SA MFC Habitat Meeting 2018

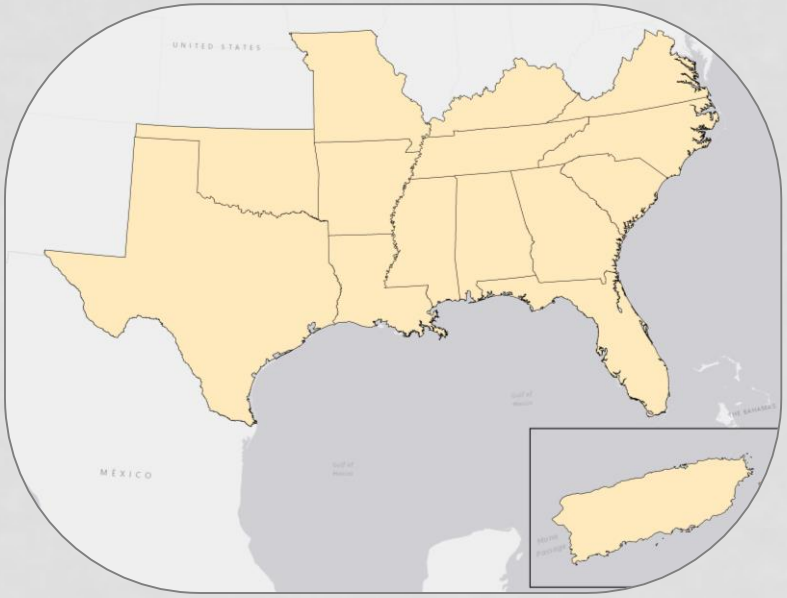
Dr. Jessica Graham

SOUTHEASTERN ASSOCIATION OF FISH AND WILDLIFE AGENCIES

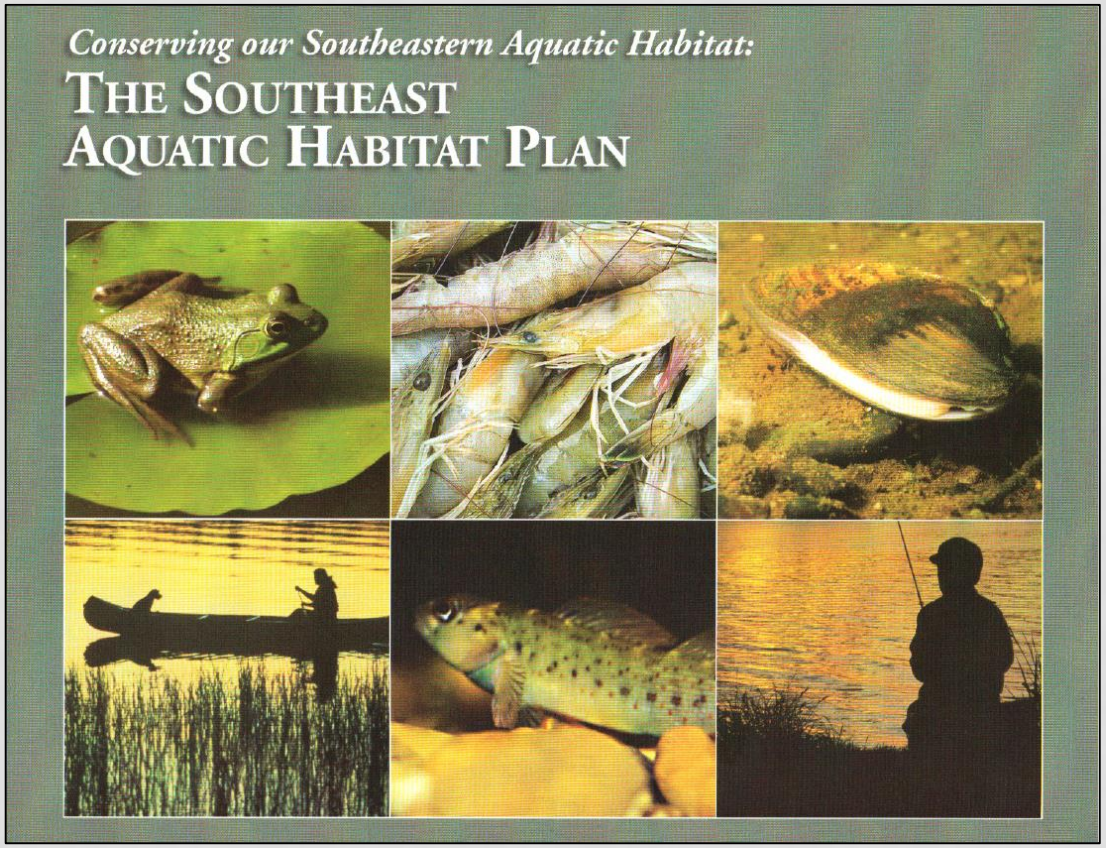
NATIONAL FISH HABITAT PARTNERSHIP

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.




Conserving our Southeastern Aquatic Habitat:
THE SOUTHEAST AQUATIC HABITAT PLAN
Conserving Fish Habitat From Rivers to the Sea:
The Story of the Southeast Aquatic Resources Partnership
SARP
NATIONAL FISH HABITAT ACTION PLAN
2ND EDITION
COOPERATION
INVESTMENT
STEWARDSHIP
NATIONAL FISH HABITAT PARTNERSHIP
National Fish Habitat
Action Plan
Cooperation
Investment
Stewardship
NATIONAL FISH HABITAT ACTION PLAN



