South Carolina
Resilient Coastal Communities Collaborative Program

Salkehatchie Watershed Plan



Resilience Portfolio for the Communities of

Hampton & Varnville

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

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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.

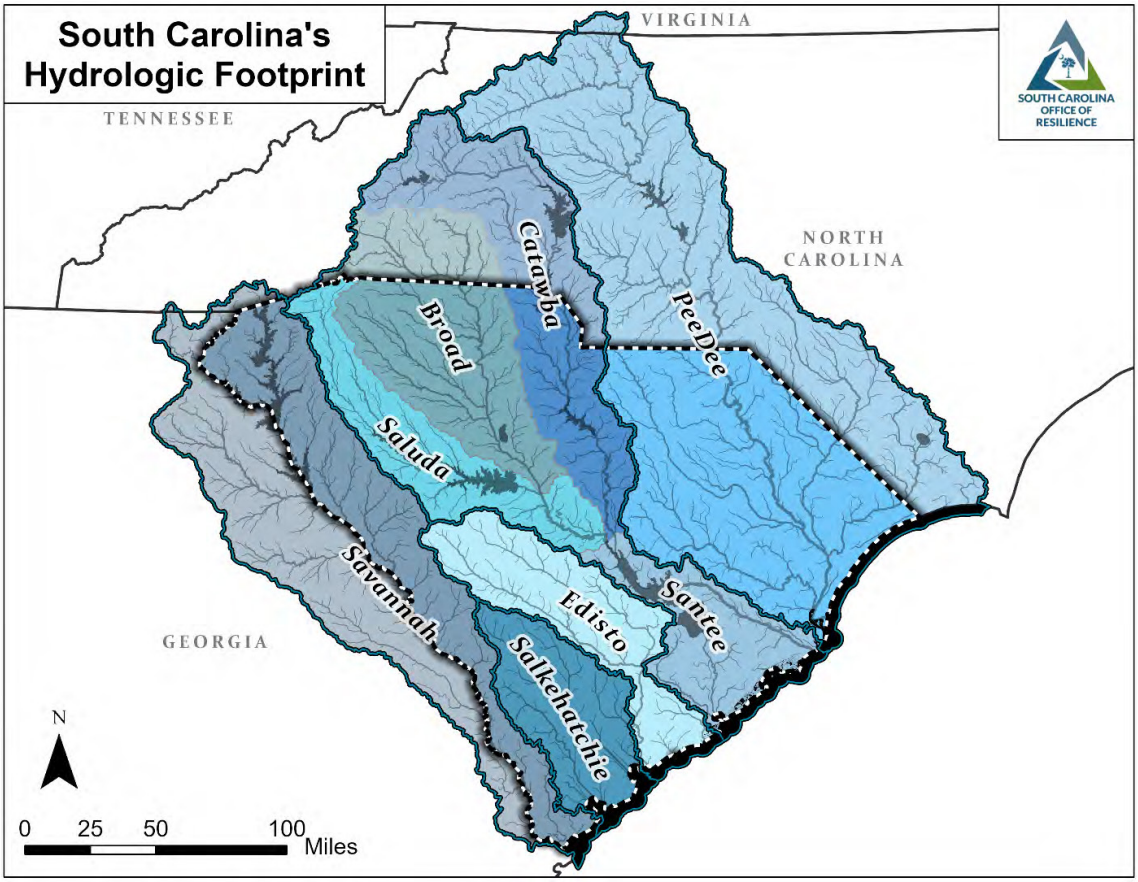


Figure 1: Salkehatchie River Basin

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.

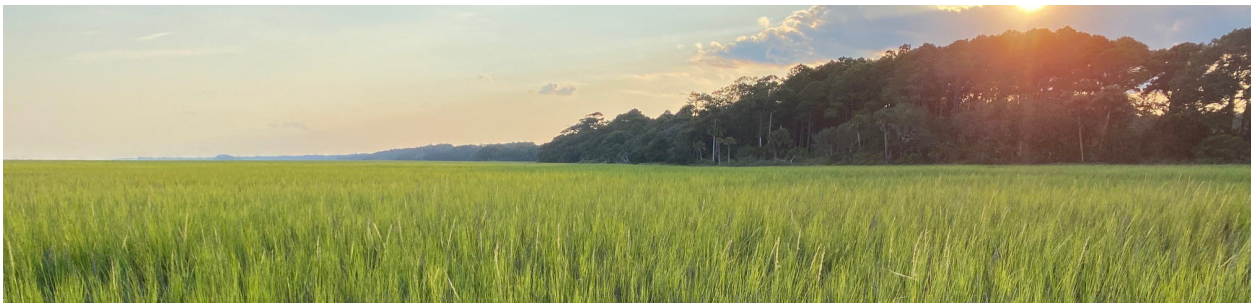
DEVELOPMENT PRESSURE: While the upper part of the Salkehatchie Watershed is primarily rural and agricultural, there is a high level of developmental pressure in the coastal region, specifically in Beaufort, Jasper, Colleton, and Hampton Counties. Forested and Agricultural land cover in the basin has 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 Savanah 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

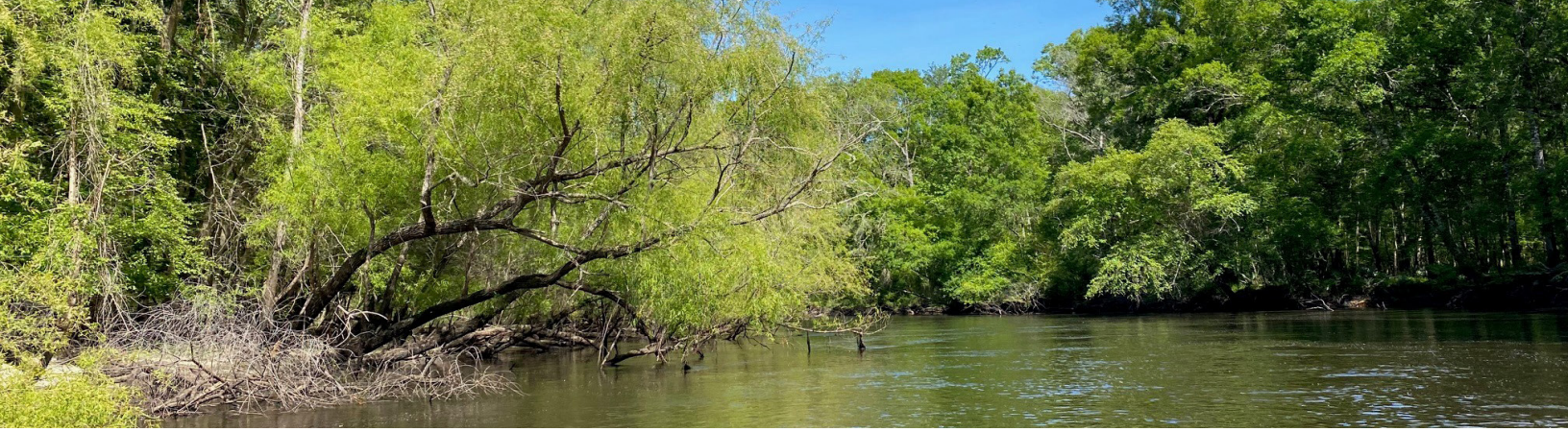
As a foundational step, **SCOR and SCSG reviewed local planning efforts** to better understand existing conditions and identify opportunities to leverage planned efforts.

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 (Winter 2025), team members shared concerns related to impacts from flooding and environmental changes. At the second Community Action Team meeting (Spring 2025), community members identified and mapped flood-prone areas directly on mapss 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 meetings 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, 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 Hampton and Varnville are predominantly rural, inland communities where residents rely heavily on individual septic systems and local ditch networks, making the communities vulnerable to systemic failures during severe weather events. Because flood reduction was identified as the highest priority in these communities, areas with known flooding were given particular attention during the desktop analysis, and preferred practices were prioritized such as land conservation and tree planting. **For cost estimation, the prioritization matrix highlighted two projects that consistently performed well across all criteria: the Conservation Area at W Carolina Avenue and Sycamore Street, which had the highest overall score, and the Stormwater Park at Ginn Street and Ballpark Lane, which had the second highest score in the community.**

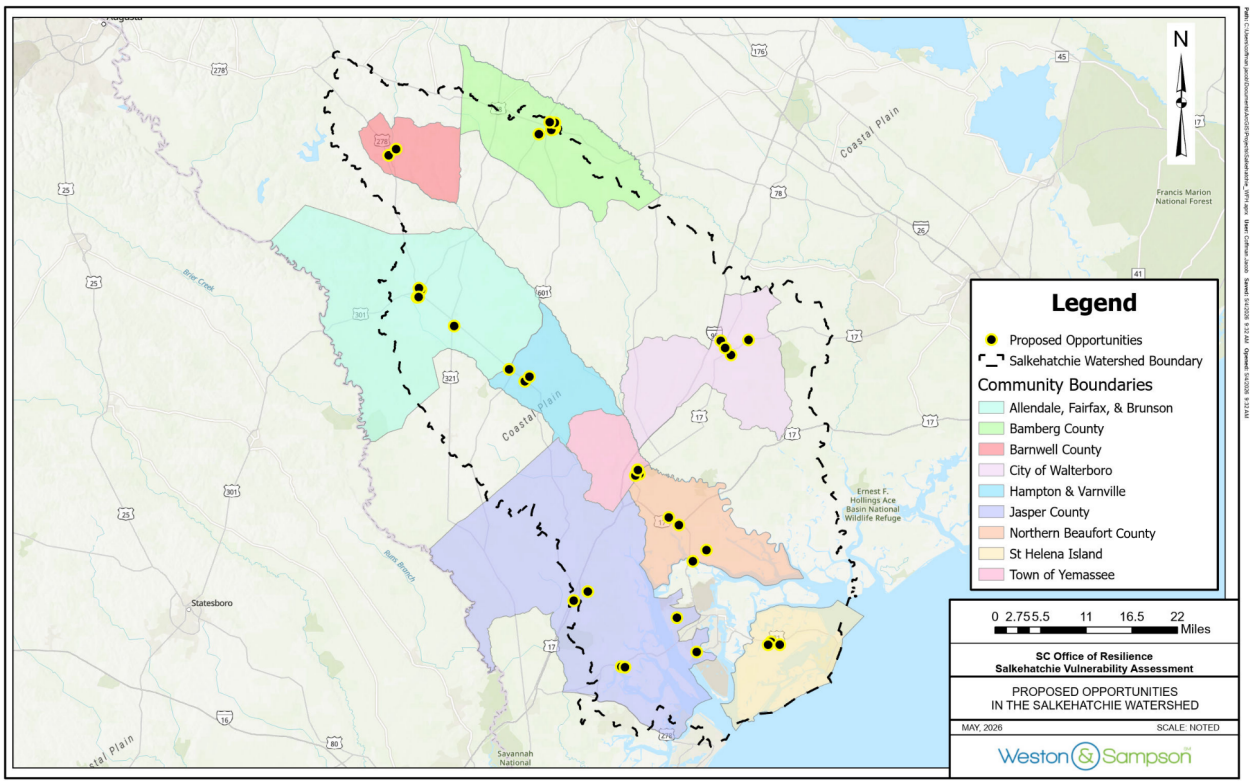


Figure 2: SCRCCCP Study Communities and Proposed Opportunities

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

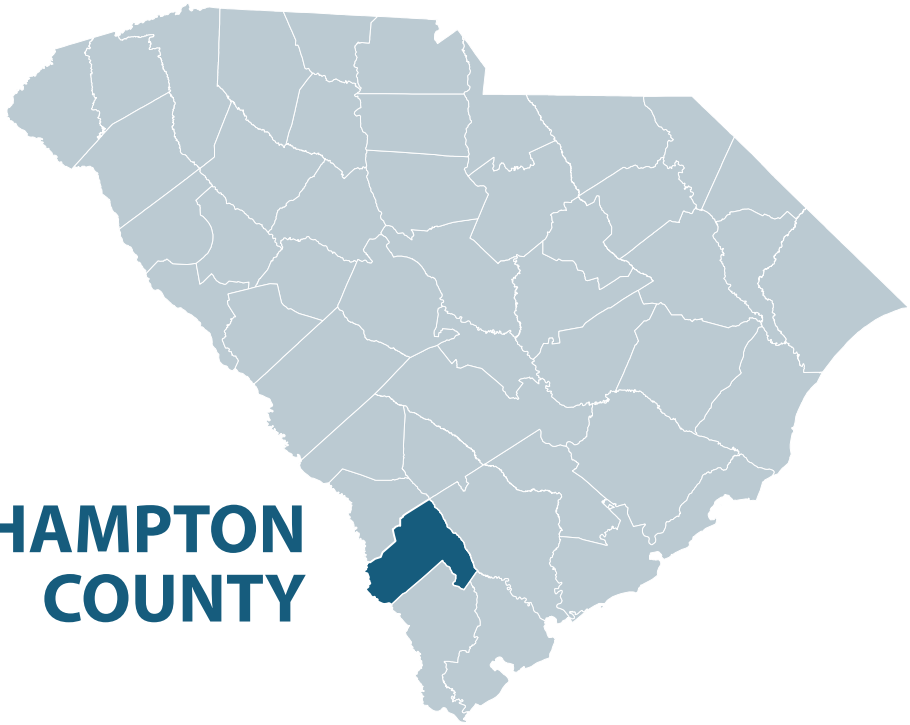
Highlight **community preferred** resilience strategies

6

Strengthen **collaboration and partnerships** within the watershed

2b. Community Background

The Communities of Hampton and Varnville are two of nine towns located in Hampton County which sits in the coastal plain of South Carolina and is located within the Lowcountry Council of Governments Region. The Town of Hampton has the largest population of the communities in



HAMPTON COUNTY

Hampton County and is the County seat. The Town of Varnville lies just to the south of the Town of Hampton, and both communities are bisected by US Hwy 278 (Yemassee Highway/Augusta Highway), which is a major evacuation route for the coastal region. Hampton County is bordered by the Savannah River to the west, Bamberg County to the north, Colleton County to the east and Beaufort and Jasper Counties to the south. The County is a predominantly rural, inland community characterized by dispersed residential populations, expansive agricultural lands, and managed forests including Hamilton Ridge Wildlife Management Area, Palachucola Wildlife Management Area, James W Webb Wildlife Center and Game Management Area, and Lake Warren State Park. Additionally, many rivers flow through the County, including the Coosawhatchie, Salkehatchie, and Little Salkehatchie Rivers. Because a large portion of the Hampton County's population resides in unincorporated areas without municipal zoning or public sanitary sewer access, residents rely heavily on individual septic systems and local ditch networks. This dispersed, rural dynamic creates unique resilience challenges, as emergency response times are naturally longer, and aging infrastructure makes the community highly vulnerable to systemic failures during severe weather events.

