

Dam U: Initiating the Arkansas Stream Heritage Partnership

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US Army Corps of Engineers



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AT PINE BLUFF
—1873—



Arkansas Stream Heritage Partnership

- Mission:
 - Restore the natural free-flowing heritage of Arkansas streams, opportunistically, and efficiently.
- Vision:
 - To create a statewide partnership that fosters the development of a network and process for supporting, aiding, and implementing the removal of barriers to stream connectivity, thereby restoring hydrologic, biologic, and ecologic function in an opportunistic, non-regulatory, and efficient manner.
- Important note and disclosure statement:
- **THIS IS NOT A DAM ATTACK! FUNCTIONAL, OPERABLE, USABLE DAMS THAT OWNERS WANT TO KEEP ARE NOT FOR CONSIDERATION! There is no need to defend any dams as part of this discussion. This is feel-good, non-regulatory, and positive.**

Arkansas Stream Heritage Partnership

Examples of barriers for partnership focus:

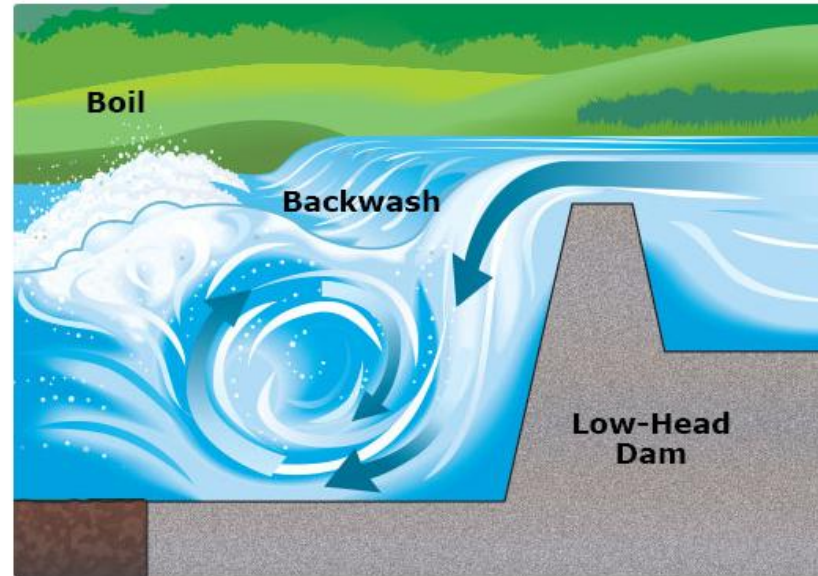
- Obsolete, inoperable, damaged, or intact dams that have lost the original utility function, with dam owners interested in removal.
- Poorly designed, and / or damaged, and / or abandoned, low-water or culvert stream crossings (referred to as “slabs” in Arkansas).

Arkansas Stream Heritage Partnership

- Major justifications or reasons for stream barrier removal and benefits to the State:
 1. Human safety
 2. Improved recreation leading to
 3. Increased tourism and economic benefits, and of course...
 4. Restored ecology.

Low-Head Dams

Boat and PWC operators may encounter physical structures such as dams, locks, and bridges. You need to be extra cautious in these situations.



Low-head dams pose a serious danger to vessel operators. Surface currents below low-head dams can suck vessels toward the face of the dam. Currents above low-head dams can sweep vessels over the dam. The recirculating currents and turbulent waters below these dams can swamp vessels and drown boaters.

Dams pose dangers both above and below the dams.

- **The low-head dam** is the most dangerous type of dam and has been named the "drowning machine." They may not be easily spotted because the top of a low-head dam can be several feet below the water's surface. Because of their small size and drop, low-head dams do not appear to be dangerous. However, water going over a low-head dam creates a strong recirculating current or backroller (sometimes referred to as the "boil") at the base of the dam. Even on small rivers, the force of the backroller can trap your boat against the face of the dam and pull you under the water—even while wearing your personal flotation device (life jacket). Be aware that on large rivers or during high water the backroller or boil may be located more than 100 feet downstream of the dam. **Avoid low-head dams.**

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Benefits to the State from barrier removal align nicely with Governor Hutchinson's recently articulated strategic plan for Arkansas:

1. Create jobs and grow the economy,
2. Create safer places where needed,
3. Encourage efficiencies by seeking collaborations and partnerships,
4. and to enhance the quality of life for Arkies.

Arkansas Stream Heritage Partnership

Objectives for partnership:

1. Pursue barrier removal projects together, opportunistically, and efficiently.
2. Common ground for barrier removal projects to share resources and information.
3. Create a stream-lined process for barrier removal (as much as possible) with regulatory agencies.
4. Inventory all barriers and associated metric data in the state.
5. Prioritize dams based on inventory database and metric data.
6. Identify and develop present and potential state funding sources.
7. Other...?

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From Dam-it, to un-dam-it:

Examples of some current or potential barrier removals in progress:

1. Lake Bella Vista Dam on Little Sugar Creek, Bentonville.
2. Pump Station Dam on West Fork of White River, Fayetteville.
3. Mine Creek Dam on Mine Creek - tributary stream to Cossatot River, Ouachita National Forest?
4. Lake Harrison Dam on Crooked Creek, Harrison.
5. Arlberg low-water crossing on Middle Fork Little Red River, Stone County.
6. Three dammed crossings on Maumelle River, Central Arkansas Water.
7. Two stream crossings on Rock House Creek, tributary to Kings River, Carroll / Madison County?, AGFC.
8. Mulberry Super-Slab on Mulberry River near Oark, Ozark National Forest, Johnson County.







