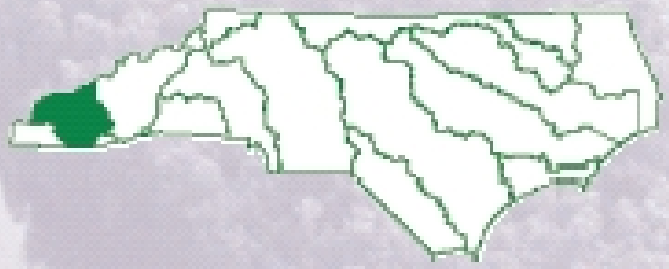
Watershed Restoration Plan for the Little Tennessee River Basin



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N.C. Wetlands Restoration Program

EXECUTIVE SUMMARY

This document, prepared by the North Carolina Wetlands Restoration Program (NCWRP), presents a description of Targeted Local Watersheds within the Little Tennessee River Basin. It is the first update to the original Basinwide Wetlands and Riparian Restoration Plan for the Little Tennessee River Basin, which was released in 1998. This plan provides more detailed descriptions of the areas of interest, the Targeted Local Watersheds, than the preceding document. NCWRP targets local watersheds based on their need and opportunity for stream, wetland and riparian buffer restoration. The NCWRP Watershed Restoration Plans are developed for each of the 17 major river basins in the State, and they are intended as companion documents to the N.C. Division of Water Quality's [DWQ] Basinwide Water Quality Plans. Both of these documents are updated on a 5-year planning cycle for each of the river basins in North Carolina.

The watershed approach used by the NCWRP infers that water quality improvements are likely to have more pronounced and longer lasting effects if assessments and restoration efforts are focused on the local watershed level, as opposed to discrete and isolated stream segments or wetland areas within the basin. The NCWRP hopes that other agencies, groups and local governments will use the information in this document when identifying and locating water quality and aquatic habitat improvement projects. By coordinating project implementation in watersheds with significant restoration need, organizations with similar goals can generate a greater positive ecological impact on North Carolina's aquatic resources.

This document is complemented by the *Guide to NCWRP's Watershed Restoration Planning Strategy (Version 1),* which provides general information pertaining to program goals and plan methodology [available at the NCWRP website: http://h2o.enr.state.nc.us/wrp/]. Information relating to Little Tennessee River Basin restoration goals and watershed-specific resource assessments are contained within this Watershed Restoration Plan. In general, this document provides an overview of the Little Tennessee River Basin and its component Subbasins within which Targeted Local Watersheds have been selected. Then each Targeted Local Watershed is described and the basis for its selection are given. The Division of Water Quality's *Basinwide Water Quality Plan* for the Little Tennessee River (DWQ, 2002) provides much more detailed information about each of the Subbasins.

Section 2 provides an overview of the basin and includes a map of the Little Tennessee River Basin with county boundaries and major municipalities. Section 2 also contains information about habitat, permitted stream and wetlands impacts, and Division of Water Quality Use Support Ratings. Again, greater detail regarding these issues is provided in the *Little Tennessee Basinwide Water Quality Plan* (DWQ, 2002) prepared by the Basinwide Planning Program within DWQ.

Section 3 outlines basin-specific restoration goals and provides a brief discussion of the Targeted Local Watershed selection process. Figure 3.1 shows the Little Tennessee River Basin with the nine Targeted Local Watersheds highlighted. This section also provides information regarding the stakeholder process that was a valuable part of the development of this plan, as public input was solicited and weighed heavily in the selection of Targeted Local Watersheds.

The Targeted Local Watersheds are described in Section 4. Maps of each Targeted Local Watershed follow the text describing the watersheds within a given Subbasin. *[Not all*

Subbasins will necessarily contain Targeted Local Watersheds.] NCWRP selected these watersheds based on their need for water quality and habitat improvement, and on the merit of potential stream, riparian buffer, and wetlands restoration opportunities in that watershed.

Section 5 contains contact information for several water quality programs and initiatives taking place within the Little Tennessee River Basin, organized by federal, state, and local program contacts.

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SECTION 1: INTRODUCTION

Purpose and Background of the NC Wetlands Restoration Program

Recognizing the value of wetlands and riparian areas for maintaining water quality, storing floodwaters, providing fish and wildlife habitat, and performing other valuable functions, the North Carolina General Assembly established the North Carolina Wetlands Restoration Program (NCWRP) in 1996. The overall mission of the NCWRP is to restore, enhance, preserve and create wetlands, stream and riparian buffer areas throughout North Carolina's seventeen major river basins (G.S. 143-214.9). Specific program goals include:

- To protect and improve water quality by restoring wetland and stream functions and values lost through historic, current and future permitted impacts.
- To achieve a net increase in wetlands acres, functions, and values in all of North Carolina's major river basins.
- To promote a comprehensive approach for protecting natural resources.
- To provide a consistent approach to addressing wetland and stream mitigation requirements associated with wetland regulations, and to increase the ecological effectiveness of mitigation projects.

Purpose of Watershed Restoration Plans

To accomplish the goals described above, the NCWRP develops Watershed Restoration Plans to focus planning and implementation of restoration activities within each of the 17 major river basins. These plans provide information on areas in the state that the NCWRP has determined are a priority for restoration efforts. The NCWRP uses the Watershed Restoration Plans to target degraded wetland and riparian areas which, if restored, could contribute significantly to the goal of protecting and enhancing local watershed functions.

The purpose of this document is to communicate to interested parties specific areas in the Little Tennessee River Basin where the NCWRP will consider implementing restoration projects, as program resources and regional mitigation needs become more clearly defined over time. This document also provides justification for those choices. It is intended to complement two other NC Division of Water Quality (DWQ) documents: 1) the *Little Tennessee River Basinwide Water Quality Plan* (DWQ, 2002), and 2) the *Guide to the NCWRP's Watershed Restoration Planning Strategy* (Version 1).

One purpose for communicating the specific watersheds where the NCWRP intends to focus its projects is to encourage other groups and organizations to consider implementing projects in these areas also. The NCWRP believes that multiple restoration projects concentrated within a local watershed will result in greater benefits to water quality and other important watershed functions.

Application of Geographic Information Systems (GIS)

In order to target areas of focus, the NCWRP relies heavily on geographic data. With a variety of habitat and water quality data available digitally, NCWRP staff can efficiently review

a large amount of information about river basins, subbasins and local watersheds to evaluate watersheds for restoration need and opportunity. The data used by NCWRP for this analysis include the following: water quality data (use support ratings and surface water quality classifications); resource information (location of streams, wetlands, important aquatic habitats, state and national forests or wilderness areas, and significant natural heritage sites); and basic location references (such as municipalities, roads and county boundaries).

As a component of the Watershed Restoration Plans, the NCWRP develops GIS-based maps to communicate NCWRP priority areas for restoration projects. Each restoration plan includes maps of the river basin, component subbasins, and Targeted Local Watersheds. To reduce printing costs, most of these maps are black and white. However, color maps are provided through the NCWRP web site [http://h2o.enr.state.nc.us/wrp/] for anyone interested in referencing more thorough and detailed geographic information on the targeted watersheds.

To evaluate watershed conditions, the NCWRP assesses multiple data and information sources describing the location and condition of natural resources. The information described in Sections 2 through 4 was compiled from a number of existing sources including DWQ's Basinwide Water Quality Plans, DWQ's Basinwide Assessment Reports, the Natural Heritage Program's Rare Plant and Animal Lists, information and recommendations received from local resource professionals and other interested parties in the basin, and the GIS data coverages noted above. A more detailed discussion of the types of information evaluated by the NCWRP is included in Section 2 of the *Guide to NCWRP's Watershed Restoration Planning Strategy*.

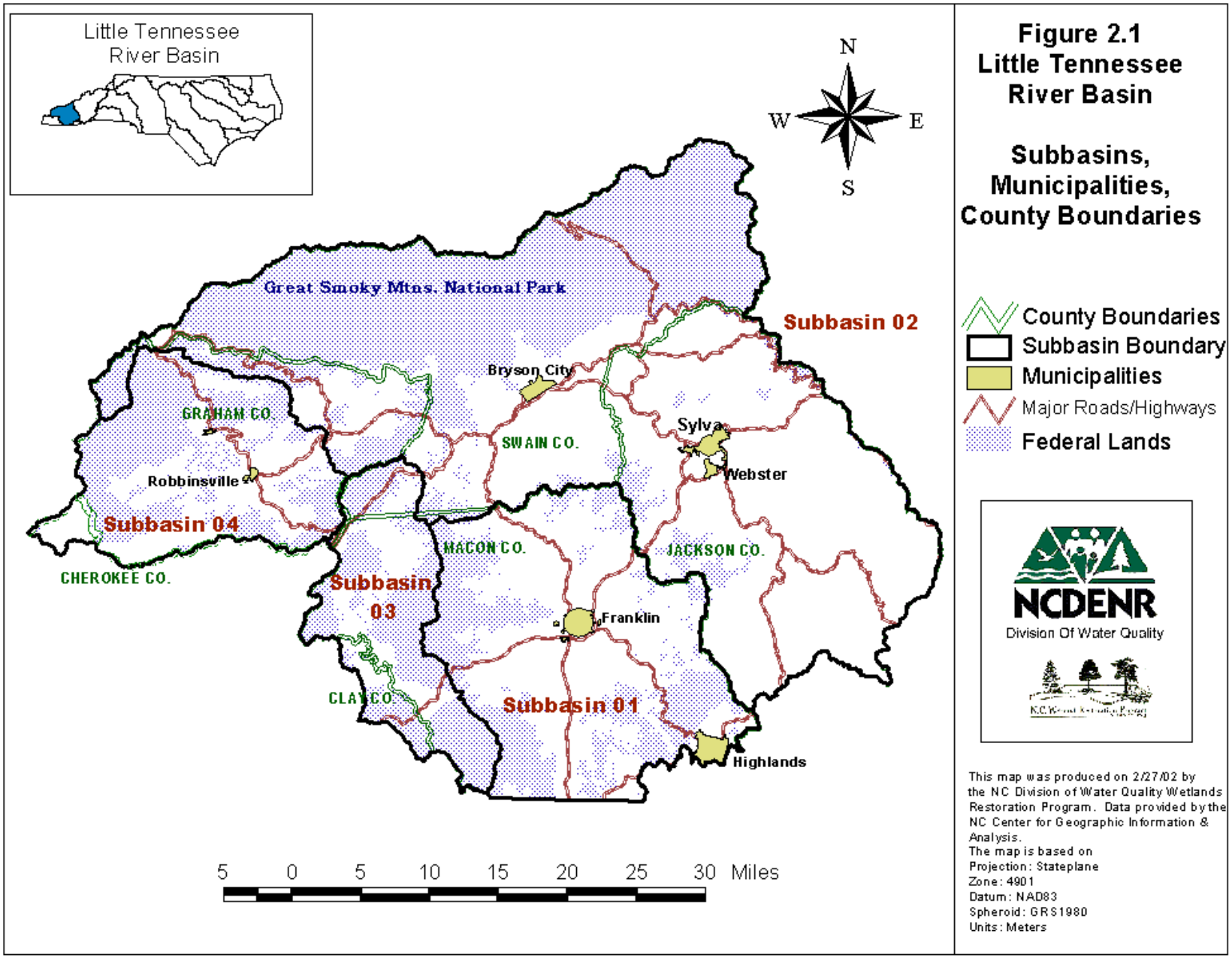
SECTION 2: OVERVIEW OF THE LITTLE TENNESSEE RIVER BASIN

The Little Tennessee River Basin covers almost the entirety of Graham, Macon, Swain, and Jackson Counties, as well as a small portion of Cherokee and Clay Counties. The basin encompasses a 1,797 square mile watershed area, which includes four major tributaries: The Cullasaja, Nantahala, Tuckasegee, and Cheoah Rivers. The land comprising the Little Tennessee River basin is mountainous and primarily rural. Approximately 90% of the land is forested, with less than 5% comprising urban/developed land uses. More than half the land in the basin is publicly owned and lies within the Great Smoky Mountains National Park or the Nantahala National Forest. There is a high density of streams in this mountain basin; there are more streams per square mile than in many other basins in the state, particularly when compared to coastal plain and piedmont river systems. The basin includes 2,565 miles of streams in a drainage area of 1,797 square miles (DWQ, 2002).

