

11. Project Plan Schedule			
Time Period/Date	Task / Milestone (list specific action(s) that lead to output(s) or outcome(s) achieved during each quarter)	Deliverable (output(s) or outcome(s) achieved during each quarter)	Anticipated Amount^{3,4}
First Quarter Ending Mar 31, 2014	<p>Conduct stakeholder meetings with landowners, local, state and government officials, community groups and project partners to develop restoration plan overview including 1) descriptive information about the watershed, 2) location, 3) size, 4) brief statement of impairment, 5) land use within watershed, and 6) background of activities in the watershed. Watershed function, stressors and indicators will also be identified.</p> <p>Develop outline of information and education component that will be used to enhance public understanding of the project.</p> <p>Develop outline of monitoring component.</p>	<p>Quarterly Invoice</p> <p>Draft project overview including outline and strategy for information and education component and monitoring program.</p>	20% \$5,227
Second Quarter Apr-Jun 2014	<p>Work with stakeholders to:</p> <p>Identify and design NPS management measures that will need to be implemented to achieve load reductions as well as to achieve other watershed goals</p> <p>Estimate pollutant load reductions expected for the management measures.</p>	<p>Quarterly Invoice</p> <p>Draft designs of NPS management measures and estimates of pollutant load reductions</p>	30%, \$8,000
Third Quarter Jul-Sep 2014	<p>Work with stakeholders to:</p> <p>Estimate technical and financial assistance needed, associated cost or sources, and authorities that will be relied upon to implement the plan.</p> <p>Schedule implementing the nonpoint source management measures identified in the plan that is reasonably expeditious.</p>	<p>Quarterly Invoice</p> <p>Draft estimate of technical and financial assistance needed and schedule for implementing NPS measures.</p>	20% \$5,000
Fourth Quarter Oct-Dec 2014	<p>Work with stakeholders to:</p> <p>Identify measurable milestones for determining whether nonpoint source management measures or other management control actions are being implemented.</p> <p>Develop criteria that can be used to determine whether pollutant load reductions are being achieved over time and substantial progress is being made towards attaining water quality standards.</p>	<p>Quarterly Invoice</p> <p>Draft measurable milestones and criteria for determining progress towards attaining water quality standards.</p> <p>Final monitoring plan.</p>	20% \$5,000

	Finalize monitoring component to evaluate the effectiveness of the implementation efforts over time measured against the criteria established to measure achieved pollutant load reductions.		
Fifth Quarter Jan-Mar 2015	Work with stakeholders to finalize the restoration plan.	Quarterly invoice Final Project Report	10% \$2,300

³ Please show percent of grant spent that quarter and anticipated dollar amount for reimbursement. Unused funds carry forward to next quarter. Invoices cannot exceed budgeted amount.

⁴ 10% of grant will be held until receipt of Final Project Report.

12. Project Need and Abstract, including background and goals of project.

Abstract

The Albemarle Commission (AC), Albemarle Resource Conservation and Development Council (ARCD), Perquimans and Pasquotank Counties, Soil and Water Conservation Districts (SWCD), Elizabeth City State University (ECSU), Elizabeth City Bass Masters (ECBM), and local community groups are working together to restore the Little River watershed, which includes about eight miles of Impaired river (2012, 303d list). The watershed was once rich in biodiversity with key anadromous fish and shellfish areas, and swamp forests critical to support native fish and wildlife, mitigate flooding, and protect water quality (Figure 1). To help restore the Little River's biodiversity, the partnership is developing a number of activities including construction of wetland filters on main drainage canals flowing into the Little River, restoration of natural hydrology in riparian buffers, conservation of riparian buffers, construction of fish habitat, improved public access, public outreach and environmental education, and monitoring and research.

Need

Agricultural operations and residential and commercial development have significantly impacted water quality and fisheries in the Little River watershed. Agricultural operations have opened drainage canals that directly carry sediments and nutrients to the river, and residential and commercial developments have increased pollution from stormwater runoff. Swamp forest buffers have been eliminated or severely degraded in many locations along the river. As a result, the upper and lower sections of the Little River have been included at different times on the 303(d) list of Impaired waters, beginning in 1998 with the upper section of the river from its source to Halls Creek (11.8 mi.) for low Dissolved Oxygen (DO).