Native Black Bass Initiative

Connectivity

Flow

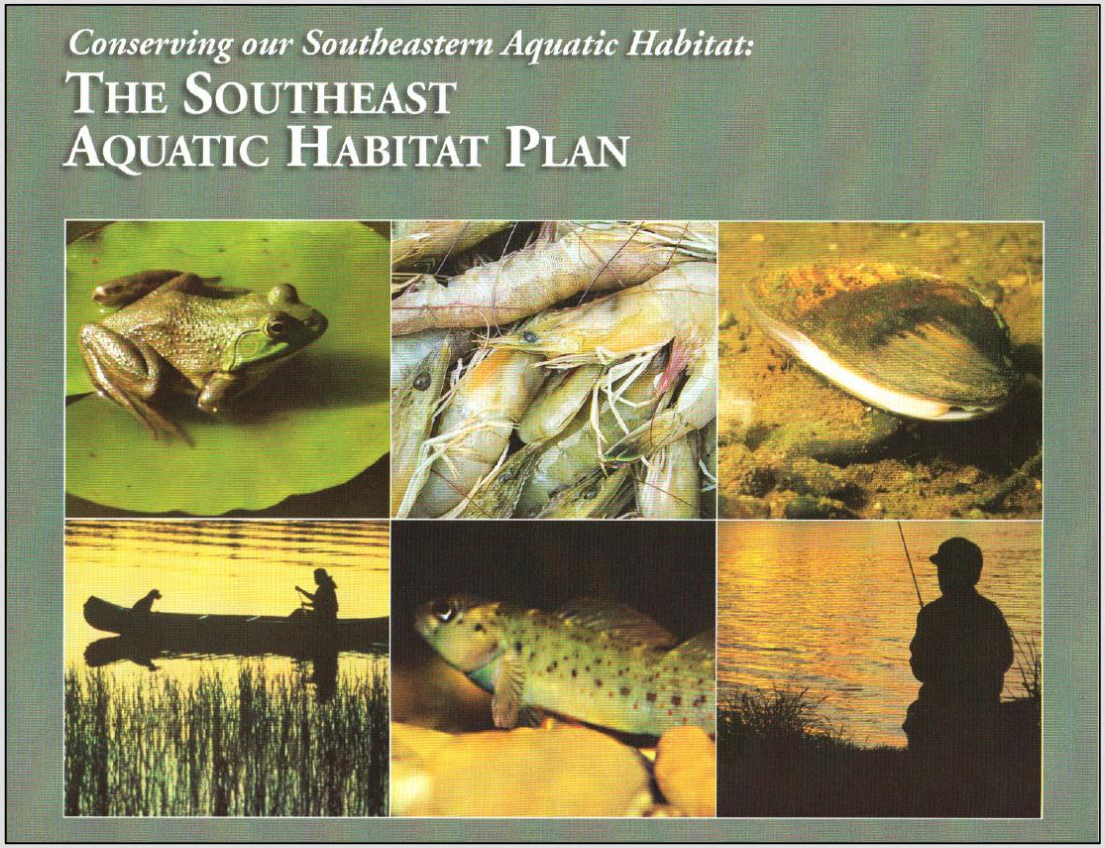
Coastal

Riparian

Physical Habitat

Water Quality

Invasive Species



Native Black Bass Initiative

Connectivity

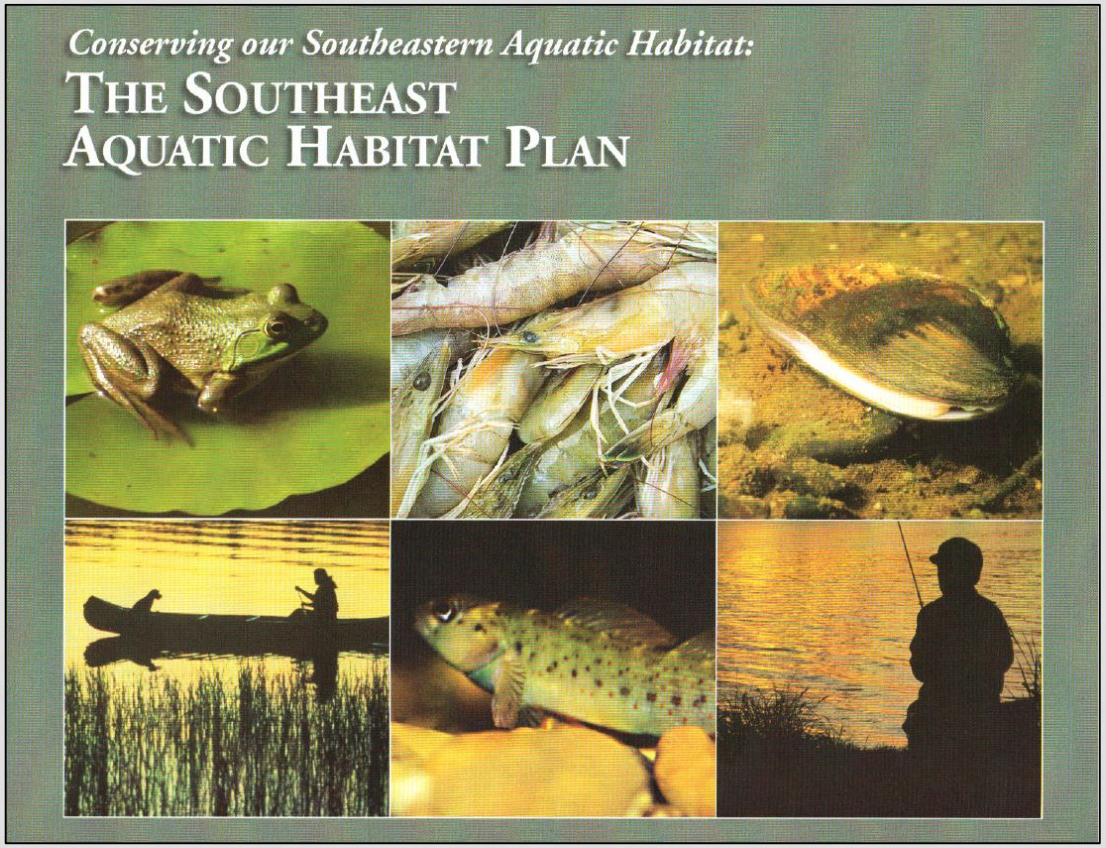
Flow

Coastal

Restoration

Water Quality

Invasive Species

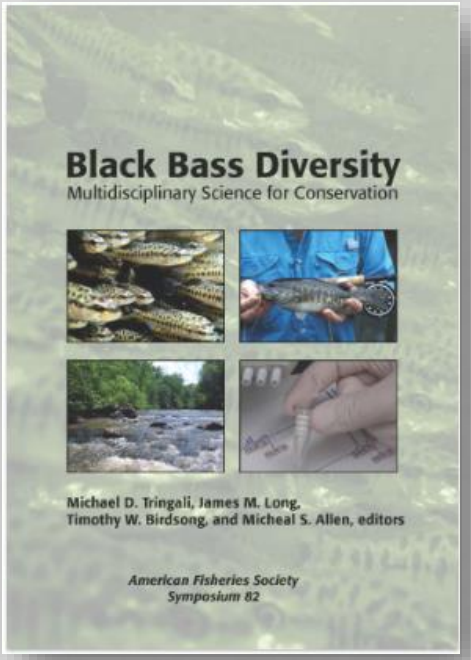


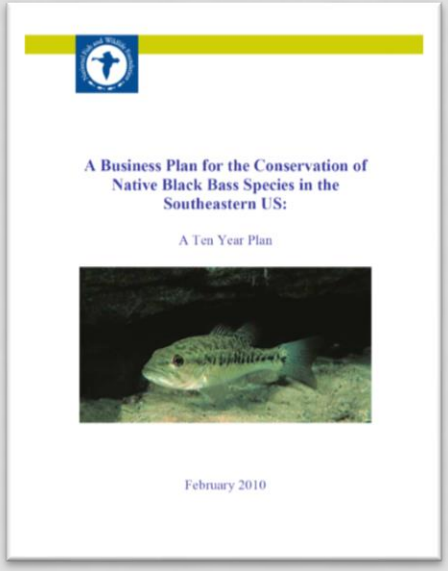
- Native Black Bass Initiative
- Connectivity
- Flow
- Coastal
- Restoration