The Communities of Hampton and Varnville are impacted by several natural hazards including tornadoes, tropical storms, hurricanes, and severe thunderstorms. The Towns are also impacted by flash flooding, riverine flooding, and tree damage from storm events, and are experiencing impacts to agriculture from rain bombs, increasing drought and extreme heat. The Project Team conducted a review of existing vulnerabilities and future threats for the Communities of Hampton and Varnville 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 Hampton and Varnville are listed in Table 1.

Table 1: Plans Reviewed for the Communities of Hampton and Varnville

Plan Name	Year
2020 Lowcountry Hazard Mitigation Plan-Updated 2026	2026
Lowcountry Transportation Resilience Improvement Plan (TRIP)	2026
Town of Hampton Comprehensive Plan	2022
Hampton County Housing Needs Assessment	2021
District 6 Housing Needs Assessment	2019
Hampton County Comprehensive Plan	2009

The vulnerabilities that were identified by the Project Team include:



Continued exposure to natural hazards and environmental change



Vulnerable **evacuation routes**



Need for **low-density zoning in sensitive areas**



Impacts from **failing septic systems** especially in the Cyprus Creek and Cyprus Branch/Coleman Run watersheds



High nutrient loads in primarily the **agricultural Black Creek-Coosawhatchie River watershed (HUC 10).**



Limited access to **sanitary sewer services**



Need for septic maintenance **education**



Need for **water quality monitoring stations**



Slow response times with **fallen trees and road washouts**

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 November 2024, April 2025, August 2025, and December 2025. The members identified for the Communities of Hampton and Varnville Community Action Team are listed in the table below.

Table 2: Team Members of Communities of Hampton and Varnville Community Action Team

Team Members Name	Team Members Title
Faye Gooding	Varnville Town Council Member
Tom Watson	Hampton County Emergency Operations Specialist
Mayor Robert Brown	Town of Hampton Mayor
Dr. William Small, Jr.	Retired Professor
Tyrone Smith	Varnville Police Chief
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** (November 2024), team members were invited to share concerns related to impacts from flooding and environmental changes they have experienced within their community. One of the primary issues raised was flooding of roads and yards. Other impacts and challenges community members identified include increasing storm and hurricane intensity, flooding impacts to homes, yards, and evacuation routes, and broader climate related challenges. Additional concerns included the need for improved ditch maintenance, the uprooting of trees due to weakening roots, and the loss of insurance coverage in some areas. Community members also noted issues stemming from large, unincorporated areas and reiterated that rising storm and hurricane intensity continues to be a major driver of local impacts.

At the **second Community Action Team meeting** (April 2025), community members identified flood-prone areas directly on maps at a public event held in the Town of Hampton. The areas identified include W. Pine Street and W. Palmetto Avenue between the Savannah River and Boggy Branch, the railroad at the Hampton–Jasper County line, Barry Avenue, and neighborhoods between Pine Street and Jackson Avenue West near Hampton Elementary School. Additionally, community members noted Varnville Elementary School, Old Salkehatchie Highway, the corner of Willard Street Extension, the corner of Jackson Avenue West near Hampton Elementary, the intersection of Jackson Avenue West and Willard Street, and the Hoover Street South and Magnolia Street West intersection as areas that flood.



Figure 3: Images from the third Community Action Team meetings

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) or 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.

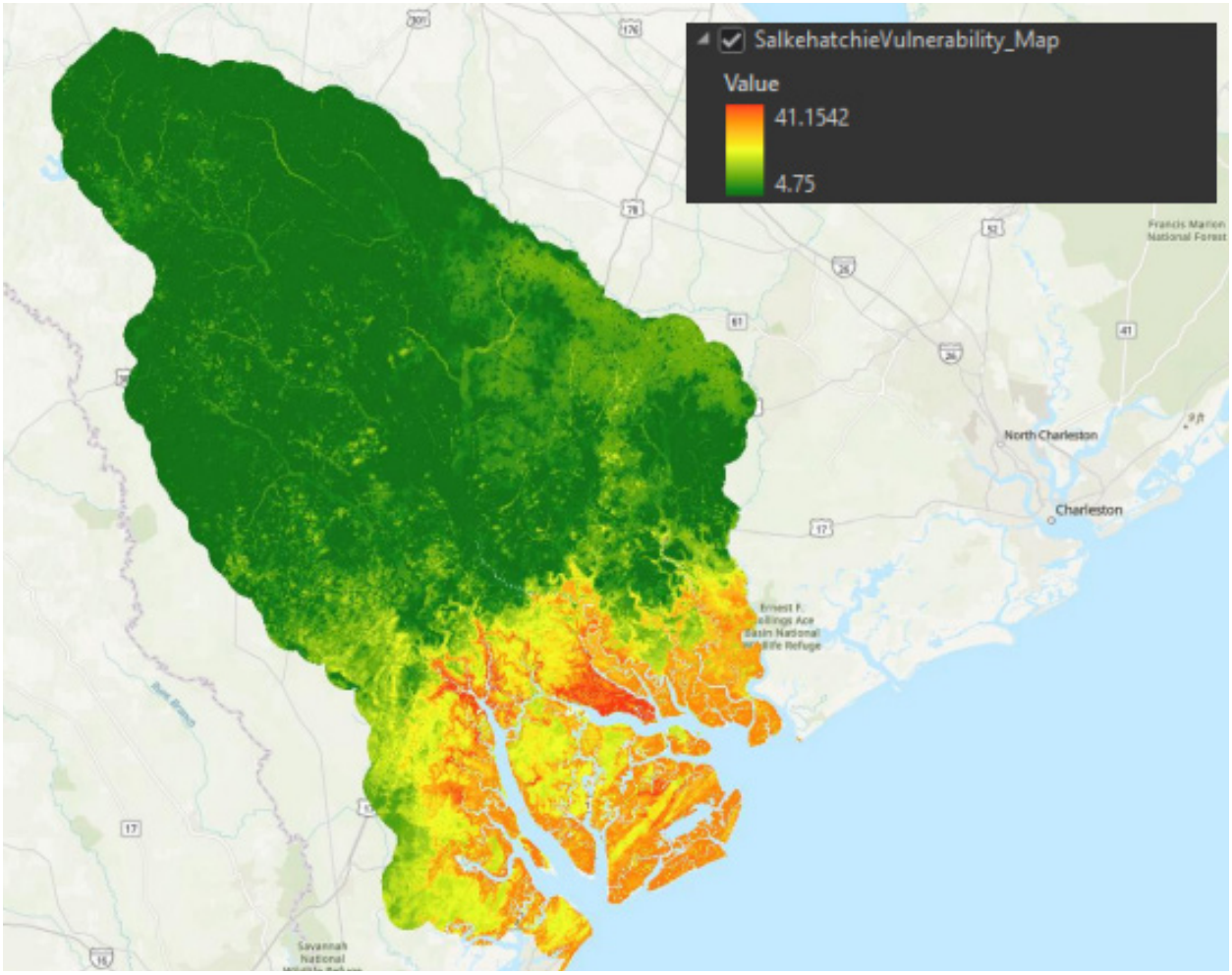


Figure 5: Salkehatchie Vulnerability Model Results

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.

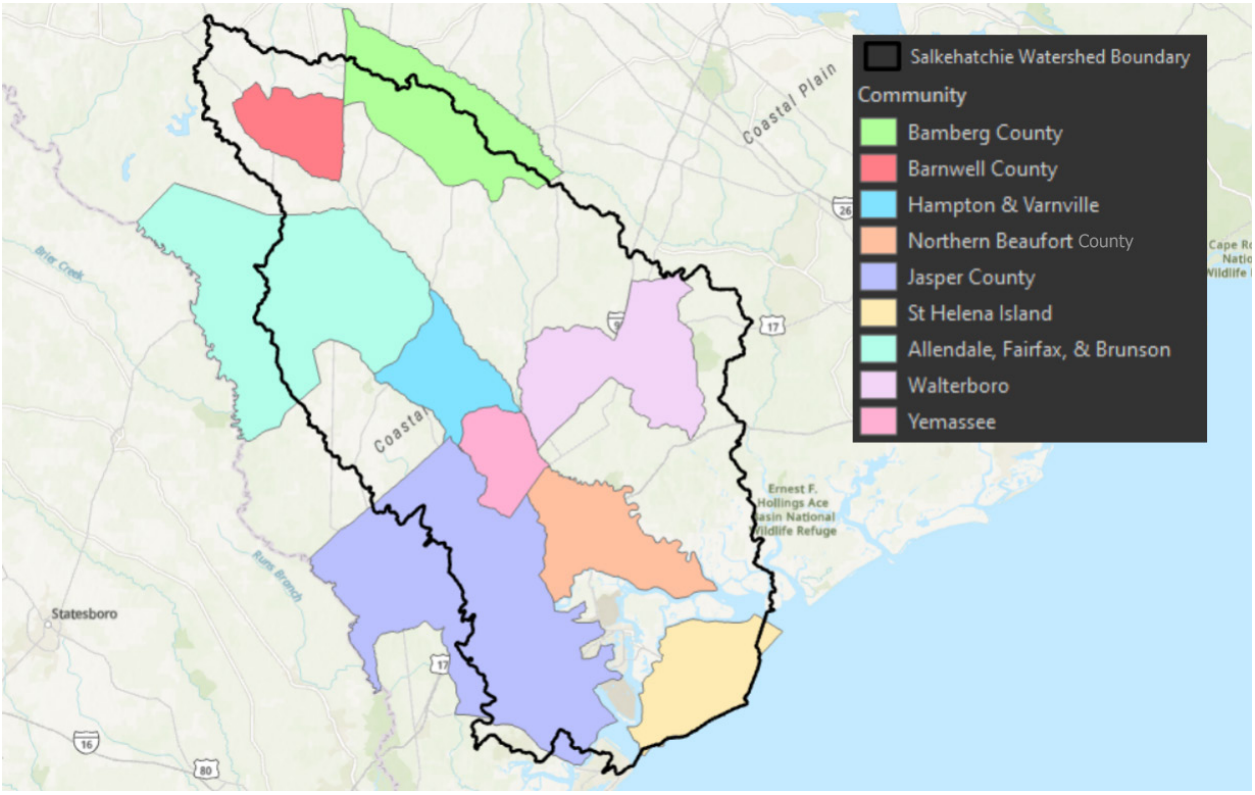


Figure 6: Salkehatchie Watershed and SCRCCCP Study Communities Census Tracts

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 Hampton and Varnville along with the locations of the highest average vulnerability scores within the Hampton and Varnville census tracts. The most vulnerable areas included the Town of Varnville and the area northeast of the Town along Walterboro Highway. The remaining most vulnerable areas are located in the southern half of the study area near Camp Branch and the area between the Coosawhatchie and Little Salkehatchie Rivers. The results were consistent with information collected from stakeholders during Community Action Team meetings.