In 2000, the lower Little River from Halls Creek to the Albemarle Sound (6,263.9 acres) was added to the 303(d) list of Impaired waters for low DO. In both upper and lower segments, swamp conditions combined with agricultural runoff were thought to be contributing to the low DO.

In 2008, the Little River from SR 1225 (one mile downstream of SR 1221) to Halls Creek was again placed on the 303(d) list for water quality standards violations. The Division of Water Quality (DWQ) recommended that the lower Little River remain on the 303(d) list of Impaired waters for further assessment of DO and swamp drainage affects.

In 2012, a section of the Little River from SR 1225 to Halls Creek (7.9 miles, Figure 1), was listed Impaired in the aquatic life category. Over the course of the five-year assessment period, nearly 11 percent of samples were above the water quality standard for Chlorophyll *a* indicating nutrient enrichment in this segment of the river. The lower Little River, from Halls Creek to the Albemarle Sound (6,263.9 acres), was not sampled during this assessment period.

The goals of the project are:

- Develop a dynamic public-private partnership of local governments, local, state and federal agencies, non-profit groups, community groups, universities and high schools working to conserve and restore the Little River.
- Create active public participation in conservation and restoration activities.
- Develop an effective water quality and fisheries monitoring program to measure project impacts.

- Develop and demonstrate practical and cost-effective technologies for improving water quality and fisheries habitat.
- Develop practical and useful communication tools for public outreach and education.
- Create a practical framework for restoring similar watersheds in eastern North Carolina.
- Improve recreational fishing in the Little River by improving water quality and by improving and creating fisheries habitat.

The development of a nine-step plan will help guide efforts to restore the Little River watershed. The plan's implementation would address the causes of Impairment by working directly with farmers, homeowners and businesses in the watershed to reduce sediment and nutrient loading from agricultural operations and stormwater. An outreach and education program would increase public awareness of and participation in conservation and restoration activities. A water quality and fisheries monitoring program would help strengthen state and federal monitoring programs in the watershed.

13. Narrative, detailed description of the project. You may use an outline. (Note: if project entails developing a Watershed Restoration Plan, then complete section 15 instead of this section)

See Section 15.

14. Stakeholder Involvement (Name and explain each stakeholder's role in the project.)

The AC will manage the 205J grant. The Albemarle RC&D Council will provide project technical support. Pasquotank and Perquimans District SWCD staff will assist with field surveys, habitat improvement, and public outreach. Pasquotank and Perquimans Counties will provide in-kind support through the SWCD offices and staff, and GIS staff. The tax offices in each county will work with the project to develop a system of tax relief for landowners who sign conservation easements along the river. Staff and students at ECSU will assist with developing and implementing programs for monitoring water quality and fisheries habitat, and processing data for public access. The ECBM will help with public education and awareness activities.

15. Projects Developing a Watershed Restoration Plan should include [EPA's 9 Key Elements for Watershed Restoration Plans](#). (This is not required, but is preferred for restoration projects and proposal is given priority.)

