

Chapter 2 -

Little Tennessee River Subbasin 04-04-02

Includes Fontana Lake and the Tuckasegee River Watershed

2.1 Water Quality Overview

Subbasin 04-04-02 at a Glance

Land and Water

Land area:	1,021 mi ²
Stream miles:	1,420.7
Lake acres:	2,276

Population Statistics

1990 Est. pop.:	38,017 people
Pop. density:	37 persons/mi ²

Land Cover (%)

Forest/Wetland:	93.5
Surface Water:	2.3
Urban:	0.6
Cultivated Crop:	0.3
Pasture/ Managed Herbaceous:	3.3

This subbasin contains the northern and eastern portion of the Little Tennessee River basin and consists primarily of the Tuckasegee River watershed. The Tuckasegee River begins in southeastern part of Jackson County and flows in a northwesterly direction into the Little Tennessee River at Fontana Lake. The largest tributary of the Tuckasegee is the Oconoluftee River. The Oconoluftee River watershed includes part of the Great Smoky Mountains National Park (GSMNP) and the Eastern Band of Cherokee Indians' (EBCI) Reservation. Other waters include Cullowhee, Savannah and Scotts Creeks, and Lake Glenville. A map of this subbasin including water quality sampling locations is presented as Figure B-2.

Bioclassifications for sample locations are presented in Table B-4. Use support ratings for each applicable category in this subbasin are summarized in Tables B-5 and B-6. Refer to Appendix III for a complete listing of

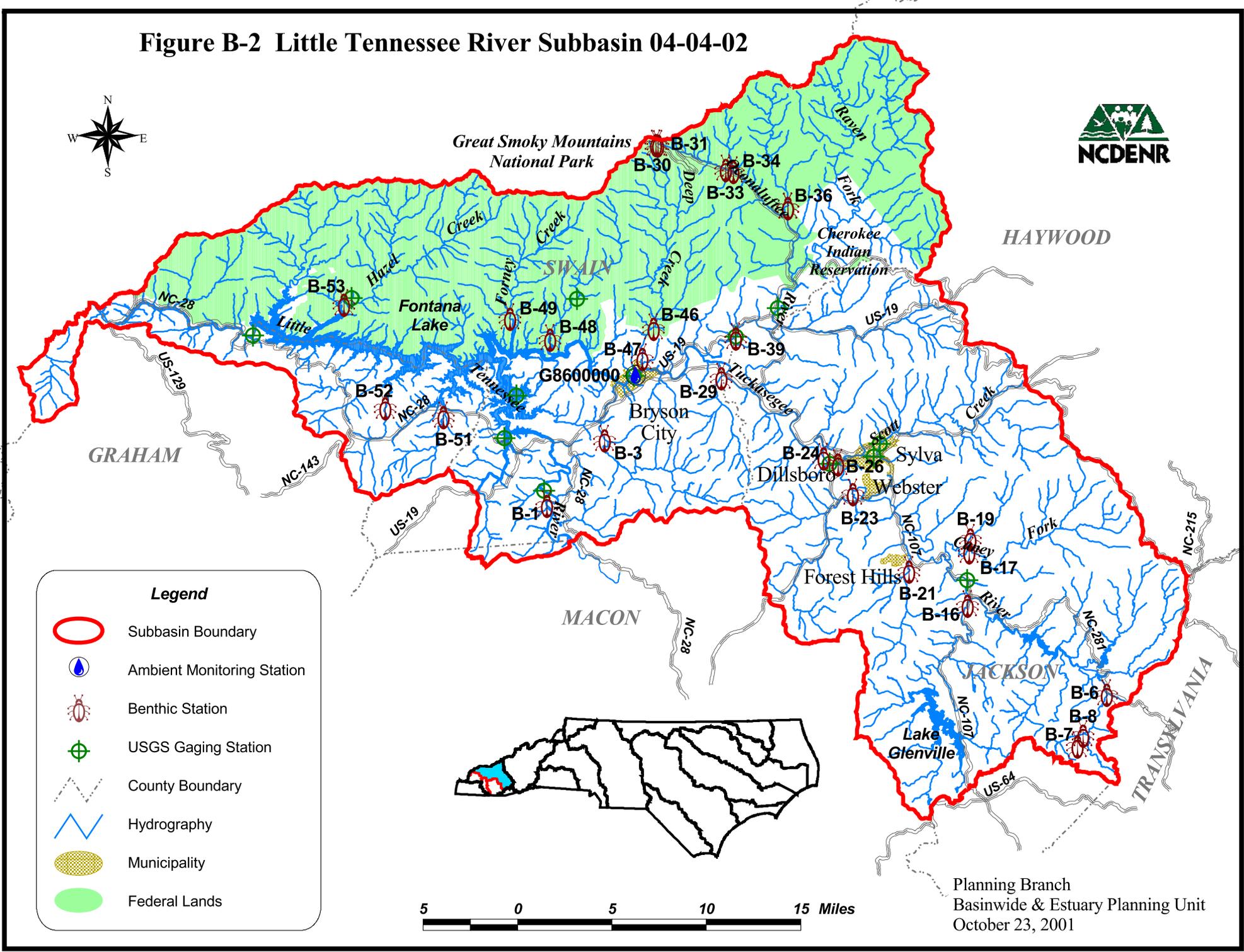
monitored waters and further information about use support ratings.

