



Town of
Leland

Growing our future. Nourishing our roots.

Resilient Coastal Communities Program



Introductions



**Mackenzie
Todd**

RCCP Program
Manager



**Adrianna
Weber**

Town
Engineer



**Dawn
York**

Project
Manager



**Mike
Robinson**

Hazard
Mitigation



**Ayse
Karanci**

Social
Vulnerability



**Amanda
Zullo**

Community
Outreach



**Rachel
Baker**

Environmental
Scientist



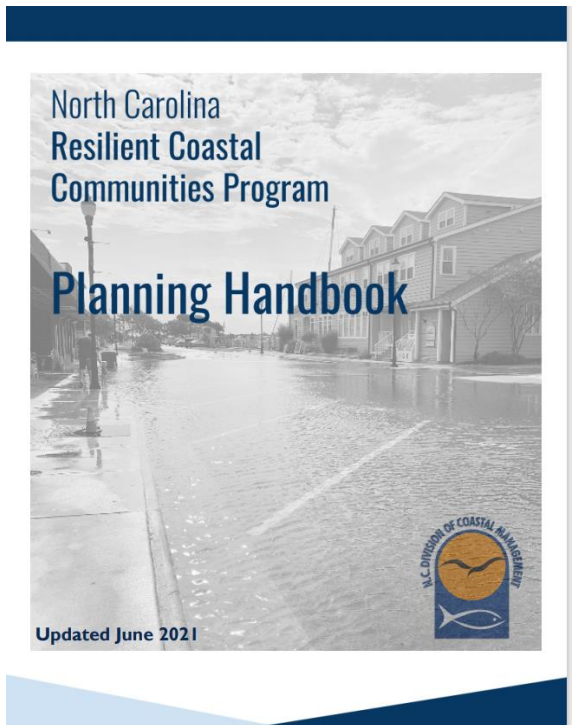
Program Steps and Requirements

- **Phase 1: Community Engagement and Risk/Vulnerability Assessment**

- ✓ Step 1: Develop a Community Action Team
- ✓ Step 2: Set Vision and Goals
- ✓ Step 3: Review Existing Local Plans & Efforts
- ✓ Step 4: Develop a Community Engagement Strategy
- ✓ Step 5: Map Critical Assets and Natural Infrastructure
- ✓ Step 6: Conduct a Risk and Vulnerability Assessment

- **Phase 2: Planning, Project Identification, and Prioritization**

- ❖ Step 1: Identify a Suite of Potential Solutions
- ❖ Step 2: Consolidate and Prioritize Projects





Schedule

Phase	Step	Task	Schedule
1	1	Develop a Community Action Team	May 2021
	2	Set Vision and Goals	July 2021
	2a	CAT meeting #1	July 7, 2021
	3	Review Existing Local Plans	May – July 2021
	4	Develop Community Engagement Strategy	June 2021
	5	Map Critical Assets/Natural Infrastructure	June – July 2021
	5a	Public Meeting	August 2021
	6	Conduct a Risk and Vulnerability Assessment	July – September 2021
			Community Action Team Meeting #2
2	1	Identify a Suite of Potential Solutions	November-December 2021
	1a	Community Action Team meeting #3	December 2021
	2	Consolidate and Prioritize Projects	December 2021
	3	Finalize Report	January 2022



Deliverables and Project Duration

- **Deliverables**

- Risk and Vulnerability Assessment Report
 - Quantitative and qualitative risk assessment performed
 - Vulnerability of critical assets, natural infrastructure, and vulnerable populations
- Project Portfolio
 - Series of options aimed at reducing exposure and sensitivity and increasing adaptive capacity to hazards
- GIS Products
 - Maps provided in map package format

- **Project Duration**

- Aim to complete deliverables by January 31, 2022.

Vision and Goal Statements

Moffatt & Nichol



Vision Statement

To promote the health, safety, and overall well-being of the residents, visitors, and patrons of Leland by creating a more resilient community, particularly with regard to floodplain and stormwater management, sheltering and evacuation, data and research, transportation and infrastructure, community planning, communication, economy, and the environment.



Goal Statements

1. Theme: Floodplain and Stormwater Management

Statement: Evaluate and identify specific risks and vulnerabilities, particularly with regard to FEMA flood zones and stormwater problem areas, and establish projects and activities to evaluate, communicate, and provide solutions to reduce those risks

2. Theme: Sheltering and Evacuation

Statement: Identify, establish, and provide information on facilities for use as shelters and staging areas, and identify key roadways within the community for emergency evacuations and mobility during disaster events





Goal Statements

3. Theme: **Data and Research**

Statement: Update and use the most recent data and innovative research to inform and support resilience activities within the community

4. Theme: **Transportation and Infrastructure**

Statement: Create solutions for critical building and transportation infrastructure with regard to flood hazards within the community

5. Theme: **Plans, Policies, and Ordinances**

Statement: Review, revise, and implement/enforce plans, policies, and ordinances, including land use, zoning, and inspections, and incorporate incentives for strong resilience practices within the community





Goal Statements

6. Theme: **Communication**

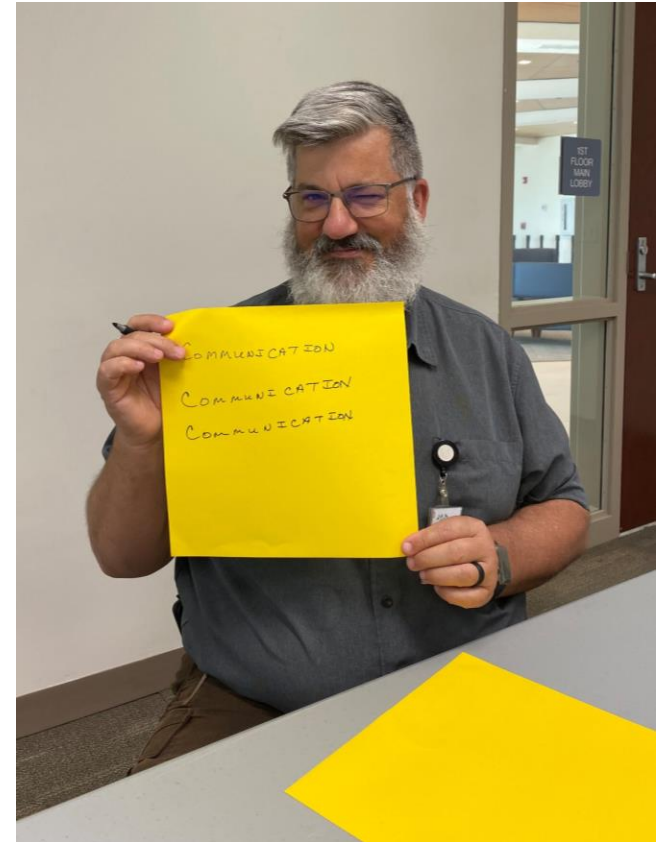
Statement: Enhance education, communication, and collaboration within the community, particularly with regard to vulnerable populations in flood-prone areas, as well as outside the community with neighboring jurisdictions, County departments, State agencies, and regional and Federal resources

7. Theme: **Economics**

Statement: Work with appropriate stakeholders and partners to enhance the economic viability and resiliency of the local economy

8. Theme: **Environmental**

Statement: Identify nature-based solutions that restore the natural beneficial functions of floodplains and wetlands to help alleviate flooding, reduce health and safety risks, and enhance the environmental appeal of the community



Risk and Vulnerability Assessment

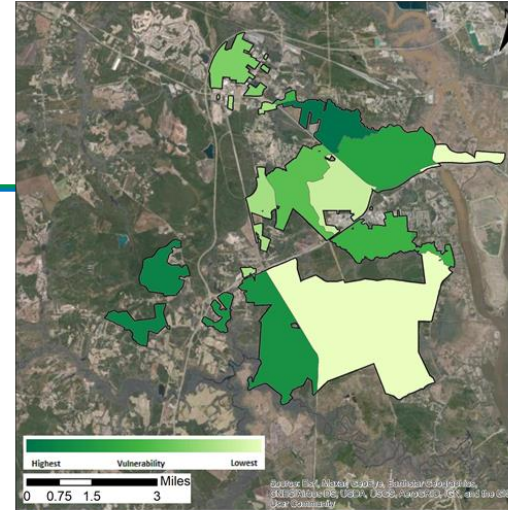
Moffatt & Nichol



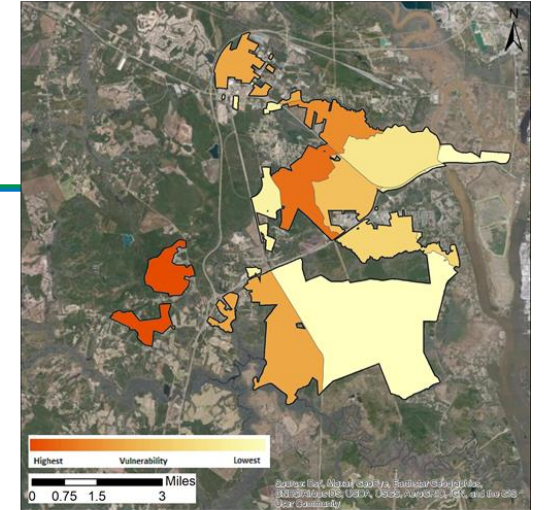
Summary of Risk and Vulnerability Assessment

OVERALL VULNERABILITY	Socioeconomic Status	Below Poverty
		Income per Capita
		Unemployment
	Household Composition	High School Education
		Aged 65 and Older
		Aged 17 and Younger
		Older than Age 5 with Disability
	Minority Status & Language	Single-Parent Household
		Minority
	Housing & Transportation	Speaks English "Less Than Well"
		Multi-Unit Structures
		Mobile Homes
		Crowding
No Vehicle		
Group Quarters		

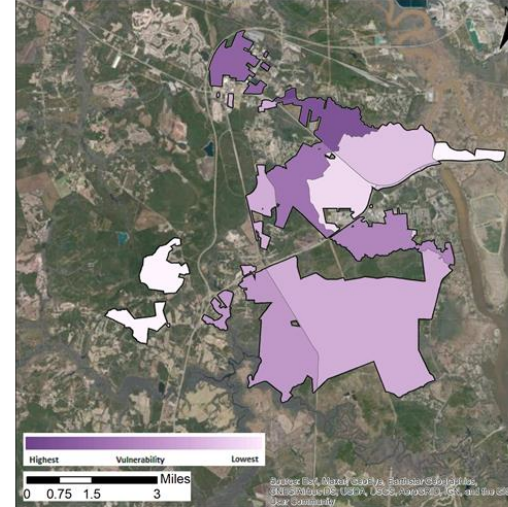
Socioeconomic Status



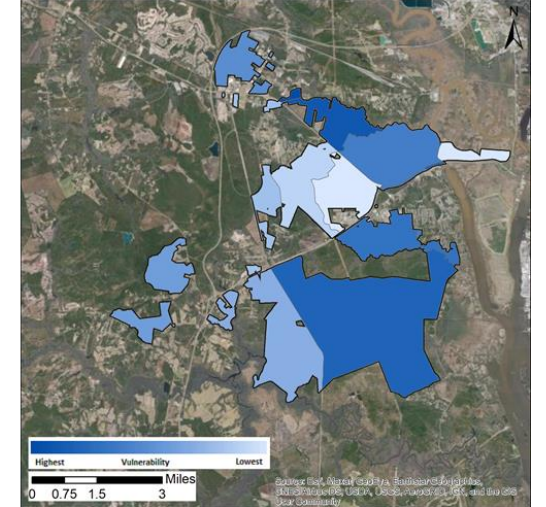
Household Composition



Minority/Language

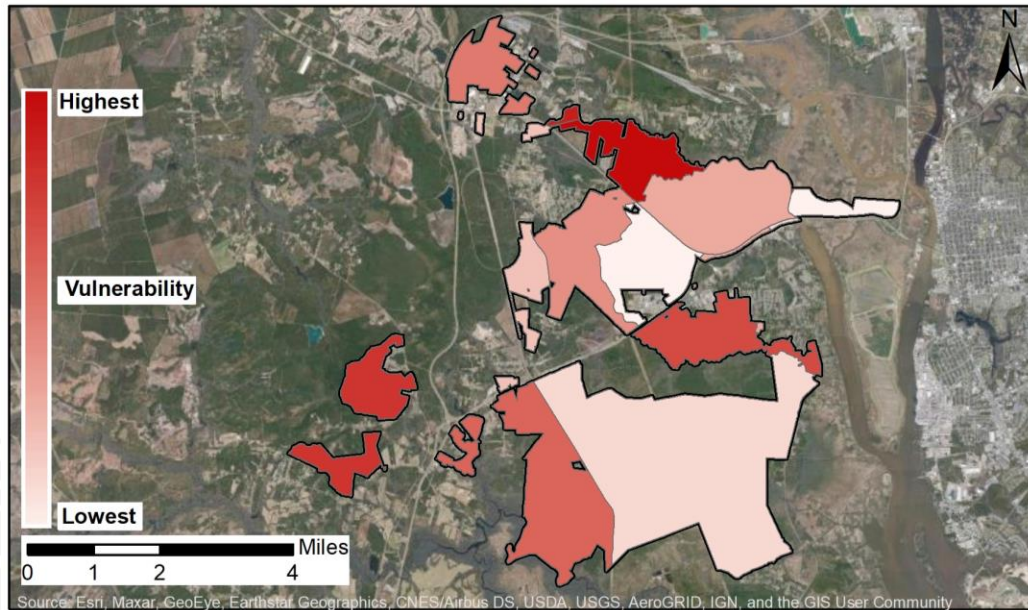


Housing/Transportation

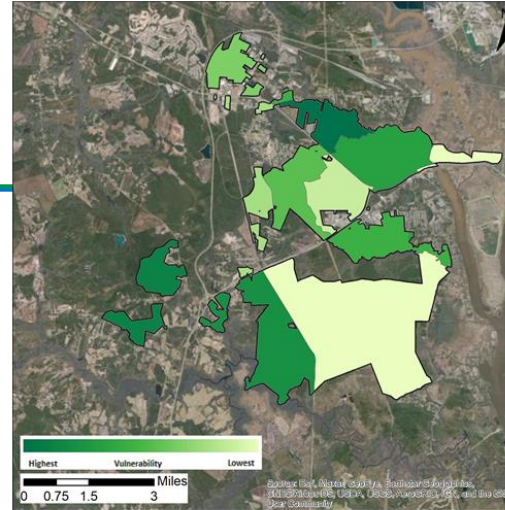




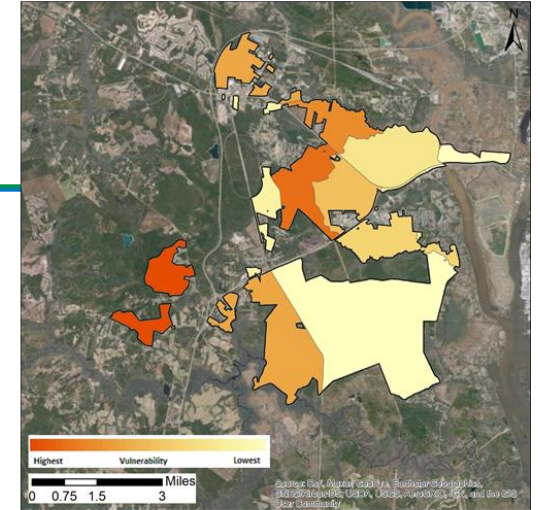
Summary of Risk and Vulnerability Assessment