<p>1</p>	<p>An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in the watershed.</p> <p>An overview will include descriptive information about the watershed including location, size, brief statement of impairment, land use within watershed, and background of activities in the watershed. Water quality data will be compiled before, during, and after implementation of the watershed restoration plan in order to gain full understanding of the watershed system. This section will include:</p> <ul style="list-style-type: none"> • <i>Watershed Function.</i> Beneficial watershed characteristics, watershed function. <ul style="list-style-type: none"> ○ The Little River watershed was once rich in biodiversity with key anadromous fish and shellfish areas, and swamp forests critical to support native fish and wildlife, mitigate flooding, and protect water quality (Figure 1). The river is used for recreational fishing, commercial crabbing and watersports. However, according to fisherman in the ECBM and local residents, fishing has declined over the past 10 years or so. • <i>Stressors</i> (causes of impairment). Physical, chemical and/or biological sources degrading the watershed function <ul style="list-style-type: none"> ○ Agricultural operations and residential and commercial development have significantly impacted water quality and fisheries in the Little River watershed. Agricultural operations have opened drainage canals that directly carry sediments and nutrients to the river, and residential and commercial developments have increased pollution from stormwater runoff. Swamp forest buffers have been eliminated or severely degraded in many locations along the river. As a result, Stormwater runoff from agriculture, and residential and commercial development in the watershed has degraded water quality to the point where about eight miles of the Little River are listed as Impaired (2012, 303d list). ○ The project will identify the sources of sediment and other stressors on the river. ○ The project will identify how harvesting of riparian wetland forests along the river has impacted water quality and fisheries. • <i>Indicators.</i> The measures of impact associated with stressors. (ex. Water quality measurements, waterbody advisories) <ul style="list-style-type: none"> ○ The upper and lower sections of the Little River have been included at different times on the 303(d) list of Impaired waters, beginning in 1998 with the upper section of the river from its source to Halls Creek (11.8 mi.) for low Dissolved Oxygen (DO). In 2012, a section of the Little River from SR 1225 to Halls Creek was listed Impaired in the aquatic life category. Over the course of the five-year assessment period, nearly 11 percent of samples were above the water quality standard for Chlorophyll <i>a</i> indicating nutrient enrichment in this segment of the river. The lower Little River, from Halls Creek to the Albemarle Sound was not sampled during this assessment period. ○ ECSU staff and students will work with state agencies and local community groups to develop a water quality and fisheries monitoring program for the entire watershed.
<p>2</p>	<p>A description of the NPS management measures that will need to be implemented to achieve load reductions as well as to achieve other watershed goals identified in the watershed based plan</p> <p>This section will describe management measures scheduled for implementation that will result in pollutant load reductions necessary to achieve water quality standards. Measures will be designed to:</p> <ul style="list-style-type: none"> ○ protect water resources and downstream areas from pollution and flood risk ○ conserve, protect, and restore priority habitat areas ○ preserve and establish riparian swamp forest buffers <p>For example:</p> <ul style="list-style-type: none"> ○ Constructing stormwater wetlands on main agricultural ditches to help reduce sediment and nutrients entering the river.

	<ul style="list-style-type: none"> ○ Reconnecting riparian swamp forests to the river to reduce flood risk and create habitat. ○ Helping Perquimans and Pasquotank counties develop a tax structure to incentivize landowners to enroll swamp forests in conservation easements. <p>Management measures will be summarized in a table with the following headings: <i>Possible Management Measures – Stressor - Targeted Load Reduction - Evaluation Measures</i></p>
3	<p>An estimate of the load reductions expected for the management measures</p> <p>Excess N and P from agricultural operations may be contributing to the Impaired listing for Chlorophyll <i>a</i>. Evaluation measures would include</p> <ul style="list-style-type: none"> ○ Reducing N and P (lbs/yr) ○ Increasing DO (mg/L) ○ Reducing TSS and Turbidity <p>Reducing sediment in the river will be one of the key objectives. The targeted load reduction would be tons of sediment per year. The evaluation measures may include TSS and Turbidity. Load reductions tools will be evaluated for calculating targets, for example:</p> <ul style="list-style-type: none"> ○ Spreadsheet Tool for the Estimation of Pollutant Load (STEPL) ○ Revised Universal Soil Loss Equation 2 (RUSLE2)
4	<p>An estimate of the amount of technical and financial assistance needed associated costs and or sources and authorities that will be relied upon, to implement the plan</p> <p>The Albemarle RC&D Council would provide project technical support. Pasquotank and Perquimans SWCD staff would assist with field surveys, habitat improvement, and public outreach. Pasquotank and Perquimans Counties would provide in-kind support through the SWCD offices and staff, and GIS staff. The tax offices in each county would work with the project to develop a system of tax relief for landowners who sign conservation easements along the river. Staff and students at ECSU would assist with developing and implementing programs for monitoring water quality and fisheries habitat, and processing data for public access. Elizabeth City Bass Masters would help with public education, habitat restoration and monitoring activities. Through the planning process, other local groups would be identified as project collaborators.</p> <p>The project would also work with DMF, WRC, other state and federal agencies, and local fishing clubs to design habitat structures and artificial reefs for the upper, middle and lower sections of the Little River. The project would also identify and work with sub-watershed landowner groups to help solve local water management and water quality problems including conservation of swamp forests.</p> <p>The restoration plan would identify potential sources of funding for project activities including</p> <ul style="list-style-type: none"> ○ Coastal Recreational Fishing License grant program ○ APNEP ○ Division of Water Resources ○ Clean Water Management Trust Fund ○ NC Division of Soil and Water Conservation ○ NRCS ○ US Fish and Wildlife Service ○ EPA ○ Other state and federal agencies ○ Grant-making non-profit organizations <p>Cost Categories would include:</p> <ul style="list-style-type: none"> ○ Staff Salaries ○ Technical Assistance ○ BMP Design and Construction ○ Public Awareness and Education ○ Monitoring and Evaluation

