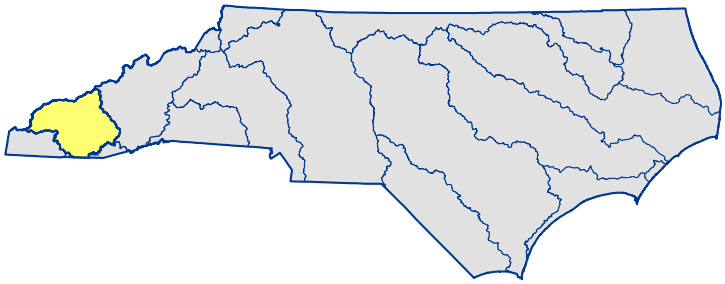
Little Tennessee River Basinwide Water Quality Plan



Summary

Introduction

This 2012 document is the fourth five-year update of the Little Tennessee River Basinwide Water Quality Plan. Previous basinwide plans for the Little Tennessee River Basin were completed in 1997, 2002, and 2007 and are available from the DWQ Basinwide Planning website. This basin plan was written to provide guidance for watershed stakeholders, municipal planners, natural resource regulators, and other environmental professionals with identifying and addressing water quality stressors, sources, and emerging issues. This document can be used in conjunction with the Supplemental Guide to Basinwide Planning which provides general information about water quality issues and DWQ programs.

National Pollution Discharge Elimination System (NPDES) permits were issued in 2012 for a five year period. Basinwide biological and lake sampling last occurred in the Little Tennessee River Basin in 2009 and will be conducted again in 2014.

The Little Tennessee River Basin spans over 1,797 square miles and is divided into three subbasins, Figure 1-1. The Division of Water Quality grouped these subbasins to conform to the federal system of river basin management. Previously, DWQ had its own set of subbasins and numbering system (formerly 040401, 040402, 040403, 040404), but is now using the federal cataloging unit known as hydrologic unit codes (HUCs), Figure 1-2. This report is organized by chapters at the 8-digit hydrologic unit or subbasin level.

The Little Tennessee River is one of three North Carolina river basins that flow westward into the Tennessee Region and eventually drain into the Mississippi River, Figure 1-3.

This plan includes three chapters covering water quality information for each of the subbasins:

- Chapter 1: Upper Little Tennessee River Subbasin HUC 06010202
- Chapter 2: Tuckasegee River Subbasin HUC 06010203
- Chapter 3: Lower Little Tennessee River Subbasin HUC 06010204

Basin at a Glance

Land Area square miles....1,797
Stream Miles.....2,501
Lake/Reservoir acres.....14,171

Counties:

Cherokee, Clay, Graham, Jackson, Macon, Swain,

Municipalities:

Bryson City, Dillsboro, Forest Hills, Franklin, Highlands, Robbinsville, Sylva, Santeetlah, Webster

Population:

