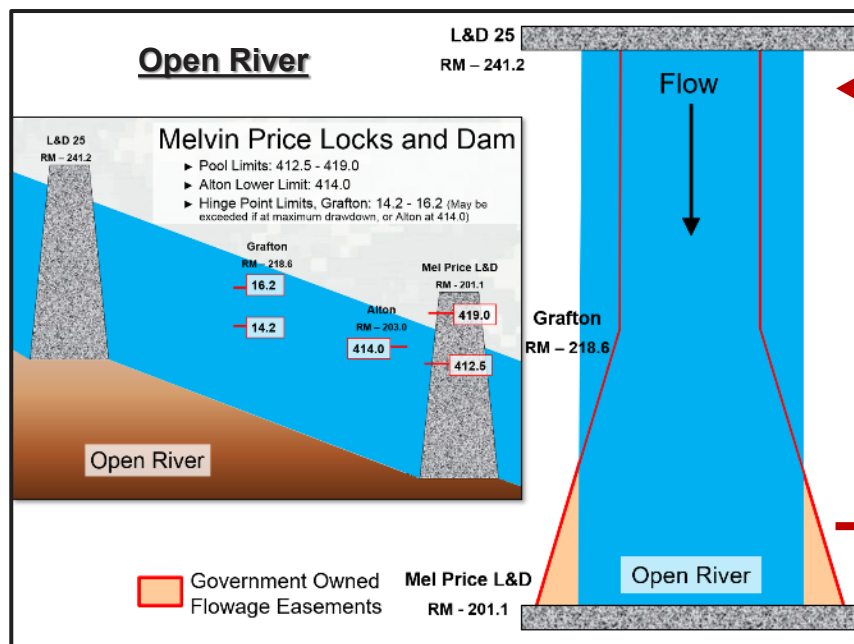
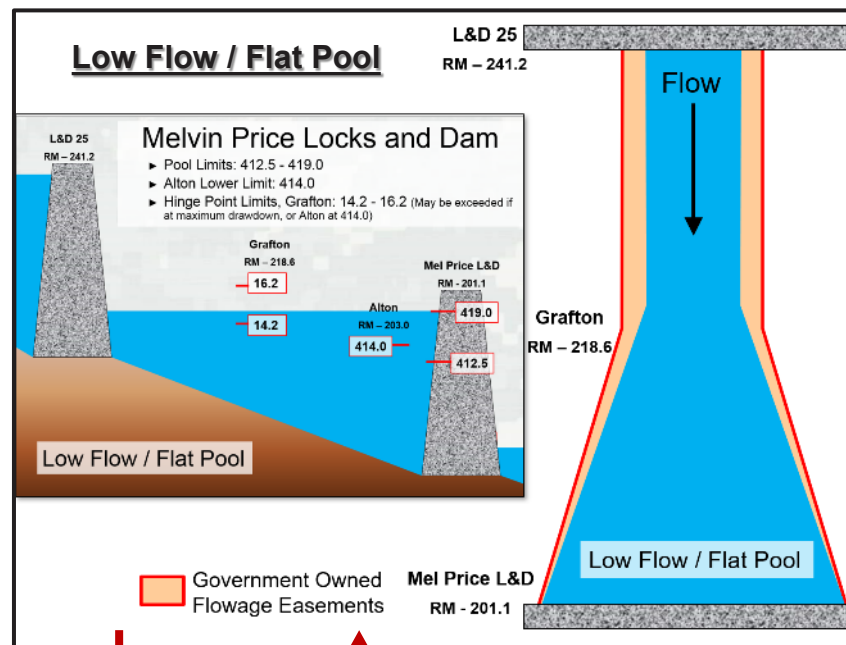
–Hinge Point Control

- The Navigation Pool is regulated from two points, the Lock and Dam and a location in the pool

MEL PRICE L&D

Hinge Point Operations

- Low flows requires being at maximum regulated pool to maintain navigation depths throughout the pool
- Higher flows encroaches upon flowage easements (i.e. hinge point upper limit)
- Open river occurs once gates are free of the water and river levels are determined by river flows





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What We Are Learning - Why 90 days matters





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ESTIMATING SEED YIELD AND DUCK-ENERGY DAYS

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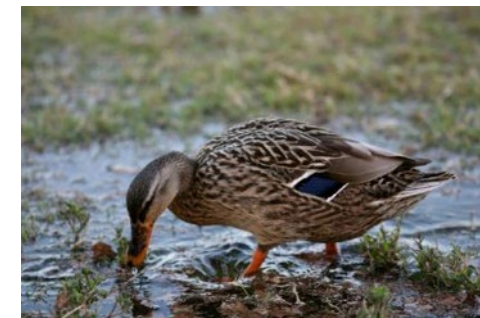
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2017 SEED PRODUCTION