NATIVE BLACK BASS INITIATIVE

Redeye Bass

Guadalupe Bass



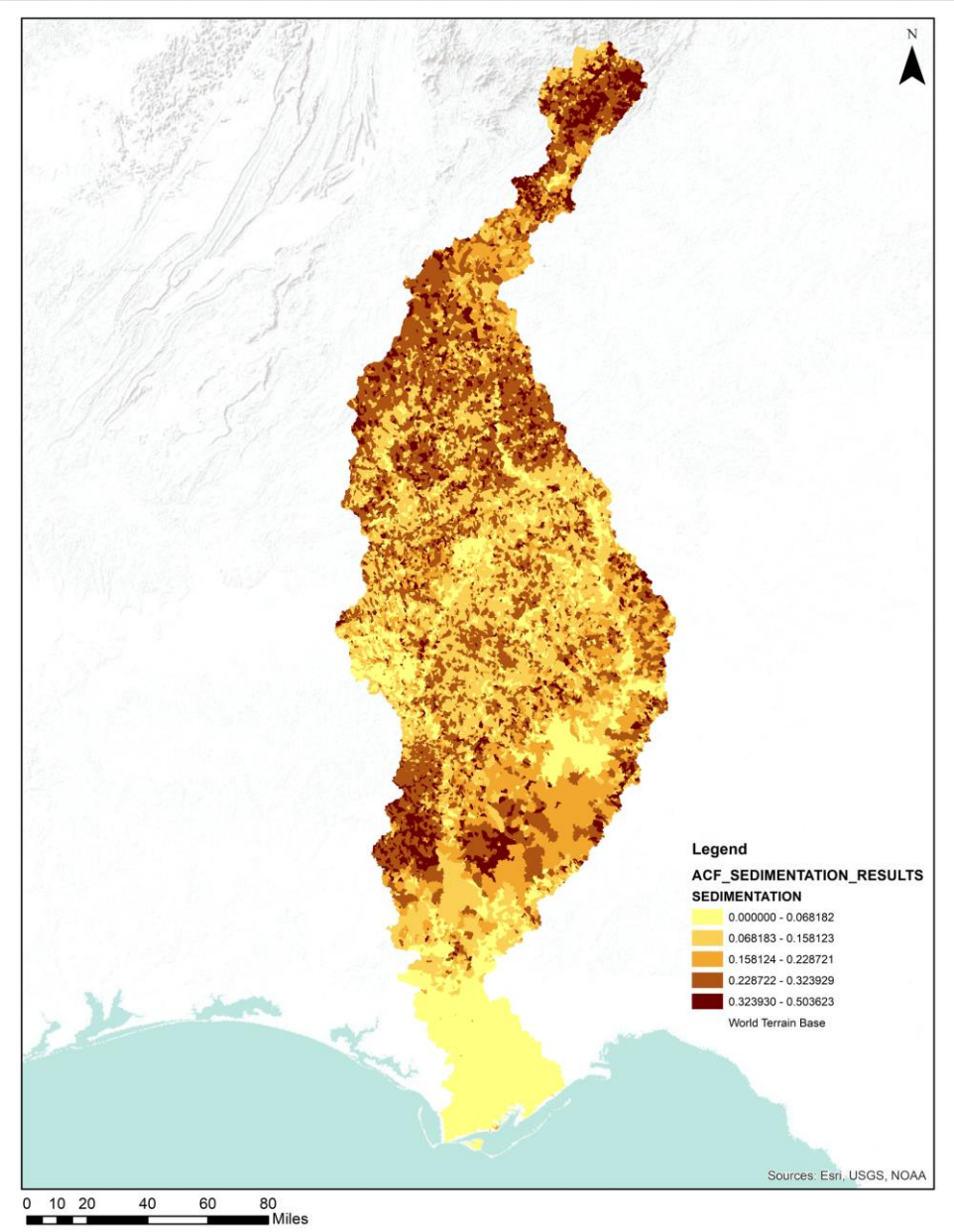


Shoal Bass

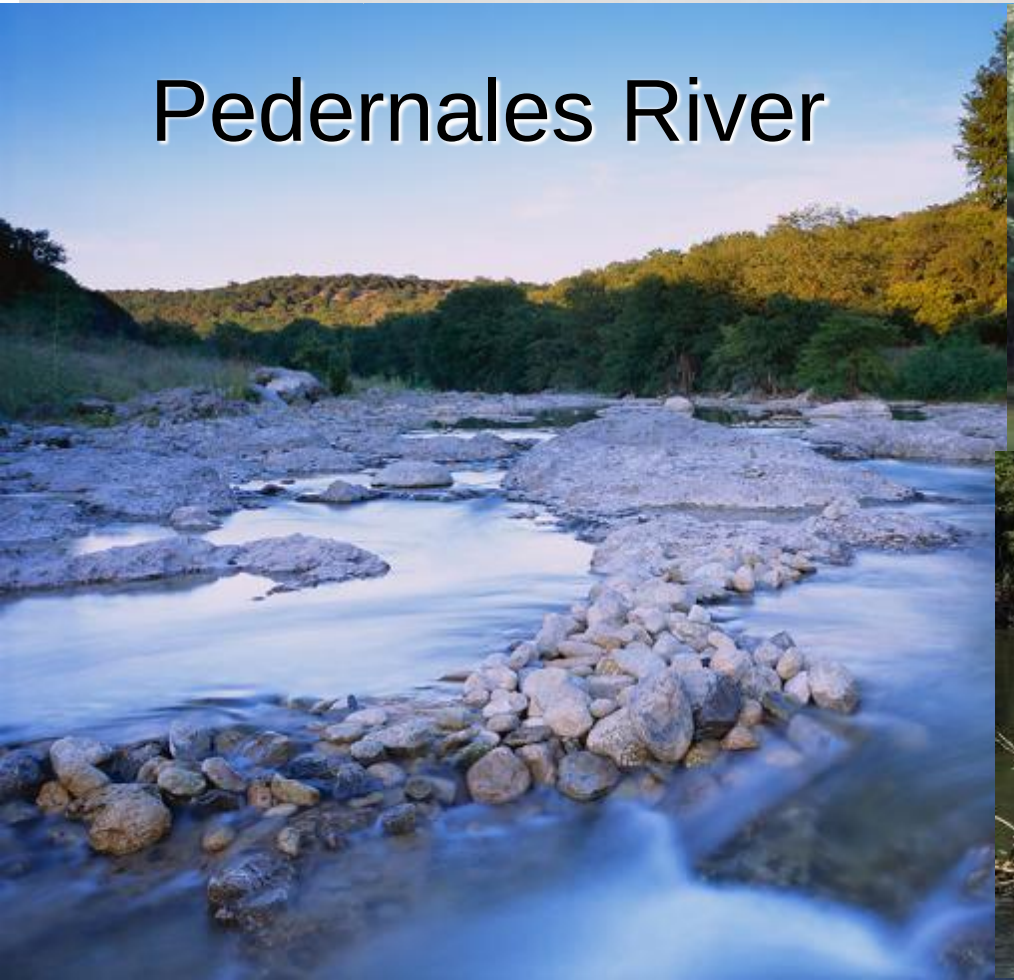
THREATS ASSESSMENT

Actionable layers

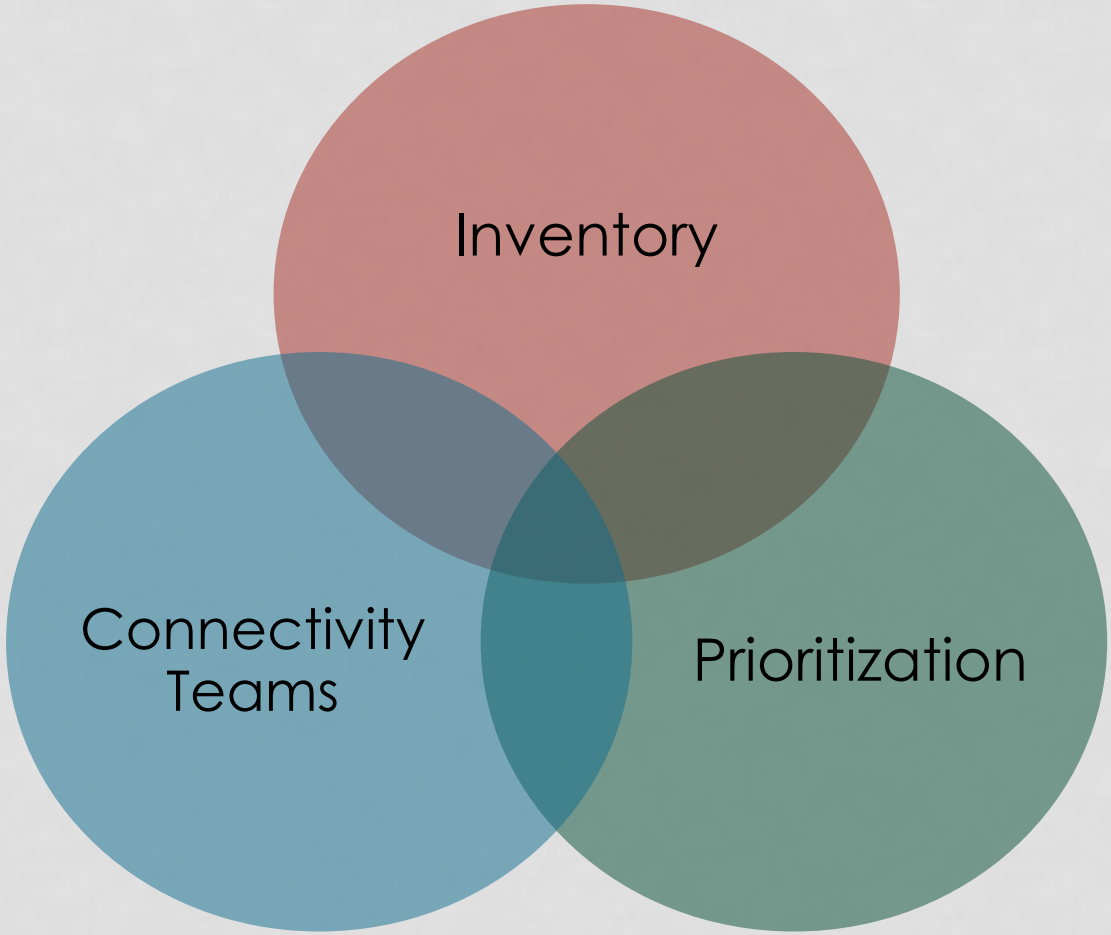
- Acquisition
- Sedimentation
- Best Management Practices
- Connectivity