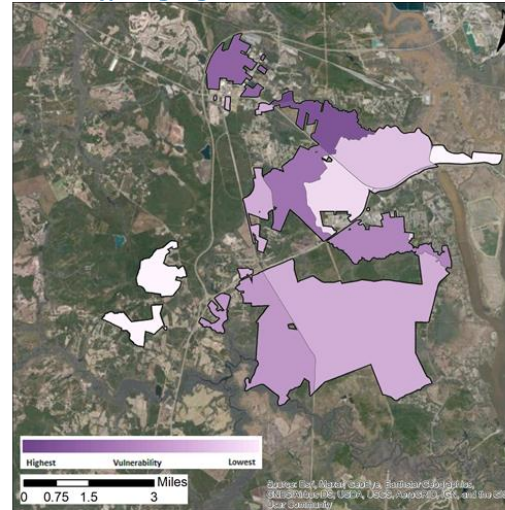
Socioeconomic Status



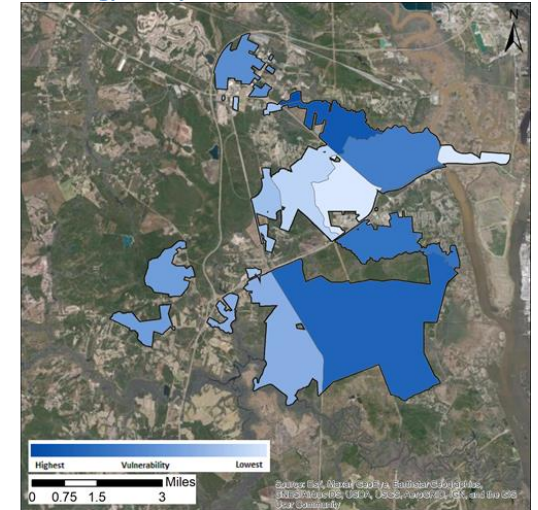
Household Composition



Minority/Language



Housing/Transportation

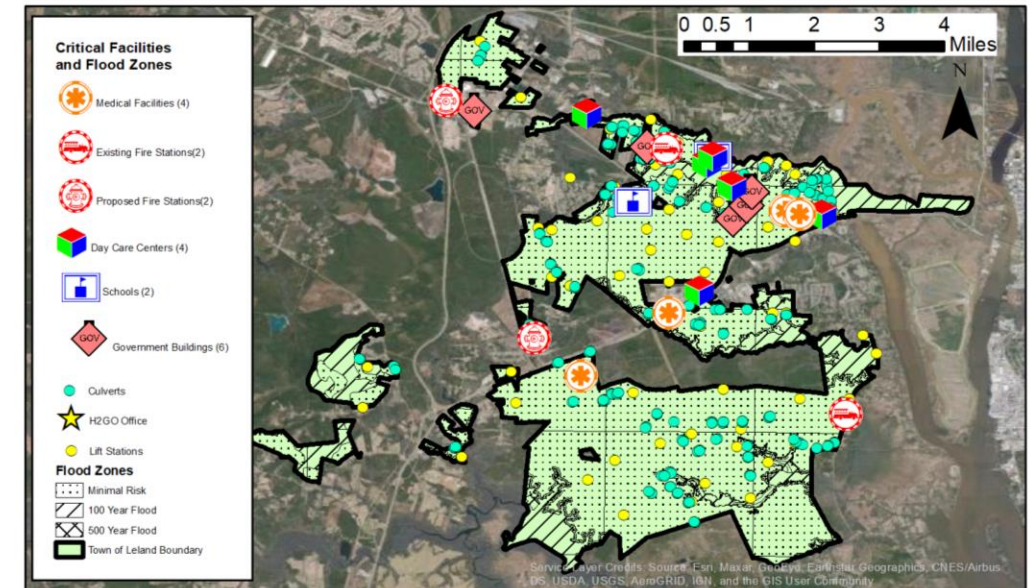




Summary of Risk and Vulnerability Assessment

		Flooding		Storm Surge					Sea Level Rise		
		100 year	500 year	Cat .1	Cat .2	Cat .3	Cat .4	Cat .5	1 ft	3 ft	5 ft
Medical Facilities	FastMed Urgent Care	-	-	-	-	-	-	-	-	-	-
	AssistedCare Home Health	-	-	-	-	-	-	-	-	-	-
	Wilmington Health Today's Care	-	-	-	-	-	-	-	-	-	-
	NHRMC Express Care	-	-	-	-	-	-	-	-	-	-
Fire Stations	Village Road	-	-	-	-	-	-	-	-	-	-
	Station 52	-	-	-	-	-	-	X	-	-	-
Education and Day Cares	Leland Middle School	-	-	-	-	-	-	-	-	-	-
	North Brunswick High School	-	-	-	-	-	-	-	-	-	-
	Kinderstop Kids LLC	-	-	-	-	-	-	-	-	-	-
	Puddle Jumpers Forest	-	-	-	-	-	-	X	-	-	-
	Christian Academy	-	-	-	-	-	-	-	-	-	-
	Childcare Network	-	-	-	-	-	-	X	-	-	-
	Excel Learning Center	-	-	-	-	-	-	X	-	-	-
	Kids World Academy	-	-	-	-	-	-	-	-	-	-
Government Buildings	Leland Town Hall	-	-	-	-	-	-	-	-	-	-
	Brunswick Center at Leland	-	-	-	-	-	-	-	-	-	-
	Leland Public Library	-	-	-	-	-	-	X	-	-	-
	Municipal Operations Center	-	-	-	-	-	-	-	-	-	-
	H2GO Office	-	-	-	-	-	-	X	-	-	-
	United States Postal Office	-	-	-	-	-	-	-	-	-	-
	NC State Government Adult Probation and Parole	-	-	-	-	-	-	X	-	-	-

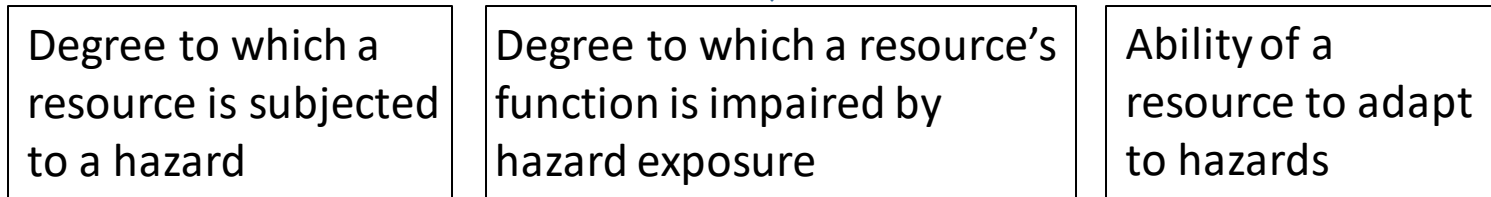
Exposure of critical facilities to identified hazards (- denotes no exposure and X denotes potential damage from specified hazard)





CAT Vulnerability Index Exercise

$$\text{Vulnerability Score} = \text{Exposure Score} + \text{Sensitivity Score} - \text{Adaptive Capacity}$$



Asset	Exposure score 0-3	Sensitivity score 0-3	Adaptive Capacity 0-3	Vulnerability Score 0-6
Asset name	0 = no exposure 1 = low 2 = medium 3 = high	0 = no sensitivity 1 = low 2 = medium 3 = high	0 = no adaptive capacity 1 = low 2 = medium 3 = high	0 - 2 = Low 3 - 4 = Medium 5 - 6 = High

NC DCM Planning Handbook





CAT Vulnerability Index Exercise

Vulnerability Score = Exposure Score + Sensitivity Score – Adaptive Capacity

		Exposure	Sensitivity	Adaptive Capacity
Medical Facilities	FastMed Urgent Care	0	0	
	AssistedCare Home Health	0	0	
	Wilmington Health Today's Care	0	0	
	NHRMC Express Care	0	0	
Fire Stations	Village Road	0	0	
	Station 52	1		
Education and Day Cares	Leland Middle School	0	0	
	North Brunswick High School	0	0	
	Kinderstop Kids LLC	0	0	
	Puddle Jumpers Forest	1		
	Christian Academy	0	0	
	Childcare Network	1		
	Excel Learning Center	1		
	Kids World Academy	0	0	
Government Buildings	Leland Town Hall	0	0	
	Brunswick Center at Leland	0	0	
	Leland Public Library	1		
	Municipal Operations Center	0	0	
	H2GO Office	1		
	United States Postal Office	0	0	
	NC State Government Adult Probation and Parole	1		

Exposure: Degree to which a resource is subjected to a hazard
Sensitivity: Degree to which a resource's function is impaired by hazard exposure
Adaptive Capacity: Ability of a resource to adapt to hazards

Phase 2: Project Planning and Prioritization

Moffatt & Nichol



Objective

- In Phase 2, Moffatt & Nichol will work with the Town, CAT, and community members to identify, plan, and prioritize a combination of policy, nonstructural, structural, and hybrid actions, including the use of natural and nature-based solutions (NNBS), organized within a project portfolio.
- Previously-identified as well as new, innovative solutions should be explored and included.
- These projects and actions will be organized within a portfolio.
- Developing this portfolio includes the following key steps:
 - 1) Identify a Suite of Potential Solutions
 - 2) Consolidate and Prioritize Projects



Strategies

Traditional Infrastructure Solution

Elevating Water Utility and Transportation Assets

- Changes like elevating critical and vulnerable transportation routes above the level of potential floodwaters, or ensuring access to critical water facilities ensure that these services and public infrastructure are designed for their lifespan and account for future conditions.
- New construction or repairs should consider the future risks of sea level rise and other hazards using scenario planning when possible



Wellhead Elevated above BFE (U.S. EPA)

2019 Sea Level Rise Assessment
Cape Fear Crossing – Alternative B –
Intermediate and High SLR Scenarios
(NC DOT)

Nature-based Infrastructure Solution

Marsh Sills: A Type of Living Shoreline

- Shoreline stabilization technique using natural habitat elements (e.g. tall grasses and wetlands) that increases resilience to coastal erosion and flooding
- Traps sediment reducing wetland or marsh edge loss, dissipates wave energy and storm surges, provides ecosystem services
- *NEW* Marsh Sill General Permit (15A NCAC 7H .2700)

Little to No Damage to
Morris Landing Rock Sill
1-month Post-Florence
Holly Ridge, NC



N.C. Coastal Reserve and NERR

Hybrid Solution

Low Impact Development (LID) & Green Infrastructure

- Replacing impervious surface with natural features allows for more effective water quantity and quality management

Example measures include:

- Downspout Disconnection
- Rainwater Harvesting
- Rain Gardens
- Planter Boxes
- Bioswales
- Permeable Pavements
- Green Streets and Alleys
- Green Parking
- Green Roofs
- Urban Tree Canopy
- Land Conservation



Georgetown Climate Center: Green Infrastructure Toolkit

Policy and Regulations

Conservation Overlay Zone

- Using multi-criteria land suitability analysis or other screening tool can help prioritize areas that are most valuable in terms of protecting or enhancing natural habitat and ecosystem services, reducing hazard (flood, sea level rise, storm surge) risks, and other benefits – these areas can be identified as part of a Conservation Overlay Zone
- Limit intensity and density of uses and location of development to minimize impacts to these critical conservation areas

CONSERVATION PRIORITY AREA (CPA)

Conservation Priority Areas (CPA) represent opportunities to allow lower density development clustered away from and respectful of environmentally sensitive areas, important natural views, and priority conservation preservation areas as identified by the community. Agricultural preservation was also identified as a community priority, but where Rural Agricultural (RA) areas overlap the CPA, the development character and density restrictions of the RA areas shall prevail, and not be further restricted by the CPA.

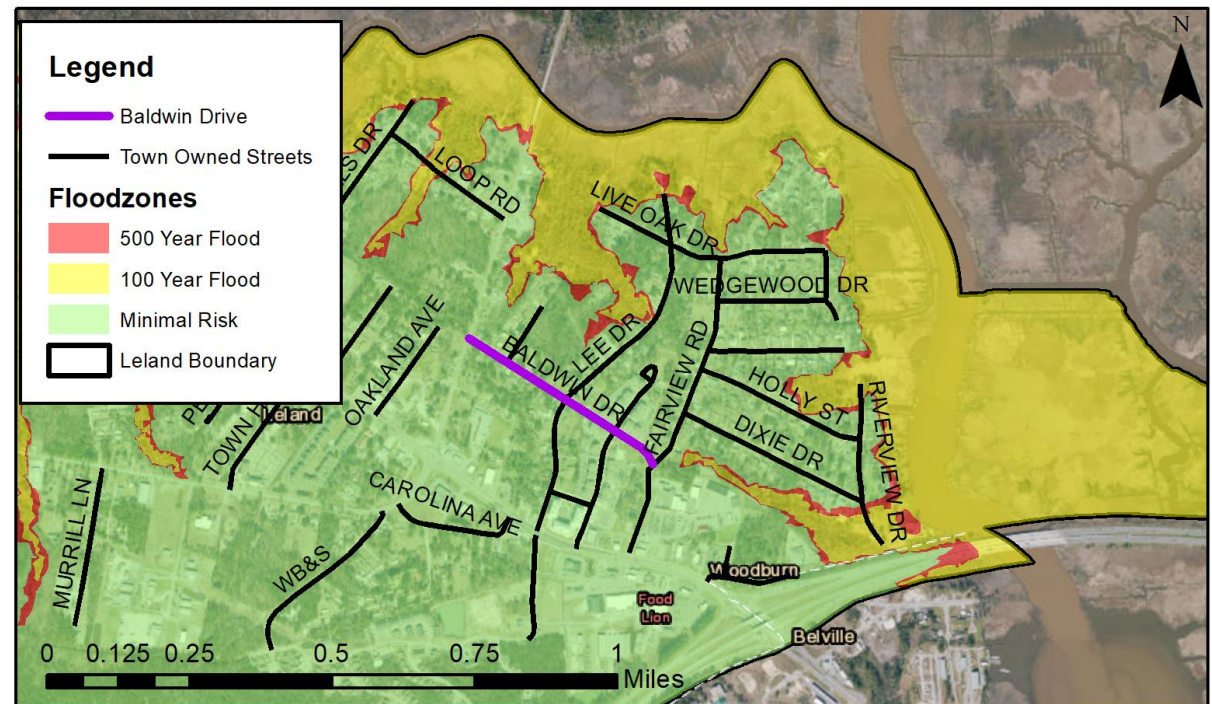


Swansboro Conservation Priority Area Overlay & Underlying Conservation Suitability



