

Chapter 1 - Upper Broad River Subbasin 03-08-01 Includes Lake Lure and Cove Creek

1.1 Water Quality Overview

Subbasin 03-08-01 at a Glance

Land and Water

Total area:	183 mi ²
Stream miles:	203.4
Lake acres:	732.0

Population

1990 Est. Pop.:	5,659 people
Pop. Density:	31 persons/mi ²

Land Cover (%)

Forest/Wetland:	92.2
Water:	1.1
Urban:	0.1
Cultivated Crop:	0.4
Pasture/ Managed Herbaceous:	6.2

This subbasin includes the headwaters of the Broad River from its source in Buncombe County to the confluence with Cove Creek in Rutherford County. This subbasin also contains the entire watershed of Lake Lure. Flat Creek, Hickory Creek and Reedypatch Creek are the largest tributaries above Lake Lure, and Buffalo Creek forms a major arm of the lake. Cove Creek is the only large tributary to the Broad River in this subbasin below Lake Lure. This portion of the Broad River and its tributaries are generally high gradient streams capable of supporting viable trout populations.

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure B-1. Table B-1 contains a summary of monitoring data types, locations and results. Use support ratings for waters in this subbasin are summarized in Table B-2. Appendix I provides a key to discharge identification numbers. Refer to Appendix III for a complete listing of

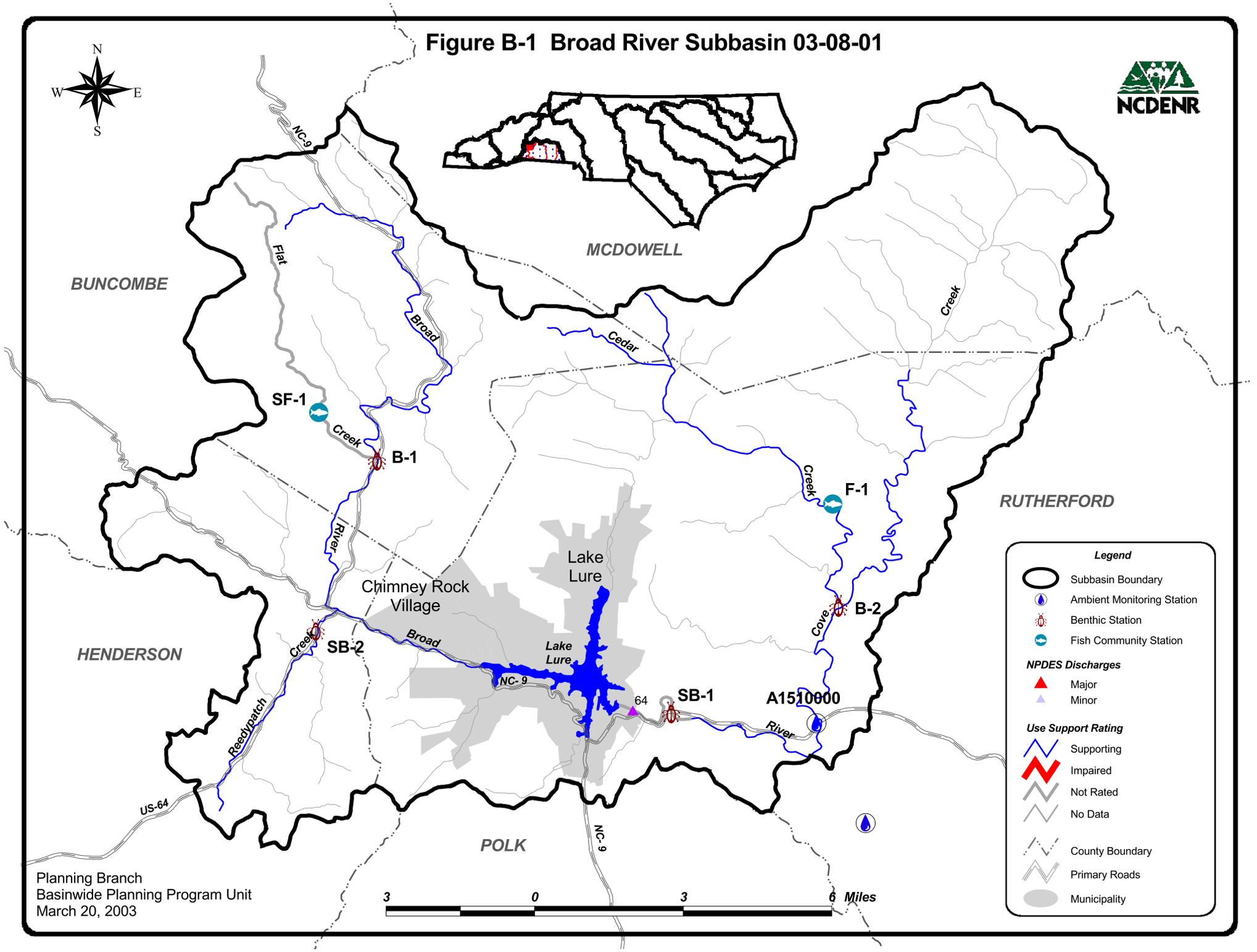
monitored waters and more information about use support ratings.