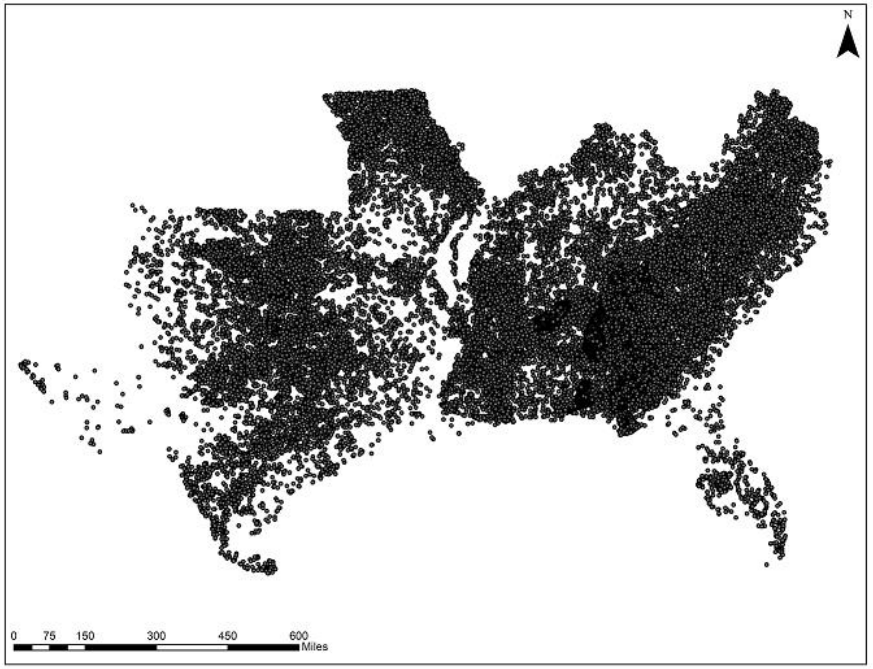


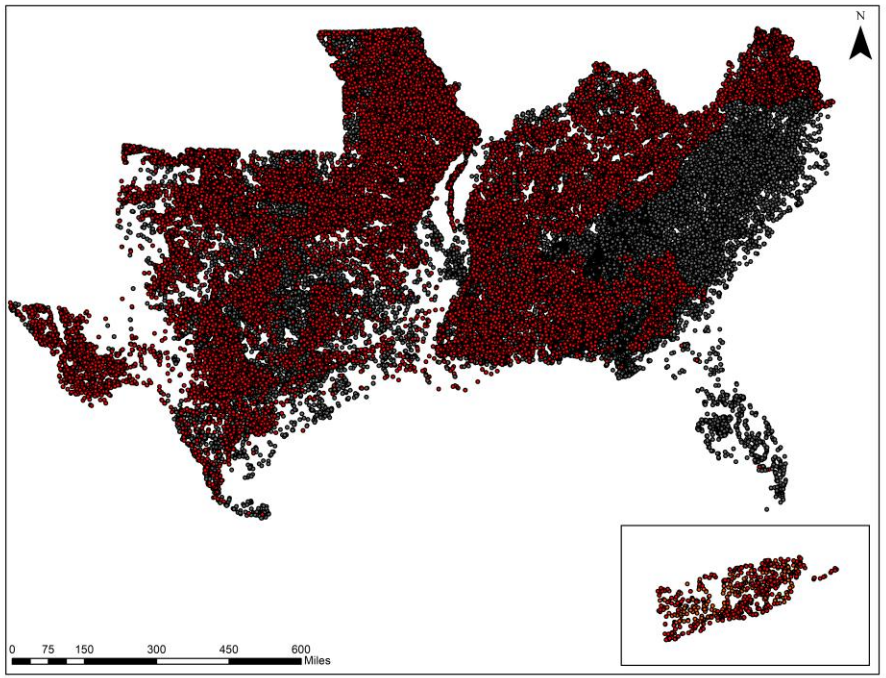
HABITAT RESTORATION



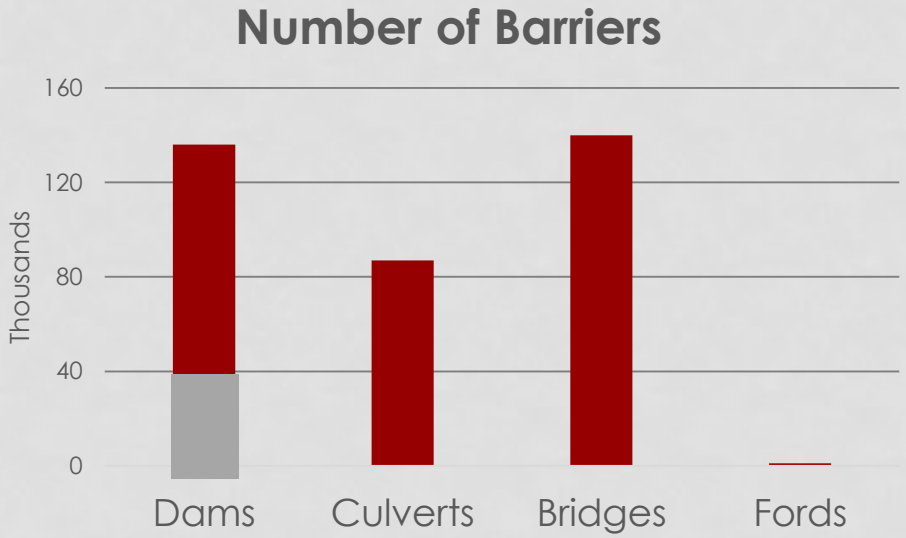
CONNECTIVITY




N
0 75 150 300 450 600
Miles

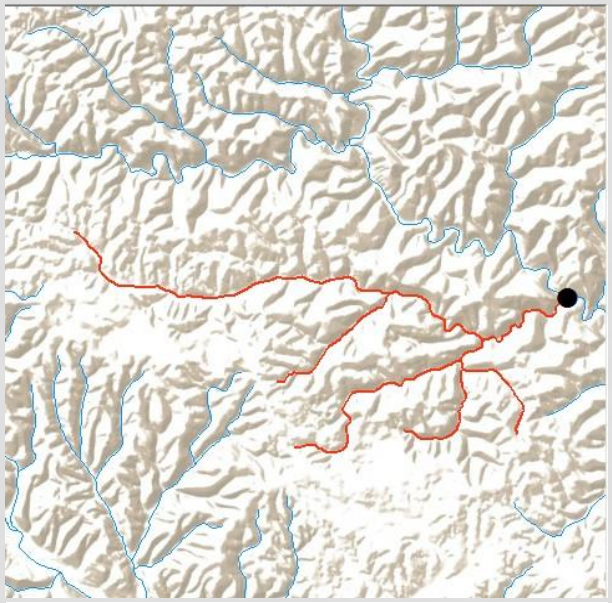

N
0 75 150 300 450 600
Miles

Inventory


Number of Barriers
160
120
80
40
0
Thousands
Dams
Culverts
Bridges
Fords

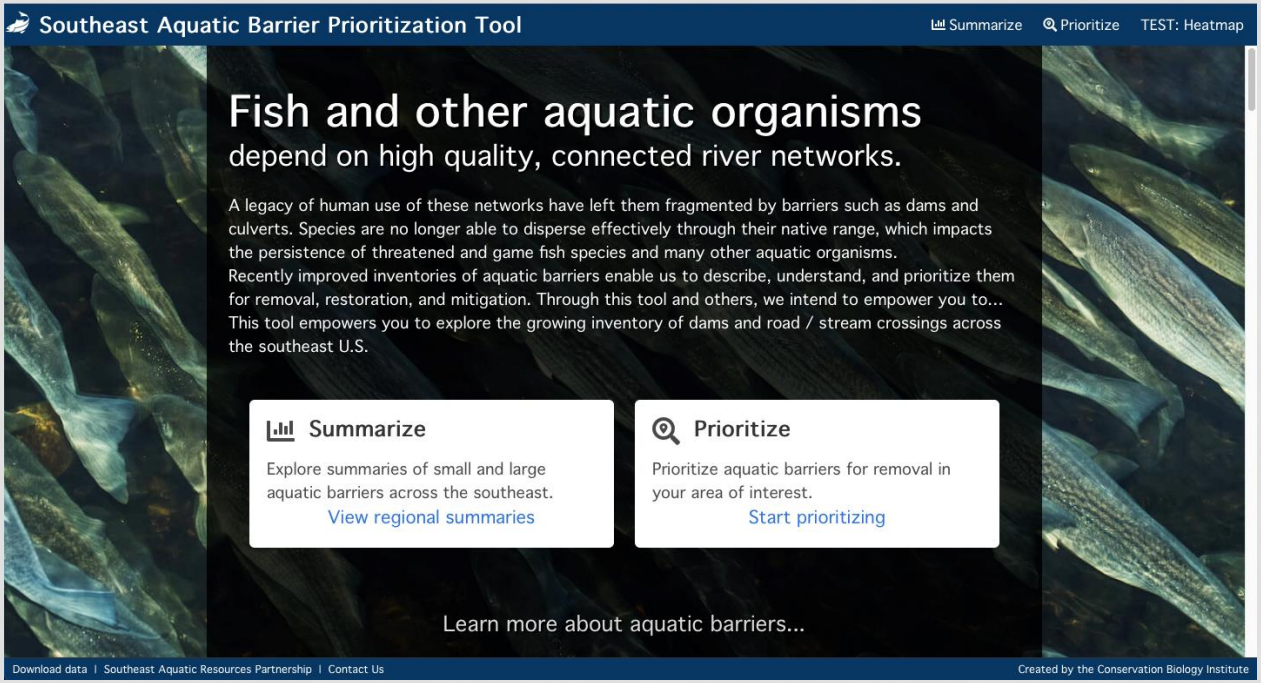
Prioritization

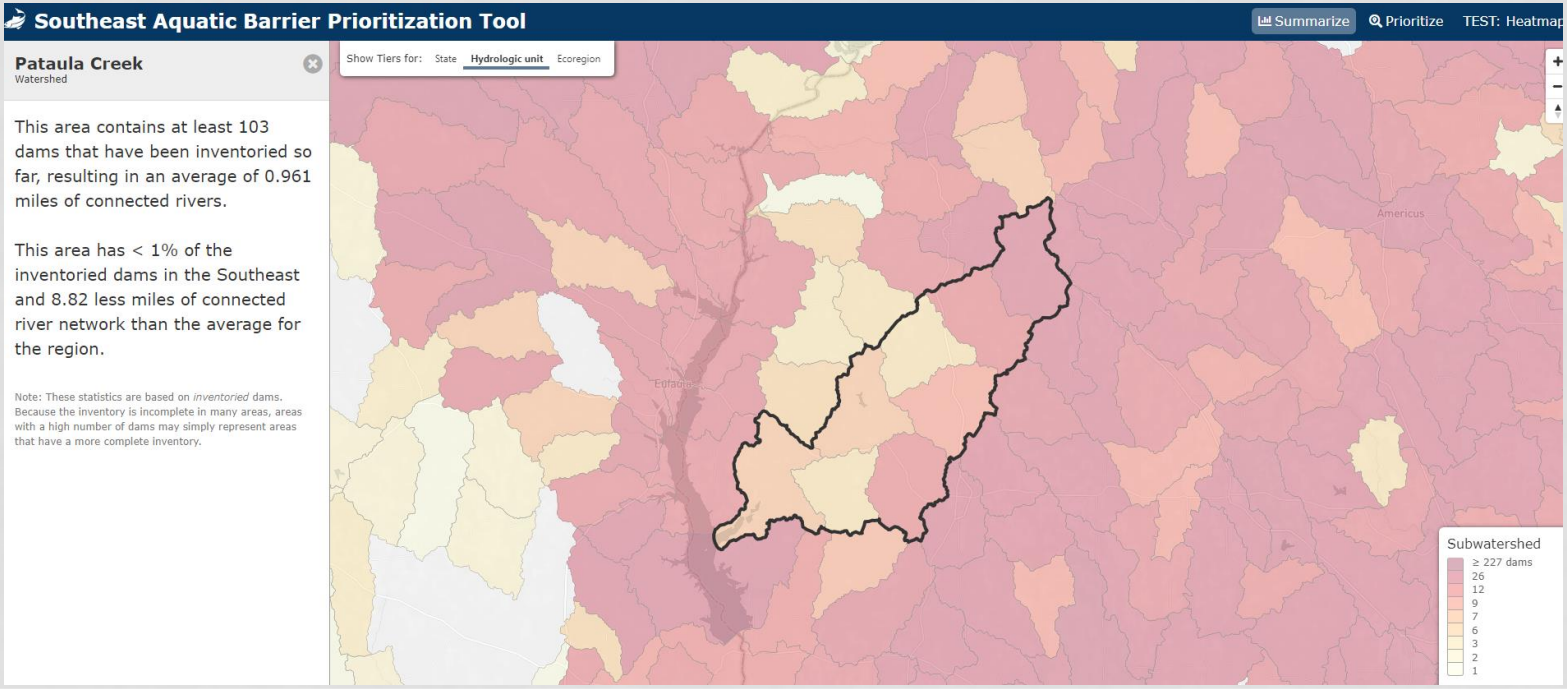
Criterion	Metric
Connectivity Benefit	Miles of habitat gained by barrier removal
Watershed Condition	Percent natural land cover in floodplain of barrier's upstream functional network
Watershed Condition	Average sinuosity of barrier's upstream functional network
Watershed Condition	Number of river size classes gained by barrier's upstream functional network



Upstream functional river network of a dam on Ozark National Forest.

Connectivity Teams


Southeast Aquatic Barrier Prioritization Tool
Summarize
Prioritize
TEST: Heatmap
Fish and other aquatic organisms
depend on high quality, connected river networks.
A legacy of human use of these networks have left them fragmented by barriers such as dams and culverts. Species are no longer able to disperse effectively through their native range, which impacts the persistence of threatened and game fish species and many other aquatic organisms.
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 intend to empower you to...
This tool empowers you to explore the growing inventory of dams and road / stream crossings across the southeast U.S.
Summarize
Explore summaries of small and large aquatic barriers across the southeast.
View regional summaries
Prioritize
Prioritize aquatic barriers for removal in your area of interest.
Start prioritizing
Learn more about aquatic barriers...
Download data | Southeast Aquatic Resources Partnership | Contact Us
Created by the Conservation Biology Institute


Southeast Aquatic Barrier Prioritization Tool
Summarize
Prioritize
TEST: Heatmap
Pataula Creek
Watershed
This area contains at least 103 dams that have been inventoried so far, resulting in an average of 0.961 miles of connected rivers.
This area has < 1% of the inventoried dams in the Southeast and 8.82 less miles of connected river network than the average for the region.
Note: These statistics are based on inventoried dams. Because the inventory is incomplete in many areas, areas with a high number of dams may simply represent areas that have a more complete inventory.
Show Tiers for: State Hydrologic unit Ecoregion
Americus
Eufaula
Subwatershed
≥ 227 dams
26
12
9
7
6
3
2
1

Standardized Protocol

- Passability assessments
- Risk of failure
- Stream degradation

SOUTHEAST AQUATIC RESOURCES PARTNERSHIP
SARP

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 (DD/MM/YYYY) _____ Lead Observer _____
Town/County _____ Stream _____
Road _____ Type ☐ MULTILANE ☐ PAVED ☐ UNPAVED ☐ DRIVEWAY ☐ TRAIL ☐ RAILROAD
GPS Coordinates (Decimal degree) ☐☐.☐☐☐☐☐ °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
Tailwater Scour Pool ☐ NONE ☐ SMALL ☐ LARGE
Riparian Vegetation Overstory % Understory % Ground level %
Inlet Scour Pool ☐ NONE ☐ SMALL ☐ LARGE
Riparian Vegetation Overstory % Understory % Ground level %
Crossing Comments

STRUCTURE 1

Structure Material ☐ METAL ☐ CONCRETE ☐ PLASTIC ☐ WOOD ☐ ROCK/STONE ☐ FIBERGLASS ☐ COMBINATION

OUTLET

Outlet Shape ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ FORD ☐ UNKNOWN ☐ REMOVED
Outlet Armoring ☐ NONE ☐ NOT EXTENSIVE ☐ EXTENSIVE
Outlet Grade (Pick one) ☐ AT STREAM GRADE ☐ FREE FALL ☐ CASCADE ☐ FREE FALL ONTO CASCADE ☐ CLOGGED/COLLAPSED/SUBMERGED ☐ UNKNOWN
Outlet Dimensions A. Width _____.__ B. Height _____.__ C. Substrate/Water Width _____.__ D. Water Depth _____.__
Outlet Drop to Water Surface _____.__ Outlet Drop to Stream Bottom _____.__ E. Abutment Height (Type 7 bridges only) _____.__
L. Structure Length (Overall length from inlet to outlet) _____.__ Evidence of undermining ☐ Y ☐ N

INLET

Inlet Shape ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ FORD ☐ UNKNOWN ☐ REMOVED
Inlet Armoring ☐ NONE ☐ NOT EXTENSIVE ☐ EXTENSIVE
Inlet Type ☐ PROJECTING ☐ HEADWALL ☐ WINGWALLS ☐ HEADWALL & WINGWALLS ☐ MITERED TO SLOPE ☐ OTHER ☐ NONE
Inlet Grade (Pick one) ☐ AT STREAM GRADE ☐ INLET DROP ☐ PERCHED ☐ CLOGGED/COLLAPSED/SUBMERGED ☐ UNKNOWN
Undermining ☐ Y ☐ N
Inlet Dimensions A. Width _____.__ B. Height _____.__ C. Substrate/Water Width _____.__ D. Water Depth _____.__