Baldwin Drive Stormwater Management

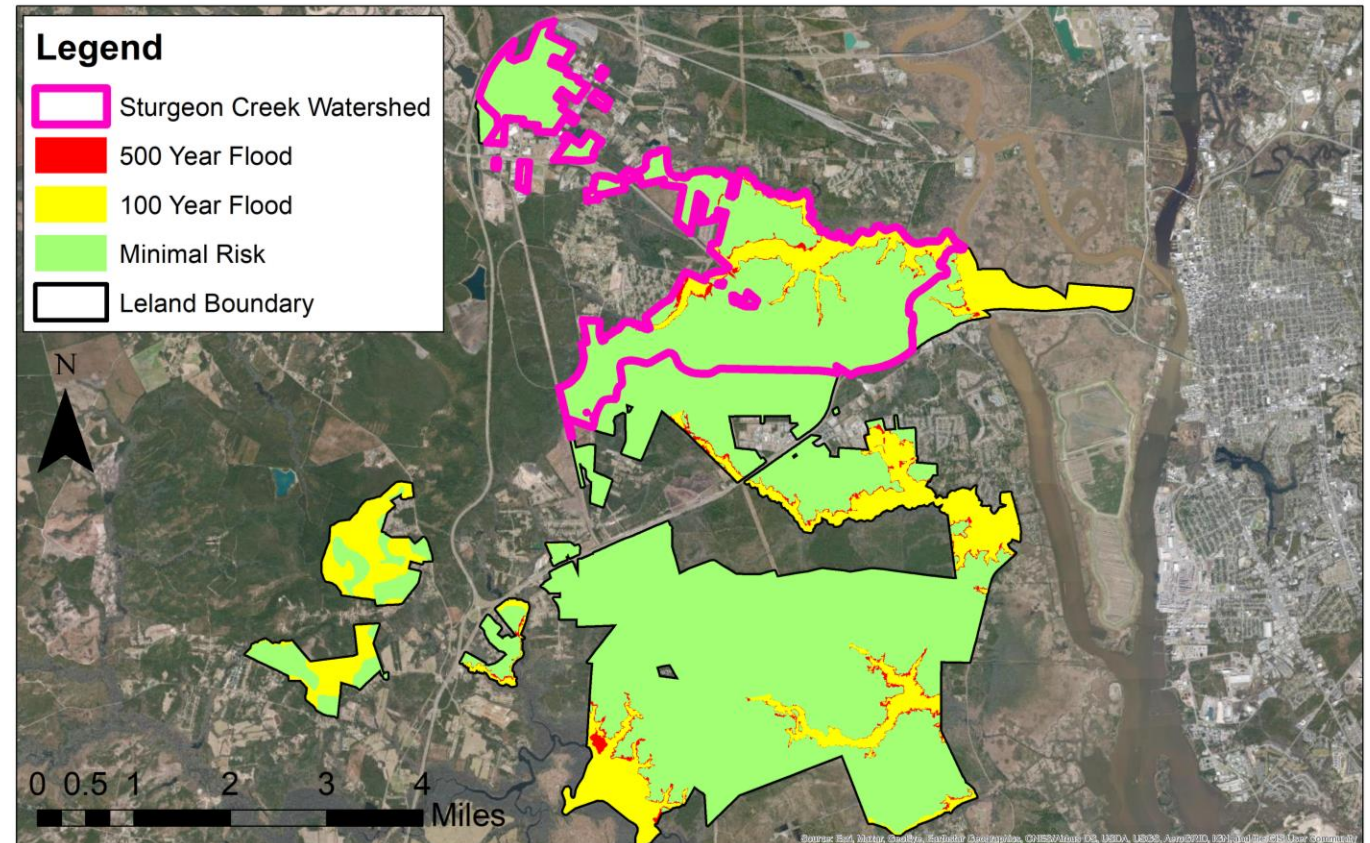
- **Project Description:** The Town of Leland already has plans for the Baldwin Drive Roadway Improvement project (this road will be paved and an adjacent sidewalk will be added). An additional goal of this project is to incorporate a regional stormwater feature for flood mitigation.
- **Hazard(s) addressed by project:** Flooding
- **Type of solution:** Hybrid Infrastructure
- **Project Estimated Cost:**
- **Potential Implementation Funding Sources:**
- **Projected Estimated Timeline:**
- **Priority Rating:**





Sturgeon Creek Watershed

- Project Description: Plans are in place already for the Town of Leland to apply for the Building Resilient Infrastructure and Communities (BRIC) Grant funding program. Funding will allow for the Town to evaluate the Sturgeon Creek watershed and identify drainage and flood control solutions.
- Hazard(s) addressed by project: Flooding
- Type of solution: Nature-based Infrastructure
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Demolition/ FEMA Buyout Program Feasibility Studies

- Project Description: Feasibility studies would be conducted on a number of sites (number and location of sites to be identified) within five years. Purpose of these studies is to provide support and justification in demolition or buyout options of property within flood-prone areas
- Hazard(s) addressed by project:
- Type of solution:
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:

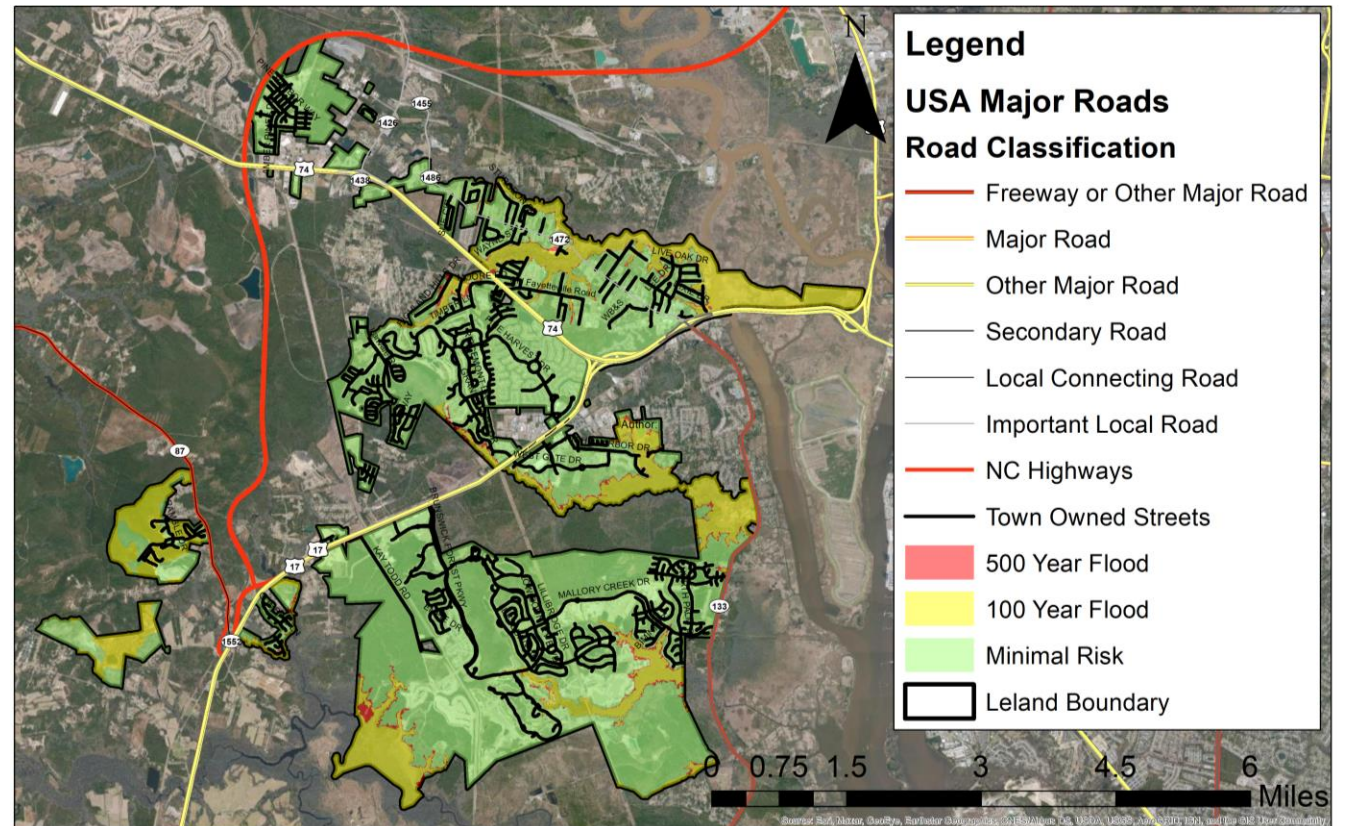


FEMA



Emergency Fuel Preparedness

- Project Description: This project entails the Town of Leland acquiring emergency fuel supplies and putting together plans for storage and distribution of supplies during natural disasters.
- Hazard(s) addressed by project:
- Type of solution: Hard Infrastructure
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Land Use Plans/ Policies/ Ordinances

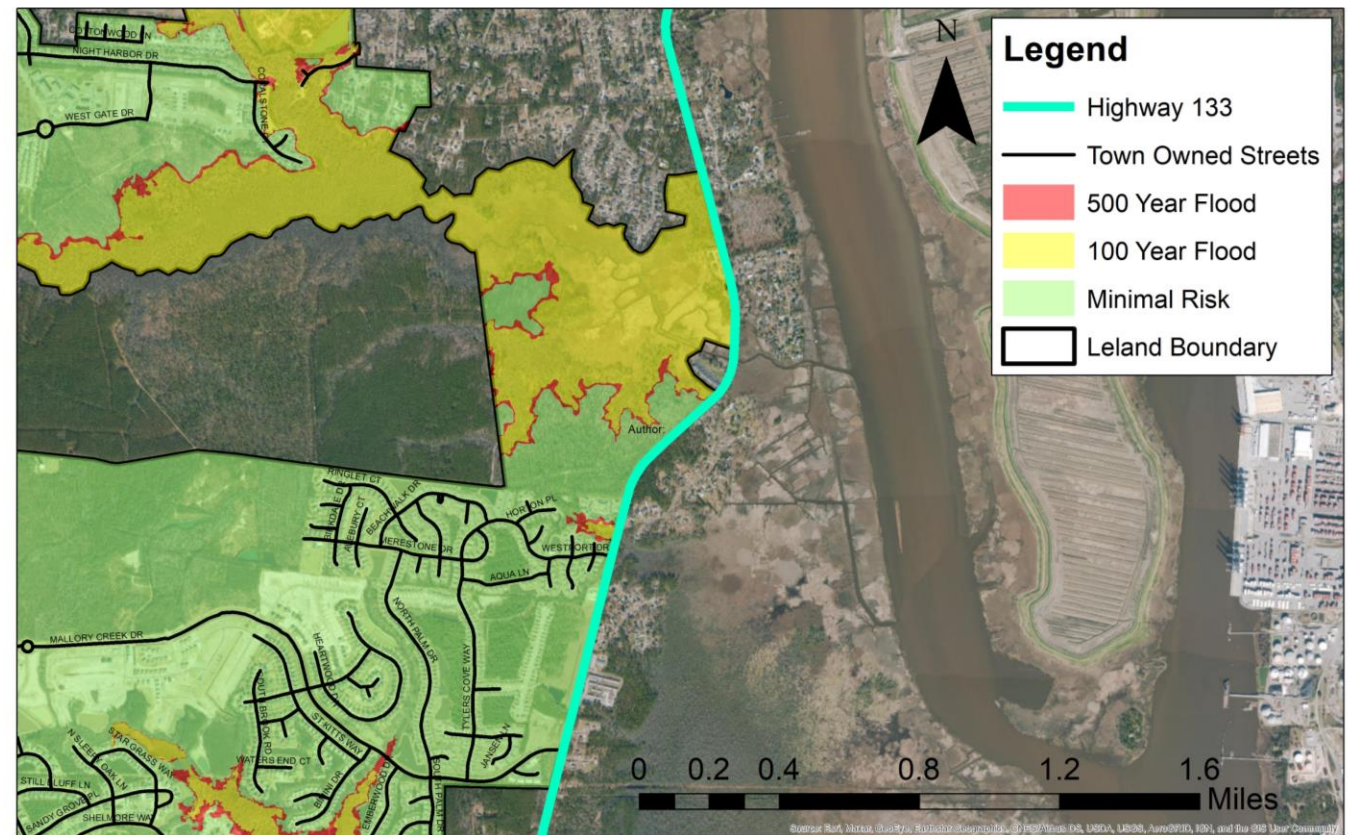
- Project Description: This idea entails incorporating new policies and regulatory tools into the Future Land Use planning process. The expectation is for policies to go above listing environmental constraints and outline what high hazard areas are prohibited for development.
- Hazard(s) addressed by project:
- Type of solution:
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Highway 133 Flood Mitigation

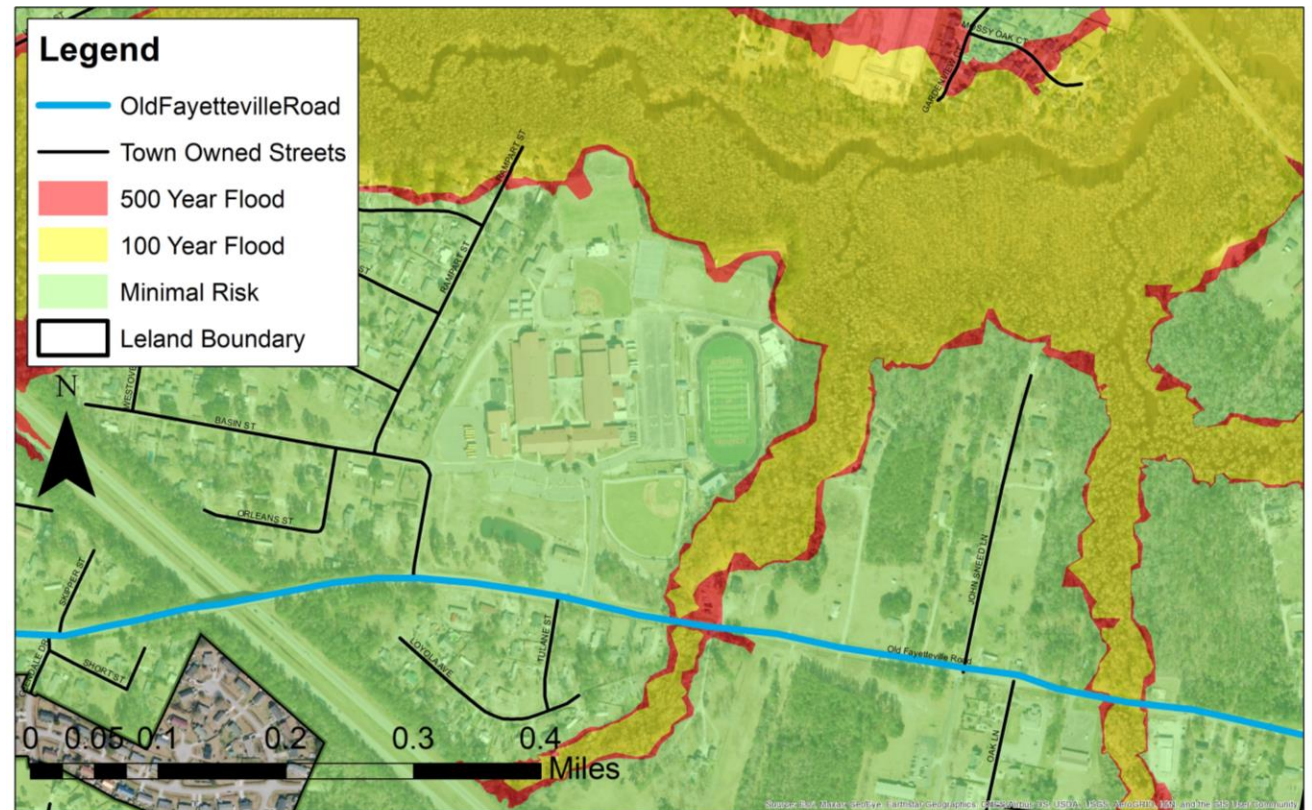
- Project Description: A site-scale/neighborhood-scale nature-based solution will be used to mitigate flooding of Hwy 133, which runs parallel to the Brunswick River and is prone to frequent flooding, posing a transportation concern.
- Hazard(s) addressed by project:
- Type of solution: Hybrid Infrastructure
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Old Fayetteville Road Flood Mitigation

