South Carolina
Resilient Coastal Communities Collaborative Program:

Salkehatchie Watershed Plan



Resilience Portfolio for the Communities of

Barnwell County

SCOR South Carolina Office of Resilience

Sea Grant S.C. SEA GRANT CONSORTIUM

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

National Fish and Wildlife Foundation NFWF

McCORMICK TAYLOR

Weston & Sampson

Biohabitats

Contents

1. Executive Summary **1-1**

1a. The Salkehatchie River Basin **1-2**

1b. Project Approach **1-5**

Community Engagement 1-5

Vulnerability Assessment 1-6

Strategy Siting 1-7

Prioritization 1-7

Results 1-8

2. Introduction **2-1**

2a. Project Objectives **2-1**

2b. Community Background **2-1**

2c. Plan Review **2-3**

2d. Community Action Team Engagement **2-5**

3. Vulnerability Assessment **3-1**

3a. Watershed Scale **3-1**

3b. Community Scale **3-3**

3c. Parcel Scale **3-5**

4. Strategy Siting **4-1**

4a. Desktop Analysis **4-1**

4b. Site Visits **4-3**

5. Prioritization Matrix **5-1**

5b. Prioritization Results **5-2**

6. Recommendations Per Community **6-1**

7. Next Steps **7-1**

7a. Grant Opportunities & Funding **7-1**

Green Infrastructure & Stormwater Parks 7-1

Ecological Restoration & Land Conservation 7-1

Infrastructure Resilience & Drainage Assessments 7-1

7b. Resilience Hubs 7-2

Core Functions 7-2

7c. Participation in Salkehatchie Working Group 7-5

7d. Conclusion 7-5

Appendix A: Survey Results

Appendix B: Detailed Project Sheets From Community Action Team Meeting Four

Appendix C: Prioritization Criteria

Appendix D: Cost Estimates

Figure List

Figure 1: Salkehatchie River Basin 1-1

Figure 2: SCRCCCP Study Communities and Proposed Opportunities 1-8

Figure 3: Images from the third Community Action Team meetings 2-6

Figure 4: Participants at the fourth Community Action Team meeting reviewed project sheets (See Appendices) to discuss which projects are the most feasible and provide the greatest benefit to the community. 2-8

Figure 5: Salkehatchie Vulnerability Model Results 3-2

Figure 6: Salkehatchie Watershed and SCRCCCP Study Communities Census Tracts 3-3

Figure 7: Barnwell Vulnerability Model – Most Vulnerable Areas 3-4

Figure 8: Vulnerability Scoring Formula 3-5

Figure 9: Strategy Prioritization Board Utilized in Community Action Team Meeting Three to Better Understand Community Preference. 4-1

Figure 10: Data Layers Used in Strategy Siting During the Desktop Analysis 4-2

Figure 11: Site Visits Conducted by the Project Team in the Communities of Barnwell County 4-3

Figure 12: Site visits to potential project locations provided an opportunity to identify barriers to implementation, property conditions, opportunities, and co-benefits. 4-3

Figure 13: Participants in Community Action Team meeting four reviewed project sheets to help prioritize projects. The top two projects for each community received an order of magnitude cost estimate. 5-2

Figure 14: Diagram depicting the three levels of the resilience hub model (Gonzaga University Institute of Climate, Water, and the Environment, 2025). Graphic inspired by the Spokane Community Resilience Hub Network and the Institute for Climate, Water, and the Environment 7-3

Table List

Table 1: Plans Reviewed for the Communities of Barnwell County 2-3

Table 2: Team Members of Communities of Barnwell County Community Action Team 2-5

1. Executive Summary

Planning at the watershed level has been recommended by both the South Carolina Floodwater Commission and the ***Strategic Statewide Resilience and Risk Reduction Plan*** to reduce impacts from flooding and enable communities, economies, and ecosystems to recover more quickly from disasters. Watershed planning was piloted in the Salkehatchie Watershed between January 2024-March 2026 through the ***South Carolina Resilient Coastal Communities Collaborative Program*** (SCRCCCP). The South Carolina Office of Resilience (SCOR) received funding from the National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund (NCRF) in December 2022 to provide technical assistance to ten communities in the Salkehatchie Watershed to assess risk and vulnerability, mitigate flooding, and increase resilience. SCOR partnered with S.C. Sea Grant Consortium and S.C. Beach Advocates to engage with communities throughout the watershed to identify locations of and impacts from flooding. Three engineering consultant firms, Weston & Sampson, McCormick Taylor, and Biohabitats, worked with SCOR and S.C. Sea Grant to synthesize community input and develop risk and vulnerability assessments and portfolios of flood reduction strategies that are included in the Community Reports section of this Salkehatchie Watershed Plan.

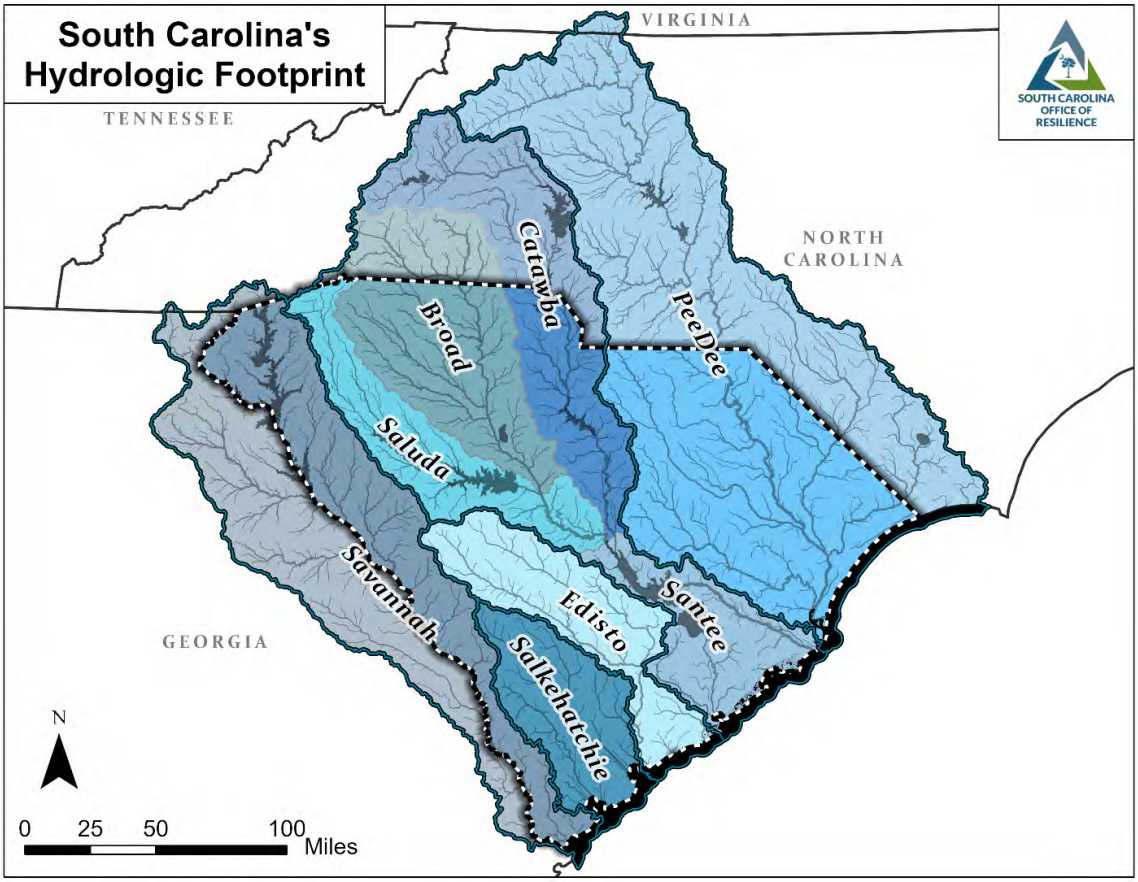


Figure 1: Salkehatchie River Basin

1a. The Salkehatchie River Basin

The Salkehatchie River Basin is located between the Lower Savannah and Edisto River Basins in the Southwestern Coastal Plain region of South Carolina. "The basin is the 7th largest in the State, encompassing approximately 653,606 acres and approximately 1,012 stream miles and 2,928 acres of lake waters" (SCDNR). The tributaries of the Salkehatchie Basin are predominantly shallow, blackwater bottomland swamps, and the rivers in the south of the basin are tidally influenced and brackish. The basin extends 95 miles inland from the Atlantic Ocean and contains eighteen HUC 10 watersheds spanning all or parts of seven counties (Allendale, Bamberg, Barnwell, Beaufort, Colleton, Hampton, and Jasper), thirty-four municipalities, and three military installations.

This Basin originates in the Upper Coastal Plain with the headwaters of the Salkehatchie and Little Salkehatchie in Barnwell and Bamberg, South Carolina and continues through the Lower Coastal Plain and Coastal Zone regions, merging to form the Combahee River just south of Horse Bay and just north of Yemassee in between Hampton and Colleton counties. The basin also contains the Coosawhatchie River which originates in Allendale and Fairfax, SC and flows through Allendale,

3

The Salkehatchie River Basin includes **three military installations**

7

The basin covers all or parts of **seven counties** (Allendale, Bamberg, Barnwell, Beaufort, Colleton, Hampton, Jasper)

7th

It is the **seventh largest basin** in the state

18

The basin spans across **eighteen HUC 10 watersheds**

34

It includes **thirty-four municipalities**

95

It extends **95 miles inland** from the Atlantic Ocean

1,012

The Salkehatchie River Basin includes **1,012 stream miles** (***SCDNR***)

315,000

Approximately **315,000 people** reside across the seven counties of the Salkehatchie River Basin

653,606

The basin encompasses approximately **653,606 acres**



Hampton, Jasper, and Beaufort Counties before merging with the Pocotaligo River to form the Broad River which then flows into Port Royal Sound and the Atlantic Ocean. The renowned ACE Basin is in the southeastern part of the Salkehatchie Basin and is comprised of the Ashepoo, Combahee, and Edisto Rivers. "The coastal area of this basin contains the most extensive estuarine water bodies in the State. These coastal water bodies are dominated by St. Helena Sound and Port Royal Sound and include numerous, often interconnecting, tidal creeks and rivers" (SCDNR). This basin also contains hundreds of thousands of acres of saltmarsh and is bounded by numerous barrier sea islands.

POPULATION: Aproximately 315,000 people reside in the seven counties located in the Salkehatchie River Basin. Beaufort County has the largest population center in the watershed (187,117), followed by Colleton, (38,604), Jasper (28,791), Barnwell (20,589), Hampton (18,561), Bamberg (13,311), and Allendale (8,039) Counties (2020 US Census). Rapid growth is occurring in Jasper and Colleton Counties, and development pressure is high in coastal areas. Populations in the communities in the middle and upper parts of the watershed have been decreasing in recent years, as people relocate to more urban areas and young adults move away after graduating from school. The coastal region of the Salkehatchie Watershed is home to Gullah Geechee communities represented by several organizations, including the Gullah Geechee Cultural Heritage Corridor Commission, the Gullah/Geechee Nation, and the Gullah Geechee Chamber of Commerce. The majority of the Gullah Geechee population resides on the sea islands in the basin.

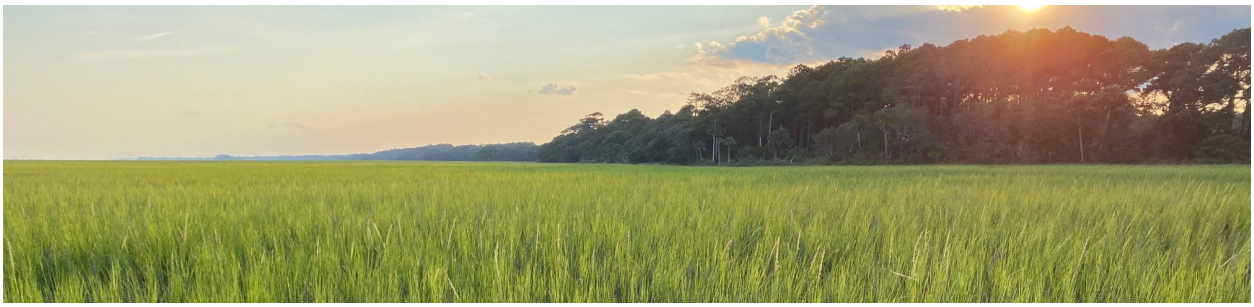
DEVELOPMENT PRESSURE: While the upper part of the Salkehatchie Watershed is primarily rural and agricultural, there is a high level of developmental pressure in the coastal region, specifically in Beaufort, Jasper, Colleton, and Hampton Counties. Forested and Agricultural land cover in the basin has decreased over the past two decades and impervious surfaces have increased, especially in coastal communities. Community members in the coastal counties expressed concerns about clearcutting, deforestation, and development in floodplains. Many

voiced support for conservation and more stringent zoning and environmental policies. They also expressed the need for education for developers, homebuyers, and foresters related to flood risk and the benefits of nature-based solutions for flood control and heat reduction.

HAZARDS & IMPACTS: The Salkehatchie Watershed is impacted by a variety of natural hazards and environmental changes, including flooding, hurricanes, tropical storms, lightning, tornados, extreme heat, drought, wildfire, and winter weather. Over the course of the SC Resilient Coastal Communities Collaborative Program (2024-2026), the most frequent hazards of concern mentioned in surveys, interviews, and at community meetings were flooding, extreme heat, high winds, and drought. Community members from sea islands and coastal areas also reported significant impacts from erosion, saltwater intrusion, and flooding due to sea level rise in addition to flooding from rain events and tropical storms/hurricanes. Community members throughout the basin reported impacts from these hazards to roads, buildings, cultural sites, and agriculture. There is concern throughout the watershed that ditches are not being cleaned and are often contributing to flooding and mosquito proliferation. As impacts from flooding were the primary focus of the SCRCCCP, the team focused on identifying locations in the Watershed that are prone to flooding, with a focus on roadway and parking lot flooding that is impacting access to services and ability to evacuate. Locations were reported and documented through interviews, surveys, and paper and electronic mapping exercises at 4 community meetings.

PLANNING CONDITIONS: There are a variety of planning efforts and projects being implemented in the Salkehatchie Watershed in addition to the SC Resilient Coastal Communities Collaborative Program. Two Council of Governments, the Lowcountry COG and the Lower Savannah COG, serve the region and assist communities with planning efforts, including Hazard Mitigation Plans, Transportation Plans, and Comprehensive Plans. Together, the two COGs support the seven counties and thirty-five municipalities located within the Salkehatchie River Basin. Major plans that are currently being updated or created include the Lowcountry Hazard Mitigation Plan , the Lower Savannah Hazard Mitigation Plan, the Lowcountry Transportation Resilience Improvement Plan, the Beaufort-Jasper Water and Sewer Authority Master Plan, and the Town of Hilton Head Island's Resilience Planning Initiative. Additionally, Hampton County, Jasper County, the City of Hardeeville, and the Towns of Yemassee, Allendale, Varnville, and Ridgeland are in the process of updating their comprehensive plans. Several regional planning collaborations, the South Carolina Lowcountry Sentinel Landscape Partnership, the Southern Lowcountry Resilience Collaborative, and the Southern Lowcountry Regional Board (SoLoCo), are also actively working to increase coordination of resilience initiatives in the region.

ECONOMIC DRIVERS & COMMUNITY RESOURCES: The primary economic drivers in the region are agriculture, education, research, industry, and tourism. Clemson Extension and SCDNR



Soil and Water Conservation Districts offer community education and assistance and both have offices in all seven counties. The Watershed hosts a variety of academic institutions, including USC Salkehatchie West (Allendale), USC Salkehatchie East (Walterboro), USC Beaufort, Technical College of the Lowcountry, Denmark Technical College, Voorhees University, and Barnwell County Career Center. Additionally, there are a number of non-profit and community-based organizations that operate in the region, offering resources and strengthening local communities. Some of the organizations that are most active in the river basin include Habitat for Humanity of the Lowcountry, Port Royal Sound Foundation, Open Land Trust, Southern Palmetto Regional Chamber, Keep Bamberg County Beautiful, Keep Allendale County Beautiful County, Coastal Conservation League, Audubon SC, and The Nature Conservancy-South Carolina.

1b. Project Approach

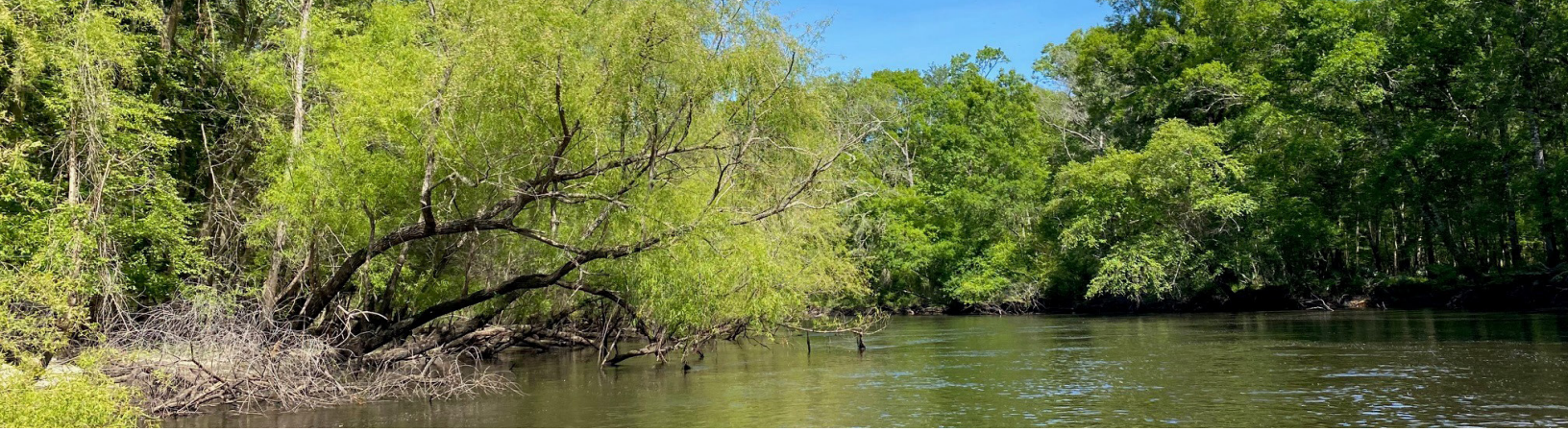
As a foundational step, **SCOR and SCSG reviewed local planning efforts** to better understand existing conditions and identify opportunities to leverage planned efforts.

The Project Team then conducted **multi-scale vulnerability assessments** at the watershed, community, and parcel levels to assess the natural hazards. This technical analysis was paired with **robust community engagement** through Community Action Team meetings, public surveys, field site visits, and consultant assessments to ensure that the vulnerability assessment results and proposed strategies were **grounded in local knowledge and priorities.**



Community Engagement

SCOR and SCSG worked together to identify local community members to form 9 Community Action Teams, which represent the 10 communities of focus. These Community Action Teams were involved with community outreach, input, and decision-making throughout the project. During the first Community Action Team meetings (Fall 2024-Winter 2025), team members shared concerns related to impacts from flooding and environmental changes. At the second Community Action Team meetings (Spring 2025), community members identified and mapped flood-prone areas directly on maps at public events, capturing localized issues often missing in broader state models. The third Community Action Team meetings (August 2025) included Community Action Team members and was also advertised for the public to attend, to gain broader perspectives. The purpose of the third Community Action Team meeting was to



provide an overview of the results of the vulnerability assessments, review potential strategies, and obtain community feedback regarding strategies and priorities to guide strategy siting. The fourth and final Community Action Team meetings took the form of two larger regional meetings in December 2025. A 6-hour regional gathering was held in the Town of Yemassee for the 5 Community Action Teams in the lower half of the watershed on December 4th and a second 6-hour regional gathering was held in the Town of Fairfax for the 4 Community Action Teams in the upper half of the watershed on December 5th. These meetings were designed to foster networking, collaboration, and coordination of regional efforts and to enhance collaborative opportunities for future implementation. The participants in these fourth Community Action team meetings were still divided into their smaller community-specific teams during part of the meeting to review proposed project ideas which contained information and photos from field visits. Participants were encouraged to evaluate each project idea using a visual grid, scoring them on two vital factors:

1. **Impact** (How much will this help the community?)
2. **Feasibility** (How realistic is it to build and maintain?)

Vulnerability Assessment

In July 2025, the Project Team completed a multi-scale vulnerability assessment. The assessment was conducted at three scales: 1) watershed-scale, 2) community-scale, and 3) parcel-level. The assessment was aimed at identifying the most vulnerable areas to flooding, extreme heat, wind, flooding, and wildfires.

The project team used First Street Foundation datasets to identify the most vulnerable areas across the Salkehatchie River Basin. For the community-scale assessment, modeling efforts focused on the 34 census tracts that encompass the ten communities of focus. The parcel level assessment focused on both near term (present day) and future (2055) conditions within the five most vulnerable areas identified in the community-scale analysis.