ADDITIONAL CONDITIONS

Slope % (Optional) _____ Slope Confidence ☐ HIGH ☐ LOW
Internal Structures ☐ NONE ☐ BAFFLES/WEIRS ☐ SUPPORTS ☐ OTHER _____
Structure Substrate Matches Stream ☐ NONE ☐ COMPARABLE ☐ CONTRASTING ☐ NOT APPROPRIATE ☐ UNKNOWN
Structure Substrate Type (Pick one) ☐ NONE ☐ SILT ☐ SAND ☐ GRAVEL ☐ COBBLE ☐ BOULDER ☐ BEDROCK ☐ ORGANIC MTRL ☐ UNKNOWN
Structure Substrate Coverage ☐ NONE ☐ 25% ☐ 50% ☐ 75% ☐ 100% ☐ UNKNOWN
Physical Barriers (Pick all that apply) ☐ NONE ☐ DEBRIS/SEDIMENT/ROCK ☐ DEFORMATION ☐ FREE FALL ☐ FENCING ☐ DRY ☐ OTHER
Severity (Choose carefully based on barrier type(s) above) ☐ NONE ☐ MINOR ☐ MODERATE ☐ SEVERE
Water Depth Matches Stream ☐ YES ☐ NO-SHALLOWER ☐ NO-DEEPER ☐ UNKNOWN ☐ DRY
Water Velocity Matches Stream ☐ YES ☐ NO-FASTER ☐ NO-SLOWER ☐ UNKNOWN ☐ DRY
Dry Passage through Structure? ☐ YES ☐ NO ☐ UNKNOWN Height above Dry Passage _____
Comments

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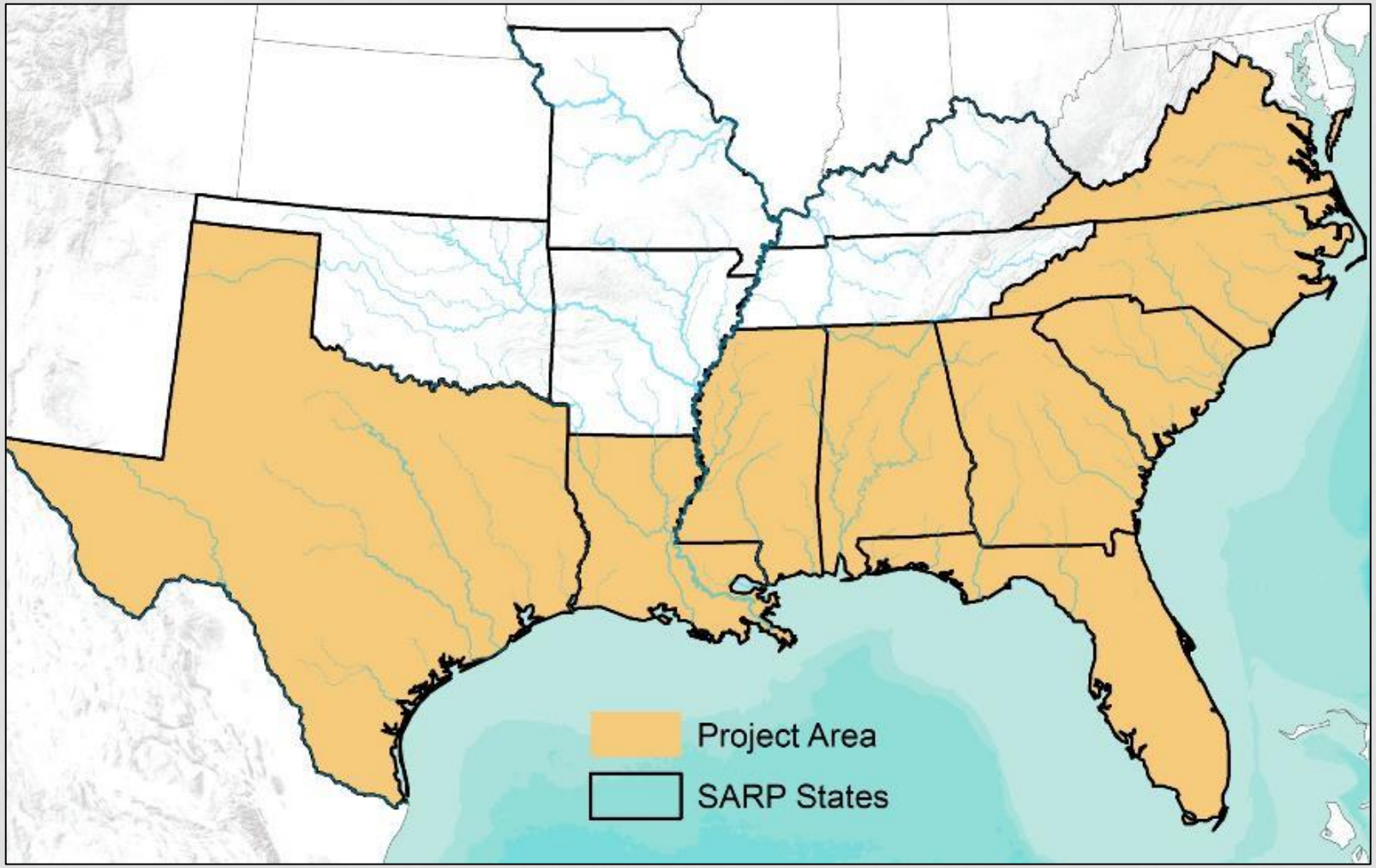
COASTAL

"Sustainable coastal habitats and associated fisheries to increase coastal resiliency and economies across the Gulf of Mexico and South Atlantic Regions"



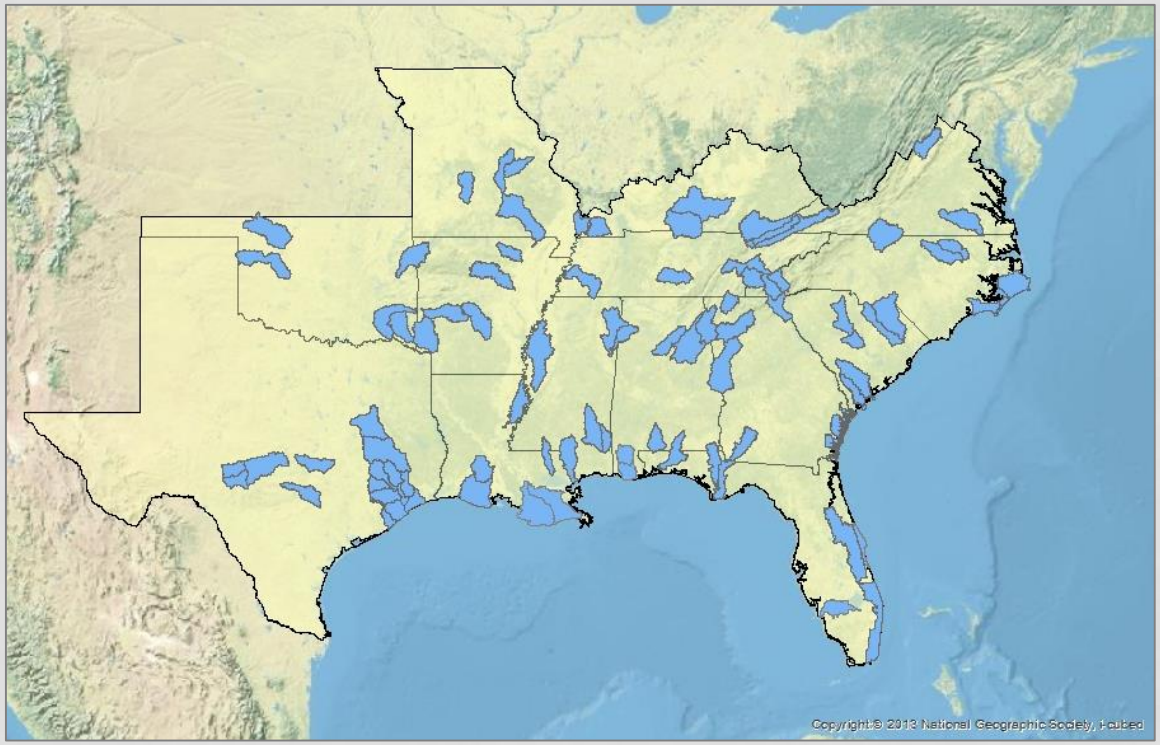
COASTAL

- SARP aims to be value added
  - Connect Gulf and South Atlantic regions
    - Coordination and Science support
  - Topical Workshops
    - Coastal Hydrological Impairments
    - Derelict Crab Trap removals and recycling
    - Freshwater Inflows/Upstream Connectivity