	Pool 26	Pool 25	Pool 24	TOTAL
Acres	753.57	519.00	338.77	1,611.34
lbs Seed	879,416.19	853,391.70	424,173.92	2,156,981.81
Avg lbs Seed/Ac	1,167.00	1,644.30	1,252.10	1354.46
Duck Energy Days (DEDs)	3,481,920.00	2,875,800.00	1,767,720.00	8,125,440.00
DEDs for 30 Days	58,032.00	47,930.00	29,462.00	270,848.00

EPM produced enough seed to feed 8 Million ducks for 1 day in 2017!!





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KASKASKIA RIVER – POOL LEVEL MANAGEMENT

-Applying principles and lessons learned from EPM to the Kaskaskia River System

- Carlyle Lake
 - Lake Shelbyville
 - Kaskaskia Lock & Dam
- Public Outreach
 - Resource Agency Coordination
 - NGOs
 - Monitoring- Vegetation, imagery analysis, outreach video





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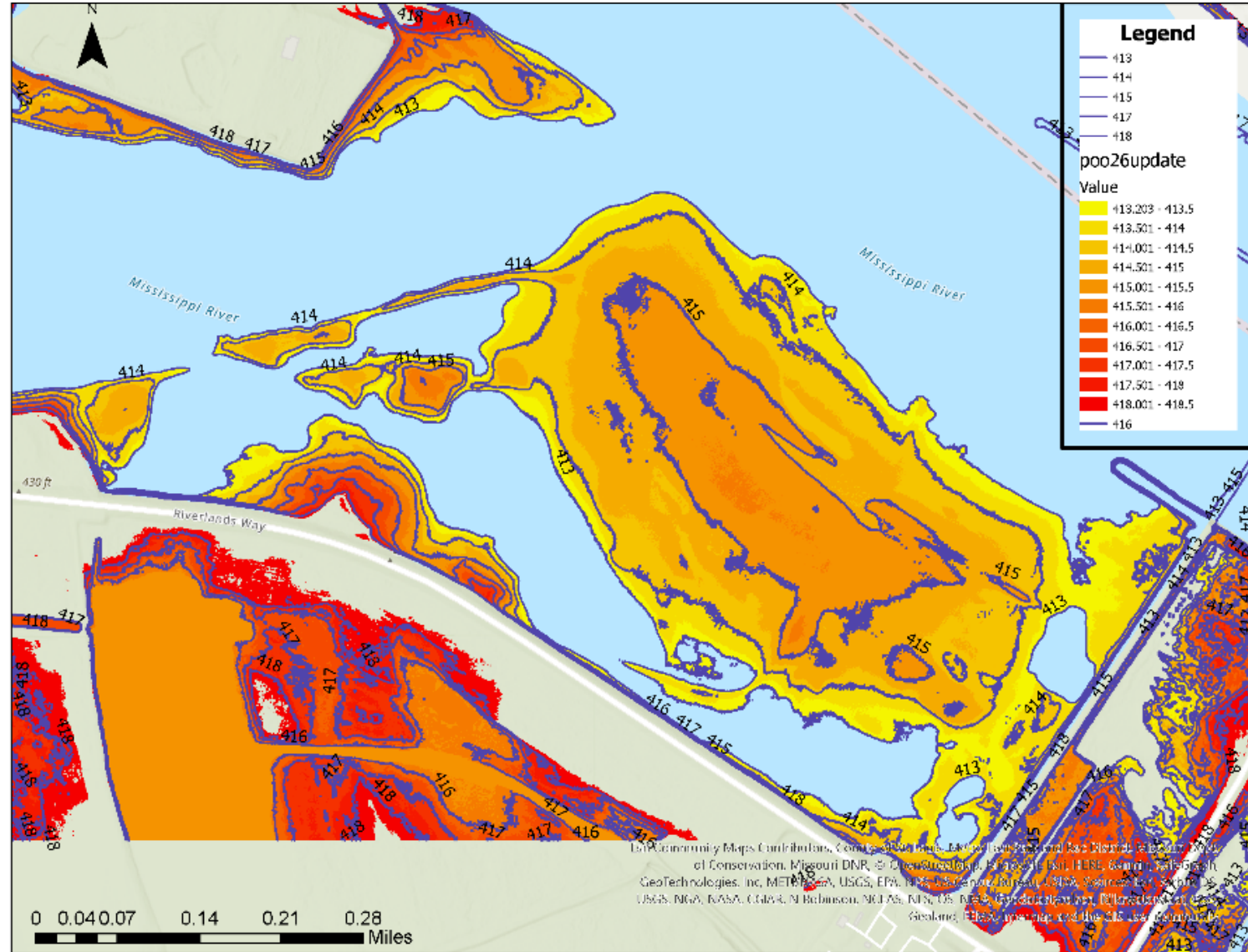


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POOL 26 - WATER LEVEL MANAGEMENT FOR SHOREBIRDS

Assess modifications to water level management during shorebird migration to enhance foraging habitat.





