SOUTH CAROLINA

Nonpoint Source Management Program

Annual Report

2022

South Carolina Department of Health and Environmental Control

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TABLE OF CONTENTS

I. HISTORY OF SC'S NONPOINT SOURCE MANAGEMENT PROGRAM

Recognizing the growing problem of NPS pollution, in 1987, Congress added nonpoint source provisions to the Clean Water Act (CWA) under Section 319. Among other provisions, Section 319 requires each state to develop and maintain a Nonpoint Source Management Program to comprehensively address nonpoint sources of pollution. Contingent on EPA's approval of the State's NPS Management Plan, Section 319 also provides grants to states for implementing NPS best management practices (BMPs).

The Nonpoint Source Management Plan has been prepared in accordance with Federal and State regulations and was originally approved by EPA in 1990. The South Carolina Department of Health and Environmental Control (DHEC) has statutory authority to enforce the Nonpoint Source Management Program provisions of 33 U.S. Code § 1329 through the SC Pollution Control Act, S.C. Code Ann. § 48-1-10, and the regulations and permitting programs promulgated pursuant to the Pollution Control Act. Additionally, the South Carolina Coastal Zone Management Act of 1977, S.C. Code Ann. § 48-39-10, provides additional authority in the coastal counties of the State. South Carolina received full coastal program approval by EPA in 2008. Since the original South Carolina NPS Program was developed, the Nonpoint Source Management Plan has been updated twice. The current plan (2020-2024) reflects improvements and additions to many of South Carolina's NPS management program activities and a refocus of program goals.

II. 2020-2024 NONPOINT SOURCE PROGRAM MISSION AND GOALS

MISSION

The South Carolina Nonpoint Source Program will protect high quality waters from NPS threats and restore waters impaired by NPS pollution.

GOALS:

1. **Restoration of SC Waters** – to restore waterbodies that are impaired by nonpoint sources so that they meet water quality standards
2. **Protection of SC Waters** – to prevent nonpoint source-related impairments of unimpaired waterbodies

DHEC has established five guiding principles to help implement strategies to achieve NPS Management Program goals and objectives for the management plan period of 2020-2024. In order to quantitatively measure progress towards DHEC's long-term goals, objectives with measurable milestones have been developed that further define the direction and activities related to achieving the intent of each goal.

III. PLAN IMPLEMENTATION

A. WATERSHED MANAGEMENT

As seen in Figure 1, DHEC divides South Carolina into eight major river basins: Broad, Catawba, Edisto, Pee Dee, Salkehatchie, Saluda, Santee, and Savannah. Together, these river basins contain over 26,000 miles of stream, 393,000 acres of lake, and 280 acres of estuary. These eight basins are broken into 12-digit Hydrologic Unit Codes (HUCs). EPA requires the use of watershed-based plans (WBPs) for 319 implementation projects and has issued specific guidelines regarding nine required elements that must be included in those plans. In order to focus efforts and most effectively target stakeholders during the project, SC's Nonpoint Management Program looks at watersheds based on 12-digit HUCs. Specifically, both WBP development and 319 project solicitations specify that proposals should have a limited

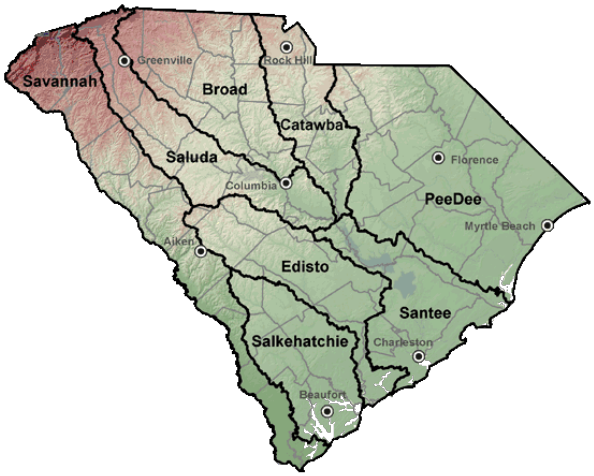

Figure 1. South Carolina's Eight Major Watersheds

watershed size to provide a workable focus area during the limited project time. Most accepted proposals cover a reasonable geographic scope of one to four 12-digit HUCs.

DHEC has developed a suite of tools to assist stakeholders in the creation and implementation of watershed-based plans. South Carolina's watershed approach takes a holistic view of nonpoint source pollution, addressing all sources within a watershed using complementary practices. The NPS Program continues to look for ways to coordinate and target resources from multiple program areas in watersheds with NPS problems, helping to ensure that maximum water quality benefits are achieved.

Each major basin in South Carolina has a Watershed Manager that supports watershed-based planning and water quality improvement projects to protect and restore waterbodies. Watershed Managers work closely with community stakeholders to develop and implement plans to address nonpoint sources of pollution. Successful development and implementation of WBPs depend upon the involvement and support of local stakeholders. Watershed Managers work with DHEC staff, local governments, other state agencies, academia, conservation organizations, landowners, and citizens in addressing chronic NPS problems throughout the state through appropriate use of BMPs. Watershed Managers also provide technical assistance in the identification, assessment, and long-term management of NPS pollution problems affecting waters of the state, primarily through the 319-grant process.

B. REGIONAL NONPOINT SOURCE RESPONSE

Due to increased population growth and drastic changes in land usage, acute nonpoint source incidents are increasing in both frequency and potential water quality impacts. DHEC's regional staff investigate nonpoint source-related complaints, including problems from silviculture, agriculture, stormwater, and runoff from construction sites.

Personnel attempt to prevent any further impact and work toward mitigation of offsite impacts with the responsible party and other interested entities. Uncooperative or recalcitrant parties are referred to DHEC's Bureau of Water Enforcement Section for violations of the Pollution Control Act and the State's Antidegradation Regulations.

C. CHAMPIONS OF THE ENVIRONMENT

The Champions of the Environment program resumed its annual grant award competition for the 2021-2022 grant cycle. Ten winners were selected for projects ranging from composting to establishing pollinator gardens. One school's project directly addressed the impact of nonpoint source pollution on water quality.

Students at Cherokee Creek Boys School sampled water quality for their Adopt-a-Stream Project. Barton Creek, in Oconee County, begins in Sumter National Forest and runs through agricultural and recreational fields before flowing through the school property. This provided a hands-on opportunity for science classes of varying grade levels to learn about riparian zone habitat restoration and ecological

succession. “Do not mow” boundaries were established along the creek banks, creating a vegetative buffer. This habitat provided shelter for small animals and increased the number of wildflowers and pollinators. The vegetative buffer also benefited water quality through improved biodiversity, stream bank erosion control, lower water temperature, increased dissolved oxygen, and reduced turbidity. Students monitored water quality through bacterial, chemical, and macro-invertebrate indexing. Collected data was entered into South Carolina’s Adopt-a-Stream program database and students charted the data changes over time.

The school partnered with the University of South Carolina’s Upstate Watershed Ecology Center to obtain a full monitoring kit and worked with United States Forest Service to access public land for additional water quality monitoring.

For 29 years, Champions of the Environment has rewarded environmental awareness and action in South Carolina’s Kindergarten through 12th grade students. Champions is sponsored by DHEC, Sylvamo, and Dominion Energy, with assistance from the Environmental Education Association of South Carolina. For more information, visit the Champions website.

D. SC ADOPT-A-STREAM

South Carolina Adopt-a-Stream (SC AAS) is a volunteer citizen water quality monitoring program that provides the opportunity to be directly involved in the protection and improved management of our watersheds. Volunteer monitors provide vital baseline data that helps determine the health of South Carolina waterways. In sharing this information on the local level, partnerships are formed that can lead to greater protection and restoration of the State’s waters. SC Adopt-a-Stream-trained volunteers increase awareness within their communities and encourage others to join in watershed stewardship. The program certified just over 645 volunteers in 2022 through our Freshwater, Macroinvertebrate and Tidal Saltwater workshops. These volunteers have generated data for 170 sites across South Carolina in 2022 and 506 sites since 2017. For more information, visit the SC Adopt-a-Stream website.

E. SC WATERSHED ATLAS

The SC Watershed Atlas brings the Agency's most current and comprehensive watershed and water quality information into a user-friendly, statewide application. This searchable atlas includes watershed boundaries and descriptions; 319 projects, Watershed Plans, and Success Stories; Bureau of Water permits and advisories; public water supply; water quality monitoring stations and assessments; water classifications; floodplains; National Wetland Inventory; National Land Cover Data; Municipal Separate Storm Sewers (MS4s); TMDLs; and more. A selection of base maps, measuring and drawing tools, map-making and printing capabilities, and an instructive help section are also available.

General maintenance of the SC Watershed Atlas is designed to be as self-sustaining as possible. Bureau of Water program layers on the Atlas are updated by program area staff in GIS, working with IT’s GIS staff as needed. In FY22, no new layers were added. However, a two-part webinar series was held over the summer to demonstrate advanced tools available on the Atlas. The target audience was Adopt-a-Stream volunteers but others who were interested could also attend. Thirty-one people attended the May workshop and thirty-nine people attended the June workshop.

F. ADVISORY PROGRAMS

Freshwater Swimming Advisories

The Watershed Program educates citizens about current nonpoint source health risk advisories, how they can reduce their NPS contributions, and encourages adherence to advisory guidelines. A website, outreach materials, and 1-800 information line increase awareness of health risks associated with swimming in impaired waters. They are also used as a springboard for increasing awareness of NPS issues and steps citizens can take to reduce their contributions to runoff pollution. Staff work with Central and Regional DHEC offices to address concerns from the public about these advisories.

Saltwater Swimming Advisories

In addition to freshwater swimming advisories, DHEC staff issue advisories for coastal waters from May through October to inform recreational users about potential bacteria risks from NPS pollution. DHEC routinely collects water samples at over 120 locations on SC beaches in accordance with federal standards. Advisories may be issued due to high bacteria counts or rainfall. DHEC uses multiple outlets to advertise advisory information including newspapers and television at affected beaches. The SC Beach Guide is a GIS layered map that shows where advisories exist along the coast.

Fish Consumption Advisories

DHEC collaborates with the South Carolina Department of Natural Resources (DNR) to educate citizens about the potential risks of eating fish due to mercury and PCB contamination. DHEC collects and tests a variety of fish from South Carolina lakes, rivers, streams, estuaries, and offshore waters and issues recommendations about which types of fish are safe and how much fish is safe to eat from each waterbody. Advisory information is communicated to the public and at-risk groups via a comprehensive website and, when funding is available, booklets and brochures. For more information, visit the DHEC Fish Consumption Advisories page.

Fish Advisories are one component of DHEC's broader Mercury Assessment and Reduction Initiative, which identifies ways that the public, industry, interested groups, and the government can collectively monitor, assess, and address mercury in the environment and reduce mercury exposure.

G. STATE REVOLVING FUND

DHEC sets aside a small percentage of the Drinking Water State Revolving Fund (DWSRF) capitalization grant (usually $150,000) for the development of watershed-based plans (WBPs) for watersheds that have Source Water Protection Areas (SWPAs). A request for proposals is issued in September for the development of watershed-based plans as mandated by the EPA's watershed-based plans development guidance document. The plans address ambient surface water pollutants and their impacts on surface water bodies that are also drinking water sources. Proposals are accepted from SRF-eligible borrowers, watershed organizations, public soil and water conservation districts, regional planning commissions, and public universities. All DHEC-funded WBPs contain EPA's nine required elements. Two WBP development projects were funded in 2022.

H. FORESTRY

The South Carolina Forestry Commission implements a coordinated, statewide Best Management Practices (BMP) Program for forestry-related activities, which is supported in part by an annual 319 grant. The BMP Program focuses on a proactive approach to preventing NPS pollution through aerial detection of harvesting sites and courtesy exams by trained Forestry BMP Specialists. The courtesy exams provide forest landowners with site-specific BMP information that can be included in timber sale contracts.

The program includes a water quality BMP training program for timber harvesters. The program also incorporates an enforceable mechanism to ensure compliance with the BMPs. Close cooperation with DHEC is essential on sites referred for enforcement action and in correcting problems to ensure compliance with water quality requirements. NPS Staff meet with the Forestry Commission at least annually and conduct an annual visit to a harvesting site to see BMPs that have been implemented.

IV. EPA SUCCESS STORY

The 2022 success story update has been approved by EPA and is in the process of being finalized and published. Current and past success stories for South Carolina can be viewed here.

NONPOINT SOURCE SUCCESS STORY Update

South Carolina

Urban Retrofit Leads to Reopening Shellfish Harvesting Waters in Battery Creek

Update Overview

The Battery Creek watershed in Beaufort County contains considerable shellfish-growing habitat, much of which has been restricted for harvesting for over a decade due to fecal coliform contamination from stormwater runoff. The City of Beaufort completed the Battery Creek Watershed Management Plan in 2013 and began a subsequent recreational pond rehabilitation and retrofit project in 2014. The project was completed in 2017 and has contributed to water quality improvements that prompted the reopening of seven stations in 2020 and three additional stations beginning October 1, 2022.

Problem

Battery Creek (HUC 030502080501) in South Carolina's Beaufort County is a tidal estuary that has shown increasing water quality impairments due to stormwater runoff from surrounding urban development. Monthly water quality monitoring by the South Carolina Department of Health and Environmental Control (SCDHEC) Shellfish Program showed that stations located downstream of the project site have not reliably met standards for shellfish harvesting due to elevated fecal coliform, which has resulted in closures for much of Battery Creek for over a decade.