2000.....81,917
2010.....94,566

2006 Land Cover:

Developed.....5%
Forested.....91%
Agriculture.....4%

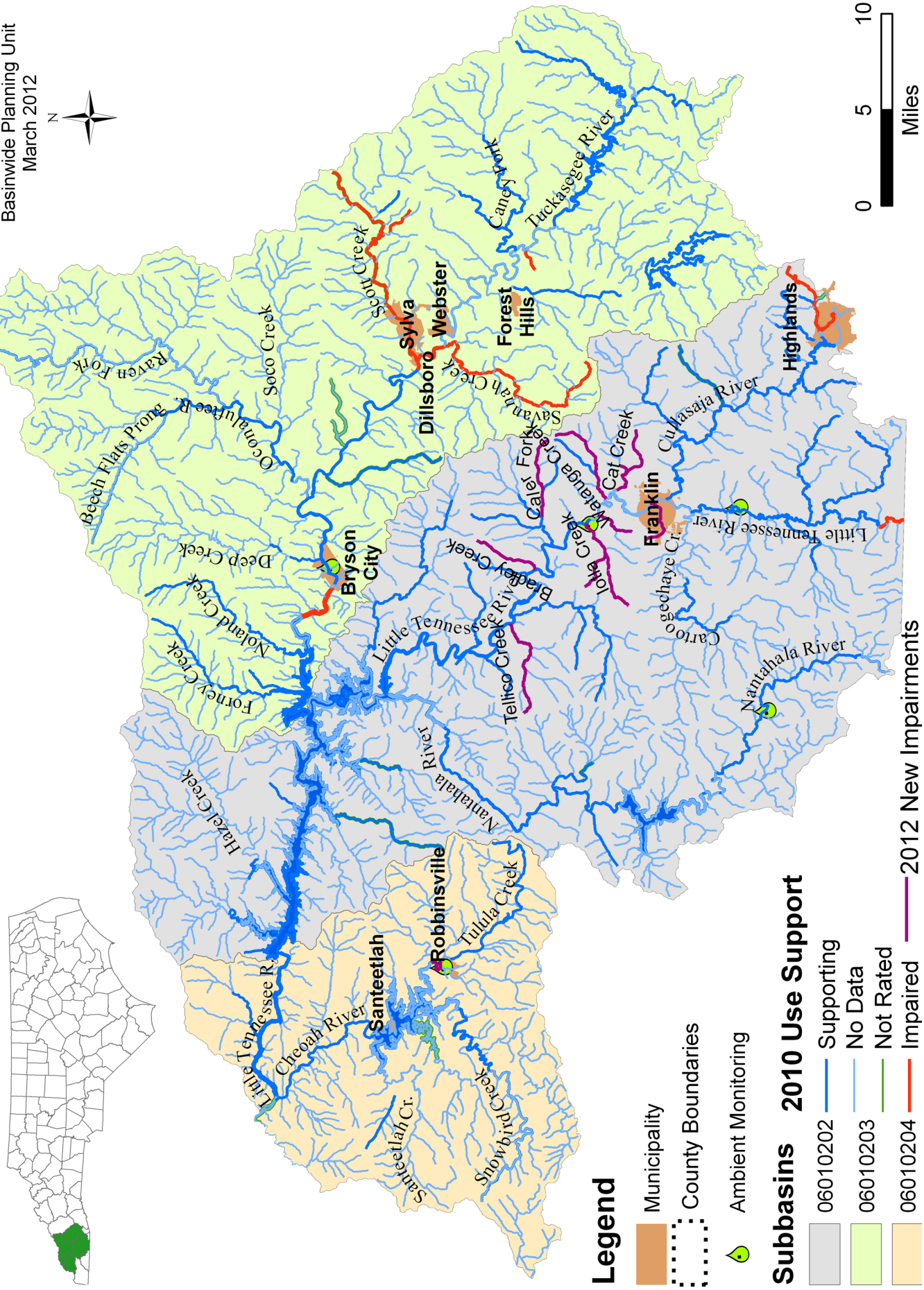
EPA Level IV Ecoregions:

Broad Basins, High Mtns., Southern Crystalline Ridges & Mtns., & Southern Metasedimentary Mtns.

Permited Facilities:

NPDES
Wastewater Discharge.....58
Wastewater Nondischarge...13
Stormwater.....38
Aquaculture Operations.....4