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LAKE STURGEON AT MELVIN PRICE LOCKS & DAM





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LAKE STURGEON

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Facts

- 1 of 3 sturgeon species in Mississippi River
- Can reach 8 feet long & weigh over 200 lbs
- Can live over 100 years
- Sexually mature between 20 & 30 yrs old
- Females spawn every 4-7 years
- Males spawn every 2 years



Conservation

- LKSN severely depleted during the late 1800's
 - Commercial overharvest
 - Pollution
 - Habitat Degradation
- Deemed “incapable of recovery” in the mid-1900's
- Designated as State-endangered in IL & MO 1970's
- USFWS and MO stocking efforts
 - MO started in 1984





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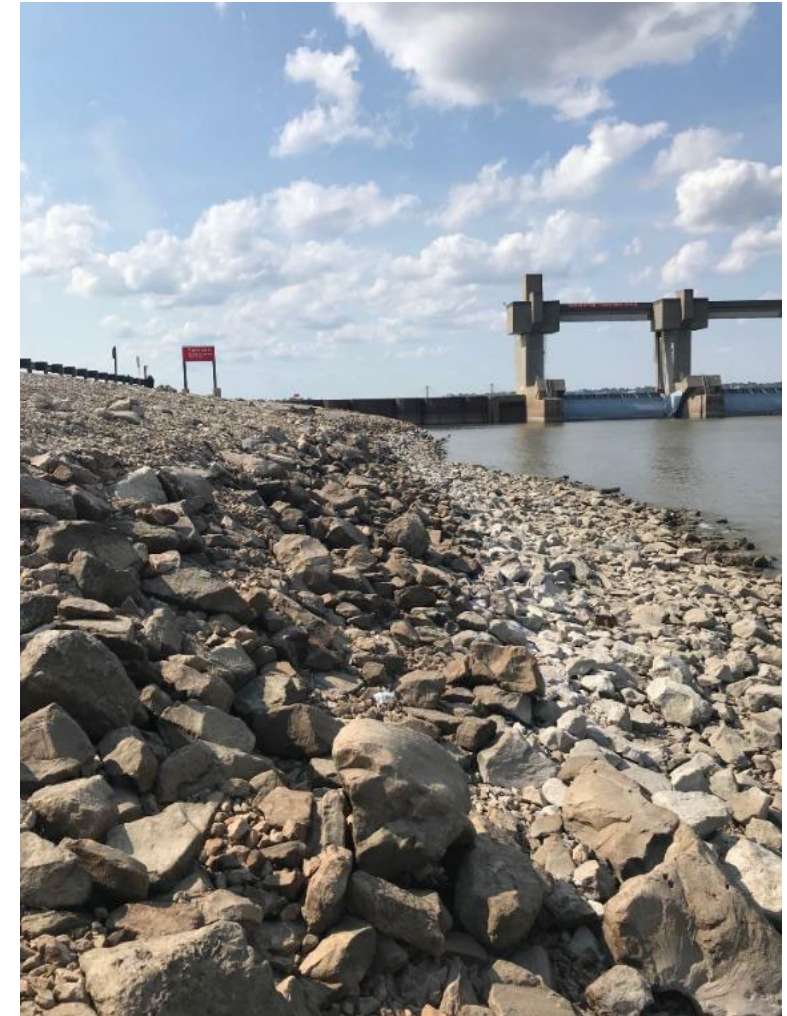
LAKE STURGEON SPAWNING

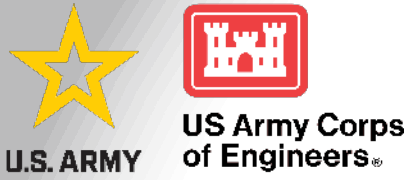
Critical Elements

- Water temps ~55 degrees
 - April thru mid-May
- Rocky substrate
- Minimum velocities of 1.0-1.5 ft/s

Known Spawning Events prior to implementation of e- flows:

- Mel Price TW in 2015

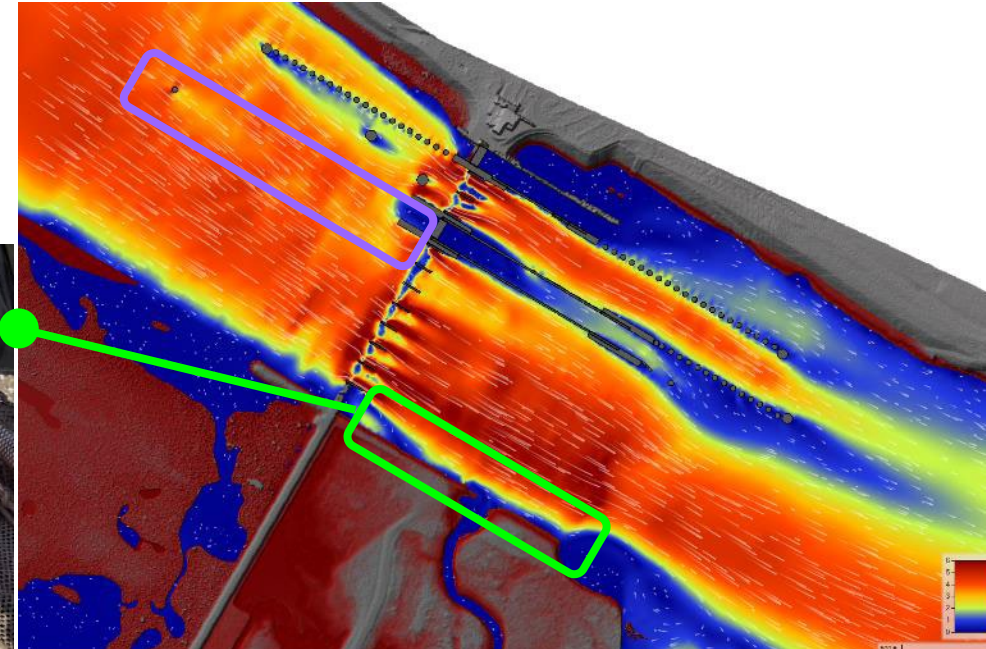
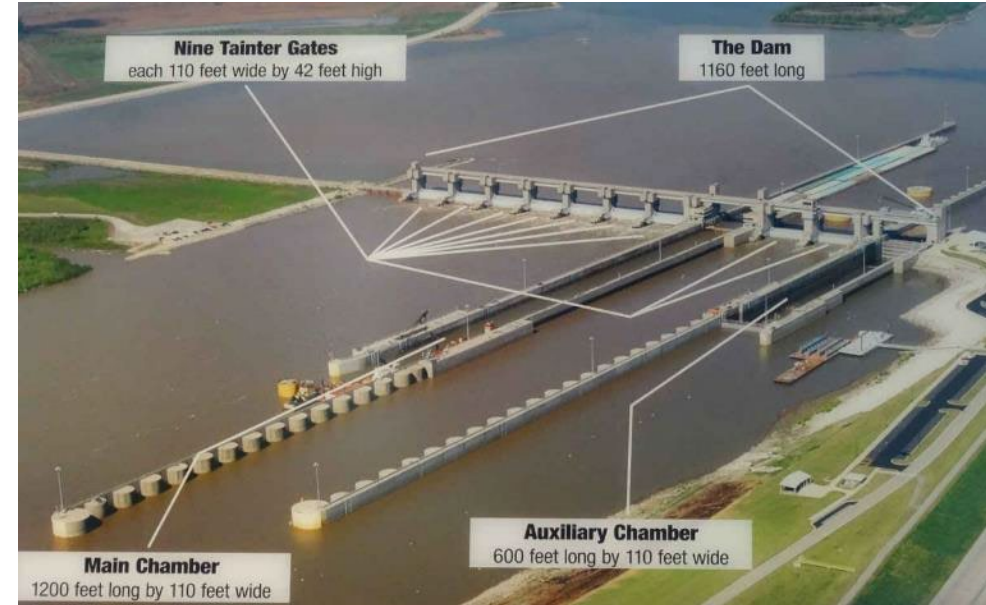




MEL PRICE L&D

HEC RAS 2D Modeling

- Evaluate conditions surrounding 2015 event
 - flows, velocities, gate settings, etc.
- Develop recommended gates settings for various conditions
- Insure no negative impacts to Navigation approach
- Reevaluated conditions during the 2022 spawning season
- Model improvements based on field data collection & observations
- Additional model improvements based on 2023 field data collection
- Develop gate table to use with various conditions during future spawning seasons





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SPAWNING!