Shellfish Stations Reopened and Sites Delisted

Story Highlights

In 2014, Beaufort County and the City of Beaufort partnered on the Burton Hill M2 Regional Water Quality Retrofit project, which repaired and improved an existing private recreational pond to serve as a catch basin for stormwater runoff. Runoff from a 470-acre sub-basin of Battery Creek is collected and diverted toward the pond, allowing ultraviolet light to kill off bacteria and sediment to settle out of the water column. This project reduced the fecal coliform load by 9.0E12 colony-forming units.

Results

Continued monthly data collection shows that fecal coliform concentrations have improved in most areas of the creek. In 2020, seven formerly restricted stations achieved fecal coliform standards and have been approved for shellfish harvesting. In 2022, three additional sites were also reclassified and will be open for shellfish harvesting beginning October 1, 2022.

Partners and Funding

The successful reduction and treatment of stormwater runoff was achieved by collaboration between the U.S. Environmental Protection Agency, SCDHEC, the City of Beaufort, Beaufort County, and a local property owner. Section 319 funds were awarded in the amount of $350,000, and the City of Beaufort and Beaufort County provided an additional $285,686 (funded through a stormwater utility fee).

Update:

U.S. Environmental Protection Agency
Office of Water
Washington, DC

For additional information contact:

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V. MEETING THE OBJECTIVES OF THE NPS PROGRAM

The SC NPS Management Program 5-Year Management Plan describes multiple long-term goals and milestones that facilitate and promote the state's efforts to manage NPS water pollution. DHEC believes that these strategies direct the NPS Program to activities most likely to result in water quality improvements as well as efficient spending of 319 grant funds. They are as follows, with corresponding FY 2022 objectives met, which is year 3 of the 2020-2024 South Carolina NPS Management Plan.

Objective	Milestone	Outcome
Monitoring and WQ Assessment		
Assess statewide water quality through consistent monitoring to identify waterbodies not fully meeting standards due to nonpoint sources of pollution	a) Collect and analyze monthly samples at 90 sites for the probabilistic monitoring program	Samples from 90 sites across the state were collected and analyzed monthly in 2022.
	b) Collect and analyze monthly samples at 235 base sites for routine monitoring	Samples from 244 base sites across the state were collected and analyzed monthly in 2022.
	c) Perform macroinvertebrate assessments statewide, typically 70 sites per year depending on hydrology	Macroinvertebrate assessments were performed at 59 regular trend sites across the state in 2022.
	d) Measure chlorophyll-a levels at 100 sites monthly May through October	Chlorophyll-a levels were measured monthly at 160 sites from May to October and bi-weekly at 3 sites from April to October 2022 across the state.
	e) Collect and analyze monthly water quality samples at established DHEC monitoring sites in all current NWQI watersheds	Monthly water quality samples were collected and analyzed at 6 monitoring sites in NWQI watersheds in 2022.
	f) Collect fish tissue samples at approximately 60 sites statewide and obtain other samples through partnering agencies and events. Analyze 900 tissue samples per year for mercury	Fish tissue samples were collected from 72 sites and 900 samples were analyzed for mercury in 2022.
Implement and update sanitary surveys based on coastal water quality monitoring data	a) Collect monthly water quality samples at 450 sites to be used to establish shellfish classifications	Monthly water quality samples were collected at 468 sites in 2022.
	b) Perform sanitary surveys, identify needed corrective actions, and develop shellfish harvesting classifications in 25 shellfish growing areas	Sanitary surveys were completed, necessary corrective actions were identified, and shellfish harvesting classifications were developed in 25 shellfish growing areas.
	c) Generate a trend report for annual shellfish harvesting classifications	Trend report was produced.

Develop and implement monitoring studies in watersheds where 319 projects have been or will be implemented	a) Update NPS monitoring QAPP to include new projects and other revisions and deliver plan to Department Quality Assurance Project Officer for final approval	The NPS monitoring QAPP was updated in 2022 to include new projects and revisions, and it was then delivered to the Department Quality Assurance Project Officer.
	b) Conduct monthly sampling at identified sites within 319 project watersheds, including all impaired locations, once projects are awarded and continuing at least 2 years after each project is completed	Monthly sampling was conducted for all 319 projects including all impaired locations within the watershed. Monitoring commenced with award and continued 2 years after project completion.
	c) Work closely with DHEC Aquatic Science Programs staff involved with 319 monitoring to ensure all 319 project sites are adequately monitored	Met and worked closely with DHEC Aquatic Science Programs staff to ensure all 319 project sites were adequately monitored.
Review 319 Monitoring Strategy and methods and revise as needed to most effectively assess 319 project water quality using available resources	a) Meet with DHEC Aquatic Science Programs staff to optimize 319 monitoring strategy and methods; incorporate results into State Monitoring Strategy	Met with DHEC Aquatic Science Programs staff to optimize 319 monitoring strategy and methods and incorporated results into State Monitoring Strategy.
Effectively assess and document the impacts of 319-funded implementation projects on water quality through collection and analysis of samples	a) Analyze all samples according to appropriate analytical protocol	Analyzed all samples according to appropriate analytical protocol.
	b) Assess all 319 project sites within 1 year after completion of post-project monitoring and document any water quality improvements for inclusion in the Annual Report and Success Stories	Assessed all 319 project sites within 1 year after completion of post-project monitoring and documented any water quality improvements for inclusion in the Annual Report and Success Stories.
	c) Compile, review, and document all available monitoring data for historical and recently completed 319 projects	Compiled, reviewed, and documented all available monitoring data for historical and recently completed 319 projects.
Identify and develop success stories for fully or partially restored waterbodies primarily impaired by NPS pollution	a) Monitor promising 319 Success Story sites regularly	Regularly monitored promising 319 Success Story sites.
	b) Identify and develop Success Stories each year for watersheds showing full restoration or showing improvement	Identified and developed a Success Story for multiple phases of 319 projects for the May River in Bluffton which have led to a removal from the 303(d) list and the reopening of a shellfish harvesting area.
SC Integrated Report and TMDLs		
Develop, maintain, and distribute South Carolina's Integrated Report including Part 1: 303(d) List of Impaired Waters and Part 2:	a) Prepare and put draft 303(d) lists on public notice and address subsequent public comments. Prepare ADB-compatible spreadsheet and GIS data files associate with 303(d) list. Deliver the Integrated	Prepared the combined 2020/2022 303(d) list and put out for public comments. Created files and comprised reports for EPA approval.

Section 305(b) Assessment and Reporting	Report comprised of both the 303(d) and 305(b) reports to EPA for approval	
Work collaboratively with the 303(d), Modeling, & TMDL section to support prioritization of restoration efforts	a) Provide assistance to TMDL staff for prioritizing locations for future TMDL development. An important criterion for TMDL prioritization is determining where there is a higher potential for implementation	Provided assistance to TMDL staff to prioritize TMDL locations.
Work collaboratively with the 303(d), Modeling, & TMDL section to support prioritization of restoration efforts	a) Provide assistance to TMDL staff for prioritizing locations for future TMDL development. An important criterion for TMDL prioritization is determining where there is a higher potential for implementation	There are currently 128 approved TMDL documents covering 668 monitoring stations (mostly for pathogens). There is currently one alternative restoration plan in place to address one impaired location in the Savannah River. In addition, there are 10 TMDL documents or alternative restoration plans under development to address 144 impairments statewide.
319 & WBP Grants		
Aid stakeholders and selected WBP development projects in the development of WBPs	a) Serve as a facilitator for WBP development, as needed	Facilitated WBP development.
	b) Work with Long Leaf Alliance, Savannah River Clean Water Fund, and SC Land Trust Network on WBPs and related feasible projects that highlight watersheds for protection	Worked with partners to highlight watersheds for protection.
	c) Reach out to and work with drinking water intakes for WBP development and subsequent 319 projects	Reached out to and worked with drinking water intakes for WBP development and subsequent 319 projects.
	d) Incorporate protection strategies into all WBPs, such as conservation easements	Incorporated protection strategies into all WBPs.
	e) Incorporate protection of unimpaired/high quality waters into WBPs, when possible	Encouraged protection of unimpaired/high quality waters into WBPs and provided a list of priority watersheds.
	f) Incorporate adaptation planning and ways to address climate change impacts, especially for coastal entities, in WBPs	Incorporated adaptation planning and climate change considerations in WBPs.
	g) Review and provide draft comments on WBPs, ensuring compliance with EPA's nine required elements for 319 grant eligibility	Reviewed and provided draft comments on WBPs, ensuring compliance with EPA's nine required elements for 319 grant eligibility.
Administer 319 grants including issuing and ensuring compliance with grant agreements, processing payments,	a) Award grant agreements following annual project selection	Awarded grant agreements for 4 selected projects.
	b) Review quarterly requests for reimbursement and progress reports from grantees to ensure compliance and track expenditures	Reviewed quarterly requests for reimbursement and progress reports from grantees to ensure compliance and to track expenditures.

and monitoring non-federal match	c) Conduct a site visit with each active project at least once annually to ensure adherence to project goals and timeline	Due to Covid-19, held virtual meetings and requested progress photos and write-ups from grantees to ensure progress. Completed some in-person site visits.
Manage the 319 and WBP program, including solicitations and selection of projects	a) Update RFPs for WBP development and 319 implementation proposals at least annually based on changes, priorities, lessons learned, etc.	Updated RFPs for WBP development and 319 implementation proposals based on changes, priorities, lessons learned, etc.
	b) Issue statewide solicitations for WBP development and 319 implementation proposals at least annually	Issued statewide solicitations for WBP development and 319 implementation proposals.
	c) Convene review committee to select projects based on NPS Program priorities after each grant solicitation period	Convened review committee to select projects based on NPS Program priorities after each grant solicitation period.
	d) Annually award funding to committee-selected 319 implementation projects and WBP development projects	Awarded funding to 4 committee-selected 319 implementation projects and 2 committee-selected WBP development projects.
	e) Award 319 implementation projects with protection components, climate change considerations, and innovative BMPs, as able	Awarded 319 implementation projects with protection components, climate change considerations, and innovative BMPs.
	f) Alert regional DHEC offices to new 319 implementation projects in their areas, including OCRM	Alerted regional DHEC offices to new 319 implementation projects in their areas, including OCRM.
	g) Create tools and share resources to assist in stakeholder-led development of watershed-based plans and 319 implementation projects	Shared resources to assist in stakeholder-led development of watershed-based plans and 319 implementation projects.
Work closely with the SC DHEC Water Pollution Compliance staff for 319 project proposals	a) Consult on project proposals to ensure BMPs go “above and beyond” MS4 requirements	Consulted on project proposals to ensure BMPs go “above and beyond” MS4 requirements.
	b) Obtain and have MS4 staff put Letters of Assurance on file to ensure 319-funded BMP load reductions will not be counted as meeting NPDES permit requirements	Letters of Assurance are on file with our compliance section in order to ensure 319-funded BMP load reductions will not be counted as meeting NPDES permit requirements.
Ensure consistency with national and regional goals and requirements through participation in trainings, conferences, meetings, and webinars	a) Participate in at least 1 national or regional conference and 1 national or regional training such as the National NPS Conference, GRTS Training, or Region IV NPS Coordinators Meeting	Attended the SC Water Resources Conference, EPA NPS Webinar series, Region IV NPS Monthly meeting, STEPL training, and GRTS training.

	b) Participate in ACWA 319/NPS Workgroup Webinars	Participated in ACWA 319/NPS Workgroup Webinars.
	c) As necessary, update the formal list of priority watersheds, according to NWQI and EPA priorities	Revising list of priority watersheds with DHEC, NWQI, and EPA priorities.
Estimate load reductions for active and recently completed 319 projects	a) Increase cumulative annual load reductions resulting from 319-funded BMPs	Annual load reductions resulting from active 319-funded projects in 2022 were as follows: • 12,013 pounds of nitrogen • 3,751 pounds of phosphorus • 1,934 tons of sediment • 7.26464E+13 CFU of fecal coliform bacteria and/or equivalent *E. coli* reduction
	b) Upload BMP and load reduction information for all applicable projects to GRTS by February 28 in accordance with FY2019 revisions and mandated data elements	BMP load reduction information for applicable projects were uploaded to GRTS.
Use the Grants Reporting and Tracking System (GRTS) to report on progress of active 319 projects	a) Regularly update and comprehensively review all project information in GRTS to ensure completeness by EPA's February 28 annual deadline in accordance with FY2019 revisions and mandated data elements	Updated and comprehensively reviewed all project information in GRTS.
Prepare Annual Report to Congress on progress in meeting NPS Program goals	a) Submit Annual Report to EPA by December 31st each year. Include information on all open 319 implementation projects and report on status of Plan milestones for the year	Submitted Annual Report to EPA by December 31st.
Submit annual 319 grant application to EPA	a) Prepare annual workplan, budget, and grant application. Submit to EPA by September 30th each year	Workplan, budget, and grant application were submitted to EPA by September 30th.
Complete grant close-out packages	a) Assemble and submit grant closeout packages within 90 days of a grant close. Grants from fiscal years 2015 through 2019 will be closed out in this 5-year Plan period	The FY17 grant has been extended for one year by EPA and the closeout will be completed and submitted by December 31, 2022. The FY18 grant has been extended for one year and will closeout in 2023.
Work with the SC Forestry Commission to implement a Statewide Forestry BMP Compliance Program	a) Request annual workplan in April/May to have in hand by July, obtain EPA approval, and then issue or amend grant agreement with SC Forestry Commission in August	Requested annual workplan in April/May, obtained EPA approval, and issued grant agreement with SC Forestry Commission in August.
	b) Renew contract every five years as appropriate	Contract was renewed August 2022.
	c) Follow up on any forestry referrals for water quality impacts	Followed up on forestry referrals for water quality impacts.