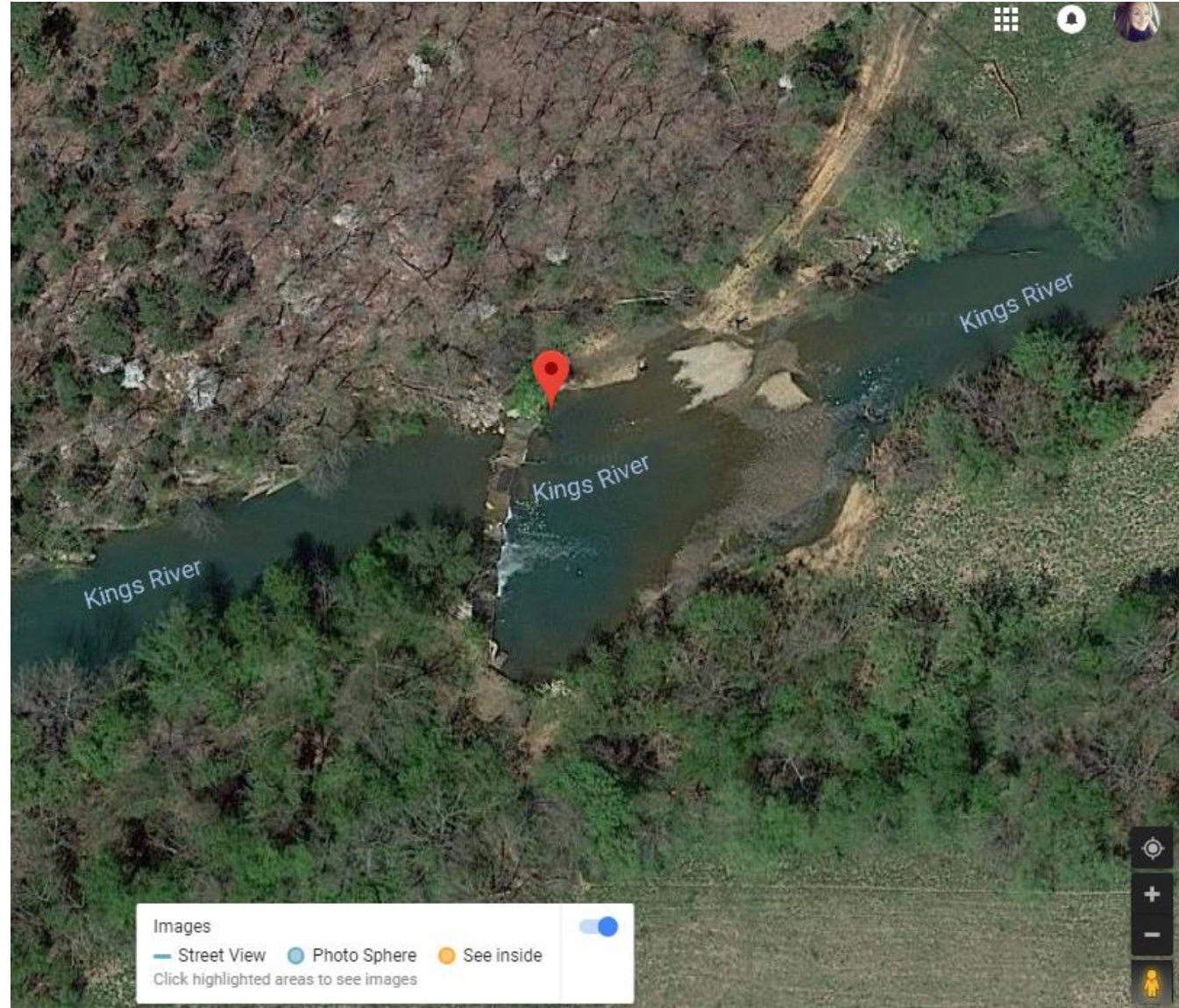
Middle Fork Little Red River

Arlberg Crossing



Not Just Dams!

- Slab crossings- Also called “low water crossings” or man-made fords across other parts of the Southeast



Arkansas Stream Heritage Partnership

To begin the conversation....

- A two-day workshop was held at Department of Arkansas Heritage, January 10th and 11th, 2018.
- The workshop focused on “dam removal” including stream crossings, culverts, Etc., and included a field tour of three dams to be removed from the Maumelle River by Central Arkansas Water.
- Workshop was conducted by American Rivers, Southern Aquatic Resource Partnership (SARP), and Arkansas Natural Heritage Commission.
- Attendance included over 40 individuals from at least 21 different Arkansas conservation organizations including state and federal agencies, NGO’s, non-profs, Etc.



Arkansas Stream Heritage Partnership

Many helped with the dam workshop:

- \$5,000 ANHC and hosted and provided one van.
- \$4,950 AGFC and two vans (thanks Chris!).
- \$500 AR AFS (thank you EX-COM!!!!)
- TNC provided one lunch and hosted a “happy hour” (thanks Joy!).
- CAW provided a lunch and hosted the dam field tour (thanks Raven).
- ATU provided 2 vans (thanks Dr. Gagen!).

Barrier Prioritization

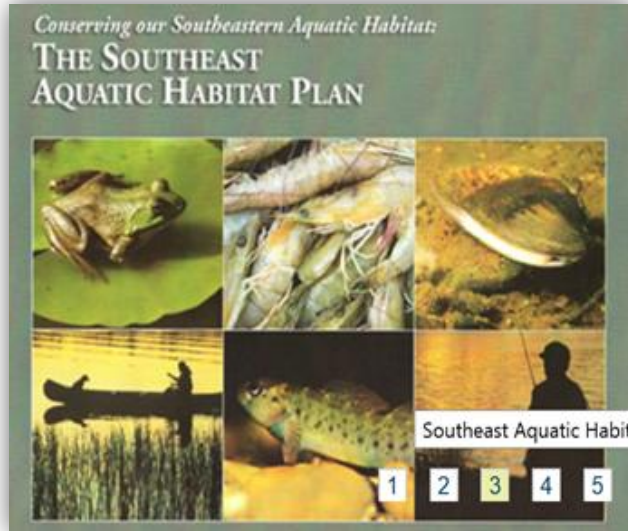
Arkansas Dam Removal
Workshop, Jan 10-12, 2017



Opportunities for Dam Removal: Notes from an Arkansas Prioritization



Southeast Aquatic Resources Partnership

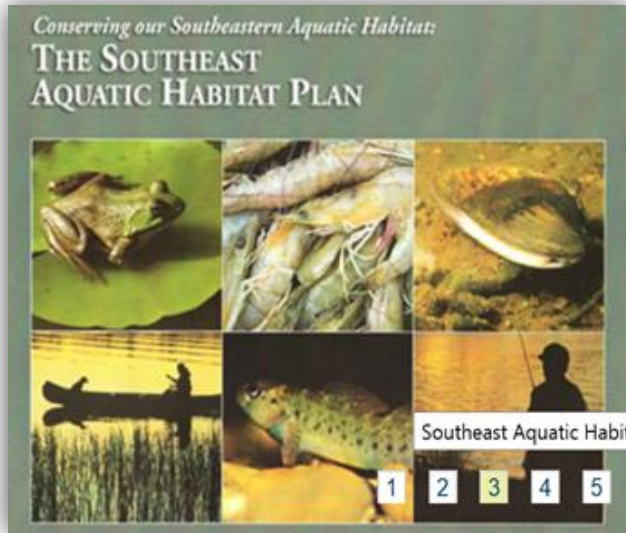


SARP Mission

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.

