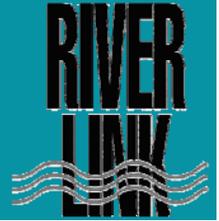


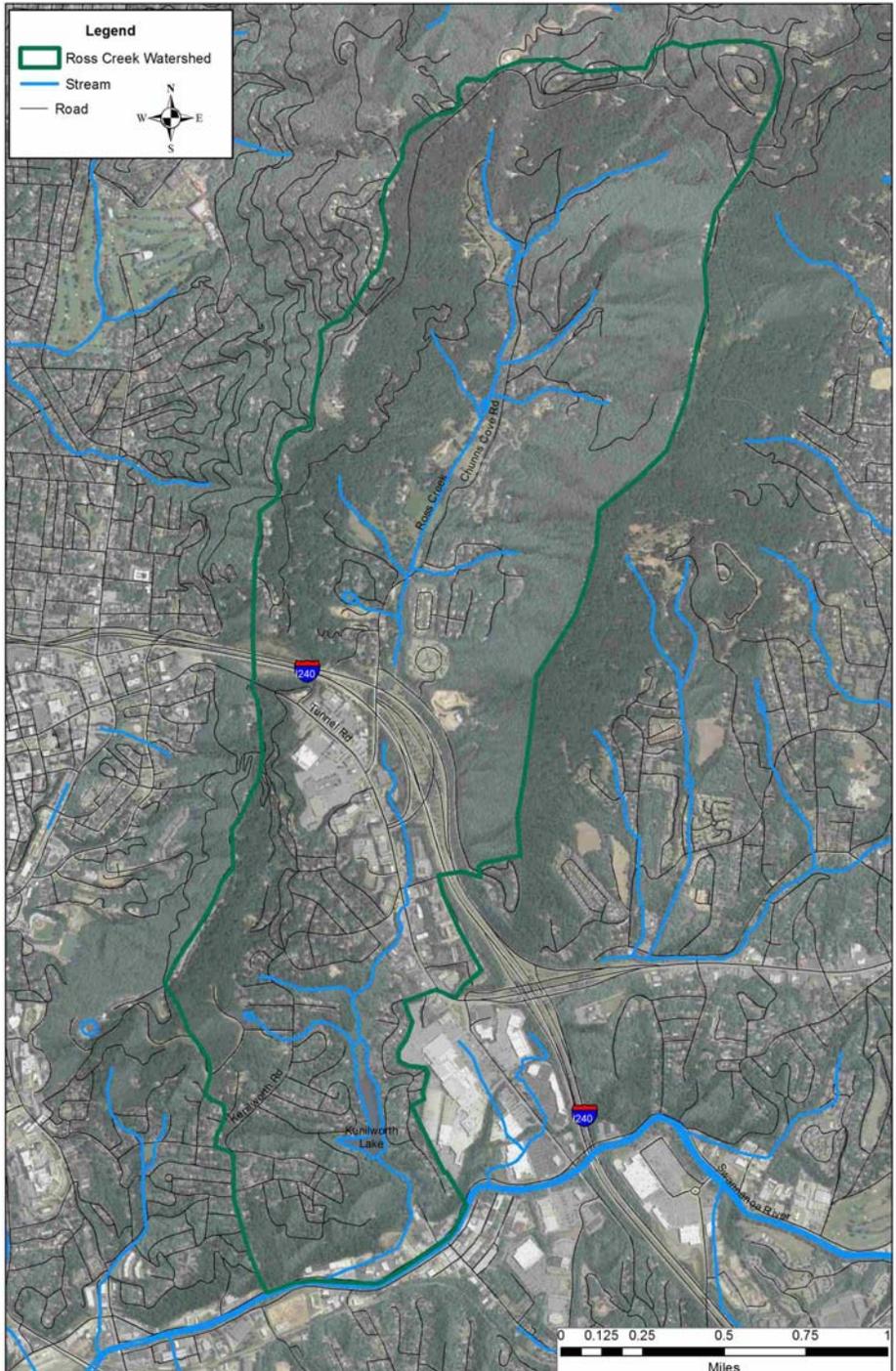
Ross Creek Stormwater Improvement Projects



What is the Ross Creek Watershed?

Ross Creek begins its journey down the mountain within the steep slopes of Chunns Cove paralleling Chunns Cove Road as it travels down along Tunnel Road, turning into Kenilworth, forming Kenilworth Lake, then descending south to the Swannanoa River. Ross Creek watershed consists of all the land draining water to Ross Creek and Kenilworth Lake.

