

Chapter 3 - Little Tennessee River Subbasin 04-04-03 Includes Nantahala River Watershed

3.1 Water Quality Overview

Subbasin 04-04-03 at a Glance

Land and Water

Land area:	155 mi ²
Stream miles:	257.4
Lake acres:	1,606

Population Statistics

1990 Est. pop.:	1,943 people
Pop. density:	12 persons/mi ²

Land Cover (%)

Forest/Wetland:	96.2
Surface Water:	1.7
Urban:	0.2
Cultivated Crop:	0.1
Pasture/ Managed Herbaceous:	1.8

The Cherokee people called the Nantahala River gorge Land of the Middle Sun because it is so deep and the sides are so sheer that only the noonday sun penetrates its depths (Sakowski, 1990). The majority of the Nantahala River watershed, including Nantahala Lake, is contained within this Little Tennessee River subbasin. Tributaries include Whiteoak, Dicks, Silvermine and Queens Creeks. There are no municipalities. A map including water quality sampling locations is presented as Figure B-3.

Bioclassifications for sample locations are presented in Table B-7. Use support ratings for each applicable category in this subbasin are summarized in Tables B-8 and B-9. Refer to Appendix III for a complete listing of monitored waters and further information about use support ratings.

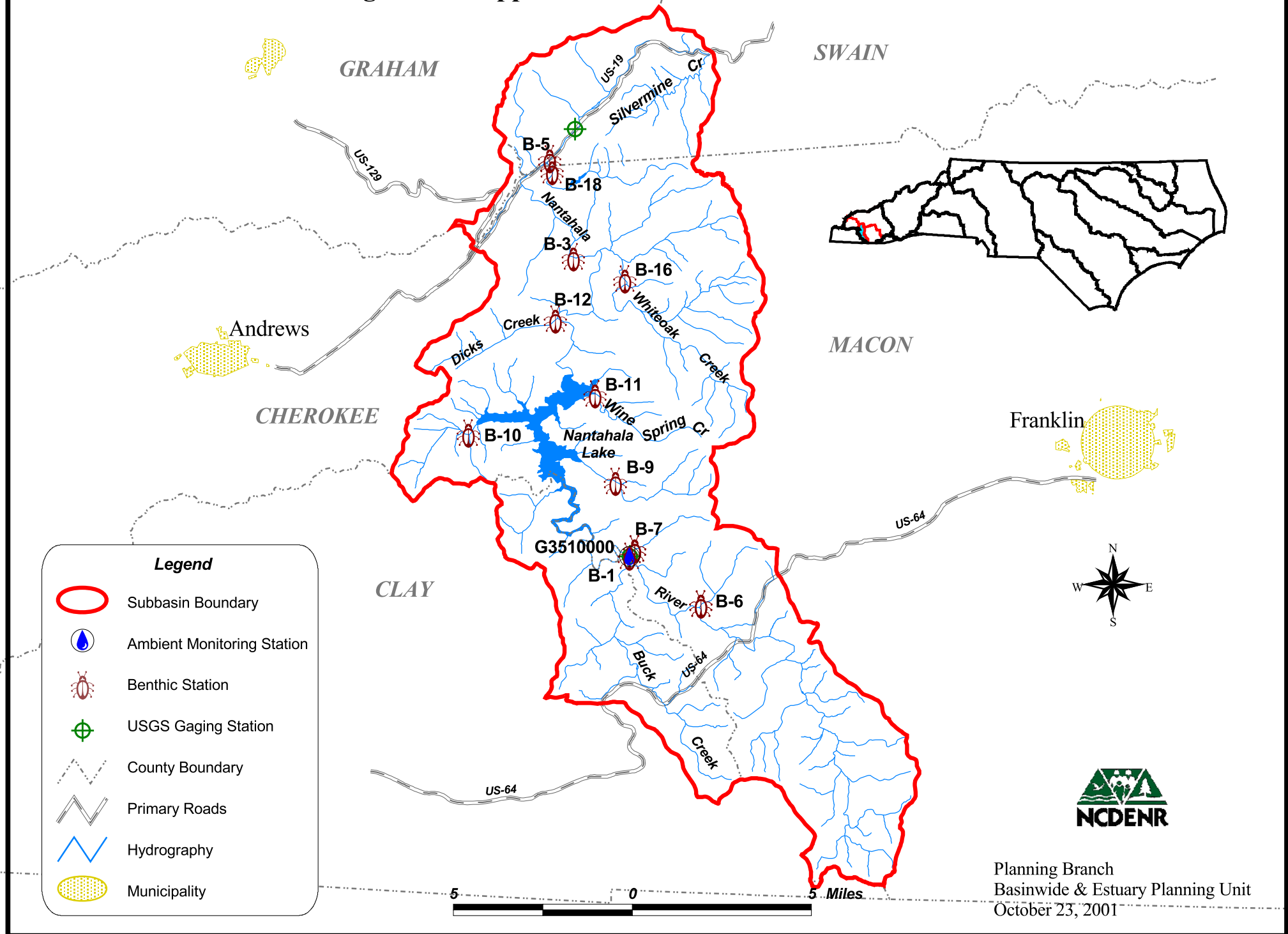
More than 96 percent of the land within this subbasin is forested. There are approximately 1,800 acres of pastureland and 1,700 acres of surface water, representing approximately 3.5 percent of the subbasin area. Less than 300 acres fall into the urban land use category.