The 2000 population for the Little Tennessee basin was approximately 80,000, with most of the basin's population centered around Franklin, Sylva, and Cherokee. The 1990 population density in the basin was 38 persons per square mile, far lower than the state average of 139 persons per square mile. The basin experiences substantial increases in seasonal populations due to recreation and tourism populations. The basin is expected to see a 31% increase in population from 2000 to 2020 (DWQ, 2002).

The NC Division of Water Quality [DWQ] subdivides each of the 17 major river basins in the state into component subbasins, which are designated with 6-digit codes. The Little Tennessee River Basin consists of 4 such subbasins, designated 04-04-01 [Subbasin 01] to 04-04-04 [Subbasin 04].

Figure 2.1 presents a general map of the Little Tennessee River Basin with municipalities, county boundaries, major roads, and subbasin boundaries depicted.


Little Tennessee River Basin
N
W
E
S
Great Smoky Mtns. National Park
Subbasin 02
Bryson City
GRAHAM CO.
SWAIN CO.
Sylva
Webster
Robbinsville
Subbasin 04
MACON CO.
JACKSON CO.
CHEROKEE CO.
Subbasin 03
Franklin
CLAY CO.
Subbasin 01
Highlands
5 0 5 10 15 20 25 30 Miles
Figure 2.1
Little Tennessee River Basin
Subbasins, Municipalities, County Boundaries
County Boundaries
Subbasin Boundary
Municipalities
Major Roads/Highways
Federal Lands
NCDENR
Division Of Water Quality
This map was produced on 2/27/02 by the NC Division of Water Quality Wetlands Restoration Program. Data provided by the NC Center for Geographic Information & Analysis.
The map is based on
Projection: Stateplane
Zone: 4901
Datum: NAD83
Spheroid: GRS1980
Units: Meters

Sensitive Species and Habitat Information

Wetland Communities

The Little Tennessee River Basin is within the Mountain physiographic province of the state. The basin contains several notable wetland community types, including spray cliffs, montane alluvial forests, and mountain bogs. Unless protected, these unique and often rare wetland types are under increasing pressure from either development or unintentional overexposure to foot traffic. For a description of Significant Natural Heritage Areas in the Little Tennessee River Basin, see Section A, Part 2.6.1 of the Basinwide Water Quality Plan (DWQ, 2002).

Wetland and Riparian Area Species Information

The Little Tennessee River Basin contains many rare animal and plant species that are dependent on wetlands or open water for their existence. There are eight federally or state-listed endangered or threatened animal species, as well as 29 species listed as either significantly rare or of special concern. Listed animal species include the Stonecat, Spotfin Chub, Striped Shiner, and four mollusks (DWQ, 2002). The Little Tennessee River Basin has two rare plant species, one a moss, the other an aquatic lichen. In addition to federally or state-listed endangered and threatened species, seven state-designated "Special Concern" species -- which have legal protection status in North Carolina -- have been documented within the basin in the past 20 years. These include four fish and three mollusks (Natural Heritage Program, 2000).

A detailed listing of the state's rare animal and plant species can be found in the "Natural Heritage Program List of Rare Animal Species of North Carolina" or the "Natural Heritage Program List of the Rare Plant Species of North Carolina", which are published every two years. More information about rare, threatened, and endangered species in the Little Tennessee River Basin, and their preferred habitat or plant community types, can be found at the N.C. Natural Heritage Program's web site [http://ils.unc.edu/parkproject/nhp/index.html].

Over 64 fish species have been found in the Little Tennessee River Basin, including a variety with recreational importance. Most frequently targeted species include brook, brown, and rainbow trout, largemouth and smallmouth bass, walleye crappie, sunfish and catfish. More information about fish species in the Little Tennessee River Basin can be found in the NC Wildlife Resources Commission (WRC), Division of Inland Fisheries, Fisheries Management Plan for the Little Tennessee (NCWRP, 1998). See the WRC website at http://www.ncwildlife.org/index.htm for more information regarding fisheries management in the mountain counties of North Carolina, including maps showing WRC-designated public mountain trout waters.

Permitted Wetland and Stream Losses

The Division of Water Quality regulates activities involving streams and wetlands to ensure that construction projects cause minimal damage to these resources and that unavoidable impacts are addressed through mitigation projects. One important role of the NCWRP is to provide compensation for permitted impacts to wetlands and streams that fall below the regulatory threshold of less than one acre for wetlands and less than 150 feet for streams. The NCWRP uses the permitting database maintained by the Wetlands/401 Certification Unit of the Division of Water Quality to evaluate where the permitted impacts to wetlands and streams across the river basin are the greatest and where NCWRP projects are needed to offset unmitigated impacts.

Tables 2.1 through 2.4 below present a summary of permitted wetland and stream impacts in the Little Tennessee River Basin for 1995 to 2001, broken down by subbasins (source: DWQ - Wetlands 401 Program, 2001). Permitted **wetland impacts** total 17.13 acres over this time period, with projects in Subbasin 02 accounting for nearly 82% of this total. Permitted *but unmitigated* [less than 1 acre] impacts to wetlands total 7.52 acres over the same time period, with Subbasins 01 and 02 accounting for over 94% of these smaller, but cumulatively important permitted impacts. Unmitigated [less than 1 acre] wetland impacts in the Basin cumulatively represent 43% of the total permitted impacts to wetlands in the Basin. **Stream impacts** from 1996 to 2001 total nearly 24,915 linear feet, with 80% occurring in Subbasin 02. Unmitigated stream impacts [for projects less than 150 linear feet] over this time period amount to 3,916 feet of this total, accounting for 15.7% of the total stream impacts for the basin.

Table 2.1 Permitted **Total Wetland Impacts** (acres) in the Little Tennessee River Basin, by DWQ Subbasin from 1995-2001.

DWQ Subbasins	1995	1996	1997	1998	1999	2000	2001	Subbasin Total
040401	1.1	0.37	0.09	0.25	0.36	0.3	0.220	2.69
040402	0.98	2.82	0.03	1.74	8.31	0.08	0.05	14.01
040403	0.19	0.12	0	0.02	0	0	0	0.33
040404	0	0	0	0	0.1	0	0	0.1
Total Acres	**2.27**	**3.31**	**0.12**	**2.01**	**8.77**	**0.38**	**0.27**	**17.13**

Table 2.2 Permitted **Unmitigated Wetland Impacts** (acres) in the Little Tennessee River Basin, by DWQ Subbasin from 1995-2001: Projects less than 1 acre.

DWQ Subbasins	1995	1996	1997	1998	1999	2000	2001	Subbasin Total
040401	1.1	0.37	0.09	0.25	0.36	0.3	0.22	2.69
040402	0.98	1.64	0.03	0.24	1.38	0.08	0.05	4.4
040403	0.19	0.12	0	0.02	0	0	0	0.33
040404	0	0	0	0	0.1	0	0	0.1
Total Acres	**2.27**	**2.13**	**0.12**	**0.51**	**1.84**	**0.38**	**0.27**	**7.52**

Table 2.3 Permitted **Total Stream Impacts** (linear feet) in the Little Tennessee River Basin by DWQ Subbasin from 1996-2001.

DWQ Subbasin	1996	1997	1998	1999	2000	2001	Total
040401	0	122	1277	1797	337	280	3813
040402	1,260	1732	3339	9699	2009	1912	19951
040403	0	0	0	275	434	161	870
040404	185	0	36	0	0	60	281
Total	**1,445**	**1,854**	**4,652**	**11,771**	**2,780**	**2,413**	**24,915**

Table 2.4 Permitted **Unmitigated Stream Impacts** (linear feet) in the Little Tennessee River Basin by DWQ Subbasin from 1996-2001: Projects less than 150 linear feet

DWQ	1996	1997	1998	1999	2000	2001	Total
040401	0	122	40	0	337	280	779
040402	501	234	262	267	666	816	2746
040403	0	0	36	0	134	161	331
040404	0	0	0	0	0	60	60

Division of Water Quality Use Support Ratings

Waters are classified according to their best-intended uses. Use support categories that are applied to waters of the Little Tennessee basin include aquatic life & secondary recreation; fish consumption; primary recreation; and water supply. Determining how well a water body supports its designated uses is an important method of interpreting water quality data and assessing a given stream or river's overall aquatic health and use impairment. The NCWRP uses the DWQ use support assessments as criteria in determining restoration need within a local watershed. *A water body that is designated as "partially supporting" or "not supporting" its designated uses indicates that water quality impairment and/or habitat degradation has occurred; therefore, wetland and/or stream restoration initiatives within that local watershed could be beneficial to water quality. If nonpoint source pollution issues are indicated as factors contributing to local water quality impairment, the NCWRP may consider it as a water body in need of restoration.*

Waters lacking sufficient biological assessment or chemical water quality monitoring data and/or having inconclusive data [e.g., swamp waters naturally low in dissolved oxygen content and pH values] are assigned a "Not Rated" [NR] rating. A more detailed discussion of the Division of Water Quality's Surface Water Classifications and the Use Support Rating System can be found in Section A 3.2 through 3.5 of the Basinwide Water Quality Plan for the Little Tennessee River [DWQ, 2002], which can be downloaded from the Division of Water Quality website at http://h2o.enr.state.nc.us/basinwide/index.html, or is available from the Division of Water Quality at (919) 733-5083 ext. 354.

Current use support ratings for the Little Tennessee Basin are summarized here for each of the four applicable use support categories for monitored and evaluated waters (DWQ, 2002):

Aquatic Life & Secondary Recreation (applies to all waters): no not supporting streams or lake waters in this use support category during this planning cycle; 0.5 % stream miles (12.9 miles) partially supporting; 79.1% of stream miles [2027.4 miles] fully supporting; 20.4 % of stream miles [524.2 miles] not rated; 1.3% lake acres (280 acres) partially supporting; 79.2% of lake waters [16,749.2 acres] fully supporting; 20.6% of lake waters [4,359.2 acres] not rated.

Fish Consumption (applies to all waters): due to a statewide advisory limiting consumption of bowfin [due to elevated mercury concentrations], all waters are considered partially supporting for this use support category; no waters in the basin are monitored for this category [actual fish tissue analyses]. Currently there are no fish consumption advisories specific to the NC portion of this basin.

Primary Recreation: no not supporting streams or lake waters in this use support category; 1.7% of lake acres (280 acres) are partially supporting; 57.6% of stream miles (136.8 miles) and 98.3% of lake acres (16,599.2 acres) are fully supporting; 42.4% of stream miles (100.5 miles) and 0% of lake acres are not rated.

Water Supply: no not supporting, partially supporting or not rated waters within the basin; 100% of stream miles (530.6 miles) and 100% of lake acres (2,4262 acres) are fully supporting.

Color maps depicting current use support ratings in individual subbasins of the Little Tennessee River Basin are presented in Section 4. These maps focus on the use support ratings for aquatic life/secondary recreation.

Table 2.5 Monitored Impaired Waters in the Little Tennessee River Basin (DWQ, 2002).

Subbasin	Listed Waters	Use Support Rating	Potential Sources of Impairment
04-04-01	Cullasaja River	PS -3.2 mi.	- Land development; Golf courses; Upstream impoundment
	Mill Creek	PS - 1.3 mi.	- Urban runoff/storm sewers; Golf courses
	Little Tennessee River	PS - 2.2 mi.	- Sources outside state jurisdiction or borders
04-04-02	Beech Flats Prong	PS - 2.3 mi.	Exposure to Anakeesta Rock Formations (acid drainage)
04-04-04	Santeetlah Lake (West Buffalo Creek Arm)	PS - 2.9 mi. PS - 280 ac.	Aquaculture (trout farming)

Section 303(d) of the federal Clean Water Act requires states to develop a list of waters not meeting water quality standards and to submit this list to the U.S. Environmental Protection Agency biennially. Waters are placed on North Carolina's 303(d) List primarily due to a partially or not supporting use support rating. Addressing water quality impairment in waters that are on the state's 303(d) List is a priority for the state. The NCWRP considers the 303(d) List in

selecting watersheds for restoration efforts. *Many of the waters listed in Table 2.5 above will be added to the state's 303(d) list of impaired waters in 2002 [DWQ, 2002]*.