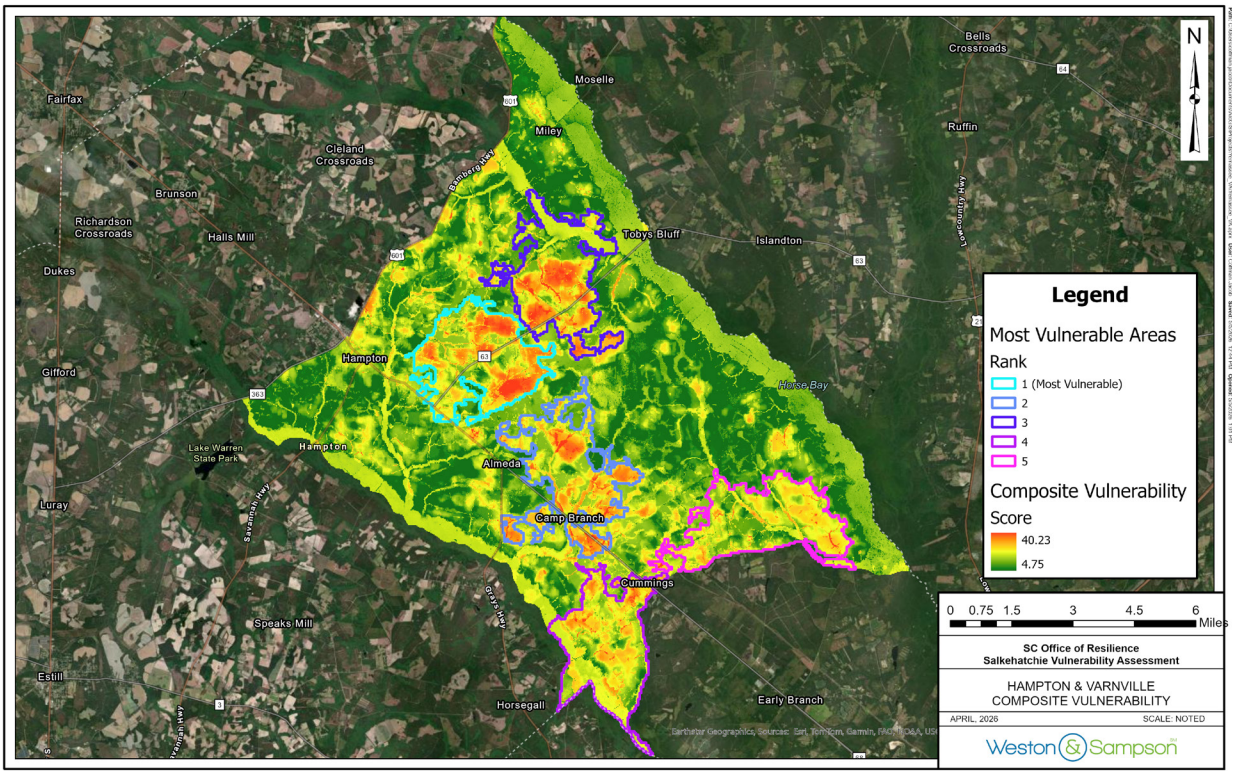


Figure 7: Hampton and Varnville Vulnerability Model – Most Vulnerable Areas

3b. 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

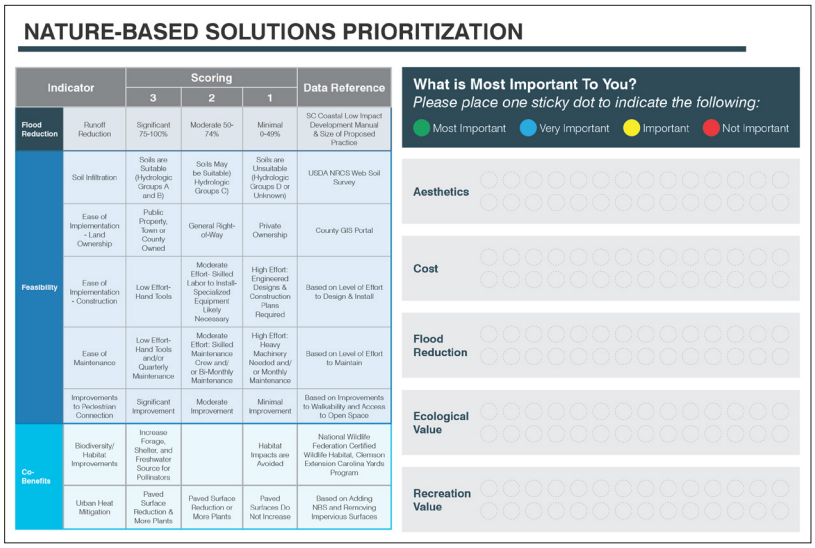
Figure 8: Vulnerability Scoring Formula



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.



Indicator		Scoring 3	Scoring 2	Scoring 1	Data Reference
Flood Reduction	Runoff Reduction	Significant 75-100%	Moderate 50-74%	Minimal 0-49%	SC Coastal Low Impact Development Manual & Size of Proposed Practice
Feasibility	Soil Infiltration	Soils are Suitable (Hydrologic Groups A and B)	Soils May be Suitable) Hydrologic Groups C)	Soils are Unsuitable (Hydrologic Groups D or Unknown)	USDA NRCS Web Soil Survey
	Ease of Implementation - Land Ownership	Public Property, Town or County Owned	General Right-of-Way	Private Ownership	County GIS Portal
	Ease of Implementation - Construction	Low Effort- Hand Tools	Moderate Effort- Skilled Labor to Install- Specialized Equipment Likely Necessary	High Effort: Engineered Designs & Construction Plans Required	Based on Level of Effort to Design & Install
	Ease of Maintenance	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	Based on Level of Effort to Maintain
	Improvements to Pedestrian Connection	Significant Improvement	Moderate Improvement	Minimal Improvement	Based on Improvements to Walkability and Access to Open Space
Co-Benefits	Biodiversity/ Habitat Improvements	Increase Forage, Shelter, and Freshwater Source for Pollinators		Habitat Impacts are Avoided	National Wildlife Federation Certified Wildlife Habitat, Clemson Extension Carolina Yards Program
	Urban Heat Mitigation	Paved Surface Reduction & More Plants	Paved Surface Reduction or More Plants	Paved Surfaces Do Not Increase	Based on Adding NBS and Removing Impervious Surfaces

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. For the Communities of Hampton and Varnville, preferred practices were prioritized such as land conservation and tree planting. **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 Hampton and Varnville 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.

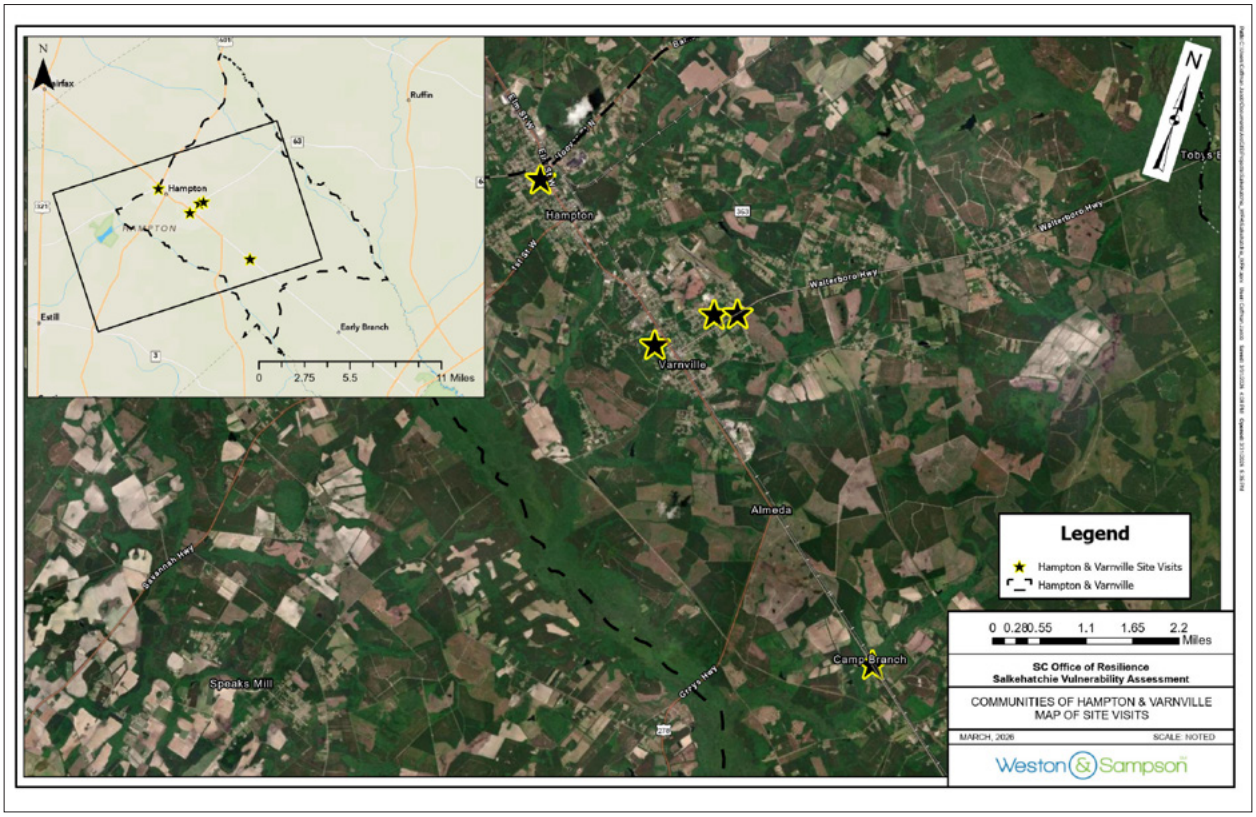


Figure 11: Site Visits Conducted by the Project Team in the Communities of Hampton & Varnville

5. Prioritization Matrix

5a. Prioritization Criteria

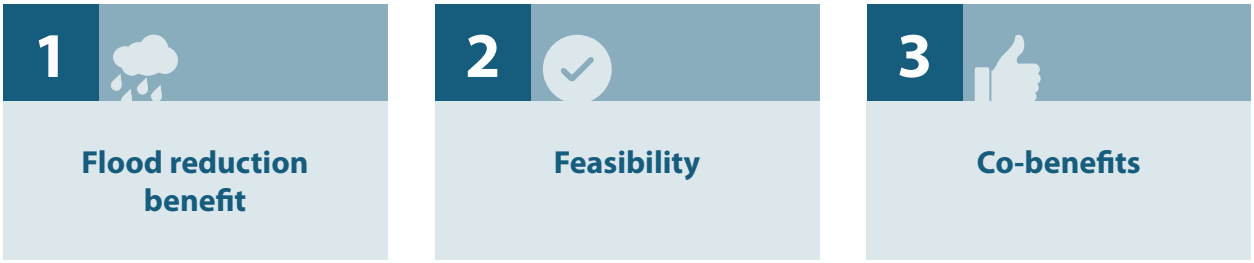
Prioritization criteria were developed to identify projects that were both feasible to implement and capable of delivering the greatest benefits to each community. A table of the prioritization criteria can be found in the appendices. Criteria were divided into three categories:

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 Hampton and Varnville, the prioritization matrix highlighted two projects that consistently performed well across all criteria. The **Conservation Area at W Carolina Avenue and Sycamore Street** 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 and wildlife habitat. **The Stormwater Park at Ginn Street and Ballpark Lane** had the second highest score in the community. This project had intermediate flood reduction potential as well as 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.

Hampton/Varnville Conservation

W Carolina Ave. and Sycamore St.

Type of Strategy

Conservation

Strategy Description

Land conservation protects natural areas to ensure they remain healthy and productive for future generations, as well as safeguarding the ecosystem from development and the associated increase in flooding due to the increase in impervious surfaces. Conserved land around riparian areas give riverine flooding a place to occur without damaging physical assets. Conservation easements are a tool that is regularly used in land conservation in which the property owner voluntarily enters into an agreement in which certain uses of the land are forever limited. Conservation easements work to protect the natural resource values of the land such as wildlife habitat, water quality protection, scenic beauty, farming, and working forest.

Narrative

The Town of Varnville owns this property which is located between parcels of higher elevation. This property is downstream of several flooding reports in the northeast side of Varnville. The property has a stream running through it and dry detention areas that do not appear to receive flow. The area is well vegetated with many tree species present including sycamore, loblolly pine, bald cypress, water oak, red oak, magnolia, tulip poplar, and sweetgum. The site size and location suggest an opportunity to create regional, watershed-scale benefits; StreamStats indicates that 292 acres drain to the unnamed stream that crosses under the highway and along the border of the property, ultimately discharging to Sanders Branch to the southwest. The stream is incised, which indicates the opportunity for a restoration project to provide better conveyance and floodplain connection. Furthermore, reconnection of the dry detention areas should enhance the ability of the parcel to manage water for downstream properties. Invasive species removal is recommended as Chinese tallow trees were identified on site. Chinese tallow trees will establish in forested wetland areas and outcompete native tree species for space and water. Key questions remain regarding site history, presence of down or upstream flooding issues, and existing connections to adjacent easements or protected lands.

Location Description

Near the intersection of W. Carolina Ave and Sycamore Street.