Strategy Siting

Strategy siting was conducted at the community level using community-specific data, feedback from the third Community Action Team meetings, and the results of the multi-scale vulnerability assessment. Following the desktop analysis, the Project Team conducted targeted site visits across the ten communities of focus in the Salkehatchie Watershed. At each location, the Project Team used a standardized field data sheet to evaluate the feasibility of the identified projects, **documenting conditions relevant to design and permitting, including:**

- land ownership
- structures on site
- paved surfaces
- drainage information
- vegetation cover
- site photos

Prioritization

Prioritization criteria were developed with SCOR and SCSG to identify projects that were both feasible to implement and capable of delivering the greatest benefits to each community. **Criteria were divided into three categories:**

1

Flood reduction benefit

Informed by project drainage areas and runoff reduction rates.

2

Feasibility

Considered factors such as land ownership, anticipated permitting effort, and maintenance costs.

3

Co-benefits

Accounted for water quality improvements, heat reduction, and wildlife habitat creation.

The prioritization matrix was used to **identify the top two projects in each community**, which then received a rough order of magnitude opinion (high-level cost estimate) which included project planning, design, and construction.

Results

Building resilience in the Salkehatchie River Basin is a continuous and adaptive process. This document is one of **nine (9)** Community Portfolios that are combined into the comprehensive, basin-wide Salkehatchie Watershed Resilience Plan. **Over fifty (50)** adaptative strategies and proposed projects were identified through this SCRCCCP process. Each portfolio provides specific information on community vulnerabilities and unique concerns as well as opportunities to reduce impacts from flooding and enhance community resilience.

The communities of the Salkehatchie River Basin have demonstrated commitment and capacity to continue to lead this work. By maintaining momentum, strengthening collaboration across the watershed, and staying engaged through regional partnerships such as the Salkehatchie Watershed Advisory Group and the Southern Lowcountry Resilience Collaborative, these communities can continue to identify sustained pathways to implementation, ensuring a **vibrant, safe, and resilient future for generations to come**.

The Communities of Barnwell County are characterized by expansive agricultural lands and managed forests, making the existing rural economy particularly vulnerable to extreme weather volatility. Because flood reduction was identified as the community's highest priority, areas with known flooding were given particular attention during the desktop analysis, and preferred practices were prioritized such as conservation areas and riparian buffers. **For cost estimation, the prioritization matrix highlighted two projects that consistently performed well across all criteria: the Stormwater Park at Barnwell Elementary School, which had the highest overall score, and the Stormwater Park at Bryan Street and Dunbarton Boulevard, which had the second highest score in the community.**

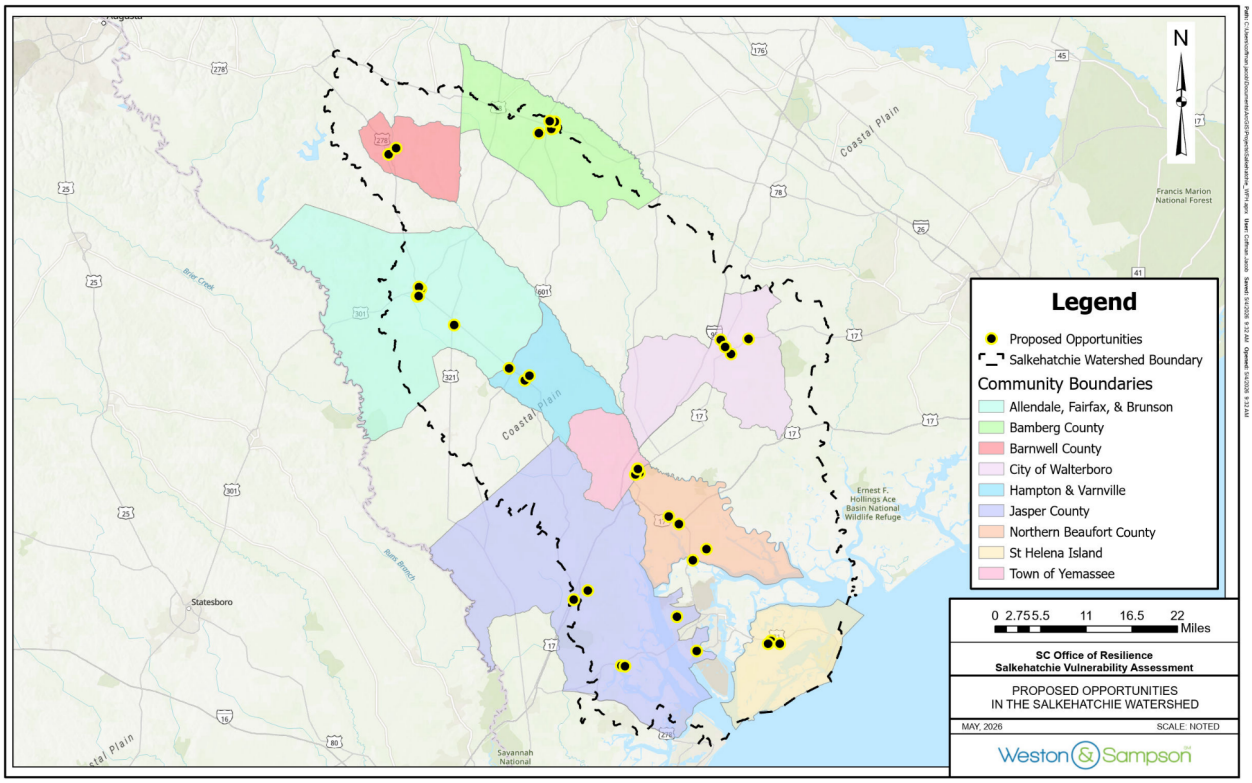


Figure 2: SCRCCCP Study Communities and Proposed Opportunities

2. Introduction

2a. Project Objectives

The goal of the South Carolina Resilient Coastal Communities Collaborative Program (SCRCCCP) is to **support communities in the Salkehatchie River Basin** by developing locally informed and locally prioritized strategies and plans that **reduce impacts from flooding and improve resilience** to natural hazards and environmental changes. This process included working with community partners to co-produce **nine (9) Community Portfolios** for ten(10) areas of focus which are combined into a basin-wide Salkehatchie Watershed Resilience Plan. Each community portfolio is intended to accomplish the following objectives.

1

Explain the community's **vulnerability and risk** through a comprehensive assessment

2

Document **community concerns** about infrastructure and vulnerabilities to natural hazards and environmental changes

3

Document input on **flooding impacts** and locations of flood-prone **vulnerable areas** within the community

4

Provide a suite of flood reduction and resilience **strategies,** that are ready for funding and implementation

5

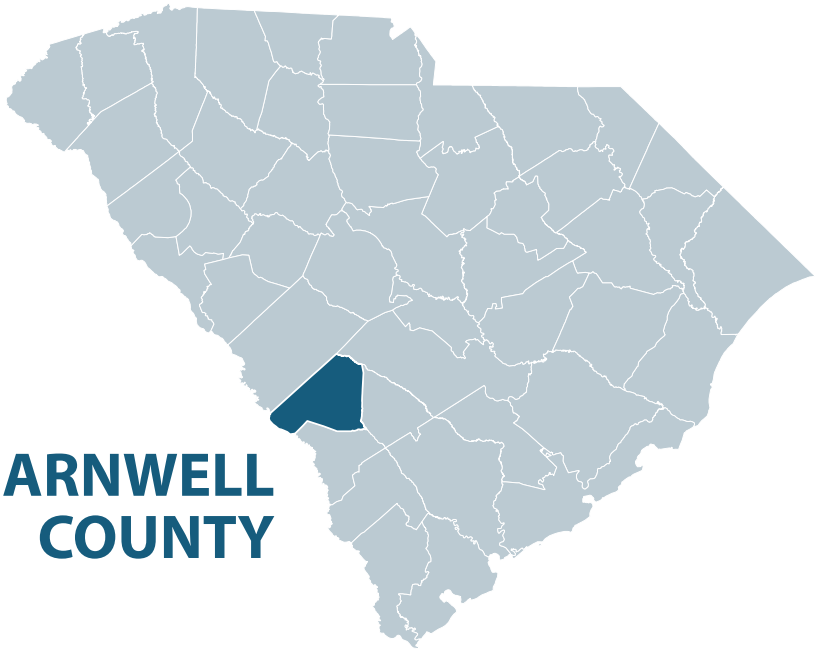
Highlight **community preferred** resilience strategies

6

Strengthen **collaboration and partnerships** within the watershed

2b. Community Background

Located within the inland coastal plain, the Communities of Barnwell County are characterized by expansive agricultural lands, managed forests, and naturally draining topography. The County sits at the top of the Salkehatchie Watershed and is bordered by the South Fork of the Edisto



BARNWELL COUNTY

River to the northeast, Orangeburg and Bamberg Counties to the east, Allendale County to the South, the Savannah River and Georgia to the southwest and west, and Aiken County to the northwest. The headwaters of both the Salkehatchie and Little Salkehatchie Rivers originate in Barnwell County, and the Salkehatchie River and Turkey Creek drain the area. The County is home to Lake Edgar Brown and Barnwell State Park and has 8 municipalities with the City of Barnwell being the County seat. The towns of Blackville and Williston developed in conjunction with the historic South Carolina Railroad built in 1832, which connected Charleston to Hamburg, near Augusta, Georgia. Freight trains still travel through the County though there are currently no active passenger or freight depots in the County's local communities. A major evacuation route, U.S. 278, also passes through the region as well as Highway 64 which leads to the Savannah River Site, a federally managed nuclear reservation located in the western part of Barnwell County. Unlike more highly urbanized or coastal regions, Barnwell County's primary economic drivers are farming and forestry, sectors that are intrinsically tied to weather patterns. While Barnwell County has historically avoided catastrophic flooding, the existing rural economy is particularly vulnerable to extreme weather volatility, such as cycles of severe drought followed by heavy rain events.

The Communities of Barnwell County are exposed to several natural hazards and have experienced 16 declared disasters over the past twenty years. Hurricanes are the most common disaster type impacting the County, with four major hurricane declarations between 2020–2026. Severe storms account for most disaster declarations and include tornadoes, straight-line winds, hailstorms, and winter storms. The Project Team gained an understanding of existing vulnerabilities and future threats for the Communities of Barnwell County through robust community engagement, plan review, and a vulnerability assessment.

2c. Plan Review

SCOR and S.C. Sea Grant reviewed local planning efforts to better understand existing conditions and to identify opportunities to leverage planned efforts. The plans reviewed for the Communities of Barnwell County are listed in Table 1.

Table 1: Plans Reviewed for the Communities of Barnwell County

Plan Name	Year
Housing Needs Assessment	2019
Barnwell County Hazard Mitigation Plan	2020
City of Barnwell Comprehensive Plan	2021
Barnwell County Housing Needs Assessment	2021
Barnwell County Comprehensive Plan	2021
Comprehensive Economic Development Strategy 2022–2027 Lower Savannah Region	2022

The Project Team conducted a review of existing vulnerabilities and future threats for the Communities of Barnwell County. **The vulnerabilities that were identified by the Project Team include:**



Increased exposure to extreme weather, specifically wind, heat, and drought, and the potential for flash flooding during heavy rainfall events.



Increased development interest in the region, which may place additional pressure on local infrastructure, land use, and natural resources if not carefully managed.



Challenges related to flood insurance, where some properties are perceived as unnecessarily included in FEMA designated floodplains, creating financial strain and confusion for homeowners.



Limited infrastructure in rural areas, particularly the lack of public transit options that restricts mobility and access to essential services.

2d. Community Engagement

The SC Office of Resilience (SCOR) and SC Sea Grant Consortium (SCSG) worked together to identify local community members to form a **Community Action Team**. The Community Action Team was involved with community outreach, input, and decision-making throughout the project, specifically during the four Community Action Team meetings which took place in January 2025, March 2025, August 2025, and December 2025. The members identified for the Communities of Barnwell County Community Action Team are listed in the table below.

Table 2: Team Members of Communities of Barnwell County Community Action Team

Team Members Name	Team Members Title
Dawn Snead	Barnwell Farmers Market Manager
Merideth Wright	Barnwell County Administrator
Christle Gleaton	Agriculture Education Teacher
Desiree Still	Agriculture Education Teacher
Bob Snead	Southern Palmetto Chamber President & CEO
Sophia Truempi	Coastal Community Engagement Specialist, S.C. Sea Grant Consortium
Karen Hardison	Watershed Coordinator-Salkehatchie & Lower Savannah, SC Office of Resilience

At the **first Community Action Team meeting** (January 2025), team members were invited to share concerns related to impacts from flooding and environmental changes they have experienced within their community. Within Barnwell County stakeholders have observed a range of environmental and community impacts in recent years including a growing concern for future earthen dam-related flooding. Although no major failures have occurred to date, many of these dams sit on private property. The SC Department of Environmental Services (SCDES) is currently evaluating the structural integrity of dams due to the high possibility of future flood events that could increase the potential for dam failure. Agriculture has been significantly affected by recent climate hazards. For example, Tropical System Helene in 2024 resulted in wind damage and downed trees. Farmers have also reported crop damage linked to rapid transitions between drought conditions and heavy rainfall as short-term surface water accumulation can strain plant health. Deer overpopulation continues to be a challenge and contributes to crop loss and road safety concerns. Lastly, team members noted that Lake Edgar Brown has experienced recurring algal blooms, creating strong odors and visible discoloration. While the lake is managed by SC Department of Natural Resources (SCDNR) as a fish stocking resource rather than a recreational amenity, they remain concerned about stagnant conditions, potential of flooding, and the persistence of algal blooms.

At the **second Community Action Team meeting** (March 2025), community members identified flood-prone areas directly on maps at a public event held at a Southern Palmetto Regional Chamber event at Barnwell State Park. Many participants noted that flooding is not a key concern as much of Barnwell County is agricultural or forested, with less impervious surface and natural drainage.



Figure 3: Images from the third Community Action Team meetings

The top concern raised by residents was deer overpopulation, which has continued to affect crops, landscapes, and roadway safety. Participants were also concerned about the stability of earthen dams within agricultural impoundments, particularly highlighting concerns that surfaced during Tropical Storm Debby in 2024. Additionally, residents recalled past stormwater drainage problems within the City of Barnwell; however, they emphasized that these issues have since been addressed and resolved by local officials.

The **third Community Action Team meeting** took place in August 2025. Community Action Team members attended, and the meeting was advertised to the public to gain broader perspectives. The purpose of the third Community Action Team meeting was to provide an overview of the vulnerability assessments, review potential strategies, and obtain community feedback regarding strategies and priorities to guide strategy siting and typology criteria. A total of eight meetings were held including a combined meeting for the Town of Yemassee and the Communities of Northern Beaufort County and one for each of the seven other communities in the Program. Participants were encouraged to talk with members from the Team and physically add feedback to displays with focus on adaptation strategies, benefits prioritization, existing conditions, and a map showing the most vulnerable areas in each community. Participants provided feedback on the adaptation strategies and benefits prioritization boards by placing color-coded dots to indicate preference for specific adaptation strategies (i.e. bioswale, tree planting, permeable pavement) and rank the importance of certain strategy benefits (i.e. aesthetics, cost, flood reduction, ecological value, and recreation value). The existing conditions and vulnerable area boards contributed important place-based information through conversational notes and location-specific pins. Community members were asked to provide locations of chronic flooding, known community assets, and identifiable landmarks. After the meetings, SCOR and SCSG provided an online survey to community members to provide feedback if they were unable to attend the third Community Action Team meeting in person. The community-specific data gained from the third Community Action Team meeting and the survey informed the type of strategies selected, the strategy siting, and prioritization matrix.

The **fourth Community Action Team meeting** took place in December 2025. A six-hour regional gathering was held in the Town of Yemassee for the five Community Action Teams in the Lower half of the Salkehatchie Watershed on December 4th, 2025 and a second six-hour regional gathering was held in the Town of Fairfax for the four Community Action Teams in the Upper half of the Salkehatchie Watershed on December 5th, 2025. These meetings were designed to foster networking, collaboration, and coordination of regional efforts. The fourth Community Action Team meetings began by reviewing the vulnerability assessments and possible strategies for implementation. Representatives from partnering agencies and organizations provided information on their respective efforts, which provided an opportunity to connect community members with potential project funding and resources.

In small, community-specific groups, participants reviewed and discussed project-level details for proposed projects with project team members. Members of the project team provided community members with project sheets that contained information gained from field site visits, including photos and conceptual renderings of the proposed projects. Participants were asked to evaluate each proposed project on two vital factors: Impact (How much will this help the community?) and Feasibility (How realistic is it to build and maintain this?). Participants scored each project using a visual grid, helping identify projects that deliver high community benefits without facing construction or permitting hurdles. Participants also provided additional valuable information to help inform the final project recommendations.





Figure 4: Participants at the fourth Community Action Team meeting reviewed project sheets (See Appendices) to discuss which projects are the most feasible and provide the greatest benefit to the community.

Following the fourth Community Action Team meetings, all community feedback, including the impact and feasibility scores, was compiled for further analysis. To translate the visual grids into quantitative data, the impact and feasibility axis were scaled from 1 to 10, and each project was assigned a standardized score for both metrics. These two scores were summed to generate a composite community preference score. Additionally, project sheets were updated to incorporate a "Community Action Team 4 Feedback / Notes" section to capture qualitative community input, such as proposed land uses, local observations, and potential funding sources.

After the fourth Community Action Team meetings, the project team met to discuss the proposed projects. The project team evaluated each project and assigned consultant opinion scores based on professional judgement informed by the break-out sessions during the fourth Community Action Team meeting, field observations, drainage patterns, and potential funding opportunities. Community preference and consultant opinion scores were considered during project prioritization.

3. Vulnerability Assessment

In July 2025, the Project Team completed a multi-scale vulnerability assessment for the Salkehatchie Watershed. **The vulnerability assessment was conducted at three scales:**

1

WATERSHED-SCALE

Utilizing the Salkehatchie Watershed Boundary

2

COMMUNITY-SCALE

Based on Census Tracts

3

PARCEL-LEVEL

Incoporating Building Point Data from First Street Foundation

Following discussions with SCOR and S.C. Sea Grant, as well as stakeholder input from the first two Community Action Team meetings, which indicated that **flooding, extreme heat, wind damage, and wildfire were top concerns**, the following raster datasets from First Street Foundation were selected for inclusion in the watershed scale and community scale vulnerability assessments:

- **Flood 2055** – 500 Year Storm Event
- **Heat Max Temperature** – 2055
- **Wind Speed 2055** – Shared Socioeconomic Pathway 2-4.5 r3000
- **Burn Probability 2055** – Shared Socioeconomic Pathway 5-8.5

i

Note: Shared Socioeconomic Pathway is a set of narratives that help describe future developments in society based on the use of fossil fuels and the social and economic factors that drive fuel consumption.

3a. Watershed Scale

The Project Team used the four datasets; Flood 2055, Heat Max Temperature 2055, Wind Speed 2055, and Burn Probability 2055, to **identify the most vulnerable areas across the Salkehatchie Watershed.**

Figure 5 shows the results of the vulnerability modeling used to identify vulnerable areas across the Salkehatchie Watershed. The vulnerability scores range from 4.75 (lowest vulnerability) to 41.15 (highest vulnerability) and the final dataset provides complete coverage for the Salkehatchie Watershed. Conducting the assessment at the watershed scale allows the project team to **identify areas most at risk** based on the First Street Foundation data.