Figure 1-1: Little Tennessee River Basin Map

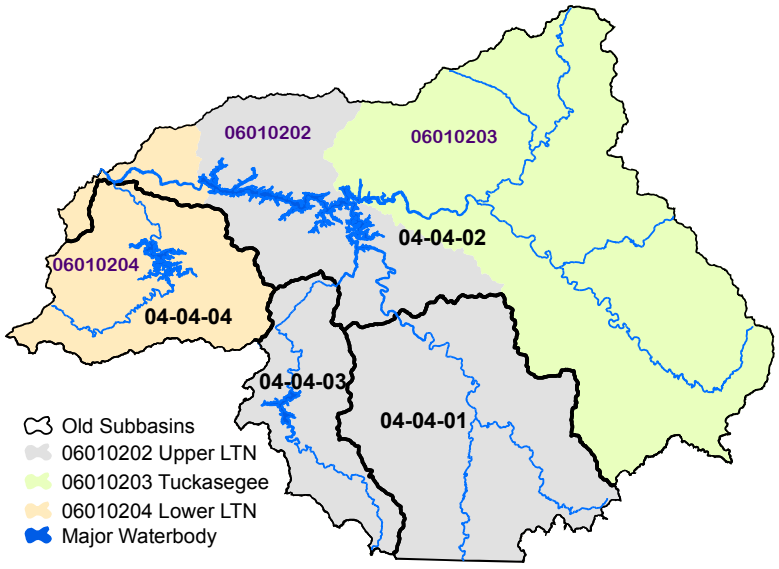


Overview

The Little Tennessee River basin is located within the Blue Ridge Province of the Appalachian Mountains of western North Carolina. It encompasses ~1,800 mi^2 in Swain, Macon, Clay, Graham, Cherokee, and Jackson counties. Much of the land within the basin is federally owned (49%) and in the U.S. Forest Service's Nantahala National Forest (Joyce Kilmer/Slick Rock Wilderness Area) or the Great Smoky Mountains National Park. The basin also includes the Cherokee Indian Reservation.

The Little Tennessee River is one of three major tributaries of Fontana Lake. The other two are the Nantahala River and the Tuckasegee River. The Cheoah River, the fourth major tributary of the Little Tennessee River in North Carolina, has its confluence with the river below Fontana Lake.

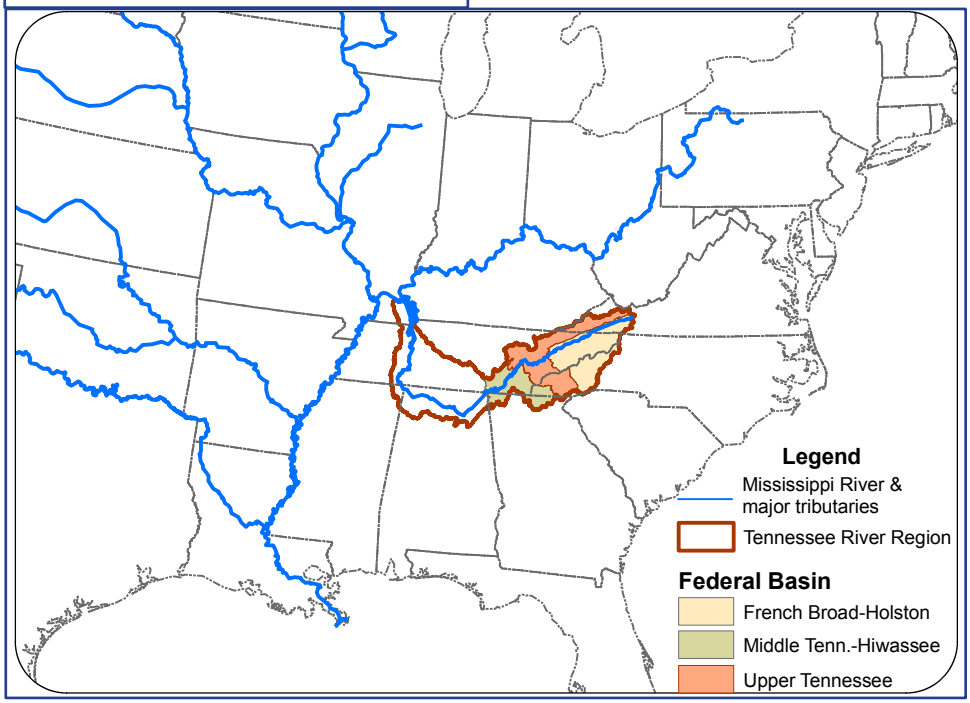
Figure 1-2: Old DWQ Subbasin- HUC Subbasin Conversion Map



