Chapter 4 -
Little Tennessee River Subbasin 04-04-04
Includes the Cheoah River Watershed and Santeetlah Lake

4.1 Water Quality Overview

Subbasin 04-04-04 at a Glance

Land and Water	
Land area:	221 mi^2
Stream miles:	352.7
Lake acres:	2,849
Population Statistics	
1990 Est. pop.:	6,140 people
Pop. density:	28 persons / mi^2
Land Cover (%)	
Forest / Wetland:	94.0
Surface Water:	2.1
Urban:	0.5
Cultivated Crop:	0.2
Pasture / Managed Herbaceous:	3.2

The Cheoah River watershed, including Santeetlah Lake, makes up this Little Tennessee River subbasin. The Cheoah River begins in the central portion of Graham County and flows in a northwesterly direction toward its confluence with the Little Tennessee River near the NC/TN state line. Major tributaries include Tulula, Snowbird, West Buffalo, Santeetlah and Yellow Creeks. A map including water quality sampling locations is presented as Figure B-4.

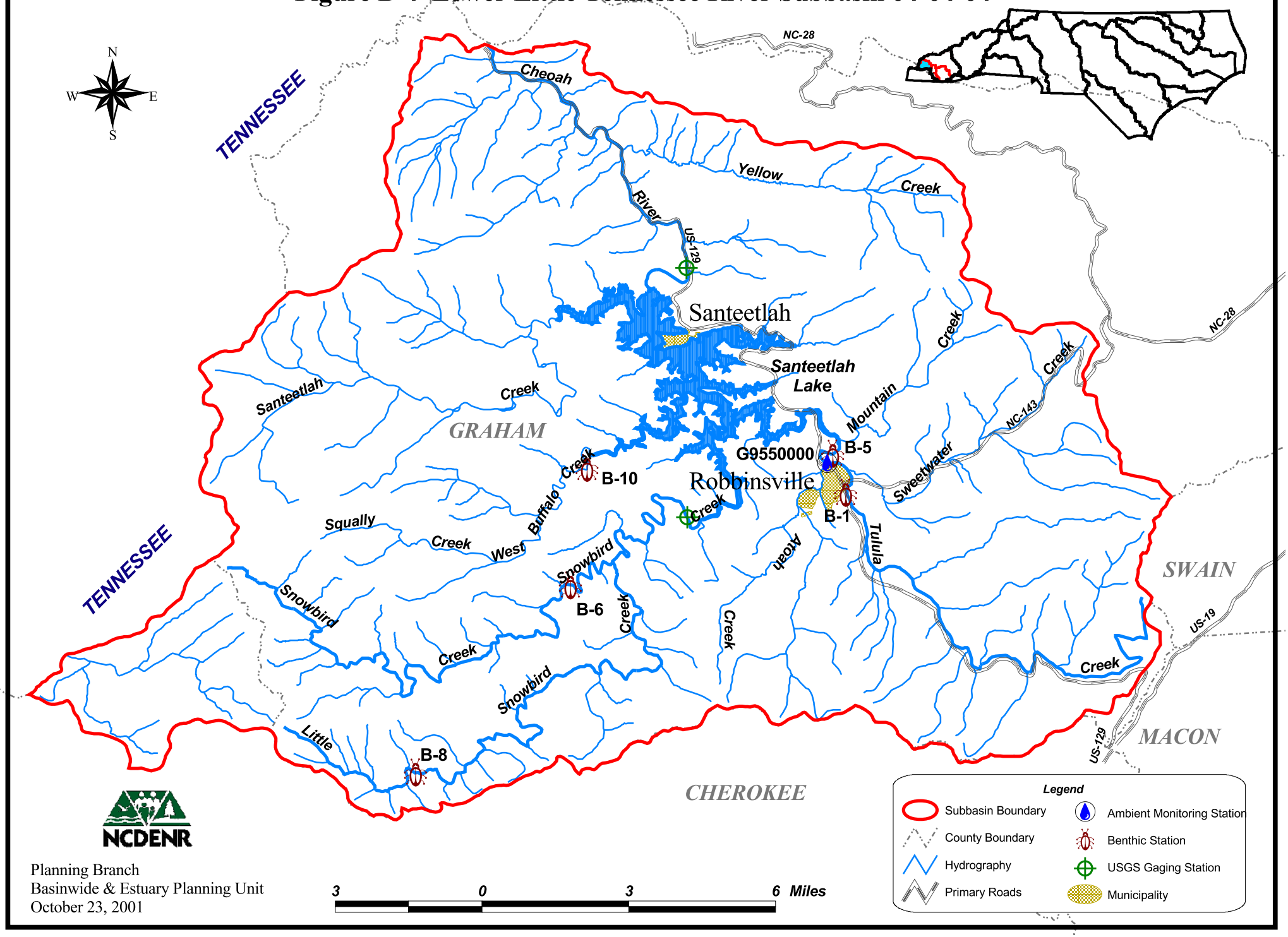
Bioclassifications for sample locations are presented in Table B-10. Use support ratings for each applicable category in this subbasin are summarized in Tables B-11 and B-12. Refer to Appendix III for a complete listing of monitored waters and further information about use support ratings.