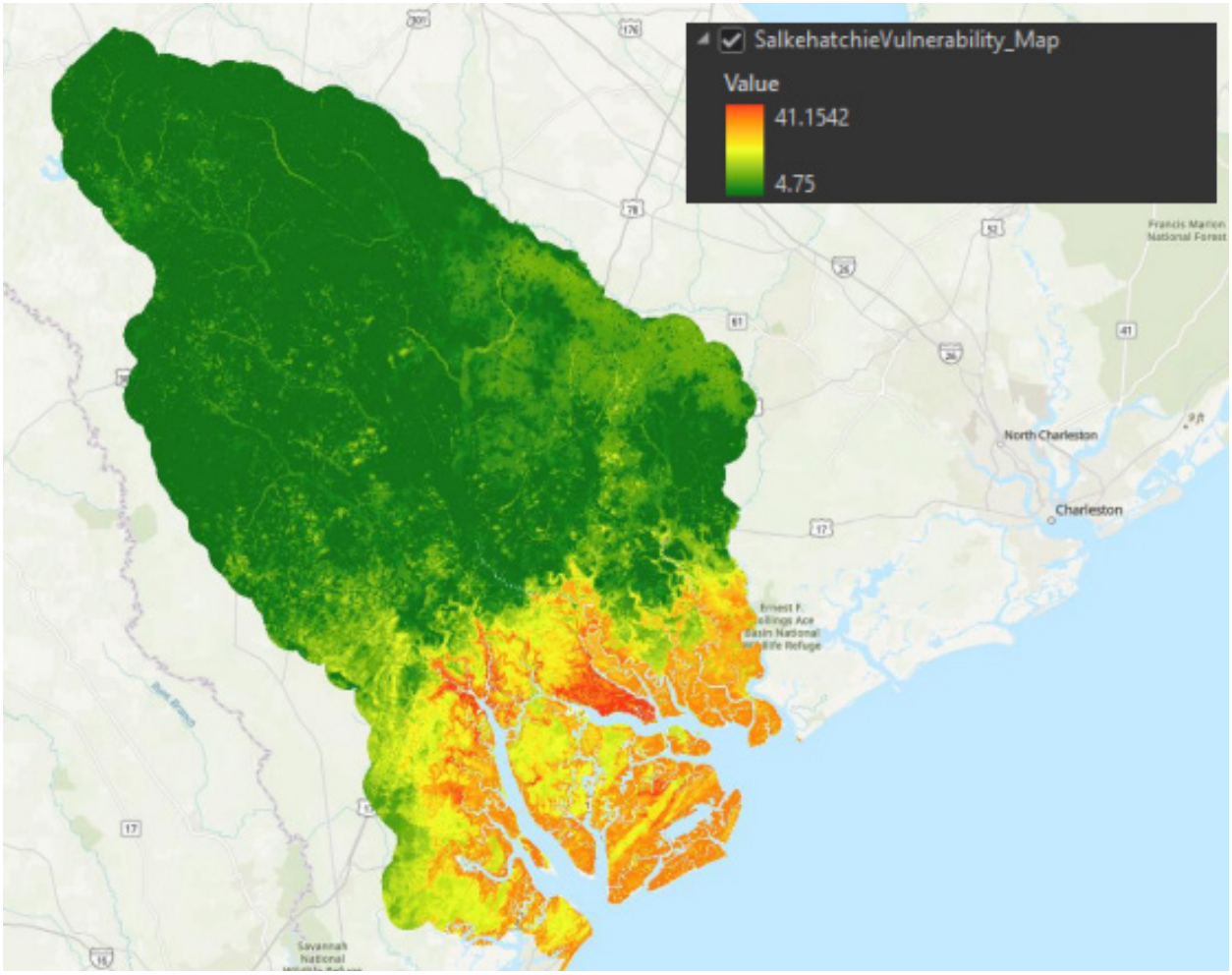


Figure 5: Salkehatchie Vulnerability Model Results

3b. Community Scale

For the community-scale component of the vulnerability assessment, modeling efforts focused on census tracts that encompass the previously identified communities of focus for the South Carolina Resilient Coastal Communities Collaborative Program (SCRCCCP). A total of **34 census tracts were selected** using maps provided by SCOR to ensure accurate representation of the Community Action Teams. Census tracts were grouped according to the communities of focus including Communities of Barnwell County, Communities of Bamberg County, Communities of Allendale, Fairfax & Brunson, Communities of Hampton & Varnville, Communities of Northern Beaufort County, Communities of Jasper County, Town of Yemassee, City of Walterboro, and St. Helena Island (Figure 6).

A spatial vulnerability assessment was conducted for each of the community-scale census tract areas shown in Figure 6. The methodology for the community-scale vulnerability assessment closely follows the approach used in the watershed-scale assessment, including the selection of data layers, scoring procedures, and weighting criteria, ensuring consistency across scales while providing a more granular understanding of vulnerability within each community.

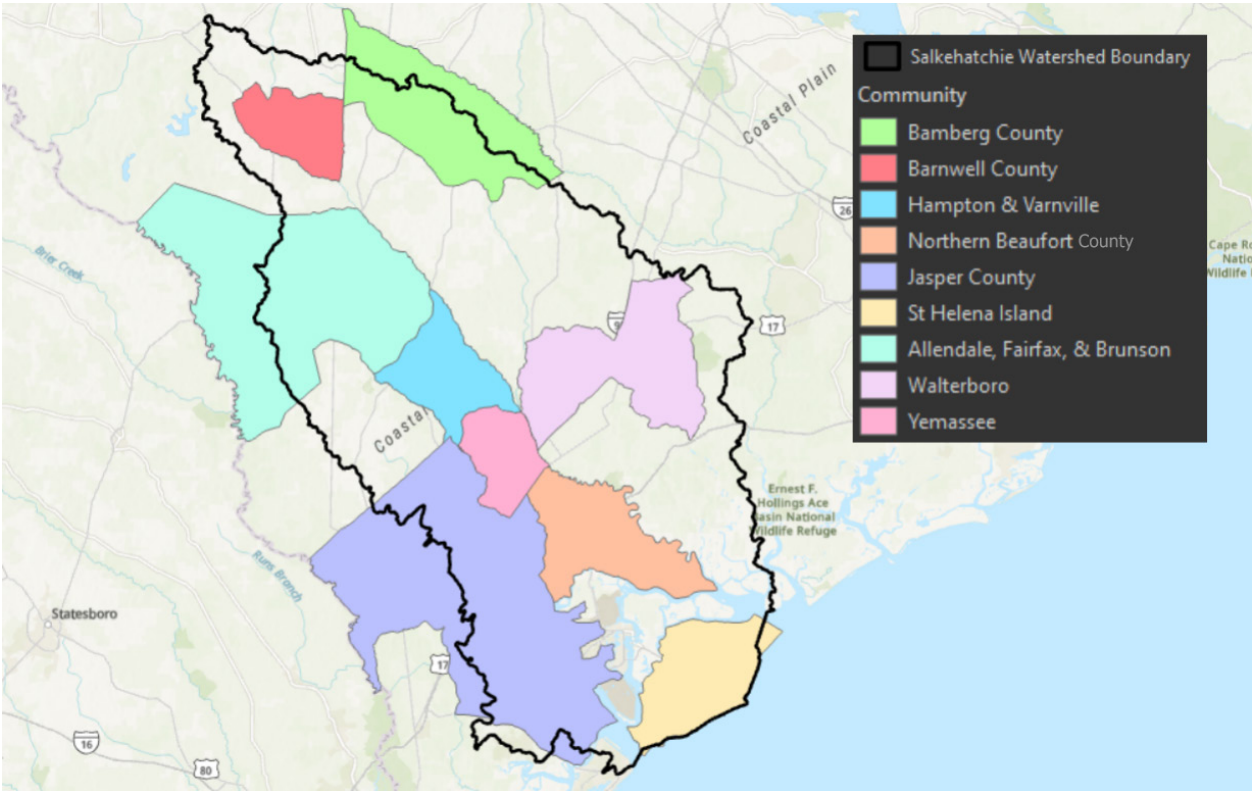


Figure 6: Salkehatchie Watershed and SCRCCCP Study Communities Census Tracts

The community-scale analysis helped:

1. Identify specific **vulnerable areas**
2. Validate **flood concerns** raised during Community Action Team meetings
3. Inform the siting of potential **adaptation recommendations**
4. Determine the **top five most vulnerable areas** in each community where parcel-level analysis was performed.

Figure 7 represents the results of the Vulnerability Assessment for the Communities of Barnwell County along with the locations of the highest average vulnerability scores within the Barnwell County census tracts. The most vulnerable areas are concentrated on the east side of the study area between State Road S 6-169 and SC Highway 64. The five most vulnerable areas are located near Toby Creek, Hercules Creek, and Georges Creek. The results were consistent with information collected from stakeholders during the second Community Action Team meeting.

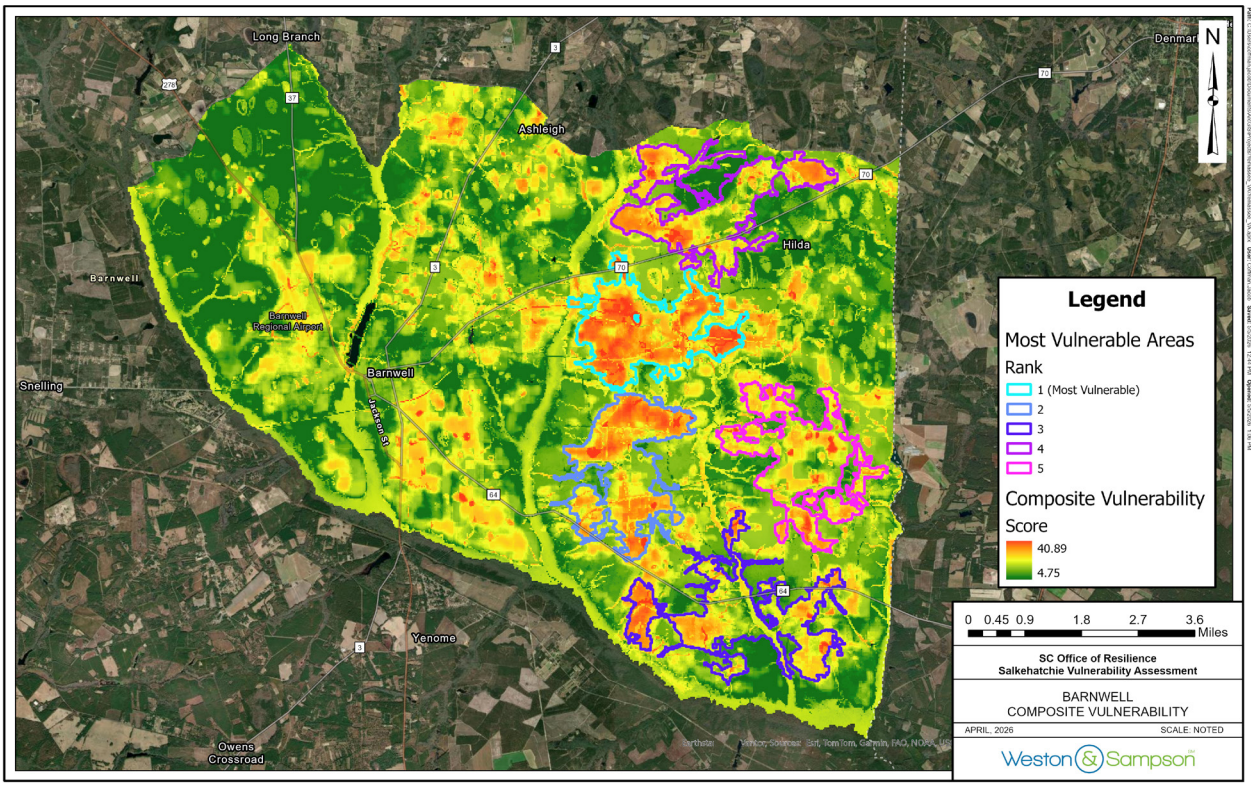


Figure 7: Barnwell Vulnerability Model – Most Vulnerable Areas

3c. Parcel Scale

The parcel-level vulnerability assessment was conducted for the five most vulnerable areas identified in each community. Parcel-level vulnerability results are not provided in this report to protect the privacy of property owners.

The assessment focused on both near-term (present-day) and future (2055) conditions. By evaluating both present and future conditions, existing vulnerabilities are identified and an understanding is gained of how risks may evolve. To understand parcel level vulnerability, the project team applied a standardized methodology that examined both exposure and sensitivity. When exposure and sensitivity are combined, these two components provide a comprehensive understanding of vulnerability for each parcel within the study communities' most vulnerable areas. Figure 8 defines exposure and sensitivity as it relates to the applied vulnerability scoring formula.

Exposure	X	Sensitivity
whether an asset is in an area that will **experience** a given hazard		whether an asset or its functionality will be **damaged** or **disrupted** from exposure to a hazard

Figure 8: Vulnerability Scoring Formula



4. Strategy Siting

4a. Desktop Analysis

Strategy siting was conducted through a desktop analysis at the community level, utilizing community-specific data, feedback from the third Community Action Team meeting, and the community-scale and parcel-scale vulnerability assessments. All data layers referenced were compiled and clipped to each community's study boundary to create a standardized spatial dataset for the analysis. Figure 10 describes the data layers used in the strategy siting analysis.

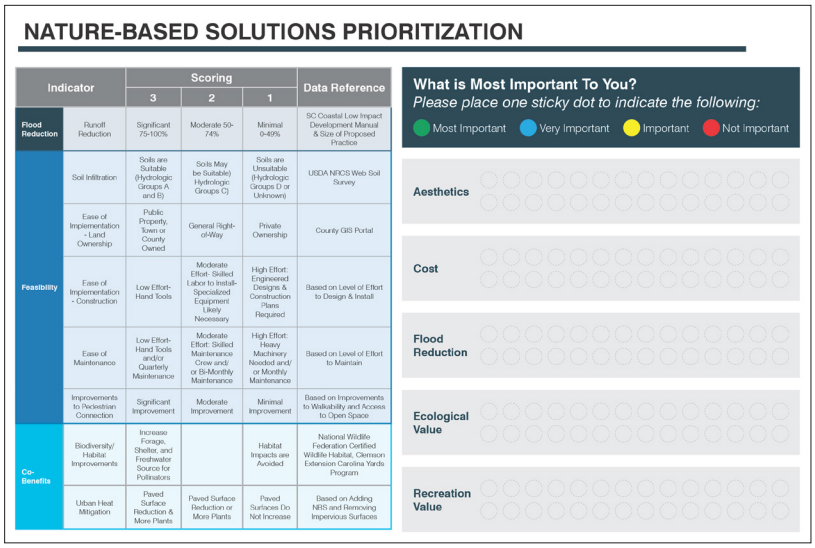


Figure 9: Strategy Prioritization Board Utilized in Community Action Team Meeting Three to Better Understand Community Preference.

The siting process was guided by community-specific strategy preferences and benefit priorities derived from the third Community Action Team meeting feedback and survey results. The preferred practicies that were prioritized by the Communities of Barnwell County were conservation and riparian buffers. **Because flood reduction was identified as the community's highest priority, areas with known flooding were given particular attention.**

Data Layer	Description	Data Source
Soil Drainage Class	Soil Hydrologic Group (A, B, C, D, A/D, B/D, C/D)	USDA NRCS Web Soil Survey, SSURGO Data
Digital Elevation Model (DEM)	Community specific elevation data	NOAA: Digital Coast LiDAR
Surface Streams (1 acre and 10 acre)	Surface streams derived from community DEM	Community DEM
Parcels	Community specific land ownership data	Beaufort County, Hampton County, Colleton County, Jasper County, Allendale County, Bamberg County, Barnwell County
SCOR Conservation Priorities	Displays SCOR's priority lands for conservation, developed land, water, and already conserved land	South Carolina Office of Resilience (SCOR)
Historic Structures	National Register of Historic Places	SC SHPO
LMI % Block Groups	Displays low-to-moderate income % by block group	HUD
20-year Flood 2025	Present-day flood depth and extent	First Street Foundation
20-year Flood 2055	Future conditions flood depth and extent	First Street Foundation
Locations of Known Flooding	Community point locations derived from Community Action Team meetings	Community Action Team Meetings Two and Three
Top 5 Vulnerable Areas	~5000 acre polygons of the most vulnerable areas in each community	Community-Scale Vulnerability Assessments

Figure 10: Data Layers Used in Strategy Siting During the Desktop Analysis

4b. Site Visits

Following the completion of the strategy siting, the project team conducted **forty-one targeted site visits across the nine study communities** to evaluate the feasibility and implementation of projects identified through the desktop analysis. At each site location, the consultants filled out a standardized field data sheet to document conditions relevant to design, permitting, and implementation of the proposed strategy. The field data sheet captured information pertaining to land ownership, structures on site, paved surfaces, drainage information, vegetation cover, feasibility comments, and site photos.

A completed field data sheet for each project visited in the Communities of Barnwell County is included in the appendices.



Figure 12: Site visits to potential project locations provided an opportunity to identify barriers to implementation, property conditions, opportunities, and co-benefits.

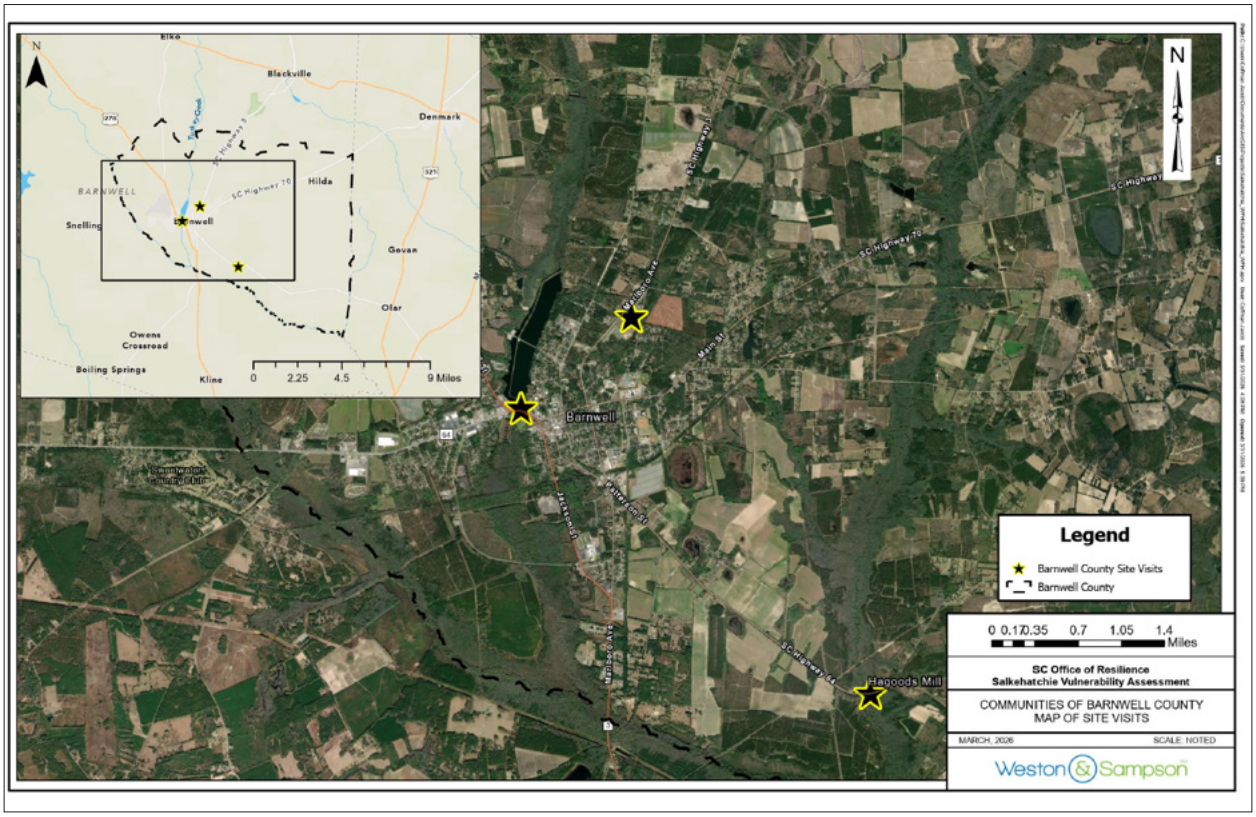


Figure 11: Site Visits Conducted by the Project Team in the Communities of Barnwell County

5. Prioritization Matrix

5a. Prioritization Criteria

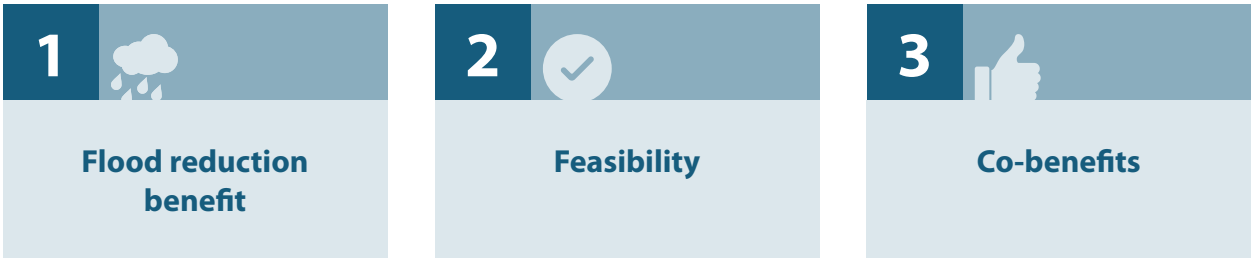
Prioritization criteria were developed to identify projects that were both feasible to implement and capable of delivering the greatest benefits to each community. A table of the prioritization criteria can be found in the appendices. Criteria were divided into three categories:

Flood Reduction Benefit: This was evaluated using the project's drainage area combined with the runoff reduction rate for each specific strategy, as outlined in the "Low Impact Development in Coastal South Carolina: A Planning and Design Guide."

Feasibility: This category evaluated practical implementation factors, such as land ownership and anticipated maintenance costs.

Co-Benefits: This accounted for the additional advantages a strategy might provide, such as water quality improvements and enhanced wildlife habitat.

Each criterion was scored on a scale from 1 to 3, where 1 represents lower benefit or greater implementation challenges and 3 represents higher benefit or greater ease of implementation. To emphasize the importance of reducing flood risk, the criteria representing flood-reduction benefit and flood exposure (present-day and future) were each weighted by 15. To ensure that both community feedback and consultant field observations were appropriately considered, Community Action Team 4 feedback and consultant opinion scores were each weighted at 10. All remaining criteria were assigned a weight of 5. This weighting structure ensures that **projects advancing flood resilience and reflecting community priorities received the highest consideration.**



5b. Prioritization Results

The prioritization matrix results helped identify the **top two projects in each community.** The top two projects for each community received an order of magnitude cost (high-level cost estimate) that considers all phases of implementation from design to construction. This information is intended to help with grant writing and future capital improvement planning. This order of magnitude cost informaiton is included in the appendices section.