23 APR 2022 & 17 APR 2023





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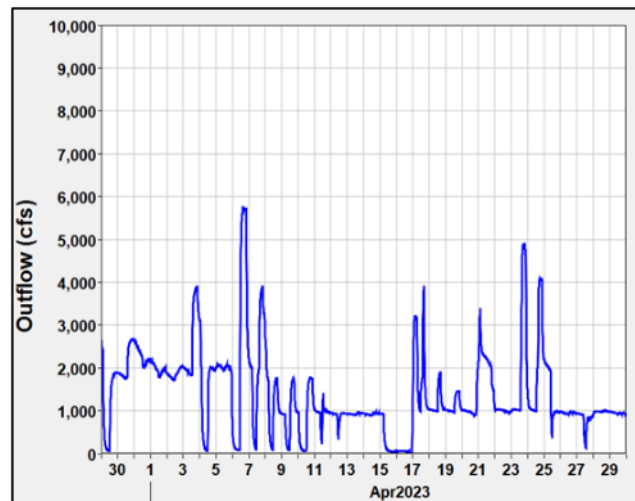
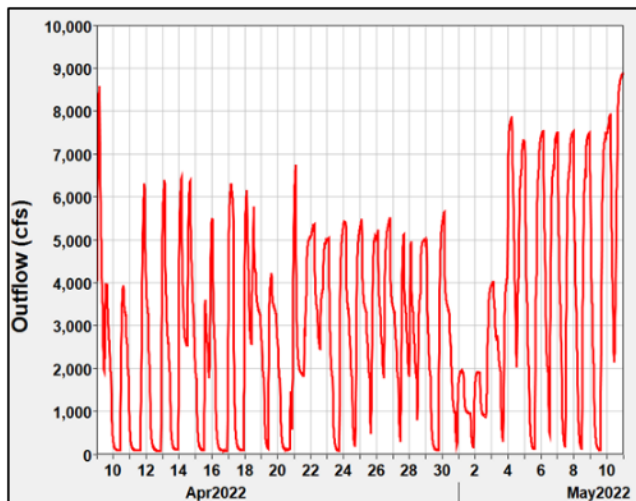
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SALT RIVER LAKE STURGEON E-FLOWS

Expansion to new river system in 2022

- Modeling
- Monitoring
- Public Outreach
- Agency Coordination/Collaboration
- Development of flow recommendations





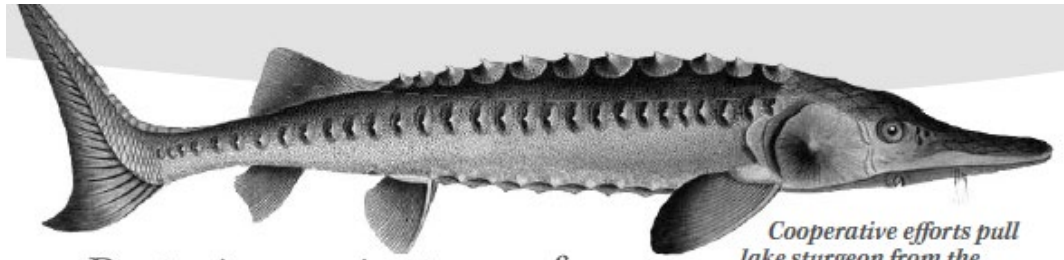
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TELL THE STORY!!!



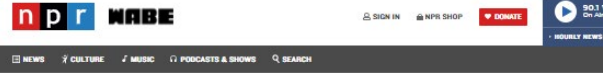
Restoring ancient megafauna Cooperative efforts pull lake sturgeon from the brink of extinction

Missouri Dept. of Conservation 1h

MDC and USACE coordinate efforts to create favorable conditions for endangered lake sturgeon to spawn again. After a gap of seven years, the prehistoric fis... See More

YEARS, it was an epic moment for the lake re the silty waters of the Mississippi River if a parking lot, a cluster of now-endangered below Mel Price Dam 26 at Alton, Illinois, as they cast lines in search of a dinner of .bsauties from a popular fishing spot on the sted a video online, and that's what alerted y now hope to replicate elsewhere. he lake sturgeon to recover?" ask Engineers wildlife biologist. He wor West Alton, Mo., along the river just where the rare spawning incident o been found spawning below dams i dam itself have the right water flo ecipe for sturgeon to spawn? He re nservancy's Sustainable Rivers Proj dams to reproduce spawning condi ow and gate conditions. the water control and hydraulics d ers District Office to create models ing. Teams take temperature and di st Alton for historic comparisons.