Most of the land within this subbasin is forested (94 percent) and lies within the Nantahala National Forest. The Joyce Kilmer National Wilderness Area is also located in this subbasin. The lower reaches of many tributaries are in agriculture, primarily pastureland. The small towns of Robbinsville and Santeetlah are the only municipalities and less than 800 acres of land fall into the urban category in this subbasin.

Water quality in this subbasin is generally excellent. Most streams are high gradient and capable of supporting trout populations. The upper half of the Snowbird Creek watershed, along with several tributaries to Long Creek, is classified High Quality Waters (HQW). Other portions of the Long Creek watershed (Town of Robbinsville's water supply) are classified WS-I, which are by definition, HQW. Several other streams would likely meet the criteria for reclassification to HQW or Outstanding Resource Waters. Refer to Section A, Part 3.2 (page 39) for further information. Additionally, the Cheoah River floodplain is considered a significant natural heritage area by the state because of the rare and endangered species it contains.

There are seven permitted dischargers in this subbasin: five trout farm operations and the Robbinsville water and wastewater treatment facilities. No significant compliance problems were noted during the most recent review period for the two Robbinsville treatment plants. Nutrients from trout farming operations are causing impairment in the West Buffalo Creek arm of Santeetlah Lake. These facilities are discussed in more detail in following sections.

Figure B-4 Lower Little Tennessee River Subbasin 04-04-04



NCDENR

Planning Branch
Basinwide & Estuary Planning Unit
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Table B-10 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (1999) for Little Tennessee River Subbasin 04-04-04

Site	Stream	County	Location	Bioclassification
Benthic Macroinvertebrates				
B-1*	Tulula Creek	Graham	SR 1275	Good
B-5	Cheoah River	Graham	Off SR 1138	Excellent
B-6*	Snowbird Creek	Graham	SR 1120	Excellent
B-8	Little Snowbird Creek	Graham	SR 1115	Excellent
B-10*	West Buffalo Creek	Graham	SR 1123	Excellent
Ambient Monitoring				
G9550000	Cheoah River	Graham	Below Robbinsville	N/A

* Historical data are available; refer to Appendix II.

Benthic Macroinvertebrates

All five streams sampled for benthic macroinvertebrates during the last basinwide cycle received Good or Excellent bioclassifications. Although there are still many streams that have not been sampled by DWQ, no stream in this subbasin thus far has ever received a bioclassification lower than Good. DWQ will attempt, resources permitting, to sample additional streams in this subbasin including Sweetwater Creek, Long Creek and Yellow Creek during the next five-year basinwide planning cycle.

Ambient Monitoring

Water chemistry samples are collected monthly from the Cheoah River between the Town of Robbinsville and Santeetlah Lake. Fecal coliform (an indicator of pathogens harmful to human health) concentrations were slightly elevated compared with previous years. There were no other notable trends, and concentrations of all parameters, including fecal coliform, fell within an acceptable range when compared with water quality standards.

Santeetlah Lake was monitored by DWQ in both 1998 and 1999. The mainstem of the lake is oligotrophic, as is typical of a mountain reservoir. However, the West Buffalo Creek and Snowbird Creek arms of the lake continued to experience (first study was conducted in 1993) accelerated eutrophication. Chlorophyll *a* concentrations in these arms were frequently higher than the 15 ug/l water quality standard that is applied to lakes that are classified trout waters. The West Buffalo Creek arm of the lake is only partially supporting its aquatic life/secondary recreation and primary recreation uses and is discussed in more detail in the following sections.

For more detailed information on sampling and assessment of streams and lakes in this subbasin, refer to the *Basinwide Assessment Report – Little Tennessee River Basin* (NCDENR-DWQ, April 2000), available from DWQ Environmental Sciences Branch at http://www.esb.enr.state.nc.us/bar.html or by calling (919) 733-9960.

Table B-11 Use Support Ratings Summary (2000) for Monitored Lakes (acres) in Little Tennessee River Subbasin 04-04-04

Use Support Category	FS	PS	NS	Total[1]
Aquatic Life/Secondary Recreation	2,569	280	0	2,849
Fish Consumption	2,849	0	0	2,849
Primary Recreation	2,569	280	0	2,849
Water Supply	0	0	0	0

Table B-12 Use Support Ratings Summary (2000) for Monitored and Evaluated[2] Freshwater Streams (miles) in Little Tennessee River Subbasin 04-04-04

Use Support Category	FS	PS	NS	NR	Total[1]
Aquatic Life/Secondary Recreation	253.8	2.9[2]	0	96.0	352.7
Fish Consumption	352.7	0	0	0	352.7
Primary Recreation	7.0	2.9[2]	0	22.2	32.1
Water Supply	82.5	0	0	0	82.5

[1] Total stream miles/acres assigned to each use support category in this subbasin. Column is not additive because some stream miles are assigned to more than one category.