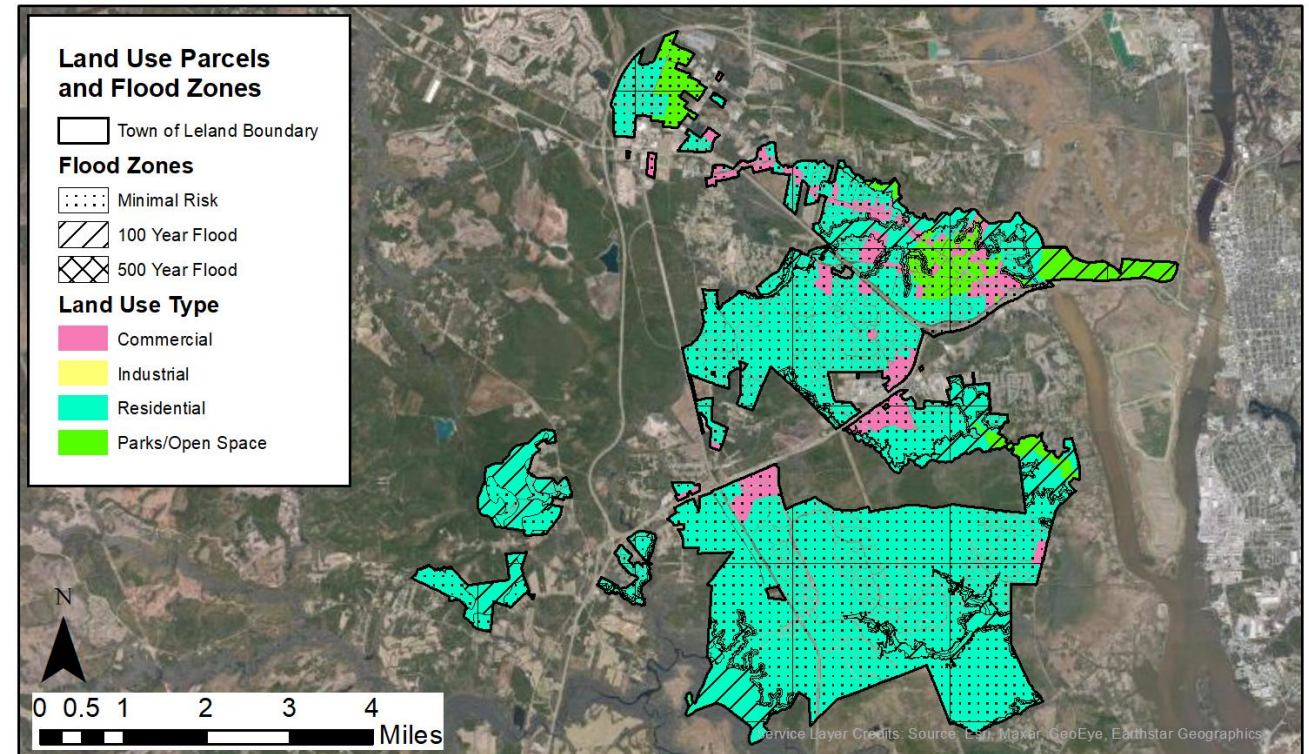
- Project Description: A site-scale/neighborhood-scale nature-based solution will be used to mitigate flooding of Old Fayetteville Road by North Brunswick High School, which currently floods during heavy precipitation events and is a transportation concern.
- Hazard(s) addressed by project:
- Type of solution:
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Education and Outreach Programs

- **Project Description:** This project would increase public awareness to garner more support on projects and grants. Program ideas include: Stormwater Education for HOAs, Improved communication between Town and HOAs, Educational materials on nature-based strategies for residents.
- **Hazard(s) addressed by project:**
- **Type of solution:** Communication
- **Project Estimated Cost:**
- **Potential Implementation Funding Sources:**
- **Projected Estimated Timeline:**
- **Priority Rating:**





Lanvale Trace Stormwater Wetland

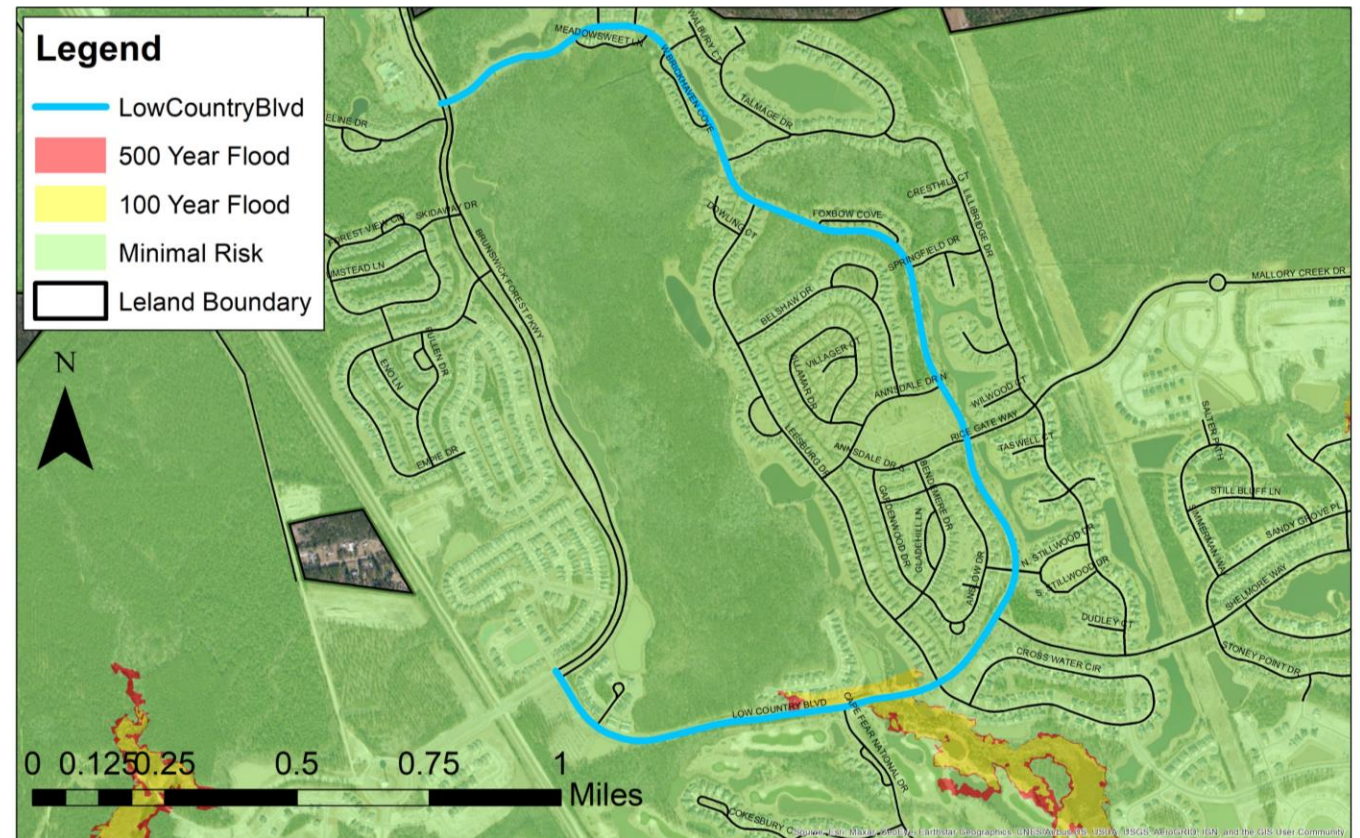
- Project Description: Located in Lanvale Trace (off of Lanvale Road), this project involves construction of a stormwater wetland for the purposes of flood mitigation.
- Hazard(s) addressed by project: Flooding
- Type of solution: Green Infrastructure
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Low Country Boulevard Culvert Enhancements

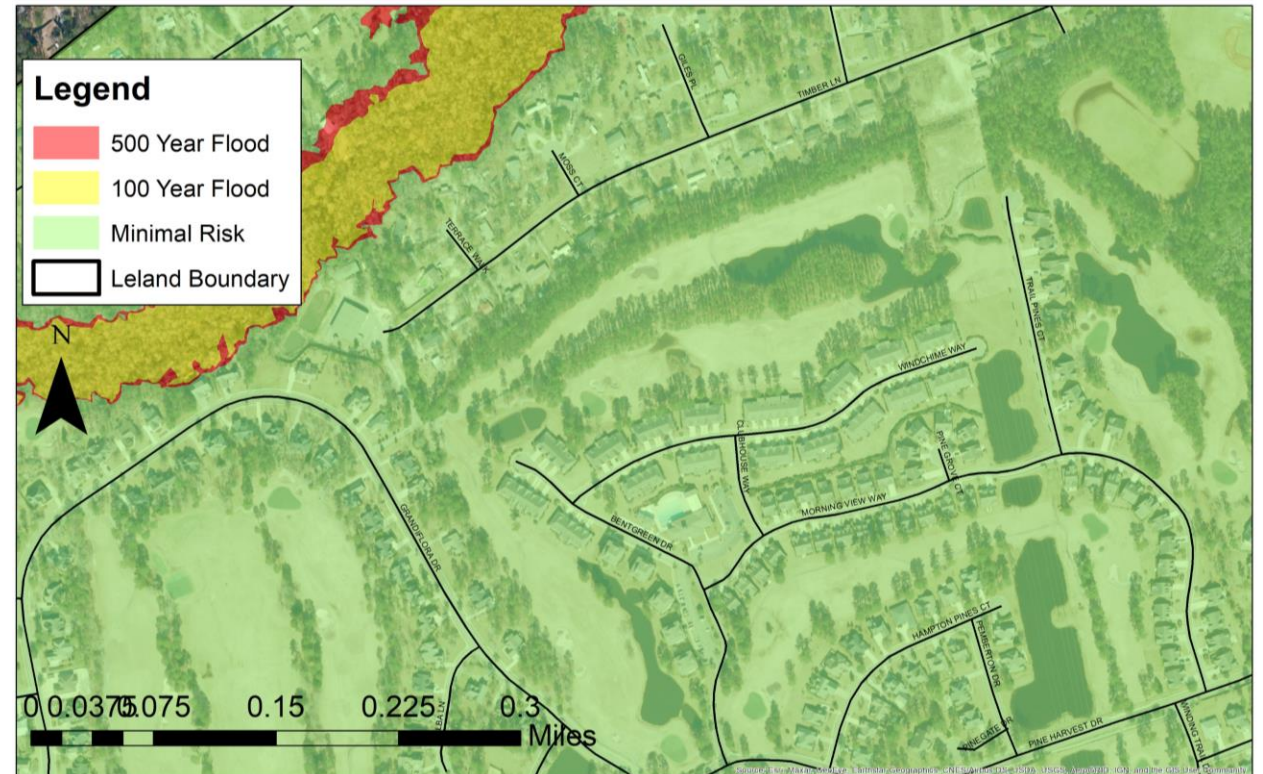
- **Project Description:** This project involves enhancements to the culverts under Low Country Boulevard for flood mitigation purposes. This area flooded during Hurricane Florence and has been a concern for residents since.
- **Hazard(s) addressed by project:** Flooding
- **Type of solution:** Grey Infrastructure
- **Project Estimated Cost:**
- **Potential Implementation Funding Sources:**
- **Projected Estimated Timeline:**
- **Priority Rating:**





Magnolia Green Stormwater Solutions

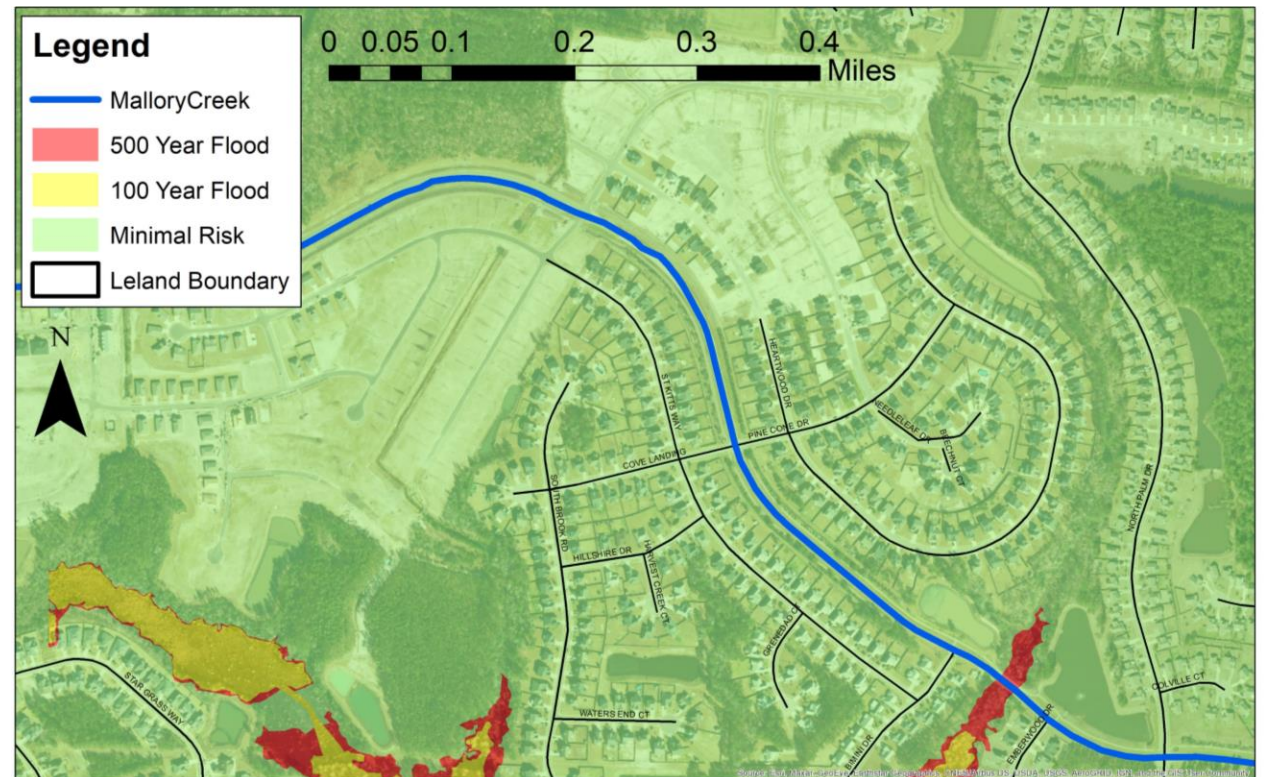
- Project Description: This project is located in the Magnolia Greens Subdivision and would consist of some type of nature-based infrastructure for flood mitigation of the existing stormwater pond and low-lying road.
- Hazard(s) addressed by project:
- Type of solution:
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