The Nantahala River watershed, from its source to the confluence with Roaring Fork, is currently classified as Outstanding Resource Waters. The headwaters of this river system lie entirely within the Nantahala National Forest. However, much of the land adjacent to this reach is privately owned by the Rainbow Springs Corporation. The river and most tributaries are high gradient systems capable of supporting wild trout populations.

Nantahala Power and Light Company (currently Duke Energy) impounded the river in 1956 creating the 1,606-acre Nantahala Lake. Flow is diverted to downstream generators at Beechertown, bypassing a seven-mile reach of the river prior to discharging back into the original channel above the Nantahala Gorge. The regulated reach of the river below the powerhouse is very popular for rafting and canoeing.

There are two NPDES permitted dischargers in this subbasin: Macon County Schools-Nantahala WWTP and the Nantahala Outdoor Center. No significant compliance problems were noted during the most recent review period.

Figure B-3 Upper Little Tennessee Subbasin 04-04-03



- Legend**
-  Subbasin Boundary
 -  Ambient Monitoring Station
 -  Benthic Station
 -  USGS Gaging Station
 -  County Boundary
 -  Primary Roads
 -  Hydrography
 -  Municipality

Planning Branch
 Basinwide & Estuary Planning Unit
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Table B-7 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (1999) for Little Tennessee Subbasin 04-04-03

Site	Stream	County	Location	Bioclassification
<i>Benthic Macroinvertebrates</i>				
B-1*	Nantahala River (near Rainbow Springs)	Macon	USFS 437	Excellent
B-3*	Nantahala River	Macon	USFS 308	Excellent
B-5*	Nantahala River	Swain	US 19/74	Good
B-6	Bryson Branch (1998)	Macon	USFS 437	Good
B-7	Roaring Fork (1998)	Macon	USFS 437	Good
	Silvermine Creek (1995)	Swain	NC 28 near Wesser	Good-Fair
B-9	Jarrett Creek (1995)	Macon	USFS 437	Good
B-10	Big Choga Creek (1995)	Macon	USFS 440	Excellent
B-11	Wine Spring Creek (1995)	Macon	SR 1310	Good-Fair
B-12*	Dicks Creek	Macon	Off SR 1401	Good
B-16*	Whiteoak Creek (above dam)	Macon	Off SR 1310	Good
B-18*	Queens Creek	Macon	SR 1412	Excellent
<i>Ambient Monitoring</i>				
G3510000	Nantahala River	Macon	Near Rainbow Springs	N/A

* Historical data are available; refer to Appendix II.

Benthic Macroinvertebrates

Benthic macroinvertebrate samples have been collected from the Nantahala River site near Rainbow Springs since 1984. Excellent bioclassifications have been found during all surveys, including the most recent collection in 1999. The portion of the Nantahala River where the majority of streamflow is being diverted to generate power (commonly referred to as the bypass reach) along US Forest Service Road 308 was sampled as part of a special study and also received an Excellent bioclassification. This represented an improvement from November 1993 when DWQ sampling resulted in a Good rating. Although the minimum flow release from Nantahala Lake and/or tributary flow in the bypass reach allowed development of a diverse and abundant fauna, the aquatic community is not quite as good as that found in the natural section of the Nantahala River above the lake.

A third Nantahala River site, located in the portion of the river regulated for recreational activities and power production (off US 19/74 at a private campground just above the old gage site), was sampled in the evening when water levels were fairly low. This site, as in 1994, was rated Good.

Three sites were sampled by DWQ as part of a larger study to gather information from streams that currently have or will have minimum flow releases from upstream impoundments. Dicks

Creek improved noticeably from a Good-Fair bioclassification in November 1993 to Good in 1999. Queens Creeks is a very small stream (two meters wide) with an impoundment that does not yet have a minimum flow release requirement. However, with corrections for small stream size, sampling resulted in an Excellent bioclassification for the site. Whiteoak Creek was sampled below a large trout farm and above an old dam off SR 1310. The stream at this site is medium size (seven meters wide) with swift flow over primarily boulder and rubble substrate. This stream received a Good bioclassification.