Regularly review NPS Management Plan for effectiveness and applicability to programmatic needs	a) Perform cursory plan review and update objectives and milestones as needed as part of annual application process and Annual Report preparation	Performed cursory plan review and updated objectives and milestones as needed as part of annual application process and Annual Report preparation.
	b) Perform full plan review and update plan as needed	Performed full plan review and updated plan as needed.
Stakeholder Outreach		
Collaborate with and provide technical assistance and water quality information to stakeholders to support the effective management of NPS pollution	a) Participate in stakeholder meetings and committees	Participated in stakeholder meetings and committees including several virtual meetings during the Covid-19 pandemic.
	b) Respond to requests for information including assistance with obtaining and analyzing water quality data	Watershed managers provided assistance and water quality data for all requests.
	c) Attend NRCS State Technical Committee meetings	Attended NRCS State Technical Committee meetings.
	d) Distribute booklets about reining in runoff, as available	Distributed booklets “Reining in Runoff” to stakeholders as needed.
Increase statewide knowledge of the 319 program, projects, and grant opportunities	a) Present on the 319 Program, grant opportunities, and projects at various events and conferences	Presented on the 319 Program, grant opportunities, and projects for University of South Carolina, SC Source Water Protection Committee, and other stakeholders.
	b) Encourage stakeholder organizations to apply for funding for WBP development and 319 implementation grants through various means, including emails, flyers, handouts, conferences, presentations, events, etc.	Encouraged stakeholder organizations to apply for funding for WBP development and 319 implementation grants through various means, including emails, flyers, stakeholder meetings, and virtual presentations.
Coastal NPS Program		
Decrease marine debris through voluntary partnerships and programs such as Adopt-a-Beach and the Clean Marina Program	a) My Coast – Adopt-a-Beach: Promote increased participation; produce annual summary including number of groups and number of debris items by type	Between January 1st and November 29th, 2022, over 600 beach cleanups were logged in the MyCoast South Carolina application. Over 85,500 debris items (estimated at over 3,500 pounds) were removed from South Carolina beaches from North Myrtle Beach to Hilton Head Island. Approximately 2,000 volunteer hours were dedicated to beach cleanups. The most common types of debris found include Cigarettes (~32,700), Plastic and Foam Pieces (~15,000), and Food Wrappers (~7,300). DHEC OCRM staff develop and share Adopt-A-Beach data summary reports with local beachfront communities annually. In February 2022, summary reports representing Adopt-A-Beach activity from January 1 - December 31, 2021, were developed and shared with 7 beachfront communities.

	b) Participate in SC Clean Marina program as administered by the SC Marine Association	DHEC OCRM continues to serve on the program and steering committees for the South Carolina Clean Marina Program in coordination with the South Carolina Sea Grant Consortium and the South Carolina Department of Natural Resources. In May, an SC Clean Marina Workshop was held for marinas interested in becoming certified or recertified Clean Marinas. The event was coordinated by South Carolina Sea Grant and hosted by the SC Clean Marina Committee. There were 8 marinas that participated in the workshop.
Collaborate with external partners to improve coastal awareness of non-point source pollution	a) Collaborate with the Ace Basin and North Inlet National Estuarine Research Reserves as well as the SC Coastal Information Network on preparation of communication materials that build awareness of BMPs among coastal stakeholders	Collaborated with the ACE Basin and North Inlet National Estuarine Research Reserves as well as the SC Coastal Information Network on preparation of communication materials that build awareness of BMPs among coastal stakeholders.
Enhance and track marine debris removal efforts through collaboration with state and regional partners	a) Convene the Abandoned Vessel Working Group to improve coordination between federal, state, and local partners on abandoned/derelict vessels	To encourage information sharing and knowledge transfer on topics relevant to abandoned and derelict vessels in the state, two Lunch & Learn Webinars were hosted for the ADV Working Group and other interested stakeholders. The first, which focused on the Vessel Turn In Programs (VTIP), was held on March 21, 2022 and featured presentations by staff from the Texas General Land Office (GLO) and Florida Fish and Wildlife Conservation Commission (FWC) to share information on their respective programs. The second webinar, which was held on June 2, 2022, provided an opportunity to learn more about fiberglass vessel hull recycling from Sarah Latshaw and Demi Fox, both with NOAA's Marine Debris Program. An in person SC ADV Working Group Meeting was held on October 24, 2022.
	b) Identify and apply for marine debris removal funding opportunities with local, state, and/or federal partners	Identified and applied for marine debris removal funding opportunities with local, state, and/or federal partners.
	c) Identify and assess Abandoned and Derelict Vessels (ADV) and other large marine debris items and process through compliance/enforcement procedures, if appropriate	Identified and assessed Abandoned and Derelict Vessels (ADV) and other large marine debris items and process through compliance/enforcement procedures.

Continue interagency coordination and planning to study and mitigate climate change and related impacts such as shoreline changes and coastal erosion	a) Coordinate with SC DNR and other Living Shorelines Working Group partners on outreach and education for living shorelines	Coordinated with SC DNR and other Living Shorelines Working Group partners on outreach and education for living shorelines.
	b) Continue to work with local governments on local comprehensive beach management plans and waterbody management planning efforts	Continued to work with local governments on local comprehensive beach management plans and waterbody management planning efforts.
Coordinate management activities between the Coastal Management Program and 319 programs	a) Coastal Program and 319 staff will meet at least annually to coordinate efforts	Met with Coastal Program staff.
	b) Coastal Program staff will serve on the 319 Review Committee for each 319-implementation funding round	Coastal Program staff served on the 319 Review Committee.
Ensure marina compliance with operation and maintenance manuals	a) OCRM Compliance and Enforcement staff will evaluate marina operation and maintenance manuals to ensure compliance with Critical Area permitting requirements	OCRM Compliance and Enforcement staff evaluated marina operation and maintenance manuals to ensure compliance with Critical Area permitting requirements.
Champions of the Environment		
Promote NPS awareness through the Champions of the Environment grant awards program	a) Promote the Champions program through teacher workshops, environmental educators' conferences, social media, mail outs, targeted emails, and organizational webpages and newsletters	Promoted the Champions program through teacher workshops, environmental educators conferences, social media, mail outs, targeted emails, and organizational webpages and newsletters.
	b) Award 8 grants to environmental education projects. Develop and air TV commercials broadcasting each project. Promote winning projects through social media and local news coverage.	Due to Covid-19 and virtual teaching, held educational webinars for teachers including lesson plans and equipment.
Adopt-A-Stream		
Increase awareness of local water quality and the Adopt-A-Stream (AAS) program	a) Encourage MS4s and other municipalities to use SC AAS as an education and outreach method for water quality awareness	Encouraged MS4s and other municipalities to use SC AAS as an education and outreach method for water quality awareness.
	b) Present Adopt-A-Stream annually at the SC Association of Stormwater Managers (SCASM) meeting	Presented Adopt-A-Stream at the SC Association of Stormwater Managers (SCASM) meeting, SC Water Resources Conference, and to other local groups.
	c) Include AAS equipment purchases as part of 319 grants planning to incorporate the SC AAS program	No equipment purchases in 2022.
	d) Make 319 grantees aware of the program and the possibility of adding local screening data	319 grantees were made aware of the program and the possibility of adding local screening data.

	e) Add AAS as an example of an education/outreach component in the revised MS4 permit.	On task to add AAS as an example of an education/outreach component in the revised MS4 permit.
SC Watershed Atlas		
Maintain SC Watershed Atlas Increase awareness of local water quality and the Adopt-A-Stream (AAS) program	a) Respond to queries generated from Atlas users	Responded to queries generated from Atlas users.
	b) Communicate feedback and queries to Agency GIS program	Communicated feedback and queries to Agency GIS program.
	c) Communicate with Bureau of Water programs to ensure assessed data are converted into Atlas specific tables and information, as the data becomes available	Communicated with Bureau of Water programs to ensure assessed data are converted into Atlas specific tables and information.
	d) Coordinate with GIS program to ensure timely updates to the Atlas	Coordinated with GIS program to ensure timely updates to the Atlas.
Document 319 implementation practices using GIS	a) Track all 319 implementation projects and locations of completed WBPs to the Atlas	Tracked all 319 implementation projects and locations of completed WBPs to the Atlas.
	b) Update Atlas as new projects are awarded	Updated Atlas as new projects are awarded.
	c) Provide links to more information on 319 projects, completed WBPs, and project Success Stories	Provided links to more information on 319 projects, completed WBPs, and project Success Stories.
Advisories		
Increase awareness of health risks associated with swimming in impaired waters and educate citizens about how to reduce those risks and their NPS contributions to local waters	a) Annually review and provide NPS educational information as needed on Agency swimming advisory website	Reviewed and provided NPS educational information as needed on Agency swimming advisory website.
	b) Maintain a swim advisory line for the public	Maintained a swim advisory line for the public.
Increase awareness of atmospheric deposition of mercury and the associated health risks through annual Fish Consumption Advisory information	a) Produce and distribute the SC Fish Consumption Advisory booklet as funds allow, and revise website	Produced and distributed the SC Fish Consumption Advisory booklet and revised website.
State Revolving Fund (SRF)		
Prioritize SRF projects according to their potential to improve water quality and complement existing NPS reduction efforts	a) Assist SRF staff with goal setting in the CWSRF Intended Use Plan and, when it occurs, participate in revision of SRF Priority Ranking System to thoroughly include criteria that target NPS projects and watershed-based plan implementation	Assisted SRF staff with goal setting in the CWSRF Intended Use Plan and participated in revision of SRF Priority Ranking System.

	b) Using the SRF Priority Ranking System, review and score each project requesting SRF funding. Review includes assessment of priority watersheds, impairments, TMDLs, and 319 projects in the project area	Reviewed and scored each project requesting SRF funding.
Alternative Funding		
Identify and advertise alternate funding opportunities for WBP and 319 projects	a) Identify alternate avenues for WBP development beyond DWSRF funds and 319 implementation projects (both federal and non-federal match) beyond 319 grant funding	Searched for alternative avenues to fund WBP development and implementation projects.
	b) Where available, work with outside entities to combine funding opportunities to support WBP and 319 grants	Worked with NRCS on various projects.
	c) Advertise alternate avenues for grant funding in annual RFPs, the SCDHEC website, partner websites, and other avenues	Advertised alternate avenues for grant funding in annual RFPs, the SCDHEC website, and partner websites.
Coordinate with SRF staff to encourage implementation of NPS Plan goals and leverage State Revolving Fund money to address waterbodies affected by NPS pollution	a) Work in conjunction with CWSRF to advertise the use of SRF funds for NPS reduction projects and the potential for combining CWSRF and 319 funds for NPS reduction projects	Worked in conjunction with CWSRF to advertise the use of SRF funds for NPS reduction projects and the potential for combining CWSRF and 319 funds for NPS reduction projects.
	b) Utilize the joint funding opportunities fact sheet with RFPs to encourage the combined use of 319 and CWSRF funds for projects addressing NPS pollution	Shared joint funding fact sheet with potential grantees.
	c) When identified, point out joint funding opportunities to public entities with potential projects	Kept grantees aware of funding opportunities.
Encourage the use of USDA resources to complement existing 319 efforts	a) Encourage grantees to utilize EQIP and other USDA funding options in watersheds with ongoing implementation projects, in annual solicitations and by word of mouth	Encouraged grantees to utilize EQIP and other USDA funding options in watersheds with ongoing implementation projects, in annual solicitations and by word of mouth.
	b) Refer septic calls outside of active septic repair/replacement 319 implementation projects to USDA's Rural Development Single-Family Housing Repair/Section 504 Home Repair program	Referred septic calls outside of active septic repair/replacement 319 implementation projects to USDA's Rural Development Single-Family Housing Repair/Section 504 Home Repair program.
Permitting		
Issue permits, perform inspections, respond to complaints, make recommendations for	a) Issue construction, industrial, and MS4 stormwater permits statewide including permits that require additional monitoring and/or	Issued construction, industrial, and MS4 stormwater permits statewide including permits that require additional monitoring

improvement of stormwater-related programs, and coordinate compliance and enforcement action as needed	installation of BMPs in impaired and TMDL watersheds	and/or installation of BMPs in impaired and TMDL watersheds.
	b) Conduct stormwater site inspections and perform MS4 program audits	Conducted stormwater site inspections and performed MS4 program audits.
	c) Investigate acute NPS complaints from the public and MS4s statewide	Investigated acute NPS complaints from the public and MS4s statewide.
	d) Refer incidents to enforcement when voluntary remediation related to acute NPS incidents are unsuccessful	Referred incidents to enforcement when voluntary remediation related to acute NPS incidents were unsuccessful.
Ensure proper installation of onsite wastewater systems and provide technical assistance as needed	a) Issue permits for new septic systems	Issued permits for new septic systems.
	b) Issue licenses for septic installers and servicers	Issued licenses for septic installers and servicers.
	c) Provide compliance assistance by investigating referrals and failing onsite wastewater systems	Provided compliance assistance by investigating referrals and failing onsite wastewater systems.
Permit, inspect, and provide technical assistance for agricultural facilities	a) Prepare and/or review agricultural waste permits statewide for animal facilities	Prepared and/or reviewed agricultural waste permits statewide for animal facilities.
	b) Perform inspections including follow-up, complaints, site assessment, etc.	Performed inspections including follow-up, complaints, site assessment, etc.
	c) Document noncompliant facilities and refer them to enforcement	Documented noncompliant facilities and referred them to enforcement.
Through 401 water quality certifications, require at least standard construction site BMP conditions to be implemented	a) Issue 401 water quality certifications requiring implementation of BMPs that will minimize erosion and migration of sediments on and off project sites during and after construction	Issued 401 water quality certifications requiring implementation of BMPs that will minimize erosion and migration of sediments on and off project sites during and after construction.
Follow up on referrals for non-compliance and violations of the SC Pollution Control Act related to nonpoint source activities	a) Assign and follow up on all referrals	Assigned and followed up on all referrals.
	b) As needed, follow enforcement procedures for NPS stormwater and onsite wastewater violations	Followed enforcement procedures for NPS stormwater and onsite wastewater violations.
Maintain a database to track permits, inspections, and compliance and enforcement actions	a) Enter all facility- and permit-related information into the Environmental Facility Information System (EFIS) or its replacement database (E-permitting)	Entered all facility- and permit-related information into the Environmental Facility Information System (EFIS) or its replacement database (E-permitting).