Mallory Creek Drive Drainage Plan

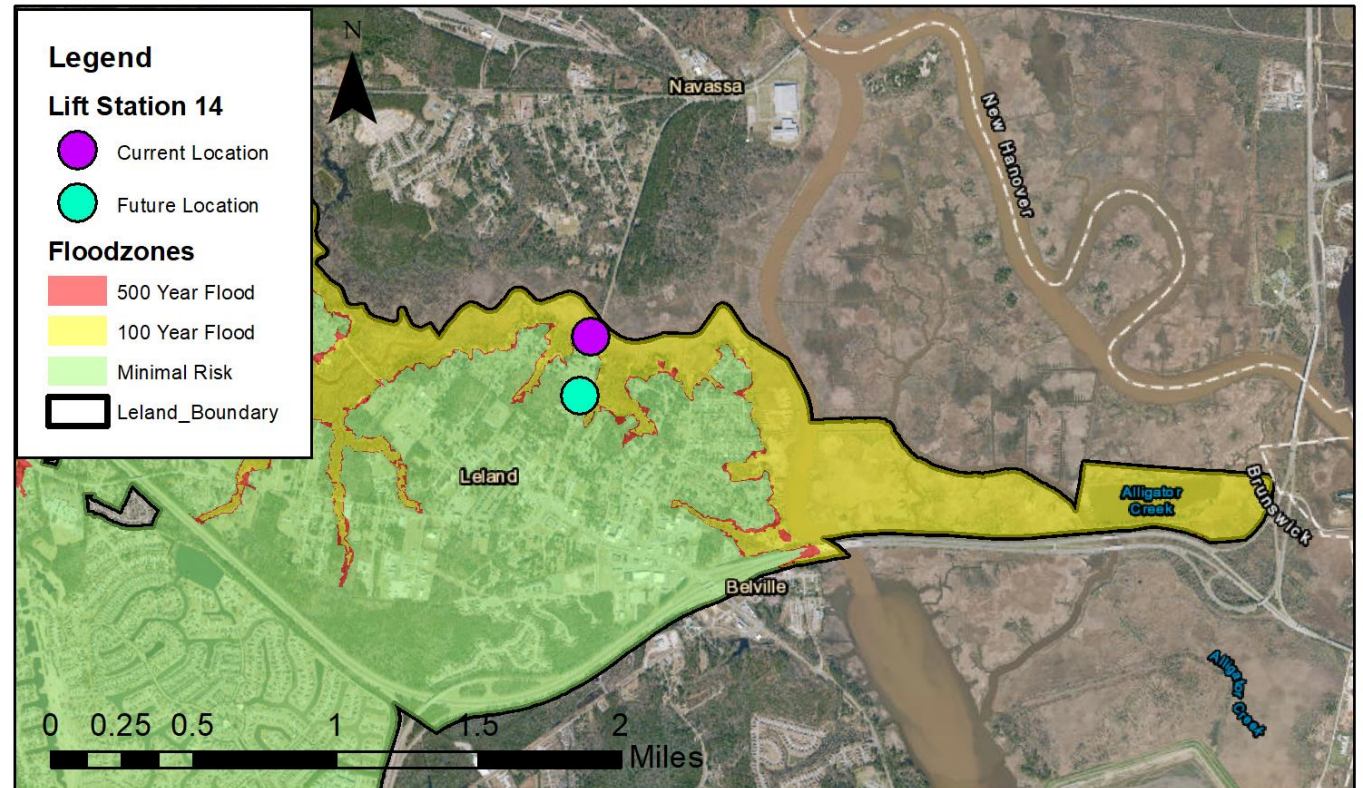
- **Project Description:** This project is located on Mallory Creek Drive near Hemlock Way, where there is frequent flooding during storm events. This would entail conducting a survey of this site and putting together a drainage plan, which requires consulting an engineer.
- **Hazard(s) addressed by project:**
- **Type of solution:**
- **Project Estimated Cost:**
- **Potential Implementation Funding Sources:**
- **Projected Estimated Timeline:**
- **Priority Rating:**





Lift Station #14 Relocation

- This project will relocate Lift Station #14 from its current location within the 100-year flood zone to another site owned by the Town of Leland. The new site of this lift station will be outside of the 100-year flood zone, reducing its exposure to natural hazards.
- Hazard(s) addressed by project: Flooding
- Type of solution: Hard Infrastructure
- Project Estimated Cost:
- Potential Implementation Funding Sources:
- Projected Estimated Timeline:
- Priority Rating:





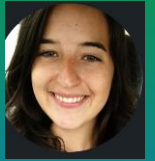
Prioritization

STAPLEE Criteria

- Social
- Technical
- Administrative
- Political
- Legal
- Economic
- Environmental

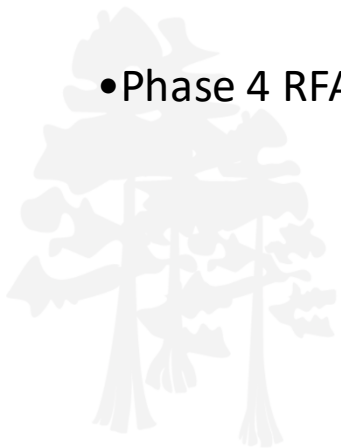
Criteria (Social)	Answer	Score
Will the proposed action adversely affect any segment of the population?	No	5
Will the action disrupt established neighborhoods, school districts, voting districts, or cause the relocation or hardship of lower-income people?	No	5
Is the action compatible with current and future community values?	Yes	5
Will the actions adversely affect cultural values or resources?	No	5
AVERAGE SCORE		5

	Social	Tech.	Admin.	Political	Legal	Econ.	Environ.	Relative Totals
Project A	1	1	1	1	1	1	1	7
Project B	1	3	3	5	1	3	5	17
Project C	1	3	5	3	3	3	5	23
Project D	5	5	5	5	5	5	5	35



RCCP Funding Updates

- DCM has received about \$545,000 from the [National Fish & Wildlife Foundation Coastal Resilience Fund](#) and \$1.15 million from the [General Assembly](#) to continue and expand the North Carolina Resilient Coastal Communities Program!
- DCM is currently drafting a "Request for Applications" for Phase 3 of the RCCP. Phase 3 will fund the Engineering and Design of a prioritized project. We estimate a total of \$40k will be available for each selected project. The Phase 3 RFA is anticipated to be posted in early 2022 (with an application deadline of March 2022).
- Phase 4 RFA is anticipated to be posted late summer/early fall 2022.



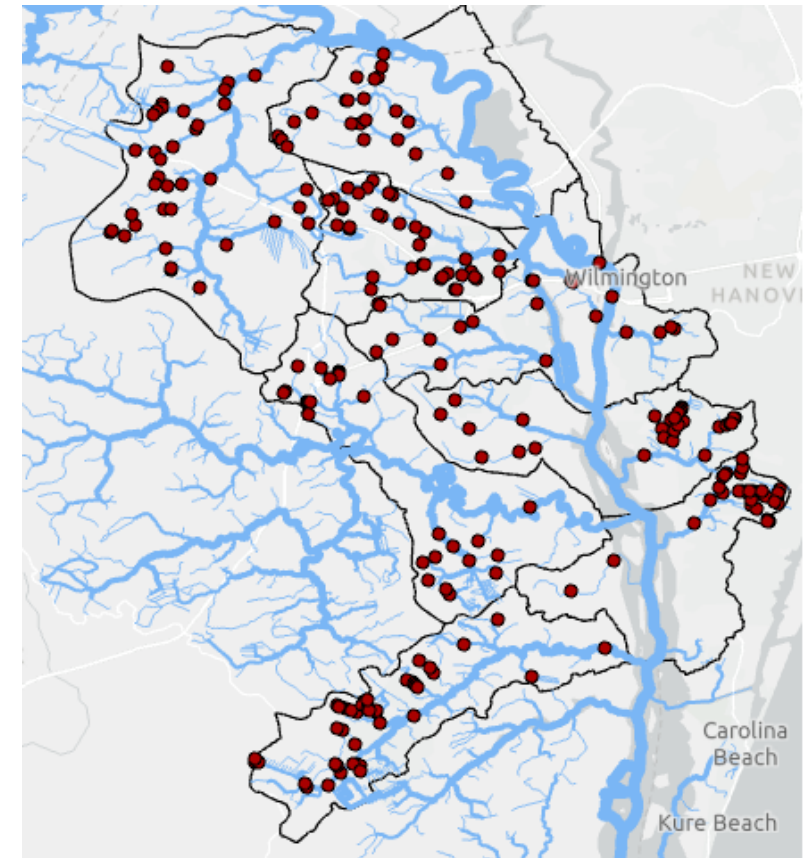
Southeast Aquatic Resources Partnership

Barrier Assessment



Barrier Assessment

- SARP uses a standardized protocol at road stream crossings to determine if a culvert or structure is a barrier for fish, constricts flow, or is in poor condition.
- SARP's Southeast Aquatic Barrier Prioritization Tool (<https://connectivity.sarpdata.com>)
- With funding from the NFWF Coastal Resilience Fund, SARP will be using new data on flood extent from TNC to identify over 200 sites for assessment in tidally influenced waters spread out between the Cape Fear and Chowan river basins.



THE SOUTHEAST
AQUATIC
CONNECTIVITY
PROGRAM

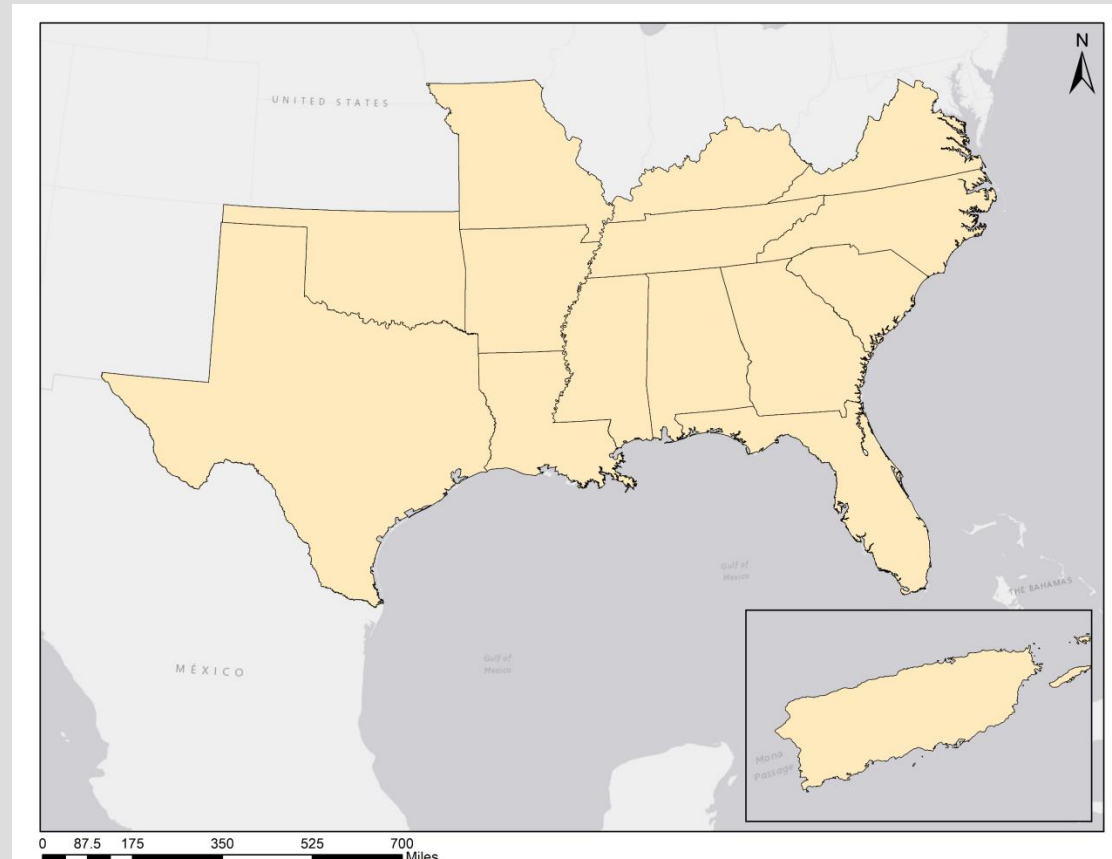
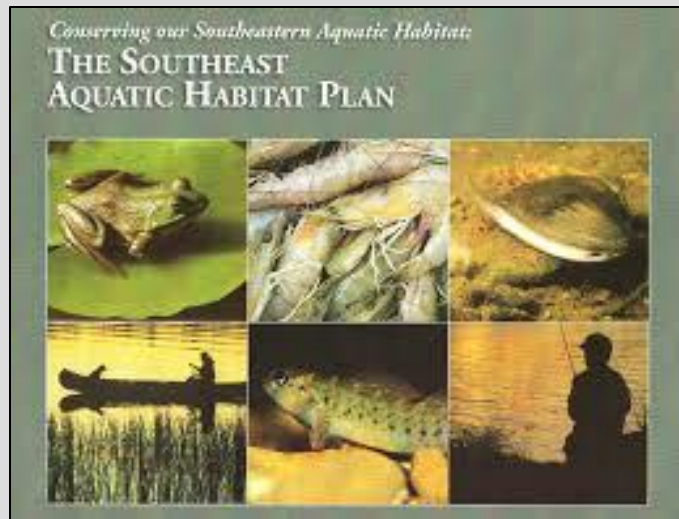
Kat Hoenke, GIS
Coordinator



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

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.