Good to excellent water quality conditions have been found at most locations in the subbasin, particularly mainstem reaches of the Broad River and its larger headwater tributaries above Lake Lure. Most of the high gradient tributary streams in this subbasin are classified as Trout waters and are capable of supporting wild trout populations. Water quality in Lake Lure is also good.

Most of the land in this portion of the basin is forested (92 percent), with some urban and agricultural uses. While most of the land is forested, portions of the subbasin are being rapidly developed for second homes, vacation lodges and recreational activities, such as golf courses. Most of these development activities are occurring in the Broad River corridor and on Lake Lure. Development in or near stream corridors and lake shorelines potentially affects water quality through nonpoint source runoff.

There is one NPDES permitted discharger in the subbasin, the Town of Lake Lure, which is permitted to discharge nearly one million gallons per day into the Broad River below Lake Lure. During this review period, the Lake Lure facility experienced problems with elevated fecal coliform in its discharge during the summer of 2000. The Lake Lure WWTP was in full compliance with its permit limits over the most recent review period.

Figure B-1 Broad River Subbasin 03-08-01



Legend

- Subbasin Boundary
- Ambient Monitoring Station
- ⊗ Benthic Station
- ⊕ Fish Community Station

NPDES Discharges

- ▲ Major
- ▲ Minor

Use Support Rating

- Blue wavy line: Supporting
- Red wavy line: Impaired
- Grey wavy line: Not Rated
- Light grey wavy line: No Data

- - - County Boundary
- == Primary Roads
- Municipality



Planning Branch
 Basinwide Planning Program Unit
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Table B-1 DWQ Monitoring Locations, Bioclassifications and Notable Chemical Parameters (2000) for Broad River Subbasin 03-08-01

Site	Stream	County	Road	Bioclassification or Noted Parameter ²
<i>Benthic Macroinvertebrate Community Monitoring</i>				
B-1	Broad River ¹	Buncombe	SR 2802	Excellent
B-2	Cove Creek ¹	Rutherford	SR 1381	Excellent
SB-1	Broad River	Rutherford	US 64/74	Not Rated
SB-2	Reedypatch Creek	Rutherford	US 64	Good
<i>Fish Community Monitoring</i>				
F-1	Cedar Creek	Rutherford	SR 1371	Good-Fair
SF-1	Flat Creek	Buncombe	SR 2902	Not Rated
<i>Ambient Monitoring</i>				
A1510000	Cove Creek	Rutherford	US 64/74 near Lake Lure	None

¹ Historical data of this type are available for this waterbody; refer to Appendix II. Sites may vary.

² Parameters are noted if in excess of state standards in more than 10 percent of samples collected within the assessment period (9/1995-8/2000).

Benthic macroinvertebrates in this subbasin were sampled during a three-year drought of a magnitude that local meteorologists compared to the Dust Bowl. Flows in all streams were well below normal, and the effects of nonpoint sources of pollution (nutrient runoff and instream scour) were minimal.