The watershed covers a three-square-mile area including Chunns Cove, a large part of the Kenilworth community, and the commercial area along Tunnel Road from Beaucatcher Tunnel south to the Days Inn. It also includes the eastern slopes of Patton, Sunset, and Beaucatcher mountains as well as the western slopes of Randall Gap, Cisco Mountain, and Piney Mountain. The map below depicts the Ross Creek watershed including the watershed boundary, streams, major roads, and communities.¹



A *watershed* is the area of land where all of the water that is under it or drains off of it goes into the same place. John Wesley Powell, scientist geographer, put it best when he said that a watershed is:

"that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."

Watersheds come in all shapes and sizes. They cross county, state, and national boundaries. In the continental US, there are 2,110 watersheds; including Hawaii, Alaska, and Puerto Rico, there are 2,267 watersheds. Ross Creek is a sub-watershed within the Swannanoa Watershed. The Swannanoa Watershed is a sub-watershed of the French Broad River Watershed.

Source: www.epa.gov

Ross Creek Stormwater Improvement Project Fact Sheet

Ways to Improve Water Quality in your Community

- Install stormwater BMPs such as rain gardens and bio-swales, to capture and cleanse water.
- Disconnect downspouts from the stormwater system, allowing water to flow over vegetated surfaces and into the soil prior to entering the stream.
- Collect and bag leaf litter, rather than allowing it to enter the storm system, potentially clogging drains and pipes.
- Collect rain water in cisterns or rain barrels for non-potable uses.
- Use correct fertilizer application rates, and remove over sprayed fertilizer from impervious surfaces, like sidewalks and driveways.
- Enhance the riparian corridor, through removing invasive species and replanting with native plants.
- Establish conservation easements along the riparian corridor, other key habitats and open space.
- Don't drain motor oil or antifreeze down storm drains.
- Pick up and properly dispose of pet waste.
- Wash your car at a commercial car wash, especially if they recycle the water.
- Properly dispose of household hazardous wastes, such as paint, cleaners, solvents, and batteries.

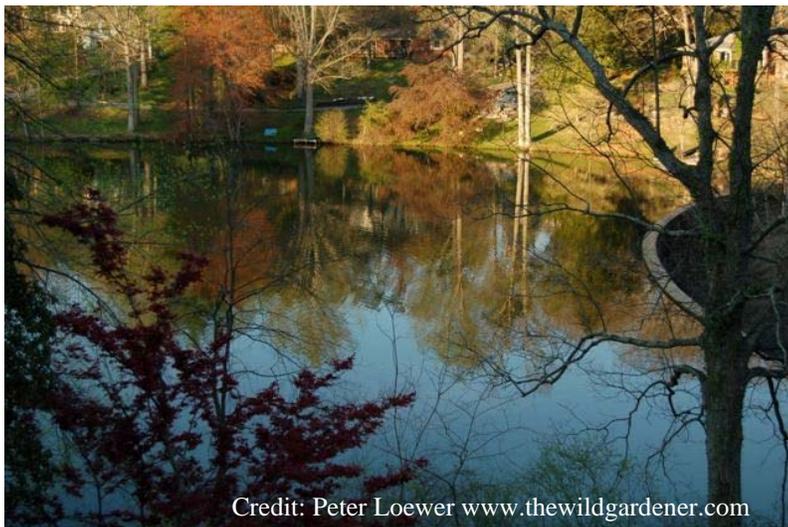
History of Ross Creek

Chunns Cove

Ross Creek begins its journey down the mountain within the steep slopes of Chunns Cove paralleling Chunns Cove Road as it travels down along Tunnel Road, turning into Kenilworth, forming Kenilworth Lake, then descending south to the Swannanoa River. Chunns Cove was once home to Chunns Cove camp for girls, one of the first camp for girls in the area. Around the same time, architect Douglas Ellington built his residence about a mile up from the camp. Before the city brought water to Chunns Cove, natural springs, which fed Ross Creek, were used for water at the Ellington residence.³ As Asheville grew, so did Chunns Cove; the area is now home to over 400 residences.