VI. WBP IMPLEMENTATION – PROJECTS COMPLETED IN FY22

North Saluda River and Saluda Lake Watershed Implementation Project

Save Our Saluda was awarded a Non-Point Source (NPS) grant to implement agricultural Best Management Practices (BMPs) to reduce sediment and improve water quality within the North Saluda River and Saluda Lake Watershed, the drinking water source for the greater Easley area. Water quality impairments for turbidity and macroinvertebrates exist within the Watershed. The project targeted agricultural property owners and operators across the Watershed, with intensively managed floodplain croplands being the highest priority areas. A variety of agricultural BMPs were installed, including cover crops, riparian buffers, sediment control basins, drainage/culvert stabilization, floodplain restoration/reforestation, stabilized access roads, heavy use areas and stream bank stabilization. An outreach effort complemented this project which educated farmers and landowners about the benefits of and methods for reducing soil loss by installation of cover crops and other soil conservation practices. The ultimate outcome of the project was a sediment load reduction of 1,870.9 tons per year into surface waters in the Watershed, about three times the original goal of 609 tons/year, and approximately 16% load reduction from the estimated annual load of 11,878 tons per year. In addition, the project reduced annual loading of phosphorus by 2,139.4 pounds, of nitrogen by 6412.0 pounds, and bacteria by 1.19E+13 cfu. The project began in October 2018 and was completed in December 2021, approximately 8 months ahead of schedule. The total project cost was $628,991.88 and included $360,799.42 of federal funding and $268,192.46 of landowner and partner match. Partners in the project included: Clemson Cooperative Extension, Easley Combined Utilities, Furman University, Greenville County, Greenville and Pickens Soil and Water Conservation Districts (SWCD), Greenville Water, Mountain Bridge Trout Unlimited, Naturaland Trust, Natural Resources Conservation Service (NRCS), Pickens County, Powdersville Water, Renewable Water Resources (ReWa), South Carolina Department of Natural Resources (SCDNR), South Carolina Rural Water Association, Save Our Saluda, Trees Upstate, Upstate Forever, and Wood Environment and Infrastructure Solutions. The project successfully reduced downstream sedimentation load, improved in-stream habitat conditions, and decreased lake turbidity levels. A follow-on 319 grant was awarded to Save Our Saluda for the entire Upper Saluda Watershed area that drains to Saluda Lake (North Saluda River, South Saluda River, Middle Saluda River, Oolenoy River, Saluda River, and Saluda Lake) for continued implementation of soil conservation projects to reduce sediment loading and protect and improve water quality. The table below shows BMP implementation and installation.

BMPs Planned for Implementation	Number Anticipated for Installation	Implemented BMPs	Number Actually Installed
Cover Crop/Intercropping/Filter strips/Field Borders	240 acres	X	**558.5 acres**
Vegetated Riparian Buffers and conveyance systems	20	X	**6.7 acres**
Culvert/Ditch/Farm Access Road Stabilization	4	X	**4,885 LF access road and 2 culverts**
Sediment Control Basins	4	X	**8**
Fencing with Alternative Water Source	96 acres		
Heavy Use Areas	2	X	**3 (4,675 sq ft)**
Stream Crossings	2		
Streambank stabilization	5,000 LF	X	**959 LF**
Agricultural Workshops/Field Days	2 Workshops/Field Days	X	**2**
Muddy Water Watch Trainings	2 Trainings		
Grade stabilization (rock check dams)			**6**

Congaree Creek Watershed Water Quality Improvement Project-Phase II

Following the original 319 grant in the Congaree Creek Watershed, through this 319 Project, Lexington County sought to continue working to reduce bacterial loads in Congaree Creek Watershed by providing cost share assistance to homeowners and businesses in Congaree Creek Watershed for septic repairs/replacements (Figure 1). These activities were expected to help restore designated uses in the watershed, protect the stream for the long term, and involve watershed stakeholders.

Thanks to the 319 grant funding and Lexington County staff's efforts, 72 failing septic systems in the watershed were repaired or replaced during the grant period, in addition to the 56 that were repaired during the original Congaree Creek 319 grant, for a total of 128 repairs between the two grants. The owners of the failing septic tanks were also educated on proper maintenance of a septic system in order to prevent future issues from occurring.

Hyatt Park Revitalization

The Hyatt Park Revitalization BMP components were the centerpiece for the park revitalization. The original plan was to daylight approximately 500 lf of an unnamed piped smith branch tributary, restore an existing USGS Blue Line Stream, plant vegetated buffers along all the new BMP's and build a new bio-retention area. During design development, it was determined that it would be beneficial to daylight more of the unnamed smith branch tributary, while leaving the existing USGS Blue Line Stream undisturbed and protecting the existing buffer. The final plan resulted in 1,150 lf of new daylighted stream that blends seamlessly with the existing USGS Blue Line Stream, has vegetated buffers with a robust native landscape, and includes 2 bio retention areas built into the new stream network.

Completed stream daylighting in Hyatt Park

The stream daylighting component, which uncovered approximately 1,150 lf of a piped unnamed Smith Branch tributary runs through the center of Hyatt Park. The Smith Branch tributary is a USGS Blue Line Stream that is listed by the South Carolina Department of Environmental Control as a 303(d) stream. Existing pipe infrastructure was removed and outlet/ inlet structures modified to open the stream channel. The new stream channel meanders through the park and is armored with a mix of stone and vegetation. The stream banks have manageable slopes

and are vegetated with a robust native planting mix. Plunge pools create a pool and riffle effect that remove sediment from the flow.

Vegetated buffers extend along the daylighted stream, existing stream and bio-retention areas. The planting palette is a mix of native plants that mimic the natural setting found in the Smith Branch streamside landscape. The vegetative buffers reduce the flow and velocity of surface runoff, enhance infiltration, and reduce pollutant discharge by capturing and holding sediments and other pollutants carried in the runoff water.

The bio-retention areas are approximately 8,115 sf and capture and filter runoff from the surrounding impervious park components and the residential/ commercial areas north of the park. Clusters of native plants that thrive in both wetland and dry conditions are planted in the basin.

The new green infrastructure will help to improve the storm water quality, habitat and diversity. Educational signs will be located near each proposed BMP to detail the work completed and the benefit to the environment and community. This component is in the works and will be implemented as funding becomes available.

Construction for the project started on March 8, 2021 and was substantially complete on October 17, 2021. A grand opening for the completed project was held on November 30, 2021. The project cost for the new daylighted stream including the vegetated buffers and bio-retention areas was $370,750.00. The funding sources for this scope included $125,000.00 from the SCDHEC 319 grant and $245,750.00 from the City of Columbia.

The overall goal of the Hyatt Park BMP project was to restore and celebrate the ecosystem that once existed in the park. The restoration exceeded project objectives by daylighting approximately 650 lf more stream that the original projections which has helped to improve water quality, reduce velocity and impact of urban runoff downstream, enhance habitat diversity, and provide an outdoor learning lab illustrating the best management practices for urban streams and storm water. The BMP components together are the main centerpiece of the overall park revitalization.

Reducing Bacteria and Sediment in the Tyger River

This project known as the South, Middle, North (S/M/N) Tyger River Implementation Phase 1 was structured and implemented to address the long-term bacterial and biological impairments in three sub-watersheds of the Tyger River Basin, the South Tyger, Middle Tyger, and North Tyger subwatersheds. Goals were met by tackling nonpoint source pollution through a combination of agricultural, septic, and land protection Best Management Practices (BMPs) over a period of 45 months. The total BMPs implemented include 25 septic repairs/replacemetns, 6 parcels protected through conservation easements, 5 riparian buffer enhancement projects, and 15 agricultural projects. Agricultural projects were implemented over four separate properties and included exclusion fencing, cross fencing, alternative water sources, permanent conservation cover, and drip irrigation. The great success of this implementation phase led our team to seek funding for a phase two implementation project in this area where we are continuing to implement BMPs throughout this region. The S/M/N Tyger River Implementation Phase 1 began October 20, 2018 and ran through July 29, 2022. In total, the project costs equaled $238,693.85 in federal funding and $217,340.43 (48%) in non-federal/partner matching funds. Project partners all played a significant role in meeting the project objectives of facilitating septic,

agriculture, and land protection BMPs. Partners providing monetary support, which amounted to $55,000, included: Greer Commission of Public Works (CPW), Startex-Jackson-Welford-Duncan Water District (SJWD), and Woodruff Roebuck Watershed District (WRWD). Partners providing in-kind support estimated to be just over $10,500 included: Greer CPW, Greenville County Soil and Water Conservation District, Clemson University Extension, City of Greer Stormwater Department, SJWD, Spartanburg County Stormwater Department, Spartanburg County Soil and Water Conservation District, The Tyger River Foundation, USC Upstate Watershed Ecology Center, WRWD, and USDA-National Resources Conservation Science (USDA).

Gills Creek Stream and Riparian Bufffer

The section of Gills Creek between Ft. Jackson Blvd. and Rosewood Drive has historically been the most impaired reach of Gills Creek due to the pressures of development, yet we rely on this creek for clean water, wildlife habitat, recreation, fish, and beautiful views. Stormwater from driveways, parking lots, and roads carries pollutants, such as bacteria, excess nutrients, sediment, and litter, into our creeks.

Gills Creek Watershed Association, in partnership with the City of Columbia and Meyers Brothers Properties (owners of the property along Gills Creek along with their tenants), have taken important steps to reduce such pollutants, as well as reduce flood potential, helping to make this section of the creek much healthier and cleaner for all. The goal of this project was to enhance the Creek's natural ability to improve water quality and reduce erosion and sedimentation into Gills Creek. Public education was also an important goal of GCWA's during the course of this project.

The overall goal of the project is to reduce nonpoint source pollution within this reach of Gills Creek, as well as to improve the water quality in Gills Creek through the implementation of stream restoration and green infrastructure practices. GCWA strove to meet this goal by restoring 1,800 linear feet of Gills Creek through bank stabilization and riparian buffer enhancement. Where feasible, stormwater BMPs were also used to handle stormwater outfalls entering Gills Creek in this area. This project also attempted to further improve water resources and water quality through environmental education. Environmental education signage was installed in the project area, providing environmental information for the general public. We also hosted three educational tours on the project site, all during construction, and will continue to host educational workshops even after the project. After project completion, these goals have been met—the BMPs are holding up and decreasing erosion and sedimentation, even when tested by heavy rainfall events. Public education has also been beneficial, through signage, newsletters, webinars, site tours, and news articles. This project began on October 30, 2017 and was completed on June 30, 2022. The total project cost was budgeted at $636,491.17, split between a federal funding amount of $386,491.17, City of Columbia funding in the amount of $250,000.00, and another grant in the amount of $24,000. However, GCWA has over-matched this amount through CDBG funds, Richland County grants, and its own organizational funds and in-kind staff time. In the end, the project cost $659,089.31.

Kingston Lake with Crabtree

Kingston Lake Watershed includes one major channelized water body, Crabtree Swamp, with smaller un-channelized swamps including Mary Branch, Brown Swamp, and Grier Swamp. This effort has many stakeholders which includes City of Conway, Horry County, Crabtree Watershed Conservation District, Horry Soil and Water Conservation District, Grand Strand Water & Sewer, S.C. Department of Natural Resources, Coastal Carolina University, Clemson University, U. S. Fish and Wildlife Services, S.C. Department

of Health and Environmental Control, and USDA- Natural Resource Conservation Service and U.S. Fish and Wildlife Service. With this grant request, our goals were to help reduce E. coli by stabilizing banks and channels to reduce sediment movement and failure of side slopes, restoring floodplains and lost wetland functions to increase filtering, assisting landowners with installing buffers to remove sediment, nutrients, and pathogens from entering water system, assisting hobby farmers with understanding manure and pasture management with planning and educational workshops, and assisting failing septic systems with repairs to reduce E. coli.

Evergreen Tract Stormwater BMP

Beaufort County has constructed a 3.5-acre pond located on land purchased by the County with the intent of improving water quality; the parcel is known as the Lowcountry Evergreen Tract. This pond will detain the collected runoff from the 24.68-acre sub-watershed and provide bacteria treatment via ultraviolet radiation penetration of the permanent pool water column and sediment settlement. The Evergreen Retrofit Project plan calls for the flow from the upstream sub-watershed to be diverted to this pond. The Okatie Highway (HWY 170) drainage system has been diverted into the pond for treatment prior to discharge into a nearby wetland channel that flows to the Okatie River. The objectives of this project were as follows:

- Treat stormwater runoff from the existing highway and adjacent developed area that currently have no stormwater BMPs.
- Reduce the peak runoff rate and runoff volume discharged from the Okatie West tributary. A reduction in the runoff volume to the receiving waters directly results in a reduction to the contaminant loads reaching
the Okatie River.
- Reduce the number of bacteria, specifically fecal coliform (FC), reaching SCDHEC Station 18-08.