Photos

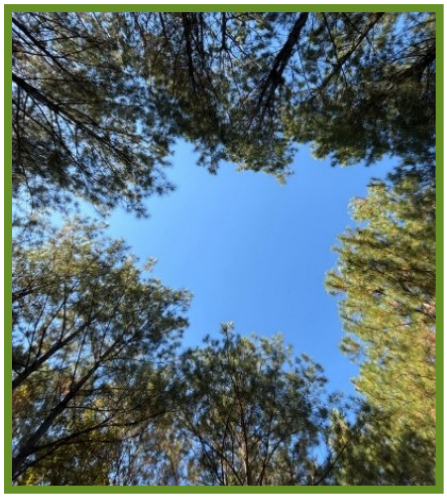
Existing Conditions



Magnolia Grove



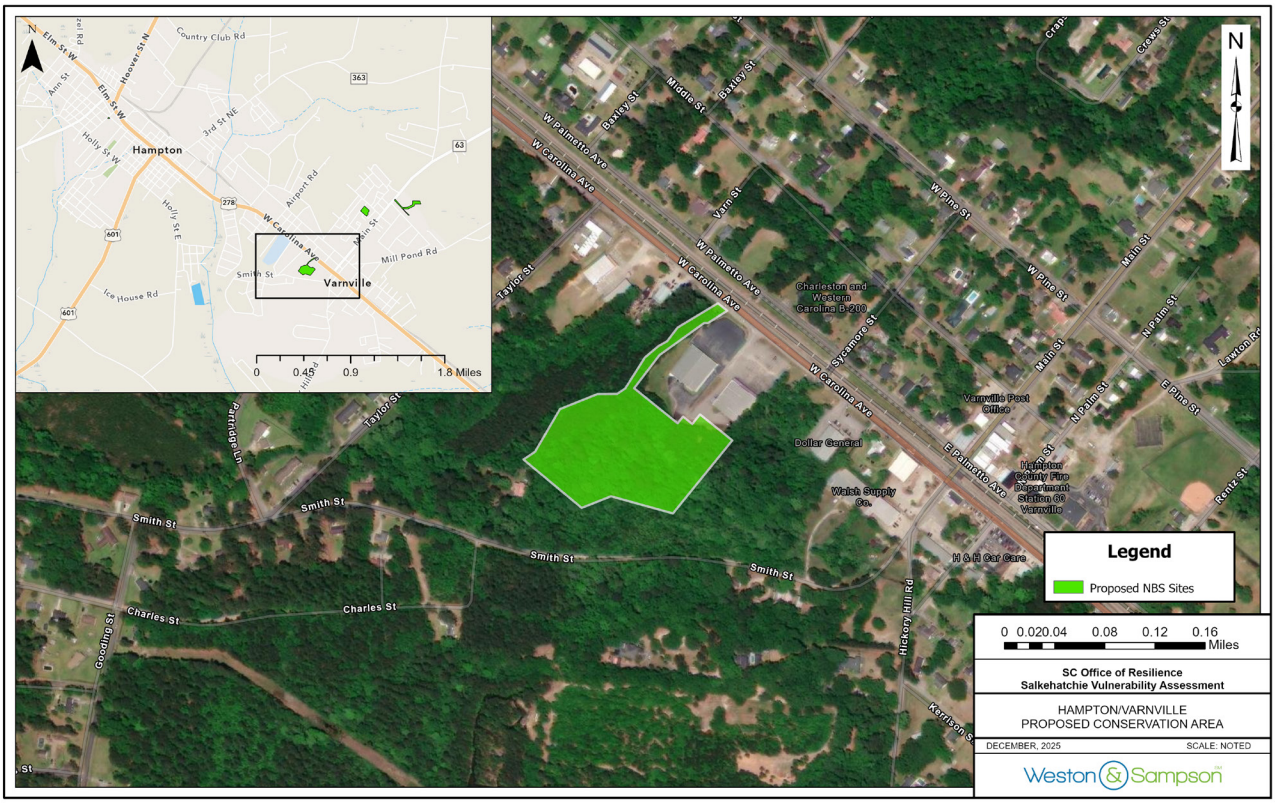
Dried up pond



Tree canopy on Town of Varnville property

Strategy Location and Map

W. Carolina Ave and Sycamore Street



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

Hampton/Varnville Stormwater Park

H.J. Brooks Neighborhood Park in Varnville

Type of Strategy

Stormwater Park

Strategy Description

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

Narrative

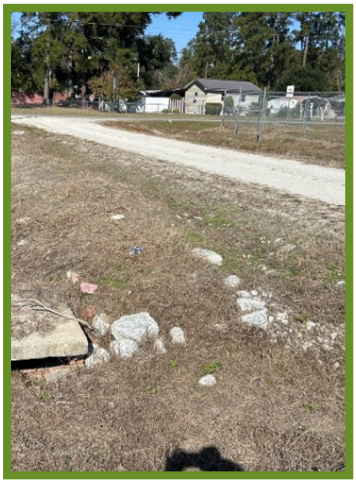
The H.J. Brooks neighborhood park, also known as Ginn Street Park, is an older neighborhood park that shows clear signs of erosion leading into existing catch basins, indicating significant stormwater flow and opportunity for improvements. StreamStats indicates that approximately 31 acres drain to this park. The property is large enough to accommodate both active recreation and added stormwater functions. The current flow path and ultimate outlet are unclear. Catch basins did not have manhole access and were filled with standing water. Further investigation is needed to understand water movement and the condition of underground pipes. There is ample opportunities to add nature-based solutions to the park to improve infiltration, store stomwater, and add native plantings. There is an ongoing park renovation project with a budget for upgrades. Implementing bioretention, native plantings, and bioswales would provide flooding and water quality benefits to the surrounding areas as well as beautify the park and serve as a community demonstration for nature-based solutions. The recommended stormwater park will maintain recreation space while integrating stormwater improvements, pending clarification of existing hydrology and with community input on park preferences. Challenges for the site include Ballpark Road which is unpaved and presents a challenge for some strategies, such as bioretention and bioswales, as the sediment from the dirt road may clog infiltration-based practices. This project ranks as a high priority because of the opportunity to incorporate these improvements as part of ongoing park renovations and because of the associated community benefits.

Location Description

H.J. Brooks Neighborhood Park in Varnville.

Photos

Existing Conditions: Photos 1-3

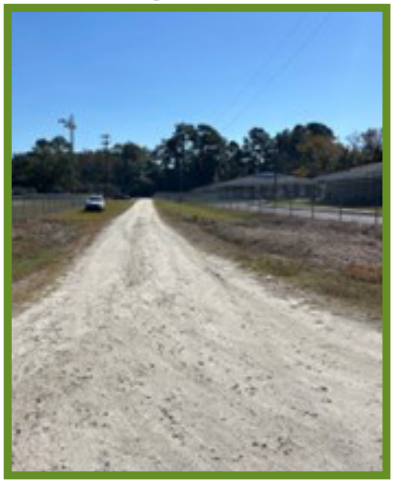


Catch basin with standing water and signs of erosion off Ginn St.



Baseball field

Existing Conditions



Dirt Road with four catch basins and erosion

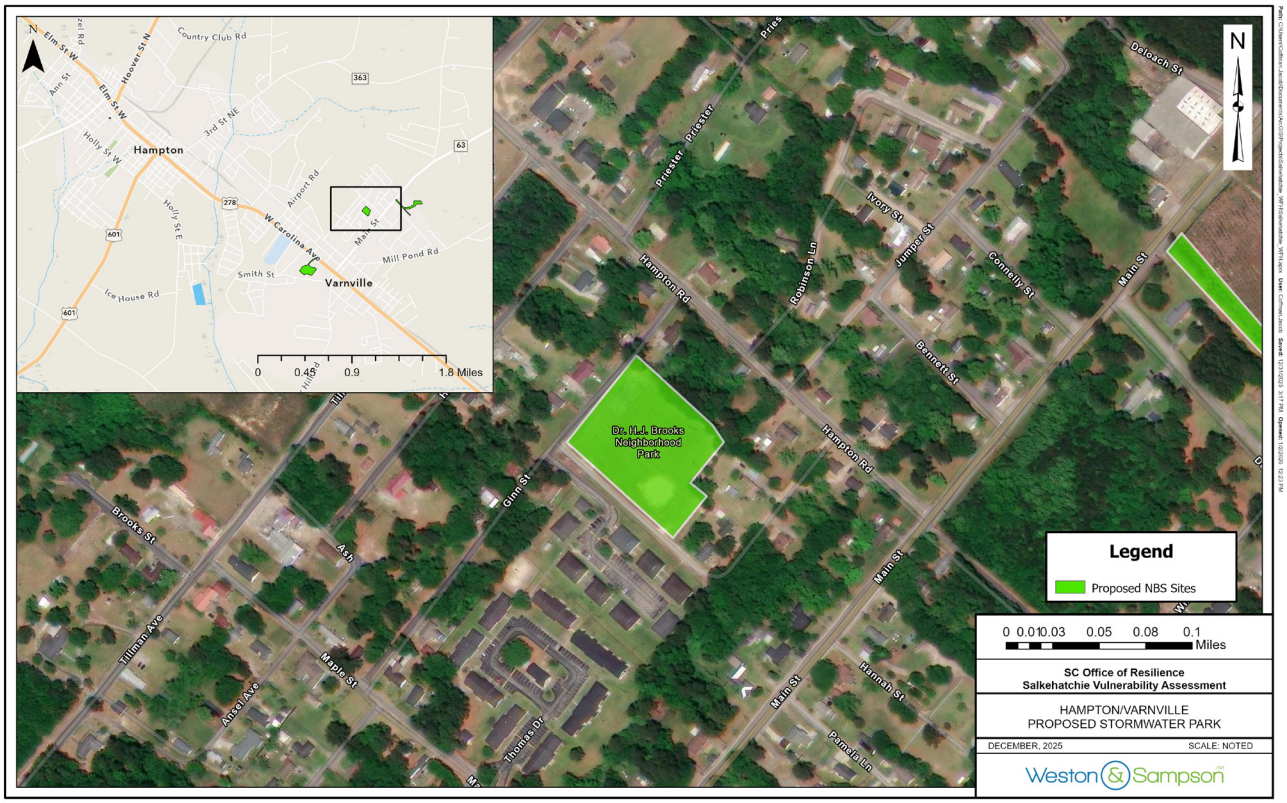
Proposed Improvements



Rendering showing bioswales along dirt road to mitigate erosion

Strategy Location and Map

H.J. Brooks Neighborhood Park



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

Hampton/Varnville Rain Gardens
Hampton Elementary

Type of Strategy
Rain Gardens

Strategy Description
Rain Gardens are landscaped depressions that are designed and located to intercept stormwater runoff from a roof or paved surface. Rain gardens use plants and amended soil media to collect, filter, and infiltrate runoff while also adding native vegetation and habitat enhancements. For this site, multiple smaller-scale rain gardens could be incorporated with minimal impact to existing use of the space.

A constructed wetland mimics the hydrology and ecological functions of natural wetlands. Constructed wetlands are engineered systems that use natural systems including vegetation, soils, and permanent pools to store and capture stormwater runoff and improve water quality. Stormwater runoff may leave the system slowly and reduce downstream flooding. For this site, the constructed wetland is only recommended if additional parcels can be acquired and utilized as part of the project.

Narrative
The elementary school and surrounding parcels offer an opportunity to implement nature-based solutions to benefit the watershed. This approach is highly scalable and could involve multiple educational rain gardens or include a much larger master-planned stormwater park. There are multiple parcels with potential for redevelopment in the vicinity, including a large concrete pad on the adjacent abandoned lot to the northeast. Since this is an elementary school and students play in the field, designed solutions should not interfere with space for student-based activities, and any construction should be well timed to avoid impacts to recreation during the school year. Strategies could involve small infiltration-based practices such as rain gardens that incorporate native plantings and educational opportunities for the students. This would be a good opportunity for education by having students or volunteer organizations involved in installation and maintenance of practices. The school's maintenance crew should be trained in maintaining practices for long-term success. The adjacent parcels could be incorporated to provide a larger benefit to the watershed without taking away recreational space from the students. If additional parcels can be incorporated, then a constructed wetland should be pursued.

Location Description
Hampton Elementary School

Photos
Existing Conditions



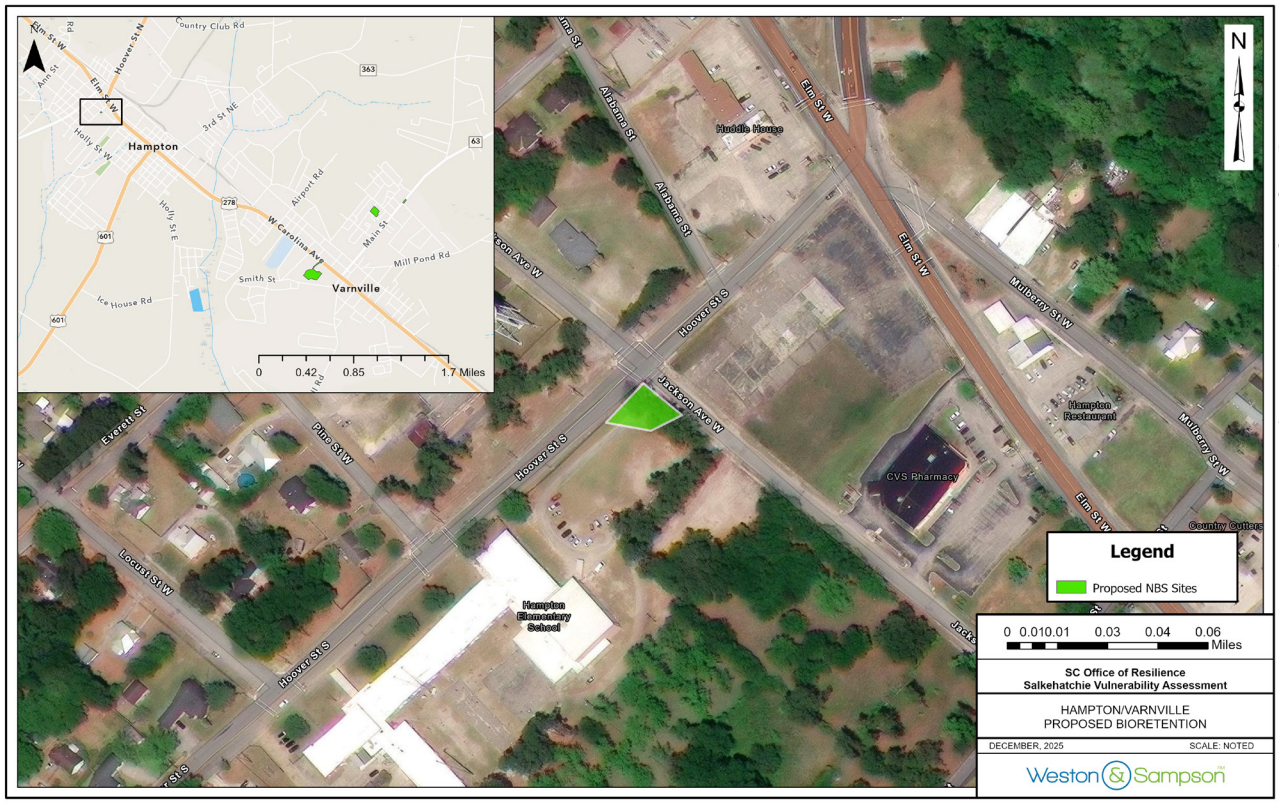
Manhole with curb inlet on Hoover St.