The North Carolina section of the Little Tennessee River is typical of many other mountain rivers. The gradient is relatively steep in most reaches of the river and the substrate is dominated by riffle habitats. Most tributaries are high gradient streams capable of supporting trout populations in the upper reaches. The Basin has one of the most outstanding and diverse aquatic communities within the entire state. It is home to a variety of rare species, including crayfish, mussels, fish, aquatic insects, and amphibians. The stretch of Little Tennessee River between Franklin and Fontana Lake (25 miles) has a faunal diversity that rivals any in the state and perhaps in the nation. Forested land continues to comprise a large majority of this basin, owing to its relatively pristine condition.

Although habitat fragmentation due to dam construction has occurred throughout this system in North Carolina and Tennessee, it continues to support an incredibly rich and diverse ecosystem. Mountain home development on steep slopes is an increasing environmental concern and the lower reaches of many tributary catchments are farmed or developed resulting in the increased potential for nonpoint source problems.

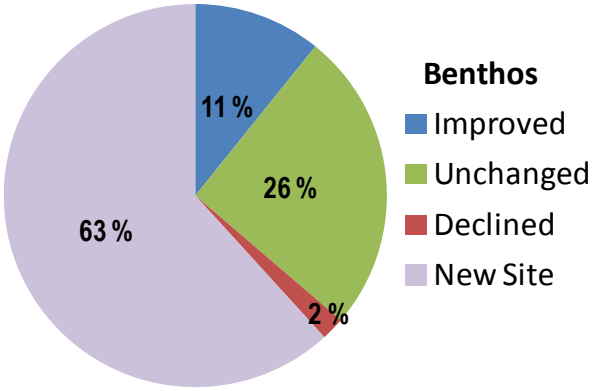
Figure 1-3: Tennessee River Region



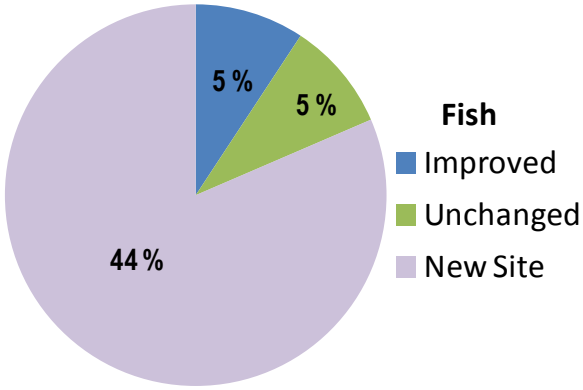
Water Quality Summary

There are five ambient water quality monitoring stations within the Basin, of which turbidity and low pH are the only parameters that have had incidences of exceeding surface water standards. Special Studies and data collected by other groups have documented incidences of high turbidity levels, high nutrient levels and high fecal coliform bacteria levels. Biological samples were taken at 39 macroinvertebrate and 12 fish community basinwide sites with an additional 63 macroinvertebrate and 42 fish samples taken because of special study requests. A majority of the macroinvertebrate sites have Excellent Bioclassification ratings and most of the fish community sites resulted in a Not Rated status due to absence of criteria for rating high gradient mountain trout waters.