Constructed wet detention pond at the outfall structure

It is expected, based on local monitoring data of existing ponds, that the pond will provide effective water treatment for stormwater runoff; reducing bacteria loads by 80% or more. The 319 Grant funds were used for the design and construction of the best management practice (BMP) by supplementing capital improvement funds dedicated to water quality improvements. The ultimate goal of this project is to improve water quality such that the shellfish beds within the Okatie River watershed are reopened for harvesting. According to Watershed Management Model (WMM) results, the regional wet detention pond

design is sufficient for bacterial pollutant removal within the Evergreen basin, thus reducing fecal coliform loads to the Okatie River.

VII. WBP IMPLEMENTATION – PROJECTS ONGOING IN FY22

Reducing Bacteria in the Cane-Little River Watershed

In August 2020, Lake Keowee Source Water Protection Team (LKSWPT) was awarded a two-year Section 319 grant to reduce bacterial pollution in the Cane Creek-Little River Watershed (030601010305), within the greater Keowee River Watershed (0306010103), through a Septic Find and Fix Program. The proposed project includes the repair and replacement of 32 septic systems to address bacterial and nutrient pollution in this watershed. Numerous stakeholders have assisted the LKSWPT by providing a combination of financial and in-kind support for this work. Project partners include: Friends of Lake Keowee Society (FOLKS), Duke Energy, Pickens County, Oconee County, Greenville Water, Advocates for Quality Development, Seneca Light and Water, Clemson Center for Watershed Excellence, Clemson Extension, and Upstate Forever.

Drain line impacted by roots (left) and visible sludge (right) at elbow of pipe before repair

Due to the pandemic, LKSWPT was delayed in hosting in-person events, but in May 2022, LKSWPT participated in a joint event with the Anderson Chamber of Commerce and other groups working on water protection in Anderson, Pickens and Oconee counties. Members of LKSWPT were part of a Source Water Panel and provided an overview of the grant funding for septic repair in the Watershed.

Outreach consisted of four informational mailings to all identified homeowners in the target watershed about funding availability. Additionally, a letter was mailed to certified septic contractors in Oconee and Pickens County announcing funding availability. Signs were strategically placed on major highways, distributed press releases to the local media, a social media campaign including Facebook and Instagram,

stakeholder websites, and newsletters. Also, two public service announcements were broadcasted on WGOG radio station. The LKSWPT also purchased 5,500 citizens addresses to be used for public outreach purposes such as to mail information about the grant and the available funding opportunities.

Other outreach efforts consisted of additional public service announcements, flyers included in Seneca Light and Water utility bills, the Blue Ridge Electric Newsletter, FOLKS publications, The Sentinel, as well as announcements on Oconee County Administrative and Tax Assessor Facebook pages. The Seneca Journal ran a front-page article on the available funding on November 18, 2021. Also, a rack card was developed in early 2022 and distributed to local realtors and festivals.

We continue to work with South Carolina Adopt A Stream (SC AAS) sites in the Watershed with five sampling locations in the Cane reek – Little River Little Cane Creek Watershed: Cane Creek Church, Crooked Creek, Flat Creek, Little Cane Creek, and Sertoma Field. We will continue monitoring data provided by SCAAS volunteers as it becomes available.

As a result of this work, LKSWPT completed (20) twenty of the 32 proposed septic repairs in the Watershed. Due to increased material costs, the estimated cost of the repairs has been greater than projected, therefore grant funding has been exhausted. However, we are continuing to repair faulty septic systems with available LKSWPT funds.

Although the projected goal of 32 repairs was not met, 20 septic repairs in the watersheds is estimated to yield the removal of a total of 4.84E11 bacteria/year.

Hog Inlet

The Waccamaw Regional Council of Governments was awarded a 319 Grant to reduce fecal coliform bacteria in the Hog Inlet-Dunn Sound Creek watershed in 2018. The Hog Inlet-Dunn Sound Creek Watershed Plan, completed in 2018, found that none of the monitoring sites in the watershed met the SCDHEC standard for fecal coliform bacteria. The purpose of this 319 Grant is to implement recommendations from that plan and reduce levels of fecal coliform bacteria in the watershed. More specifically, this will be achieved by reducing reliance on malfunctioning septic tanks, increasing the population of harvestable oysters, reducing the stormwater runoff impacts on water quality, and enhancing public awareness.

In 2022, Coastal Carolina University completed a second oyster restoration project along the shoreline of House Creek, adjacent to the Future Farmers of America property located off of Little River Neck Rd. The restoration project occurred on April 27-28, 2022 and involved numerous volunteers. This project served as a second phase of the project that completed in 2022, expanding on the size of the previous installation.

Riverside Park shoreline plantings

In the Spring, Charleston Aquatics completed two stormwater shoreline planting projects, one on Riverside Drive at Riverside Park in unincorporated Horry County and another off of Nixon Street in the City of North Myrtle Beach. These projects varied in the fact that one was a freshwater pond, while the other is impacted by saltwater. While the plantings varied, both projects were focused on shoreline stabilization to reduce the pollutants from stormwater runoff.

In addition to these two pond projects, the City of North Myrtle Beach also installed Filtrexx Stormwater Catchment Basin Filters at seven locations along Ocean Blvd. The purpose of installing these BMPs was to reduce sediment loading into the stormwater system, thus reducing nutrients from be transported with the sediments.

Filtrexx Stormwater Catchment Basi
Filter on Ocean Blvd

Additionally, in partnership with Horry Soil and Water Conservation District, three septic tank upgrades were completed in the Little River Neck area on Jacks Circle, in addition to a sewer tie-in on Riverside Drive. North Myrtle Beach has recently secured federal funding to install sewer lines in existing gap areas off Little River Neck Rd, which will have a significant impact on water quality, as there will be more future opportunities to tie properties into a municipal sewer system, as opposed to septic repair or replacement.

Earlewood Park Stream Restoration

The stream restoration and stabilization project was constructed on a short tributary to Smith Branch that originates within the park below a pipe that drains an older established neighborhood. Storms cause intensive flows from the pipe into the high gradient upper portion of the tributary. These flows, coupled with erosion and soil compaction on steep side slopes from a popular disc golf course have created extreme bank erosion and stream incision within the tributary over many years. The stream has been a hazard to park users and the erosion has resulted in excessive sedimentation to the lower part of the tributary and eventually to Smith Branch. In April 2019 The City of Columbia received US Army Corps of Engineers approval to use Nationwide Permit 18 to raise the bed and regrade 207 linear feet of moderately and highly eroded intermittent stream and 146 feet of moderately and highly eroded ephemeral stream. Project construction began shortly afterwards and was completed in late August of 2019. The repaired stream channel includes gentler sloping banks that connect to a floodplain during excessive flows, and a series of rock step pools designed to prevent bed and bank erosion and allow for water infiltration in the uppermost portion of the stream and more uniform and extended flows to the channel below the project. The project was designed so that it would not impact the wetland and less impaired perennial portion of the stream below. Two walkways, each leading to a separate wooden bridge crossing, were constructed to concentrate foot traffic to planned and maintained areas in order to minimize erosion from disc golf course users and other park visitors. Planted turf grass and biodegradable matting, along with pioneering herbs, vines, and shrub and tree saplings maintained the side slopes and banks until the stream buffer planting with native vegetation was completed in November of 2022.

Earlewood Park stream buffer planting

More than three years after completion, the stream restoration is performing well. The rock check dams maintain the integrity of the pools and stream bed. Some rock displacement has occurred and repairs will be made as needed. No significant erosion is apparent on the slopes around the project area, and no significant sedimentation is visible within the stream. Some erosion was occurring on the pathway to the upper bridge crossing on the steep southern slope of the stream, so the City designed and installed a step pathway on this slope in the fall of 2022 to access the bridge and reduce erosion problems there. No negative impacts to the stream and wetland below the project can be detected. The City of Columbia and The Congaree Riverkeeper coordinated approximately twenty volunteers, many University of South Carolina students, to conduct stream buffer planting along the restored stream section on November 5, 2022, after postponements due to COVID-19. A total of seven native tree species and seventeen native shrubs, grasses, and perennial herbs were planted in the stream restoration area and the bioretention area. This stream restoration project should substantially reduce sediment loading to the stream, as well as nitrogen, phosphorus, and BOD loading.

Construction of the bioretention area in the northern portion of the park was also completed by August 2019. It was designed to collect and treat stormwater from an outflow pipe coming from a low-density residential neighborhood, as well as stormwater sheet flow from the adjacent NOMA Dog Park. The pipe system just above the bioretention area is constructed to divert excessive flows to a discharge channel below the bioretention structure, which should prevent damage to the structure during intense storms. The excess flow and treated flow enter Smith Branch a short distance downstream. Bioretention is expected to treat and reduce nitrogen, phosphorus, sediment and bacteria loading to Smith Branch.

Earlewood Park bioretention area

The bioretention area functioned well, with planted turf grass remaining healthy and no sign of

deterioration more than three years after project completion. Planting of the bioretention area with carefully selected native vegetation was completed in November 2022, after delays due to COVID-19. Planting with native vegetation should enhance wildlife habitat in and around the bioretention area and along the restored stream corridor and is expected to reduce BOD, nitrogen, phosphorus, sediment, and bacteria loading to the tributary.

Signage is planned for each of the three project components which will provide information and education about their function and importance to water quality. Signage will be in place in December of 2022.

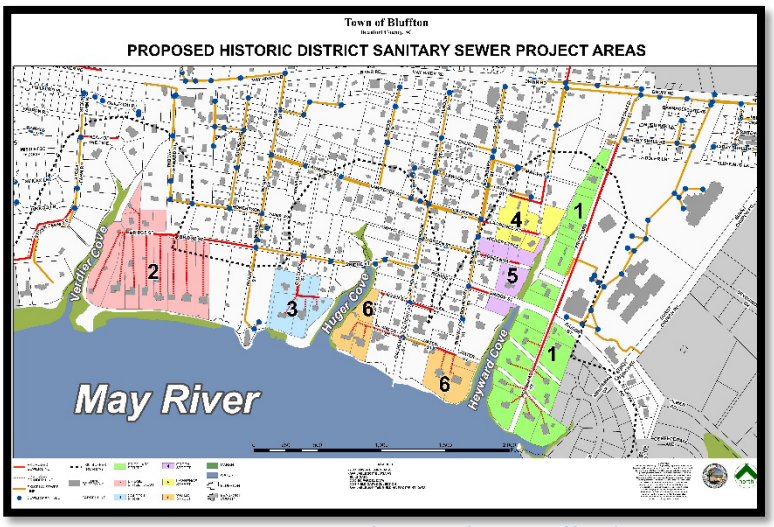
The City of Columbia maintains a water quality monitoring station in Smith Branch downstream from Earlewood Park which provides real time monitoring of temperature, pH, dissolved oxygen, specific conductivity, and turbidity. The City also collects grab samples at this location to monitor TSS and bacteria levels. The City established a monitoring location in the tributary downstream from the stream restoration area prior to construction of the project. This station records temperature, specific conductivity, and turbidity data. Grab samples for TSS and bacteria are also collected at the location. This station will be maintained until sometime after full project completion in order to determine the efficacy of the stream repair and buffer projects on water quality improvement.

May River Action Plan – Phase IV Sanitary Sewer Connection

In response to rising fecal coliform concentrations, the May River was designated a priority and threatened watershed in 2008 by EPA and SCDHEC. The Phase 4 319 Grant supports the connection of forty-nine (49) homes to sanitary sewer in the Poseys Court (6 connections) and Little Aaron Road (12 connections) neighborhoods as well as 31 connections within a 500-foot waterfront priority buffer area of the Town's Historic District Phases 1 & 2. The project is expected to reduce fecal coliform loading by eliminating human waste, a microbial source tracking-confirmed source of fecal coliform bacteria, in the May River. The Town of Bluffton Town Council's goal is to ultimately eliminate septic systems throughout the May River watershed.

At the outset of the Historic District sewer connection projects, staff held separate public meetings with residents of Phase 1 and Phase 2 to discuss project scope and timeframe. Communication has continued with the public at large and the affected residents throughout the design and construction.

Construction was completed January 2021 in the Poseys Court neighborhood. Historic District Phase 1 construction was completed in February 2022. Little Aaron Road mainline construction was halted due to an issue with the contractor and is scheduled to resume



Priority areas within a 500-ft waterfront buffer for sewer connections in Bluffton

in early 2023. Acquisition of Historic District Phase 2 right-of entry and redesign to accommodate an historic Live Oak tree is complete and construction will be bid December 2022.

Following construction and inspection of the mainlines, the Town will receive permits to operate from SCDHEC. After receipt of these permits, lateral line sewer connections and septic system abandonment will begin on Little Aaron Road and Historic District Phase 2. The public can learn more about these projects and their current status by visiting the Town's Sewer story map.

Sand River Stormwater BMP Implementation

The goal of this project is to provide stormwater volume reduction which will reduce flow and velocity of stormwater discharged into the Sand River. Reducing the volume of stormwater will diminish erosion in the Sand River and provide water quality benefits such as decreasing the amount of nonpoint source pollutants, turbidity, litter, and fecal coliform found in urban runoff. This will benefit the existing TMDL for pathogens in this watershed. Stormwater volume reduction will be achieved through construction of an underground stormwater detention system that will intercept stormwater from the main stormdrain outfall and infiltrate stormwater prior to entering the Sand River.

BMP6A initial vault sections installation

With construction on the project beginning in September 2021, the project has now been substantially completed as of the end of November. Remaining tasks to be completed are the installation of the stop logs to cause the interception of stormwater flow into BMP6, installation of two monitoring wells, paving of South Boundary road at the project site, and final landscaping. These activities are currently underway. No medical injuries were incurred during the project and the project spending remains within budget. A ribbon cutting ceremony is scheduled to be held with Aiken City Council and the public invited on December 18, 2022.