Recovery
The recovery was no accident; instead, it's the result of long-time work by the Wisconsin Department of Natural Resources and USFWS which collect roe and mill for the restocking program, said Travis Moore, an MDC fisheries management biologist. Fertilized eggs raised to fry and fingerlings in the USFWS Genoa National Fish Hatchery in Wisconsin are stocked in the Upper Mississippi. Fish raised in the MDC Lost Valley Fish Hatchery in Warsaw, Missouri, are stocked into Missouri tributaries.



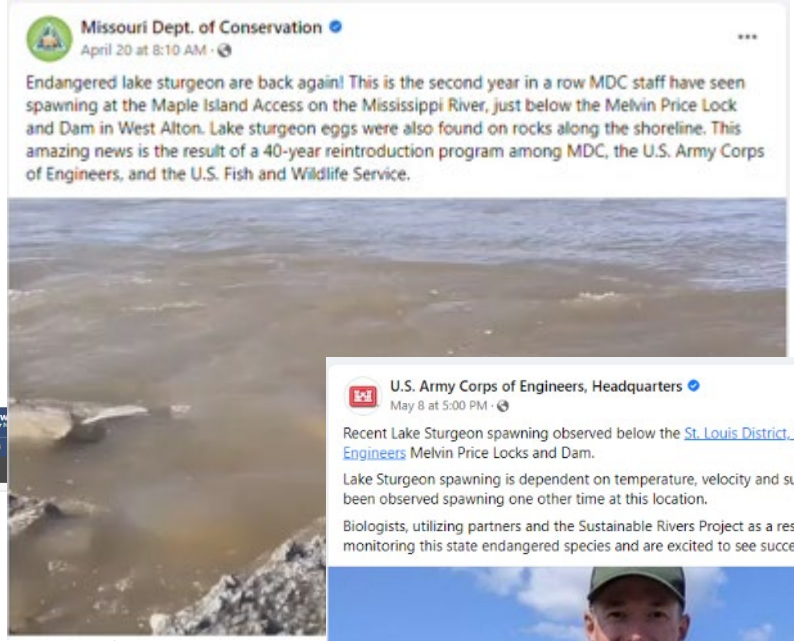
Missouri scientists work to save lake sturgeon by electronically tracking them

May 16, 2022 · 12:08 PM ET

CHARLA PARZAH



Sarah Papp, Missouri Department of Conservation Fisheries Management Biologist, downloads fish tracking data on the Mississippi River at West Alton, Mo. Photo © Luke Price/USACE



U.S. Army Corps of Engineers, Headquarters
Recent Lake Sturgeon spawning observed below the [St. Louis District, U.S. Army Corps of Engineers](#) Melvin Price Locks and Dam. Lake Sturgeon spawning is dependent on temperature, velocity and substrate. Females have only been observed spawning one other time at this location. Biologists, utilizing partners and the Sustainable Rivers Project as a resource, have been monitoring this state endangered species and are excited to see successful spawning occurring.