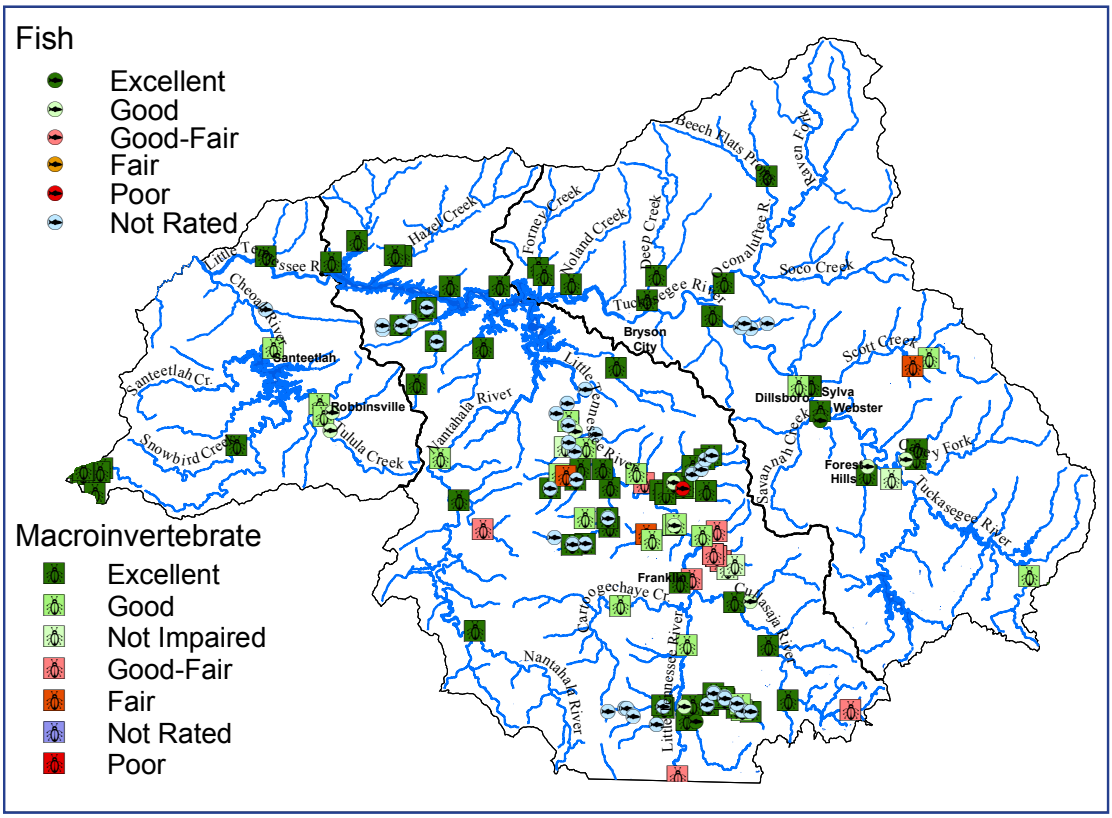
Change in Benthic Macroinvertebrate Site Ratings



Change in Fish Community Site Ratings



Biological Sample Sites and Ratings between 2005-2011



Improved Waters

The Cullasaja River (Ravenel Lake) AU# 2-21-(0.5)a is no longer Impaired for biological integrity as the benthic macroinvertebrate sample resulted in a Good-Fair Bioclassification rating in 2010. This is an improvement over the Fair rating it received in the previous four samples.

Impaired Waters

Water quality data within a 5- year data sampling period is assessed every two years and reported to EPA to meet requirements under Section 303(d) of the Clean Water Act of 1972. Impaired waterbodies exceed a surface water quality standard for that waterbody's designated use; these waterbodies are listed on the 303(d) list. The following list in Table 1-1 includes waterbodies in which a parameter exceeded the standard and enough samples were collected to meet criteria assessment.