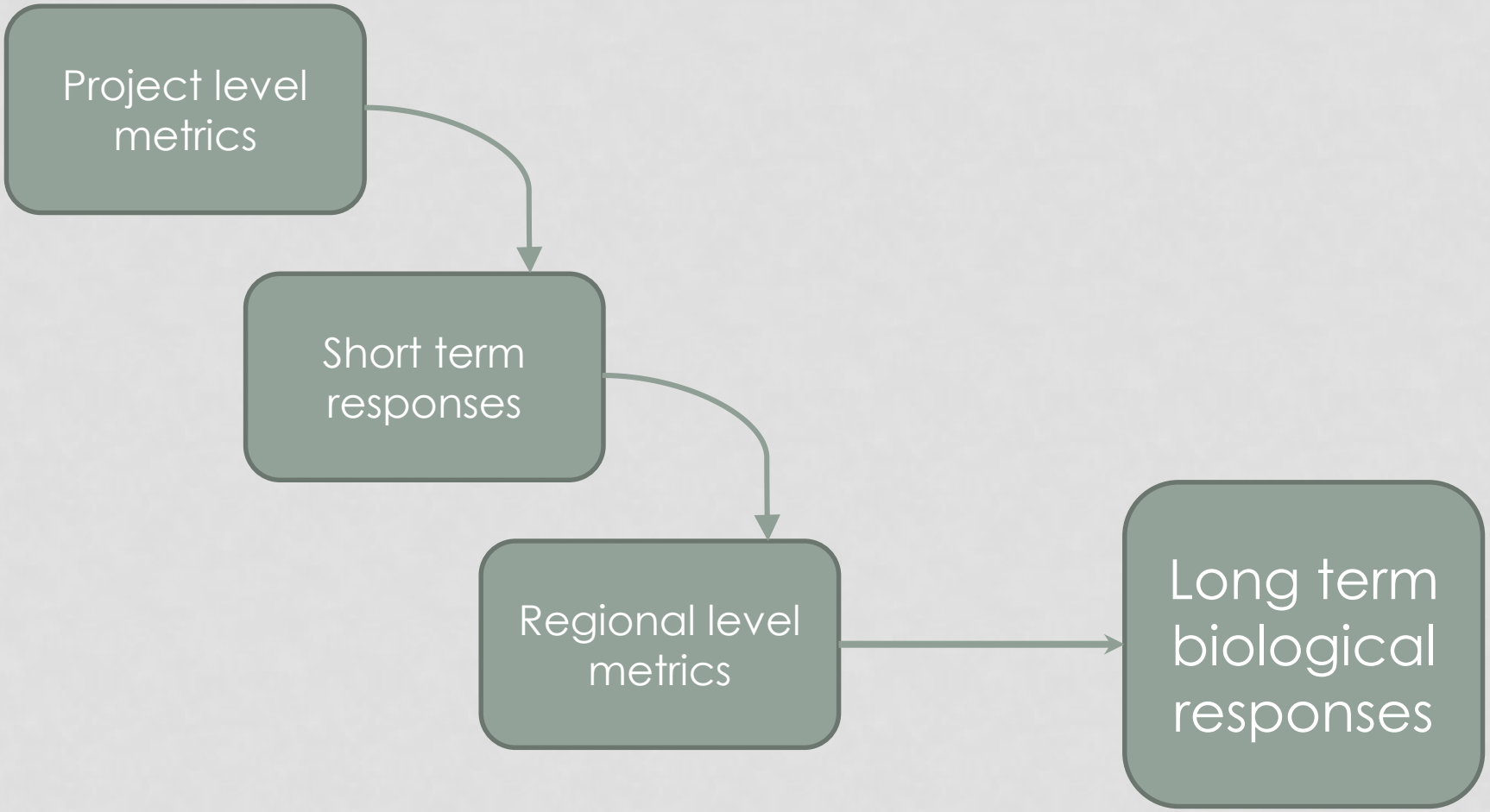
Watershed Needs/Threats

Conservation Actions

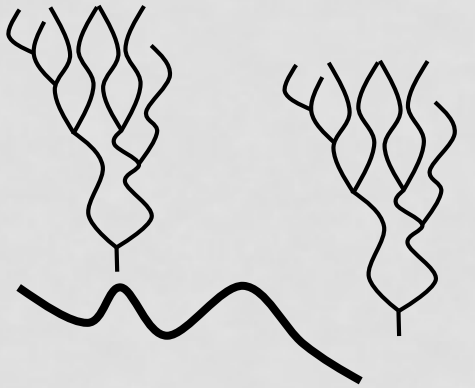
Delivery Network



EFFECTIVENESS METRICS

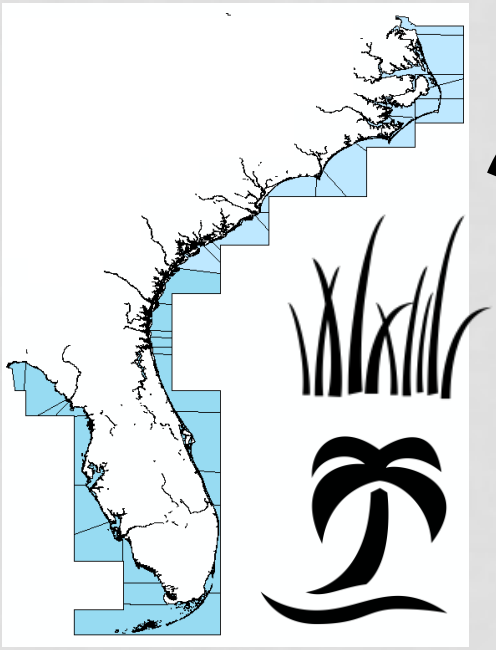


A CROSS-SCALE APPROACH TO MODELING COASTAL HABITAT & BIOTA



Watershed-scale variables

Hierarchical Bayesian & structural equation modeling

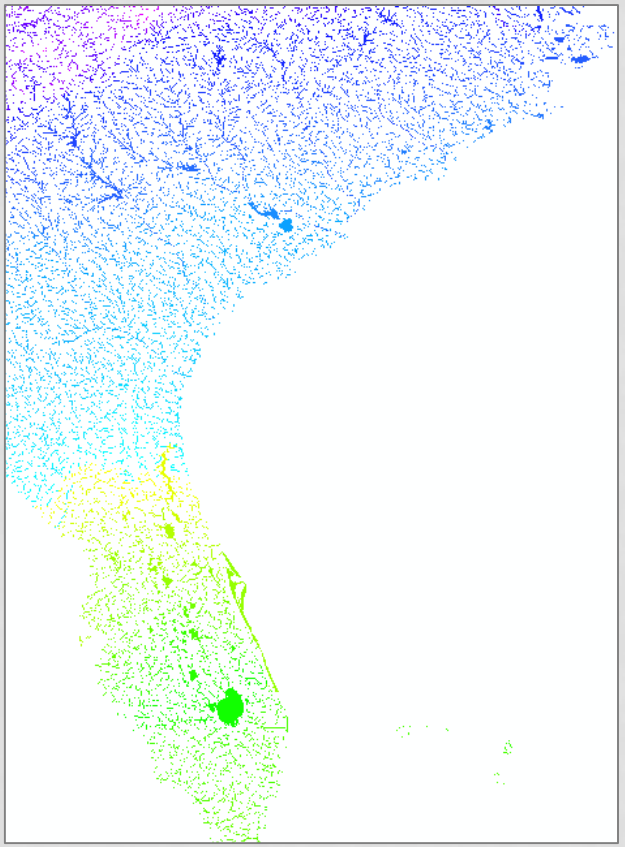


Coastal habitat

Coastal biota

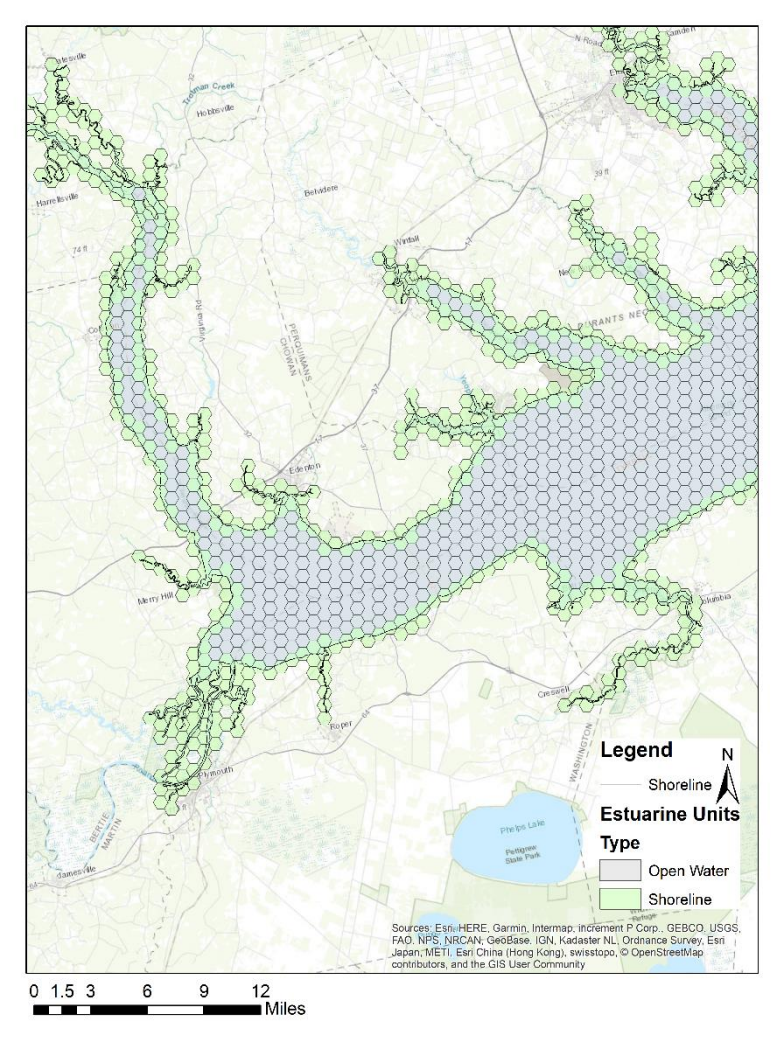
WATERSHED-LEVEL FACTORS & DATASETS

- **Anthropogenic land use**:
  - National Land Cover Database
- **Human population size**:
  - US Census
- **Water quality etc:**
  - US EPA StreamCat dataset
- **Natural attributes**
  - (precip, streamflow, etc): Earth-Env dataset



COASTAL HABITAT VARIABLES: LEVERAGING EXISTING SARP WORK

- **Seagrass & oyster reef habitat**:
  - TNC South Atlantic Bight Marine Assessment
- **Wetland habitat coverage**:
  - National Wetlands Inventory
- **Habitat areas of particular concern**:
  - NOAA

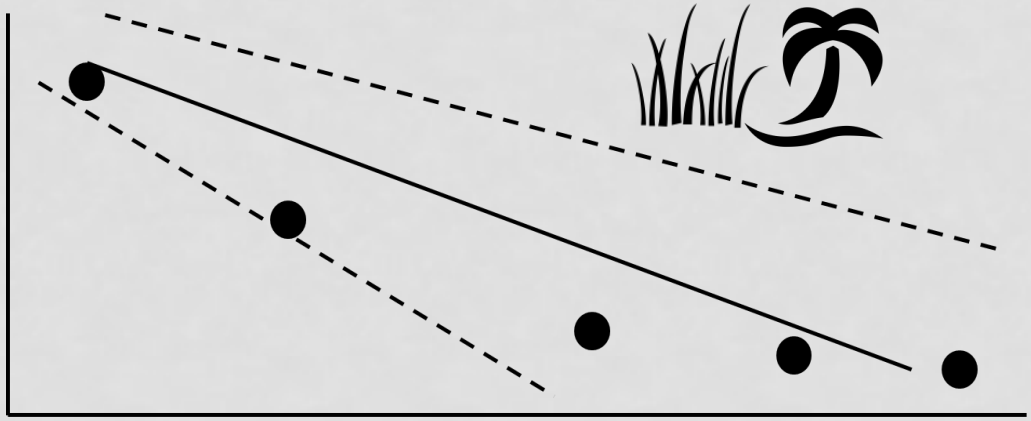


COASTAL BIOTIC DATA

- **Southeast Area Monitoring and Assessment Program—South Atlantic (SEAMAP-SA)**
  - **Abundance, biomass & size structure of key species**
  - **Trawl & longline surveys**