Kenilworth Lake

Kenilworth Lake was created by James "Jake" Chiles, the land developer who created the Kenilworth neighborhood. In 1916, shortly after the Kenilworth Inn was demolished by a fire, Chiles reconstructed the Inn as a luxurious resort. It opened in 1926, when the work began on the residential side of Kenilworth. The Kenilworth neighborhood developed quickly, due to the location and recreational opportunities. Chiles purchased the hunt club in Happy Valley to expand to neighborhood. Most areas were planned as residential, yet a large area was set aside to be developed as a golf course or lake. Around this time Chiles visited Castle Kenilworth in England, after which the neighborhood was named. Chiles discovered the castle property contained a lake, and brought this concept to Asheville, developing Lake Kenilworth in 1925 at a cost of \$108,000. Since, the lake has been enjoyed by residents, providing recreational opportunities, wildlife habitat, and scenic views. Today the lake is maintained by the Kenilworth Lake Association, which originally formed to raise funds to repair the dam, proving how invaluable the lake is to its community.³



Credit: Peter Loewer www.thewildgardener.com



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References:

1. Land of Sky Regional Council, *The Ross Creek Urban Watershed Project: Project Factsheet*, February 2001.
2. EPA, *Stormwater Phase II Final Rule: Small MS4 Stormwater Program Overview*, revised December 2005.
3. Land of Sky Regional Council, *The Ross Creek Urban Watershed Project: Newsletter*, June 2001.

Ross Creek Stormwater Improvement Project Fact Sheet

Project Description

The Ross Creek Stormwater Improvement Project is an effort to implement portions of the 2007 Ross Creek Master Plan. Numerous stormwater best management practices (BMPs) were identified in the plan, yet due to funding restrictions, land availability, and willing partners, only two opportunities are feasible at this time. Through funding from North Carolina's Clean Water Management Trust Fund and in-kind support from The City of Asheville and RiverLink, this project implements two (2) of the projects identified in the Master Plan, one at St. Luke's Church on Chunns Cove Road and the other on residential property at the corner of Waverly and Lakewood Dr.

Lakewood Drive

This property is owned by Dr. John Umhau, given to his son-in-law by Asheville and Kenilworth resident, David Herbert. The property is steep and narrow, as it is cut through the center by a tributary to Kenilworth Lake. The proposed project develops a stormwater wetland at the eastern end, trapping and reducing pollutants and sediment from entering the lake. Additionally the project proposes stabilizing small sections of stream to protect the long term structure of the drainage and proposed wetland. RiverLink will be assisting the project through hosting volunteer invasive species removal workdays in the spring of 2013.



Rain Garden in the backyard of Kenilworth residence.

St. Luke's Church

Ross Creek borders the church's property along the eastern boundary. Between the creek and the church there is a large grassed field, the gravel parking lot wraps the north end of the field between the church and Chunns Cove Rd. This project proposes a grassed swale, that parallels the main parking area, turning to a vegetated wet swale as it winds around the front of the field. This will clean water draining from Chunns Cove Rd and the church before it enters into Ross Creek. The all native planting will improve water quality and enhance St. Luke's *Fellowship Actions Impacting the Habitat* (FAITH) designation by the NC Wildlife Federation, as a place of worship that has enhanced the habitat and displayed good stewardship of native flora and fauna for all to enjoy.

Over the past 5 years the church established a butterfly garden, eliminated its pesticide use, and has been removing invasive species from the riparian area as part of the FAITH program. Over the past six months RiverLink volunteers and staff, along with church and community members, have teamed up on efforts to remove the invasive species. These efforts will continue throughout the project and include minor stream bank grading and the replanting of these areas with native riparian plants.

Benefits of Stormwater Management

- Improved Water Quality
- Reduce Non-point source pollution
- Reduced Flooding
- Improved quality of life
- Improved infrastructure, safety and security
- Reduce erosion of stream banks and drainages
- Provide habitat for wildlife
- Reduce use of potable water on your landscape



Ross Creek Stormwater Improvement Project Fact Sheet

Current Condition of Ross Creek & Kenilworth Lake

In 1999, the North Carolina Division of Water Quality (DWQ), sampled the stream's benthic community. The field staff inventoried the bottom-dwelling creatures in the stream, such as snails, mussels, and aquatic insects. Some of these organisms are highly tolerant of pollution while others are sensitive. This enables us to predict water quality by looking at the number and type of these organisms in the stream. Samples were taken upstream at St. Luke's Church in Chunn's Cove, and downstream at the AMF Bowling alley. Based on these samples the upstream site was rated at the lower end of "good-fair" and the downstream was rated as "poor". Due to this rating, in 2000 DWQ designated Ross Creek from I-240 to the backwater of Lake Kenilworth as impaired due to habitat degradation, sighting urban runoff as the potential source. Ross Creek has since remained on the list. DWQ monitored Ross Creek again in 2002, with no conclusive improvement, and the Volunteer Water Information Network (VWIN) at EQI continues to monitor today. These efforts assist us in identifying the problems and sources of degradation used to develop a watershed plan with specific recommendations for restoring the health of Ross Creek and Kenilworth Lake.