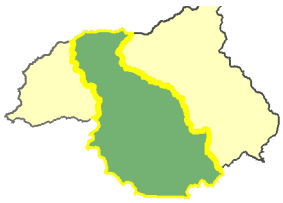
Table 1-1: Impaired Waters

Waterbody	Classification	Assessment Unit #	Length	Parameter	Impaired Year
Caler Fork Creek	C	2-29-4	4.6 mi.	EBIF	2012
Cat Creek	C	2-23-4a 2-23-4b 2-23-4b	2.5 mi 0.5 mi. 0.5 mi.	FCB EBIB FCB	2012 2010 2012
Cheoah River	C;Tr	2-190-(3.5)	1.4 mi.	Turbidity	2012
Crawford Branch	C	2-22	2.7 mi.	FCB EBIB	2012
Cullasaja River (Ravenel Lake)	WS-III;Tr	2-21-(0.5)b	0.7 mi.	EBIB	1998
Bradley Creek	C;Tr	2-33	3.7 mi.	FCB	2012
Iotla Branch	C	2-27-1	2.4 mi.	FCB	2012
Iotla Creek	C	2-27	5.5 mi.	FCB	2012
Little Tennessee R.	C	2-(1)a	2.1 mi.	EBIF	2002
Mill Creek	WS-III;Tr	2-21-3	1.3 mi.	EBIB	1998
Rabbitt Creek	C;Tr	2-23b	2.1 mi.	EBIB FCB	2010 2012
Rocky Branch	C	2-26	2.3 mi.	FCB	2012
Savannah Creek	C;Tr	2-79-36	13.4 mi.	FCB	2008
Scott Creek	C;Tr	2-79-39	15.3 mi.	FCB	2008
Sugarloaf Creek	C	2-79-39-5-1	1.8 mi.	EBIB	2010
Tellico Creek	C;Tr	2-40b	1.0 mi.	EBIB	2012
Tuckasegee River Arm of Fontana Lake	C	2-(78)a	170.6 ac.	FCB	2008
Tuckasegee River	C	2-79-(38)	0.7 mi.	FCB	2008
Tuckasegee River	C;Tr	2-79-(35.5)a 2-79-(35.5)b	1.4 mi. 0.5 mi.	FCB	2008
UT Tuckasegee	C	2-79-(24)ut4	1.3 mi.	Low pH	2010
Watauga Creek	C;Tr	2-24	5.4 mi.	FCB	2012

EBIF= Ecological Biological Integrity Fish Community
EBIB= Ecological Biological Integrity Benthos (Macroinvertebrates) Community
FCB= Fecal Coliform Bacteria

Subbasin Water Quality Summaries

Upper Little Tennessee River Subbasin HUC 06010202

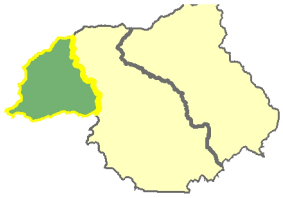


Water quality issues of concern in this subbasin include impacts from developments on steep slopes, agricultural runoff, trout farm waste, stream bank erosion, limited riparian buffers, failing culverts and individual onsite wastewater failures. Waterbodies currently on the 2010 303(d) list of Impaired waters include: a two mile reach of the Little Tennessee River, Cullasaja River, Mill Creek, Cat Creek, Rabbit Creek and Iotla Branch. Also a new fish advisory was issued in 2008 for Lake Fontana due to the potential mercury content in walleye. In 2011, The **Little Tennessee Watershed Association** completed their State of the Streams report. This document is an excellent resource, covering land use changes, natural history, local biomonitoring program results and restoration initiatives.

Chapter 2: Tuckasegee River Subbasin HUC 06010203

This subbasin contains some of the most pristine high quality waters in the state and supports numerous trout streams. Water quality issues of concern in this subbasin include impacts from developments on steep slopes, agricultural runoff, stream bank erosion, limited riparian buffers and individual onsite wastewater failures. Waterbodies currently on the 2010 303(d) list of Impaired waters include: a 1.3 mile unnamed tributary to the Tuckasegee River, Scott Creek, Sugarloaf Creek, Savannah Creek and 170 acres of the Tuckasegee River Arm of Fontana Lake.

Chapter 3: Lower Little Tennessee River Subbasin HUC 06010204



This subbasin contains high quality waters and supports numerous trout streams. Water quality issues of concern in this subbasin include agricultural runoff, stream bank erosion, and individual onsite wastewater failures. There are currently no waterbodies on the 2010 303(d) list of Impaired waters, however a new fish advisory was issued in 2008 for Lake Santeetlah due to the potential mercury content in walleye. Water quality improvements were made in West Buffalo Creek with the removal of four trout farms that were contributing nutrients to Santeetlah Lake, in the Cheoah River with the improved management of water releases from Santeetlah Dam to support aquatic habitat, and in the Tellico River watershed by the restoration of forest and stream conditions impacted from off-highway vehicle recreation.

