



Watershed Plan for Sediment in the North Saluda River and Saluda Lake

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1. EXECUTIVE SUMMARY

The following Watershed Plan was developed to address sediment in the North Saluda River and Saluda Lake. It lays the groundwork for implementation of practices and measures to reduce sediment runoff and help prevent future sediment runoff to the river and lake. The Plan was developed by Save Our Saluda (SOS) in cooperation with partnering organizations.

Saluda Lake and its contributing rivers in the Upper Saluda Watershed are vital water resources for local communities in the Upstate of South Carolina. Headwaters of both the North and South Saluda Rivers feed reservoirs which supply water to the greater Greenville area. Watershed areas above the two reservoirs are protected and provide some of the highest quality drinking water in the country. Downstream near Greenville, Saluda Lake supplies water to the Easley area and its dam supplies hydropower. The Upper Saluda Rivers also support business and industry, provide recreational opportunities to thousands of Upstate residents and visitors, and generally support a rich diversity of aquatic life.

Sediment is a significant problem for Saluda Lake. In 2011-2012, approximately 366,600 cubic yards of sediment were dredged from the lake at a cost of approximately seven million dollars to Easley Combined Utilities. Upper parts of Saluda Lake are rapidly filling in with sediment and recent surveys indicate the dredged area of the lake is already 2/3 filled in again after only six years. Projected future dredging costs are near ten million dollars.

Water quality in the lake and rivers upstream is impaired, aquatic habitat is degraded, and recreation is diminished due to sedimentation, particularly in the North Saluda River. Cost effective and sustainable watershed-based solutions are needed for long-term erosion prevention and sediment control. Strategies to minimize soil loss from the Watershed will help protect drinking water sources and downstream property, improve river and lake water quality, restore aquatic habitat conditions, and enhance recreational experiences for property owners and the public.

After prioritizing the North Saluda River for initial focus, project partners were recruited to help support and develop a watershed plan to address sediment in watershed areas above the lake. The project was funded through the South Carolina Department of Health and Environmental Control (SCDHEC) Nonpoint Source Program with support from the partnership. Partners included multiple utilities, county stormwater programs, agricultural agencies, universities, and nonprofit groups whose representatives comprise the Technical Advisory Stakeholder Committee (TASC). The TASC met regularly to help oversee and guide the project, and additional focus meetings were held with agricultural, urban, and forestry stakeholders to discuss practices, regulations, and landowner issues related to sediment runoff in the watershed planning area. A



workshop on cover crops and soil health was held in the Watershed and an online survey was conducted to gather public input.

WATERSHED ASSESSMENT AND PLAN

The primary goal of the Watershed Plan is to reduce sediment loading to the river and lake. The Watershed planning area spans the Blue Ridge and Piedmont physiographic regions and encompasses approximately 124.7 square miles in Greenville and Pickens Counties. It includes the North Saluda watershed and drainage areas around Saluda Lake.

Methods

The watershed assessment involved desktop and field surveys to gather land use and water quality data for the watershed planning area. A windshield survey was conducted, and recent aerial photos were evaluated to verify land use mapping and to identify obvious sediment source areas. Modeling of the watershed area was done to estimate existing sediment loading using EPA's "Spreadsheet Tool for the Estimation of Pollutant Load" (STEPL). STEPL incorporates many of the watershed characteristics such as soils, land use, rainfall data and number of agricultural animals. STEPL utilizes the Universal Soil Loss Equation (USLE) to estimate sediment load from surface runoff of different land use areas.

Best management practices (BMPs) and measures were selected and prioritized to address the greatest sources of sediment pollution. These include structural, programmatic, and educational BMPs. Sediment load reduction from implementation of the selected BMPs/management measures was estimated using a number of assumptions, including level of participation and the effectiveness of the practice for reducing sediment loading.

Watershed Assessment Results

Land use data indicate that 77 percent of the North Saluda-Saluda Lake watershed planning area is forested land. Managed rural areas (pastures, crops and hay) make up 8 percent of the total area and 13 percent of land use is categorized as urban. The Upper North Saluda subwatershed above the North Saluda Reservoir is nearly entirely forested and is protected through a conservation easement. As such, the Plan focuses on the lower areas of the Watershed in greatest need of restoration and protection.

Assessment of existing water quality data corroborates designated impairments in the Lower North Saluda River and Saluda Lake related to sediment. High sustained turbidity levels during and following stormflow have been observed in the river and lake. Since the watershed assessment area is largely forested and forests are a fairly stable land use, this indicates that the sediment runoff originates from a relatively small proportion of the watershed drainage area.



Sedimentation is ongoing in the upper parts of Saluda Lake. Data indicate that turbidity in the lake increased during dredging operations, peaked in 2013, and remains higher than pre-dredging levels. STEPL model results indicate that 74% of the overall sediment load originates from the Lower North Saluda River subwatershed and that 67% of the overall sediment load is coming from croplands. STEPL does not estimate gully, streambank, or in-stream erosion (remobilization of legacy sediment, which is significant), only sediment runoff from the land.

Watershed modeling and field observations confirm that intensively managed crop areas in floodplains in lower watershed areas are large contributors of sediment loading to the river and lake downstream. Therefore, these land use areas are the focus for ongoing and future sediment control projects as part of the watershed protection plan described below. Other sediment source areas addressed in the Plan include livestock areas, urban areas (development sites and unpaved driveways), forestry, and streambank erosion.

Watershed Plan

This Watershed Plan for Sediment in the North Saluda River and Saluda Lake identifies priority areas and strategies for watershed restoration and protection. BMPs identified for sediment control are listed below for priority sources.

Agricultural BMPs include:

- Cover crops
- Intercropping
- Conservation tillage
- Vegetated filter strips
- Field borders
- Pollinator strips
- Culvert/ditch stabilization
- Farm road stabilization
- Vegetated waterways
- Sediment control basins
- Terracing and contouring
- Streambank stabilization
- Conservation plans
- Livestock fencing/watering
- Loafing sheds
- Stream crossings
- Cross fencing
- Pasture planting
- Heavy use area stabilization
- Vegetated riparian buffers

Programmatic measures for sediment control for existing and future urban source areas include:

- Land development regulations
- Riparian buffer protections
- Land conservation easement program
- Citizen training and reporting
- Education and outreach
- Watershed Manager



The Plan identifies technical and financial assistance needed for implementation and proposes solutions to help meet those needs. These include grants and programs such as 319 Nonpoint Source Pollution Grants and the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP). Community outreach and education efforts were aimed at building community awareness of the Plan and support for the protection and enhancement of land and water resources in the Upper Saluda Watershed. These included hosting a workshop on soil health and cover crops in the Watershed area of focus, conducting an online survey for community feedback, and developing the first implementation project/demonstration site at a crop farm along the North Saluda River near Marietta. Project fact sheets and website materials were developed, including an online interactive watershed map and an educational video currently under development.

Thank you project partners: Clemson Cooperative Extension, Easley Combined Utilities, Furman University, Greenville County, Greenville County Soil and Water Conservation District, Greenville Water, Mountain Bridge Trout Unlimited, Naturaland Trust, Pickens County, Powdersville Water, Renewable Water Resources, Save Our Saluda, South Carolina Department of Health and Environmental Control, South Carolina Department of Natural Resources, South Carolina Rural Water Association, Upstate Forever and Wood Environment & Infrastructure Solutions.