School field with potential for a rain garden or other stormwater practices

Strategy Location and Map

Hampton Elementary School



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 will 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



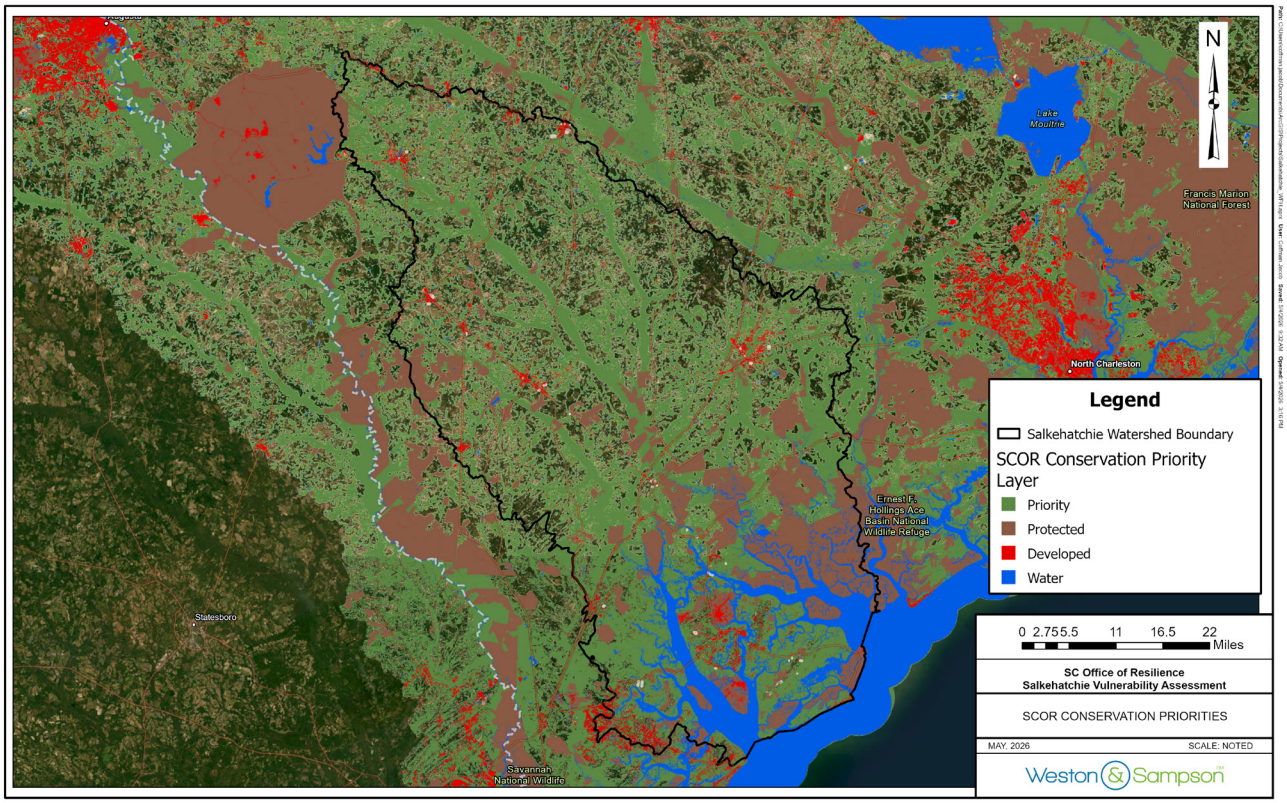
Longleaf Pine Savannas



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.

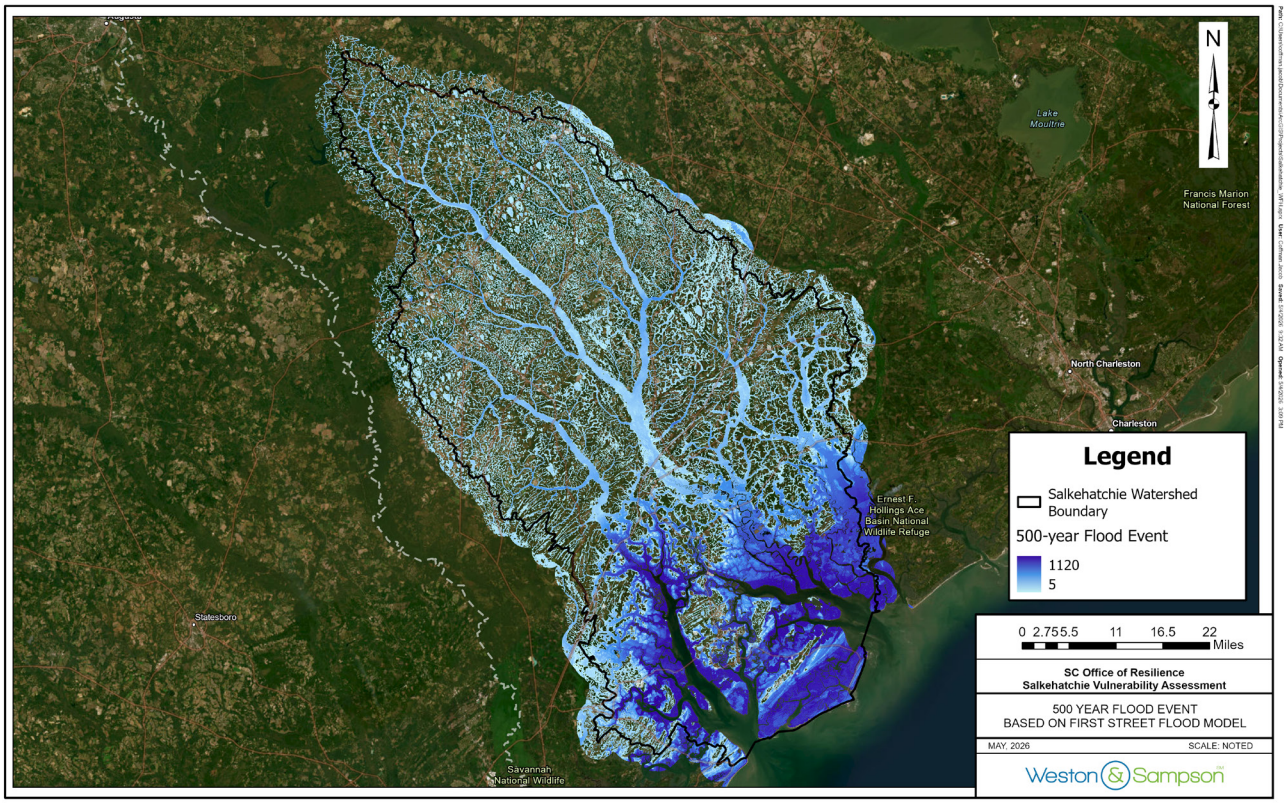
Narrative
This strategy proposes a 1D watershed-wide stormwater model for the Salkehatchie Watershed to improve understanding of hydrologic and hydraulic conditions at a watershed scale. The study can develop a comprehensive watershed model that evaluates current and future flood risks and identifies 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

Anticipated Flood Reduction Benefit

Low | Medium | High

Ease of Implementation

Low Ease | Moderate Ease | High Ease

Estimated Cost

Low | Medium | High

Flood Vulnerability of Location

High



Priority Rating

Low | Medium | High

7. Next Steps

7a. Grant Opportunities & Funding

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

Water Quality & Wastewater Infrastructure

SCDES Section 319(h) Nonpoint Source Grants: This is the primary funding source for addressing agricultural nutrient runoff in the Black Creek- Coosawhatchie River watershed and widespread septic failures. Section 319 funds can be utilized to implement septic tank repair programs or install nature-based solutions to filter runoff before it enters local waterways. (Note: Accessing these construction funds requires an EPA-approved 9-Element Watershed Based Plan).

SC Rural Infrastructure Authority (RIA) State Grant Program (Stormwater): RIA provides critical funding for public wastewater utilities. The county and municipalities should target RIA Regional Planning Grants to study the feasibility of expanding municipal sanitary sewer services to neighborhoods currently reliant on failing septic tanks, ultimately reducing ground and surface water contamination.

Flood Mitigation & Nature-Based Solutions

National Fish and Wildlife Foundation (NFWF) – National Coastal Resilience Fund & Southeast Aquatics Fund: NFWF provides substantial funding for nature-based solutions (NBS) that reduce flood risk while enhancing habitats. These funds are a mechanism for implementing green infrastructure (such as bioretention or stormwater parks) near the elementary schools and along the Boggy Branch corridor to alleviate chronic stormwater backups.

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.

Hazard Mitigation

FEMA Hazard Mitigation Grant Program (HMGP): Administered through the SC Emergency Management Division (SCEMD), these funds are specifically designated for hazard mitigation infrastructure. HMGP is a funding mechanism to stabilize highly vulnerable roads, upsize critical culverts, and harden evacuation routes against future washouts.

7b. Resilience Hubs

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.).

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

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 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).

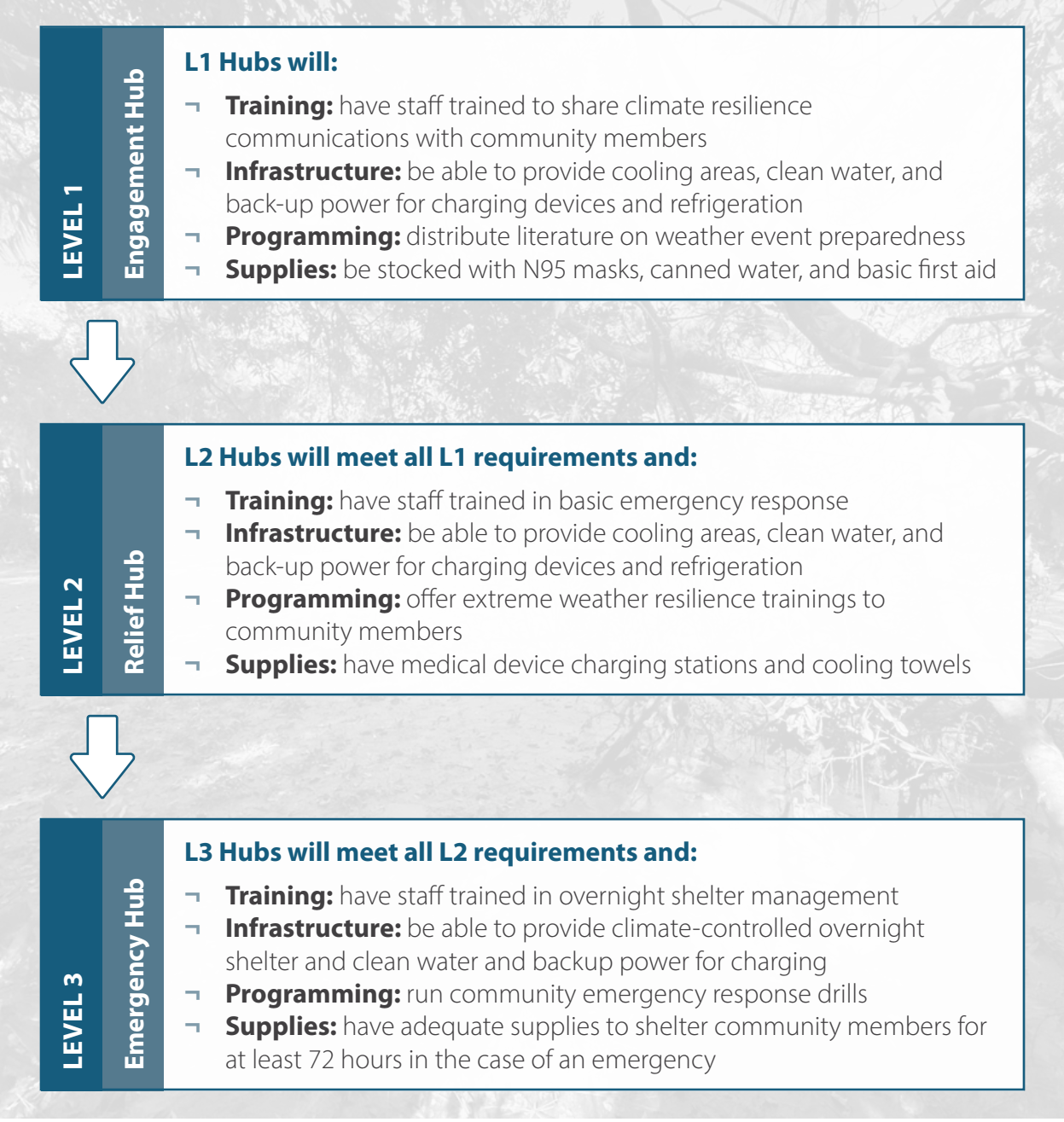


Figure 14: Diagram depicting the three levels of the resilience hub model (Gonzaga University Institute of Climate, Water, and the Environment, 2025). Graphic inspired by the Spokane Community Resilience Hub Network and the Institute for Climate, Water, and the Environment



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

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.

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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.

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.

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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?