Local Initiatives & Needs

One of the major assets this basin has to protect and preserve water quality are the local groups that are actively participating in stream restoration, protection, monitoring, education, research and land acquisition. Their specific activities are incorporated within the descriptions of water quality issues within the subbasin chapters of this Basin Plan. DWQ supports and encourages these local groups to continue to identify problems and solutions and to implement activities to improve and protect water quality.

Sediment Control

In 1995, a group of Little Tennessee River Basin stakeholders, particularly non-profit organizations and public agencies, was convened as the Little Tennessee Non-Point Source Team (LTNPST) by the NC Division of Water Quality. The participants in the LTNPST continue to meet on a regular basis to exchange information and ideas and, at times, pursue collaborative opportunities. Various participants facilitated the meetings and in 2007, NC Natural Heritage Program assumed a leadership role in convening meetings. In 2008, a Conservation Action Plan for the Upper Little Tennessee River Basin was assembled with assistance

from World Wildlife Fund, and with direction provided by LTNPST. In 2009, the stakeholders changed the name of this informal group to “Partners for the Little Tennessee”.

The PLT has identified the need for a system of erosion and sediment control (E&SC) trainings within the western North Carolina region as a priority, as some counties require contractors to have annual E&SC training while other counties do not. Research about mountainous terrain E&SC best management practices specific to western NC has been identified as a need. In November 2009, key PLT participants (Land Trust for the Little Tennessee, Watershed Association of the Tuckasegee River, Little Tennessee Watershed Association, Jackson-Macon Conservation Alliance, Southwestern Resource Conservation and Development Service, NC Natural Heritage Program) invited the Hiwassee River Watershed Coalition and Haywood Waterways Association to a discussion about E&SC training for the seven westernmost counties [Haywood, Jackson, Macon, Swain, Graham, Clay, Cherokee]. This steering committee has been meeting since that time, working on the Regional Erosion and Sediment Control Initiative for Western North Carolina. The steering committee continues to pursue grant funding and promote this effort which could have a significant impact on the sedimentation problem in mountain region stream systems. In addition to the benefit of reduced sedimentation, the initiative will benefit local economies and small businesses by helping contractors create and retain jobs.

Franklin to Fontana Local Watershed Plan

Between 2008 and 2011, the North Carolina Ecosystem Enhancement Program led a watershed study and planning effort in the Little Tennessee River watershed between Lake Emory and Lake Fontana. This effort included an assessment of the health of the Little Tennessee River and its tributaries, identification of the major stressors that impact stream quality, development of a plan that names specific recommendations to restore and protect watershed resources, and the production of an atlas of on-the-ground projects that can provide the greatest benefit to the watershed. The data collected during this assessment greatly enhanced DWQ’s existing dataset and provides valuable knowledge on site specific restoration needs. Implementation of identified restoration and protection projects is encouraged.

Impervious Surfaces

Impervious surfaces alter the natural hydrology by preventing infiltration of water into the soil. Impervious surfaces include roads, rooftops, and parking lots; all are characteristics of conventional growth and development. As watershed vegetation is replaced with impervious surfaces, the ability of the landscape to absorb and diffuse the effects of natural rainfall is diminished. Urbanization results in increased surface runoff and correspondingly earlier and higher peak streamflows after rainfall. Bank scour from these frequent high flow events tends to enlarge streams and increase suspended sediment. These effects are compounded when small streams are channelized or piped, and storm sewer systems are installed to increase transport of stormwater downstream.

Progressive planning is needed to protect our water resources to prevent exceeding a watershed’s impervious surface threshold. Both counties and the municipal jurisdictions within the basin should implement the voluntary Universal Stormwater Management Program (USMP) to address stormwater runoff concerns. Under the USMP, a local government will be able to meet the different post-construction requirements for many existing stormwater strategies (HQW, Phase 2 NPDES, etc) with just a single set of requirements.