BMP6 Vault Installation

BMP 6A was installed first, then BMP6. The Stormwater interception lines for the railroad and South Boundary stormwater lines and the interconnection line between the two BMPs were completed next. Installation of the Opti control system was then

completed after a service visit by the control valve personnel and the Opti system is now live, recording activity and ready for automatic operation.

A problem was encountered during the initial excavation for BMP6. When the foundation for the BMP was underway, it was discovered that kaolin clay was in the area and was of sufficient quantity that the infiltration of the BMP6 vault system would be significantly inhibited. Investigation showed that the kaolin layer was approximately 25 ft. thick and that below the kaolin layer was sand similar to the Sand River. The corrective action was to drill 20 – 3 ft diameter stone chimneys strategically around the base. The chimneys were filled with the same stone that was used for the vault base. This has restored the infiltration planned for the project. DHEC required that we obtain an injection well construction permit and to install monitoring wells so that the BMP will obtain an operating permit. This is in process.

May River Watershed Action Plan Phase V – Bridge Street Streetscape

The Town plans to construct Bridge Street Streetscape CIP project to improve pedestrian connectivity, safety, and treat urban runoff. Bridge Street is a SC DOT east-west connector road in the Historic District that parallels the May River and pre-dates stormwater requirements. Currently, urban runoff discharges directly into Heyward Cove of the May River near SCDHEC SFH Site 19-26. Phase 1 of this project includes improved sidewalks and lighting and provides opportunity for stormwater retrofit to reduce bacteria and other local pollutants of concern.

Working with project partners and based on final design plans, the Town proposes to install a total of 14 infiltration BMPs to capture and improve water quality of first flush runoff volume of the initial 1.95" of rainfall from impervious surface areas draining to each BMP. Of the 14 BMPs to be installed, 9 BMPs are related to 319 grant funding award and 5 additional BMPs are provided to meet the project goal of capturing/treating 1.95" of rainfall from impervious surface areas. As such, the Town believes the project would qualify for additional 319 grant funding if additional grant funds were determined to be available. The figure below presents a BMP summary of drainage area; Target/Required Stormwater retention volume (SWrv) based on the impervious cover in the contributing drainage area; available SWrv; and excess or deficit volume available for each BMP. While not all individual BMPs provide adequate storage for the Target/Required SWrv, using treatment trains allows for the SWrv to be retained in the downstream practice. The three BMP systems currently provide an excess treatment volume of 2,461 cubic feet over the Target/Required SWrv.

BMP Number	Drainage Basin No. (Plan Set Sheet D1)	Contributing Drainage Area (sf)	CDA Turf Cover (sf)	CDA Impervious Cover (sf)	Target/ Req'd SWrv* (cf)	Available SWrv (cf)	Excess SWrv Available (cf)
BMP-01A	1 & 2	10,545	3,545	7,000	1,137.5	2,196.4	1,058.9
BMP-01B	3 & 4	11,729	3,416	8,313	1,350.9	1,378.0	27.1
BMP-01C	5 & 6	7,440	3,426	4,014	652.3	733.2	80.9
BMP-01D	7	5,892	2,532	3,360	546.0	1,073.0	527.0
BMP-01E	8, 9, 10 & Boundary E & W	61,565	35,792	25,773	4,188.1	1,456.0	(2,732.1)
BMP-01F	11 & 12	4,041	1,892	2,149	349.2	693.2	344.0
BMP-01G	13 & 14	6,509	3,136	3,373	548.1	1,127.8	579.7
BMP-01H	15	4,696	1,521	3,175	515.9	1,602.0	1,086.1
System 01 Sub-total		**112,417**	**55,260**	**57,157**	**9,288.0**	**10,259.6**	**971.6**
BMP-02A	18, 19, 20 & 21	19,552	9,892	9,660	1,569.8	1,353.0	(216.8)
BMP-02B	17	2,037	808	1,229	199.7	202.0	2.3
BMP-02C	16	1,526	638	888	144.3	207.0	62.7
BMP-02D	-	-	-	-	-	1,274.0	1,274.0
System 02 Sub-total	-	**23,115**	**11,338**	**11,777**	**1,913.8**	**3,036.0**	**1,122.2**
BMP-03	22	14,559	4,862	9,697	1,575.8	110.0	(1,465.8)
System 03 Sub-total	-	**14,559**	**4,862**	**9,697**	**1,575.8**	**110.0**	**(1,465.8)**
Project Total	-	**150,091**	**71,460**	**78,631**	**12,777.5**	**13,405.6**	**628.1**

Bridge Street Streetscape Project BMP Summary Table

Since the date of grant award, the Town has completed project design of the proposed improvements, obtained all permits for construction, advertised and awarded the construction contract to JS Construction Services, Inc. Due to on-going supply chain issues and impacts to contractor schedules, the Town incorporated a two-part contract award process. Part One was issuing a Notice of Intent to Award Construction Contract which allowed the contractor to determine availability and delivery timing of materials required for construction. Part 2 established the construction schedule and issuance of Notice to Proceed for Construction. As of this writing, the Contractor is scheduled to break ground for project construction in December 2022. Construction is scheduled to be completed Fall 2023. The public can learn more about this project and its current status by visiting the Town's CIP story map page.

Three and Twenty Creek Watershed BMP Implementation

In 2020, Upstate Forever was awarded a three-year 319 grant to implement BMP recommendations from the Watershed Based Plan for the Three and Twenty Creek Watershed, to reduce bacteria, nutrient, and sediment pollution in the Three and Twenty Creek subwatershed. To date, Phase 1 has included the repair and replacement of 27 septic systems, 3 agricultural improvement projects, protection of 100 acres or more of priority lands, and a stream bank repair project/workshop. Numerous partners have assisted Upstate Forever along the way by providing a combination of financial and in-kind support for this work. Project partners include Anderson Regional Joint Water System (ARJWS), Anderson County, Anderson County Soil and Water Conservation District, City of Anderson Stormwater Department, Anderson & Pickens County Stormwater Partners (APCSP), Clemson Cooperative Extension, Pickens County Stormwater Department, and Lake Hartwell Association.

Drainfield being repaired with the installation of EZ Flow drainage lines

Upstate Forever has been successful at recruiting landowners to participate in this project even with the obstacles presented by the COVID-19 pandemic. Upstate Forever participated in several in-person events throughout the year since transmission rates of COVID-19 have steadied out. Outreach events have included a landowner outreach event in April, participation in the Barrels and Beer event in May, and attendance at the Farm City Farmers Breakfast in November. Our team has continued social media posts and other publications, such as our monthly blog, the Water Log, to encourage participation in the project. Upstate Forever has made excellent progress in two years, completing 27 septic repairs, with two more in progress, and reducing bacteria to waterways by 6.53E+11. This reduction is an exceedance of our projected success and is largely attributed to the high demand for septic tank repairs/replacements in the watershed.

Sediment and bacterial pollution from eroding stream banks are another contributing factor of biological and recreation water quality impairments in this subwatershed. Upstate Forever is partnering with Clemson Extension to conduct a streambank repair workshop on Boscobel Golf Course in the spring of 2023. The workshop is set to be divided into two components: a classroom portion and a hands-on installation workshop. The classroom portion is planned to provide background information to participants regarding the benefits of riparian buffers, nonpoint source pollution, and the Section 319(h) program. We are working closely with Boscobel Golf Course on several ideal locations for streambank restoration to pick the best native plant species to suit their needs.


Images of failing drainage field (left) and surfacing wastewater (right) in the Three and Twenty Creek Watershed.

South Pacolet River Watershed BMP Implementation

Spartanburg Water System received a Section 319 Grant in November 2020 to address the recurring eutrophication conditions at Lake Bowen and Municipal Reservoir #1 in northern Spartanburg County. Four (4) Best Management Practices (BMP) were identified in the grant application which can reduce nutrient loading into the lake. These BMPs included livestock exclusion practices on local farms adjacent to the Lake, a bioretention feature and lakeshore stabilization projects near Anchor Park at the Lake Bowen Landing, and modifications to existing stormwater outfalls around Lake Bowen. An update on the progress of each of the four (4) projects is detailed below.

The first project involved the relocation of fencing above the 827’ contour and the installation of the solar powered watering trough at Forty Oaks Farm. The livestock exclusion project was completed in March 2021 and has been fully in use for over a year.


Livestock exclusion fencing and alternative water source

The second project is the installation of a bioretention feature near Anchor Park at the Lake Bowen Landing at US Hwy 9 and Lake Bowen. Construction began in July, 2021 and was completed in August, 2021. In September 2021, sod was placed around the bioretention feature to expedite stabilization and deter the Canadian Geese from destroying the bank around the feature.

Bioretention feature

The third project will address the stormwater and the soil erosion along peninsula banks at the Lake Bowen Landing around Anchor Park. Approximately 2,000 LF of shoreline will be stabilized with vegetative buffers, bioretention and shoreline armoring as necessary. LandArt Design Group prepared the conceptual plan and Black & Veatch developed the civil/site plans. Stormwater permitting was completed in October 2022 with the issuance of the necessary approvals. The Shoreline Stabilization master plan exceeds the current budget so the project will be installed in phases. Spartanburg Water will seek additional 319 Grant funding for the future phases.

The fourth project now targets five (5) different stormwater outfall structures that directly discharge into Lake Bowen. Black & Veatch provided the civil/stormwater engineering support for the design of regenerative stormwater swales, bioswales and other BMPs to reduce sediment entry into the lake. Spartanburg Water has deferred funds from another stormwater project to cover the expenses above the current budgeted grant and local match funds. A request for proposals was advertised November 27, 2022, with deadline for submittals January 5, 2023 and an anticipated award of contract in January 2023.

The bioretention feature, and livestock exclusion project at Forty Oaks Farm were highlighted during the first session of Spartanburg Water's Water Matters Citizen's Academy on October 14, 2022. Water Matters is an annual opportunity for community members interested in learning about critical water and wastewater issues and how a water utility operates. During the visit to the Lake Bowen Landing, participants learned more about the area's watershed and how projects like the Forty Oaks livestock exclusion project can benefit drinking water quality. They also received information on stormwater best management practices around the lake, the purpose of the bioretention feature and how these measures also improve water quality.

Little Pee Dee with Chinners Swamp Phase II

In November of 2020, the Horry Soil and Water Conservation District began Phase II of the Little Pee Dee 319 Water Quality Grant Program. This program was really a continuation of the Phase I Water Quality Grant Program when you consider that it began with over a hundred applications on hand from the Phase I Project. As soon as the Program began, the many diverse homeowners started having septic repairs made. Covid 19 slowed the progress in the beginning of the Program, but repairs have been steady in the last year with the dry conditions and the reduction of Covid 19 illnesses. Applications continue to be submitted for repairs. Repairs includes 81 septic systems and 51 sewer tie on and 1 Agricultural thus far.

The DHEC sponsored 319 Water Quality Improvement Grants have provided the matching funds to enable the Horry Soil and Water Conservation District to cost share with homeowners to make needed repairs to their failing septic systems or tie on to sewer in areas where it is available. The Water Quality in Horry County is better than it would have been without these needed repairs. This partnership with DHEC has improved the quality of life in Horry County.

Failing drainfield before and after construction

Timrod Park Stream Enhancement Project

Progress on the 319 Grant for calendar year 2022 include the initial field work and data collection for the Timrod Park Stream Enhancement Project (Project). This baseline work included topographic survey, geomorphic assessment, bank erosion assessment and invasive species survey. Shortly following the award of the 319 Grant for the Project, the City initiated the planning and design of an additional stormwater improvement project upstream of the Project area (Cedar-McQueen). Cedar-McQueen includes the installation of a constructed wetland treatment complex upstream of Spruce Street and the daylighting of Doe Branch from Spruce Street into Timrod Park. This will impact the design and construction of the Project at the culvert outfall and work around the confluence of Doe Branch and Gully Branch. The initial concept design for the Project is being modified to incorporate this new section of daylighted and realigned stream channel. Overall, the synergy between these two projects will provide significant ecological uplift and improved water quality through wetland treatment and a new stable stream alignment through a portion of Timrod Park. The two projects will be designed and permitted concurrently but constructed under separate construction contracts. Construction will be completed for Cedar-McQueen prior to construction of the Project to reduce potential for sedimentation and disturbance along the Project area. Currently, it is anticipated that construction for Cedar-McQueen will occur in late 2023, with construction of the Project completed in early 2024. This represents a slight delay in the initial grant schedule, but falls within the timeline of the granting period. Progress updates will be provided to SCDHEC as design of both projects reach critical

Culverts to be daylighted in the upcoming work

milestones (60% design, permitting and bid letting). Any potential delays that could impact final completion of the Project will be presented as soon as possible for discussion regarding grant extensions. However, that is not anticipated at this time.

Upper Saluda Watershed Implementation for Sediment

The goal of Save Our Saluda's implementation project is to install agricultural Best Management Practices (BMPs) to reduce sediment pollution, protect water quality, and improve the health of aquatic communities in the Upper Saluda River Watershed. During 2022, a total of 48 acres were planted in cover crops at 5 sites. Ten acres were seeded to create native meadows and a half acre wetland area was planted with native trees, shrubs, and herbaceous plants to restore floodplain and riparian areas at a site along the Middle Saluda River. An organic multi-species cover crop seed mixture was planted on 5 acres of crop fields along the floodplain of the North Saluda River. Fall cover crops were planted across 33 acres at 3 additional farms in floodplains next to Terry Creek and the North Saluda River.