Approximately 60 percent (330,000 acres) of the GSMNP is located in North Carolina and the majority is contained within this subbasin. The subbasin also contains several thousand acres of the Nantahala National Forest. Therefore, nearly 94 percent of the subbasin is forested. The largest urban areas are Bryson City, Sylva and Cherokee. More than two percent of this subbasin is open water reflecting six major lakes including the more than 10,000 acres of Fontana reservoir.

Water quality in this subbasin is excellent. Some of the most famous trout streams in North Carolina are found here, including Hazel Creek, Forney Creek, Deep Creek and Noland Creek. A large number of streams throughout the subbasin carry the supplemental classification of High Quality Waters. The Tuckasegee River and its tributaries (including Pathertown Creek) from its source to Tennessee Creek are designated Outstanding Resource Waters.

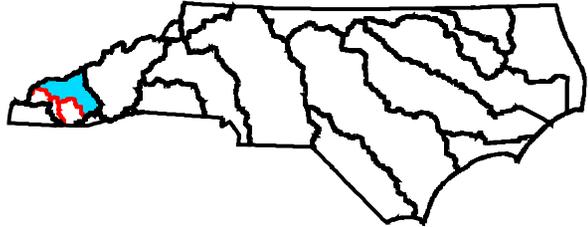
There are 18 permitted dischargers in this subbasin; the largest of which are two Tuckasegee Water and Sewer Authority (TWSA) WWTPs discharging to the Tuckasegee River and Scotts Creek and the Bryson City WWTP. TWSA Plant 1 and the Bryson City WWTP are required to monitor the toxicity of their discharges. No significant compliance or toxicity problems were noted for any facility in this subbasin during the most recent review period.

Figure B-2 Little Tennessee River Subbasin 04-04-02



Legend

- Subbasin Boundary
- Ambient Monitoring Station
- Benthic Station
- USGS Gaging Station
- County Boundary
- Hydrography
- Municipality
- Federal Lands



Planning Branch
 Basinwide & Estuary Planning Unit
 October 23, 2001

Table B-4 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (1999) for Little Tennessee River Subbasin 04-04-02

Site	Stream	County	Location	Bioclassification
<i>Benthic Macroinvertebrates</i>				
B-1*	Little Tennessee River	Swain	Off SR 1113	Good
B-3*	Alarka Creek	Swain	SR 1185	Excellent
B-6*	Tuckasegee River	Jackson	SR 1140	Excellent
B-16	West Fork Tuckasegee River	Jackson	SR 1133	Good
B-24	Tuckasegee River	Jackson	Off SR 1377	Good
B-7	UT Panthertown Creek	Jackson		Excellent
B-8	Panthertown Creek	Jackson		Good
B-17*	Caney Fork	Jackson	SR 1740	Excellent
B-19*	Moses Creek	Jackson	SR 1739	Excellent
B-21*	Cullowhee Creek	Jackson	SR 1001	Excellent
B-23*	Savannah Creek	Jackson	SR 1367	Good
B-26*	Scotts Creek	Jackson	SR 1556	Good
B-29*	Conley Creek	Swain	SR 1177	Excellent
B-30	Beech Flats Prong (1995)	Swain	Headwaters (above)	Excellent
B-31	Beech Flats Prong (1995)	Swain	US 441 (below)	Fair
B-33	Beech Flats Prong (1995)	Swain	Above Kephart Prong	Excellent
B-34	Kephart Prong (1995)	Swain	Near mouth	Excellent
B-36*	Bradley Fork (1999 & 1995)	Swain	Off US 441	Excellent
B-39*	Oconoluftee River	Swain	SR 1359 at Birdtown	Excellent
B-46*	Deep Creek	Swain	Above campground	Excellent
B-47*	Deep Creek	Swain	SR 1340	Excellent
B-48	Noland Creek	Swain	Near mouth	Excellent
B-49*	Forney Creek	Swain	Near mouth	Excellent
B-51*	Panther Creek	Swain	SR 1233	Excellent
B-52*	Stecoah Creek	Swain	SR 1237	Excellent
B-53*	Hazel Creek	Swain	Near mouth	Excellent
<i>Ambient Monitoring</i>				
G8600000	Tuckasegee River	Jackson	SR 1364 at Bryson City	N/A
G8550000	Oconaluftee River	Swain	SR 1359 at Birdtown	N/A