Trout Farms

Macroinvertebrate and chemical sampling data collected in streams used by and adjacent to trout farms indicated negative impacts to water quality standards. In an effort to improve and protect water quality, while supporting the trout farm industry in the region, a collaborative approach has been undertaken which includes trout farmers, NC Department of Agriculture and Consumer Services, NC Cooperative Extension and DWQ. The outcome of the collaborative work should lead to a better understanding of farm operations, best management practices (BMPs), water resource/quality protection and regulatory needs for all parties. The NCG530000 permit is anticipated to be renewed in July 2012. Any necessary permit modifications to fully protect surface waters used by trout farm operations will be considered and discussed by DWQ and stakeholders during the renewal period. Possibilities may include individual permits for certain farms, farm-specific BMP plan requirements and system modifications.

The economic impact of trout farms in the rural counties within which they are located is considered important. The past six years have seen a decrease of ten percent of the total number of trout farms in the state. Various reasons account for the changes, including an aging farmer population, land valuation increases and, considered most significant, an increase in water temperatures. Options are being considered to maintain current production levels in light of the water temperature change.

Bacteria

Whether a stream is classified for primary recreation (B) or not, the nature of mountain streams lead to a heavy recreation use. High levels of fecal coliform bacteria have been detected in several streams due to the increase in monitoring during a special study. The bacteria normally would have gone undetected because DWQ's limited monitoring resources primarily focus on Class B waters. The detected instream high bacteria counts reinforce the need to reduce non-point source pollution, focus on limiting livestock access to streams, implement agriculture BMPs, promote domestic pet waste pick-up, control urban stormwater and repair failing septic systems.

WaDE

The discharge of untreated or partially treated sewage can be extremely harmful to humans and the aquatic environment. Pollutants from illegally discharged household wastewater contain chemical nutrients, disease pathogens and endocrine disrupting chemicals. Special study requests led to an increase in number of streams sampled for bacteria and have led to several new stream impairments. As of 2012, there are 58 stream miles and 171 lake acres Impaired because of high fecal coliform bacteria levels. The economies of the counties in this basin are highly dependent upon river recreation, especially for tourists and seasonal residents. Reducing bacterial contamination is crucial for supporting a tourist economy. In order to protect human health and maintain water quality, straight pipes must be eliminated and failing septic systems should be repaired.

Recent budgetary changes caused the dissolution of an important program that provided significant water quality as well as human health and quality of life benefits. The Wastewater Discharge Elimination (WaDE) Program formed to identify and correct straight-piped wastewater discharges and failing septic systems, lost funding for all activities. The work that had been accomplished by the program assisted in the reduction of fecal coliform levels in several watersheds across the region. The Division of Water Quality in the Asheville region receives regular phone calls from health department personnel, county personnel and other agencies seeking assistance to help families in need of septic system repairs. Funds need to be reallocated to reestablish the WaDE program or allocated to County Health Departments to assist in detecting and eliminating straight pipes and septic failures.

DWQ Asheville Regional Office Outreach

The Asheville Regional Office (ARO) has recently embarked upon a long-term, outreach initiative designed to establish partnership and understanding across the wide variety of industries and organizations within its management area. To accomplish its mission and obtain its goals, the DWQ understands that partnership-building, continuous education efforts and leveraging of resources are required. In that direction, the ARO has launched several efforts with more to come:

- Western North Carolina is home to a large set of active environmental organizations (EOs) involved in numerous initiatives, many involving water quality. Those organizations, located across the nineteen counties of the Asheville Regional Office, house many resources, including experienced staff, community members and local knowledge. The DWQ employs experienced staff as well, with regulatory and technical expertise. Clearly, leveraging the resources of EOs and the DWQ would benefit all parties in the common mission of protecting water quality. In late 2011, DWQ staff launched an effort in pursuit of such partnering. EOs from across the western region along with DWQ personnel will convene several summits during 2012 to develop a better understanding of the work being done across the region and how to mutually benefit from building partnerships.