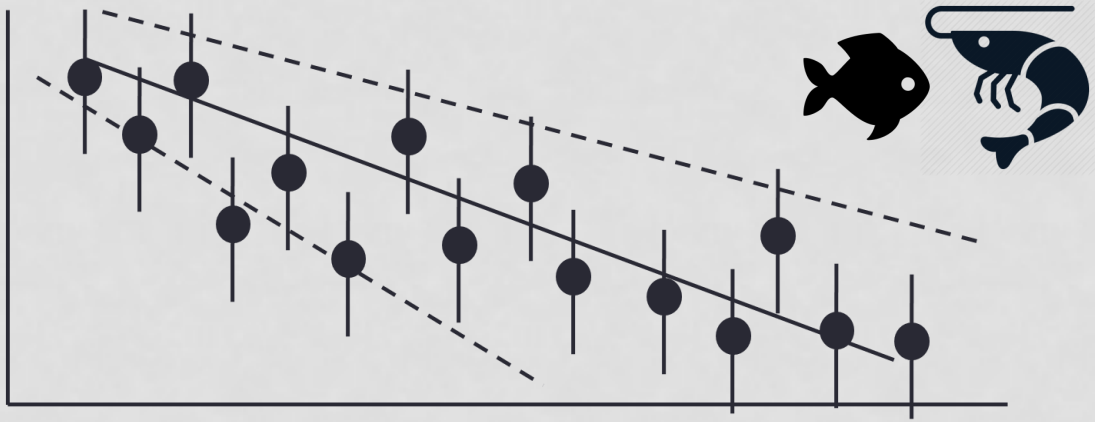
Level 1: estimate effects of watershed attributes on coastal habitat

Coastal habitat variable y_i



Watershed variable x_i

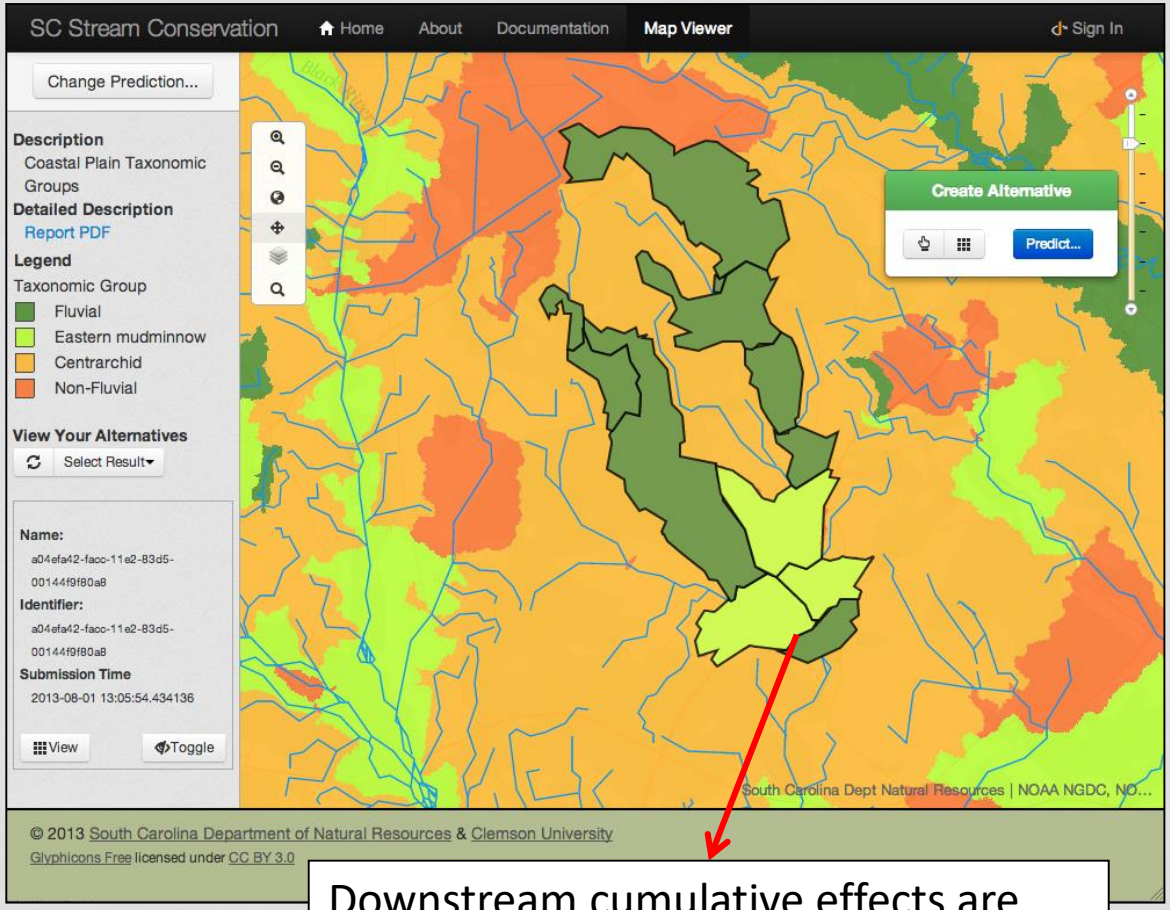
Biotic variable y_i



Coastal habitat variable x_i

INTERACTIVE CONSERVATION PLANNING

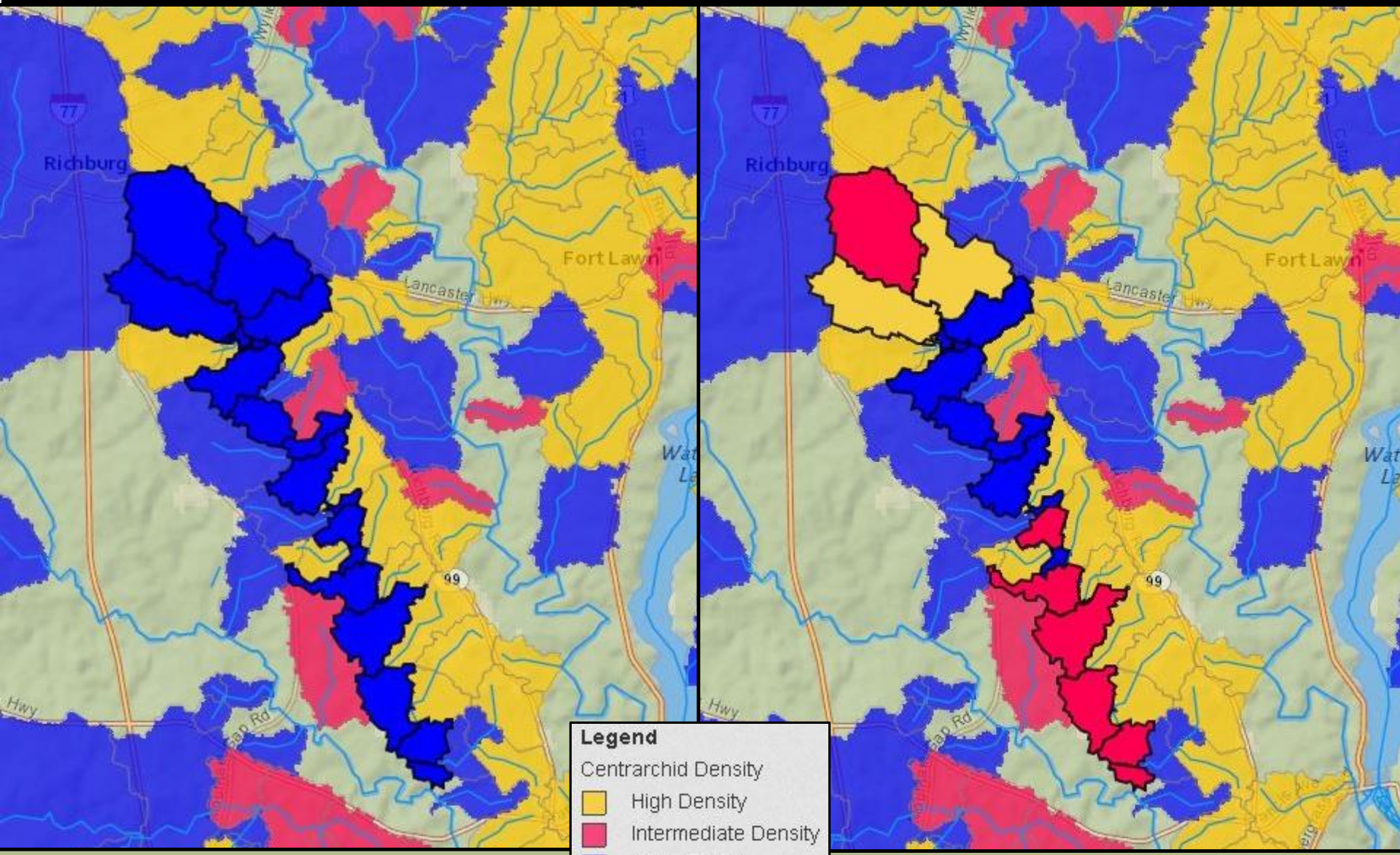
- Server process *dynamically executes a random forest prediction* inside an R statistical computing environment
- Results are returned and displayed in the map viewer.



Downstream cumulative effects are automatically calculated and incorporated into prediction.

Initial

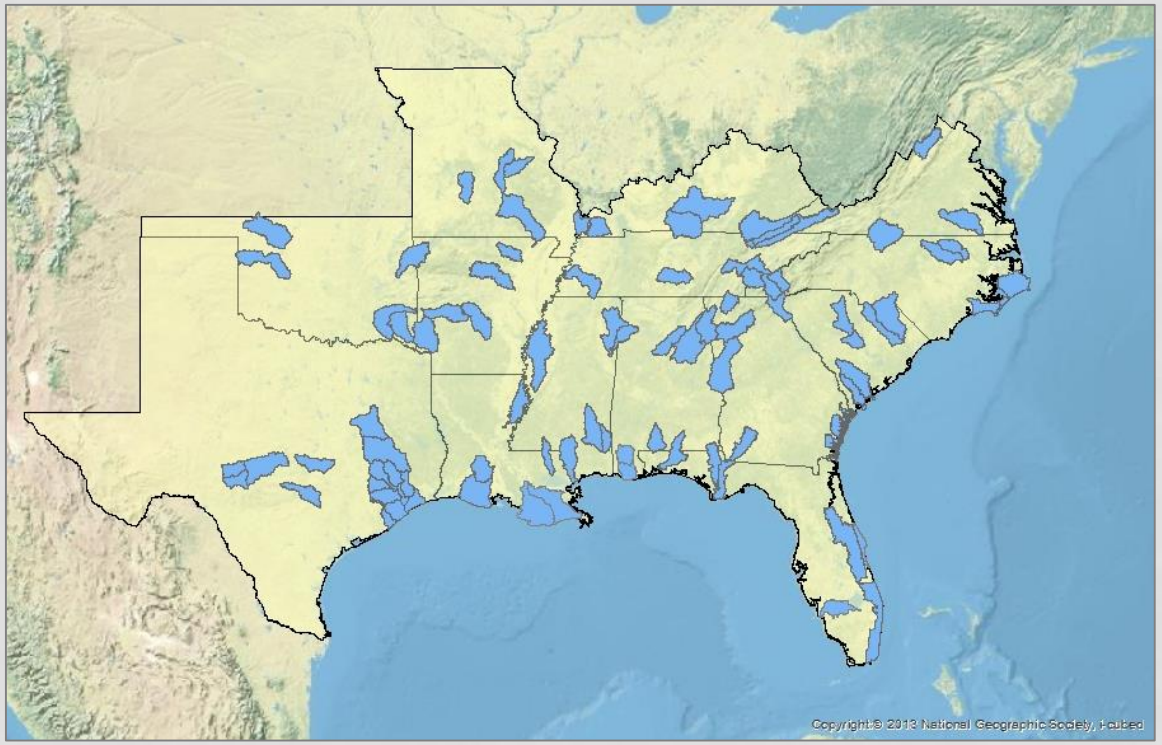
↓ Forest 30% ↑ Urban 30%



Watershed Needs/Threats

Conservation Actions

Delivery Network



Return on Investment


QUESTIONS?