Local Water Resource Management Initiatives

The Little Tennessee River Basin encompasses all or portions of six counties and nine municipalities, all of which fall within the Region A Council of Governments planning jurisdiction. The population in the Little Tennessee River basin is projected to increase by 35,000 people over the next 20 years, with most of this growth occurring in Jackson and Macon Counties. Given the valuable natural resources in the basin, there is a need for environmental planning efforts at the local government level -- especially in the areas of land use planning, nonpoint source pollution controls, storm water management, and general water quality protection. A discussion of state and local planning considerations pertinent to the Little Tennessee basin is presented in Section A Chapter 4 of the Basinwide Water Quality Plan [DWQ, 2002].

Proactive planning efforts from county and municipal governments in the basin -- for instance, developing ordinances designed to limit impervious surfaces and preserve intact riparian buffer zones and wetlands -- are needed to ensure that new development is done in a manner that maintains water quality. Given that in mountain basins such as the Little Tennessee the prevailing trend focuses new development in river valleys, local governments interested in protecting water quality may benefit from ordinances addressing riparian corridor protection, which may be linked to open space and greenway planning. Hillside ordinances that limit development on high-gradient slopes may also provide water quality benefits by decreasing erosion and sedimentation in runoff from steeply graded areas. Jackson and Swain Counties and the Town of Highlands currently have local erosion and sediment control programs.

There are no municipalities within this basin that fall within the requirements for the Phase II storm water permitting program, which requires the development of a strategy for implementing storm water Best Management Practices [BMPs] in six program areas. For additional information regarding the Phase II storm water program requirements in North Carolina, go to http://h2o.enr.state.nc.us/su/stormwater.html.

Unified Watershed Assessment

In September of 1998 the NC Division of Water Quality and the USDA-Natural Resource Conservation Service evaluated all 8-digit cataloging units [CUs] in the state using the US Environmental Protection Agency's (EPA) Framework for the Unified Watershed Assessment to determine priority areas for water quality restoration. The assessment assigned one of four categories to each 8-digit CU in the state:

- Category I: Watersheds in Need of Restoration. These watersheds do not now meet, or face imminent threat of not meeting, clean water and other natural resource goals.
- Category II: Watersheds Meeting Goals, Including Those Needing Action to Sustain Water Quality. These watersheds meet clean water and other natural resource goals and standards and support healthy aquatic systems.

- Category III: Watersheds with Pristine or Sensitive Aquatic System Conditions on Lands Administered by Federal, State, and Tribal Governments.
- Category IV: Watersheds With Insufficient Data to Make an Assessment.

As shown in Figure 2.2, the Unified Watershed Assessment process identified one 8-digit CU [# 06010202] in the Little Tennessee River basin as a Category I priority area for restoration. This CU encompasses Subbasins 01 and 03 (and a portion of Subbasin 02) in the basin.

Unified Watershed Assessment Category I watersheds receive priority for EPA Section 319 Incremental Grant funds. The NCWRP is committed to working with other agencies and programs to leverage Section 319 resources in the Unified Watershed Assessment high-priority areas. In some cases, the NCWRP can provide matching funds for projects located in NCWRP Targeted Local Watersheds. Information on the NC 319 Grant Program is available online at http://h2o.enr.state.nc.us/nps/bigpic.htm.

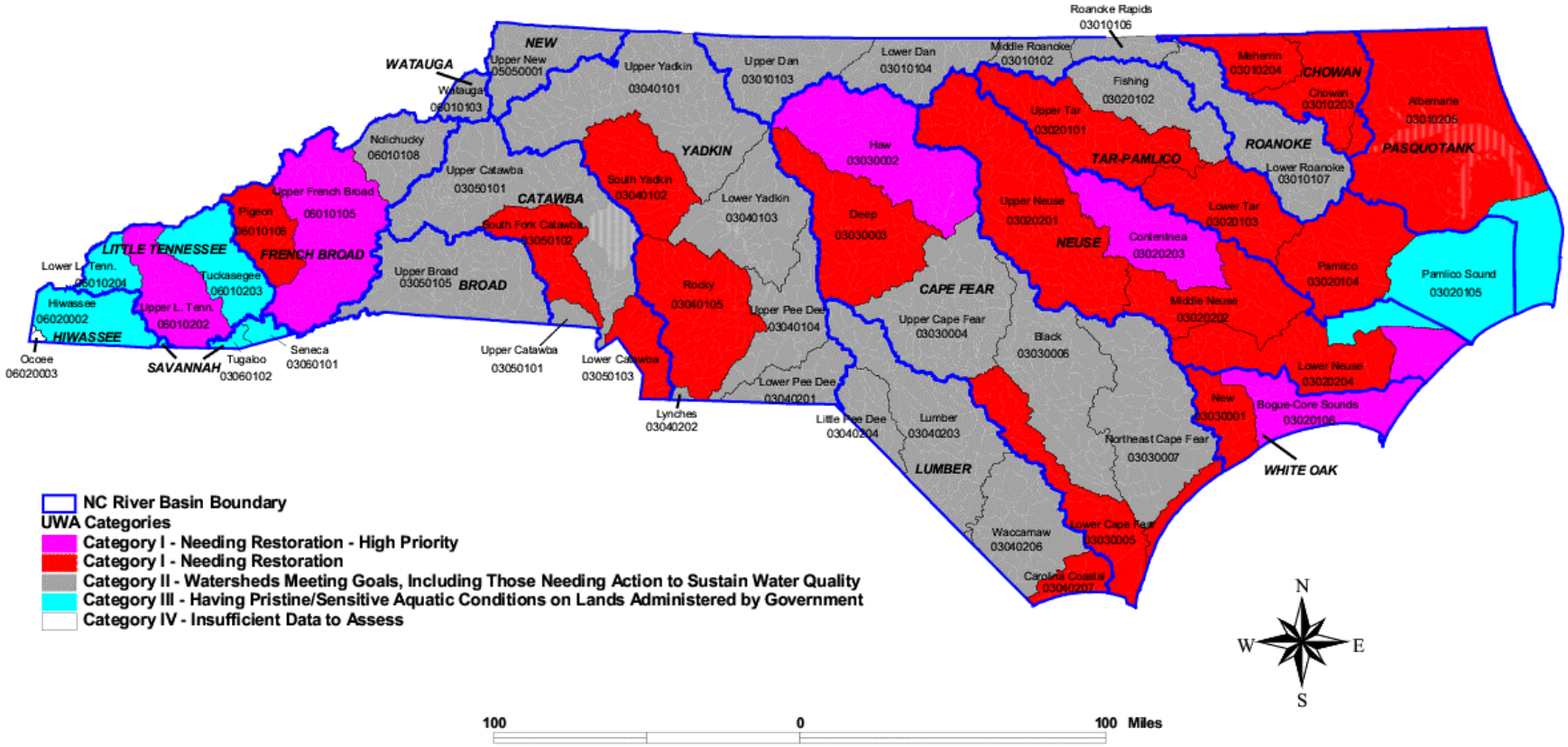


Figure 2.2 Unified Watershed Assessment Categories for 8-Digit Hydrologic Units in North Carolina.

SECTION 3: RESTORATION GOALS FOR THE LITTLE TENNESSEE RIVER BASIN

Based on an assessment of existing watershed characteristics and resource information, the NCWRP has developed three broad restoration goals for the Little Tennessee River Basin. Each goal reflects the NCWRP's watershed restoration strategy to focus restoration projects within local watersheds in order to address water quality impacts from nonpoint source pollution. The goals also reflect the NCWRP's focus on restoring wetland and riparian area values such as maintaining and enhancing water quality, increasing storage of floodwaters, and improving fish and wildlife habitat. The general restoration goals for the Little Tennessee River Basin are listed below, including specific objectives for reaching those goals.

1. Protect and improve water quality throughout the Basin by reducing sediment and nutrient inputs into streams and rivers.

- Implement stream restoration projects that reduce in-stream sources of sediment pollution by stabilizing stream banks and restoring channel meanders, especially in headwater tributaries and upper portions of rivers.

- Restore riparian vegetation and wetlands to trap sediment pollution and remove nutrients from surface runoff.

2. Protect and improve in-stream and riparian habitat for aquatic resources including trout.

- Restore riparian buffers to provide shade for temperature control and a source of woody debris for instream habitat.

- Restore riffles and pools in designated trout streams to improve spawning and foraging areas.

3. Support efforts to restore local watersheds in the Little Tennessee River Basin.

- Work with local or regional land trusts, property owners (public and private) and the Eastern Band of Cherokee to protect high quality watersheds through restoration and preservation of critical riparian and wetland tracts.

- Support the education/outreach efforts of local Cooperative Extension Service and Soil & Water District staff.

- Work with the Little Tennessee Nonpoint Source Team to obtain funding for (and implement) local projects related to storm water BMPs and other nonpoint source solutions.

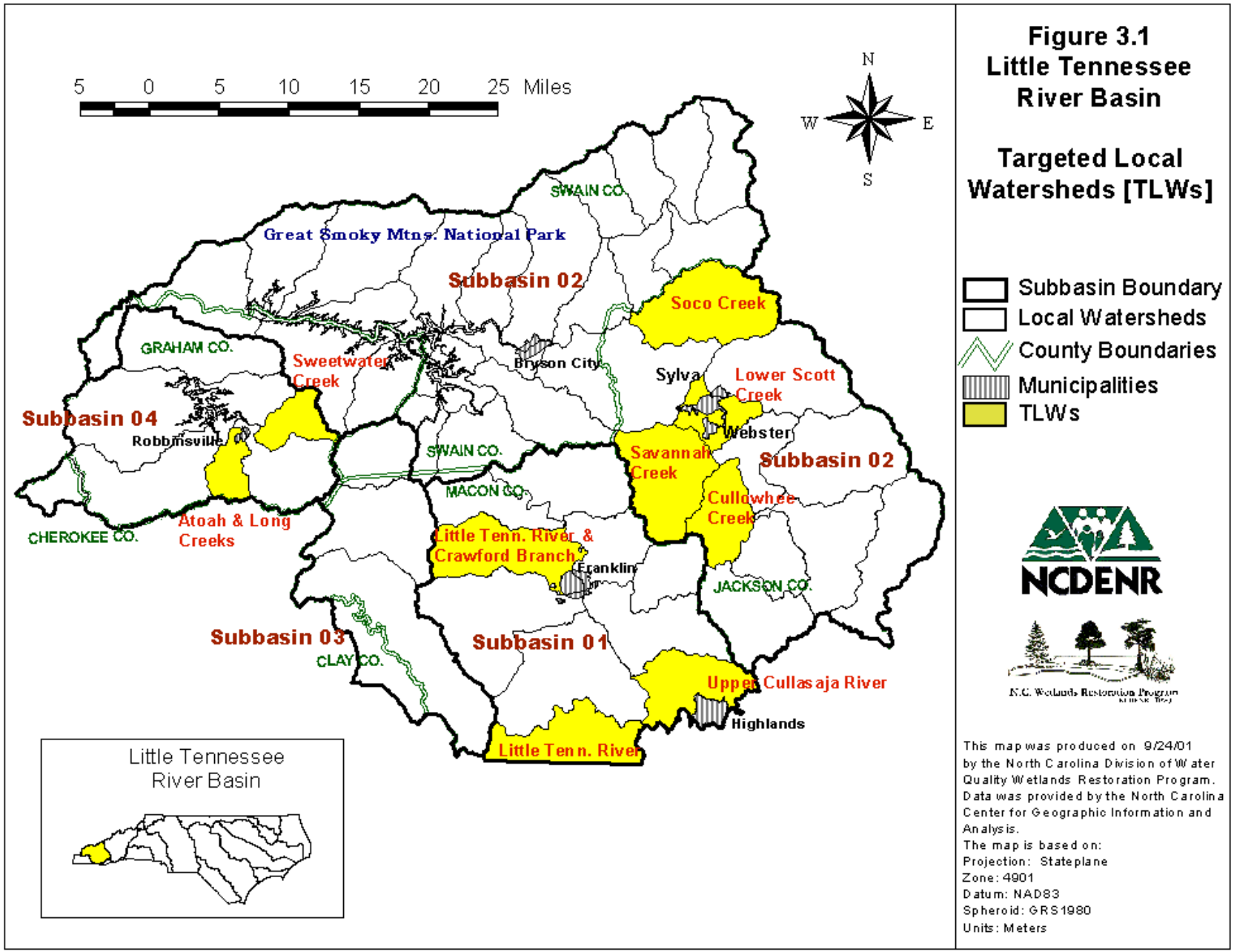
Targeted Local Watersheds

In order to meet the identified restoration goals, the NCWRP has selected **nine Targeted Local Watersheds** in the Little Tennessee River Basin. Figure 3.1 presents a map of the Basin with Targeted Local Watersheds highlighted. These geographic priorities have been selected based on need and opportunity for restoration. The decision-making process used to make these selections is described in detail in the *Guide to the NCWRP's Watershed Restoration Planning Strategy (Version 1*). The purpose for selecting Targeted Local Watersheds is to concentrate projects geographically. In doing so, projects are more likely to result in water quality protection, flood control benefits, and habitat improvement through the cumulative effect of multiple projects within smaller-scale drainage systems.