For the Communities of Barnwell County, the prioritization matrix highlighted two projects that consistently performed well across all criteria. **The Stormwater Park at Barnwell Elementary School** had the highest overall score. This project has the potential for high flood-reduction benefits and for multiple co-benefits including urban heat island reduction, water quality improvements, and the potential to benefit vulnerable populations. **The Stormwater Park at Bryan Street and Dunbarton Boulevard** had the second highest score in the community. This project had lower flood reduction potential due to its relatively small size but has potential for multiple co-benefits including urban heat island reduction, water quality improvements, and the potential to benefit vulnerable populations.





Figure 13: Participants in Community Action Team meeting four reviewed project sheets to help prioritize projects. The top two projects for each community received an order of magnitude cost estimate.

6. Recommendations Per Community



Opportunity Sheets

Navigating the Project Pages

To guide the development and implementation of resilience actions within the Salkehatchie watershed, a portfolio of potential projects, referred to as strategies, have been summarized in the following pages. Each strategy has been evaluated and presented with a standard set of criteria. These categories provide transparency, enable comparison among strategies, and offer a starting point for conversation with stakeholders who may be involved in advancing the strategy toward implementation. The sections below explain each element and its role in providing key information to support informed decision making.

Type of Strategy The Type of Strategy section simply identifies what project or practice is being described in detail on the sheet.

Strategy Description

The Strategy Description section provides a standard definition of what kind of solution is being proposed. This allows for a shared understanding in case some of the terms are unfamiliar.

Location Description

The Location Description section provides additional information to help identify the site when a specific address is not available. This may include descriptions such as the site being located between two streets or references to names commonly used by the community, such as "the old high school football field." This description helps readers clearly understand the location being referenced.

Narrative

The Narrative section provides a more detailed summary of the proposed project or study including background, scope, and key features. This overview offers a concise snapshot of what the project entails and includes additional context or information that may not fit in with other sections.

Photos

The Photos section includes on-the-ground photos of existing site conditions. Additionally, some sites have renderings or visualizations that illustrate what the site could look like after proposed improvements are implemented. The photos help provide context for those who have not visited the site, while the proposed conditions visuals help those unfamiliar with the strategy better envision how it would appear once installed.

Strategy Location and Map

Location identifies the specific area where the project will be carried out. This could be a site address, neighborhood, corridor, watershed, or broadly county-wide project. Understanding where a project takes place is essential for evaluating its vulnerability context, affected populations, and potential to address locally specific hazards.

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☑ Nature-based Solutions
- ☐ Infrastructure/Facility Retrofit

The Type of Solution section allows the reader to quickly understand the nature of the proposed approach. This may include a physical project, such as a nature-based solution; a modification to existing infrastructure through a facility or infrastructure retrofit; or a plan or policy intended to guide and support future solutions. Each type of solution plays an important role in supporting overall community resilience.

Supporting Function

- ☐ Flood Mitigation
- ☑ Stormwater Management
- ☐ Conservation Opportunity
- ☐ General Resiliency Advancement
- ☐ Biodiversity Enhancement
- ☐ Floodplain Management
- ☐ Water Quality Improvement
- ☐ Urban Heat Reduction

The Supporting Function section identifies the primary purpose of the strategy by selecting from a defined list of intended outcomes. These selections indicate the benefits the strategy is expected to provide. Categories include flood mitigation, stormwater management, conservation, general resilience, biodiversity, floodplain management, water quality, and urban benefits.

Flood Vulnerability of Location



The Flood Vulnerability of Location section uses flooding data from First Street Foundation (Foundation) to determine how susceptible a site is to flooding. The Foundation's modeling incorporates terrain data, climate projections, historical flood events, and hydraulic simulations to estimate flood elevations for a range of storm events and future time periods. For this analysis, both current (2025) and future (2055) flooding conditions were evaluated using the 20-year storm event (5% annual chance of occurrence). Locations not projected to flood under either scenario were classified as "Low". Sites projected to flood under the future scenario only were classified as "Medium". Locations that were projected to flood under both current and future conditions were classified as "High". An understanding of the flooding conditions at the site can indicate both the need for the strategy and the anticipated success of the strategy.

Anticipated Flood Reduction Benefit



The Anticipated Flood Reduction section estimates the potential reduction in stormwater runoff volume expected from implementing the strategy. The ranges used for these estimates are based off guidance from the "Low Impact Development in Coastal South Carolina: A Planning and Design Guide," which provides typical runoff reduction values for common nature-based solutions. Flood reduction is a key focus of increasing community resilience in the Salkehatchie watershed.

Ease of Implementation



The Ease of Implementation section reflects key factors that may influence how easily a strategy can be carried out, including land ownership and permitting requirements. Strategies rated with a "Low Ease" of implementation generally require multiple permits and are located on private property. In contrast, strategies rated with a "High Ease" of implementation typically require no permits and are located on publicly owned property. Understanding the feasibility of implementation helps set expectations up front and identify potential challenges to address early in the implementation process.

Priority Rating



The Priority Rating section is categorized in "Low," "Medium," and "High" priority rating tiers based on a combination of variety of factors already discussed (flood reduction, cost, permitting) as well as additional factors such as the community's preference, consultant opinion, and co-benefits anticipated (water quality, cultural, habitat). The priority rating category helps decision-makers allocate limited resources efficiently.

Estimated Cost



The Estimated Cost section provides a preliminary projection of the financial investment required to implement. Strategies anticipated to be installed with basic or volunteer labor or consisted of modifications to an existing practice were classified as "Low" while strategies that require engineered designs were classified as "High". Understanding cost early in the process helps assess feasibility, plan budgets, and prioritize investments with fiscal constraints.

Barnwell Stormwater Park

Bryan St/Dunbarton Blvd

Type of Strategy

Stormwater Park

Strategy Description

A stormwater park is a public park intentionally designed to collect, capture, store, treat, and manage stormwater runoff, then slowly release it, while also serving as recreational open space.

Narrative

The parking lot on the south side of Lake Brown is a low lying area receiving overland flow from Bryan Street. Lake Brown discharges through a triple cell box culvert under Bryan Street adjacent to this property. With multiple sources of flow and flooding potential in this area, the parking lot serves as a good opportunity to implement a stormwater park with permeable pavement and bioswales or bioretention areas along the perimeter. There is also an opportunity to install bioswales along Bryan Street. Enhancing infiltration in the parking lot and surrounding area will provide water quality benefits to the downstream Turkey Creek where fisheries are present. Additionally, this area appears to be regularly used by the community with walking paths on Lake Brown across the street. In addition to the opportunities for nature-based solutions in the parking lot area and Bryan street, shoreline buffers can be installed along Turkey Creek or Lake Brown to protect against shoreline erosion.

There are ongoing conservation efforts with the Department of Natural Resources in adjacent areas as well as a community park that the County is working towards. There is funding secured for $2.6M by Ardurra and DP3 to develop a 900 seat amphitheater assumed to be located on the other side of Lake Brown. This area would benefit from permeable pavement and rain garden in conjunction with the planned development. There is also potential to include Fuller Park and the larger conservation area to the south to enhance wildlife and habitat connectivity. Special consideration is needed to coordinate with multiple property owners and initiatives within this proposed project area. This proposed project ranked high in the priority rating because of the enhancements of community space through the incorporation of multiple NBS and because of the opportunities surrounding existing efforts including the planned amphitheater and fish hatchery.

Location Description

75 Bryan Street, Barnwell, SC 29812. This Stormwater park would be located in the open parking lot of Bryan St/Dunbarton Blvd and surrounding area has potential for nature based solutions.

Photos

Existing Conditions



Lake shoreline looking West along Bryan Street

Proposed Improvements



Rendering showing a vegetated shoreline buffer to improve water quality and reduce erosion.

Existing Conditions



View of parcel from Bryan Street

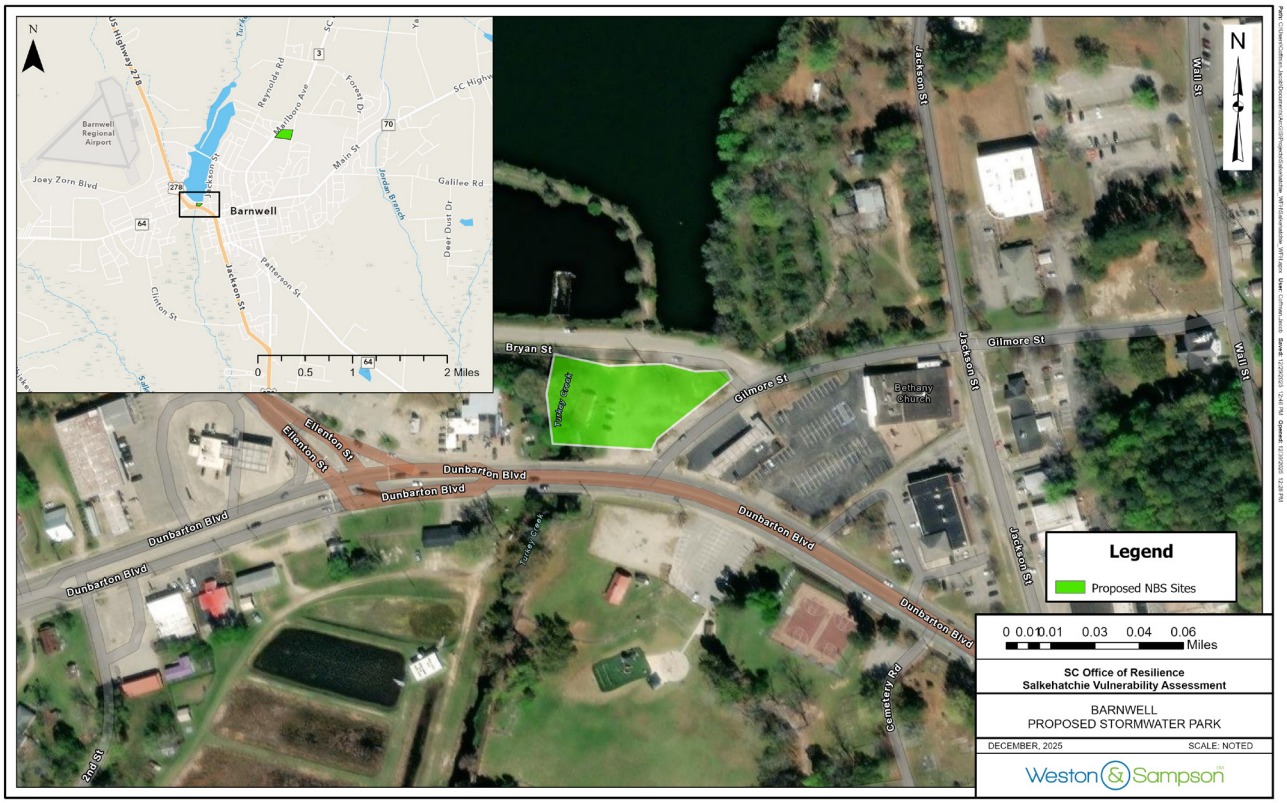
Proposed Improvements



Rendering showing a retrofit of the parking lot with permeable pavers and a bioswale along the perimeter

Strategy Location and Map

75 Bryan Street, Barnwell, SC 29812



Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☑ Nature-based Solutions
- ☑ Infrastructure/Facility Retrofit

Supporting Function

- ☐ Flood Mitigation
- ☑ Stormwater Management
- ☐ Conservation Opportunity
- ☐ General Resiliency Advancement
- ☑ Biodiversity Enhancement
- ☐ Floodplain Management
- ☑ Water Quality Improvement
- ☐ Urban Heat Reduction

Flood Vulnerability of Location

Low



Anticipated Flood Reduction Benefit

Low | Medium | High

Ease of Implementation

Low Ease | Moderate Ease | High Ease

Estimated Cost

Low | Medium | High

Priority Rating

Low | Medium | High

Barnwell Stormwater Park

Barnwell Elementary on Marlboro Ave

Type of Strategy

Stormwater Park

Strategy Description

A stormwater park is a public park intentionally designed to collect, capture, store, treat, and manage stormwater runoff, then slowly release it, while also serving as recreational open space.

Narrative

The Barnwell Elementary Stormwater Park provides an opportunity to enhance existing stormwater practices with the addition of nature-based solutions. The community benefits include water quality protection, beautification, and educational features. Several stormwater practices are already present and are in good condition including check dams and stormwater ponds. The stormwater pond could be retrofitted to included a forebay for long-term maintenance and pollution removal. The littoral shelf of the stormwater pond could be planted with emergent, aquatic native plant species to help filter out pollutants and provide habitat benefits. Bioretention cells and/or rain gardens could be installed near the baseball field to capture runoff from rooftop surfaces. Open spaces could be converted to infiltration practices as space allows. Tree plantings may also occur within open spaces to provide head reduction benefits. A rainwater harvesting system may be installed adjacent to roof structures on the school. This site is located within the South Carolina public waters protection zone and has a TMDL for fecal coliform. Adjacent to this site exists a SE Conservation Blueprint priority area.

Location Description

The location of this stormwater park is at Barnwell Elementary School, on Marlboro Ave. Barnwell Elementary School (10524 Marlboro Ave, Barnwell, SC 29812). Between Marlboro Ave and Calhoun Street

Photos

Current Conditions



Stormwater Pond

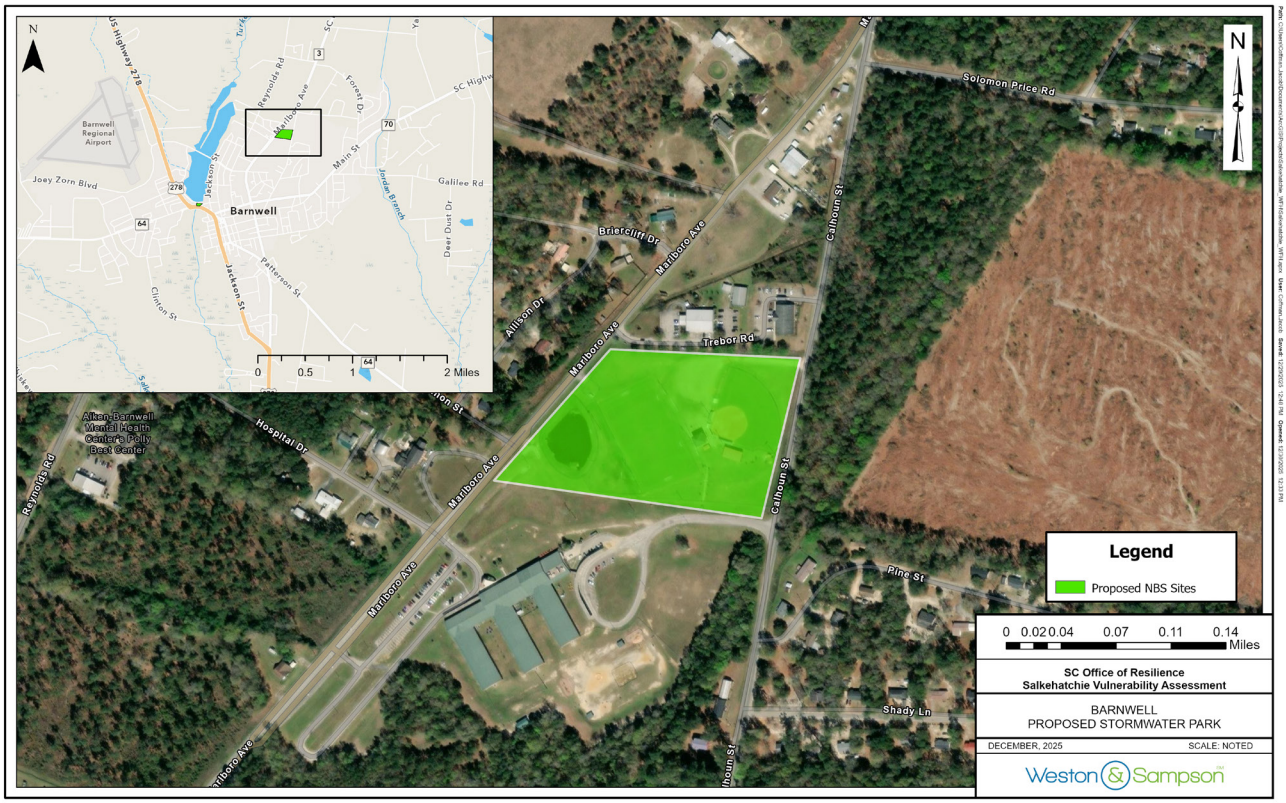
Current Conditions



Upstream end of outfall pipe crossing under Marlboro Avenue

Strategy Location and Map

10524 Marlboro Ave, Barnwell, SC 29812



Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☑ Nature-based Solutions
- ☑ Infrastructure/Facility Retrofit

Supporting Function

- ☐ Flood Mitigation
- ☑ Stormwater Management
- ☐ Conservation Opportunity
- ☐ General Resiliency Advancement
- ☑ Biodiversity Enhancement
- ☐ Floodplain Management
- ☑ Water Quality Improvement
- ☐ Urban Heat Reduction

Flood Vulnerability of Location

Low



Anticipated Flood Reduction Benefit

Low | Medium | High

Ease of Implementation

Low Ease | Moderate Ease | High Ease

Estimated Cost

Low | Medium | High

Priority Rating

Low | Medium | High

Conservation and Riparian Buffer Mapping
Salkehatchie Watershed-Scale

Type of Strategy
Conservation Mapping

Strategy Description
A Conservation and Riparian Buffer Mapping Plan is a planning level effort that uses spatial analysis and stakeholder input to identify, evaluate, and prioritize undeveloped lands and riparian corridors that are suitable for conservation. The plan relies on existing data sources and mapping tools to understand current land use, ecological value, floodplain function, and connectivity across the watershed. The resulting maps and datasets seek to provide a watershed-wide framework to guide future conservation priorities, support funding decisions, and inform local planning.

Narrative
This strategy proposes the development of a Conservation and Riparian Buffer Mapping Plan to identify and prioritize land conservation opportunities throughout the Salkehatchie Watershed. The project could establish a Salkehatchie Conservation Committee (SCC) and engage local governments, conservation professionals, non-profit organizations, and community members to guide the development of a watershed-wide conservation and riparian buffer mapping plan, ensuring that criteria and resulting maps reflect local knowledge and community-defined values. Using available state and regional data, a series of spatial analyses can be completed to inventory existing open space, evaluate undeveloped and available parcels, and identify priority riparian buffer areas that support flood resilience and watershed health. A complementary funding analysis can evaluate conservation funding programs and realistic funding strategies to support conservation goals identified through the mapping effort. The final Land Protection Vision Plan can synthesize these findings into a 25 year blueprint, providing communities and state partners with clear, data driven guidance to support future conservation planning and investment.

Location Description
Watershed-scale.