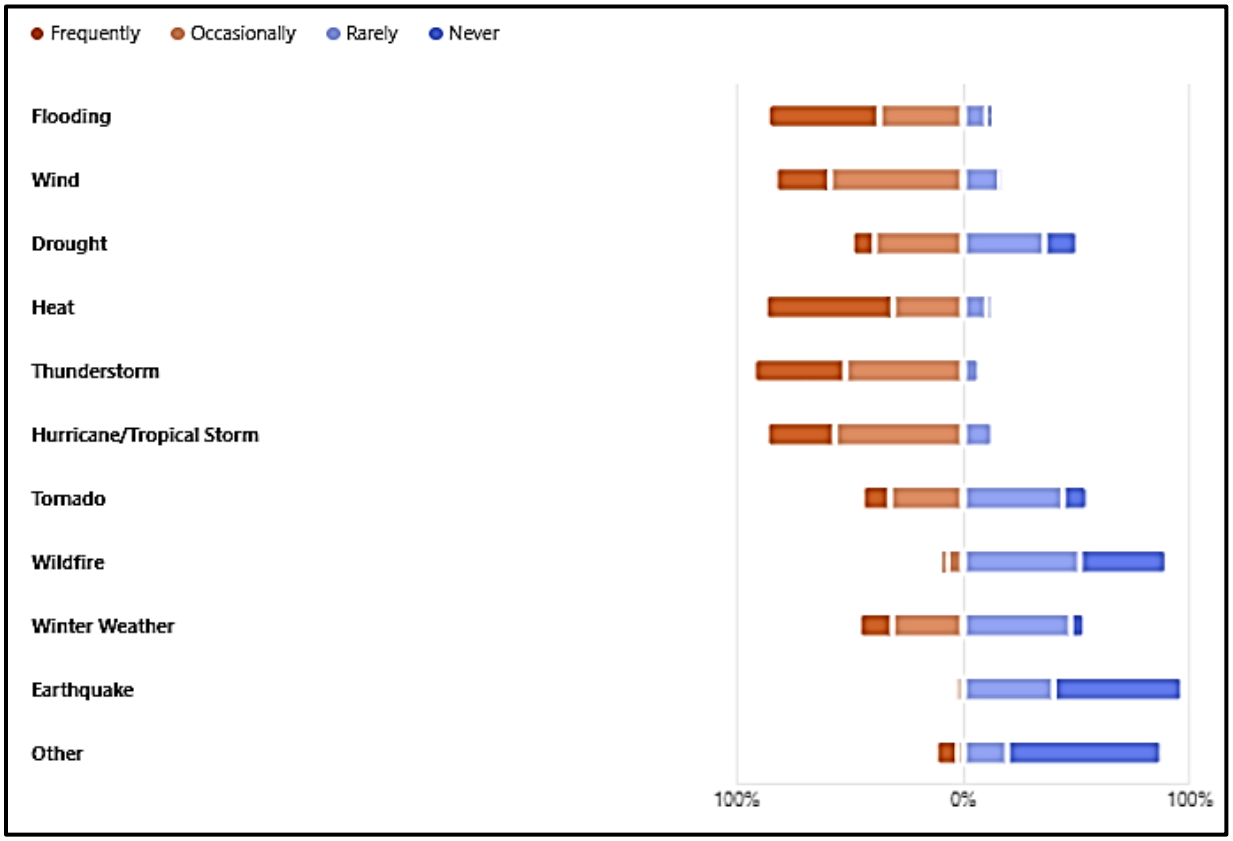
11. If you would like someone with the South Carolina Office of Resilience's Watershed-Based Planning Program to reach out to you to discuss assistance with resilience planning, community needs, identifying funding opportunities, and more, please provide your email here:

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#

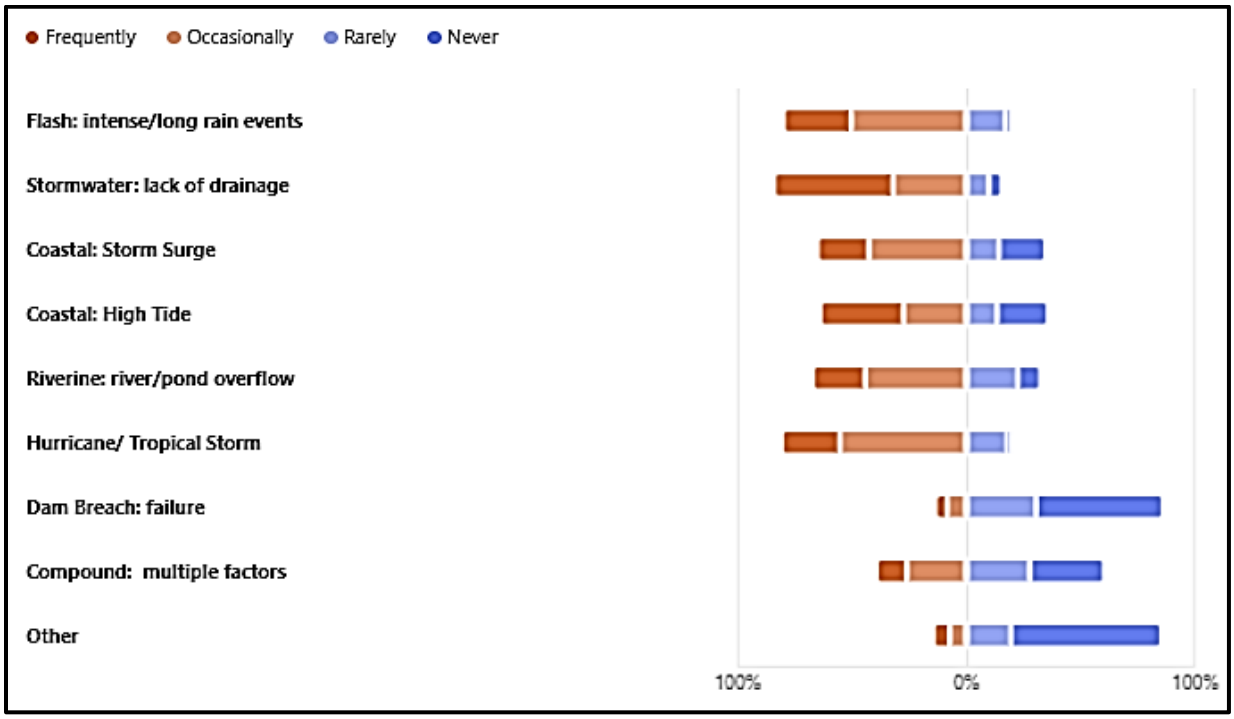
The natural hazards reported by respondents to be of greatest concern were: Heat, Flooding, Thunderstorm, Hurricane, and Wind



Heat		Flooding		Wind	
Frequently	56.6%	Frequently	49.7%	Frequently	24.3%
Occasionally	30.9%	Occasionally	36.9%	Occasionally	58.8%
Rarely	10.3%	Rarely	10.2%	Rarely	16.2%
Never	2.2%	Never	3.2%	Never	0.7%

Thunderstorm		Hurricane/Tropical Storm	
Frequently	40.7%	Frequently	30.3%
Occasionally	52%	Occasionally	56.6%
Rarely	7.3%	Rarely	13.2%

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%

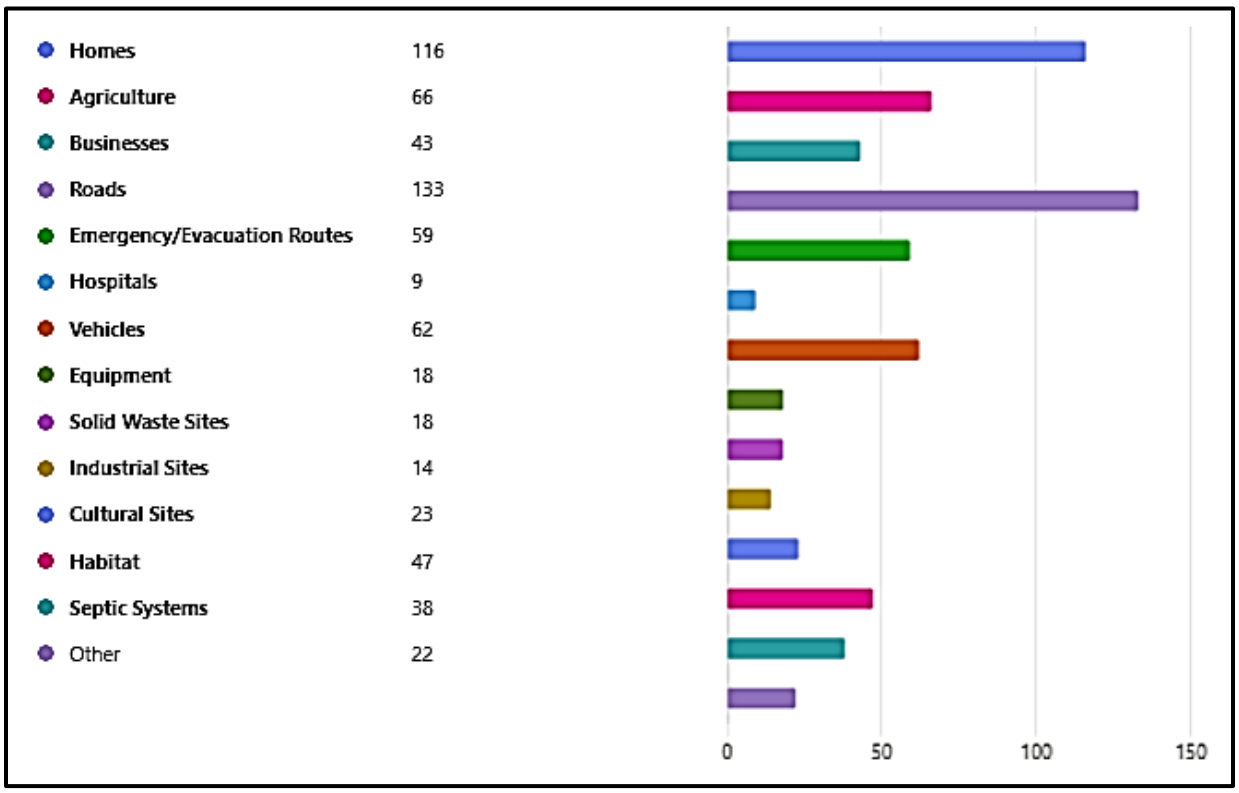
Coastal: High Tide	
Frequently	36.6%
Occasionally	27.5%
Rarely	13.4%
Never	22.5%

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%

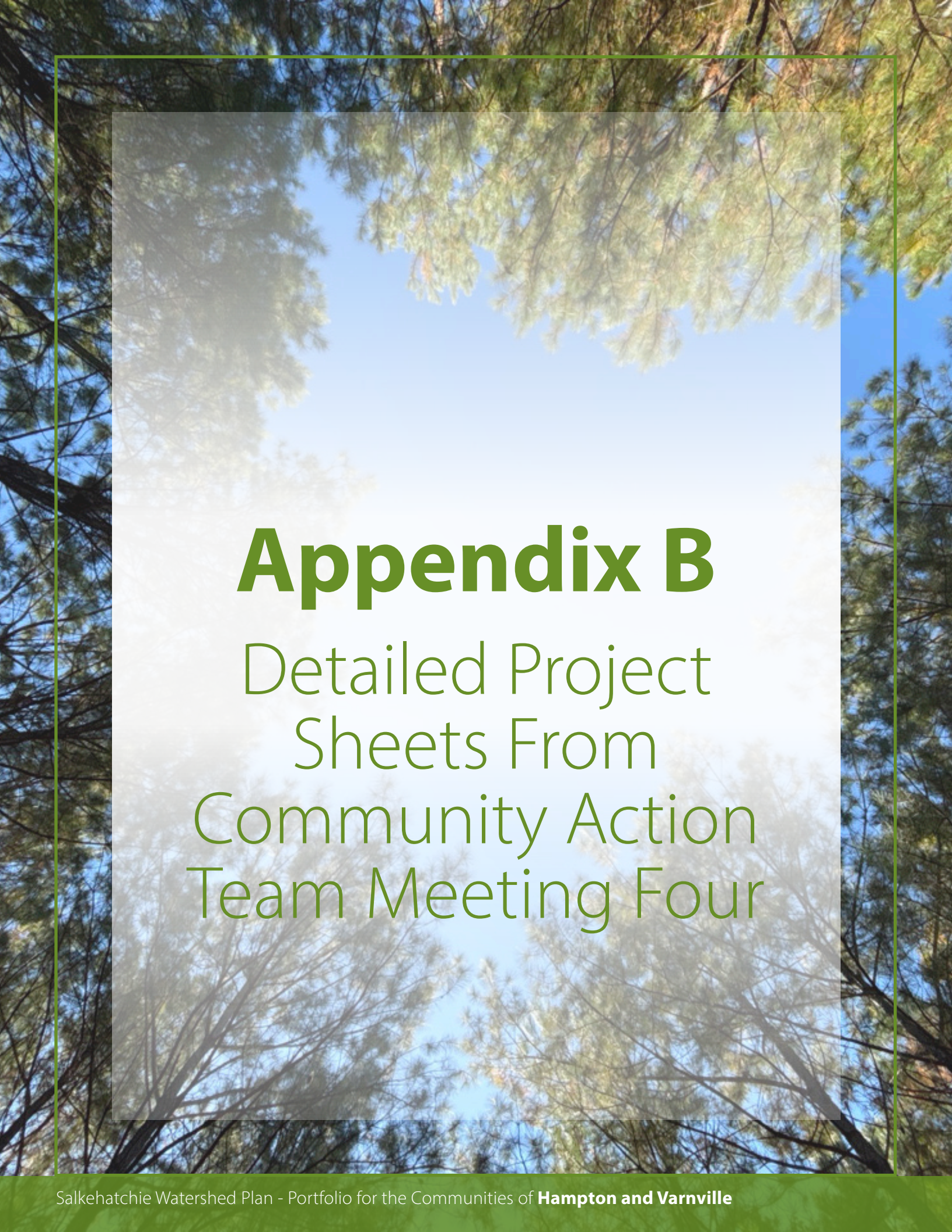
Survey respondents reported many impacts from flooding. Roads, Homes, Agriculture, Vehicles, and Evacuation routes topped the list.