connectivity.sarpdata.com

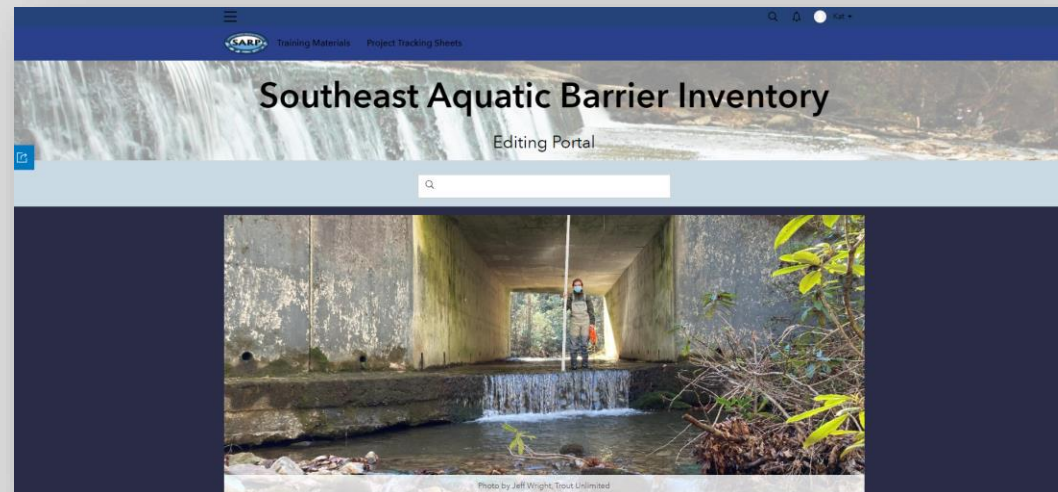
SARP CONNECTIVITY PROGRAM

Inventory

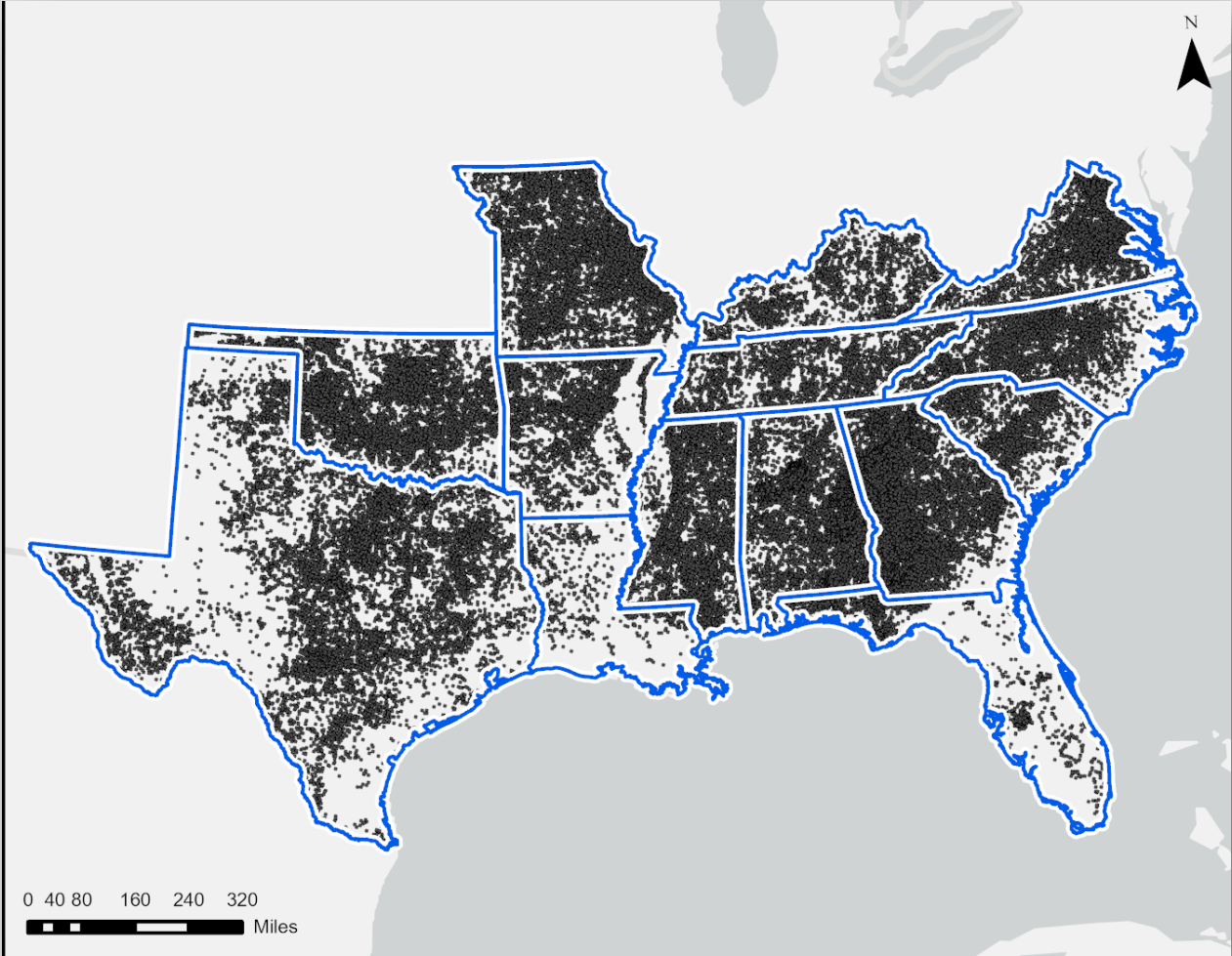
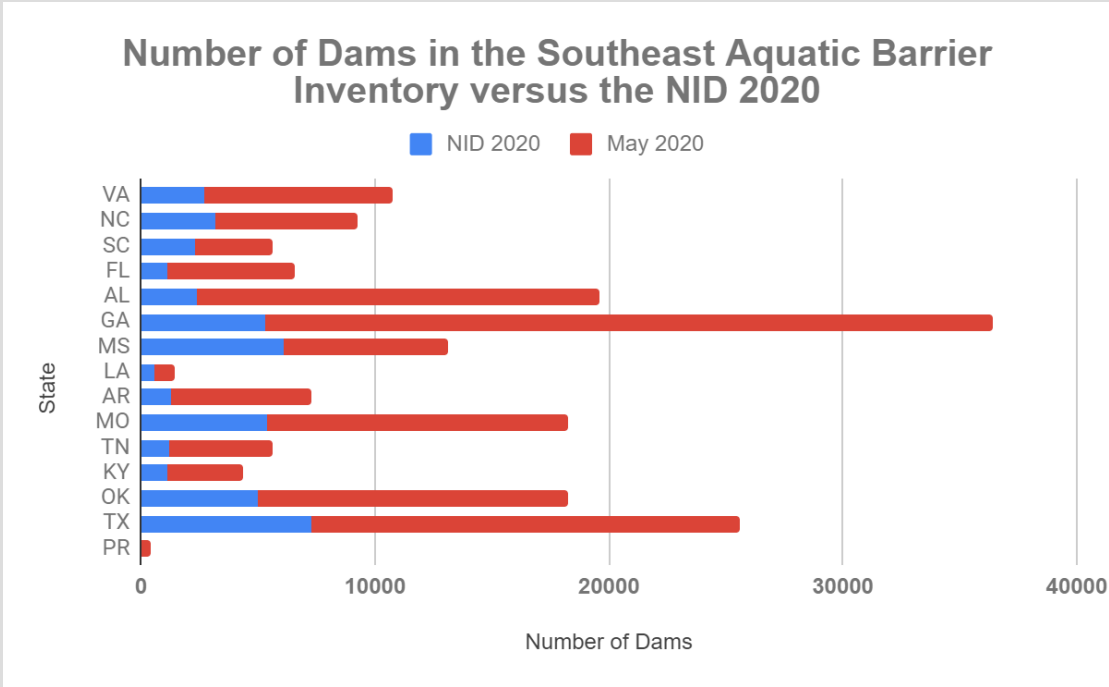
Dams

Road Crossings

Waterfalls



Dams

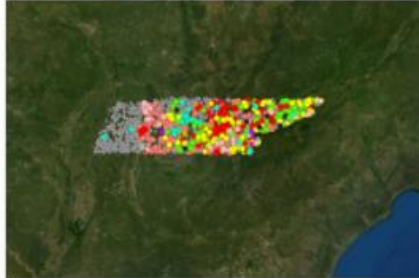




Aquatic Barrier Prioritization Tool

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.

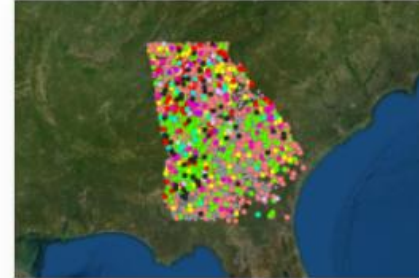
[Read Dam Recon Instruction Manual](#)



01 Tennessee Aquatic Connectivity Team Map



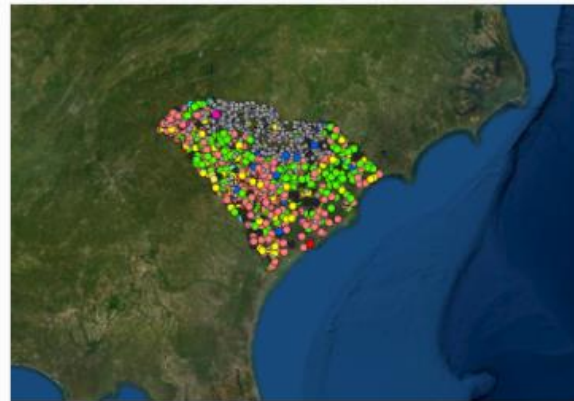
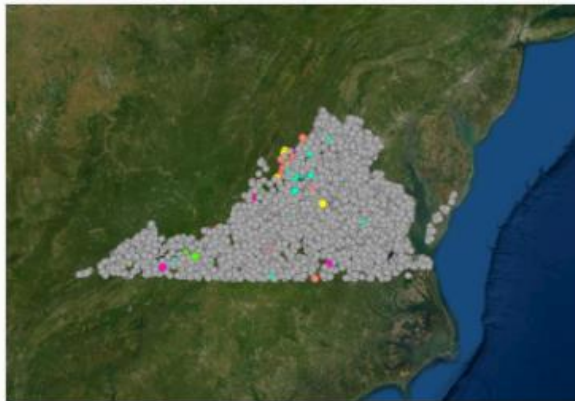
02 North Carolina Aquatic Connectivity Team Map



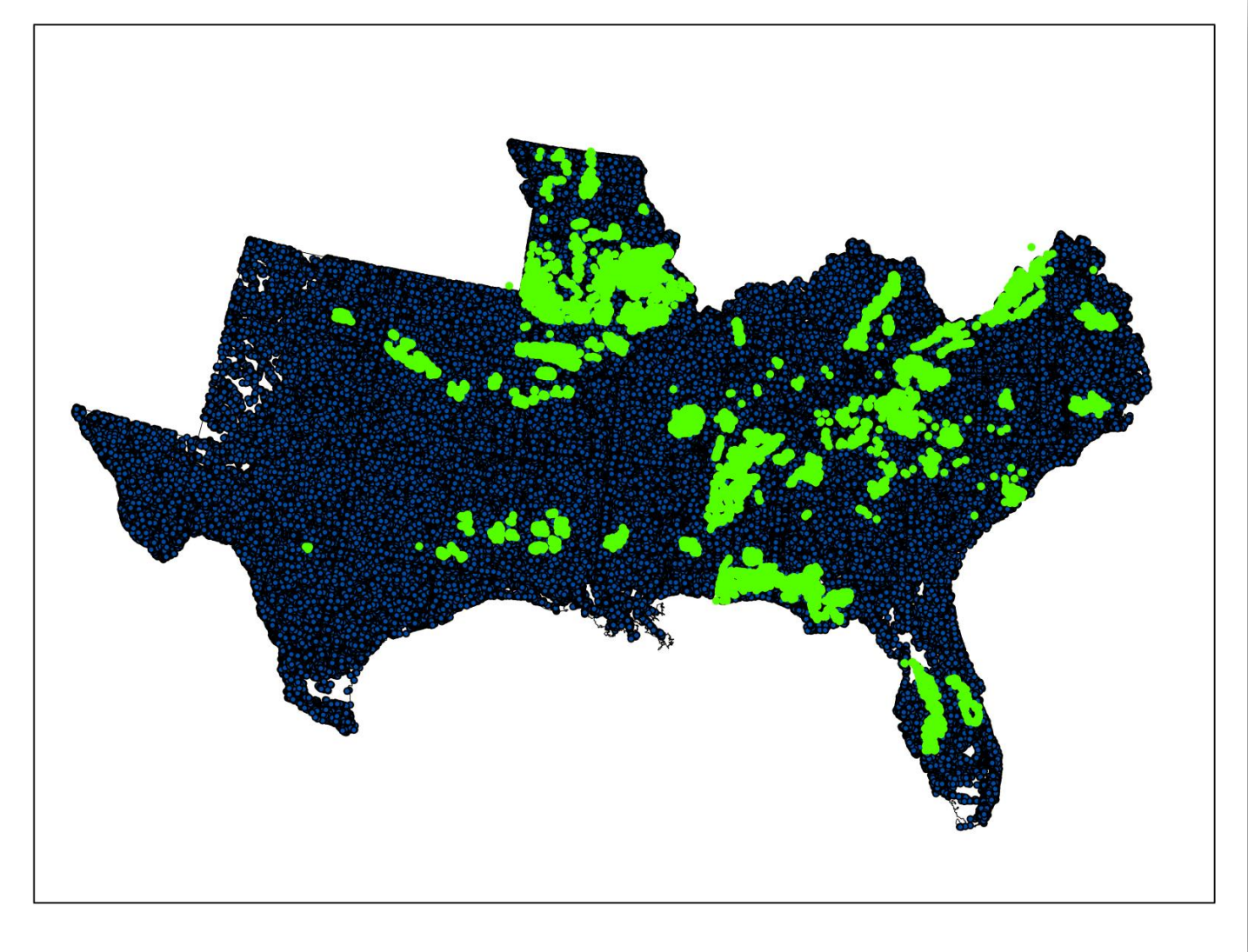
03 Georgia Aquatic Connectivity Team Map



04 Arkansas Stream Heritage Partnership...



Road Crossings



- Crossings are assessed by multiple partners using AOP assessment protocols (green)
- 26k total assessed



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 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 FAILING

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

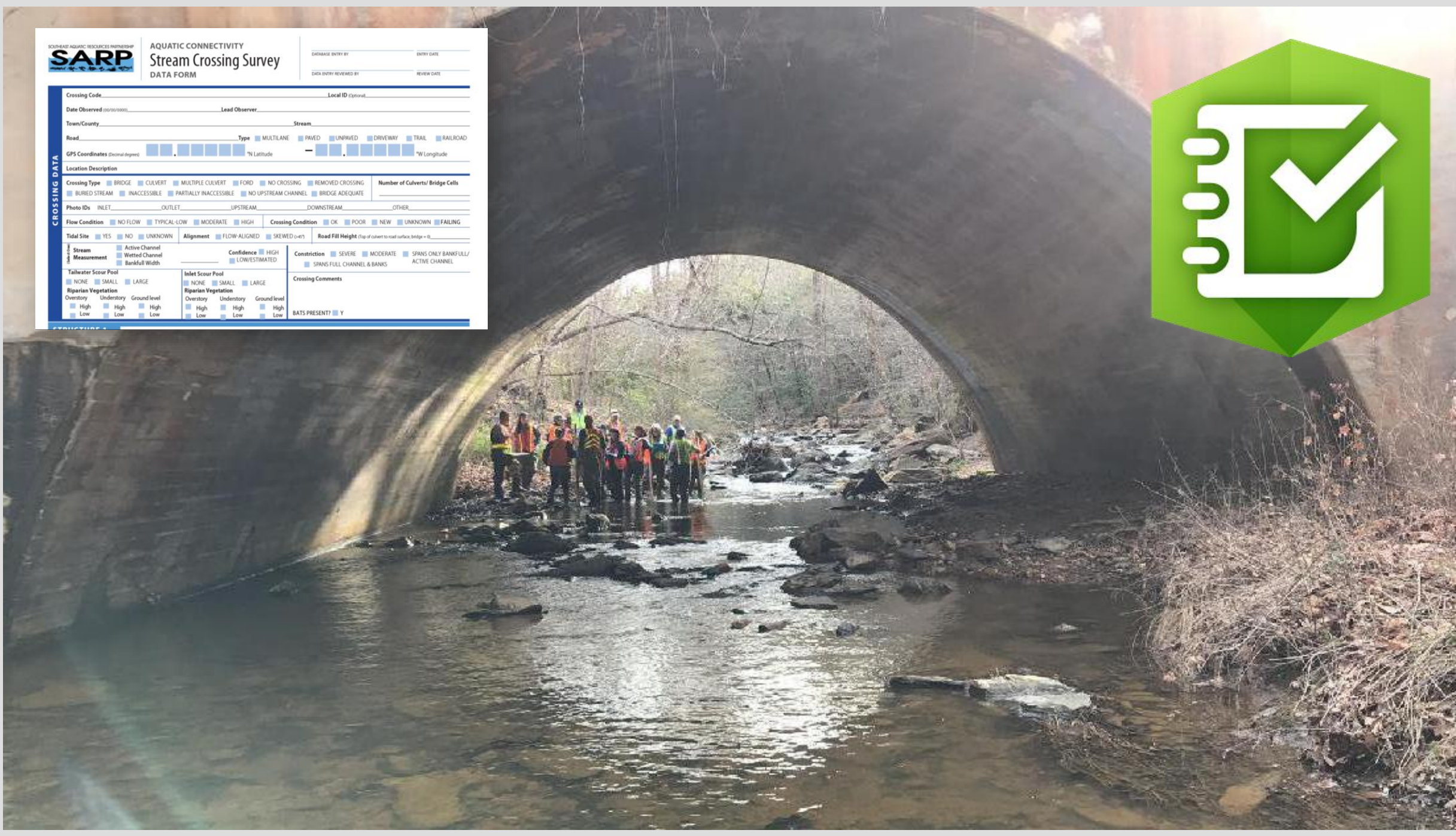
Stream Measurement Active Channel Wetted Channel Bankfull Width Confidence HIGH LOW/ESTIMATED _____