Photos

Existing Conditions



A few habitat types of the Salkehatchie Watershed: Bottomland Hardwoods



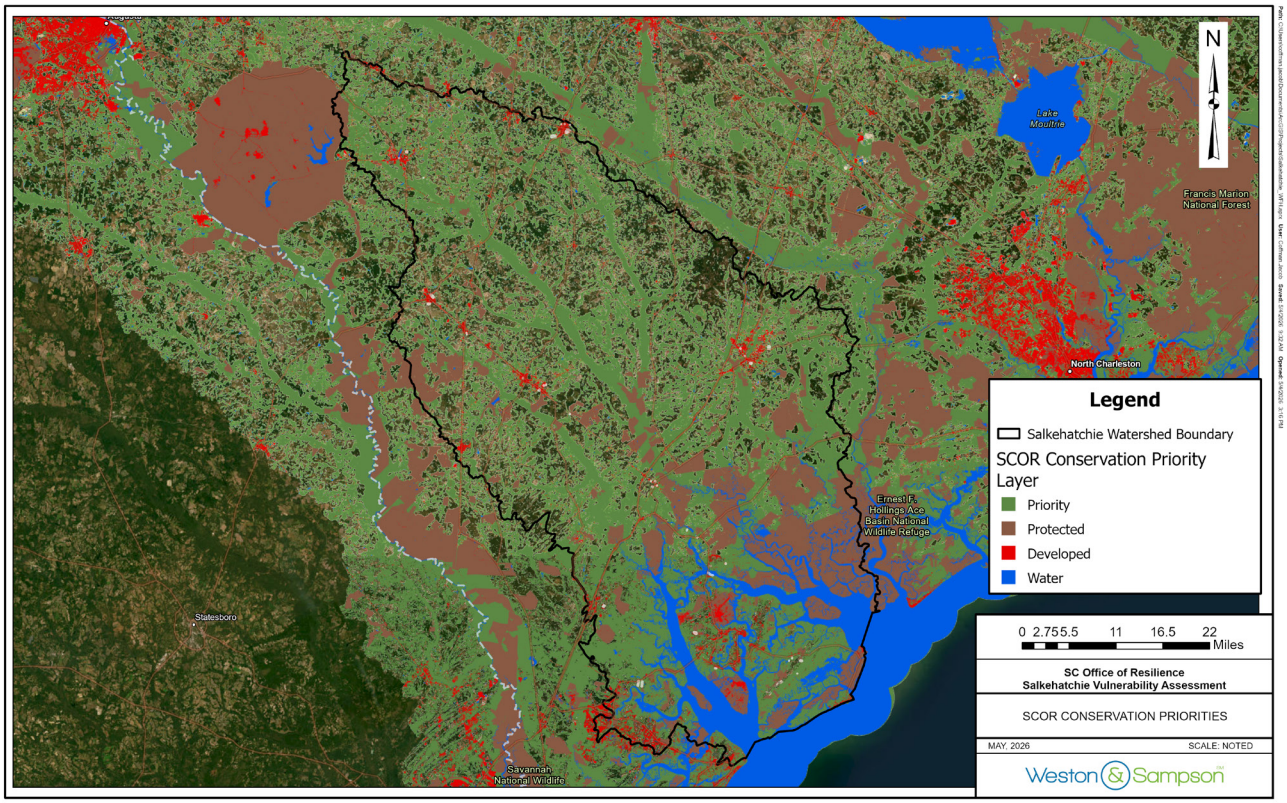
Longleaf Pine Savannas



Tidal Wetlands

Strategy Location and Map

Salkehatchie Watershed



Type of Solution

- ☐ Nature-based Solutions
- ☑ Plans, Policies, and Ordinances
- ☐ Infrastructure/Facility Retrofit

Supporting Function

- ☑ Flood Mitigation
- ☑ Stormwater Management
- ☑ Conservation Opportunity
- ☑ General Resiliency Advancement
- ☑ Biodiversity Enhancement
- ☑ Floodplain Management
- ☑ Water Quality Improvement
- ☑ Urban Heat Reduction

Flood Vulnerability of Location

High



Anticipated Flood Reduction Benefit

Low | Medium | High

Ease of Implementation

Low Ease | Moderate Ease | High Ease

Estimated Cost

Low | Medium | High

Priority Rating

Low | Medium | High

Hydrologic & Hydraulic (H&H) Study
Salkehatchie Watershed-Scale

Type of Strategy
H& H Study

Strategy Description
A watershed-wide stormwater model, also referred to as a hydrologic and hydraulic (H&H) study, is a comprehensive analysis of how rainfall, runoff, and floodwaters move through an entire watershed system. This type of study evaluates surface and sub-surface drainage, streams, rivers, bridges, culverts, and other infrastructure to understand how the watershed currently functions and how it may respond to future conditions such as increased development or more intense rainfall. The resulting model serves as a planning and decision-making tool to identify flood risks, prioritize infrastructure improvements, support future detailed H&H analyses, and coordinate stormwater management across multiple jurisdictions.

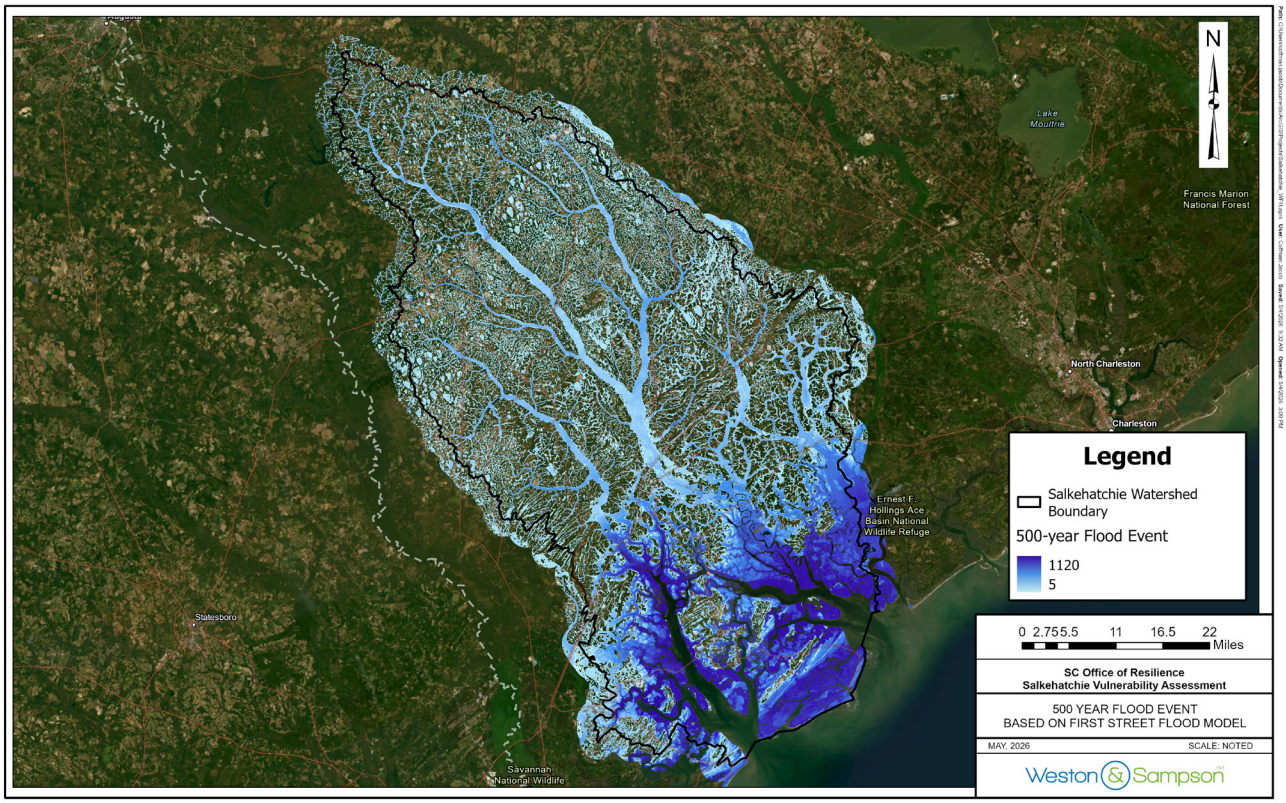
Narrative
This strategy proposes a 1D watershed-wide stormwater model for the Salkehatchie Watershed to improve understanding of hydrologic and hydraulic conditions at a watershed scale. The study will develop a comprehensive watershed model that evaluates current and future flood risks and identifies vulnerable infrastructure such as roadways, bridges, culverts, and evacuation routes. The initial model can be calibrated using existing FEMA H&H models and refined through stakeholder engagement and information gathered during the Salkehatchie Watershed Vulnerability Assessment.

The model is intended to serve as a flexible, long-term planning tool that can be updated over time as communities inventory drainage systems or complete their own stormwater or H&H studies. As local investments are made, higher-resolution 2D modeling can be incorporated in areas where additional detail is needed, allowing communities to evaluate localized flooding while understanding watershed-scale impacts. Ultimately, this effort will support coordinated decision-making and help prioritize flood mitigation and infrastructure improvements at the state, county, and local levels throughout the watershed.

Location Description
Watershed-scale.

Strategy Location and Map

Salkehatchie Watershed



Type of Solution

- ☐ Nature-based Solutions
- ☑ Plans, Policies, and Ordinances
- ☑ Infrastructure/Facility Retrofit

Supporting Function

- ☑ Flood Mitigation
- ☑ Stormwater Management
- ☐ Conservation Opportunity
- ☑ General Resiliency Advancement
- ☐ Biodiversity Enhancement
- ☑ Floodplain Management
- ☐ Water Quality Improvement
- ☐ Urban Heat Reduction

Flood Vulnerability of Location

High



Anticipated Flood Reduction Benefit

Low | Medium | High

Ease of Implementation

Low Ease | Moderate Ease | High Ease

Estimated Cost

Low | Medium | High

Priority Rating

Low | Medium | High

7. Next Steps

7a. Grant Opportunities & Funding

The vulnerability analysis and community engagement process for the Communities of Barnwell County identified several critical resilience challenges. To transition these identified strategies into projects, the following grant funding opportunities could be considered.

Green Infrastructure & Stormwater Parks

NFWF Five Star and Urban Waters Restoration Grant:
This is an optimal funding mechanism for the Barnwell Elementary site, as this grant specifically finances smaller, high-visibility ecological improvements and green infrastructure at community and educational facilities.

SCDES Section 319(h) Nonpoint Source Grants:
This program is a primary funding source for implementing nature-based solutions—such as stormwater parks—to filter runoff before it enters the local watershed. (Note: Accessing these construction funds requires an EPA-approved 9-Element Watershed Based Plan).

SC Rural Infrastructure Authority (RIA) State Grant Program (Stormwater):
Both stormwater parks can be strategically positioned as combined drainage and water quality improvement projects under the standard RIA application cycles.

Ecological Restoration & Land Conservation

South Carolina Conservation Bank (SCCB):
The Carolina Bay Restoration is a unique ecological asset and a highly competitive candidate for SCCB funding, which prioritizes flood mitigation and land protection.

NFWF National Coastal Resilience Fund (NCRF):
The buffer mapping and Carolina Bay restoration strongly align with NCRF's dual mandate to enhance wildlife habitat and reduce community flood risk.

Infrastructure Resilience & Drainage Assessments

USDA NRCS Watershed and Flood Prevention Operations (PL-566):
The culvert assessment can serve as the initial "Preliminary Investigation" required to justify a comprehensive, 100% federally funded watershed plan. This program is an optimal mechanism for addressing systemic, rural drainage issues along Toby Creek.

SC Rural Infrastructure Authority (RIA) Grants:
The County can leverage RIA's Regional Planning Grants or Basic Infrastructure funding to assess and ultimately upgrade the deteriorating culvert infrastructure at the SC Hwy 64 intersection.

7b. Resilience Hubs

> *i*
>
> **Resilience Hubs** are facilities designed to support residents of a community before, during, and after natural disasters and emergencies.

Resilience Hubs are facilities designed to support residents of a community before, during, and after natural disasters and emergenciies. These facilities provide back-up power, air conditioning, and shelter, but also give the opportunity for community networks to **collaborate and bolster local resilience.** Resilience Hubs can be established community gathering areas such as schools, libraries, or community centers. These facilities can also be scalable, starting as a community center that evolves to include elements such as back-up solar power, dry-floodproofing, overnight shelter, and staff trained in emergency response. Ideally, the locations of Resilience Hubs provide easy access for residents in the facility's service area during an event and are resilient to natural disasters (i.e. elevated, outside of the 100-Year flood plain, flood-proofed, etc.).

Core Functions

Resilience hubs have several core functions before, during, and after a natural disaster. **These functions include:**

- Information & Communications
- Community Services
- Emergency Support
- Recovery, and Coordination

Prior to a natural disaster, the Resilience Hub can function as a **reliable source of information** on the event, help residents find resources for emergency alert systems and recovery resources, provide internet access to residents to communicate with family members and, provide refuge prior to evacuation before the natural disaster occurs. Additionally, the Resilience Hub provides **community services** throughout the year including workforce training, workshops, and space for gathering and organizing community groups. This provides a deeper connection within the community and can help residents find information on disaster preparedness and climate awareness.

During an event, the Resilience Hub will provide **emergency support for residents.** This includes safe shelter during extreme weather conditions like hurricanes, heat waves, or flooding. The facility should have back-up power to support charging devices or powering medical equipment. Finally, the facility provides food, water, first-aid, and other critical supplies during natural disasters for those affected.

In support of recovery efforts, the Resilience Hub can function as a **central point of distribution for supplies post-disaster.** These facilities can also help connect residents to resources for insurance, housing, and financial assistance in partnership with local, state, and federal agencies.

The Urban Sustainability Directors Network (USDN, 2019) provides further guidance on developing Resilience Hubs, which informs the development of these facilities. This is referred to as a living document that will be updated as new information becomes available. Additional



Figure 14: Diagram depicting the three levels of the resilience hub model (Gonzaga University Institute of Climate, Water, and the Environment, 2025). Graphic inspired by the Spokane Community Resilience Hub Network and the Institute for Climate, Water, and the Environment



resources such as the Spokane Community Resilience Hub Network and Gonzaga University Institute for Climate, Water, and Environment provide further information on Resilience Hubs and the different levels of Resilience Hubs based on the services they provide (Figure 14).

Implementation

As one of the recommendations for the communities within the Salkehatchie Watershed, establishing Resilience Hubs comes from a few important considerations for implementation. One key aspect of identifying appropriate locations for Resilience Hubs is a **Vulnerability Assessment within the community** to identify areas with the most extreme exposure to climate hazards such as extreme heat, flooding, and high wind. At the same time, social vulnerability and adaptive capacity of neighborhoods should also be considered in siting these facilities to provide support where it is needed. With the information generated by the Salkehatchie SCRCCCP Watershed Plan, the parcel-level and community-level vulnerability assessment already conducted provides ample information to begin working with communities to identify locations for Resilience Hubs

i

Resilience Hubs are practical solutions that turn existing community gathering locations into trusted sources of information, programs and training before natural disasters, lifelines during natural disasters, and support networks post-disaster. By identifying existing community centers, libraries, places of worship, or community gathering locations, communities in the Salkehatchie watershed can begin to identify locations to establish their own Resilience Hubs.

Starting with basic services, the **hubs can be retrofitted to increase their resilience to natural disasters and provide additional services over time** as new sources of funding become available and the community identifies key services for their respective Resilience Hub. Over time, these various Community Resilience Hubs may form a network to share resources, develop partnerships, and collaborate with neighboring communities with a shared goal of increasing resilience to natural disasters.

After identifying potential locations within the communities, it will be critical to **establish a project team** to engage community members in the design and implementation of these facilities. This will help to integrate the Resilience Hub in local emergency management plans and to establish partnerships with local government, non-profit organizations, and utility providers.

7c. Participation in Salkehatchie Working Group

Community Action Team members and stakeholders from state, regional and local entities with knowledge and expertise related to flooding, natural hazard mitigation, planning, and resilience were invited to be part of a **Watershed Advisory Group** to give input on watershed scale strategies and review the Salkehatchie Watershed Plan. A virtual meeting was held on February 12, 2026 and a survey was sent out to gather input.

Group members will determine goals and future meeting frequency. This group may decide to form subcommittees for the upper half of the Watershed and the lower half of the Watershed. **There are several working groups** currently working on resilience, stormwater policy, and flood reduction strategies in Beaufort County and the Lowcountry Council of Governments (COG) region including the Southern Lowcountry Regional Board (SoLoCo) and the Southern Lowcountry Resilience Collaborative (SLRC).

7d. Conclusion

The creation of this Community Portfolio represents a comprehensive, community-driven effort developed under the South Carolina Resilient Coastal Communities Collaborative Program (SCRCCCP). The SCRCCCP was designed to support communities across the Salkehatchie River Basin in developing locally informed and prioritized strategies and projects that are anticipated to reduce flooding impacts and improve resilience to natural hazards and environmental change. To accomplish this, the Project Team conducted multi-scale vulnerability









assessments at the watershed, community, and parcel levels to clearly identify specific vulnerabilities and risks from natural hazards facing the community. The vulnerability analysis was also informed by robust community engagement through Community Action Team meetings, public surveys, field site visits and consultant assessments ensuring that each proposed project was supported by the community it is meant to serve. By actively listening to residents and thoroughly documenting their concerns about infrastructure, natural hazards, and flood-prone areas, the Project Team has produced **results that are both technically sound and relevant locally.**

The result of this effort is a practical roadmap for action. Detailed individual opportunity sheets outline a suite of targeted, flood-reduction and resilience projects that reflect community-preferred strategies and are ready for funding and implementation. Rough order of-magnitude cost estimates for the highest-ranked projects provide the specific information needed to pursue competitive grant opportunities and inform municipal capital improvement planning.

This document is one of nine Community Portfolios that have been combined into a comprehensive, basin-wide Salkehatchie Watershed Resilience Plan. By maintaining the momentum established from this planning effort and by continuing to strengthen collaboration and partnerships within the watershed, the community can continue to identify pathways towards implementation, ensuring a vibrant, safe, and resilient future for generations to come.

i

This community-driven process would not have been possible without the **dedication, time, and deep local expertise of the Community Action Team members** as their insights and consistent participation were integral at every step of this project. While this portfolio outlines immediate next steps, building resilience is a continuous and adaptive process.



Appendix A

Survey Results

This Salkehatchie Community Survey was distributed in paper form and virtually through flyers and email to communities throughout the Salkehatchie Watershed with the help of Community Action Team members and local libraries. 166 responses were returned to SCOR.

Salkehatchie Community Survey

Thank you for taking time to answer the 10 questions below. The South Carolina Office of Resilience and S.C. Sea Grant Consortium are seeking input from government officials and community members in the Salkehatchie Watershed about their experiences with flooding and other hazards to learn more about the risks, vulnerabilities, and needs of the communities in the region to be able to assist with connection to resources to build more resilient communities. The Salkehatchie River Basin includes all or portions of 7 counties: Allendale, Bamberg, Barnwell, Beaufort, Colleton, Hampton, and Jasper. We appreciate your input.

Please email **Salkehatchie@scor.sc.gov** with any questions.

Disclaimer: This survey will be used for general analytical purposes to identify and assess potential risks from future disasters in your area and to implement flood mitigation and resilience measures across South Carolina's watershed basins. Your responses are voluntary and will be identified by area only and shall not be identified by individual; the responses will be compiled together and analyzed as a whole.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

Community Questions

1. Which Community do you live/work in?

2. What are your roles in the community? (Citizen, Farmer, Government Official, Community Organization Leader, Business Owner, Retiree, Volunteer)?

3. Which natural hazards are of greatest concern to your community & how often? (frequently, occasionally, rarely, never)? Examples: flood, wind, drought, heat, severe thunderstorm, tropical storm/hurricane impacts (other than flooding or flooding as a result of), tornados, wildfire, winter weather, earthquake, other:

	Frequently	Occasionally	Rarely	Never
Flooding	◯	◯	◯	◯
Wind	◯	◯	◯	◯
Drought	◯	◯	◯	◯
Heat	◯	◯	◯	◯
Thunderstorm	◯	◯	◯	◯
Hurricane/Tropical Storm	◯	◯	◯	◯
Tornado	◯	◯	◯	◯
Wildfire	◯	◯	◯	◯
Winter Weather	◯	◯	◯	◯
Earthquake	◯	◯	◯	◯
Other	◯	◯	◯	◯

4. Which types of flooding do you experience in your community? Check all that occur:

	Frequently	Occasionally	Rarely	Never
Flash: intense/long rain events	◯	◯	◯	◯
Stormwater: lack of drainage	◯	◯	◯	◯
Coastal: Storm Surge	◯	◯	◯	◯
Coastal: High Tide	◯	◯	◯	◯
Riverine: river/pond overflow	◯	◯	◯	◯
Hurricane/ Tropical Storm	◯	◯	◯	◯
Dam Breach: failure	◯	◯	◯	◯
Compound: multiple factors	◯	◯	◯	◯
Other	◯	◯	◯	◯

5. Where does flooding occur in your community?

6. What is impacted and/or damaged by flooding in your community?

- [ ] Homes
- [ ] Agriculture
- [ ] Businesses
- [ ] Roads
- [ ] Emergency/Evacuation Routes
- [ ] Hospitals
- [ ] Vehicles
- [ ] Equipment
- [ ] Solid Waste Sites
- [ ] Industrial Sites
- [ ] Cultural Sites
- [ ] Habitat
- [ ] Septic Systems
- [ ] Other

7. Are there other concerns or long-term environmental changes/issues that your community has or is experiencing? Examples: Water quality, higher temperatures, land use change, population change, habitat loss, tree health, invasive species, mosquitos, etc.

8. What are your community's top priorities and biggest needs related to natural hazards and building resilience?

9. What kind of assistance would be most helpful to your community?

10. Is there anything else that you would like to share related to resilience, flooding, and other hazards in your community?