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: Hampton/Varnville

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

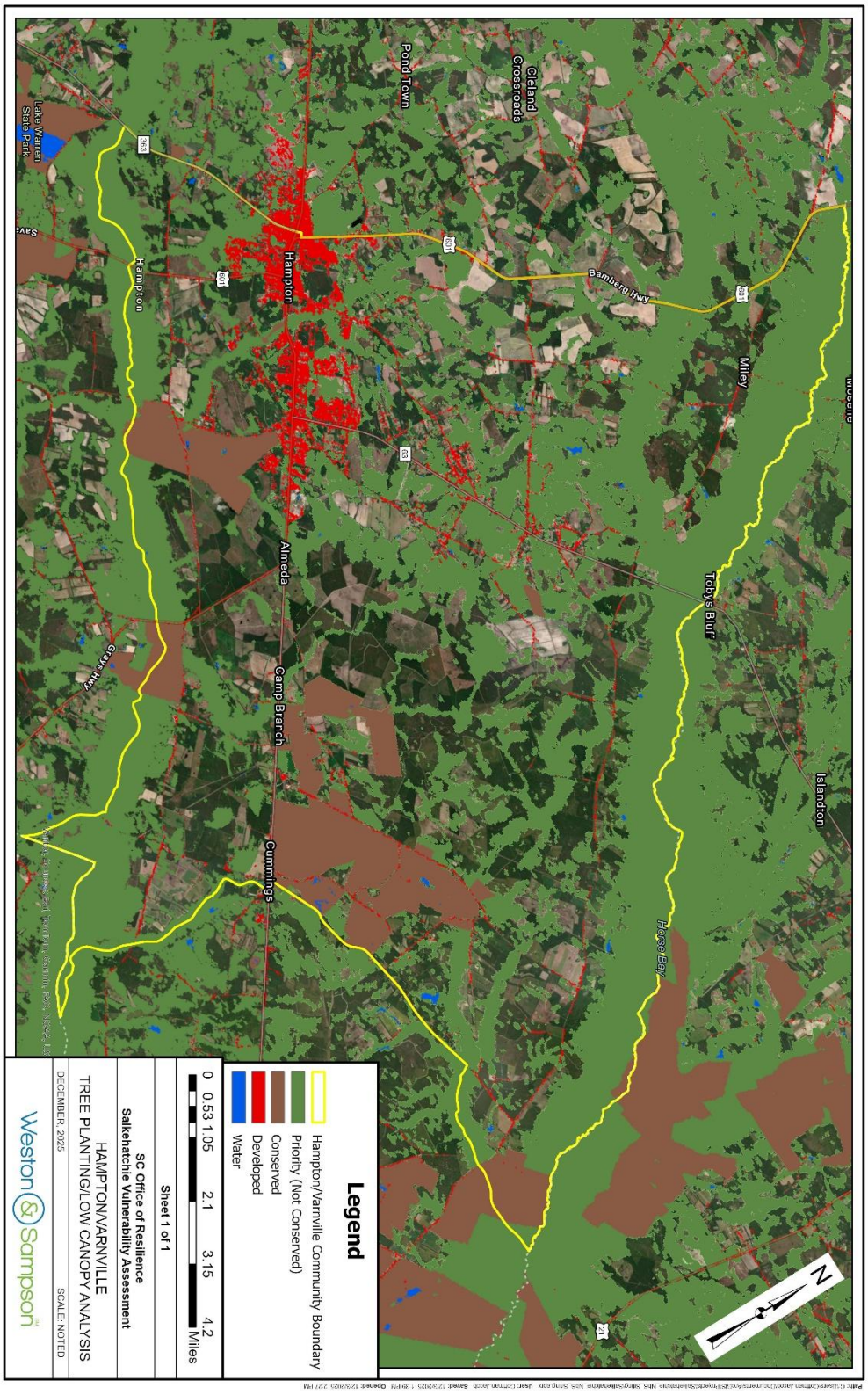
Estimated tree canopy cover: Variable

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 Conservation Priority Data

Salkehatchie Project Sheet

Community: Hampton

Potential Adaptation Strategy: Bioretention

Address: Hampton Elementary School

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

Rainfall in past 24 hrs (CoCoRaHS): No Rain

Structure(s) on site: ☐ Yes ☒ No

Describe structure(s): Utility pole with flood light, school sign.

Description of paved surfaces on site: 5 ft wide cement walking path, track in oval shape around edge.

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

Estimated tree canopy cover: 5%

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): Inlet on adjacent, water flow from SW+NW to NE.

Comments/Observations: Parcel to northeast is overgrown cement pad, could be tied into a larger adaptation practice. Kickball field cage on site. Parcel to east is abandoned. Hesitant about taking away kids' play space.

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





1. Walking path and kickball field as seen from Hoover St.

2. Curb inlet with culverts on Hoover St.



3. Manhole with curb inlet on Hoover St.

Salkehatchie Project Sheet

Community: Hampton

Potential Adaptation Strategy: Conservation

Address: Near Intersection of W Carolina Ave and Sycamore Street

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

Rainfall in past 24 hrs (CoCoRaHS): No Rain

Structure(s) on site: ☐ Yes ☒ No

Describe structure(s): None

Description of paved surfaces on site: None. But nearby warehouses and parking lot.

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

Estimated tree canopy cover: 95%

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): Incised stream.

Comments/Observations: There are several large, abandoned warehouses next to the site. The trees here include sycamore, sweetgum, loblolly pine, water oak, bald cypress, red oak, red cedar, magnolia, and tulip poplar. There are also young mixed hardwoods and pines, with a few larger loblolly pines scattered around. We're also seeing signs of wetlands. What's the history of this property? Are there any flooding problems downstream? If so, could this area be improved to help hold more stormwater? Is this park connected to any existing conservation easements or protected lands? Can the abandoned lots nearby be restored or reused? There may be an opportunity for a broader, regional benefit here.

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



1. Incised stream through middle of property. 2. Magnolia grove.



3. Dried up pond.



4. Open spot in canopy.

Salkehatchie Project Sheet

Community: Hampton

Potential Adaptation Strategy: Culvert Maintenance

Address: Main St and Dennis Blvd

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

Rainfall in past 24 hrs (CoCoRaHS): No Rain

Structure(s) on site: ☐ Yes ☒ No

Describe structure(s): None

Description of paved surfaces on site: Main St.

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, material, condition): There are culverts under the road and grass ditches that need maintenance. Culverts vary in sizes from 15-30 inches.

Comments/Observations: Floodwater probably can't move the way it's supposed to because parts of the ditch have been filled in. A bioswale isn't a good fit for this ditch, since it would likely clog from the amount of runoff coming from nearby areas. This spot would also require regular maintenance to keep it functioning properly. There's no evidence that floodwaters have ever flowed over the road at this location.

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





1. 1-2in of standing water on south side of Main St. 2. Culvert running under Main St.





3. Ditch and approx. 30 inch pipe going southeast on Dennis Blvd. 4. 36” culvert going west under Dennis Blvd.

Salkehatchie Project Sheet

Community: Hampton

Potential Adaptation Strategy: Stormwater Park

Address: H.J. Brooks Neighborhood Park in Varnville

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

Rainfall in past 24 hrs (CoCoRaHS): No Rain

Structure(s) on site: ☒ Yes ☐ No

Describe structure(s): Ball field and playground.

Description of paved surfaces on site: Paved playground area in north corner of park.

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, material, condition): Underground stormwater pipe along entire northwest edge of park.

Comments/Observations: There is standing water in every catch basin. It's not clear how the park is currently being used or how the roadside curbs are meant to direct water. We couldn't locate a visible outlet for the stormwater system, but it appears that the pipes may run underneath the ball field. We need to know the soil's infiltration rate to understand how well water can soak in. This seems to be an older park, and the erosion around the catch basins shows that a fair amount of runoff is already flowing into the system. There seems to be enough space to keep all the recreational uses while still adding stormwater improvements. The next step is figuring out exactly where the water is being directed, since there's no obvious outlet at the site.

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



1. Low point of the property.



2. Dirt road with four catch basins and erosion.



3. Catch basin off Ginn Street.



4. **Proposed:** Dirt road with bioswales.

Salkehatchie Project Sheet

Community: Hampton

Potential Adaptation Strategy: Culvert Assessment

Address: Yemassee Hwy / Tara Rd

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

Rainfall in past 24 hrs (CoCoRaHS): No Rain

Structure(s) on site: ☒ Yes ☐ No

Describe structure(s): Bridge 1: 10 pilings; steep slopes. Bridge 2: parallel to railroad track

Description of paved surfaces on site: Yemassee Highway

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

Estimated tree canopy cover: ~90% outside right of way.

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): Click or tap here to enter text.

Comments/Observations: There is a very low area between the bridges that clearly holds water after storms, but the nearby roads sit much higher, so the roads likely aren't at risk often. There's no evidence of any damage from past flooding. The low areas next to the road are likely to flood during heavy rain, but that seems expected for the area. The municipality should make sure no new buildings are put in the low corner where flooding is most likely. Overall, there are no signs of significant or harmful flooding in this area.

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



1. Railroad bridge as seen from Yemassee Hwy. 2. Looking south from Yemassee Hwy bridge.



3. Standing water as seen from bridge. 4. Standing water from below bridge.

Salkehatchie Project Sheet

Community: Hampton/Varnville

Potential Adaptation Strategy: Tree Canopy 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): Open fields and other areas that lack canopy cover.

Description of paved surfaces on site: Places for recommended tree plantings may be adjacent to paved surfaces such as roadways or parking lots.

Existing vegetation (all that apply):☐Woods ☐Shrubs ☐Dirt ☐Open Fields

Estimated tree canopy cover: 0 to 15%

Presence of standing water: ☒ Possible ☐No

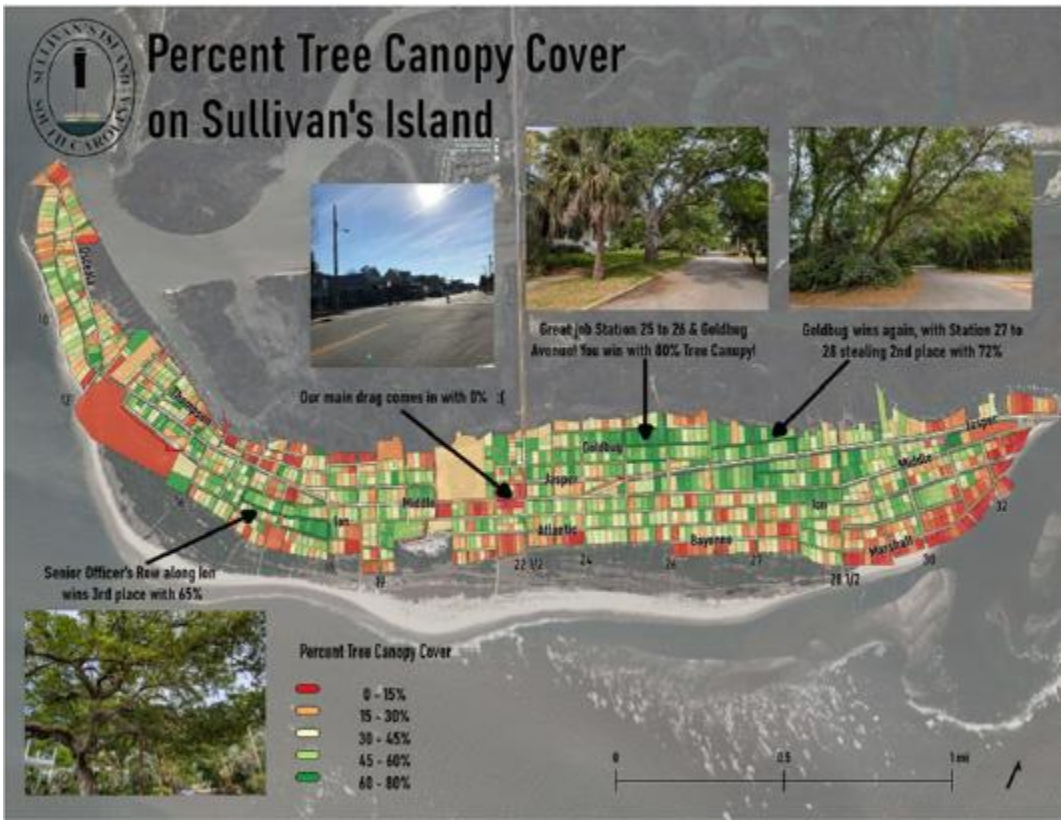
Drainage on site (all that apply): ☐Grassed Ditches☐ Stormwater Pipes/Culverts ☐Stormwater Ponds ☐Inlets ☐Curbs ☒Other: Forested areas can assist with drainage.

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

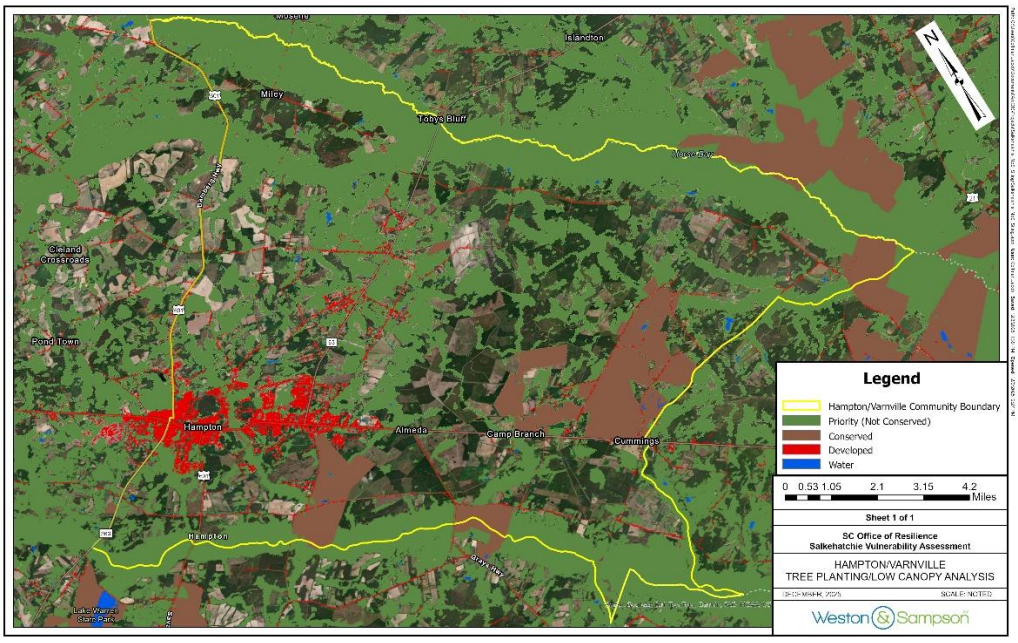
Comments/Observations:

A healthy tree canopy offers abundant benefits including cooling effects, beautification, water management, pollution remediation, and wildlife habitat. A tree canopy analysis, in coordination with the South Carolina Forestry Commission and other organizations, can offer guidance to increase tree plantings on public and private property and recommend strategies for long-term forest success. Open fields that may lay fallow from former agricultural use can be converted to forested areas to assist with water management and more. A tree canopy analysis will help to identify areas with low to no tree canopy cover and prioritize areas for tree planting.