* Historical data are available; refer to Appendix II.

Benthic Macroinvertebrates

All streams in this subbasin received Good or Excellent benthic macroinvertebrate bioclassifications in 1999. Bioclassifications for Moses Creek, Cullowhee Creek, Tuckasegee River, Oconaluftee River and Stecoah Creek improved from Good to Excellent. Extremely high

flows prior to sample collection, and the increased nonpoint source pollution that accompanies them, most likely caused the lower bioclassifications in 1994. Nine sites were Excellent in both 1994 and 1999. The benthic macroinvertebrate community in Scotts Creek improved from Good-Fair in 1994 to Good in 1999. Declining water quality was observed only at Savannah Creek (Excellent to Good).

In 1995, DWQ worked with the National Park Service and the National Biological Survey to sample several streams in the Great Smoky Mountains National Park. These streams included Beech Flats Prong, Kephart Prong and Bradley Fork in the Oconaluftee River watershed. All sites sampled received Excellent bioclassifications with the exception of one site on Beech Flats Prong below US Highway 441 where the stream comes in contact with Anakeesta Rock formations. This site received a Fair bioclassification and that portion of stream is considered impaired.

Ambient Monitoring

Water chemistry samples are collected monthly from two locations in this subbasin: the Tuckasegee River at Bryson City and the Oconaluftee River at Birdtown. Data collected over the past five years (1995-1999) indicated excellent water quality at both locations.

Lake Assessment

Four reservoirs in this subbasin were monitored by DWQ in 1999: Wolf Creek, Bear Creek (known locally as Bear Lake), Cedar Cliff and Thorpe (known locally as Lake Glenville). As is expected for mountain reservoirs, all were found to be oligotrophic with no reported algal blooms or nuisance aquatic plants. All are 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-5 Use Support Ratings Summary (2000) for Monitored Lakes (acres) in Little Tennessee River Subbasin 04-04-02

Use Support Category	FS	PS	NS	Total ¹
Aquatic Life/Secondary Recreation	2,276	0	0	2,276
Fish Consumption	2,276	0	0	2,276
Primary Recreation	2,276	0	0	2,276
Water Supply	2,276	0	0	2,276

Table B-6 Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (miles) in Little Tennessee River Subbasin 04-04-02

Use Support Category	FS	PS	NS	NR	Total ¹
Aquatic Life/Secondary Recreation	1183.7	2.3	0	234.7	1420.7
Fish Consumption	1420.7	0	0	0	1420.7
Primary Recreation	69.8	0	0	37.0	106.8
Water Supply	362.6	0	0	0	362.6

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.

2.2 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.

2.3 Status and Recommendations for Newly Impaired Waters

One additional stream segment in this subbasin was rated as impaired based on recent DWQ monitoring (1994-1999): Beech Flats Prong from US Highway 441 to Aden Branch. Impacts to other streams from narrow riparian buffer zones, sedimentation and moderate to severe bank erosion are discussed in Part 2.5 below.

2.3.1 Beech Flats Prong (2.3 miles from US Highway 441 to Aden Branch)

Current Status

Beech Flats Prong, located in the GSMNP, is partially supporting the aquatic life/secondary recreation designated use due to acidic conditions resulting from exposure of Anakeesta rock formations in the vicinity of Newfound Gap as a result of US Highway 441 construction. Anakeesta rock contains elements that, when exposed to water, produce low pH levels and high concentrations of heavy metals in adjacent streams. It is fairly common throughout the southwestern Appalachian Mountains for road cuts or landslides, mining activities or the use of fill material containing this rock to cause water quality impacts.