149

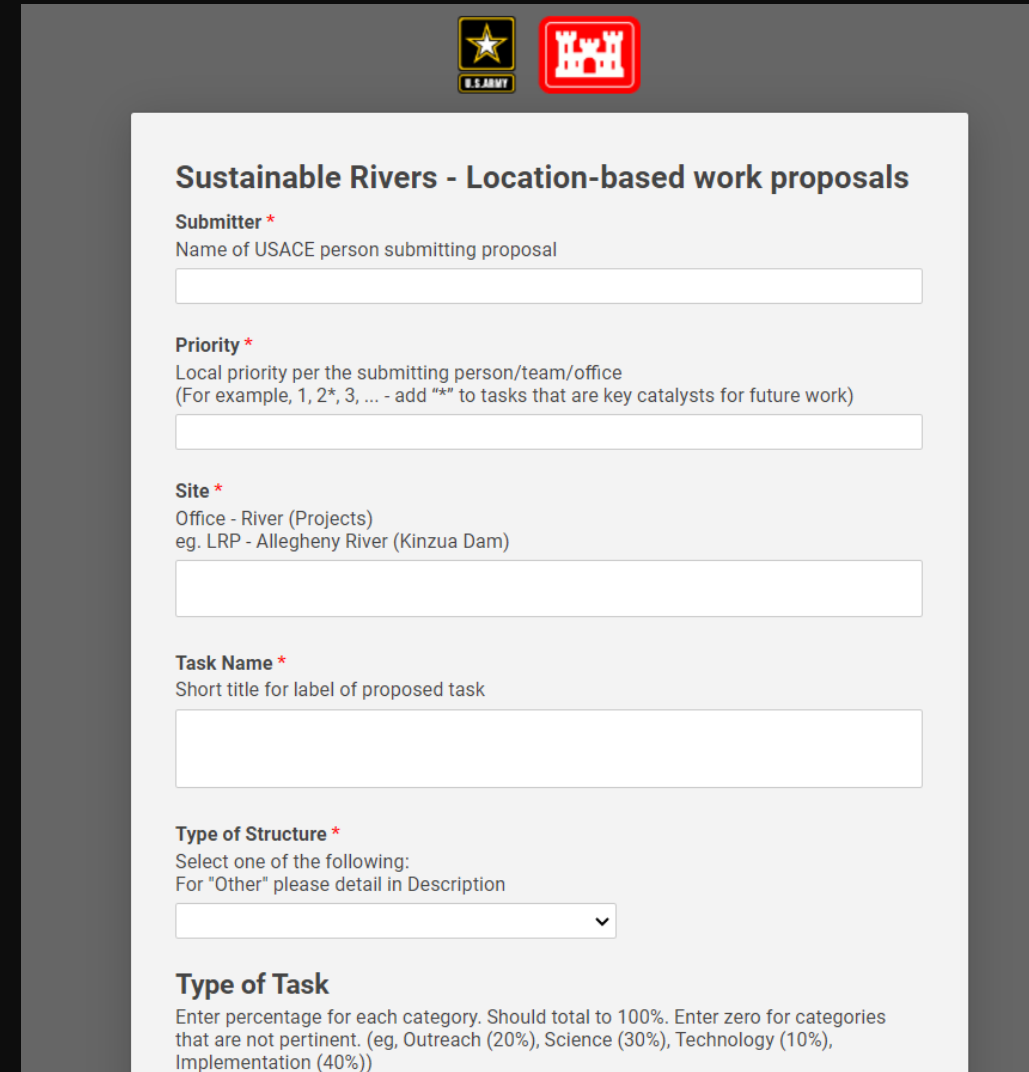
7 comments 6 shares

FY24 Request for Proposals

- Open - Due 14 Sept
- Webinars on 17 Aug and 28 Aug, 2-3pm ET
- Proposal process is simple

Link to the online RFP application

<https://app.smartsheetgov.com/b/form/5331fbef090c47078cc569584aeb3c2a>



The screenshot shows a web form for 'Sustainable Rivers - Location-based work proposals'. At the top right are the U.S. Army and USACE logos. The form fields are:

- Submitter ***: Name of USACE person submitting proposal (text input)
- Priority ***: Local priority per the submitting person/team/office (For example, 1, 2*, 3, ... - add "*" to tasks that are key catalysts for future work) (text input)
- Site ***: Office - River (Projects) eg. LRP - Allegheny River (Kinzuva Dam) (text input)
- Task Name ***: Short title for label of proposed task (text input)
- Type of Structure ***: Select one of the following: For "Other" please detail in Description (dropdown menu)
- Type of Task**: Enter percentage for each category. Should total to 100%. Enter zero for categories that are not pertinent. (eg, Outreach (20%), Science (30%), Technology (10%), Implementation (40%)) (text input)



Email if you want to be on the SRP distribution list!!

Sustainable Rivers Program priorities

SRP Location-Based Projects follow a Multi-Step Process of

Advance

- USACE Coordination & Stakeholder Engagement
- Literature Review & State of the Science
- E-Flow or other Environmental Workshops to Define Environmental Strategies

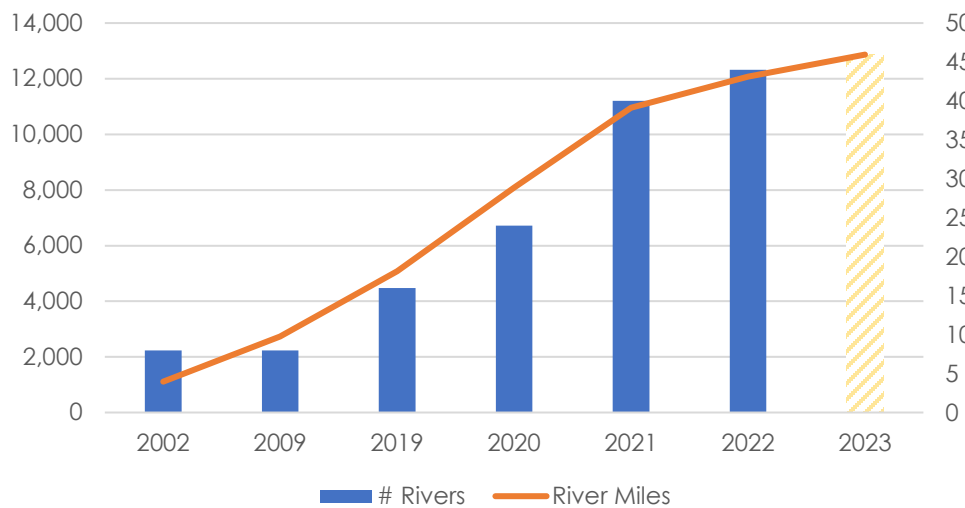
Implement

- Test Flow Prescriptions & Environmental Strategies
- Monitor Effectiveness & Adapt Strategies
- Document Environmental Benefits & Tradeoffs