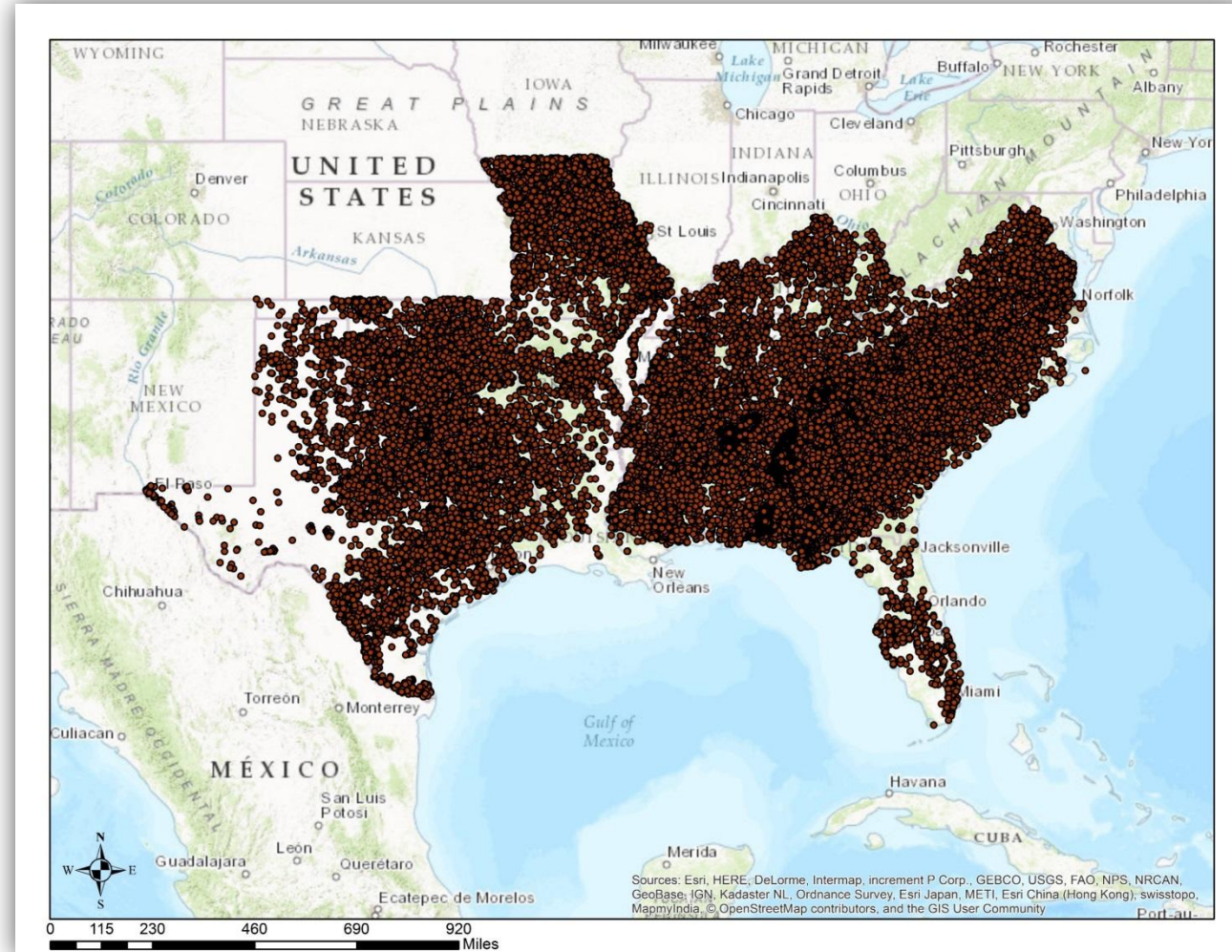
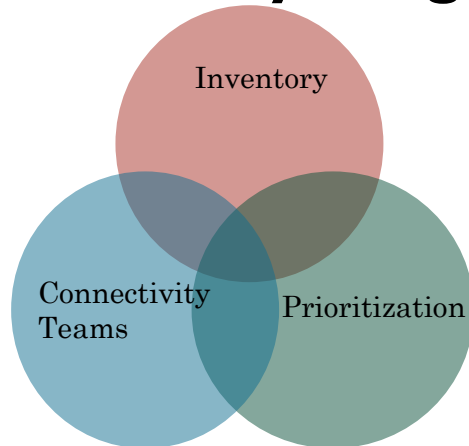


SARP Connectivity Program Background



Objective 3:
Improve or maintain watershed connectivity

Connectivity Program



The Inventory: Comprehensive Southeast Aquatic Barrier Inventory

- The SARP Comprehensive Southeast Aquatic Barrier Inventory contains:

- *Dams*

- *Stream Crossings*

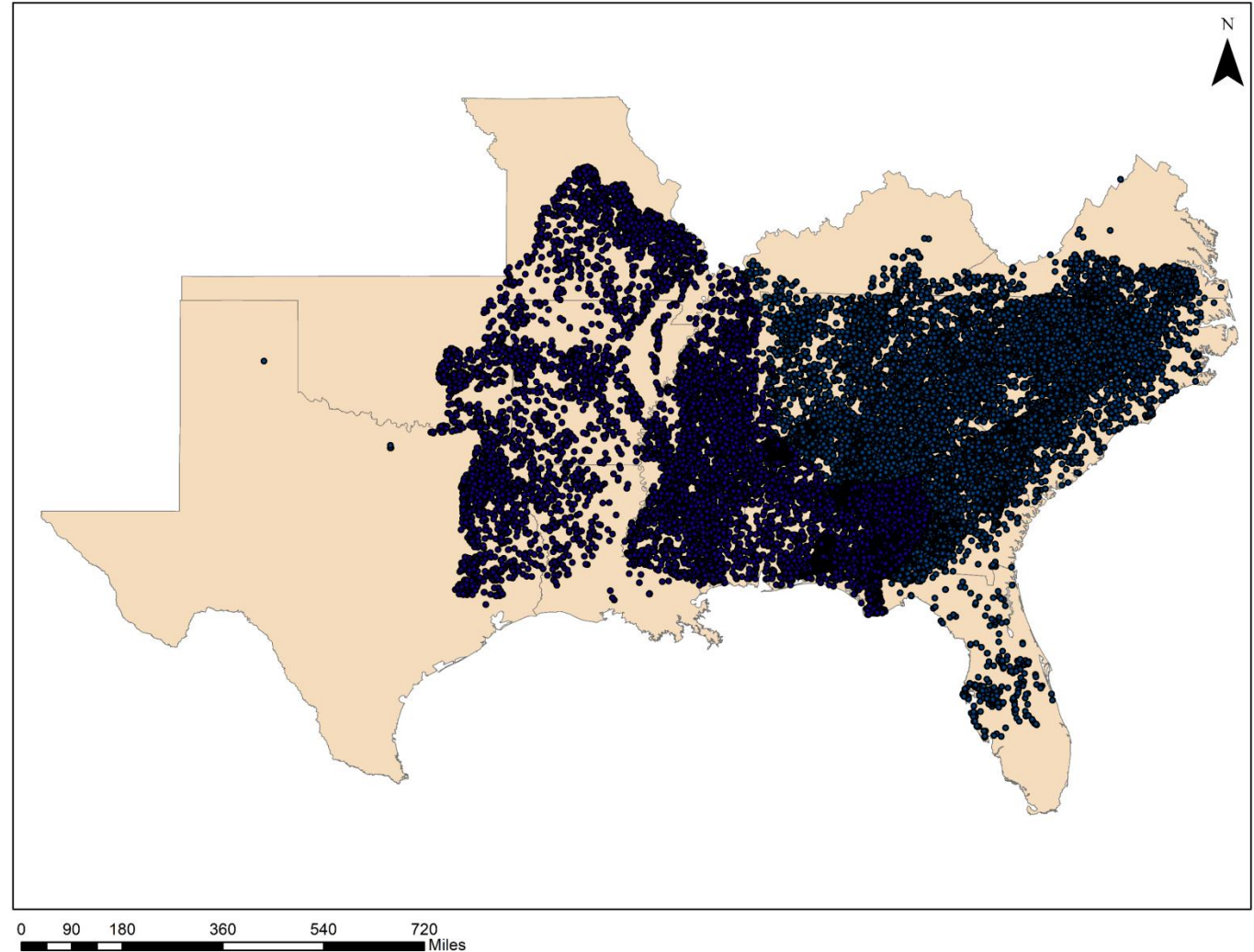
- Culverts
- Fords
- Low water crossings
- Bridges
- Road crossings



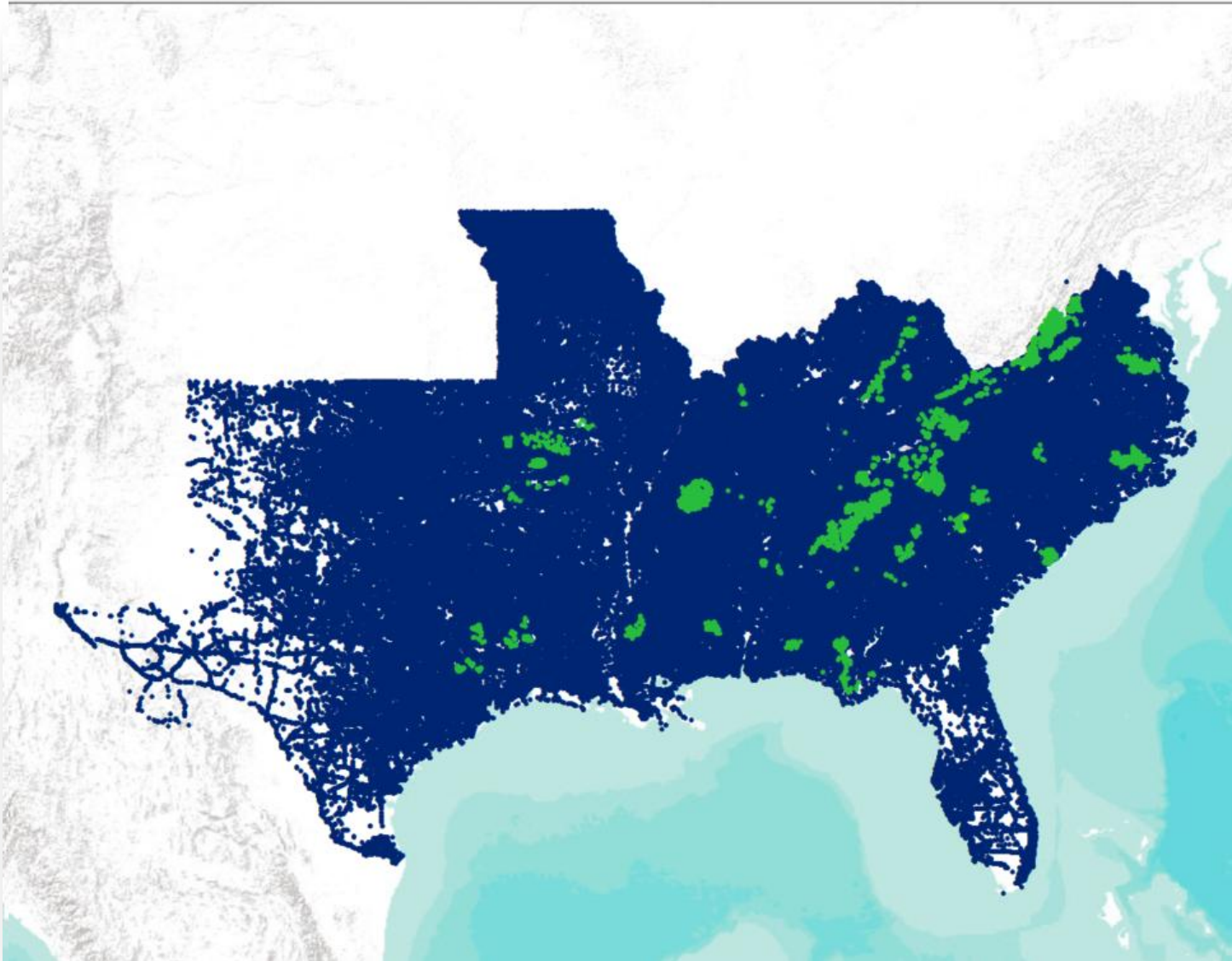
Inventory

What's Next?

- Gulf Coastal Plains and Ozarks LCC Prioritization!
- Build inventory for Arkansas
- Includes road barriers!