Watershed Planning

Two planning efforts have been completed in the last 10 years, for Ross Creek and Kenilworth Lake. Based on the 1999 sampling and concerned neighbors the Land of Sky Regional Council (LOS) initiated the Ross Creek Urban Watershed Project in 2001. LOS performed stream assessments, engaged the community, and produced the Ross Creek Watershed Restoration Strategy. The constructed wetland and rain garden behind AMF Bowling was identified in the plan and implemented in 2005.

In 2005, Ross Creek was designated as a targeted watershed by the NC Ecosystem Enhancement Program (EEP) and the City of Asheville for stream and wetland restoration efforts. In 2006 the City funded the development of the Ross Creek Watershed Protection and Improvement Master Plan. This plan builds on the 2001 plan, expanding it detailing the water quality assessment of Ross Creek and its watershed. The study identifies the significance of urbanization and stormwater runoff from surrounding impervious surfaces on the stream's impairment. The plan provides recommendations to improve water quality and stream conditions, and alleviate flooding and erosion along Ross Creek, and one of the central commercial corridors in Asheville.

Stormwater is water which falls during a storm or other wet weather event, that does NOT soak into the ground. As this water travels from the sky over impervious surfaces, such as roofs, driveways and streets, it picks up pollutants which flow directly into streams.

A **Stormwater BMP** is a technique, structure, process, or activity used to reduce the pollutant content and volume of runoff. Examples of structural BMPs include rain gardens, bio-retention areas, and vegetated swales. These are typically depressed gardens used to capture and treat the runoff prior to entering the stream.

Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
- Oil, grease, and toxic chemicals from urban runoff and energy production;
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems

Ross Creek Stormwater Improvement Project Fact Sheet

Determining Stream Health

There are numerous factors which help us ascertain the health of a stream; water quality, physical structure of the stream, and vegetation along the stream are the major components. The quality of the water is often the most commonly thought of factor when we think about stream health. Yet the physical structure and environmental factors are also key aspects. The physical aspects of the stream include the stability of the banks determining if the stream is eroding, connectivity to a floodplain providing flood management, and vegetation along the stream providing habitat and water quality filtration. Another component of stream health is examining the aquatic life and stream habitat. Other factors including in determining stream health also include the designated use of the stream, such as water used for municipal drinking supply is WS. The French Broad is classified B, to be used for primary recreation, as is Ross Creek.

Any activity that occurs on the land has the potential to affect the health of a stream whether it happens immediately beside the stream or miles away at the most distant point in the watershed. So when we evaluate the health of a stream, we have to look beyond the stream banks to the entire watershed.¹



Who Determines Stream Health?

The City of Asheville is designated by the US Environmental Protection Agency (EPA) as an MS4 community, where the municipal sewer system has separate storm and septic systems. EPA's Stormwater Phase II Rule establishes an MS4 stormwater management program that focuses on non-point pollution prevention through community education, construction site runoff control, public participation, and illicit discharge detection and elimination to improve the water quality in the watershed. The North Carolina Department of Environment and Natural Resources Division of Water Quality (DWQ) is the agency responsible for statewide regulatory programs in surface water and groundwater protection, including the EPA's Non-point source pollution prevention program. DWQ, through examination of water samples, benthic organisms, and stream assessments, develops a list of streams that are impaired or impacted by non-point source pollution, under their Impaired & Impacted Stream Initiative, called the 303d list. These programs also assist in evaluating the watershed to identify on-going conservation and potential BMPs. Ross Creek is designated as impaired from I-240 to the backwaters of Lake Kenilworth for poor bioclassification.



EPA's Stormwater Phase II Rule

Establishes an MS4 stormwater management program that is intended to improve the nation's waterways by reducing the quantity of pollutants that stormwater picks up and carries into storm sewer systems during storm events. Common pollutants include oil and grease from roadways, pesticides from lawns, sediment from construction sites, and carelessly discarded trash, such as cigarette butts, paper wrappers, and plastic bottles. These pollutants can impair the waterways, thereby discouraging recreational use of the resource, contaminating drinking water supplies, and interfering with the habitat for fish, other aquatic organisms, and wildlife.²