	<ul style="list-style-type: none"> ○ Office Supplies ○ Travel ○ Permitting
5	<p>An information/education component that will be used to enhance public understanding of the project</p> <p>Public education and outreach will be a major component throughout the watershed planning process. Key stakeholders will be identified and included in the development and implementation of the watershed plan. Local, state, and federal programs will also be included in the planning process to tie in financial and technical assistance. Examples of information and education activities include:</p> <ul style="list-style-type: none"> ○ Develop a project web site for public access to information and activities for conservation and restoration. Also access to monitoring data. ○ Develop informational brochures and materials for public meetings and educational events. ○ Conduct public meetings for landowners in Pasquotank and Perquimans Counties. ○ Implement BMPs in areas visible to the public ○ Conduct educational workshops for local high school students. ○ Install information kiosks and signage at river access sites, along the river and at BMPs to highlight project activities in watershed conservation and restoration.
6	<p>A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious</p> <p>The implementation schedule component of the watershed plan will turn the goals and objectives into specific tasks. The schedule will include a timeline of when tasks will be implemented and accomplished, and identify the agency/organization responsible for implementation. The timeline will cover the entire watershed recovery process, with short and long term goals. The parameters for the tasks will include:</p> <ul style="list-style-type: none"> ○ Duration ○ Geographic Scope ○ Critical Areas ○ Goal Statement ○ Objectives and Key Elements ○ Implementation ○ Costs ○ Schedule ○ Monitoring
7	<p>A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented</p> <p>Milestones will measure watershed improvement by setting:</p> <ul style="list-style-type: none"> ○ Short-term goals (1 – 2 years) <ul style="list-style-type: none"> ○ For example, completing the watershed restoration plan and beginning implementation activities including public education and baseline monitoring. ○ Mid-term goals (2 – 5 years) <ul style="list-style-type: none"> ○ For example, establishing six demonstration BMPs throughout the watershed, and a long-term monitoring program. ○ Long-term goals (5 – 10 years) <ul style="list-style-type: none"> ○ For example, measuring reductions in N, P, and sediment, and improvements in water quality and fisheries stocks. Obtaining commitments from local governments and state and federal agencies to provide technical and financial assistance. <p>Measureable milestones will be organized by priority, and set out in the goals. Tasks set under each goal will include time estimates and responsible parties.</p>
8	<p>A set of criteria that can be used to determine whether loading reductions are being achieved overtime and substantial progress is being made towards attaining water quality standards</p>

	<p>The restoration plan will provide a time estimate and criteria by which the pollutant controls will result in water quality standard attainment for Chlorophyll <i>a</i> ($\mu\text{g liter}^{-1}$).</p> <p>Criteria would include</p> <ul style="list-style-type: none"> • Reducing N and P (lbs/yr) • Increasing DO (mg/L) • Reducing TSS and Turbidity <p>The EPA’s recommended narrative for chlorophyll <i>a</i> in the Chesapeake Bay (2003) may be a good guide for the Little River watershed: <i>Concentrations of chlorophyll a in free-floating microscopic aquatic plants (algae) shall not exceed levels that result in ecologically undesirable consequences—such as reduced water clarity, low dissolved oxygen, food supply imbalances, proliferation of species deemed potentially harmful to aquatic life or humans or aesthetically objectionable conditions—or otherwise render tidal waters unsuitable for designated uses.</i></p>
9	<p>A monitoring component to evaluate the effectiveness of the implementation efforts over time measured against the criteria established under item 8.</p> <p>The project monitoring plan will address the following:</p> <ul style="list-style-type: none"> • Identify purpose of monitoring, including all valuable indicators • Consider data quality needed to meet the goals and objectives in the management plan • Define who and how the data will be used • Collect background information in the watershed that can be used to refine the goals and objectives if needed • Provide the identity and experience of the monitoring plan preparer • Description of the monitoring plan • Parameters to be monitored • Method of analysis • Monitoring frequency • Monitoring site locations (mapped in GIS) <p>ECSU staff and students will work with DWQ, NCDMF, WRC, other state and federal agencies, and local stakeholders to design and implement a water quality and fisheries monitoring program. A QAPP will be developed as a component of the project.</p>