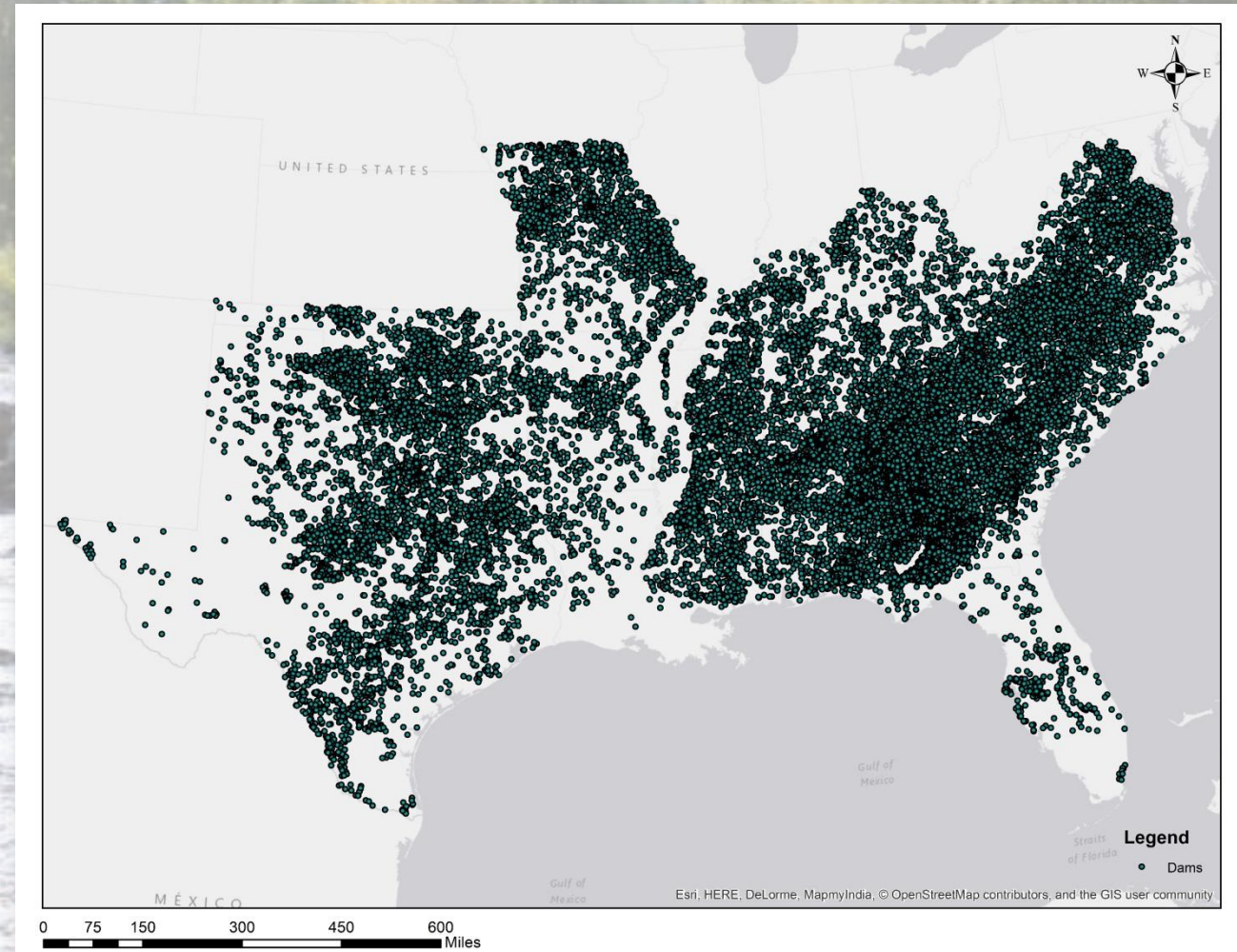
Comprehensive Southeast Barrier Inventory of Stream Crossings



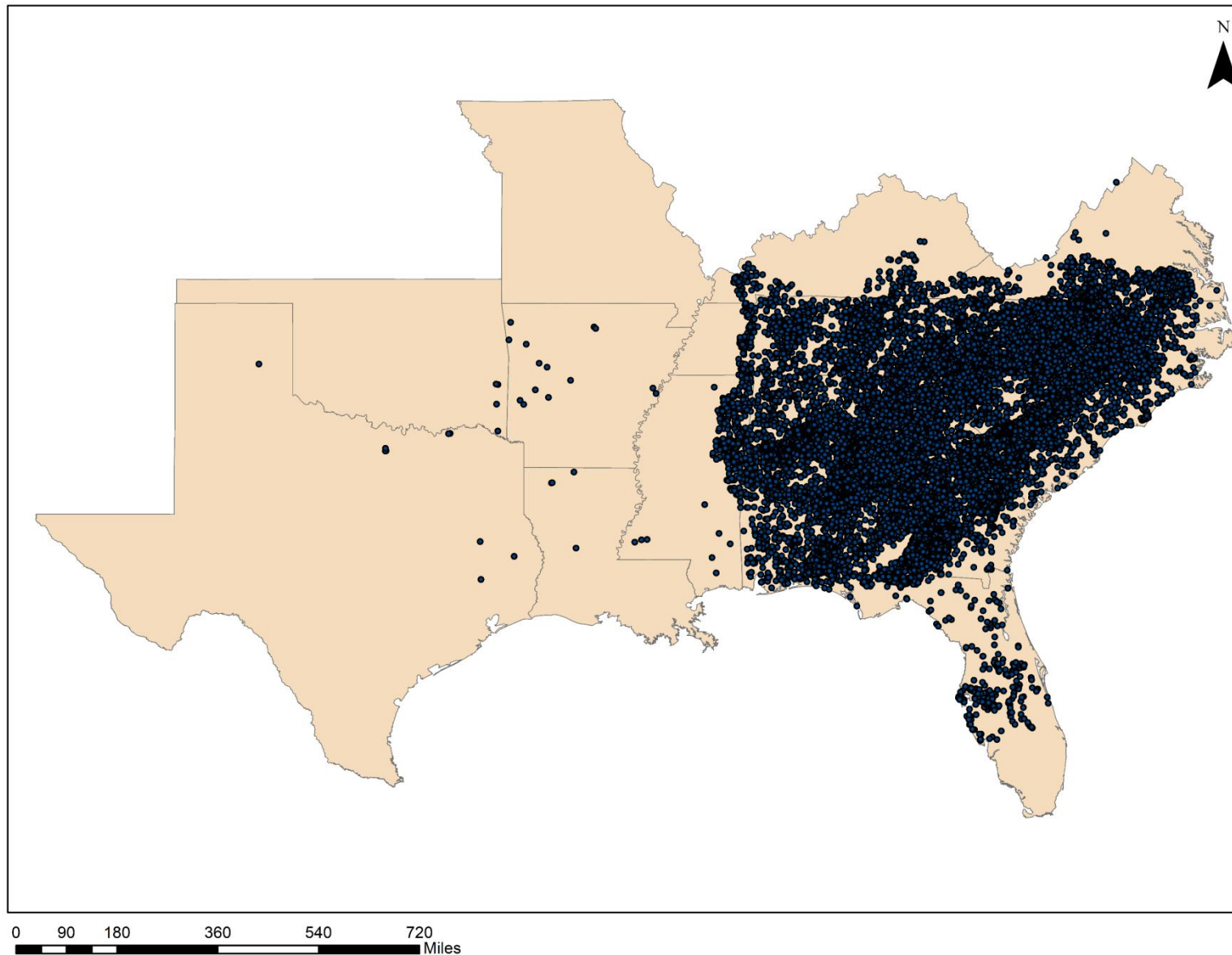
- Consists of National Bridge Inventory, DOT databases, and local assessment databases
- Includes culverts, bridges, fords, low water crossings, and road crossings