Public Input into the Targeted Local Watershed Selection Process

To solicit input on proposed local watershed selections, NCWRP held a three-hour meeting at Southwestern Community College's Swain Center near Bryson City on October 4, 2001. Representatives from federal, state and local government agencies, environmental and resource protection groups and organizations, and other interested parties from throughout the Little Tennessee River Basin were invited to participate. The purpose of the meeting was to involve citizens and resource professionals in updating the Watershed Restoration Plan for the Little Tennessee River Basin. This meeting included an overview of the NCWRP watershed planning approach and an opportunity for participants to brainstorm on restoration needs and opportunities within the Little Tennessee Subbasins and NCWRP-proposed Targeted Local Watersheds. Water quality problems, habitat degradation "hot spots", and ongoing restoration projects were identified by meeting participants. A field trip to explore possible candidate sites for restoration projects in the Basin was conducted the following day (October 5, 2001). This trip also included visits to existing stream restoration sites in the vicinity of Bryson City and Cherokee.

As a follow-up to the resource professionals meeting, a letter was sent on October 24, 2001, detailing draft final Targeted Local Watershed selections. At this point, much effort had gone into analyzing available data and soliciting input from the public. Response to the draft Targeted Local Watershed picks weighed heavily in the final selection of the nine targeted watersheds.


5 0 5 10 15 20 25 Miles
N
W
E
S
SWAIN CO.
Great Smoky Mtns. National Park
Subbasin 02
Soco Creek
GRAHAM CO.
Sweetwater Creek
Bryson City
Sylva
Lower Scott Creek
Webster
Subbasin 04
Robbinsville
SWAIN CO.
Savannah Creek
Subbasin 02
MACON CO.
Cullowhee Creek
CHEROKEE CO.
Atoah & Long Creeks
Little Tenn. River & Crawford Branch
Franklin
JACKSON CO.
Subbasin 03
Subbasin 01
CLAY CO.
Upper Cullasaja River
Highlands
Little Tenn. River
Little Tennessee River Basin
Figure 3.1
Little Tennessee River Basin
Targeted Local Watersheds [TLWs]
Subbasin Boundary
Local Watersheds
County Boundaries
Municipalities
TLWs
NCDENR
N.C. Wetlands Restoration Program
This map was produced on 9/24/01 by the North Carolina Division of Water Quality Wetlands Restoration Program. Data was provided by the North Carolina Center for Geographic Information and Analysis.
The map is based on:
Projection: Stateplane
Zone: 4901
Datum: NAD83
Spheroid: GRS1980
Units: Meters

SECTION 4: TARGETED LOCAL WATERSHEDS IN THE LITTLE TENNESSEE RIVER BASIN BY SUBBASIN

This section summarizes the status of water quality and aquatic habitat conditions within the Targeted Local Watersheds selected within three of the four subbasins in the Little Tennessee River Basin. [No Targeted Local Watersheds have been selected within Subbasin 3]. This section also includes information about potential causes of resource degradation within these areas from the Division of Water Quality [DWQ] Basinwide Water Quality Plans, and comments provided by resource professionals and other interested parties within the basin. Maps of each Subbasin with Targeted Local Watersheds in the Little Tennessee River Basin are provided in their respective sections.

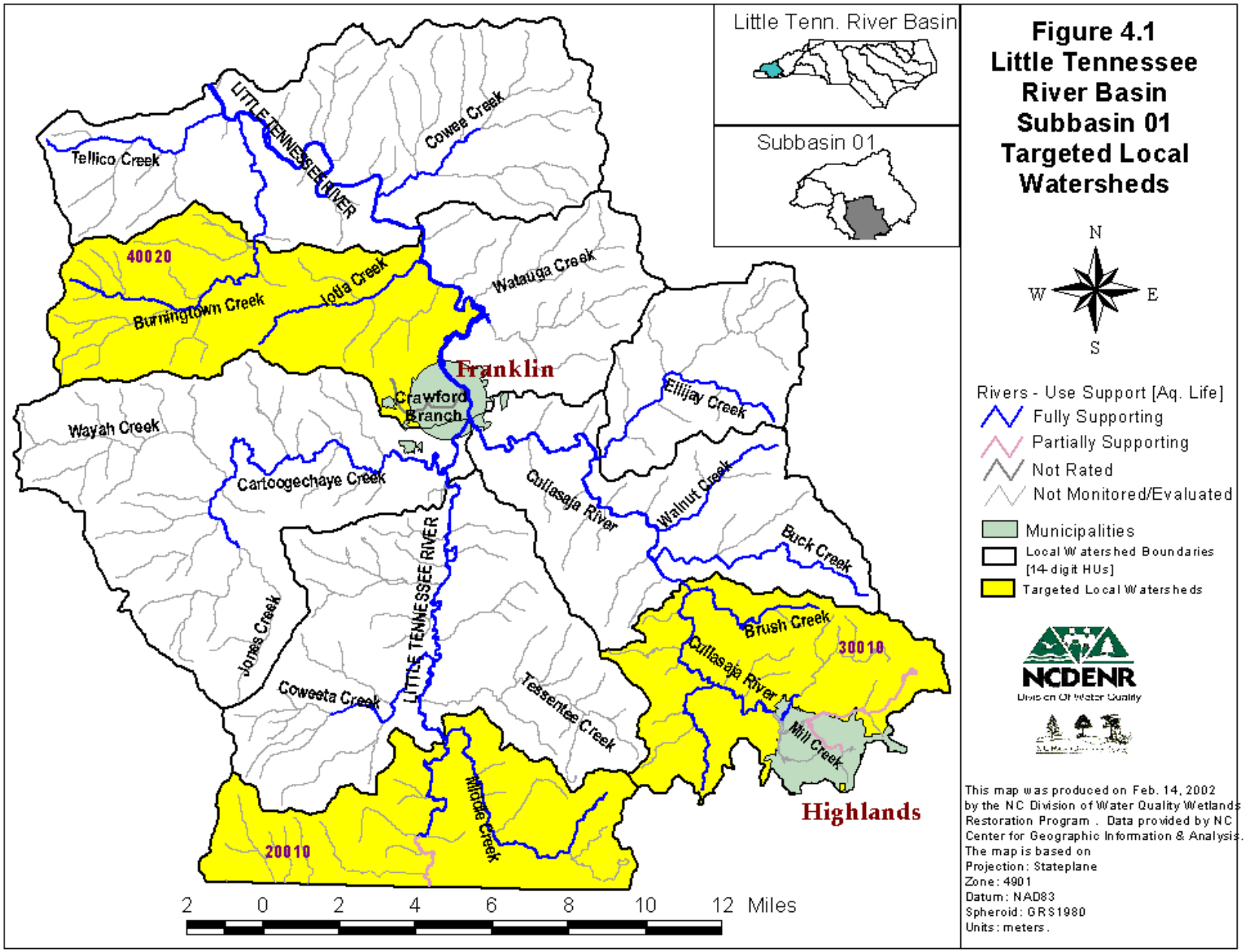
[Note: the term "local watershed" denotes a small, defined drainage area within a larger subbasin. Specifically, the term "local watershed" or "Targeted Local Watershed" refers to the 14-digit hydrologic unit as defined by the Natural Resource Conservation Service (NRCS). The term "subbasin" is reserved solely to denote a subbasin of the larger Little Tennessee River Basin, as defined by the DWQ.]

The NCWRP selected these Targeted Local Watersheds based on readily available resource information [e.g., GIS coverages] and on comments and recommendations received from local resource professionals, environmental organizations, citizens, and groups or agencies with planned or ongoing water quality projects in the local watersheds. The Targeted Local Watersheds are selected primarily on the basis of their ***need*** for water quality and habitat restoration, and on the basis of the ***opportunity*** to initiate collaborative water quality and habitat restoration projects within the local watersheds. [Readers interested in a more detailed explanation of the methodology used to target and prioritize local watersheds for restoration work are referred to the ***Guide to the North Carolina Wetland Restoration Program's Watershed Restoration Strategy, version 1*** (NCWRP, 2001)].

Subbasin 04-04-01

Figure 4.1 presents the use support ratings for monitored waters within this subbasin, as well as the Targeted Local Watersheds.

For an overview of water quality issues in this subbasin -- including population statistics, land cover data, and use support ratings for streams -- see Section B, Chapter 1 of the Little Tennessee River Basinwide Water Quality Plan (DWQ, 2002).


Little Tenn. River Basin
Subbasin 01
Figure 4.1
Little Tennessee
River Basin
Subbasin 01
Targeted Local
Watersheds
N
W
E
S
Rivers - Use Support [Aq. Life]
Fully Supporting
Partially Supporting
Not Rated
Not Monitored/Evaluated
Municipalities
Local Watershed Boundaries
[14-digit HUs]
Targeted Local Watersheds
NCDENR
Division Of Water Quality
This map was produced on Feb. 14, 2002
by the NC Division of Water Quality Wetlands
Restoration Program . Data provided by NC
Center for Geographic Information & Analysis.
The map is based on
Projection: Stateplane
Zone: 4901
Datum: NAD83
Spheroid: GRS1980
Units: meters.
LITTLE TENNESSEE RIVER
Cowee Creek
Tellico Creek
40020
Burningtown Creek
Iotla Creek
Watauga Creek
Franklin
Crawford Branch
Wayah Creek
Cartoogechaye Creek
Ellijay Creek
Cullasaja River
Walnut Creek
Buck Creek
Jones Creek
Coweeta Creek
LITTLE TENNESSEE RIVER
Tessentee Creek
Brush Creek
30010
Cullasaja River
Mill Creek
Highlands
Middle Creek
20010
2 0 2 4 6 8 10 12 Miles

Targeted Local Watersheds in Subbasin 01

See Table 4.1 for a concise summary of water quality and resource conditions in the four Targeted Local Watersheds selected within this Subbasin. See Figures 4.2 and 4.3 for maps depicting the major hydrologic and natural resource features in each of the four Targeted Local Watersheds selected within this subbasin.

Upper Little Tennessee River and Middle Creek Watershed (HU 060102020 20010)

This 34-square mile watershed includes a 2.2-mile stretch of the Little Tennessee River (from NC/GA state line to Mulberry Creek) that is currently rated as only Partially Supporting in the aquatic life/secondary recreation use support category. Some of the water quality and habitat impairment in this stretch may be attributable to upstream dischargers and runoff from agricultural land in Georgia. However, DWQ biologists have reported eroding stream banks, heavily embedded substrate, few riffle areas, and little mature riparian vegetation at a sampling station in the upper reaches of the Little Tennessee River (DWQ, 2001).

One local resource professional noted that the Land Trust for the Little Tennessee and the Little Tennessee Watershed Association are working towards riparian restoration/preservation along the entire stretch of the Little Tennessee River from the state line to Lake Emory. The Clean Water Management Trust Fund (CWMTF) has supported the acquisition, by the Southern Appalachian Highlands Conservancy, of over 75 acres of riparian bottomlands along the Little Tennessee River and lower Middle Creek within this local watershed. Any restoration efforts along Middle Creek would build upon stream improvement work conducted by the Macon County SWCD and the NRCS in the 1980s.