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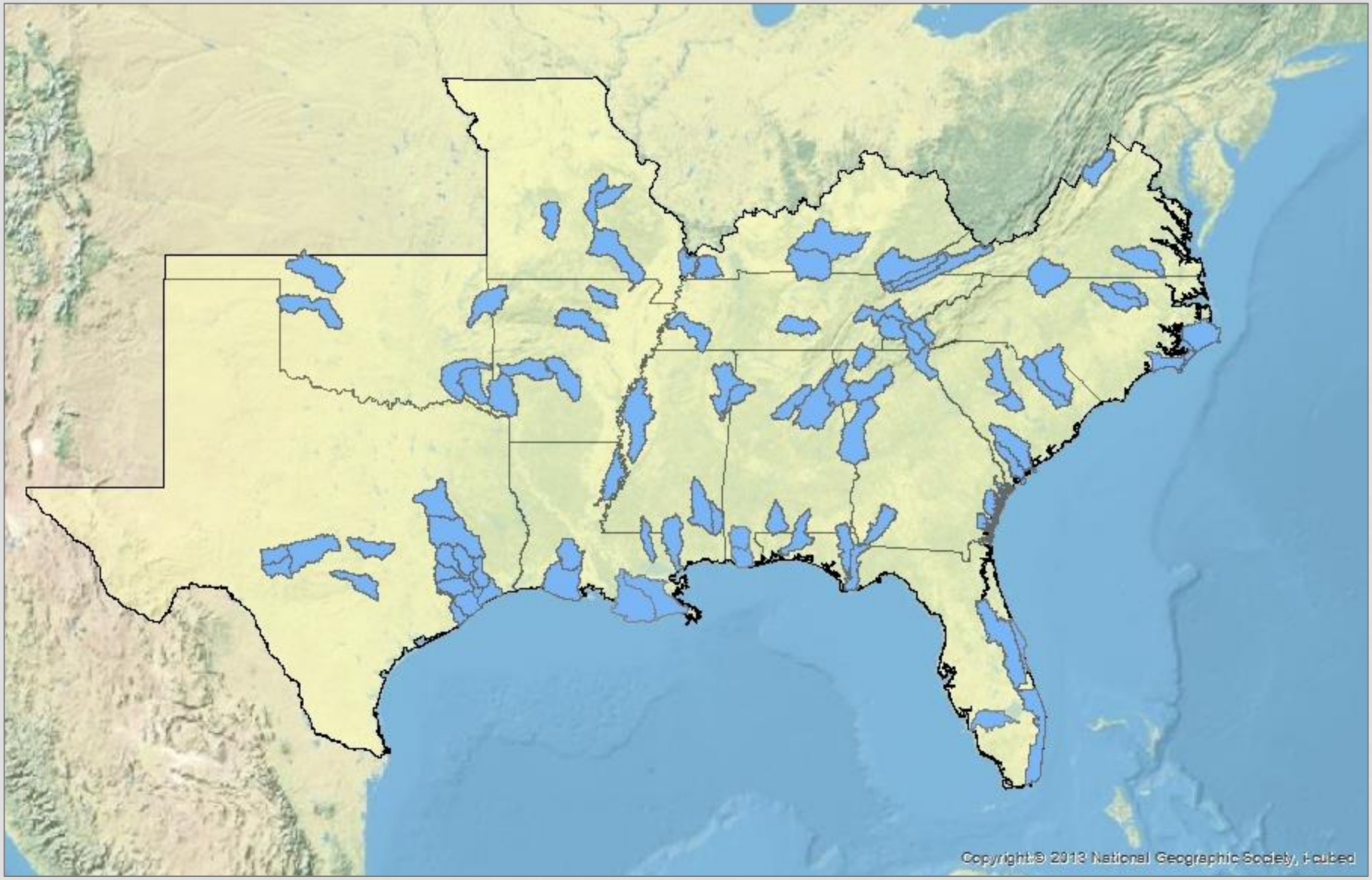
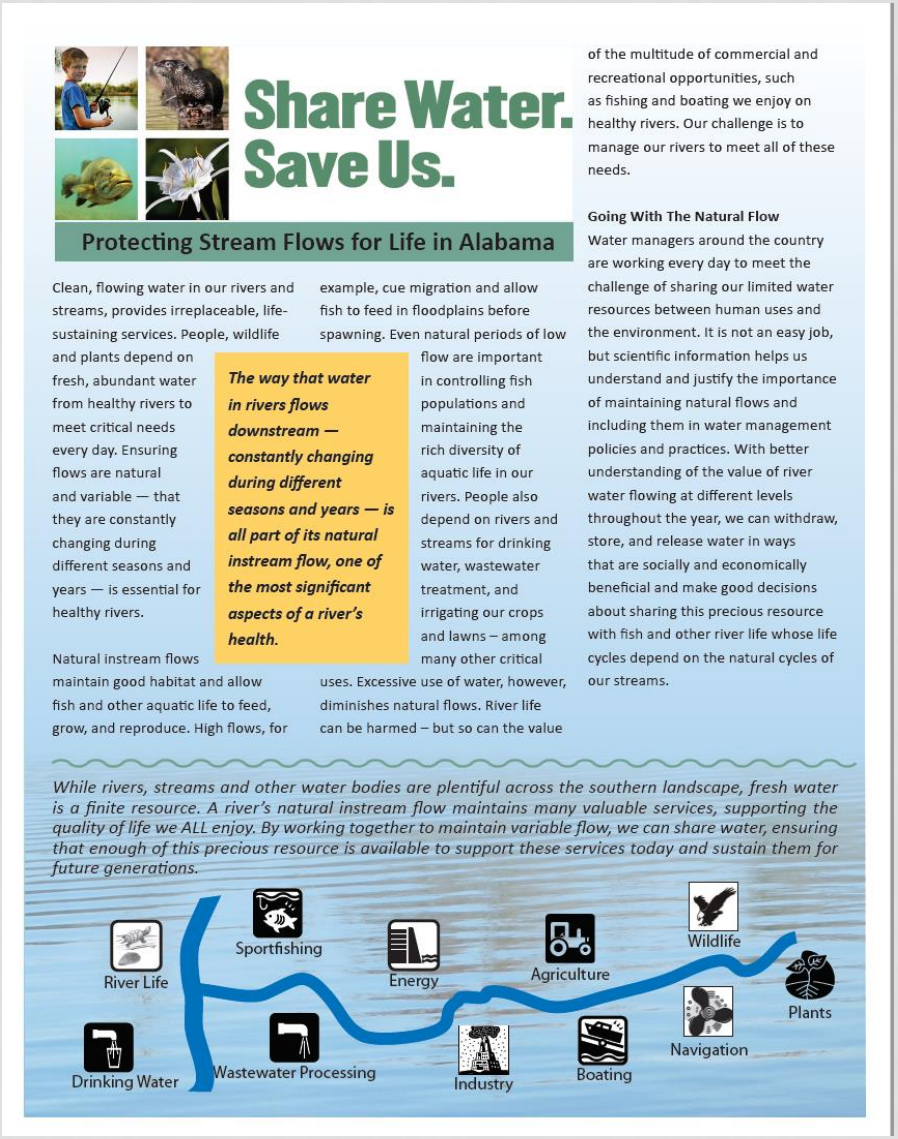
NATIONAL FISH HABITAT PARTNERSHIP




THE
ARBOR ROOM
SOUTHEAST AQUATIC RESOURCES PARTNERSHIP
SARP
Our Programs:
Coastal
Connectivity
Native Black
Bass Initiative
Watershed
Restoration
Instream Flow
CONSERVING
AQUATIC RESOURCES
THROUGH SUSTAINABLE
LAND MANAGEMENT
PRACTICES
SOUTHEAST AQUATIC RESOURCES PARTNERSHIP
SARP

INSTREAM FLOW

- Research Agenda
  - Long term goals
    - Promote Instream Flow Research
    - Disseminate Information
    - Facilitate Communication
    - Promote Instream Flow Regime Standards



Share Water. Save Us.

Protecting Stream Flows for Life in Alabama

Clean, flowing water in our rivers and streams, provides irreplaceable, life-sustaining services. People, wildlife and plants depend on fresh, abundant water from healthy rivers to meet critical needs every day. Ensuring flows are natural and variable — that they are constantly changing during different seasons and years — is essential for healthy rivers.

The way that water in rivers flows downstream — constantly changing during different seasons and years — is all part of its natural instream flow, one of the most significant aspects of a river's health.

Natural instream flows maintain good habitat and allow fish and other aquatic life to feed, grow, and reproduce. High flows, for example, cue migration and allow fish to feed in floodplains before spawning. Even natural periods of low flow are important in controlling fish populations and maintaining the rich diversity of aquatic life in our rivers. People also depend on rivers and streams for drinking water, wastewater treatment, and irrigating our crops and lawns – among many other critical uses. Excessive use of water, however, diminishes natural flows. River life can be harmed – but so can the value of the multitude of commercial and recreational opportunities, such as fishing and boating we enjoy on healthy rivers. Our challenge is to manage our rivers to meet all of these needs.

Going With The Natural Flow

Water managers around the country are working every day to meet the challenge of sharing our limited water resources between human uses and the environment. It is not an easy job, but scientific information helps us understand and justify the importance of maintaining natural flows and including them in water management policies and practices. With better understanding of the value of river water flowing at different levels throughout the year, we can withdraw, store, and release water in ways that are socially and economically beneficial and make good decisions about sharing this precious resource with fish and other river life whose life cycles depend on the natural cycles of our streams.

While rivers, streams and other water bodies are plentiful across the southern landscape, fresh water is a finite resource. A river's natural instream flow maintains many valuable services, supporting the quality of life we ALL enjoy. By working together to maintain variable flow, we can share water, ensuring that enough of this precious resource is available to support these services today and sustain them for future generations.