A special study was conducted in 1995 and 1998 to evaluate the impact of timber harvesting on the benthic invertebrate community in Bryson Branch. This stream is a tributary to the Nantahala River in the river's ORW headwaters area. Post-harvest samples collected in 1998 resulted in a decline from Excellent to Good in both the logged and reference (Roaring Fork) streams, suggesting that observed impacts were more related to flow differences than timber harvesting practices.

Four tributaries to the Nantahala River and Nantahala Lake were sampled in 1995 as part of the Lower Nantahala River Watershed ORW Investigation (NCDENR-DWQ, September 1996). Big Choga Creek received an Excellent bioclassification, and benthic macroinvertebrates in Jarrett Creek fell right on the borderline of Good and Excellent. Wine Spring and Silvermine Creeks both received Good-Fair bioclassifications and are discussed in further detail in Part 3.5 of this chapter.

Ambient Monitoring

Water chemistry samples are collected monthly from the Nantahala River near Rainbow Springs on the Macon/Clay county line. Data collected over the past five years (1995-1999) showed the lowest variability for total suspended solids, hardness, fecal coliform and nutrients of any ambient monitoring site in the Little Tennessee River basin. Overall, these data indicate excellent water quality at this location.

Lake Assessment

Nantahala Lake was monitored by DWQ in 1999. As is expected for a mountain reservoir, the lake was found to be oligotrophic, with no reported algal blooms or nuisance aquatic plants. It is currently fully supporting all designated uses.

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-8 Use Support Ratings Summary (2000) for Monitored Lakes (acres) in Little Tennessee River Subbasin 04-04-03

Use Support Category	FS	PS	NS	Total ¹
Aquatic Life/Secondary Recreation	1,606	0	0	1,606
Fish Consumption	1,606	0	0	1,606
Primary Recreation	1,606	0	0	1,606
Water Supply	0	0	0	0

Table B-9 Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (miles) in Little Tennessee River Subbasin 04-04-03

Use Support Category	FS	PS	NS	NR	Total ¹
Aquatic Life/Secondary Recreation	183.9	1.0	0	72.5	257.4
Fish Consumption	257.4	0	0	0	257.4
Primary Recreation	36.0	0	0	0	36.0
Water Supply	0	0	0	0	0

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.

3.2 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 identified one impaired water in this subbasin: Whiteoak Creek.

3.2.1 Whiteoak Creek (1.0 mile from SR 1397 to SR 1423)

1997 Recommendations

Whiteoak Creek was sampled upstream and downstream of a large trout farm operation in 1990. The stream received an Excellent benthic macroinvertebrate bioclassification above the operation and a Fair bioclassification below it. The stream was rated partially supporting, and the recommendation was for DWQ to monitor the stream again to evaluate the implementation of best management practices by the trout farm operator.

Status of Progress

Although DWQ did sample Whiteoak Creek in 1999, the collection occurred much further downstream of the trout farm in a location that has historically received Good bioclassifications and does not accurately represent the impaired reach of stream. Therefore, this portion of Whiteoak Creek remains partially supporting the aquatic life/secondary recreation use category.

2002 Recommendations

DWQ will sample benthic macroinvertebrates at the SR 1397 location below the trout farm on Whiteoak Creek during the next basinwide cycle.

3.3 Status and Recommendations for Newly Impaired Waters

No stream segments in this subbasin were rated as impaired based on recent DWQ monitoring (1994-1999). However, impacts to many streams from narrow riparian buffer zones, sedimentation and moderate to severe bank erosion were documented. Part 1.5 below discusses specific streams where these impacts were observed.

3.4 303(d) Listed Waters

Whiteoak Creek (discussed above) is the only water listed 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.

3.5 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.

3.5.1 Silvermine Creek

Silvermine Creek flows north and east into the Nantahala River in Swain County. At the time of the 1997 basinwide plan, Silvermine Creek was rated support threatened based on a Good-Fair benthic macroinvertebrate bioclassification when the stream was sampled in 1993. Silvermine Creek also received a Good-Fair when the stream was sampled in 1995 during the Lower Nantahala River Watershed ORW Investigation. Biologists felt that the majority of the impacts to water quality in this watershed were due to runoff from SR 1103 which follows the stream for most of its length (NC DENR-DWQ, September 1996). The NC Department of Transportation should evaluate drainage from this road and make improvements to prevent further habitat degradation. DWQ will plan, resources permitting, to sample this stream during the next basinwide cycle.

3.5.2 Wine Spring Creek

Wine Spring Creek flows east into Nantahala Lake in Macon County. As was mentioned previously, this stream was sampled in 1995 during the Lower Nantahala River Watershed ORW Investigation. Biologists could not determine impacts to water quality at that time. Precipitation data indicated heavy rain events in several months prior to sampling that might have led to scouring of the stream channel (NCDENR-DWQ, September 1996). More investigation is needed to determine potential impacts to water quality from nonpoint source pollution in the watershed. DWQ will plan, resources permitting, to sample this stream during the next basinwide cycle.