

Riparian Buffer Field Tour - May 23, 2000 Tour

8:30 a.m. Depart McKimmon Center

8:45 a.m. – 10:30 a.m. _Urban Development on Richland Creek near Entertainment and Sports Complex

Hosts: Steve Mitchell, Division of Water Quality, North Carolina Department of Natural Resources (DENR), Regional office – 571-4700

John Dorney, Division of Water Quality, DENR, State Office - 733-1786

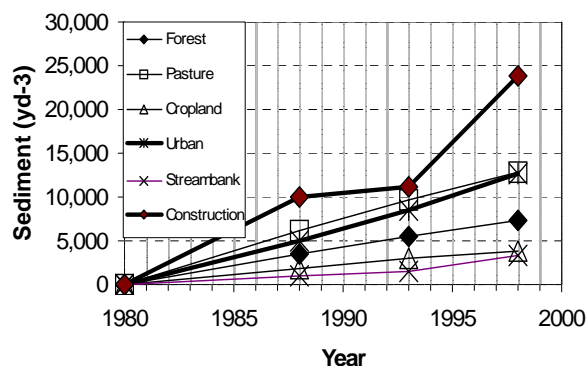
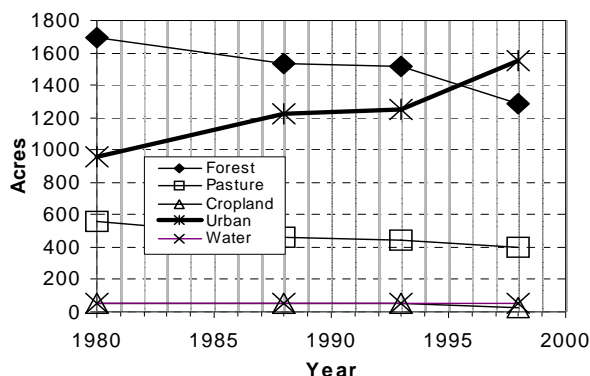
We will stop at two locations to examine construction and protection (and lack thereof) of the riparian buffers on Richland Creek and tributaries. Examples of do's and don'ts during urban construction will be viewed. Most of the construction activities have occurred since 1997. Many of the construction activities occurred prior to the Neuse Buffer rules, but were subject to 401 regulations which involve avoidance, minimization, and mitigation of stream impacts.

Richland Creek has experienced increased and severe streambank erosion since the removal of its riparian buffers and increase in impervious areas in the watershed.

We will also examine an upstream section of Richland Creek that has riparian buffers. This area is slated for development. Opportunities for protection of the headwaters for Richland Creek will be discussed.

11:35 a.m. Richland Lake (downstream)

Drive by (no getting out of vehicles)



Land Uses Changes in the Richland Lake 3320 acre watershed.

Cumulative sediment deposition estimated for each land use, Richland Lake

Data Source: Wake County sediment surveys for Richland and Shelly Lakes. June 1999. Richland Lake was surveyed in December of 1998 to measure the rate of sediment accumulation. This was the first sediment survey on Richland Lake since its 1980 completion. The survey included an estimate of the original profile and depth of the lake's bottom, amount of sediment deposition since 1980, and land use changes within the lake's watershed since 1980. Substantial sedimentation due to construction activities (e.g., Edwards Mill Road Extension, arena, residential and commercial development) was measured.

10:45 - 11:15 p.m. Urban Reference Reach – Brookhaven Park at Berkley Dr.

Site Host: Karen Hall, NCSU Water Quality Group

This site is upstream of Crabtree Valley Mall. We will take a short walk (about 5 minutes) to a stable urban stream. This site has been surveyed as an example of a stable urban stream.

11:30 –12:15 p.m. Oakwood Cemetery Stream Restoration Project

Site Host: Chris Rivenbark, Project Development and Environmental Analysis Branch, NCDOT

Approximately 1,300 ft of Cemetery Creek lies within Historic Oakwood Cemetery in downtown Raleigh, North Carolina. Over the years, Cemetery Creek has become degraded and in some places unstable. NCDOT was approached about using this site as stream mitigation for stream impacts due associated with construction of the Raleigh Outer Loop (I-540). Construction began in early March of 1999 and was completed late April 1999.

12:30 – 1:30 p.m. (tour stop, lunch, and bathrooms)

**Yates Mill Pond Mill and Historic Mill Site, Penny Road
Yates Mill Pond Watershed**

Conservation Easements and Yates Mill Pond Watershed Protection and Restoration Efforts

Host: Rebecca Cope, Wake County (856-6675)

THIS IS A CONSTRUCTION SITE – PLEASE BE CAUTIOUS OF NAILS, ETC.

Wake County Parks and Recreation is working in partnership with Yates Mill Associates, North Carolina State University, and the NC Department of Agriculture to restore historic Yates Mill in southern Wake County and to develop a 612-acre educational park around the mill site and the surrounding natural areas. Yates Mill (circa 1756) is a water-powered mill that operated on Steep Hill Creek in southern Wake County for more than 200 years and is an outstanding record of the evolution of early industry in the lower Piedmont region of North Carolina.