Why Prioritize?

- Shear number of dams: > 80,000 in Southeast
- Project justification: Quantify environmental benefits
- Desire for new implementable projects with big benefits



Completed Barrier Prioritizations



What Makes a Priority Dam?

- The hypothetical 'best' dam would....
 - **Reconnect** many miles of river
 - Reconnect high **quality habitat**
 - Be **obsolete**
 - Pose a safety **hazard**



Next Steps

- Build up the Inventory of dams!
 - Add dams to inventory – via webmap or through Kat.
 - Recon dams on inventory via webmap.
- Send stream crossing data.
- Stream crossing protocol training!

Implement Projects!



Arkansas Stream Heritage Partnership

How to be a part of it:

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2. Email me, Darrell.bowman@Arkansas.gov , or Kat Hoenke kat@southeastaquatics.net , and request to be placed in the “dam group”.
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Any Questions?

Living Inventory: Partner Interaction

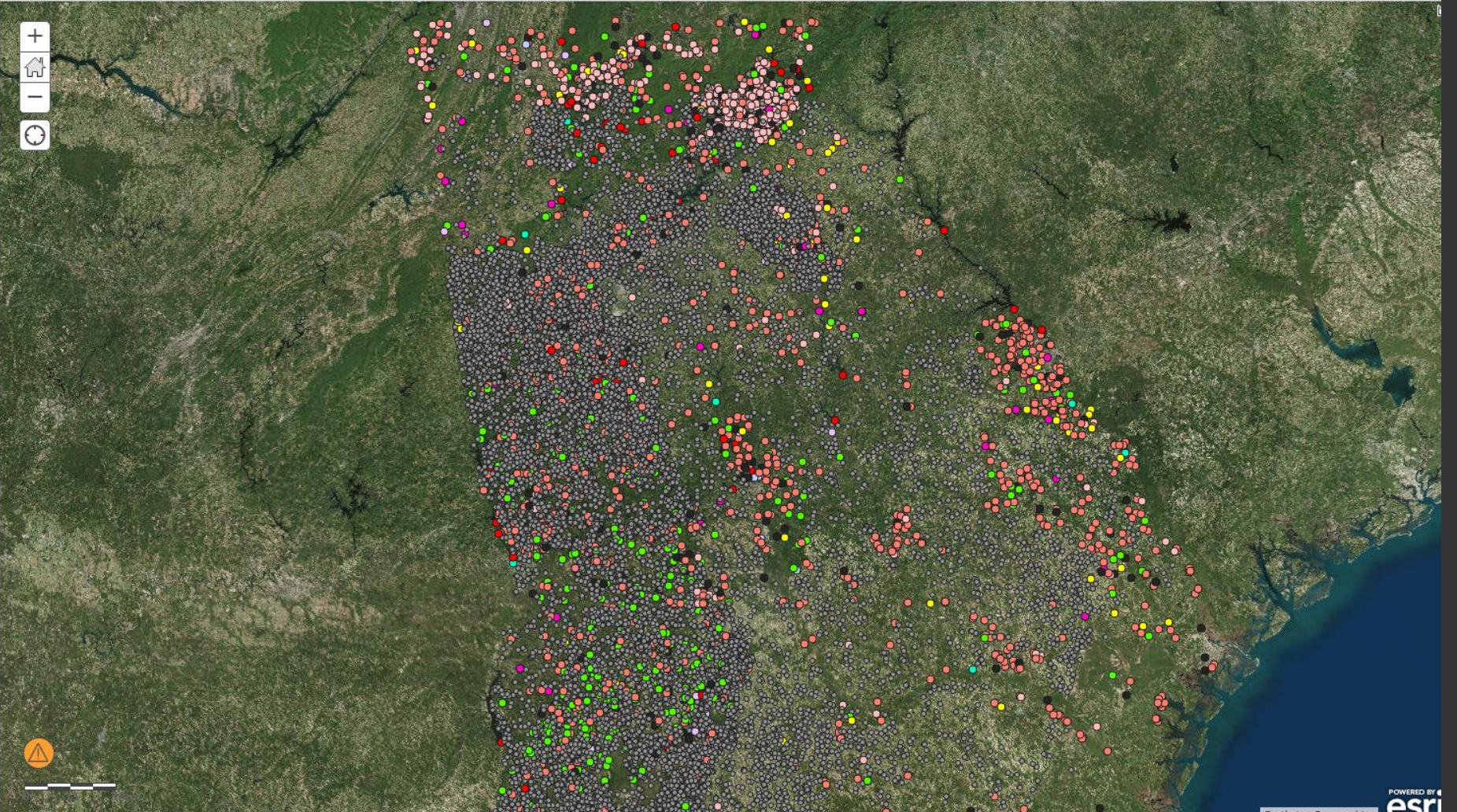
Home ▾ Georgia Aquatic Connectivity Team Map New Map ▾ Create Presentation Kathleen ▾

Details Add ▾ Edit Basemap Save ▾ Share Print ▾ Measure Bookmarks Find address or place

About Content Legend

Contents

- Georgia Small Barriers 11012017
 - Passable Structure
 - Culvert is impassable to some degree
 - Inaccessible
 - No Upstream Habitat
 - No Crossing
 - Indeterminate
 - Proposed Project
 - Completed Project
 - Unassessed
 - Buried Stream
 - Other
- R4 Georgia Dam Inventory
- GA SWAP Priority Watersheds
- USFWS Region 4 Fisheries Watershed Priorities 2013 - Watersheds with Scores 35
- GA EOS 2016
- USA Counties
- USA States (Generalized)
- Final Critical Habitat
- USA NHDPlusV2
- Imagery