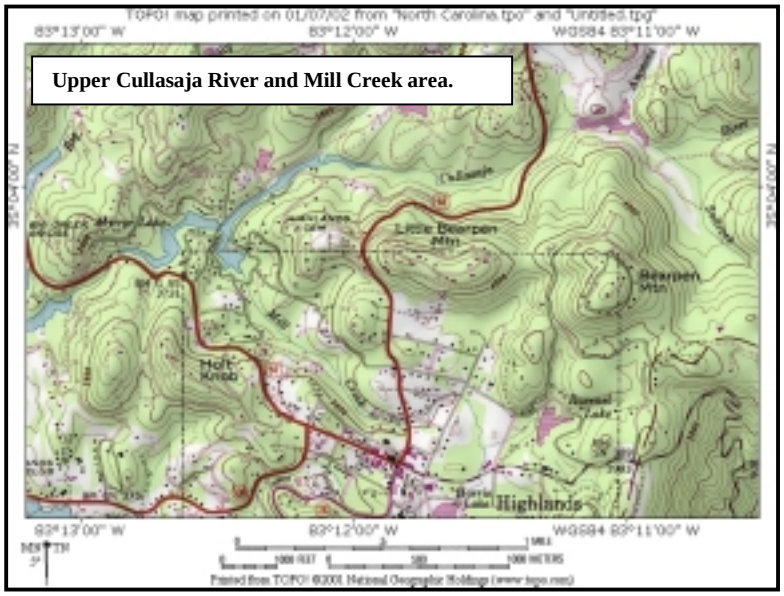
Significant Natural Heritage Areas in this watershed, as identified by the NC Natural Heritage Program, include Middle Creek Falls in the headwater reaches of Middle Creek. To maximize the benefits of any stream or wetlands restoration projects within this watershed, efforts should be made to encourage the initiation of similar restoration efforts (and implementation of nonpoint source BMPs) in upstream portions of the Little Tennessee River across the Georgia state line in Rabun County [see photo above left].

Upper Cullasaja River and Mill Creek Watershed (HU 060102020 30010)

Upper Cullasaja, adjacent to golf course

Although this 34-square mile watershed is over 90% forested (by land area), with much of that in the Nantahala National Forest, most of the relatively undisturbed forest lands occur in the lower reaches of the watershed, downstream of the Town of Highlands. The upper Cullasaja River above Lake Sequoyah (4.8 miles from its source to SR 1545) and all of Mill Creek (1.4 miles from source to Mirror Lake) have been impaired due to nonpoint source pollution from various urban land uses in the Highlands area. Sedimentation is noted as a significant problem. These impaired streams are rated as Partially Supporting in the aquatic life/secondary recreation use support category. The urban land uses contributing to this

impairment include roads, residences, golf courses [see photo at left], construction sites, and commercial businesses. The impaired stream reaches are classified as water supply (WS-III) and trout waters (Tr).

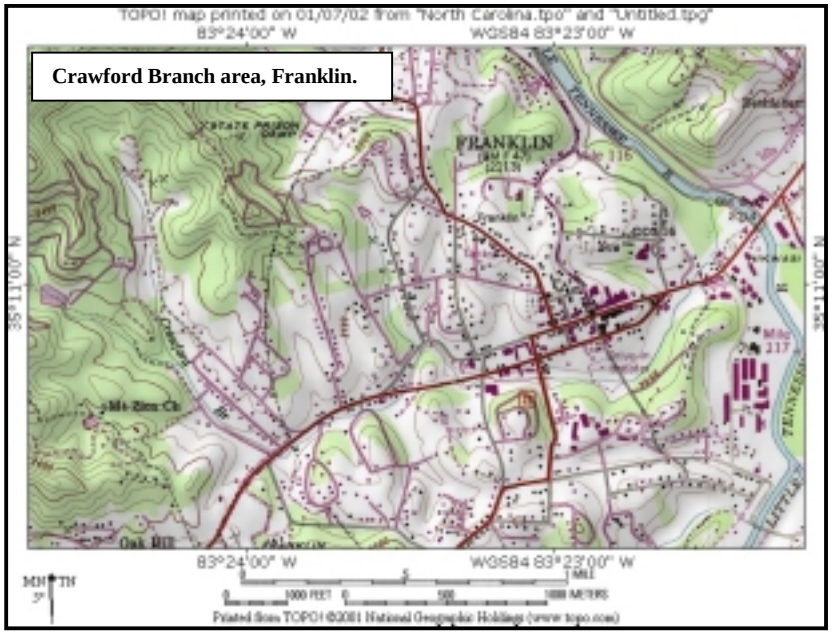


The NC Division of Water Quality's Watershed Assessment & Restoration Program [WARP] has been conducting biological sampling, chemical water quality monitoring, and habitat evaluation in the headwater section of the Cullasaja above Mirror Lake and in Mill Creek [see map at left]. Recommendations from the WARP study (report expected spring 2002) should serve as a foundation and an impetus for local stream and riparian restoration efforts. The Upper Cullasaja Watershed Association is an active local steward within this watershed.

The NC Natural Heritage Program has designated several Significant Natural Heritage Areas within this watershed, including the Cullasaja Gorge, Skitty Branch Bog, Ravenels Woods Remnants (upper Cullasaja River bottomlands), and Highlands Bog. Public parkland occupies a 26-acre tract along Mill Creek in Highlands; such public parks and greenways often provide good opportunities for stream restoration work. Also within this watershed is Big Creek, a water supply water [WS-II] and HQW water that is considered a top priority for protection.

<u>Iotla Creek, Crawford Branch, and Little Tennessee River</u> (HU 060102020 40020)

Lands cleared for agriculture and development represent approximately 15% of this 40-square mile watershed, with the town of Franklin situated in its southeastern corner. Over a third of the land area falls within the Nantahala National Forest, which encompasses the tributary headwaters of the Burningtown Creek and Iotla Creek sub-watersheds. Significant Natural Heritage Areas within this watershed include Wildes Cove in the upper reaches of Wildes Creek.



Crawford Branch [map at left] is a relatively small tributary to the Little Tennessee River that flows through the town of Franklin. Over 65% of the land area in the Crawford Branch sub-watershed has been cleared for residential, industrial or commercial uses. Nonpoint sources of pollution include

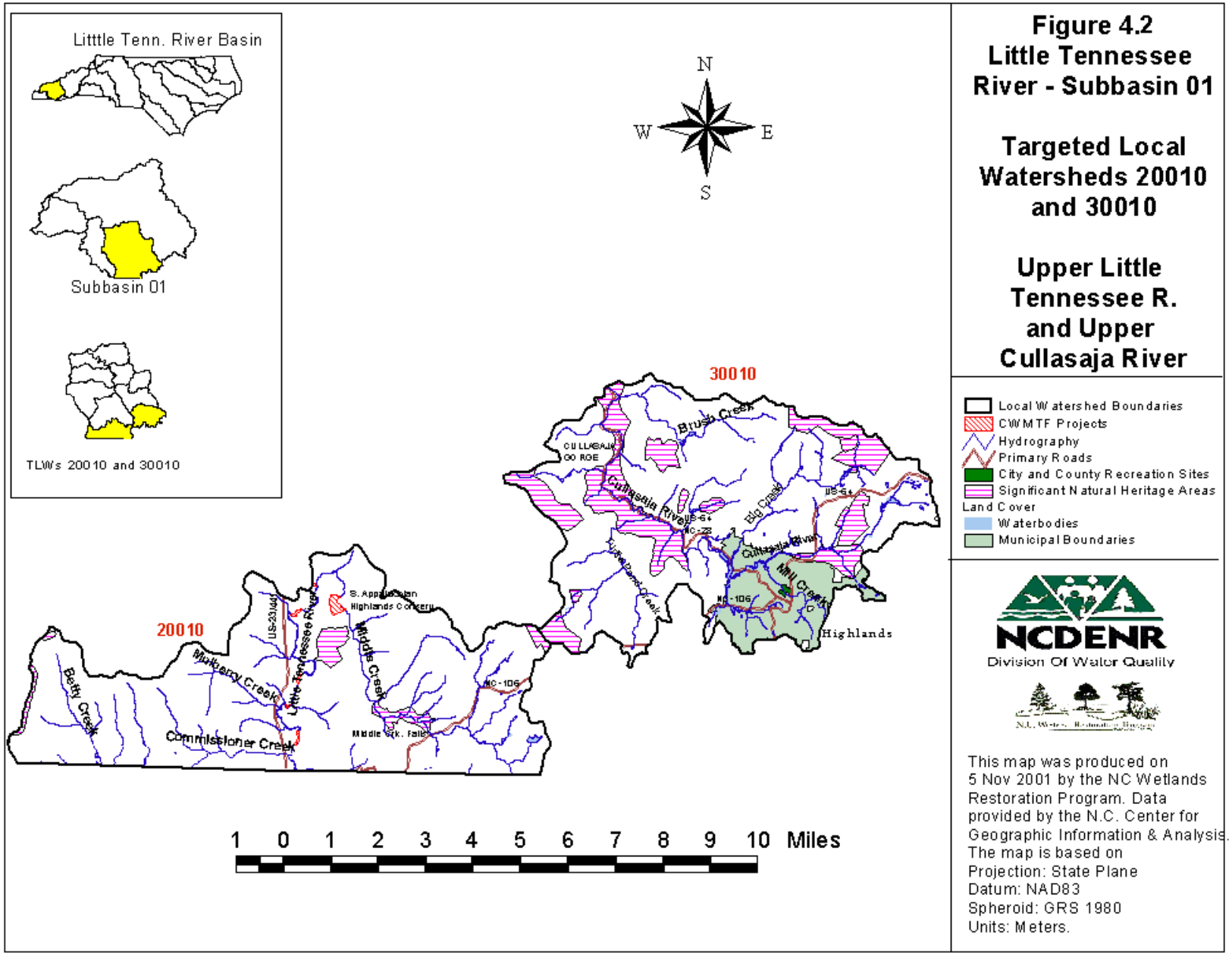
urban runoff and sediment from construction sites. The stream shows "obvious impacts to water quality", including a severely stressed benthic community noted at the most downstream sampling site (DWQ, 2001). With funds allocated from the Little Tennessee Nonpoint Source Team, a watershed management plan has been developed for Crawford Branch. This plan identifies several potential sites for installation of nonpoint source BMPs, and a stormwater wetland demonstration project is planned within this watershed. Stormwater management and stream restoration efforts here represent a significant educational opportunity.