Supportive Graphics:



Source: Town of Sullivan's Island Tree Canopy Mapping



Source: SC Office of Resilience Conservation Priority Data



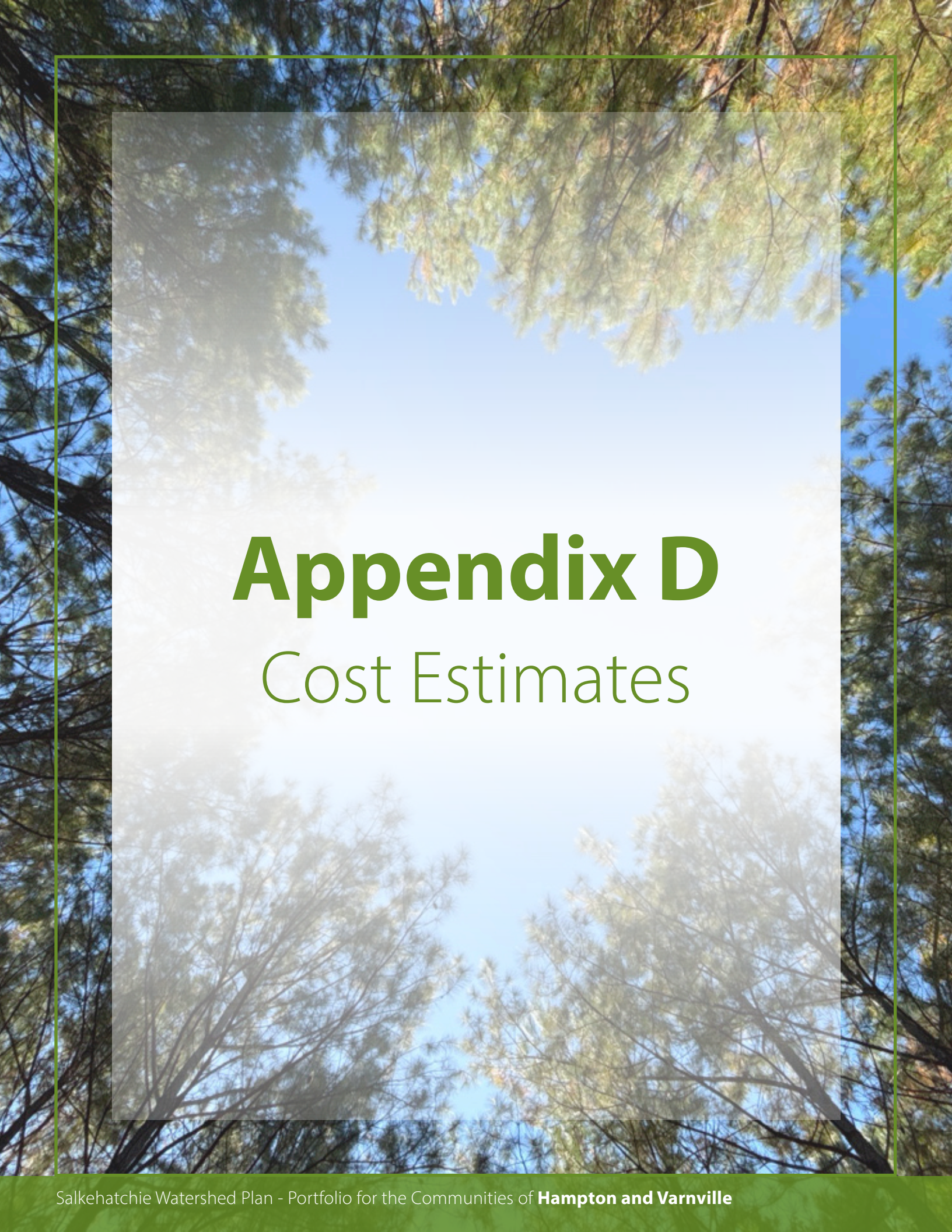
Appendix C

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:

Hampton/Varnville Conservation

Conservation Easement

Community: Communities of Hampton and Varnville

Strategy Address/Location: W. Carolina Ave. and Sycamore St. Parcel southwest of 181 W Carolina Ave, TMS#120-11-06-013 (32.482798, -80.954720)

Date of Estimate: 03/31/2026

Overarching Assumptions

- Property is already owned by the municipality interested in placing a conservation easement on the property.

Transaction Costs

- Appraisal:
    - Description- A qualified conservation easement appraisal determines the property's value before and after the easement to calculate the value of the donated development rights. This valuation is required by the IRS to claim federal tax benefits.
    - Assumptions- Estimated from a Tall Timbers example published online (Tall Timbers is a nonprofit organization based out of FL that does conservation easement work in SC). This estimate was adjusted downward because this is a smaller, 7-acre parcel.
    - Disclaimer- A qualified appraiser would determine highest and best use, and consider comparable land sales, development potential, zoning, subdivision potential, proximity to roads/utilities, and existing structures. The appraisal must meet IRS conservation easement standards.
- Attorney:
    - Description- An attorney reviews and helps finalize the conservation easement document to ensure the landowner's rights are clearly defined and legally protected, and that the agreement complies with state and federal law.
    - Assumptions- Taken directly from Tall Timbers example
- Title opinion:

    - Description- A title opinion confirms that the landowner has clear legal ownership of the property and the authority to grant a conservation easement and identify any liens or encumbrances.
    - Assumptions- Proof of ownership may be required depending on existing documentation. The Tall Timbers example was used here and reduced slightly because of the small parcel size and likely clear ownership. Title insurance or opinion costs vary by transaction complexity.
- Accountant:
    - Description- An accountant advises on the tax implications of the easement donation, including how to apply federal deductions and South Carolina tax credits, and ensures proper reporting to maximize financial benefits.
    - Assumptions- Accountant fee from Tall Timbers example adjusted down slightly for small lot size.
- Land Trust Cost Recovery:
    - Description- Some land trusts request reimbursement for the staff time and technical work required to complete the easement, including site visits, mapping, baseline documentation, and drafting the agreement.
    - Assumptions- Often based on a percentage of the conservation easement's value (1%). The reimbursement fee is slightly overestimated due to the small property size to be safe. Covers baseline documentation report, staff time, mapping, conservation management plan, and admin costs.
- Stewardship Donation:
    - Description- A one-time contribution to the land trust's stewardship fund, used to support long-term monitoring and enforcement of the easement in perpetuity. This is often based on a percentage of the easement value.
    - Assumptions- Some land trusts require a donation equal to 1% of the value of the conservation easement. The conservation easement value is roughly estimated at $12,600. This could be larger if the Owner wants to entice a land trust to accept the property.
- Survey (if needed):
    - Description- A land survey may be required to clearly define property boundaries or the specific area under easement, especially if only a portion of the property is being conserved or if existing legal descriptions are unclear.
    - Assumptions- Not always required but recommended by Tall Timbers. If the entire parcel is put under easement and an existing legal description exists then a survey may not be required.

Tax Deductions

- Federal Tax benefit
    - Description- This tax benefit is a percentage of the total easement value and can be claimed all in one year or taken as 50% of adjusted gross income annually.
    - Assumptions- Assuming landowner is in a 32% tax bracket and the deduction would be all used in one year as opposed to 50% of adjusted gross income annually. Estimated easement value = $12,600. 32% of the easement value is this number.
- SC State Tax Credit
    - Description- SC state offers the smaller of two "caps" as tax credit for a conservation easement. Either 25% of the easement value ($3,150) or $250 per acre ($1,750).

Assumptions- Note that a larger tract of land placed under conservation easement carries more tax incentive and with a large enough tract of land the tax benefits can outweigh the costs.

Table 1. Planning and Design Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
Appraisal	*LS*	*1*	5,000	5,000
Attorney	*LS*	*1*	1,500	1,500
Title opinion	*LS*	*1*	3,000	3,000
Accountant	*LS*	*1*	1,500	1,500
Land Trust Cost Recovery	*LS*	*1*	3,000	3,000
Stewardship Donation	*LS*	*1*	125	125
Survey (if needed)	*LS*	*1*	5,000	5,000
Subtotal Planning and Design				**19,125**
Federal Tax Benefit	*LS*	*1*	-4,000	-4,000
SC State Tax Benefit	*LS*	*1*	-1,750	-1,750
Contingency (30%) *				**4,013**
GRAND TOTAL				**17,388**

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

Optional Add-Ons

- Drainage Study

    - During the site visit, the stream channel on the property appeared incised, which may indicate that it is conveying more stormwater than it can naturally handle. To better understand site and watershed-level flood storage capacity, a drainage or flood study is recommended. This analysis could also help inform a broader conservation strategy by identifying areas vulnerable to increased impervious cover or located within sensitive stream corridors.
- Stream Restoration
    - If a drainage study is completed, it may support the development of a targeted stream restoration project. Restoration efforts could address the incised channel and improve the stream's ability to slow, store, and manage stormwater more effectively.

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

Hampton/Varnville Stormwater Park

Stormwater Park (bioswales)

Community: Communities of Hampton and Varnville

Strategy Address/Location: H. J Brooks Neighborhood Park on Ginn Street

Date of Estimate: 3/31/2026



1. Proposed Bioswales along Ballpark Lane in green

Planning and Design

- Project Management:
    - Description- Coordinate with the Owner on the proposed schedule, project progress, deliverables, and budget for the project duration. Meet on a bi-weekly basis to provide updates on budget, progress on deliverables, gain feedback, and discuss needs. Provide monthly invoices that include an estimate of percent complete and percent spent, and an estimate of hours spent during the prior month as well as hours spent to date.

    - Assumptions- Project is billed as lump sum. Regardless of billing arrangement, project management deliverables will remain consistent and include regular communication and opportunities for the Owner to provide feedback on design.
- Surveying:
    - One pre-construction survey is needed and should be provided as PDF and CAD files.
    - Pre-construction survey must include:
        - Property corners and property lines for subject parcel
        - Edge of pavement, centerline and edge of roadway on Ballpark Laneand edge of rights of ways, centerline and edge of DOT right-of-way on adjacent roadway (Ginn Street), paths and edge of pavement for intersecting streets for project extents
        - Existing structures (fencing, asphalt/concrete pads for sports, signs, etc.)
        - Existing utilities
        - Utility easements or rights of ways
        - Drainage infrastructure (including inlets, outfalls, catch basins)
        - Topography of roadside ditch areas
        - Wetland delineation
- Permitting:
    - Description- Estimate for coordination with Town/County.
    - Assumptions- no permits will be needed except for minimal coordination with the Town/County, disturbance is under 1 acre, Ballpark Lane is locally owned, not directly altering any drainage infrastructure.
- 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 the Owner 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 bioswales, limits of disturbance, property boundaries, existing wetlands, structures on site, trees, connecting existing drainage infrastructure.

        - Details and notes for bioswales 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 2. Planning and Design Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
Project Management	*LS*	*1*	4,500	4,500
Surveying	*LS*	*1*	3,500	3,500
Permitting	*LS*	*1*	2,000	2,000
Engineering	*LS*	*1*	15,000	15,000
Subtotal Planning and Design				**25,000**

Construction and Implementation

- Site Preparation:
    - Description-
        - Bioswale: Excavation for two bioswales bordering Ballpark Lane, each bioswale will have 12.5' top width, 0.5' bottom width with 2' depth at a 3:1 side slope for 400 LF each.
    - Assumptions- 811 shall be called to locate existing utilities ahead of digging.
- Soil Amendments:
    - Description-
        - Bioswale: 4" depth along bottom width and side slopes. 4" depth along bottom width and side slopes for mulch.
    - Assumptions- Costs include delivery.
- Planting:
    - All disturbed areas besides bioswale areas to be seeded with turf grass and provided with temporary irrigation.
    - Bioswale:
        - Plantings installed by hand per planting plan. Plants shall be native species.
        - Temporary irrigation for bioswale until plants are established.
        - Assumptions- plants are available and purchased from a local nursery. Costs include delivery.

- Structural Elements:
    - Bioswale
        - Assumptions: underdrain not included in cost but could potentially be needed based on soil infiltration capabilities.

Note: All items include delivery and installation where applicable.

Table 3. Construction and Implementation Costs

Item	Unit	Quantity	Unit Cost ($)	Total ($)
2 Bioswales ~ 400 LF each				
Site Preparation – excavation 24-36"and grading	*CY*	*920*	50	46,000
Double or triple shredded hardwood mulch	*2 CF*	*880*	7	6,160
Non-mushroom Compost (Cotton Burr Compost)	*2 CF*	*370*	12	4,440
Temporary road closure	*LS*	*1*	1,000	1,000
Planting	*SF*	*10,000*	3	30,000
Educational Signage	*EA*	*1*	1,500	1,500
Subtotal Construction and Implementation				**89,100**
Construction Oversight (20%)				**17,820**
Contingency (30%) *				**34,230**
GRAND TOTAL Planning, Design, Construction, and Implementation				**166,150**

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

Maintenance

- Plant Maintenance:
    - Description- 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.
    - Assumptions- Town or City staff/landscapers will oversee maintenance
- Erosion Repair:
    - Bioswale – bimonthly 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.

- Assumptions- Town or City staff/landscapers will oversee maintenance

Table 4. Maintenance Effort Per Year

Item	Unit	Quantity
Plant Maintenance	*Hrs*	48 (4 staff hours per month)
Erosion repair	*Hrs*	24 (4 staff hours every other month)

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.