Constriction SEVERE MODERATE SPANS ONLY BANKFULL/ACTIVE CHANNEL SPANS FULL CHANNEL & BANKS _____

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

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

Crossing Comments _____
BATS PRESENT? Y



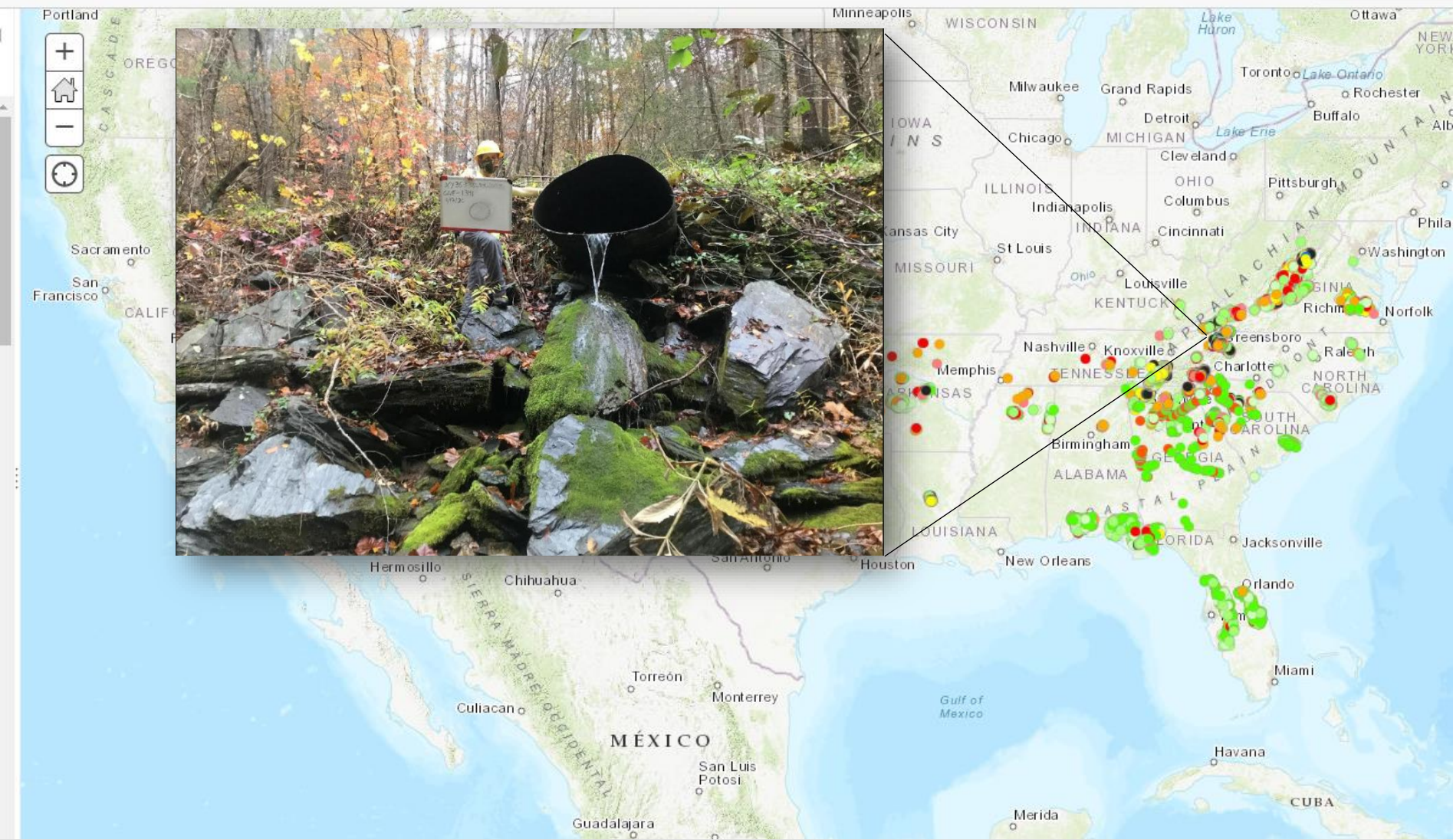
Inventory

Details Add ▾ Edit Basemap Analysis Save ▾ Share Print ▾ Directions Measure Bookmarks Find address of p

About Content Legend

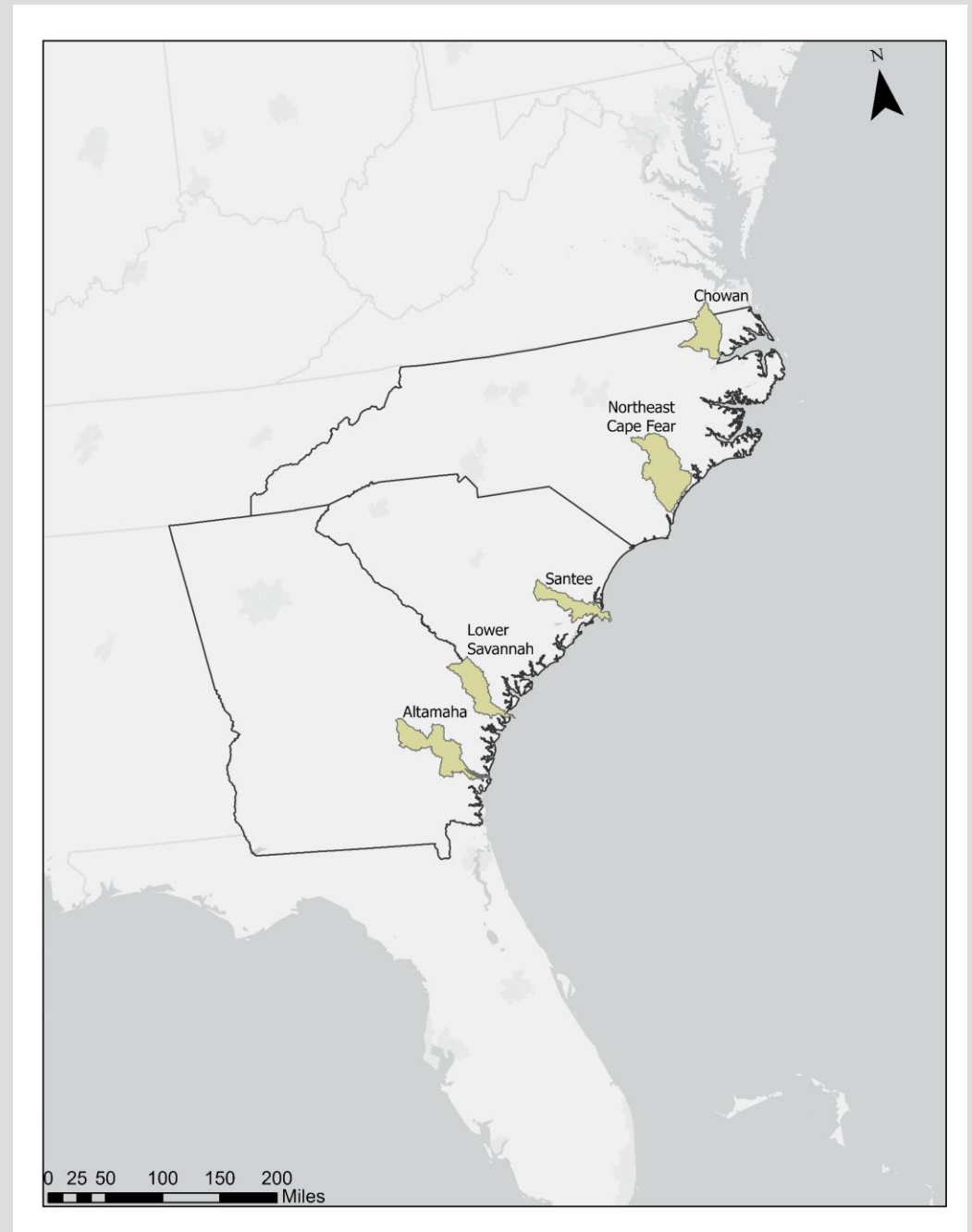
- ### Legend
- #### 05012019 SARP AOP Stream Crossing Survey Protocol
- Severe Barrier
 - Minor Barrier
 - No Upstream Channel
 - Insignificant Barrier
 - No Barrier
 - Moderate Barrier
 - Significant Barrier
 - No Crossing
 - Inaccessible
 - Not Scored
 - Buried Stream

- #### SARP AOP Coarse Survey Form
- No Drop
 - Severe Drop
 - Significant Drop
 - Minor Drop
 - Insignificant Drop
 - Moderate Drop



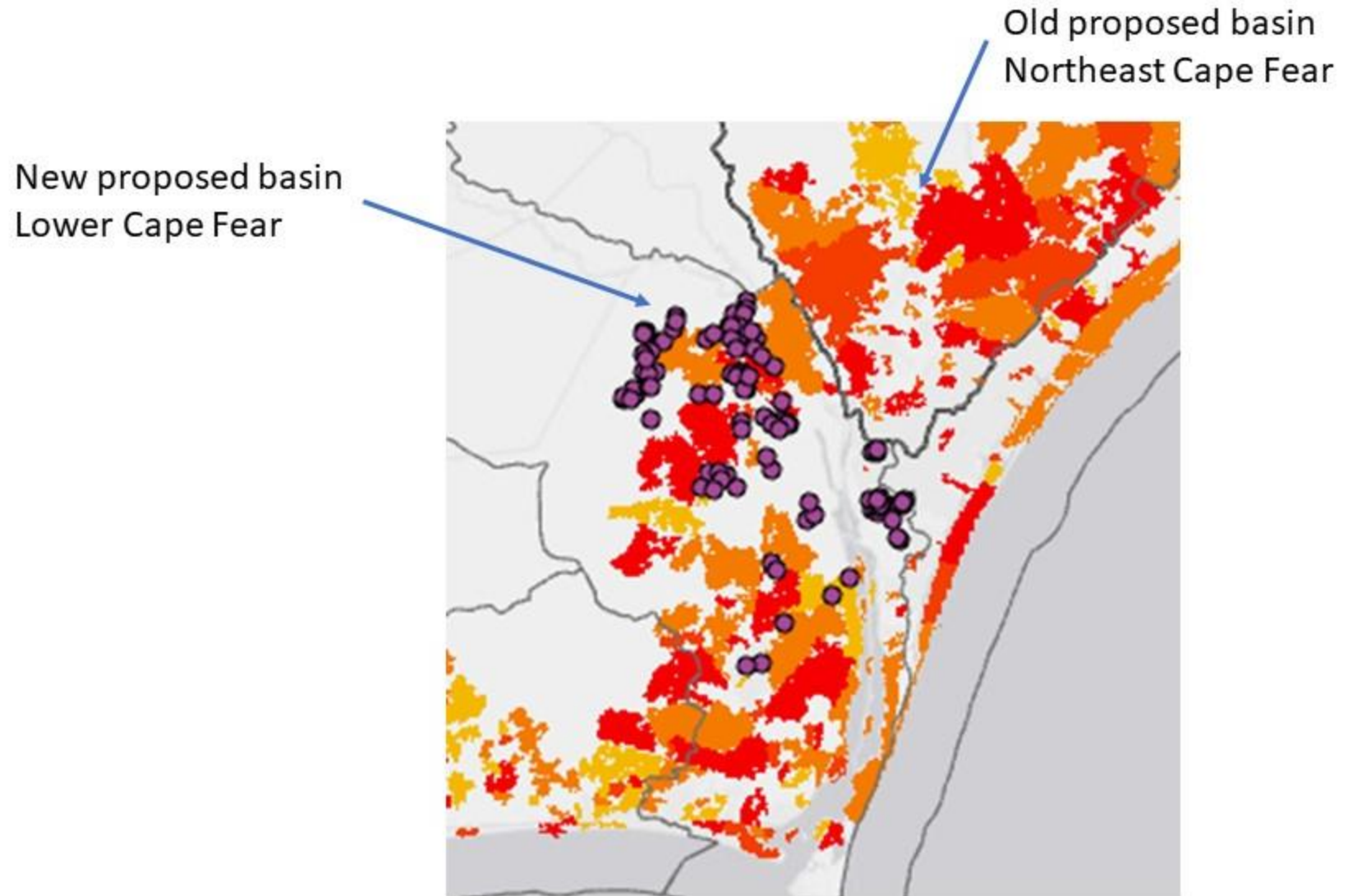
NFWF TIDAL ROAD STRUCTURES

- Assess 100 structures in 5 basins using tidal protocol
- Ensure structures help with community resiliency
- Work closely with local communities to identify priority structures
- Must address both coastal resiliency and aquatic habitat