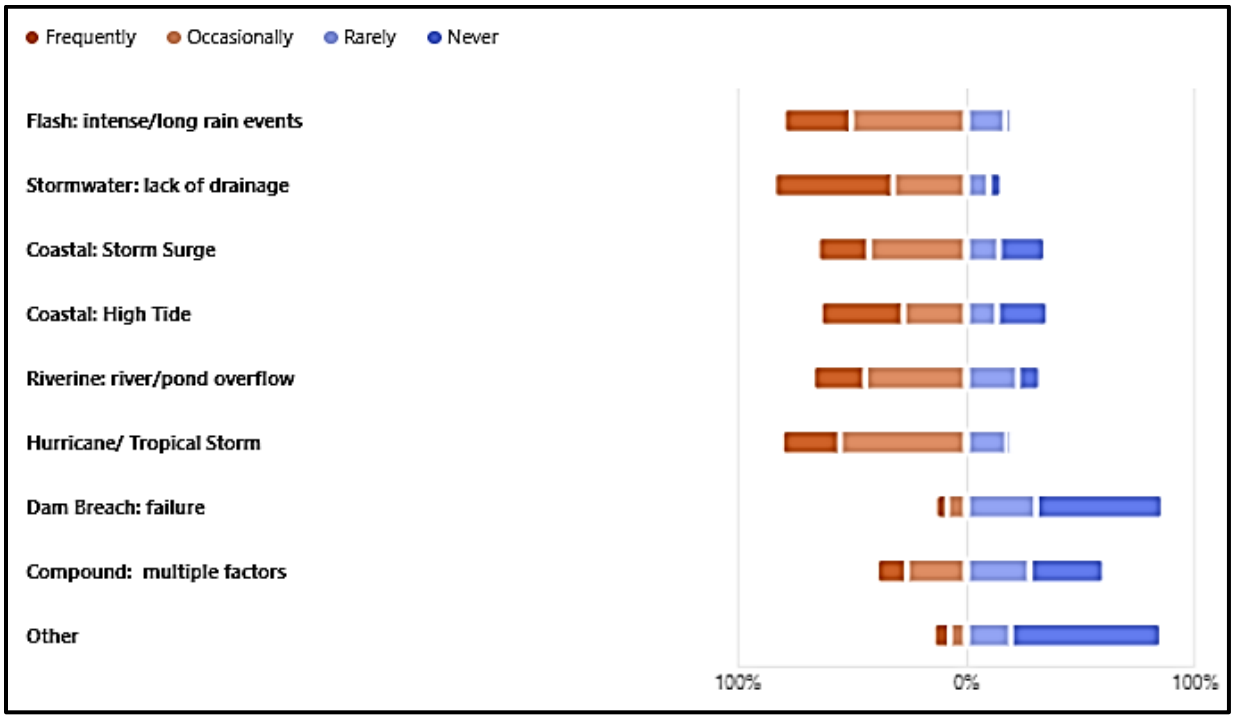
11. If you would like someone with the South Carolina Office of Resilience's Watershed-Based Planning Program to reach out to you to discuss assistance with resilience planning, community needs, identifying funding opportunities, and more, please provide your email here:

You may also complete this optional Statewide flooding survey to share details about specific locations of flooding your community. View the dashboard to see a live report of survey responses collected so far.

SCOR Flooding Experience Survey
https://survey123.arcgis.com/share/58d1be8df8004aaaae917395d2a9a2a3

SCOR Public Flooding Survey Response Dashboard
https://www.arcgis.com/apps/dashboards/6972b4799d7542fbb755adf9a9330cd4#

Flooding from "Stormwater: lack of drainage" was reported to be the most frequent type of flooding followed by "Coastal: High Tide", "Flash: intense/long rain events", Hurricane/Tropical Storm", and "Coastal: Storm Surge".



Stormwater: lack of drainage	
Frequently	52.3%
Occasionally	32%
Rarely	9.8%
Never	5.9%

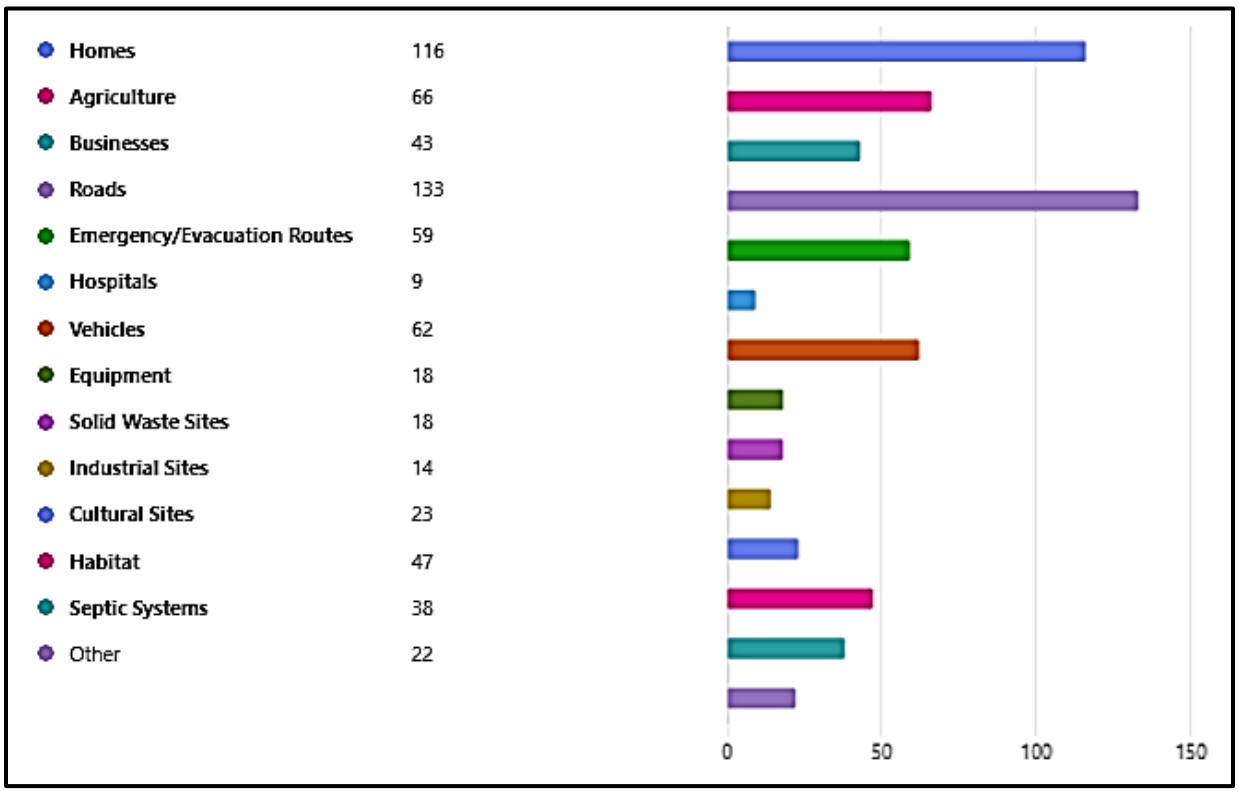
Coastal: High Tide	
Frequently	36.6%
Occasionally	27.5%
Rarely	13.4%
Never	22.5%

Flash: intense rain events	
Frequently	29.8%
Occasionally	50.4%
Rarely	17%
Never	2.8%

Hurricane/Tropical Storm	
Frequently	25.7%
Occasionally	55.3%
Rarely	17.8%
Never	1.3%

Coastal: Storm Surge	
Frequently	22.7%
Occasionally	42.6%
Rarely	14.2%
Never	20.6%

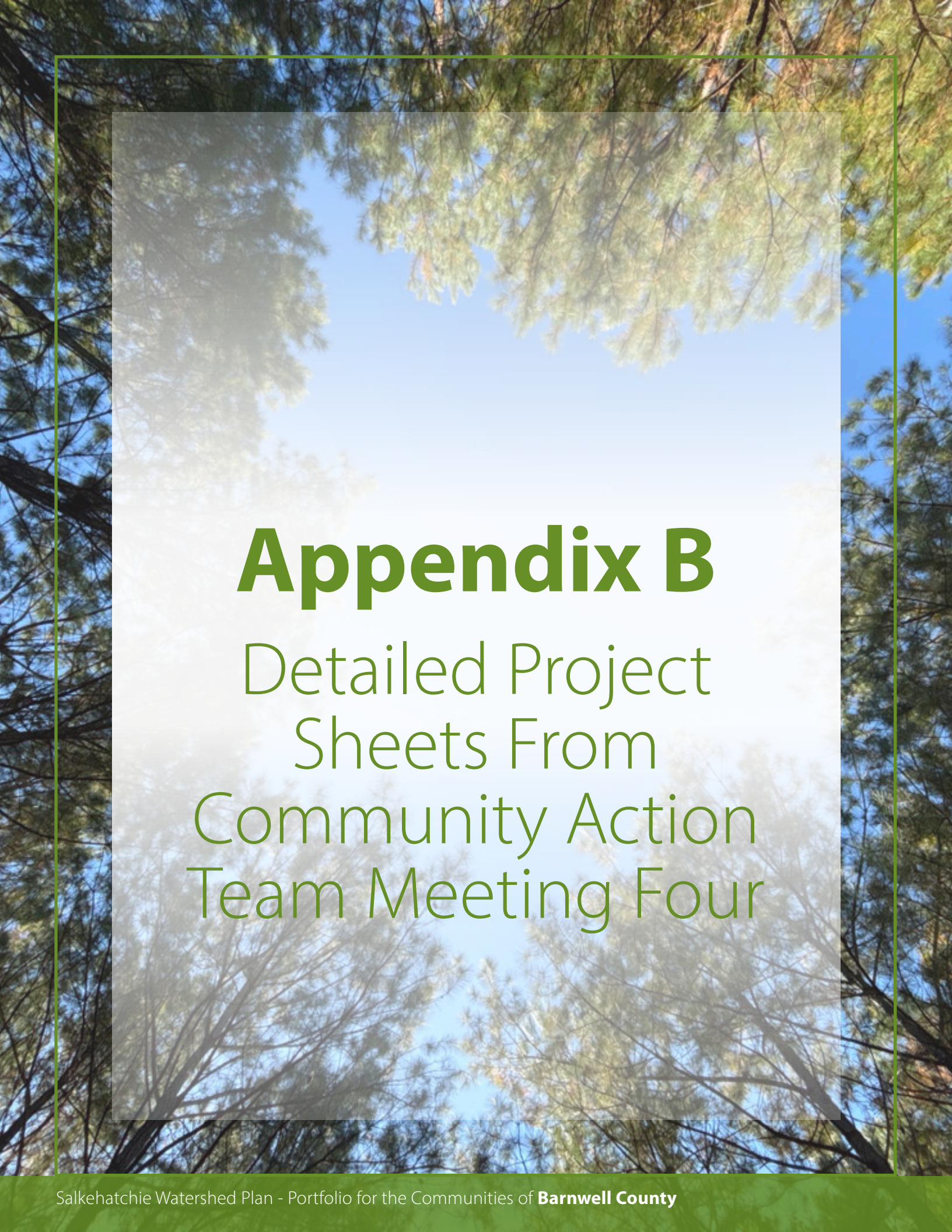
Survey respondents reported many impacts from flooding. Roads, Homes, Agriculture, Vehicles, and Evacuation routes topped the list.



Other concerns and long-term environmental changes that were shared include:

- **Land use change**
- **Rapid development**
- **Habitat loss**
- **Tree health**
- **Higher temperatures**
- **Water quality**
- **High intensity rain events**
- **Sea level rise**
- **Pollution**
- **Mosquitos**

Assistance community members responded would be helpful includes funding, infrastructure repair, better stormwater management, flood mitigation, ditch cleaning/maintenance, drainage, septic repair and replacement, road and bridge repair, and replacement of old pipes.



Appendix B

Detailed Project Sheets From Community Action Team Meeting Four

Salkehatchie Project Sheet

Community: Barnwell

Potential Adaptation Strategy: Conservation/Riparian Buffer Mapping

Address: Community-wide

Parcel ownership: ☒Private ☒Public (Town/City, County, State)☐Other: Click or tap here to enter text.

Rainfall in past 24 hrs (CoCoRaHS): NA

Structure(s) on site: ☒ Yes ☐ No

Describe structure(s): Variable

Description of paved surfaces on site: Variable.

Existing vegetation (all that apply):☒Woods ☒Streams ☒Wetlands ☒Grass

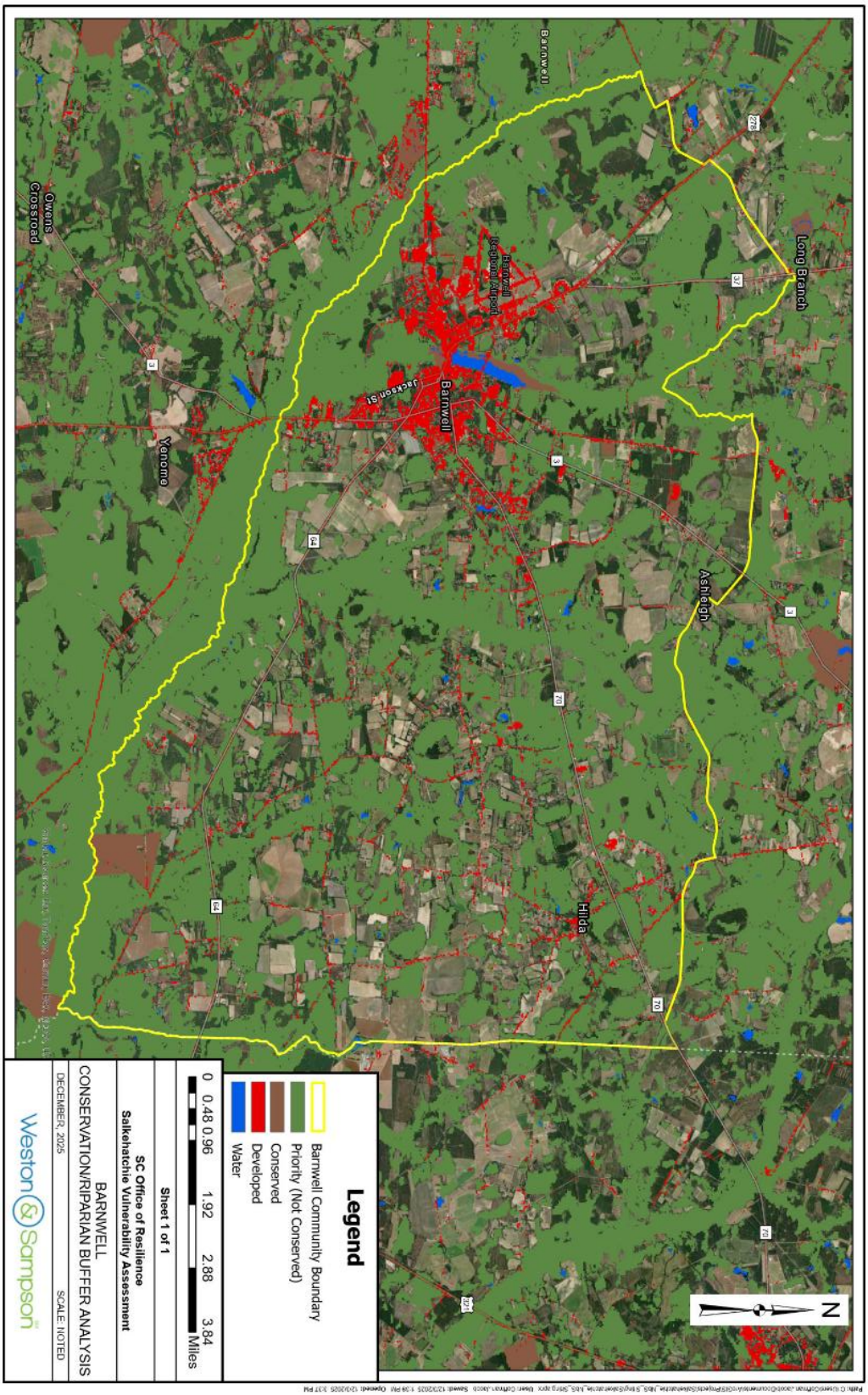
Estimated tree canopy cover: Variable

Presence of standing water: ☒ Yes ☐No

Drainage on site (all that apply): ☒Grassed Ditches☒ Stormwater Pipes/Culverts ☒Stormwater Ponds ☒Inlets ☒Curbs ☐Other: Click or tap here to enter text.

Drainage infrastructure notes (diameter, dimension, material, condition): Variable

Comments/Observations: A conservation mapping exercise can help to develop a plan that will prioritize land conservation based on community need and existing conditions. If flooding is a community concern, then focus can be placed on riparian buffers and floodplain protection. If wildlife corridors are of interest, then opportunities to connect already conserved land is recommended. By creating a plan for conservation, public sector, non-profit organizations, and private partners can collaborate to assist landowners interested in conservation easements as well as fee simple opportunities where parcels may be acquired for future public access and use.



Source: SC Office of Resilience

Salkehatchie Project Sheet

Community: Barnwell

Potential Adaptation Strategy: Stormwater Park

Address: Barnwell Elementary between Marlboro Ave and Calhoun St

Parcel ownership: ☐Private ☒Public (Town/City, County, State) ☐Other:

Rainfall in past 24 hrs (CoCoRaHS): No rain.

Structure(s) on site: ☒ Yes ☐ No

Describe structure(s): Park building (concession stands), batting cage pavilion, shed, bleachers.

Description of paved surfaces on site: Concrete sidewalk around park building, concrete around bleachers. Parking lot and driveway off Calhoun St. is gravel

Existing vegetation (all that apply): ☐Woods ☒Shrubs ☒Dirt ☒Grass

Estimated tree canopy cover: 0%

Presence of standing water: ☒ Yes ☐No

Drainage on site (all that apply): ☒Grassed Ditches ☒ Stormwater Pipes/Culverts ☒Stormwater Ponds ☒Inlets ☐Curbs ☐Other: Click or tap here to enter text.

Drainage infrastructure notes (diameter, dimension, condition): There is no curb along Calhoun St or Marlboro Ave, therefore water likely drains from the street into the project boundary. Within the project boundary is a series of grass swales, vegetated detetion basin, and a stormwater pond.

Comments/Observations: The stormwater system on this property looks fairly new, with features like riprap pads and check dams already in place. There are still opportunities to add more green infrastructure. The land slopes from Calhoun Street down into the park, so a bioretention area could be built next to the baseball field to capture some of that runoff. Since there is no curb along Marlboro Avenue, another bioretention area could be added on the northwest side of the property to collect water flowing in from that direction. These new detention areas could be connected to the existing stormwater pond. Overall, the park already has a good amount of stormwater storage capacity.

Photos (structures, paved surfaces, standing water, vegetation, drainage):



1. Grass swale facing upstream



2. Park building and gravel parking lot



1. Stormwater pond



4. Upstream end of outfall pipe crossing under Marlboro Ave.



5. Inlet and swale draining school property

Salkehatchie Project Sheet

Community: Barnwell

Potential Adaptation Strategy: Carolina Bay Restoration Analysis

Address: Community-wide

Parcel ownership: ☒Private ☒Public (Town/City, County, State) ☐Other: Click or tap here to enter text.

Rainfall in past 24 hrs (CoCoRaHS): NA

Structure(s) on site: ☒ Yes ☐ No

Describe structure(s): Variable

Description of paved surfaces on site: Variable.

Existing vegetation (all that apply): ☒Woods ☐Streams ☒Wetlands ☒Grass

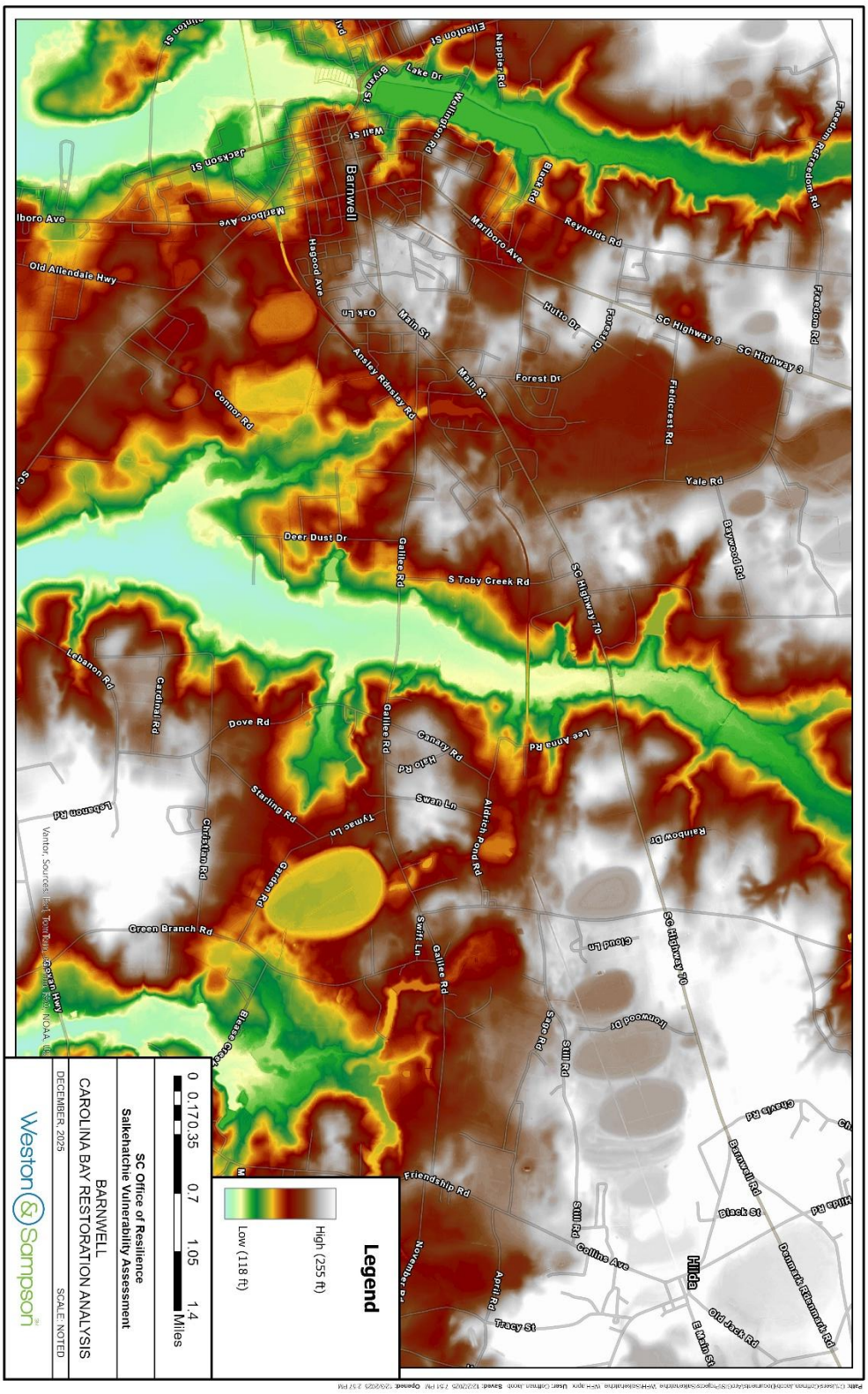
Estimated tree canopy cover: Variable

Presence of standing water: ☒ Yes ☐No

Drainage on site (all that apply): ☒Grassed Ditches ☐ Stormwater Pipes/Culverts ☐Stormwater Ponds ☐Inlets ☐Curbs ☐Other: Click or tap here to enter text.