Overall, water quality in this subbasin is very good, with the majority of the four sites having a bioclassification of Good or Excellent based on macroinvertebrate data. The Broad River above Lake Lure and Cove Creek, a major tributary to the lake, was given Excellent bioclassifications; and Reedypatch Creek, a smaller tributary, was rated Good.

The Broad River at US 64/74 received a designation of Not Rated (NR). This site near Uree was sampled to determine if discharges from the Lake Lure WWTP or low flows, as regulated by the Lake Lure dam, were the greater impact on water quality in this stretch of stream. However, because the site is located too close to the dam to expect a natural aquatic community, the site was not given a bioclassification and is considered Not Rated.

Fish community surveys were conducted at two locations in this subbasin: Flat Creek and Cedar Creek. In 1998, Flat Creek at SR 2902 was evaluated as a fish community regional reference site. The high gradient stream was considered to be a "trout stream" and could not be assigned a bioclassification using current methods. Cedar Creek was also evaluated as a fish community regional reference site. The fish community was given a NCIBI bioclassification of Good-Fair, but sources for the impacts could not be identified.

Water chemistry samples are collected monthly from Cove Creek a few miles above its confluence with the Broad River. Although there was no indication of substantial water quality problems, turbidity was in excess of the state standard (50 NTU) at the station in 7 percent of the samples collected between 1995 and 2000.

Lake Lure was monitored in this subbasin in 2000. In 1995, Lake Lure was rated oligotrophic. While there was an increase in total organic nitrogen and a slight decline in light penetration from 1995 to 2000, these changes were not sufficient to change the lake's oligotrophic rating. Lake Lure is considered to be supporting all use support categories.

For more detailed information on sampling and assessment of streams and lakes in this subbasin, refer to the *Basinwide Assessment Report - Broad River Basin* (NCDENR-DWQ, December 2001), available from DWQ Environmental Sciences Branch at <http://www.esb.enr.state.nc.us/bar.html> or by calling (919) 733-9960.

Table B-2 Use Support Ratings Summary (2000) for Monitored and Evaluated Freshwater Streams (miles) and Lakes (acres) in Broad River Subbasin 03-08-01

Use Support Category	Units	Supporting	Impaired	Not Rated	No Data	Total
Aquatic Life/Secondary Recreation	miles	151.1	0.0	10.0	42.3	203.4
	acres	732.0	0.0	0.0	0.0	732.0
Fish Consumption	miles	203.4	0.0	0.0	0.0	203.4
	acres	732.0	0.0	0.0	0.0	732.0
Primary Recreation	miles	0.0	0.0	0.0	2.5	2.5
	acres	732.0	0.0	0.0	0.0	732.0
Water Supply	miles	0.0	0.0	0.0	0.0	0.0
	acres	0.0	0.0	0.0	0.0	0.0

1.2 Status and Recommendations for Previously Impaired Waters

The 1998 Broad River Basinwide Plan identified no impaired waters in this subbasin.

1.3 Status and Recommendations for Newly Impaired Waters

No stream segments were rated as impaired based on recent DWQ monitoring (1996-2000); however, as mentioned previously, some impacts to water quality were observed. Refer to page 81, as well as page 54, for further discussion of potential water quality problems in this portion of the basin.

1.4 Section 303(d) Listed Waters

There are no waterbodies listed on the state's draft 2002 303(d) list in this subbasin. Refer to Appendix IV for more information on the state's 303(d) list and listing requirements.

1.5 Other Water Quality Concerns and Recommendations

The surface waters discussed in this section are supporting designated uses based on DWQ's use support assessment and are not considered to be impaired. However, notable water quality problems and concerns have been documented for some waters based on this assessment. While these waters are not considered impaired, attention and resources should be focused on these waters 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 47 and Appendix III.

Water quality problems in the Broad River basin are varied and complex. Inevitably, many of the water quality impacts noted are associated with human activities within the watershed. Solving these problems and protecting the surface water quality of the basin in the face of continued growth and development will be a major challenge. Voluntary implementation of BMPs is encouraged and continued monitoring is recommended. DWQ will notify local agencies and others of water quality concerns for the waters 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 program agency contacts are listed in Appendix VI.