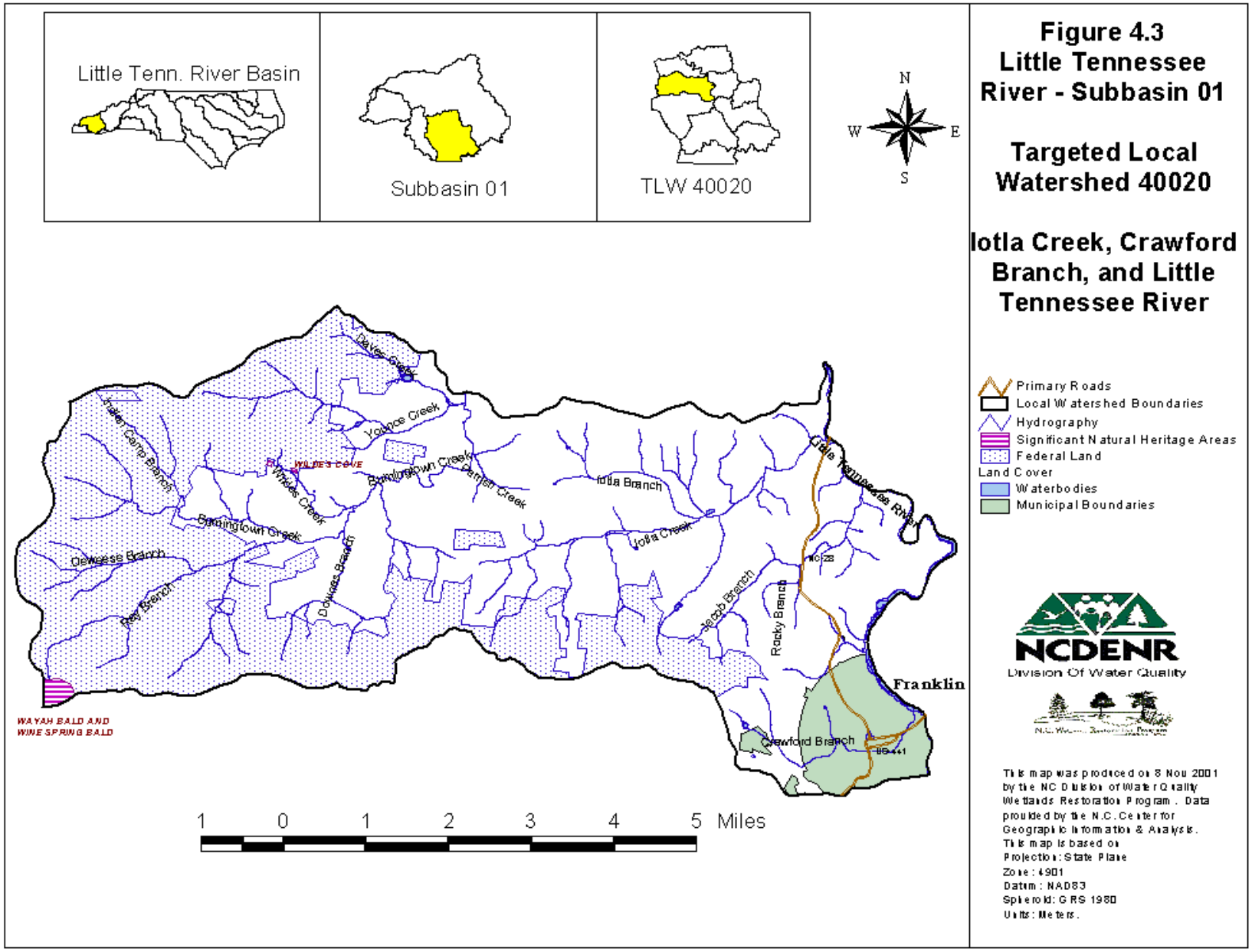
Iotla Creek also falls within this local watershed, and it is noted to have significant sedimentation problems and "abundant wetland restoration opportunities". The threatened Spotfin Chub has also been documented within this stream (McLarney, personal communication, 2002).

Table 4.1 Summary of information about Targeted Local Watersheds in Little Tennessee River Basin Subbasin 01

TARGETED LOCAL WATERSHED	UPPER LITTLE TENNESSEE RIVER & MIDDLE CREEK	UPPER CULLASAJA RIVER & MILL CREEK	IOTLA CREEK, CRAWFORD BR., AND LITTLE TENN. RIVER
County	Macon	Macon	Macon
14-digit Hydrologic Unit #	060102020 20010	060102020 30010	060102020 40020
Land Area [sq. mi.s]	33.8	34.3	39.8
Impaired Waters? [NS or PS use support rating][1]	Yes	Yes	Crawford Branch Not Rated, but nonpoint source impacts noted
Possible Causes/Sources of Degradation[2]	Agric. runoff, livestock in streams and pt. source discharges in GA	land development, urban runoff, golf courses and upstream impoundments	urban runoff; storm sewers
Land Cover - % Cleared	7	4	13
Land Cover - % Developed	0	2	2
Land Cover - % Forested	93	94	85
WS; HQW, ORW or Tr Waters?[3]	Yes	Yes	Yes
Aquatic Natural Heritage Element(s)?[4]	Yes (e.g., the Little Tenn. River crayfish)	Yes (e.g., the Green Salamander)	Yes (e.g., the Spotfin Chub, Wildes Cove)
Existing Watershed Projects (319, CWMTF, NCWRP)?[5]	Yes	Yes	Yes

1 See Section 2 for a brief explanation of use impairment. See the ***DWQ Little Tennessee River Basinwide Water Quality Plan*** (DWQ, 2002) for a more complete explanation of DWQ stream classifications & standards and use support ratings.
2 Information on possible **causes** [e.g., habitat degradation, sediment & nutrient inputs] and **sources** [e.g., non-point source runoff from agricultural/logging areas] of water quality degradation and use support impairment is obtained primarily from the ***DWQ Basinwide Water Quality Plan***(DWQ, 2002**)** and ***Basinwide Assessment Report*** (DWQ, 2000) for the Little Tennessee basin.
Habitat degradation includes instream sedimentation, bank erosion, channelization, lack of riparian vegetation, loss of pools/riffles, removal of woody habitat, and streambed scour.
3 WS = Water Supply waters. **ORW** = outstanding resource waters. **HQW** = high quality waters. **Tr** = DWQ-designated Trout streams [many are also WRC-designated public trout waters].
4 Aquatic Natural Heritage elements are unique or threatened aquatic species, habitats, or community types identified by the NC Natural Heritage Program. This designation includes Significant Natural Heritage Areas and/or Priority Areas identified by the Natural Heritage Program.
5 These include past and/or ongoing watershed and water quality-related projects funded by EPA/State nonpoint source program grants (319), the Clean Water Management Trust Fund (CWMTF), and the Wetlands Restoration Program (NCWRP). These projects often represent a mix of federal, state and local funding sources.


Litttle Tenn. River Basin
Subbasin 01
TLWs 20010 and 30010
N
W
E
S
30010
20010
Brush Creek
Big Creek
Cullasaja River
Mill Creek
Highlands
Buck Creek
Mulkey Creek
Little Tennessee River
Middle Creek
Betty Creek
Commissioner Creek
US-64
US-23/441
NC-28
NC-106
1 0 1 2 3 4 5 6 7 8 9 10 Miles
Figure 4.2
Little Tennessee River - Subbasin 01
Targeted Local Watersheds 20010 and 30010
Upper Little Tennessee R. and Upper Cullasaja River
Local Watershed Boundaries
CWMTF Projects
Hydrography
Primary Roads
City and County Recreation Sites
Significant Natural Heritage Areas
Land Cover
Waterbodies
Municipal Boundaries
NCDENR
Division Of Water Quality
This map was produced on 5 Nov 2001 by the NC Wetlands Restoration Program. Data provided by the N.C. Center for Geographic Information & Analysis.
The map is based on
Projection: State Plane
Datum: NAD83
Spheroid: GRS 1980
Units: Meters.


Little Tenn. River Basin
Subbasin 01
TLW 40020
N
W
E
S
Figure 4.3
Little Tennessee River - Subbasin 01
Targeted Local Watershed 40020
Iotla Creek, Crawford Branch, and Little Tennessee River
Primary Roads
Local Watershed Boundaries
Hydrography
Significant Natural Heritage Areas
Federal Land
Land Cover
Waterbodies
Municipal Boundaries
Yellow Creek
Yokonce Creek
Baker Camp Branch
Wrights Creek
Burningtown Creek
Parish Creek
Iotla Branch
Little Tennessee River
Iotla Creek
Dewease Branch
Dry Branch
Douglas Branch
Jacob Branch
Rocky Branch
NC 28
Franklin
Crawford Branch
US 441
WAYAH BALD AND WINE SPRING BALD
1 0 1 2 3 4 5 Miles
NCDENR
Division Of Water Quality
This map was produced on 8 Nov 2001 by the NC Division of Water Quality Wetlands Restoration Program. Data provided by the N.C. Center for Geographic Information & Analysis.
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Subbasin 04-04-02

Figure 4.4 depicts the Targeted Local Watersheds selected within this subbasin, as well as use support ratings for monitored waters. Based on an evaluation of restoration need and opportunity, the NCWRP has selected four Targeted Local Watersheds in this subbasin, the most of any of the Little Tennessee River subbasins.

For an overview of water quality issues in this subbasin -- including population statistics, land cover data, and use support ratings for streams -- see Section B, Chapter 2 of the Little Tennessee River Basinwide Water Quality Plan (DWQ, 2002).

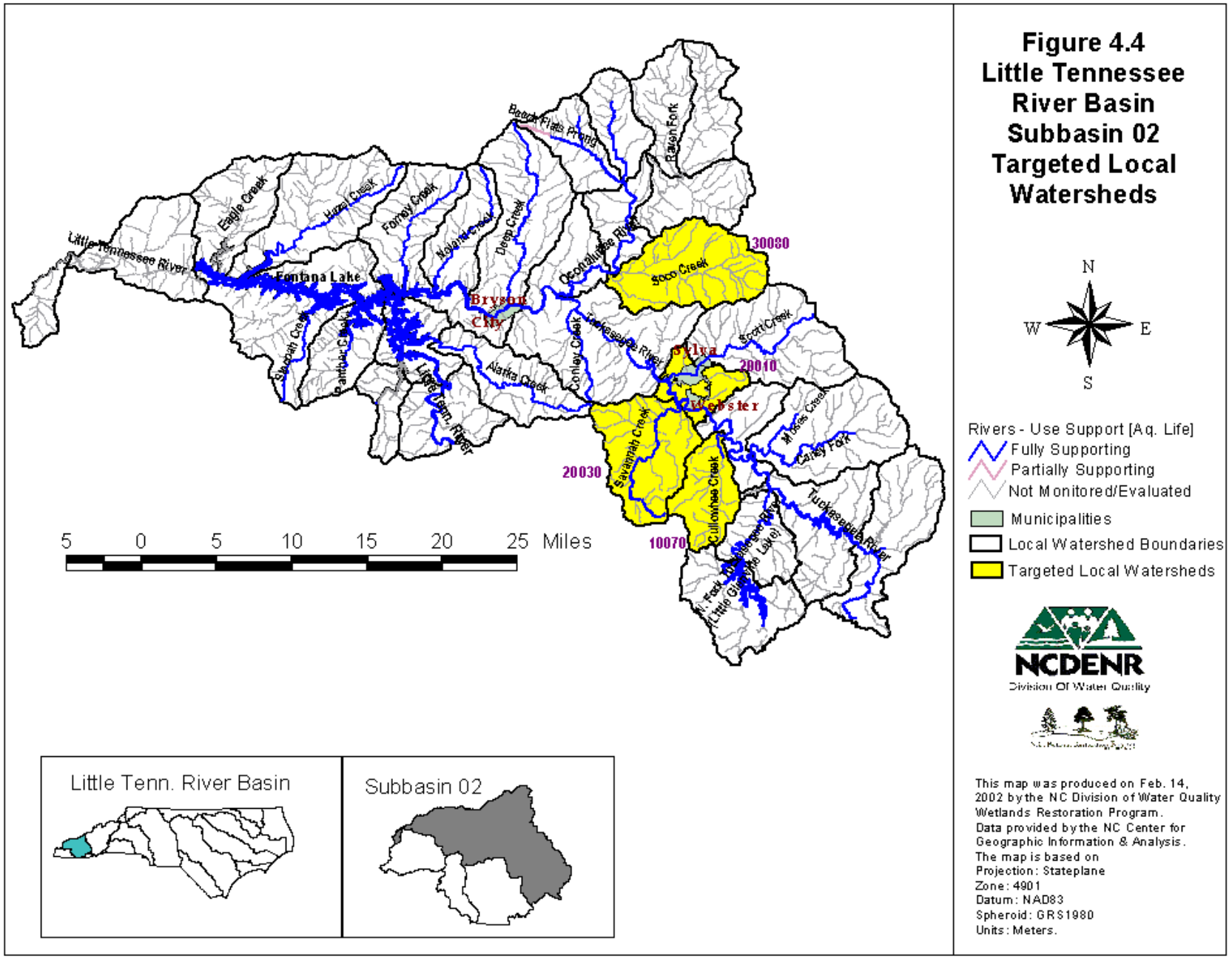


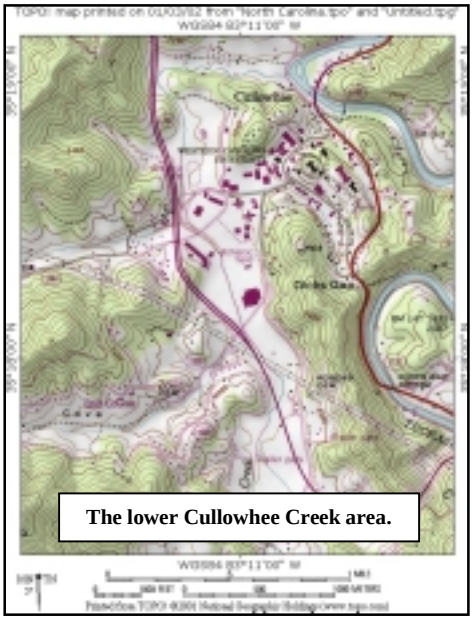
Figure 4.4
Little Tennessee River Basin
Subbasin 02
Targeted Local Watersheds
Little Tennessee River
Eagle Creek
Hazel Creek
Forney Creek
Nolan Creek
Deep Creek
Beech Flats Prong
Raven Fork
Fontana Lake
Bryson City
Oconaluftee River
Soco Creek
30080
Sylva
Scott Creek
20010
Webster
Tuckasegee River
Conley Creek
Alarka Creek
Savannah Creek
20030
Cullowhee Creek
Caney Fork
Moses Creek
10070
Shoal Creek
Little Glenville Lake
Little Tenn. River
5 0 5 10 15 20 25 Miles
N
W
E
S
Rivers - Use Support [Aq. Life]
Fully Supporting
Partially Supporting
Not Monitored/Evaluated
Municipalities
Local Watershed Boundaries
Targeted Local Watersheds
NCDENR
Division Of Water Quality
Little Tenn. River Basin
Subbasin 02
This map was produced on Feb. 14, 2002 by the NC Division of Water Quality Wetlands Restoration Program.
Data provided by the NC Center for Geographic Information & Analysis.
The map is based on
Projection: Stateplane
Zone: 4901
Datum: NAD83
Spheroid: GRS1980
Units: Meters.