Drainage infrastructure notes (diameter, dimension, material, condition): Variable

Comments/Observations: Carolina Bays are elliptical depressions that can collect rainwater and support plant communities associated with wetlands. Many Carolina bays have been modified by human activity such as the conversion to agricultural uses, commercial and residential development, as well as ponds. Carolina Bays were approved as a protection priority of the South Carolina Heritage Trust Program in 1983. (dnr.sc.gov/geology/Carolina-bays). A Carolina Bay management plan could help identify Carolina Bays for protection and/or restoration so that the Carolina Bay can benefit the community from a flood protection standpoint and support biodiversity.



Source: NOAA Digital Coast LIDAR Data

Salkehatchie Project Sheet

Community: Barnwell

Potential Adaption Strategy: Culvert Assessment / Roadway Elevation

Address: SC Hwy 64

Parcel ownership: ☐Private ☒Public (Town/City, County, State) ☐Other:

Rainfall in past 24 hrs (CoCoRaHS): No rain.

Structure(s) on site: ☐ Yes ☒ No

Describe structure(s): No structures present on site.

Description of paved surfaces on site: Hwy 64 is an asphalt road.

Existing vegetation (all that apply): ☒Woods ☒Shrubs ☒Dirt ☒Grass

Estimated tree canopy cover: Trees located along the banks of the channel (15% estimated canopy cover).

Presence of standing water: ☒ Yes ☐No

Drainage on site (all that apply): ☒Grassed Ditches ☒ Stormwater Pipes/Culverts

☐Stormwater Ponds ☐Inlets ☐Curbs ☐Other: Click or tap here to enter text.

Drainage infrastructure notes (diameter, dimension, condition): Toby Creek flows under Hwy 64 through a 4-cell box culvert. (Total culvert width: 52' 5". Each cell is approximately 12' 8" wide. Bottom of creek to top of culvert opening: 128"; Bottom of creek to top of culvert structure: 140"; Top of water to bottom of culvert opening: 85"). The banks adjacent to the culvert are well vegetated, besides about 30' of length on the right bank upstream side of the culvert (looking downstream). The culvert appears to be in good condition however there may be an alignment issue on the upstream end of the culvert. Only 2 of the culvert cells are in line with the channel, with land blocking flow on the eastern half of the culvert. This is likely due to an incoming ditch along the east side of SC Highway 64 which transitions to a wetland area at its confluence with Toby Creek. This may limit water flowing through the culvert (see photos).

Comments/Observations: The road slopes downhill from Highway 64 toward the creek, and it meets the creek at a slight angle from both directions. The culvert looks to be in good shape, with only a little erosion on the upstream bank. To know whether the road or culvert needs to be raised, we would need to evaluate how well the culvert handles water flow.

That analysis would tell us the proper elevation and opening size needed for safe hydraulic performance.

Photos (structures, paved surfaces, standing water, vegetation, drainage)



1. Downstream End of Culvert Under HWY 64



2. Upstream End of Culvert under HWY 64



1. Roadside ditch Upstream of Culvert crossing



4. Downstream side of culvert crossing



5. Downstream side of culvert crossing

Salkehatchie Project Sheet

Community: Barnwell

Potential Adaptation Strategy: Stormwater Park, shoreline buffer, creek conservation

Address: Bryan St/Dunbarton Blvd

Parcel ownership: ☒Private ☐Public (Town/City, County, State) ☐Other:

Rainfall in past 24 hrs (CoCoRaHS): No rain.

Structure(s) on site: ☒ Yes ☐ No

Describe structure(s): Hair/tanning salon, shed.

Description of paved surfaces on site: Parking lot is a mix of asphalt and gravel.

Existing vegetation (all that apply): ☒Woods ☒Shrubs ☒Dirt ☒Grass

Estimated tree canopy cover: Trees line the channel. Estimated 10% canopy coverage.

Presence of standing water: ☒ Yes ☐No

Drainage on site (all that apply): ☐Grassed Ditches ☐ Stormwater Pipes/Culverts ☐Stormwater Ponds ☐Inlets ☐Curbs ☒Other: Turkey Creek

Drainage infrastructure notes (diameter, dimension, condition): Water outfalls from the pond and flows through a triple cell box culvert under Bryan St. Erosion is present on both banks of Turkey Creek and next to the bridge on Dunbarton Blvd. There are no drainage structures within the project boundary, however there are two grate inlets outside of project boundary on either side of Gilmore St.

Comments/Observations: The land slopes downhill from Bryan Street toward Dunbarton Boulevard. There are several good spots to add nature-based solutions. A shoreline buffer could be added along the pond on Bryan Street to improve water quality and reduce erosion. Bioswales could be placed along Bryan Street at the edge of the project area to capture runoff from the road before it flows into Turkey Creek. The parking lot could be rebuilt with permeable pavement so water can soak through instead of running off. A detention basin or underground storage area could be added along the south side of the property to hold stormwater during heavy rain. The banks of Turkey Creek could also be reinforced to stop ongoing erosion and protect the stream.

Photos (structures, paved surfaces, standing water, vegetation, drainage):



1. Shoreline erosion along bank of Turkey Creek





2. Lake shoreline existing (left), proposed vegetated shoreline (right)



3. Photo of Turkey Creek at the downstream end of box culvert





4. Existing conditions (left) proposed permeable pavers (right).



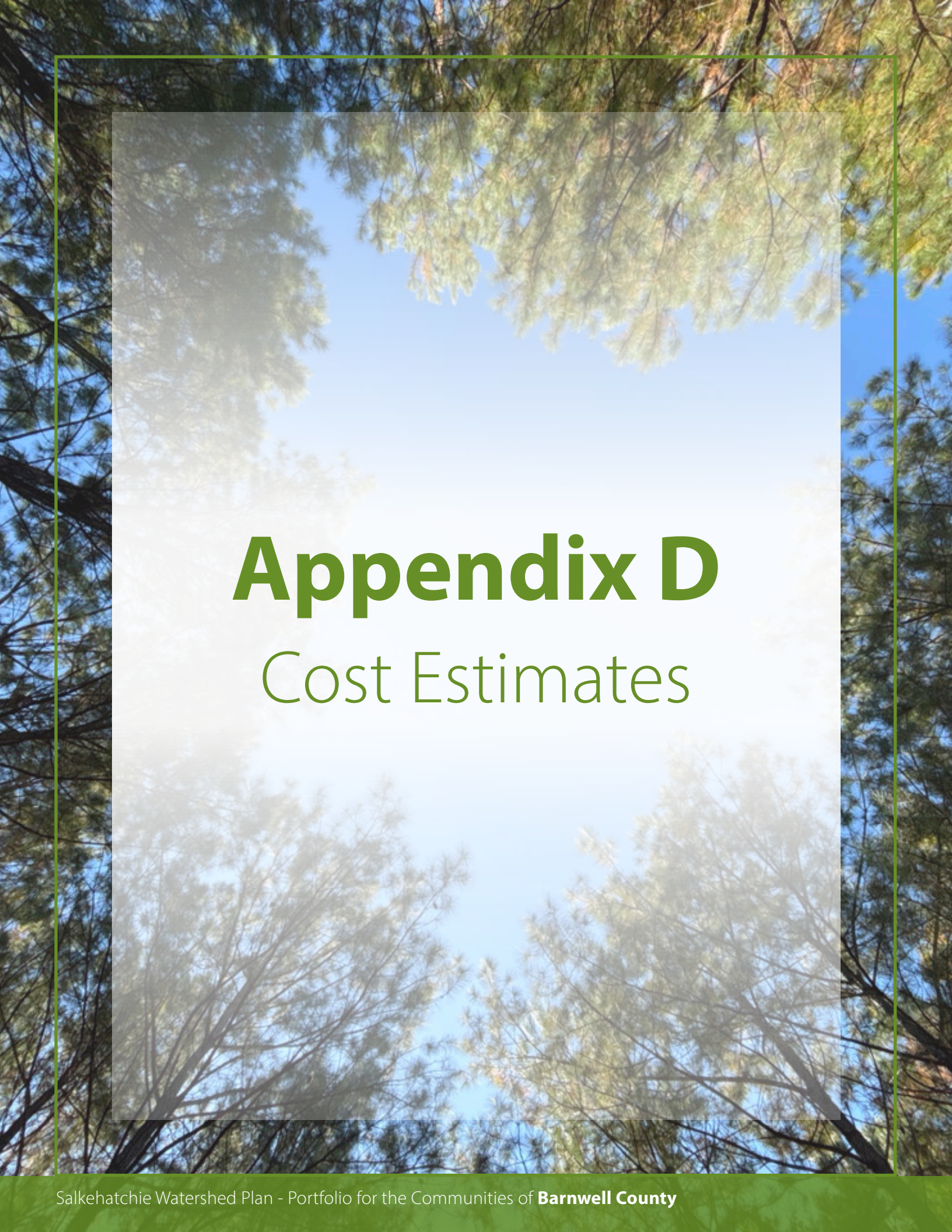
Appendix C

Prioritization Criteria

Prioritization Criteria for Ranking Adaptation Strategies

Indicator		Scoring			Weight	Data Reference
		3 (Best)	**2**	**1** (Least)		
Flood Reduction	Function of Area of Practice and Runoff Reduction Rates*	**Top 1/3** calculated flood reduction	**Middle 1/3** calculated flood reduction	**Bottom 1/3** calculated flood reduction	15	SC Coastal Low Impact Development Manual
Feasibility	Flooding – Current (2025) and Future (2055)	Located in **both** the 2025 and 2055 5% (20 yr) Flood	Located in **either** 2025 or 2055 5% (20 yr) Flood	Located in **neither** the 2025 or 2055 5% (20 yr) Flood	15	2025 and 2055 5% (20 yr) Flood (First Street Foundation)
	CAT 4 Project Preference	**Top 1/3** Composite Impact and Feasibility Scores	**Middle 1/3** Composite Impact and Feasibility Scores	**Bottom 1/3** Composite Impact and Feasibility Scores	10	CAT 4 Meetings
	Consultant Opinion	High Feasibility and Impact (**No foreseen hurdles**)		Low Feasibility or Impact (**Significant hurdles identified**)	10	Consultant Team Meeting
	Cost (see Table below)	**Low Effort:** Existing Practice or Unskilled/ Volunteer Labor	**Moderate Effort:** Skilled Labor to Install- Specialized Equipment Likely Necessary	**High Effort:** Engineered Designs and Construction Plans Required	5	Based on Level of Effort to Design and Install
	Permitting	**No Land Disturbance** Permitting or **Outside of SCDOT ROW**	**SCDOT ROW**	Section **401/404, CZC** Authorization, **Conservation** Areas	5	GIS Parcels
	Land Ownership	**Public Property:** Town or County Owned		**Private Property**	5	GIS Parcels

Indicator		Scoring			Weight	Data Reference
		3 (Best)	**2**	**1** (Least)		
Feasibility	Operations and Maintenance (see Table below)	**Low Effort:** Hand Tools and/or Quarterly Maintenance	**Moderate Effort:** Skilled Maintenance Crew and/or Bi-Monthly Maintenance	**High Effort:** Heavy Machinery Needed and/or Monthly Maintenance	5	Based on Level of Effort to Maintain
	Soil Infiltration Rate	Soils are **Suitable** (Hydrologic Group A)	Soils **may be Suitable** (Hydrologic Groups B and C)	Soils are **Unsuitable** (Hydrologic Groups A/D, B/D, C/D, D, or Unknown)	5	USDA NRCS, Web Soil Survey
Co-Benefits	Priority Populations Benefitted (LMI%)	LMI: > 51%		LMI: < 51%	5	HUD LMI Block Groups
	Urban Heat Mitigation/ Pedestrian	Paved Surface Reduction **and** Increased Plantings	Paved Surface Reduction **or** Increased Plantings	Paved Surfaces are not Reduced **Nor** are Plantings Increased	5	Based on Adding NBS and Removing Paved Surfaces
	Cultural	**Located** at Nationally Registered Historic Place		**Not Located** Nationally Registered Historic Place	5	SC SHPO
	Water Quality (see table below)	95 – 100 % of Total Suspended Solids Removed	80 – 94 % of Total Suspended Solids Removed	0 – 79 % of Total Suspended Solids Removed	5	SC Coastal Low Impact Development Manual
	Biodiversity/ Habitat (see table below)	**Increases** forage, shelter, **and** freshwater source for pollinators	**Either** increases forage, shelter, **or** freshwater source for pollinators	Habitat **not improved** during NBS project	5	NWF's Certified Wildlife Habitat
				TOTAL	**100**	



Appendix D

Cost Estimates

Order of Magnitude Cost (High-Level Cost Estimate) for:

Barnwell Stormwater Park

Type of Strategy: Stormwater park (bioretention, dry detention, plantings)

Community: Communities of Barnwell County

Strategy Address/Location: Barnwell Elementary / 10592 Marlboro Ave, Barnwell, SC, 29812

Date of Estimate: 03/24/2026

Planning and Design

- Project Management:
    - Description- Coordinate with the Owner on project schedule, deliverables, and budget throughout the duration of the project. Recurring meetings will be held to provide progress updates, review budget status, and address Owner feedback and needs. Monthly invoices will include estimated percent complete, percent spent, prior month hours, and cumulative hours to date.
    - Assumptions- Project management is billed as lump sum.
- Surveying:
    - Two surveys are needed and include a pre-construction survey and as-built survey that are provided as PDF and CAD files.
    - Pre-construction survey must include:
        - Property corners and property lines for subject parcel
        - Edge of pavement, centerline, curb and gutter, and edge of DOT right-of-way on Calhoun Street, paths and edge of pavement for intersecting streets for project extents
        - Existing structures (concession stands, fencing, signs, etc.)
        - Existing utilities
        - Utility easements or rights of ways
        - Drainage infrastructure (including inlets, outfalls, catch basins)
        - Stormwater pond embankment (grades, contours,), water surface elevation at time of survey, locations and elevations of inflow and outflow structures
        - Topography of low-lying ditch areas
        - Wetland delineation

    - As-built survey will document the placement, grading, and dimensions of the bioretention area, stormwater detention pond, and the extents of pond embankment plantings. Locations, elevations, and dimensions of all new inlets, outlets, and pipes shall be included in as-built survey.
    - Assumptions – 811 shall be called prior to survey.
- Permitting:
    - Description- Estimate based on SCDES Notice of Intent. Includes permit package prep and agency coordination. Also includes any necessary permits from the Town/County.
    - Assumptions- One round of permitting and comments with resubmission to SCDES.
- Modeling:
    - Existing conditions PCSWMM model to identify flooded areas on site.
    - Proposed conditions PCSWMM model to analyze BMP effectiveness.
    - Assumptions – modeling cost estimate is incidental to engineering line item.
- Engineering:
    - Conduct desktop analysis and one site visit to collect information necessary to produce 30% design.
    - Conduct one additional site visit to collect additional information necessary to produce 90% design. The owner will have the opportunity to provide feedback and revisions at 30% and 90% design.
    - Produce 90% stamped designs for submittal to SCDES for proposed improvements. The 90% design will need to include all information required for permitting to include but is not limited to:
        - Site plans to include plan and profile of bioretention, detention pond, and additional pipe network, limits of disturbance, property boundaries, existing wetlands, extents of sports fields, structures. on site, trees, connecting existing drainage infrastructure.
        - Details and notes for bioretention, detention pond, and existing pond embankment planting, including a grading plan, soil layers, ponding depths, and planting plans.
        - Include considerations for staging equipment and construction means and methods such as construction entrances and laydown areas for equipment and materials.
        - Sediment and erosion control measures during construction
    - Assumptions- The engineered drawings will provide sufficient detail, including dimensions of proposed practices, and necessary materials to develop specifications for project construction.

Table 1. Planning and Design Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
Project Management	*LS*	*1*	7,500	7,500
Surveying	*LS*	*2*	3,500	7,000
Geotechnical	*LS*	*1*	18,000	18,000
Permitting	*LS*	*1*	5,000	5,000
Modeling	*LS*	*1*	15,000	15,000
Engineering	*LS*	*1*	30,000	30,000
Subtotal Planning and Design				**82,500**

Construction and Implementation

- Site Preparation:
    - Description-
        - Bioretention: Excavation for 5,000 SF footprint with a 3' depth and 3:1 side slopes. Grade in pilot channel to facilitate flow.
        - Detention pond: Excavation for 2,000 SF footprint with a 6' depth and 3:1 side slopes.
        - Stormwater pipe trench: Excavate 4' wide and 3' depth along total proposed pipe length for installation.
    - Assumptions- 811 shall be called to locate existing utilities ahead of digging.
- Soil Amendments:
    - Description-
        - Bioretention: 4" depth for soil amendments, 4" depth for mulch, 2' depth for bioretention soil.
    - Assumptions- No amendments used for detention pond.
- Planting:
    - Bioretention:
        - Plantings installed by hand per planting plan. Plants shall be native species.
        - Planting plan shall specify a mix of emergent and forested wetland vegetation. "Bioretention plug" plants shall be used to promote vigorous root growth (i.e., 5" deep containers with root volumes equal to a 4" pot).
        - Assumptions- plants are available and purchased from a local nursery. Costs include delivery.
    - Existing pond embankment:

        - Medium shrubs and pond edge/aquatic plants to be planted. Shrubs to be planted 2' grid spacing from water surface elevation to WSE +4' along bare pond embankment (~300 LF). Pond edge and aquatic plants to be planted along WSE every 0.75'.
        - All disturbed areas besides bioretention to be seeded with turf grass and provided with temporary irrigation.
    - Assumptions- plants are available and purchased from a local nursery. Costs include delivery.
- Structural Elements:
    - Description:
        - Underdrain: included for the primary flow path within the bioretention area.
        - RCP pipe: included to route flow to bioretention & detention pond and then back online.
        - Educational signage: included for bioretention area as it is green infrastructure and adjacent to a school.
        - Riprap: for channel protection at inlet/outlet for bioretention and detention pond.
        - Outfall structure: structure for both bioretention and detention pond.
    - Assumptions- RCP pipe will be less than 24". Costs include all materials as well as installation costs.
- Additional Elements:
    - Description: Includes mobilization, utility staking, traffic control, clearing and grubbing, utility relocation, erosion and sediment control, construction phase services and materials testing.

Table 2. Construction and Implementation Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
Bioretention (5,000 SF)				
Site Preparation (excavation and grading)	*CY*	*570*	50	28,500
Underdrain	*LF*	*70*	30	2,100
RCP pipe	*LF*	*200*	90	18,000
Rip rap	*SY*	*3*	75	225
Outfall structure	*EA*	*1*	4,500	4,500
Educational signage	*EA*	*1*	1,500	1,500
Bioretention planting	*SY*	*560*	50	28,000
Bioretention soil	*CY*	*370*	90	33,300

Mulch	*CY*	*45*	100	4,500
Soil amendments	*CY*	*45*	150	6,750
Subtotal Bioretention				**127,375**
Detention Pond (2,000 SF)				
Site Preparation (excavation and grading)	CY	380	50	19,000
RCP pipe	LF	260	90	23,400
Rip rap	SY	3	75	225
Outfall structure	EA	1	4,500	4,500
Subtotal Detention Pond				**47,125**
Pond Embankment Planting				
Medium shrubs	EA	300	75	22,500
Pond edge and aquatic plants	EA	400	35	14,000
Turf grass seed (all disturbed areas besides bioretention)	SY	1,700	1	1,700
Temporary irrigation	SF	15,000	0.75	11,250
Subtotal Pond Embankment Planting				**49,450**
Subtotal Construction and Implementation				**223,950**
Construction Oversight (20%)				**44,790**
Contingency (30%) *				**91,935**
GRAND TOTAL Planning, Design, Construction, and Implementation				**443,175**

*Contingency allows for budget to address any unforeseen risks or uncertainties with the project that may arise.