Before and after photos of restoration of a floodplain of Middle Saluda River

Conservation plans are complete for BMP implementation projects at three farms that will leverage NRCS EQIP funding with 319 and partner match funding. The first project includes streambank stabilization, riparian buffer planting, access road stabilization, lined waterways, and heavy use area protection. It is located in the Terry Creek floodplain directly upstream of the stream restoration project implemented and funded by a previous 319 grant in 2021. The new project was designed by NRCS with input from Save Our Saluda, and the permit application has been submitted to the US Army Corps of Engineers. The second project is located in the floodplain of the North Saluda River and includes streambank stabilization, riparian buffer plantings, and a lined waterway. It has been designed by NRCS and is in the process of final approval. Construction for these two projects is planned for the 1st quarter of 2023. The third project is at a livestock farm on Railroad Creek and will include streambank stabilization, a stream crossing, exclusion fencing, well rehabilitation, watering facilities, access road stabilization, and heavy use area protection. Design work is underway by NRCS and construction is anticipated in 2023. Greenville County is assisting with required no-rise analyses and floodplain permitting for all three of these projects.

Continuing to build on previous recruitment efforts, cover crop post cards were again mailed to crop farmers within the watershed and were posted at local Feed & Seeds and on social media. They were also emailed to the Soil Water Conservation Districts and to Save Our Saluda list-serves. These efforts

advertised the grant, reminded farmers that it was time to plant fall cover crops, and of the availability to rent a roller crimper and no till seed drill, both of which were previously purchased with a 319 grant. Additionally, Save Our Saluda met with numerous landowners to discuss conservation needs and promote fall cover crops. As a result, several applied for assistance.

Save Our Saluda, in coordination with Clemson Extension, conducted a Streambank Stabilization Workshop on November 10, 2022 with over 50 people in attendance. The workshop included speakers on topics including methods for repairing eroding streambanks, controlling exotic invasive species, and for establishing, enhancing, and maintaining riparian buffers to protect streambank property and downstream water quality. Partnering organizations shared information on local programs, available technical and financial assistance. Each participant received a packet of information that included fact sheets on riparian buffers, live stake harvesting and planting techniques, species lists for native floodplain and riparian herbaceous and woody species, regional plant vendors, stream restoration contacts, and Clemson Extension's Stream Bank Repair Manual for South Carolina. The afternoon included a field tour of a nearby stream restoration project and a live stake demonstration.

Streambank repair workshop in November 2022

Phase II: South, Middle, North Tyger River Watersheds BMP Implementation Project

Upstate Forever is continuing to implement the BMP recommendations from the Watershed Based Plan (WBP) for South, Middle, and North Tyger River Subwatersheds during Phase 2, a three-year 319 grant, awarded in 2022. These projects are aimed to reduce bacteria and sediment pollution in the Tyger River subwatersheds. So far, Phase 2 has included the repair and replacement of 21 septic systems with one more in progress, and the completion of 1 agricultural improvement project. Numerous partners have committed to assisting Upstate Forever again in Phase 2 by providing a combination of financial and in-kind support for this work. Project partners include Greer Commission of Public Works (Greer CPW), Startex-Jackson-Wellford-Duncan Water District (SJWD), Woodruff Roebuck Water District (WRWD), Spartanburg County, and Spartanburg County Natural Resources Conservation Service (NRCS).

Upstate Forever has successfully recruiting landowners to participate in this project even with the obstacles presented by the COVID-19 pandemic. Upstate Forever participated in several in-person events throughout the year since transmission rates of COVID-19 have steadied out. Outreach events have included our participation in Discover Your Watershed in May, Imagine a Day Without Water in October, and Lake Robinson Day in November. Our team has continued social media posts and other publications including our monthly blog, the Water Log, to encourage participation in the project. With the completion of 21 septic installations, and one more in progress, a bacteria reduction of 5.08E11 bacteria/year has been removed from these watersheds (18 South Tyger, 2 Middle Tyger, 1 North Tyger).

Images of a failing septic drainage field (left) and surfacing wastewater (right) in the South Tyger River Watershed

Sediment and bacterial pollution from eroding stream banks are another common contributing factor of biological and recreational water quality impairments in these watersheds. Upstate Forever worked with a landowner to install a stream crossing on their property, a tributary to the North Tyger River located in the northern section of the North Tyger River Watershed.

Before and after of a stream crossing installation

North Saluda Rivers Headwaters Restoration Project

Greenville Water completed the majority of Phase One of the North Saluda River Headwaters Restoration project in 2022. Phase One consists of cleaning the weir channel and restoring the North Saluda River by grading streambanks, installing instream structures, and mitigating erosion runoff on landowner partners' property. Phase One is expected to be completed no later than January 2023.

The project began with the weir channel cleanout and the grading of streambanks and installation of instream structures at the demonstration site. Work on the weir channel was completed in March 2022. Next, ~800 linear feet of streambank was graded and ~200 linear feet of toe wood revetments along with 4 instream structures were installed at the demonstration site. Work on the demonstration site was completed by replanting the riparian buffer with native trees, shrubs and grasses.

Phase One also included the remediation of several sites on the Callahan Branch of the river owned by cooperating property owners. Several acres at Camp Old Indian, a Boy Scouts camp, that were originally bare and gullied were regraded, planted with grasses, and had proper drainage installed. The driveways of project partners responsible for excessive erosion runoff were regraded, filled with adequate material, and had proper runoff and drainage control measures implemented. Where applicable, the Callahan Branch streambanks were also stabilized on these properties.

Boy scout property pre-work (left) and post-work (above)

In late 2022, DHEC awarded Greenville Water additional funding for the project. This funding was used to remove debris, stabilize ~800 feet of streambank through grading, and to replant the native riparian buffer at the old Dover nursery (a property recently purchased by Greenville Water).


Dover property before photo (left) showing eroded bank and dilapidated building and after (right) hydroseeded and matted bank area

During Phase One, Greenville Water made numerous connections in the community. Partnering with landowners created significant opportunities for education. Many of the area's property owners attended a Greenville Water picnic to showcase the demonstration site and to learn more about the North Saluda River Headwaters Restoration project.

VIII. WBP IMPLEMENTATION – PROJECTS BEGINNING IN FY23

North Saluda Rivers Headwaters Restoration Project Phase II

Greenville Water proposes a 36-month restoration project on two sites. The first section is 2,100 linear feet of stream in a 115-acre portion of the Callahan Branch, the main tributary to the upper portion of the North Saluda River. The second location, known as "The Dover Property," is further downstream. Work on the Dover Property will restore ~700 linear feet of streambank and riparian buffer, while also removing a derelict plant nursery in the adjacent floodplain. Impairments and historical practices on the Callahan Branch and Dover Property have led to an unstable system jeopardizing water quality and recent river restoration efforts downstream. The proposed projects will enhance water quality, provide suitable habitat for macroinvertebrates and other aquatic life, and permanently remediate longstanding problem areas of invasive species, legacy sediment, turbidity, and runoff. The restoration program will restore natural stream pattern, profile, and dimension, by implementing principles of natural channel design, based on fluvial geomorphology to protect from additional runoff, mitigate instream erosion, and create a habitat for all aquatic life. Greenville Water will engage the community by implementing a multi-generational outreach program. Streambank stabilization and riparian buffer reinstallation on portions of the Callahan Branch, along with the Dover Property will maintain the pristine water downstream of the North Saluda River release, restoring water quality standards suitable to support aquatic life.

Horry County Septic and Agricultural Project

The Horry Soil and Water Conservation District with a partnership with Horry County Storm Water Department, Grand Strand Water and Sewer Authority, City of Conway, Crabtree Watershed District, Simpson Creek Watershed District, Gapway Watershed, Todd Swamp Watershed and Buck Creek Watershed District wants to improve the water quality within the county. Based on determinations from the field of poor soil quality, high population density, and socially underserved urban and rural land users. The district will work to help landowners with cost assistance in repairing failing septic systems and

agricultural producers install Best Management Practices to reduce E. Coli within the Horry County Septic and Agricultural Project Area. The area includes Monie Swamp, Grissett Swamp, Mitchell Swamp, Tom's Fork, Juniper Swamp, Buck Creek, Simpson Creek, Holmes Swamp, Crabtree, Maple Swamp-Kingston, White Oak Swamp, as well as Hooks Branch, Headwater Gapway Swamp, Jordan Creek, Cartwheel Branch, Black Creek, Lumber River, Back Swamp, Tredwell Swamp, Cypress Creek, Brown Swamp, Big Cypress Swamp, Palmetto Swamp, Brunson Swamp, Chinners Swamp, Long Branch-Iron Springs Swamp, Playcard Swamp located in and around Aynor, Loris, and Conway. The goal of the project is to improve the water quality within the project area by helping improve by reducing runoff with e-coli for 300 cattle, 50 horses, and 95 households.

Lake Keowee Watersheds Project

The Lake Keowee Source Water Protection Team (LKSWPT) is applying for implementation funds to address bacterial, sediment, and nutrient pollution in the Little River-Lake Keowee and Keowee River-Lake Keowee watersheds. The Lake Keowee watersheds include drinking water intakes for three water utilities that provide drinking water to nearly 569,000 residents in Oconee, Pickens, Anderson, Greenville, and Laurens counties.

Building upon the success of the Phase 1 funding received in 2020 for septic repairs in the Cane Creek and Little Cane Creek watersheds, the LKSWPT plans to expand implementation efforts to the full Lake Keowee watersheds area to include 32 septic repairs, repairing the septic system at the third island bath house at Mile Creek Park, and 200+ acres of land protection through conservation easements. This combination of BMPs addresses the bacterial, nutrient, and sediment reduction needs of the area. The LKSWPT is an established group of stakeholders with a common goal of protecting and restoring the Lake Keowee watersheds and the important resources they provide. The LKSWPT's working relationships with local municipal/county/state governments and local interest groups ensures the continued success of BMP implementation in the Lake Keowee watersheds.

Given the combined acreage of the Lake Keowee watersheds (184,000 acres) and the bacterial, nutrient, and sediment load reductions required per the WBP, it was necessary to divide the nonpoint source pollution reduction plan into a series of manageable phases to generate meaningful load reductions without imposing unrealistic financial burdens on local governments, utilities, and residents. The implementation of Phase 2 of the proposed protection and restoration projects in the Lake Keowee watersheds will allow the LKSWPT to take advantage of our Phase 1 accomplishments and further the reduction and prevention of nonpoint source pollution loading to these important source waters. While septic repairs work to reduce pollutant loads, land protection works to prevent pollution from entering waterways. Thus, pollutant load reduction calculations include both restoration and prevention methods. The expected bacterial pollutant loading reduction/prevention from septic repairs and land protection is 8.68E+11 counts/year. Sedimentation prevention/reduction from land protection is estimated to be 10.09 tons/year. Nutrients (nitrogen/phosphorus) prevention/reduction from land protection and septic repairs is estimated to be 1,958.06 lbs/year.

May River Phase VI – Pritchard Street Drainage Project

The Town of Bluffton plans to construct Pritchard Street Drainage and Water Quality Improvement CIP Project to improve drainage, safety, and treat urban runoff to protect water quality in the May River. Pritchard Street is a Town owned North-South connector road in the Historic District that runs perpendicular to the May River and pre-dates stormwater requirements. Currently, urban runoff discharges directly into Heyward Cove of the May River near SCDHEC SFH Site 19-26. This project

provides opportunity for stormwater retrofit to reduce bacteria and other local pollutants of concern. Working with project partners including Beaufort County School District, University of South Carolina-Beaufort (USCB), and Lowcountry Stormwater Partners (LSP) Consortium, the Town proposes to install fourteen (14) Spring Box Inlet BMPs, structures SB-01 – SB-14; five (5) Infiltration/filter swale BMPs, structures INF-01 – INF-05; and one (1) rain garden/tree well type infiltration BMP (type of BMP to be determined based on design development) located in existing MC Riley Elementary School parking lot as represented on the Pritchard Street Drainage and Water Quality Improvement Project Preliminary/Concept Plan. The efficacy of these BMPs will be monitored and evaluated by USCB and communicated to the public and design community by LSP media platforms.

The ultimate outcome or goal of this project is to incorporate water quality BMPs within the Pritchard Street Drainage and Water Quality Improvement project to demonstrate how BMPs can effectively be incorporated within public works projects to reduce pollutant loads in stormwater runoff and to provide water quality treatment to impervious areas that had no prior treatment (retrofit).

IX. WBP DEVELOPMENT – PROJECTS COMPLETED IN FY22

Developing a WBP for Edisto Island and the Town of Edisto Beach

Clemson Extension and partners, including the South Carolina Department of Natural Resources, the ACE Basin National Estuarine Research Reserve, the South Carolina Sea Grant Consortium, and the Edisto Island Open Land Trust, developed this watershed-based plan (WBP) to address bacteria and turbidity impairments in three HUC-12 watersheds in the Lowcountry of South Carolina. The three watersheds include Store Creek (HUC 030502060307), the South Edisto River-Atlantic Intracoastal Waterway (HUC 030502060308), and the Dawho River-North Edisto River (HUC 030502060405), which encompass the entirety of Edisto Island and the Town of Edisto Beach. Referred to in this watershed-based plan as the Edisto Island watershed, this watershed has been classified as an Outstanding Resource Waters and has abundant shellfish resources. Many of these shellfish beds are currently closed to harvest due to elevated bacteria levels.