Incorporate

- Initiate Process of Incorporating E-flows & Environmental Strategies in Operations
- Formalize Operations in Policy
- Continue Monitoring & Adaptive Management Program

SRP's 20 Year Footprint



- Accelerate implementation and incorporation at existing SRP sites
- Expand geographically with a goal of 17,500 river miles by 2025
- Multi-year projects with a vision for Implementation

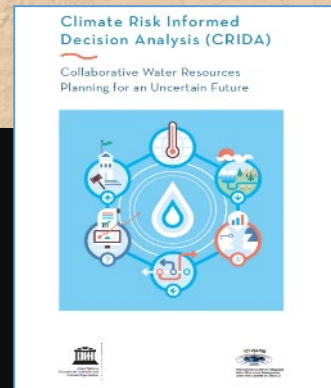
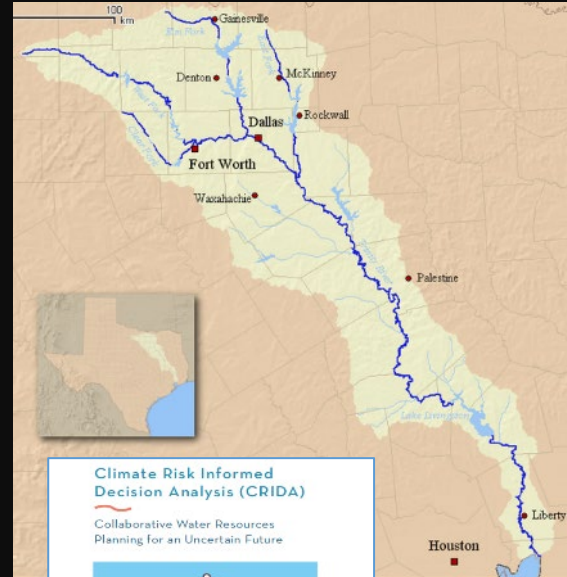


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Sustainable Rivers Program priorities

Trinity River, Fort Worth District



- Broaden the types of environmental actions to achieve sustainable management of water and ecosystems
hydropower
- Continue to apply SRP approach to other infrastructure types
locks and dams, dry dams, Section 7 reservoirs, levee notches, pump stations, etc.
- Honing methods currently used and testing new methods

CRIDA, FIRO, CIRO

FINAL



US Army Corps of Engineers

NATIONAL HYDROPOWER PROGRAM

Strategic Plan FY2020 Through FY2024

Prepared by Sapere Consulting, Inc. - July 2019



Our mission is to ensure USACE hydropower assets are available to provide reliable renewable energy and flexible capacity to our nation's electric grid.



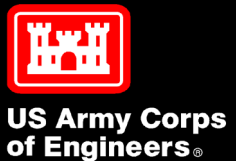
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Sustainable Rivers Program priorities



- Use of innovative metrics or monitoring approaches to better quantify environmental responses to SRP actions.
- Find ways to engage with underserved communities
 - TNTCX rivercane and tule restoration with indigenous tribes





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Submit a Proposal for FY24 SRP funding

SRP supports projects that improve the operation of USACE infrastructure for the environment, while maintaining project authorized purposes.

1. Great ideas for SRP projects typically come from
 - USACE Operations
 - H&H and Water Control
 - Planning
 - State and federal agency partners
2. FY24 funding expected between \$5-6M.
3. Work through your local district to submit a proposal.

If you need a Corps or SRP POC

- John Hickey SRP Program Lead -HEC
- Brian Johnson – SRP Lock & Dam Lead - MVS
- Michelle Mattson SRP Program Support – IWR



Thank you!

Questions and Discussion

RESOURCES:

Link to the online RFP application

<https://app.smartsheetgov.com/b/form/5331fbef090c47078cc569584aeb3c2a>

SRP USACE Website: https://www.hec.usace.army.mil/sustainable_rivers/

SRP TNC Website: <https://www.nature.org/en-us/what-we-do/our-priorities/protect-water-and-land/land-and-water-stories/sustainable-rivers-project/>