2002 Recommendations

The National Park Service has been studying ways of addressing the water quality problems in Beech Flats Prong (and other streams that are likely impacted by roads running through the GSMNP). No scientifically and economically defensible way to manage the extensive road cut has been found. Disturbance of Anakeesta materials should be avoided in the GSMNP and other areas in the southern Appalachian Mountains in the future to prevent these impacts.

2.4 303(d) Listed Waters

There are currently no impaired waters in this subbasin 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.

2.5 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.

2.5.1 Scotts Creek

Scotts Creek flows west and south from the Plott Balsam Mountains, which form the divide between the Little Tennessee and French Broad River basins (also separating Jackson and Haywood counties), down through Sylva and into the Tuckasegee River. The watershed contains a variety of land uses including agriculture and timber harvesting as well as residential areas. Stormwater runoff from the towns of Sylva and Dillsboro and a major four-lane highway (23/74) likely impact this stream. Some residential areas are suspected to contain straight pipes and failing septic systems.

In 1994, Scotts Creek received a Good-Fair benthic macroinvertebrate bioclassification reflecting impacts from primarily nonpoint source pollution in the watershed. The stream was given a fully supporting but threatened rating. The 1997 Little Tennessee River Basinwide Plan recommended that local governments and agencies, and possibly the Little Tennessee Nonpoint Source Team, identify specific causes and sources of these impacts to aquatic life.

There are three permitted discharges in the Scotts Creek watershed: Tuckasegee Water and Sewer Authority (TWSA) WWTP 2 in Sylva, Ensley Adult Home Care, and the Scotts Creek Elementary School. No significant compliance or toxicity problems were noted for any of these facilities during the most recent review period. Jackson County is currently building a new school, and it is likely that the Scotts Creek Elementary School WWTP discharge will be eliminated in 2001.

In 1999, the benthic macroinvertebrate bioclassification improved to Good, reflecting a water quality improvement. This change is not considered to be related to differences in flow regimes

between sampling years. TWSA has been working to eliminate leaks in the sewer collection system, and an increased percentage of Jackson County's wastewater has been routed to WWTP 1, which discharges directly into the Tuckasegee River. Despite the Good bioclassification, Scotts Creek received a low habitat evaluation. The stream channel lacks diversity of habitat, and there has been significant loss of riparian vegetation throughout the watershed. Much of the channel has been modified with riprap lining the banks. For general recommendations on habitat degradation and best management practices for minimizing nonpoint source pollution, please refer to Section A, Chapter 4 (page 59).

2.5.2 Savannah Creek

Savannah Creek flows in a northeasterly direction into the Tuckasegee River near Webster. The benthic macroinvertebrate community declined from Excellent in 1994 to Good in 1999. The sampling site received a low habitat score due in part to stream alterations in the lower portion of the watershed. Potential impacts to water quality in this watershed include runoff from Jackson County Road 99, which follows the stream for most of its length. The county should evaluate drainage from this road and make improvements to prevent further habitat degradation. However, more investigation is needed to determine potential impacts to water quality from nonpoint source pollution in the watershed. DWQ will sample this stream again during the next basinwide cycle.

2.6 Additional Issues within this Subbasin

The previous part discussed water quality concerns for specific stream segments. This section discusses water quality issues related to multiple watersheds within subbasin 04-04-02.

2.6.1 Projected Population Growth

From 2000 to 2020, estimated population growth for Jackson County is 34 percent and Swain County is 22 percent. Growth management within the next five years will be imperative in order to maintain good water quality in this subbasin. Growth management can be defined as the application of strategies and practices that help achieve sustainable development in harmony with the conservation of environmental qualities and features of an area. On a local level, growth management often involves planning and development review requirements that are designed to maintain or improve water quality.

Local Erosion and Sediment Control Ordinances

Jackson and Swain counties have locally-delegated erosion and sediment control programs. Jackson County's program began in November 2000. Like the statewide program administered by the Division of Land Resources, the county requires an erosion and sediment control plan for development activities disturbing more than one acre of land. The county attempts to inspect all projects weekly. Land disturbing activities that occur on sites less than one acre in size are inspected only when a complaint is received.