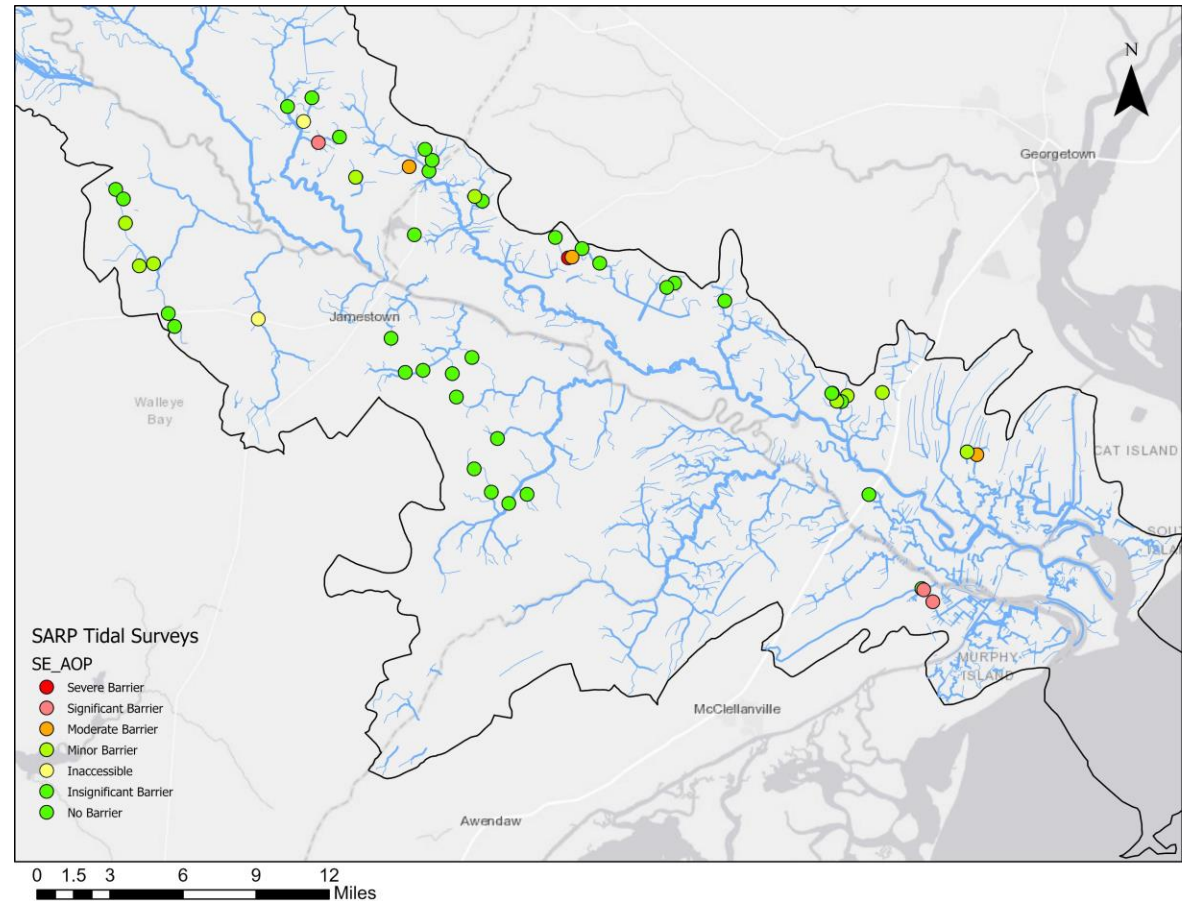
PROPOSED STRUCTURES

- Selected 100 structures working with Dawn
- Sturgeon creek and beyond
- Surveyed between now and August 2022
- Want to align with town priorities
- Results provided for your use!



RESULTS PREVIEW

- Identify possible pinch points / flood risk
- Identify issues for fish passage
- Quantify connectivity benefit



SARP CONNECTIVITY PROGRAM

Inventory

Prioritization



Southeast Aquatic Barrier Prioritization Tool

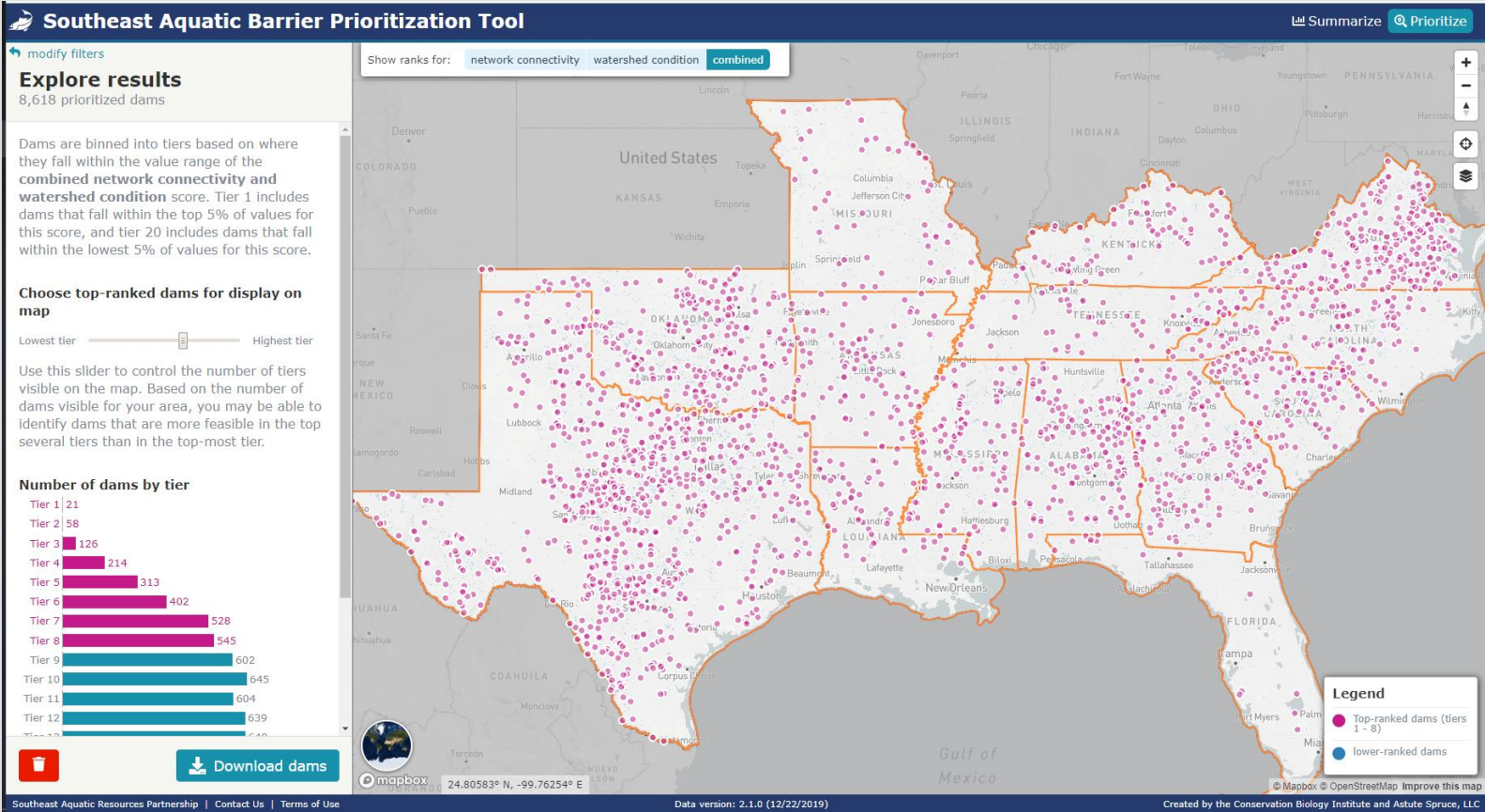
Improve aquatic connectivity by prioritizing aquatic barriers for removal using the best available data.

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



ROAD BARRIER PRIORITIZATION

[modify filters](#)

Show ranks for: [network connectivity](#) [watershed condition](#) **[combined](#)** for [full networks](#) [perennial reaches only](#)

Explore results

113 prioritized road-related barriers

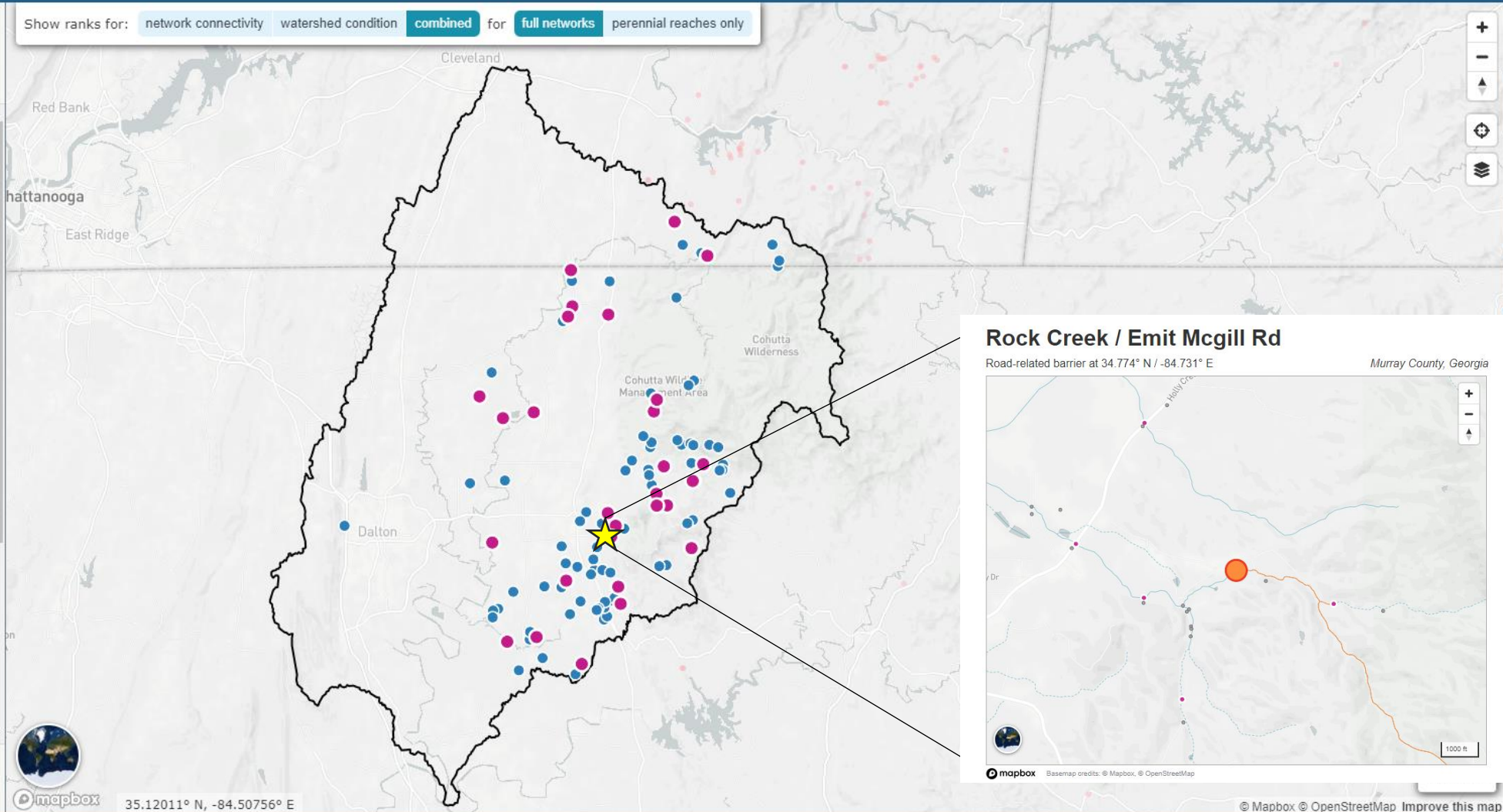
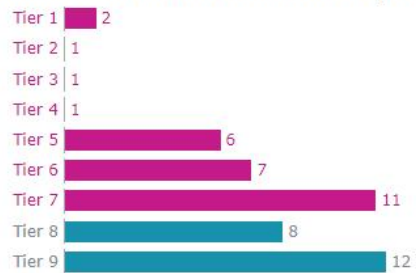
Road-related barriers are binned into tiers based on where they fall within the value range of the **combined network connectivity and watershed condition** score. Tier 1 includes road-related barriers that fall within the top 5% of values for this score, and tier 20 includes road-related barriers that fall within the lowest 5% of values for this score.

Choose top-ranked road-related barriers for display on map

Lowest tier Highest tier

Use this slider to control the number of tiers visible on the map. Based on the number of road-related barriers visible for your area, you may be able to identify road-related barriers that are more feasible in the top several tiers than in the top-most tier.

Number of road-related barriers by tier

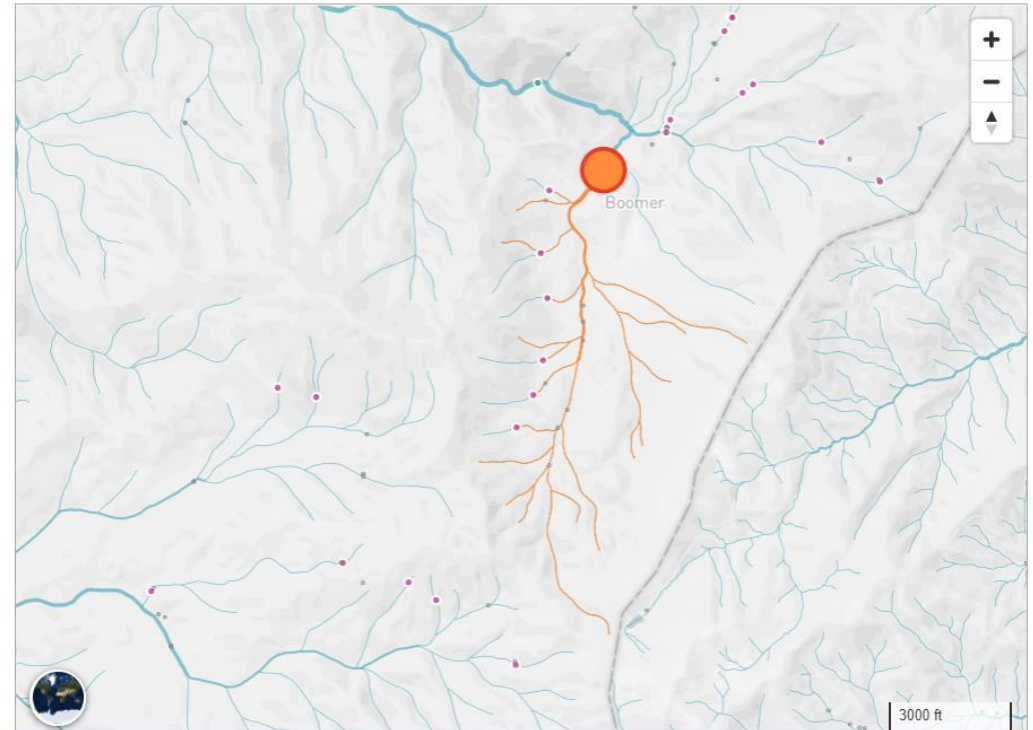


[Download road-related barriers](#)

Trail Fork / Fsr 3249

Road-related barrier at 35.8° N / -83° E

Cocke County, Tennessee



Functional network information

3.21 total miles could be reconnected by removing this road-related barrier, including **3.21 miles** of perennial reaches.

0% of the upstream network is in altered stream channels (coded as canals / ditches).

0 river size classes could be gained by removing this barrier.

96% of the upstream floodplain is composed of natural landcover.

<i>Network statistics:</i>	upstream network	downstream network
Total miles	8.52	3.21
Perennial miles	8.52	3.21
Ephemeral / intermittent miles	0	0
Altered miles	0	0
Unaltered miles	8.52	3.21

Prioritization Results

HOLLY CREEK, GA EARTH DAY 2021



Next Steps

Discussion



What's Next?

- Complete Vulnerability scoring and ranking for critical assets
- Finalize Risk and Vulnerability Assessment
- Prioritize projects and complete project portfolio
- Compile Resilience Strategy and submit to NCDCCM and Town

M&N would like to extend our staff and resources to the Town in support of the Phase 3 application process, if needed.



Town of
Leland

Growing our future. Nourishing our roots.

Resilient Coastal Communities Program