Eighteen water quality monitoring stations across the watershed are classified as impaired for bacteria, eleven monitoring stations are classified as impaired for sediment, and two monitoring stations have been assigned total maximum daily loads for bacteria. This watershed-based plan outlines a case for the primary sources of pollution causing these impairments and identifies key areas to target for protection and management. The plan includes recommendations for best management practices to implement across the watershed and associated calculations of existing pollution loads and potential load reductions. Potential funding opportunities are identified, and outreach and education strategies are outlined. Reducing existing levels of water pollution may seem daunting, but there are several success stories across South Carolina where recommendations from a watershed-based plan were implemented and resulted in the removal of an impairment. Using this watershed-based plan as a guide, and treating it as a living document that can be updated and modified over time, increases the likelihood of restoring water quality across the Edisto Island watershed and preserving the ability of the community to enjoy and benefit from a healthy ecosystem.

Developing a Comprehensive WBP for Lake Wateree

McCormick Taylor Inc. (MT) was contracted by the City of Orangeburg Department of Public Utilities (DPU) to develop a watershed-based plan (WBP) to identify and quantify sources of bacteria pollution and provide project recommendations within the Lower Caw Caw Swamp – North Fork Edisto River

Watershed (HUC-12 030502030306). This watershed is 14,227 acres and extends from the City of Orangeburg northeast across I-26 into Calhoun County. Both the Lower Caw Caw Swamp and North Fork Edisto River provide a critical source of drinking water for the City of Orangeburg, Orangeburg County, and Calhoun County. The City of Orangeburg utilizes the North Fork as its drinking water source, with its intake located within the Edisto Memorial Gardens. This Watershed-Based Plan (WBP) for the Lower Caw Caw Swamp addresses key issues impacting source water protection and water quality issues within the watershed, which is currently under Total Maximum Daily Load (TMDL) requirements related to fecal coliform (FC) bacteria. The watershed faces problems typically associated with stormwater impacts resulting from agriculture and increasing development, such as stream erosion, water quality degradation, and loss of natural resources. The purpose of this WBP is to utilize the framework of the United States Environmental Protection Agency's (EPA) nine required elements to identify, quantify, and provide recommendations to reduce pollutants in the watershed. This WBP will also provide recommendations to measure and monitor progress and discuss funding needs and opportunities. Additionally, this plan will incorporate components that address climate change consideration, and the protection of public drinking water sources in the watershed. The total population in this watershed is approximately 7,962. Currently, the major land cover types in the watershed are forest (50%), residential (29%), and commercial (9%). Other developed land uses include industrial (5%), and roadway (2%). The amount of impervious surfaces in the Lower Caw Caw Swamp Watershed is estimated to be 3,372 acres (24%) in total.

Outlet Waccamaw River – Atlantic Intracostal Waterway and Great Pee Dee River WBP

During the development of this Watershed- Based Plan, the stakeholders and their consultant evaluated pollutants which are of concern for the Waccamaw and Great Pee Dee Rivers' designated use as a freshwater stream and a source water. According to SCDHEC's Water Classifications and Standards, waters classified as "Freshwaters" are freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of SCDHEC. "Freshwaters" are suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora (SCDHEC, 2012). "Freshwaters" are also suitable for industrial and agricultural uses. The considerations in determining which pollutants are of concern for the Waccamaw River and Great Pee Dee included current water quality results, concerns for the water treatment plant and likely sources of pollutants in the watershed. It was determined that the key non-pointnonpoint source pollutants of concern are: Nutrients (nitrogen and phosphorous), Sediment (TSS), and Bacteria (Fecal Coliform or E. coli). Each of these pollutants is detrimental to the recreation, drinking water, fishing, and aquatic life, industrial, and agricultural uses designations. The Waccamaw River's low pH level is not considered a concern because the River is a blackwater system, characterized by naturally low pH conditions. Therefore, low pH was not addressed as a pollutant of concern in this Plan. High levels of nutrients, sediment, and bacteria in streams are harmful to human health and to the health of the river; therefore, this WBP describes the sources of pollutants and identifies the recommendations needed to improve and protect the Waccamaw and Great Pee Dee River's water quality. The Plan has considered the unique conditions within the watershed and developed suitable approaches to minimize future impacts to the Waccamaw and Great Pee Dee Rivers. Altogether, the importance of developing this WBP to address the pollutants in the Waccamaw River Watershed is very clear. Efforts that will be taken to reduce pollutants in the Waccamaw and Great Pee Dee Rivers will be a tremendous benefit to the water treatment plants, the local economy, and the quality of life for citizens who live around and enjoy the rivers.

Lower Caw Caw Swamp Source Water and EPA Nine Element Watershed-Based Plan

McCormick Taylor Inc. (MT) was contracted by the City of Orangeburg Department of Public Utilities (DPU) to develop a watershed-based plan (WBP) to identify and quantify sources of bacteria pollution and provide project recommendations within the Lower Caw Caw Swamp – North Fork Edisto River Watershed (HUC-12 030502030306). In this report, the watershed will be referred to as the Lower Caw Caw Swamp Watershed. This watershed is 14,227 acres and extends from the City of Orangeburg northeast across I-26 into Calhoun County. Both the Lower Caw Caw Swamp and North Fork Edisto River provide a critical source of drinking water for the City of Orangeburg, Orangeburg County, and Calhoun County. The City of Orangeburg utilizes the North Fork as its drinking water source, with its intake located within the Edisto Memorial Gardens.

This Watershed-Based Plan (WBP) for the Lower Caw Caw Swamp addresses key issues impacting source water protection and water quality issues within the watershed, which is currently under Total Maximum Daily Load (TMDL) requirements related to fecal coliform (FC) bacteria. The watershed faces problems typically associated with stormwater impacts resulting from agriculture and increasing development, such as stream erosion, water quality degradation, and loss of natural resources. The purpose of this WBP is to utilize the framework of the United States Environmental Protection Agency's (EPA) nine required elements to identify, quantify, and provide recommendations to reduce pollutants in the watershed. This WBP will also provide recommendations to measure and monitor progress and discuss funding needs and opportunities. Additionally, this plan will incorporate components that address climate change consideration, and the protection of public drinking water sources in the watershed.

The Three Rivers WBP

The ultimate goal of this plan is leveraging the current collaborative efforts of the 3RW Stakeholder Group to create a regional framework for meeting water quality standards within the 3RW Area. After years of coalition building and stakeholder coordination, the next logical goal for the 3RW Stakeholder Group is to develop a Watershed-Based Plan to assist in identifying pollutant sources, establishing common water quality management goals and strategies, and implement local and regional scale BMPs. As such, the watershed-based plan will serve as a practical regional guideline and progress monitoring tool to reduce bacterial contamination and improve water quality in the 3RW Area.

The proposed scope of work is designed to provide a series of both local and regional water quality management strategies. These strategies will vary in scope and obligation, from regional programmatic water quality monitoring coordination systems, to targeted stream restoration projects. While 319 Implementation funds are envisioned as a viable funding source for many of the BMP's, this plan is expected to provide strategies which could be successfully implemented by individual jurisdictions or through the leveraging of regional coalitions such as the 3RW Stakeholder Group, MS4's, or stormwater consortiums. That said, the coordination and financial investment demonstrated by the 3RW Stakeholder Group make it an ideal vehicle for further collaboration in restoring water quality within and surrounding the confluence of the Three Rivers Watershed.

Creating a Comprehensive WBP for Lake Greenwood, Saluda River Basin

The ultimate goal of this planning effort is to develop a roadmap to reduce bacteria, nutrient, and sediment pollution through BMP projects and other protective measures for the six identified Lake Greenwood HUC-12 watersheds. Once the completed plan is approved, UF and SCRWA intend to actively

seek funding for implementation from a variety of sources, including SCDHEC's Section 319 Nonpoint Source Pollution grant program, local governments, and private donations. As it stands, we foresee UF taking the lead on plan implementation while relying on the committed organizations such as SCRWA to assist, as needed. For example, identifying and securing priority parcels for protection and BMP implementation will be a critical component of this WBP. Committed project partners will be able to help identify such landowners and assist us in making those important connections in the watersheds. Additionally, UF and SCRWA will develop an ambitious public outreach and education campaign to engage local landowners and secure future BMP implementation projects including land protection. Approaching Lake Greenwood's water quality at a nearly full-basin scale will make it possible to identify those projects that will have the biggest impact on the protection and restoration of the water resources in these watersheds in the most cost-effective manner.

X. WBP DEVELOPMENT – PROJECTS ONGOING IN FY22

Creating a Watershed Based Plan for the Twelvemile River-Keowee River Watershed

UF and the Center (the project team) will develop a comprehensive WBP for the entire Twelvemile River Watershed. Developing this WBP, which builds upon the plan completed in 2016 (PCBEAC, 2016), is the critical next step in protecting these important water resources. This work will include the incorporation of the results from the 2016 completed plan, recommendations for the upper portion of the watershed, which currently does not have a plan, and land prioritization for the entire watershed to help identify where BMP implementation would be most effective (see Map 3). Identifying and securing priority parcels for protection in the watershed will be a critical component of this WBP and will help to guide on-the-ground decisions about utilizing land protection as a strategy to protect source water in the region. UF's Land Protection Program is active in Pickens County and has worked closely with landowners to secure conservation easements in the area. UF currently manages 24 conservation easements in Pickens County and protects four conservation easements within the watershed. As a result, UF has long-standing relationships with many residents in Pickens County (see Map 4). Once the WBP is completed, UF will seek funding from a variety of sources, including SCDHEC's 319 Nonpoint Source Pollution Program, for the WBPs implementation, following the recommendations of both this WBP and the 2016 WBP. Current discussions foresee UF taking the lead on the plan's implementation while relying on the committed organizations to assist as needed. Implementation of this WBP includes working with committed and supporting partners to identify strategic landowners, build relationships and work with them towards land protection efforts. Additionally, there is potential to leverage funding from other governmental programs (e.g., EQIP, WHIP, conservation bank) to implement BMPs throughout the focus area. Although several areas within the basin that fall under Pickens County's and the City of Clemson's MS4 Phase II permits (Map 1) most of the watershed falls outside of MS4 permit jurisdiction, thus emphasizing the need for a comprehensive WBP to address nonpoint source pollution. UF will work closely with the Pickens County and City of Clemson to ensure that the WBP compliments the goals and objectives of their MS4 permits and leads to significant reductions in bacteria and sediment pollution in the watershed.

Givhans Ferry/Edisto River Basin Watershed-Based Plan

The ultimate goal of this planning effort is the development of a watershed-based plan that is both embraced and implemented by the project's Cooperating Partners, including Charleston Water System,

Dorchester County, Colleton County, as well as the supporting partners and stakeholders. The recommendations included in the plan will serve as the foundation for future 319 grant opportunities in the watershed, and should serve as a framework for addressing identified water quality problems with realistic, effective and implementable solutions. We will work to ensure that the partners who participate in the development of the plan take a sense of ownership in the final product as it will be those agencies who will be ultimately responsible for its implementation.

XI. WBP DEVELOPMENT – PROJECTS BEGINNING IN FY23

Big Dutchman and Burgis Creek WBP

The goal of creating the watershed-based plan is to begin implementation of the plan within the watersheds once it is approved. In coordination with the stream restoration "currently in progress" (CIP) list, the plan will assist in prioritizing projects within the watersheds in order to ensure a focus on rectifying existing pollution and preventing additional pollution where possible.

York County, Fort Mill, Tega Cay, York, the Catawba Indian Nation, and the City of Rock Hill can use the final watershed-based plans to coordinate with the respective jurisdictions to move forward with project selection and approval in a way that prioritizes activities outlined in the watershed-based plan. Each municipality will fund and manage projects in their jurisdiction or work together on regional solutions to water quality issues. The Watershed Evaluation Team will continue to meet to discuss projects that are underway and to coordinate resources. The watershed-based plans will be used to apply for 319-implementation projects. The development of the watershed-based plans will allow jurisdictions to become proactive, rather than reactionary, to issues involving water quality in their areas.

The City established a Stormwater Utility fee in 1996, which will be used to design and construct various recommended stream restoration projects within the City limits. The City has three (3) full time crews dedicated to stormwater maintenance and construction, which will be used to complete construction of the projects in a timely manner as well as reduce overall project costs. Even though the Stormwater Utility fee exists within the City, additional funding sources are always sought to allow funds to be leveraged further. The City of Rock Hill will pursue 319 funds after the watershed-based plan is approved and in place. The other Watershed Evaluation Team jurisdictions will use funding from stormwater fees or budgeted funds for implementation of best practices and water quality solutions.

Fishing Creek WBP

The goal of this planning effort is to develop targeted strategies that reduce the impacts from bacteria, nutrient, and sediment pollution through BMP implementation and other protective measures for the watersheds selected. If the proposed WBP is funded, SCRWA will work diligently with the committed partners and other stakeholders to complete the WBP. SCRWA would then plan to facilitate implementation funding for the targeted strategies from sources such as the 319 Nonpoint Source Implementation grant program, local governments, and private donations.

SCRWA hopes to establish a long-term water quality improvement strategy focused on mitigating the effects from nonpoint source pollution in the Catawba-Wateree River Basin through opportunities like the 319 Nonpoint Source Program-Watershed-Based Plan development grant. If approved, this WBP will be part of a systematic watershed planning strategy that would allow SCRWA to not only address water quality issues in the proposed watersheds but would also create added benefit to downstream watersheds, like the ones identified in SCRWA's Lake Wateree WBP.

SCRWA's Natural Resources Protection Specialist will lead plan implementation but will rely on the assistance from stakeholders in the watersheds. Approaching the Fishing Creek Reservoir-Catawba River, Sixmile Creek-Catawba River, and Waxhaw Creek watersheds water quality at this scale will make it possible to identify cost effective projects that will have the biggest impact on the protection and restoration of water resources in these watersheds.

XII. PROGRAM CONTACTS

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