Additional general items not included in this estimate include mobilization, utility staking, traffic control, clearing and grubbing, utility relocation, erosion and sediment control, and materials testing.

Maintenance

- Replanting:
    - Description- Annual maintenance for bioretention area and replanting along pond embankment as needed. Bioretention plants will need to watered 1 time per day after planting for two weeks. Irrigate 1 time per week during the heat of summer or drought conditions. For both pond embankment and bioretention, plants will need to be monitored and dead or dying vegetation removed in winter. Remove vegetation due to overcrowding in late summer. Weeding should occur 1 time per month or 4 times per year minimum in the bioretention and pond embankment.

    - Assumptions- Town or city staff/landscapers will oversee maintenance
- Stormwater infrastructure maintenance
    - Description- RCP pipe to be cleaned every 10 years for sediment/debris accumulation. Detention pond to be mowed and sediment cleaned out annually. Outfall structures to be cleaned for sediment/debris every 2 years.

Table 3. Maintenance Effort Per Year

Item	**Unit**	**Quantity (Annual)**
Bioretention *weeding, mulching, debris removal, removing dead vegetation*	*Hrs*	36 (8 hours per quarter)
RCP Pipe *Debris clearing*	*Hrs*	4
Detention Pond *Embankment damage/erosion repair, mowing, debris clearing, seeding*	Hrs	36 (8 hours per quarter)
Outfalls *Erosion inspection, debris/sediment clearing, photo documentation*	Hrs	4

Order of Magnitude Cost (High-Level Cost Estimate) for:

Barnwell Stormwater Park

Type of Strategy: Stormwater park (bioretention, bioswale, permeable paving, streambank planting)

Community: Communities of Barnwell County

Strategy Address/Location: Bryan St/ Dunbarton Blvd located at 75 Bryan St Barnwell, SC 29812

Date of Estimate: 03/27/2026

Planning and Design

- Project Management:
    - Description- Coordinate with the Owner on project schedule, deliverables, and budget throughout the duration of the project. Recurring meetings will be held to provide progress updates, review budget status, and address Owner feedback and needs. Monthly invoices will include estimated percent complete and percent spent.
    - Assumptions- Project management is billed as lump sum.
- Surveying:
    - Two surveys are needed and include a pre-construction survey and as-built survey that are provided as PDF and CAD files.
    - Pre-construction survey must include:
        - Property corners and property lines for subject parcel
        - Edge of pavement, centerline, curb and gutter, and edge of DOT right-of-ways on Bryan Street, Gilmore Street, and Dunbarton Boulevard. Include paths and edge of pavement for intersecting streets for project extents
        - Existing structures (nail salon, fencing, signs, etc.)
        - Existing utilities
        - Utility easements or rights of ways
        - Drainage infrastructure (including inlets, outfalls, catch basins)
        - Brown Lake pond embankment along Bryan Street (grades, contours), water surface elevation at time of survey, locations and elevations of outflow structures
        - Topography of low-lying ditch areas

        - Wetland delineation
    - As-built survey will document the placement, grading, and dimensions of the bioretention area, bioswales, permeable pavement, and the extents of streambank planting along the right bank of Turkey Creek. Locations, elevations, and dimensions of all new inlets, outlets, and pipes shall be included in as-built survey.
    - Assumptions – 811 shall be called prior to survey.
- Permitting:
    - Description- Estimate based on SCDES Notice of Intent and a FEMA no-rise permit. Includes permit package prep and agency coordination. Also includes any necessary permits from the Town/County.
    - Assumptions- One round of permitting and comments with resubmission to SCDES. FEMA permit assumed to be no-rise but expect increased costs if a CLOMR is unavoidable.
- Modeling:
    - Existing conditions PCSWMM model to identify flooded areas on site.
    - Proposed conditions PCSWMM model to analyze BMP effectiveness.
    - Assumptions – modeling cost estimate is incidental to engineering line item.
- Engineering:
    - Conduct desktop analysis and one site visit to collect information necessary to produce 30% design.
    - Conduct one additional site visit to collect additional information necessary to produce 90% design. The owner will have the opportunity to provide feedback and revisions at 30% and 90% design.
    - Produce 90% stamped designs for submittal to SCDES for proposed improvements. The 90% design will need to include all information required for permitting to include but is not limited to:
        - Site plans to include plan and profile of bioretention, bioswales, and additional pipe network, limits of disturbance, property boundaries, existing wetlands, structures on site, trees, connecting existing drainage infrastructure.
        - Details and notes for bioretention, bioswales, permeable paving, and streambank planting, including a grading plan, soil layers, ponding depths, and planting plans.
        - Include considerations for construction staging and sequence.
        - Include specifications for sediment and erosion control measures during construction.

- Assumptions- The engineered drawings will provide sufficient detail, including dimensions of proposed practices, and necessary materials to develop specifications for project construction.

Table 4. Planning and Design Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
Project Management	*LS*	*1*	7,500	7,500
Surveying	*LS*	*2*	3,500	7,000
Geotechnical	*LS*	*1*	10,000	10,000
Permitting	*LS*	*1*	7,500	7,500
Modeling	*LS*	*1*	15,000	15,000
Engineering	*LS*	*1*	45,000	45,000
Subtotal Planning and Design				**92,000**

Construction and Implementation

- Site Preparation:
  - Description-
    - Bioretention: Excavation for 1,500 SF footprint with a 3' depth and 3:1 side slopes. Grade in pilot channel to facilitate flow.
    - Bioswale: Excavation for 0.5' bottom width with 2' depth at a 3:1 side slope for 180 LF total.
    - Stormwater pipe trench: Excavate 4' wide and 3' depth along total proposed pipe length for installation.
    - Permeable pavement: Excavate 2' deep for 1,440 SF to install permeable pavement for 8 parking spaces.
    - Road milling: milling of existing pavement to install permeable pavement, bioretention, and RCP.
  - Assumptions- SC811 shall be called to locate existing utilities ahead of digging.
- Soil Amendments:
  - Description-
    - Bioretention: 4" depth for soil amendments, 4" depth for mulch, 2' depth for bioretention soil.
    - Bioswale: 4" depth along bottom width and side slopes. 4" depth along bottom width and side slopes for mulch.
  - Assumptions- Costs include delivery.
- Planting:

    - Bioretention and Bioswale:
        - Plantings installed by hand per planting plan. Plants shall be native species.
        - Planting plan shall specify a mix of emergent and forested wetland vegetation. “Bioretention plug” plants shall be used to promote vigorous root growth (i.e., 5” deep containers with root volumes equal to a 4” pot).
        - Assumptions- plants are available and purchased from a local nursery. Costs include delivery.
    - Streambank planting:
        - Livestakes to be planted along eroding right bank of Turkey Creek. Plant 2’ grid spacing from baseflow WSE to WSE + 4’.
        - All disturbed areas besides bioretention, bioswale, and areas to be repaved to be seeded with turf grass and provided with temporary irrigation.
    - Assumptions- plants are available and purchased from a local nursery. Costs include delivery.
- Structural Elements:
    - Description:
        - Road paving: repaving parking area besides areas to be used for permeable pavers and bioretention.
        - Underdrain: included for the primary flow path within the bioretention area.
        - RCP pipe: included to route flow underneath driveway from one bioswale to the next, and then from the bioswale to the bioretention area, and ultimately to Turkey Creek.
        - Educational signage: included as the project includes green infrastructure and adjacent to a park.
        - Powerblock permeable pavers: permeable pavement for 8 parking spaces adjacent to nail salon. Includes materials and delivery fees.
        - Riprap: for channel protection at inlet/outlet for bioretention area.
        - Outfall structure: structure for bioretention area.
        - Bioretention soil: 2’ depth across the footprint of the bioretention area.
    - Assumptions- RCP pipe that routes bioswale to bioretention as well as the bioswale equalization pipe will be less than 24”. Pipe that routes bioretention area to Turkey Creek will be 24”. Costs include all materials as well as installation costs.

Note: All items include delivery and installation where applicable.

Table 5. Construction and Implementation Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
Bioretention (1,500 SF)				
Site Preparation (excavation and grading)	CY	120	50	6,000
Underdrain	LF	40	30	1,200
RCP pipe	LF	120	150	18,000
Rip rap	SY	6	75	450
Outfall structure	EA	1	4,500	4,500
Educational signage	EA	1	1,500	1,500
Bioretention planting	SY	170	50	8,500
Bioretention soil	CY	110	90	9,900
Mulch	CY	14	100	1,400
Soil amendments	CY	14	150	2,100
Subtotal Bioretention				**53,550**
Bioswale (180 LF)				
Site Preparation (excavation and grading)	CY	85	50	4,250
Plantings	SF	2,430	3	7,290
RCP pipe	LF	180	90	16,200
Mulch	CY	23	100	2,300
Soil Amendments	CY	23	150	3,450
Subtotal Bioswale				**33,490**
Permeable Paving (1,440 SF)				
Site Preparation (excavation and grading)	CY	105	50	5,250
Powerblock Permeable Pavers	SF	1,440	25	36,000
Subtotal Permeable Paving				**41,250**
Streambank Planting				
Livestakes	EA	160	8	1,280
Turf grass seed	SY	330	1	330
Temporary irrigation	SF	3,000	0.75	2,250
Road milling	SF	12,000	4	48,000
Road paving	SF	8,900	8	71,200
Subtotal Streambank Planting				**123,060**
Subtotal Construction and Implementation				**251,350**
Construction Oversight (20%)				**50,270**
Contingency (30%) *				**103,005**
GRAND TOTAL Planning, Design, Construction, and Implementation				**496,625**

*Contingency allows for budget to address any unforeseen risks or uncertainties with the project that may arise.

Additional general items not included in this estimate include mobilization, utility staking, traffic control, clearing and grubbing, utility relocation, erosion and sediment control, and materials testing.

Maintenance

- Replanting:
    - Description- Annual maintenance for bioretention area, bioswales and replanting along Turkey Creek as needed. Plants will need to watered 1 time per day after planting for two weeks. Irrigate 1 time per week during the heat of summer or drought conditions. Plants will need to be monitored and dead or dying vegetation removed in winter. Remove vegetation due to overcrowding in late summer. Weeding should occur 1 time per month or 4 times per year minimum in the bioswales and bioretention areas.
    - Assumptions- Town or city staff/landscapers will oversee maintenance
- Erosion Repair:
    - Permeable Pavers – cleaning of system minimum 4 times per year by pressure washer, street sweeper, or regenerative vacuum truck.
    - Bioretention – bi-monthly maintenance as needed to include: reshaping and regrading as needed, spot mulch application to maintain 3" layer of mulch, removal of trash, sediment, debris and replace with clean stone as needed.
    - Streambank Planting- bi-monthly maintenance as needed to include: removal of trash, sediment, debris and replace plants to ensure stabilization as needed.
    - Assumptions- Maintenance will be conducted by Owner's staff and/or contracted landscape company.
- Stormwater infrastructure maintenance
    - Description- RCP pipe to be cleaned every 10 years for sediment/debris accumulation. Outfall structures to be cleaned for sediment/debris every 2 years. Permeable pavers to be periodically cleaned from sediment to prevent clogging.

Table 6. Maintenance Effort Per Year

Item	**Unit**	**Quantity**
Bioswale *Debris/sediment removal, weeding, spot mulching, removing dead vegetation, initial irrigation, re-planting as needed, inspection for erosion hot spots and erosion repair.*	*Hrs*	24
Bioretention *Debris/sediment removal, weeding, spot mulching, removing dead vegetation, initial irrigation, re-planting as needed, inspection for erosion hot spots and erosion repair.*	*Hrs*	24
RCP pipe *Debris clearing*	Hrs	4
Permeable Pavement *Vacuum sweeping, addressing clogging issues*	Hrs	8
Inlets *Erosion inspection, debris/sediment clearing, photo documentation*	Hrs	4

Order of Magnitude Cost (High-Level Cost Estimate) for:

Salkehatchie Watershed Conservation/Riparian Buffer Mapping

Community: Salkehatchie Watershed-Scale

Date of Estimate: 3/31/2026

Planning and Design

- Project Coordination and Stakeholder Engagement:
    - Description- project coordination, creation of the Salkehatchie Conservation Committee (SCC), engagement with the SCC, stakeholder engagement
    - Assumptions-
        - 1 kickoff meeting with the client, 12 internal team coordination meetings, budget management, scope and schedule oversight
        - SCC will include relevant, qualified stakeholders such as representatives from local government staff and local land conservation professionals to guide and inform the process. Coordination, material development, and facilitation of up to four meetings with the SCC to collect input on key milestones. At least two SCC engagement sessions will be held in-person.
        - Coordination, material development, and facilitation of up to ten in-person public engagement sessions at each community within the Salkehatchie watershed. Creation of one digital survey to be distributed to the public. Synthesized analysis of public survey data
        - Staff involved: project manager and technical/design professionals
- Spatial Analysis
    - Description- Data collection from sources deemed necessary to assist in identification and prioritization of undeveloped and available parcels, Inventory of existing open space and analysis to identify open space suitable for protection, Development of prioritization criteria to evaluate open space opportunities, geospatial analysis of land conservation opportunities though incorporation of prioritization criteria and production of maps to demonstrate areas of focus for land conservation efforts and aid in parcel selection
    - Assumptions –

        - Data sources are available and accessible from sources such as the South Carolina conservation bank, South Carolina Office of Resilience, etc.
        - A series of maps will be produced at each step of the spatial analysis that will guide discussion among SCC, input from SCC will be incorporated in each step of the analysis
        - ESRI ArcGIS geodatabase will be created to produce the spatial analysis
        - Staff involved: project manager, senior technical/design professional, technical/design professional, junior technical/design professional, GIS professional
- Funding Analysis
    - Description – comprehensive review of similar land protection funding programs in the southeast and the associated administrative frameworks, Funding recommendations will be produced that estimate the cost of meeting the conservation goals as established by the SCC. The analysis will identify and assess the potential for a range of funding strategies that are realistic and that would substantially increase public funding to address parks, recreation, and conservation needs. Presentation to the client of key research findings
    - Assumptions-
        - Funding resource recommendations will include grants, loans, and options from federal, state, local, and private sources
        - Funding review will include examining the revenue-raising capacity, the fiscal impact to government budgets, and/or taxpayers of the local property tax needed to back general obligation bonds
        - Staff involved: project manager, senior technical/regulatory professional, technical/regulatory professional, junior technical/regulatory professional
- Land Protection Vision Plan –
    - Description - Draft plan development based on information gained from previous tasks to develop a comprehensive plan that will identify land protection opportunities, a forecast of land protection needs, and an analysis of the funding pathways necessary to meet the land conservation goals as defined by the SCC, final plan development with input from the SCC and client on the draft comprehensive plan, presentations to the SCC of final land protection vision plan
    - Assumptions –

- Land protection goals of the final land protection vision plan will be on a 25 year future timeline
- Staff involved: project manager and technical/design professionals

Table 1. Estimate of Cost

Item	Unit	Quantity	Total ($)
Project Coordination and Stakeholder Engagement	*LS*	*1*	45,000
Spatial Analysis	*LS*	*1*	30,000
Funding Analysis	*LS*	*1*	30,000
Land Conservation Vision Plan	*LS*	*1*	30,000
Contingency (30%) *			**40,500**
GRAND TOTAL			**175,500**

*Contingency allows for budget to address any unforeseen risks or uncertainties with the project that may arise.

Order of Magnitude Cost (High-Level Cost Estimate) for:

Salkehatchie Watershed Hydrologic & Hydraulic (H&H) Study

Community: Salkehatchie Watershed-scale

Date of Estimate: 3/31/2026

Overarching Assumptions

The goal of this study is to develop a better understanding of the hydrologic conditions within the Salkehatchie Watershed. The study's aim is to develop a model that can be used as a tool to evaluate present and future flood risks at the watershed-scale while also forming the basis of a master model, which can later be updated to include detailed 2D models of communities within the watershed. This initial model will be calibrated using existing available HEC-RAS models in the watershed and will be validated through stakeholder engagement and information collected through the Salkehatchie Watershed Vulnerability Assessment.

This watershed-wide model will identify critical infrastructure (roadways, evacuation routes, bridges, culverts, etc.) that are vulnerable to flooding in the present day and in the future, which will help the SC Office of Resilience and the communities within the Salkehatchie watershed to prioritize projects at the state and County level. Additionally, this model is intended to be updated as communities within the watershed begin inventorying their own drainage systems and developing their own H&H studies or stormwater master plans. As communities begin investing in stormwater infrastructure solutions, they can be added to this model as high-resolution 2D zones to provide additional detail around communities where it is needed. This model can serve as a resource to communities in their own H&H modeling efforts to help with model calibration and validation as well.

Ultimately, the development of this model will help provide a better understanding of Hydraulic & Hydrologic conditions in the watershed and will immediately inform potential projects at the State and County level within the watershed by identifying undersized culverts and bridge crossings. As funding becomes available and other communities begin inventorying and/or developing their own stormwater models, this model can be used as a master watershed model to house the model of each community and help determine upstream and downstream impacts for larger-scale projects.

Model Development

- Project Management:
    - Description- Project Management, Kick-off Meeting with Client and Project Team and Public Meetings & Engagement
    - Assumptions-
        - Quarterly Report Meetings (6 virtual meetings)
        - Kick-off Meeting with client (1 virtual meeting)
        - Stakeholder Engagement Meeting Materials and Planning
        - Staff involved- project manager, senior technical/design professional, technical/design professional, junior technical/design professional, and GIS professional
- Field Investigation and Survey:
    - Description- Spot elevations for critical infrastructure (bridges, culverts, roads, etc.)
    - Assumptions-
        - Only State and County stormwater infrastructure assets will be modeled as part of this project
        - Survey will be limited to spot elevations on critical assets, as needed
        - Staff involved- senior technical/design professional, technical/design professional, junior technical/design professional, and GIS professional
- Data Collection:
    - Description – Review of Existing Reports, FEMA Hydraulic Models, FEMA Flood Insurance Studies and Claims, SCDOT As-builts, Water Level Sensors, and Riverine Gauges. The team will also compile existing data for landcover, soils, drainage complaints, and topography.
    - Assumptions –
        - Hydraulic models (i.e. FEMA HEC-RAS) are available and accessible throughout the watershed
        - 1 virtual meeting with client to review data collection
        - *1 site visit which includes installation of a riverine gauge on the upstream side of the culvert crossing (optional)*
        - *$1,250 for riverine gauge equipment (assuming level logger and supplies to construct well) (optional)*
        - Staff involved- project manager, senior technical/design professional, technical/design professional, junior technical/design professional, and GIS professional

- Model Development:

    - Description- Gather stakeholder information (Survey123/ArcGIS StoryMap); Review of base mapping to use for hydrology & hydraulic design (soils, topography, drainage areas, etc.) and select appropriate design storms for model scenarios; Develop Existing and Future Conditions (2050) H&H Models
    - Assumptions –
        - 1 meeting with client to review stakeholder information, basemaps of model elements, and to select appropriate design storm events for existing and future conditions scenarios
        - Scenarios will include one existing conditions model and one future conditions model
        - Technical report will be produced
        - 1 virtual meeting with client to review model results
        - Staff involved- project manager, senior technical/design professional, technical/design professional, junior technical/design professional, and GIS professional
- Model Calibration/Validation:
    - Description- Stakeholder engagement to ground truth model results; Capture additional areas prone to flooding and inconsistencies in model results; Identify up to ten (10) recommended strategies for flood mitigation.
    - Assumptions-
        - Model validation will include comparison of results to at locations where existing H&H Models are present (i.e. HEC-RAS)
        - 1 engagement event in each community (10 total) to identify additional areas of concern and validate model results
        - Staff involved: project manager, senior technical/design professional, technical/design professional, and junior technical/design professional
- Proposed Conditions Model:
    - Description- Model ten (10) recommended strategies to determine potential for flood mitigation; Conduct Benefit-Cost Analysis (BCA) on 10 recommended strategies
    - Assumptions-
        - 10 recommended strategies will be assessed using the existing and future conditions models
        - A formal BCA will be conducted for each of the ten (10) projects

- Final Report:

- Description- Development of final report consisting of project goals and objectives, summarization of field investigations, and literature review; Assessment of results of BCA and ranking of ten (10) improvement projects.
- Assumptions-
  - Recommendations will be made for 10 improvement projects
  - Projects will be ranked by BCA score

Table 2. Cost Estimates

Item	Unit	Quantity	Total ($)
Project Management	*LS*	*1*	20,000
Field Investigation and Survey	*LS*	*1*	40,000
Data Collection	*LS*	*1*	55,000
Model Development	*LS*	*1*	110,000
Model Calibration/Validation	*LS*	*1*	40,000
Proposed Conditions Model	*LS*	*1*	65,000
Final Report	*LS*	*1*	45,000
Contingency (30%) *			**112,500**
GRAND TOTAL			**487,500**

*Contingency allows for budget to address any unforeseen risks or uncertainties with the project that may arise.