1.5.1 Broad River (below the Carolina Mountain Power Company Dam at Lake Lure)

During a special study in 2000, conducted as a result of a citizen's request, the Broad River below Lake Lure was sampled to determine if discharges from the Lake Lure WWTP or low flows as regulated by the Carolina Mountain Power Company Dam were the greater impact on water quality in this stretch of stream. However, because the site is located too close to the dam to expect a natural aquatic community, the site did not receive a bioclassification and is considered Not Rated.

In early 2000, Lake Lure WWTP experienced short-term violations of fecal coliform limits. The facility was issued a Notice of Violation, and the problem was corrected by operational changes in the facility. The Lake Lure WWTP is currently in full compliance with permit limits.

2003 Recommendations

DWQ will continue to monitor and work with the Lake Lure WWTP to insure compliance with their permit and to prevent degradation of downstream waters. During the next basinwide cycle, DWQ will attempt to sample the Broad River below the current sampling site and above the confluence with Cove Creek to determine if discharges from the Lake Lure WWTP and/or low flows as regulated by the Carolina Mountain Power Company Dam are impacting on water quality in this stretch of stream.

1.5.2 Cedar Creek

Cedar Creek was sampled in 2000 as a possible fish community survey regional reference site; however, the fish community was rated only as Good-Fair. Compared to the other regional

reference sites, the site at Cedar Creek had fewer species of darters, sunfish, bass, trout and suckers. The total number of species collected at Cedar Creek was also less than collected at the other regional reference sites.

It is unclear why the fish community at this site, rated only Good-Fair. The site was sampled during low flow conditions, although in early September 1996, the upper Broad River basin experienced torrential flooding. It is likely that scouring that occurred during the flooding contributed a large amount of sediment to the stream, impacting the fish diversity within the stream. It is also possible that despite the high quality habitat at this specific site, the water quality in this section of the stream is actually only Good-Fair.

2003 Recommendations

DWQ will plan to sample this stream at this site and an upstream site during the next basinwide cycle to further assess water quality conditions.

1.6 Additional Issues within this Subbasin

The previous section discussed water quality concerns for specific stream segments. This section discusses water quality issues that relate to multiple watersheds in subbasin 03-08-01. Increased growth and stormwater management were identified by participants at the public workshop as significant issues in this subbasin.

1.6.1 Streams Where Volunteer Monitoring Results Indicate Water Quality Impacts

In the upper Broad River watershed (Henderson and Rutherford counties), VWIN monitors three sites on the Broad River, two sites on Lake Lure, and seven sites on tributaries including Reedypatch, Hickory, Cane and Buffalo Creeks. Sampling data from this program for the four-year period from July 1996 through June 2000 indicate excellent water quality (Maas et al., August 2000). However, problems with excess sedimentation especially during rain events were noted in the Broad River, Reedypatch, Hickory and Buffalo Creeks, and Lake Lure. BMPs should be put in place during construction and on agricultural operations to reduce sediment inputs in order to protect these streams and to prevent further water quality degradation. For more information of the VWIN program, refer to page 46 and page 137.

1.6.2 Projected Population Growth

From 2000 to 2020, the estimated population growth for Buncombe County is 29 percent and Rutherford County is 16 percent. Growth management within the next five years will be imperative, especially in and around developing areas, 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. Refer to page 62 for more information about urbanization and development and recommendations to minimize impacts to water quality.

1.6.3 Phase II Stormwater Requirements

Amendments were made to the Clean Water Act in 1990 (Phase I) and most recently in 1999 (Phase II) pertaining to permit requirements for stormwater dischargers associated with storm sewer systems. Part of Phase II requires some county and municipal storm sewers systems serving populations under 100,000, which are located in larger urban areas and/or that have a high population density to obtain an NPDES stormwater permit. The county and municipal permitting requirements are designed to lead into the formation of comprehensive stormwater management areas for county and municipal areas. Buncombe County will be considered for inclusion under Phase II rules because of a population greater than 10,000 and/or a population density greater than 1,000 persons per square mile. DWQ is currently developing criteria that will be used to determine whether Buncombe County and other counties and/or municipalities will be required to obtain a NPDES permit. Refer to page 26 for further information.