Targeted Local Watersheds in Subbasin 02

Raven Fork, a fully supporting stream in Subbasin 02.

See Table 4.2 for a concise summary of water quality and resource conditions in the four Targeted Local Watersheds selected within this Subbasin. See Figures 4.5 and 4.6 for maps depicting the major features in each of the four Targeted Local Watersheds selected within this subbasin.

<u>Cullowhee Creek</u> (HU 060102030 10070)



The lower Cullowhee Creek area.

At just over 23 square miles in area, this watershed is approximately 90% forested, with the Nantahala National Forest encompassing the headwater reaches of Cullowhee and Tilley Creeks. Although the lower section of Cullowhee Creek is not monitored (and therefore not rated) by the Division of Water Quality, over 5,000 feet of this section, as it flows from Highway NC-107 through the campus of Western Carolina University, has been channelized and/or is lacking a riparian buffer [map at left; photo at right]. This is predominantly University-owned land that provides an excellent opportunity for stream restoration/stabilization projects, particularly if done in conjunction with a campus-wide stormwater management plan. Restoration projects here would also offer excellent educational and student-participation opportunities.

Significant Natural Heritage Areas within the watershed include Wolf Creek, a headwater tributary to Cullowhee Creek, that is designated as a High Quality Water by the DWQ.

<u>Lower Scott Creek and the Tuckasegee River</u> (060102030 20010)

At approximately 17 square miles in area, this watershed encompasses a relatively small area that includes the towns of Dillsboro, Sylva and Webster. Although rated fully supporting for its entire 14.7-mile length, Scott Creek has been identified as having low habitat diversity and likely impacts from nonpoint sources in the watershed. Stormwater runoff from these towns and a major four-lane highway [US-23/74] has likely impacted Scott Creek, and straight pipes and failing septic systems are suspected in some residential areas. Furthermore, much of lower Scott Creek has degraded or non-existent riparian buffer zones, and has had channel and stream bank modifications (DWQ, 2002).

One resource professional noted that Jackson County has applied for a CWMTF grant to support greenways planning along Scott Creek from Dillsboro to Sylva. With two public parkland parcels located directly beside Scott Creek in Sylva, there could be good opportunities for NCWRP or other groups to partner with the town in implementing local stream and riparian buffer restoration projects.

***Savannah Creek* (060102030 20030)**

In this 41-square mile watershed, Savannah Creek flows to the northeast into the Tuckasegee River near Webster. This creek has experienced declining bioclassifications and habitat scores during the 1990s, due in part to channel and stream bank modifications in the lower portion of the watershed. Residential development in recent years is also noted as a potential cause of aquatic habitat degradation in this watershed. Roadway runoff [from US-23/441 and NC-116] has likely also contributed to water quality impairment and habitat degradation in this stream (DWQ, 2002).

This watershed contains a Significant Natural Heritage Area (Kirby Knob) in the headwater reaches of Savannah Creek.

***Soco Creek* (060102030 30080)**

This 45-square mile watershed lies primarily within the Qualla Boundary of the Eastern Band of Cherokee Indians. Soco Falls, a Significant Natural Heritage Area, lies within the headwaters of Soco Creek. This creek, a designated trout habitat, flows out of the Plott Balsam Mountains (and the Blue Ridge Parkway) and runs through the heart of the Cherokee Reservation before joining the Oconaluftee River near the Town of Cherokee. Highway US-19 parallels the Creek throughout its length. Highway runoff and gravel mining operations in the floodplain have likely contributed to habitat and water quality impacts in Soco Creek. Loss of riparian vegetation buffers and channel straightening/armoring have also occurred along this stream. Lower Soco Creek [see map and photo at left] has at least one stream restoration project underway.

The lower Soco Creek area.

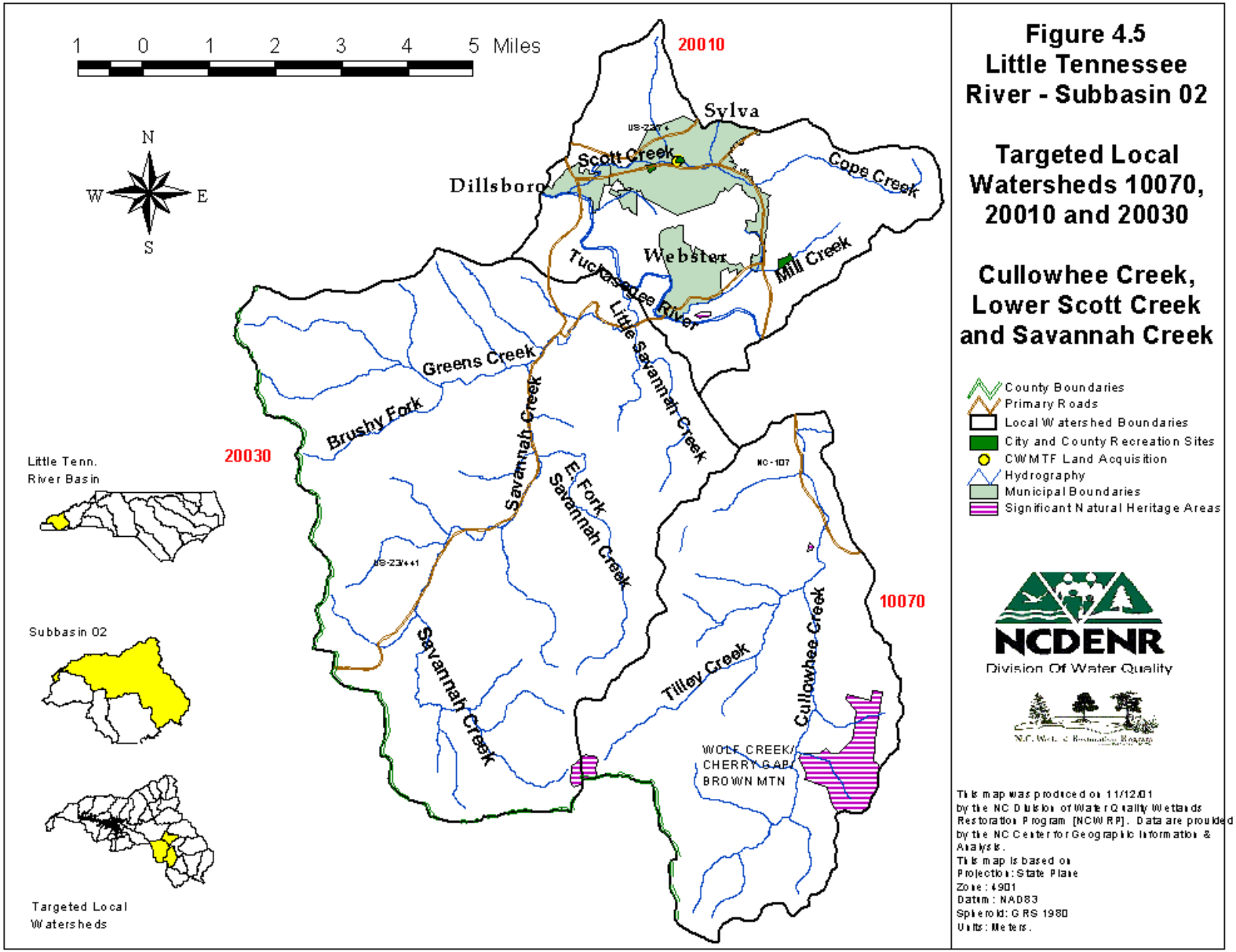

A stream restoration site on lower Soco Creek

This watershed also includes a designated WS-II water supply area surrounding Indian Creek, a tributary to middle Soco Creek. According to one resource professional, the Eastern Band of Cherokee is presently conducting several watershed management activities within their lands, including: stormwater management; stream and wetland restoration projects; the use of pervious paving materials; and the enforcement of local erosion & sediment control ordinances.

Table 4.2 Summary Information for Targeted Local Watersheds in Little Tennessee River Subbasin 02

TARGETED LOCAL WATERSHED	CULLOWHEE CREEK	LOWER SCOTT CREEK & TUCKASEGEE RIVER	SAVANNAH CREEK	SOCO CREEK
County	Jackson	Jackson	Jackson	Jackson
14-digit Hydrologic Unit #	060102030 10070	060102030 20010	060102030 20030	060102030 30080
Land Area [sq. mi.s]	23.3	16.6	40.9	45.1
Impaired Waters? [NS or PS use support rating][1]	No (but habitat degradation noted)	No (but habitat degradation and fecal coliform noted)	No (but habitat degradation noted)	Not Monitored
Possible Causes/Sources of Degradation[2]	loss of riparian buffer; channelization; urban runoff	urban runoff; septic systems; straight pipe discharges	highway/bridge runoff	loss of riparian buffer; channelization; urban runoff
Land Cover - % Cleared	5	12	6	4
Land Cover - % Developed	2	6	1	1
Land Cover - % Forested	93	81	93	95
WS; HQW, ORW or Tr Waters?[3]	Yes	No	Yes	Yes
Aquatic Natural Heritage Element(s)?[4]	Yes	Yes	No	Yes
Existing Watershed Projects (319, CWMTF, NCWRP)?[5]	No	Yes	No	Yes

1 See Section 2 for a brief explanation of use impairment. See the ***DWQ Little Tennessee River Basinwide Water Quality Plan*** (DWQ, 2002) for a more complete explanation of DWQ stream classifications & standards and use support ratings.
2 Information on possible **causes** [e.g., habitat degradation, sediment & nutrient inputs] and **sources** [e.g., non-point source runoff from agricultural/logging areas] of water quality degradation and use support impairment is obtained primarily from the ***DWQ Basinwide Water Quality Plan*** and ***Basinwide Assessment Report*** (DWQ, 2000) for the Little Tennessee basin. **Habitat degradation** includes instream sedimentation, bank erosion, channelization, lack of riparian vegetation, loss of pools/riffles, removal of woody habitat, and streambed scour.
3 WS = Water Supply waters. **ORW** = outstanding resource waters. **HQW** = high quality waters. **Tr** = DWQ-designated Trout streams and/or WRC-designated public trout waters.
4 Aquatic Natural Heritage elements are unique or threatened aquatic species, habitats, or community types identified by the NC Natural Heritage Program. This designation includes Significant Natural Heritage Areas and/or Priority Areas identified by the Natural Heritage Program.
5 These include past and/or ongoing watershed and water quality-related projects funded by EPA/State nonpoint source program grants (319), the Clean Water Management Trust Fund (CWMTF), and the Wetlands Restoration Program (NCWRP). These projects often represent a mix of federal, state and local funding sources.