When hurricane Fran hit back in September of 1996, Yates Millpond was emptied. Since that time, the 20-acre millpond has been resculpted, thanks to a grant from the NC Division of Water Resources and matching funding from Wake County. Over 40,000 cubic yards of sediment were removed from the pond bottom, which will improve the millpond's ability to supply the mill with water for its operations, as well as improve water quality and flood control within the millpond's watershed. The millpond was re-established on February 25th, 2000.

Thanks to a grant from the NC Clean Water Management Trust Fund, Wake County Parks and Recreation and NC State University have also been able to restore around 1,400 linear feet of

stream corridor upstream of Yates Millpond. The millpond is part of the Swift Creek watershed and the larger Neuse River Basin. The restored stream area will become an important educational feature for the proposed park. The Clean Water grant will also allow Wake County to purchase riparian areas upstream of the millpond. All of these areas will be placed under the protection of conservation easements.

The proposed park features include the restored mill building, restored 16-foot stone dam, and the resculpted 20-acre millpond. Features in the pond to encourage wildlife habitat include: littoral study area (shallow water), research berms, tree stumps for fish habitat and historical significance, and a boardwalk over the wetlands in the upper reaches of the pond. The park center will be used for education and research, outdoor field classrooms, boardwalks, and hiking trails through ecologically-diverse natural habitats, including pine and hardwood forests, creek, wetlands, and beaver marsh. Many of these natural areas represent environments that are rapidly being lost in Wake County due to rapid development and population pressure.

1:40 p.m. – 3:00 p.m. (Visit 2 sites in the Yates Mill Pond Watershed)

Site a.

**Yates Mill Pond Watershed Stream and Riparian Buffer Restoration project -
N.C. State University, Lake Wheeler Road Field Laboratory**

Site Host: Kevin Tweedy, NCSU Water Quality Group

The Yates Millpond Sub-watershed in southern Wake County is part of the Neuse River Basin and drains into the 42,300 acre Swift Creek Watershed in the central Piedmont region of North Carolina. On-going water quality studies in the sub-watershed have indicated that the existing land uses and stream instability are degrading water quality.

The project which is visited consisted of the restoration of approximately 750 feet of degraded stream channel within the Yates Millpond watershed. Straightening and channelization of the stream in the past resulted in downcutting of the streambed and associated bank erosion as the stream channel began to widen. Restoration consisted of constructing a new meandering stream channel with the proper dimension, pattern, and profile on the abandoned floodplain, and widening the existing riparian buffer. In-stream structures were used to provide both channel stability and improved aquatic habitat. Sod mats and transplants were used to provide immediate bank protection for the new channel. Floodplain restoration consisted of the creation of several small ponds and wetland depressions. Bare root plantings and live staking will be used in the fall of 2000 to establish the riparian buffer for the new channel. The project, completed in May 2000, is the first of a two phase project which will restore approximately 2,500 feet of the incised stream channel and reduce sediment loads to Yates Millpond. Funding is through Wake County and the NC Clean Water Management Trust Fund.

Site b.

Riparian Buffer Research Site - N.C. State University, Lake Wheeler Road Field Laboratory (off Mid Pines Road)

Site Hosts: John Parsons, J. Wendell Gilliam, and Rich McLaughlin

This research site is in the Yates Mill Pond watershed.

An established riparian buffer was evaluated to estimate the effectiveness of treatment of phosphorus and nitrogen. Riparian buffers of 2 different widths were monitored for hydraulic movement and water quality treatment. Various treatments of nutrient inputs from the adjacent farm production field were evaluated. The nutrient applications to the farm field were commercial fertilizer and animal waste applications.

Current research involves evaluating the different buffer sizes and types for removal of typical pollutants in runoff from row crop production. The focus is on pesticides commonly used in corn production.

3:15 - 4:15 p.m. Abbotts Property – Stream / Riparian Area Restoration, off Walnut Street, Raleigh

Site Host: Clarence Coleman, Project Development and Environmental Analysis Branch, NCDOT

This property has an incised stream with some riparian buffers. Woody vegetation, including black willow, river birch, and alder exists

In upper reach. The lower portion of the stream is sparsely vegetated with this beneficial woody vegetation. The stream is incised due downcutting through sediment in the former pond bed.

This site was formerly a pond that eventually filled in with sediment. The dam was breached (intentionally) in the early 1990's. A massive head cut is working its way upstream from the dam through the sediment. The sediment from streambank erosion is a water quality concern in downstream Walnut Creek.

NCDOT has selected this as a mitigation site to offset stream impacts from Holly Springs By-pass.

The restoration plan is to restore the stream to a stable dimension, pattern, and profile, put the stream back on its previous floodplain elevation, which in this case, is the basin of the former pond, maintain existing woody vegetation; and restore the riparian buffer with woody-herbaceous vegetation. The restoration effort is being done in conjunction with the homeowners association and the area will also serve as a community park.

4:30 p.m. – Return to McKimmon Center

Additional technical resource folks on tour (feel free to ask questions)

Robert Evans, hydraulology, drainage

Jim Gregory, vegetation, soils

Greg Jennings, water quality, watershed management

Jean Spooner, monitoring design, data evaluation, watershed management