[2] Represents 280 acres of the West Buffalo Creek arm of Santeetlah Lake.

4.2 Status and Recommendations for Previously Impaired Waters

This section reviews use support and recommendations detailed in the 1997 basinwide plan, reports status of progress, gives recommendations for the next five-year cycle, and outlines current projects aimed at improving water quality for each water. The 1997 Little Tennessee River Basinwide Plan did not identify any impaired stream segments in this subbasin.

4.3 Status and Recommendations for Newly Impaired Waters

One additional waterbody in this subbasin was rated as impaired based on recent DWQ monitoring (1994-1999): West Buffalo Creek Arm of Santeetlah Lake.

1.4.1 **Santeetlah Lake, West Buffalo Creek Arm** (280 acres beginning at SR 1148)

1997 Recommendations

The 1997 basinwide plan noted problems with nuisance algal blooms in the West Buffalo Creek arm of Santeetlah Lake that appeared to result from excessive nutrient loading from upstream trout farms. Recommendations were to examine these operations and determine what cost-effective measures could be put into place to reduce the input of nutrients to both West Buffalo

and Snowbird Creeks. The plan also recommended that DWQ consider denying NPDES permits for new trout farms on these streams.

Current Status

A special study of Santeetlah Lake, specifically the West Buffalo and Snowbird Creek arms of the lake, was conducted by DWQ in 1998 and 1999. The study concluded that the assimilative capacity for nutrients in the West Buffalo Creek arm has been exceeded due to NPDES permitted trout farm discharges. Further conclusions were that the Snowbird Creek arm of the lake has reached its capacity to assimilate nutrients without violations of water quality standards (NCDENR-DWQ, June 2000). As a result of this study report, DWQ placed a moratorium on new trout farms in the Santeetlah Lake watershed and on expansion of existing operations. DWQ also notified trout farm permit holders and the public of potential management strategies that included lowering nutrient (especially phosphorus) permit limits, placing limitations on production, and possible non-renewal of NPDES permits for trout farming operations in the watershed.

In early 2001, the Graham County Trout Growers Association began discussing with DWQ ways to reduce the input of nutrients from trout farming operations that included feed and manure handling improvements; an evaluation of the use of medicated feed for sick fish; a fish stocking rotation that would move fish out of the West Buffalo Creek farms during times of the year when algae blooms were more likely; and the possibility of farm buy-outs.

2002 Recommendations

Existing NPDES permits on the West Buffalo Creek arm of Santeetlah Lake will be reevaluated with emphasis placed on total phosphorus effluent reductions. Modeling of nutrient/production limits will be conducted based on this most recent DWQ study. No new sources of nutrients into any arms of Santeetlah Lake will be permitted without a rigorous evaluation of nutrient impacts.

Current Water Quality Improvement Projects

The Southwestern NC Resource Conservation and Development Council (Southwestern RC&D) applied for a $1.25 million grant from the Clean Water Management Trust Fund to buy four trout farms that currently discharge into West Buffalo Creek. In addition to removal of the nutrient-laden discharges, the project would also restore functional riparian buffers and establish permanent conservation easements of the restored trout farm properties.

4.4 303(d) Listed Waters

The West Buffalo Creek Arm of Santeetlah Lake, discussed above, is impaired and on the state's year 2000 303(d) list. Refer to Appendix IV for more information on the state's 303(d) list and listing requirements.

4.5 Other Water Quality Impacts and Recommendations

Based on DWQ's most recent use support assessment, the surface waters discussed in this section are not impaired. However, notable water quality impacts were documented during this process. While these waters are not considered impaired, attention and resources should be

focused on them over the next basinwide planning cycle to prevent additional degradation or facilitate water quality improvement. A discussion of how impairment is determined can be found on page 51.

Although no action is required for these streams, voluntary implementation of BMPs is encouraged and continued monitoring is recommended. DWQ will notify local agencies and others of water quality concerns discussed below and work with them to conduct further monitoring and to locate sources of water quality protection funding. Additionally, education on local water quality issues is always a useful tool to prevent water quality problems and to promote restoration efforts. Nonpoint source agency contacts are listed in Appendix VI.

4.5.1 Sweetwater Creek

The headwaters of Sweetwater Creek begin near the Graham/Swain county line and drain the eastern side of the Cheoah Mountains. The Sweetwater Creek watershed is almost entirely in private ownership, and much of the land is used for agricultural activities. In addition, NC 143 parallels the stream for much of its length. The NC Department of Transportation is currently conducting a major widening project on NC 28 in Graham County (subbasin 04-04-02). As this highway is improved, traffic will likely increase on NC 143 between NC 28 and Robbinsville. DWQ plans to sample this stream during the next basinwide cycle.