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Adding low-head dams to Webmap

- YOU can add dams to our inventory!
- Send SARP bulk data
- Explore webmap and add points

The screenshot displays the 'Arkansas Connectivity Map' web application. The interface includes a top navigation bar with 'Home', 'Arkansas Connectivity Map', 'New Map', 'Create Presentation', and a user profile 'Kathleen'. Below this is a toolbar with 'Details', 'Add', 'Edit', 'Basemap', 'Save', 'Share', 'Print', 'Measure', and 'Bookmarks'. A search bar shows coordinates '36.267466, -93.943469'. The main map area shows an aerial view of a dam structure. On the left, the 'Add Features' panel is open, displaying a legend for 'DamInventoryV2' with various colored dots and their corresponding descriptions. On the right, a data entry form for 'DamInventoryV2' is open, showing fields for 'Barrier Name' (War Eagle Mill), 'Your Affiliation' (SARP), 'State' (Arkansas), 'Structure Category' (Dam), and 'OwnerType' (Private). The bottom of the screen features 'UNDO', 'REDO', and 'MANAGE' buttons, along with a scale bar and 'Esri.com' branding.

Home ▾ Arkansas Connectivity Map ✎

New Map ▾ Create Presentation Kathleen ▾

Details Add ▾ Edit Basemap Save ▾ Share Print ▾ Measure Bookmarks 36.267466, -93.943469

Add Features

DamInventoryV2

- Good candidate for removal. Move forward with LO contact
- Dam is breached and no impoundment visible.
- Dam is in the wrong spot and needs to be moved
- Dam may be removed or error.
- Dam needs follow-up with landowner, etc.
- Dam was once considered, need to revisit.
- Removal is extremely unlikely. Large reservoirs, unfavorable etc.
- Removal is unlikely. Social conditions unfavorable etc.
- Removal planned
- Take immediate action, abandoned-looking dam in poor condition
- Unfeasible in short term
- Unsure, need second opinion

UNDO REDO MANAGE

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Metric Data: Using GIS to Identify Priority Dams

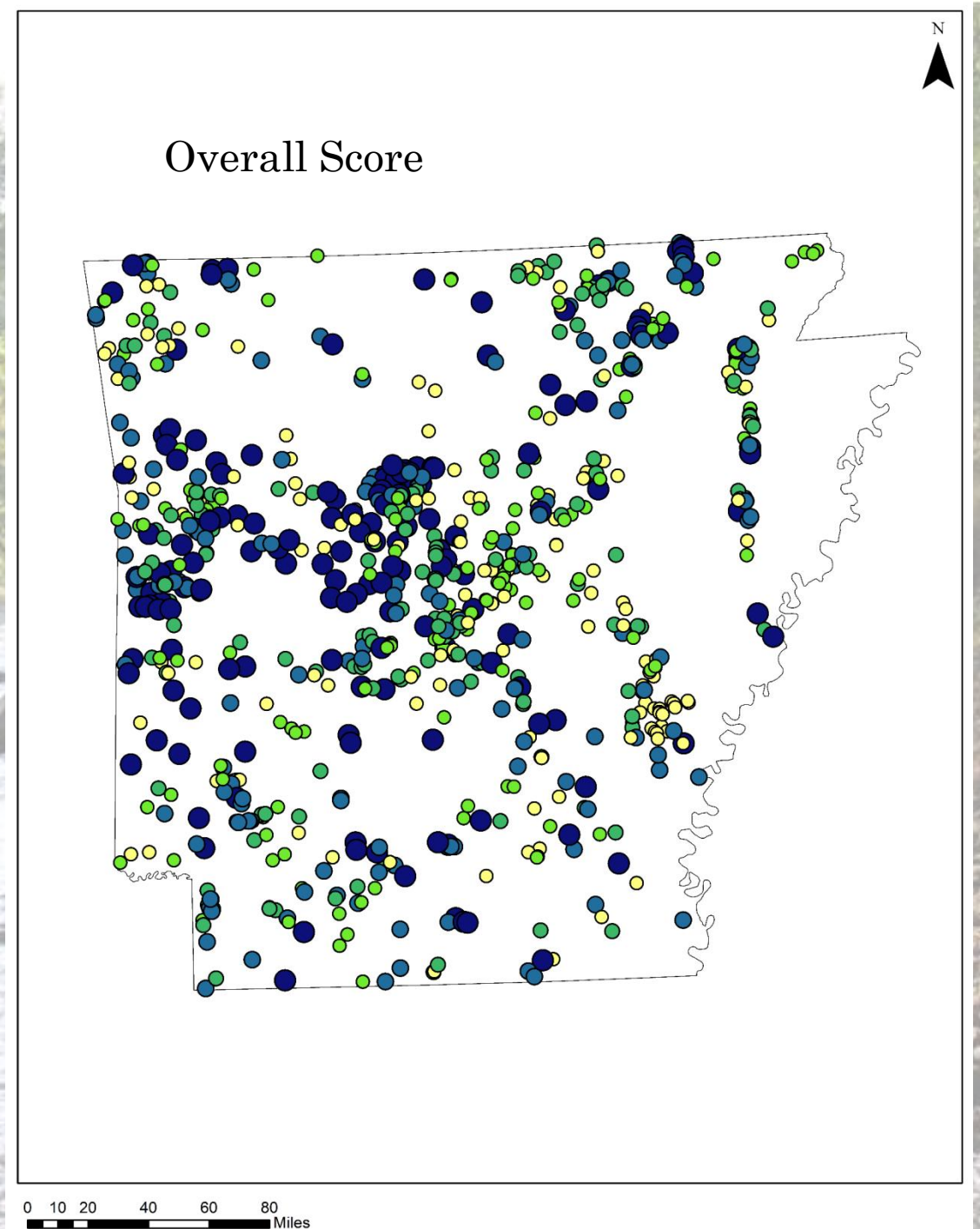
- We can use GIS to identify qualitative and quantitative information about each dam.

Connectivity	<ul style="list-style-type: none">• Reconnect many miles of river<ul style="list-style-type: none">-Number of miles opened by removal
Habitat Quality	<ul style="list-style-type: none">• Reconnect high quality habitat<ul style="list-style-type: none">-Percentage of watershed that is forested
Social	<ul style="list-style-type: none">• Be obsolete<ul style="list-style-type: none">-Listed purpose
Safety	<ul style="list-style-type: none">• Pose a safety hazard<ul style="list-style-type: none">-Hazard status-Condition rating



Hypothetical Best Dam

- The hypothetical 'best' dam would have....
 - Open the most miles
 - 100% natural landcover
 - The most rare fish
 - Have no current purpose
 - Poor condition
 - High or intermediate hazard



Culverts!

- Research shows that “Aligning removals and road culvert upgrades boosts conservation return-on-investment” Fitzpatrick et al. 2018



STANDARDIZED PROTOCOL



AQUATIC CONNECTIVITY Stream Crossing Survey DATA FORM

DATABASE ENTRY BY _____ ENTRY DATE _____
 DATA ENTRY REVIEWED BY _____ REVIEW DATE _____

CROSSING DATA

Crossing Code _____ Local ID (Optional) _____

Date Observed (00/00/0000) _____ Lead Observer _____

Town/County _____ Stream _____

Road _____ Type MULTILANE PAVED UNPAVED DRIVEWAY TRAIL RAILROAD

GPS Coordinates (Decimal degrees) °N Latitude — °W Longitude

Location Description

Crossing Type BRIDGE CULVERT MULTIPLE CULVERT FORD NO CROSSING REMOVED CROSSING
 BURIED STREAM INACCESSIBLE PARTIALLY INACCESSIBLE NO UPSTREAM CHANNEL BRIDGE ADEQUATE

Number of Culverts/ Bridge Cells _____

Photo IDs INLET _____ OUTLET _____ UPSTREAM _____ DOWNSTREAM _____ OTHER _____

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

Tidal Site YES NO UNKNOWN
 Alignment FLOW-ALIGNED SKEWED (>45°)
 Road Fill Height (Top of culvert to road surface; bridge = 0) _____

Bankfull Width (Optional) _____ Confidence HIGH LOW/ESTIMATED
 Constriction SEVERE MODERATE SPANS ONLY BANKFULL/ACTIVE CHANNEL
 SPANS FULL CHANNEL & BANKS

Tallwater Scour Pool
 NONE SMALL LARGE
Inlet Scour Pool
 NONE SMALL LARGE

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

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

Crossing Comments _____

Easy to implement

- Easily merges into database
- Scores barriers for connectivity

Passability Scoring

“The best way to consider the aquatic passability scores is that they represent the degree to which crossings deviate from an ideal.”



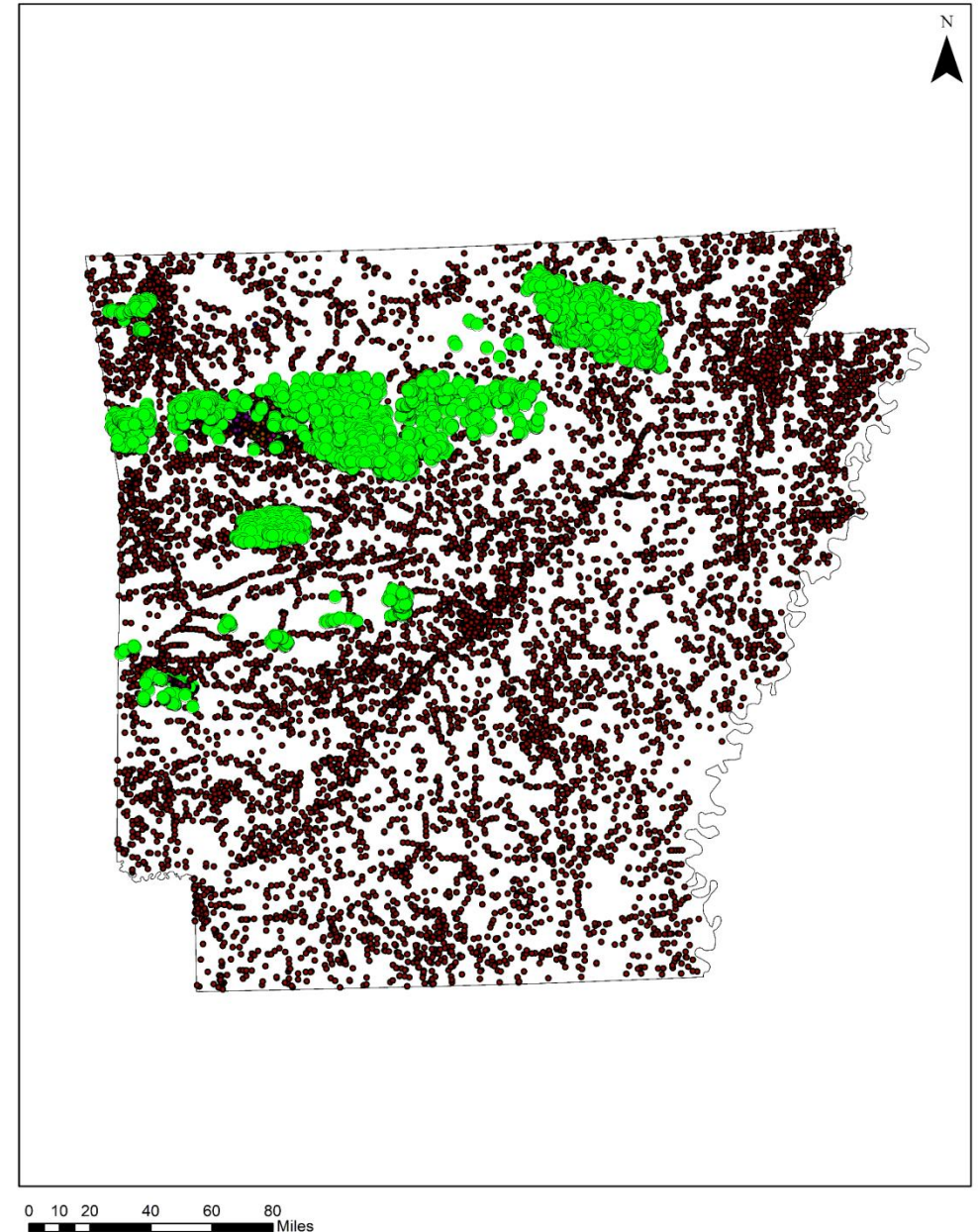
Protocol Basics

- Categorical determinations
- Structure measurements
- Easy to use



Assessments in Arkansas

- Assessments already completed by TNC, USFS
- All will be incorporated into SARP database and GCPO LCC Prioritization
- Arkansas Heritage Partnership can collaborate for more assessments.



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