1 0 1 2 3 4 5 Miles
N
W
E
S
20010
Sylva
Scott Creek
Dillsboro
Cope Creek
Webster
Mill Creek
Tuckasegee River
Little Savannah Creek
Greens Creek
Brushy Fork
Savannah Creek
E. Fork Savannah Creek
20030
NC-107
US-23/441
10070
Tilley Creek
Cullowhee Creek
WOLF CREEK
CHERRY GAP
BROWN MTN
Little Tenn. River Basin
Subbasin 02
Targeted Local Watersheds
Figure 4.5
Little Tennessee River - Subbasin 02
Targeted Local Watersheds 10070, 20010 and 20030
Cullowhee Creek, Lower Scott Creek and Savannah Creek
County Boundaries
Primary Roads
Local Watershed Boundaries
City and County Recreation Sites
CWMTF Land Acquisition
Hydrography
Municipal Boundaries
Significant Natural Heritage Areas
NCDENR
Division Of Water Quality
This map was produced on 11/12/01 by the NC Division of Water Quality Wetlands Restoration Program [NCWRP]. Data are provided by the NC Center for Geographic Information & Analysis.
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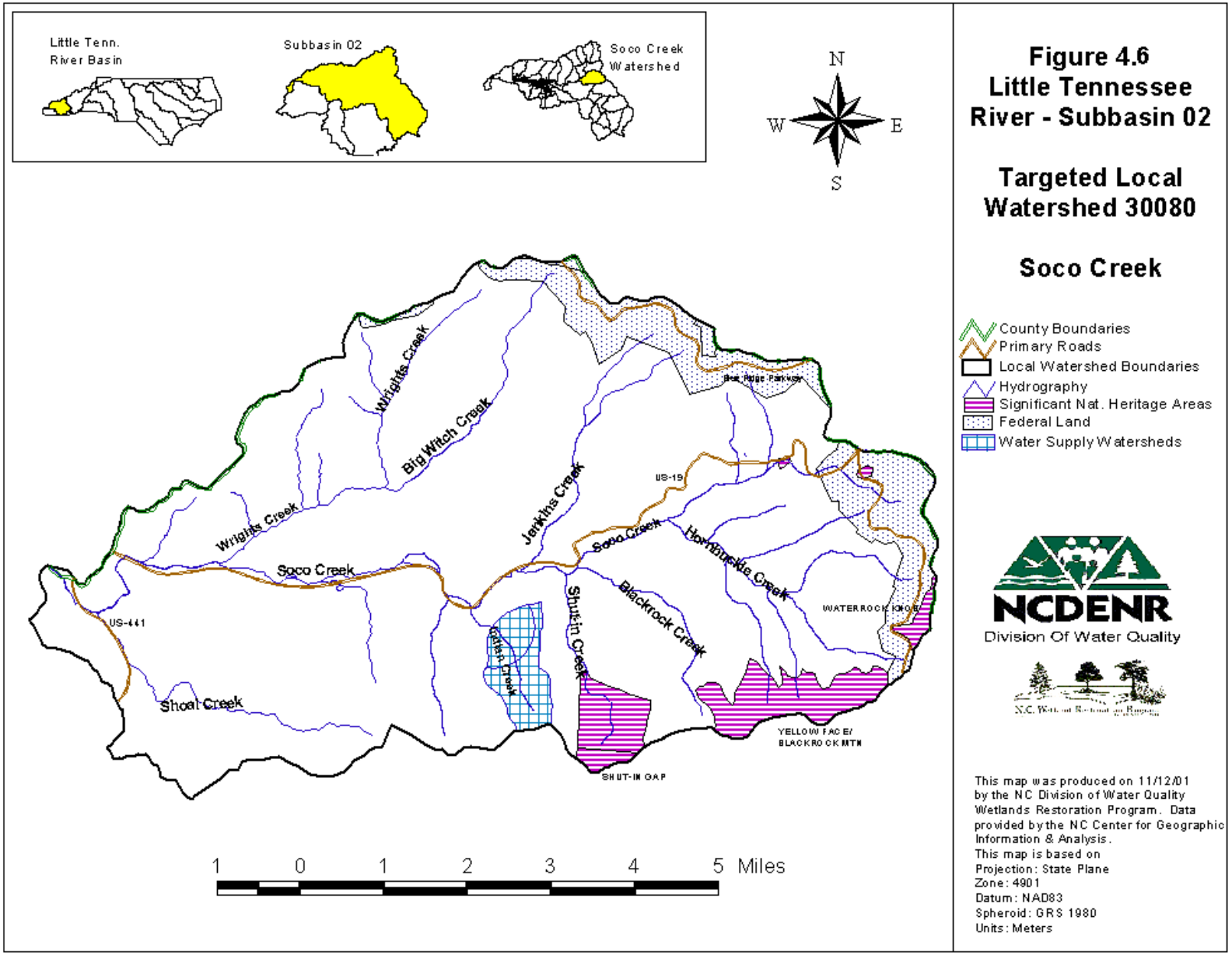
Little Tenn.
River Basin
Subbasin 02
Soco Creek
Watershed
N
W
E
S
Figure 4.6
Little Tennessee
River - Subbasin 02
Targeted Local
Watershed 30080
Soco Creek
County Boundaries
Primary Roads
Local Watershed Boundaries
Hydrography
Significant Nat. Heritage Areas
Federal Land
Water Supply Watersheds
Wrights Creek
Big Witch Creek
Jenkins Creek
Soco Creek
Hornbuckle Creek
Blackrock Creek
Shuttin Creek
Golden Creek
Shoal Creek
US-441
US-19
Blue Ridge Parkway
WATERROCK KNOB
YELLOW FACE/
BLACKROCK MTN
SHUT-IN GAP
NCDENR
Division Of Water Quality
N.C. Wetland Restoration Program
1 0 1 2 3 4 5 Miles
This map was produced on 11/12/01
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Wetlands Restoration Program. Data
provided by the NC Center for Geographic
Information & Analysis.
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Units: Meters

Subbasin 04-04-03

No Targeted Local Watersheds have been selected within this subbasin. There are currently no impaired waters in this subbasin; however, some impacts have been observed by DWQ. The most notable is a one-mile segment of Whiteoak Creek downstream of a trout farm operation. Additional stream monitoring and the implementation of best management practices by the trout farm operator have been recommended to address this issue (DWQ, 2002). Trout farm discharges are regulated under the NPDES permitting system and, as such, are not considered as targets for NCWRP restoration activities, which focus on nonpoint source impacts to streams.

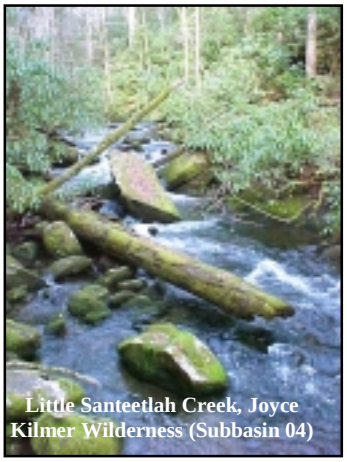
In portions of Subbasin 04 [below], trout farm impacts to local streams (e.g., West Buffalo Creek) are being addressed by using CWMTF monies to buy out the operations and restore the floodplain areas. Also, DWQ has placed a moratorium on new trout farms in the Santeetlah Lake watershed and on the expansion of existing operations.

Subbasin 04-04-04

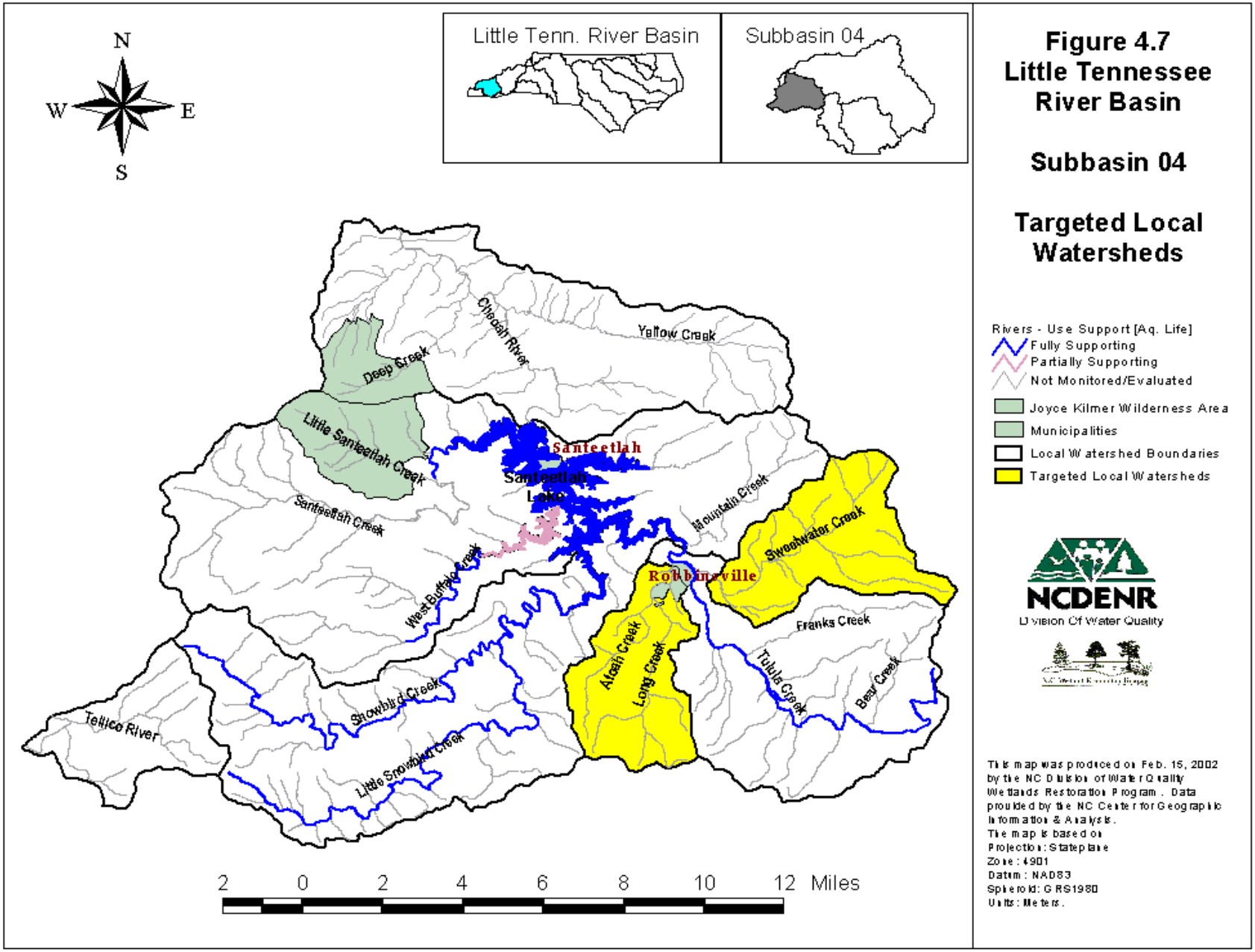
Much of this subbasin is forested and lies within the Nantahala National Forest. Water quality is generally excellent; however, the lower reaches of many tributaries are in pastureland and some streams have likely been affected by agriculture-related impacts.

Figure 4.7 depicts the two Targeted Local Watersheds selected within this subbasin.

For an overview of water quality issues in this subbasin -- including population statistics, land cover data, and use support ratings for streams -- see Section B, Chapter 4 of the Little Tennessee River Basinwide Water Quality Plan (DWQ, 2002).



Little Santeetlah Creek, Joyce Kilmer Wilderness (Subbasin 04)


N
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Little Tenn. River Basin
Subbasin 04
Figure 4.7
Little Tennessee
River Basin
Subbasin 04
Targeted Local
Watersheds
Rivers - Use Support [Aq. Life]
Fully Supporting
Partially Supporting
Not Monitored/Evaluated
Joyce Kilmer Wilderness Area
Municipalities
Local Watershed Boundaries
Targeted Local Watersheds
Chegoah River
Yellow Creek
Deep Creek
Little Santeetlah Creek
Santeetlah
Santeetlah Lake
Santeetlah Creek
Mountain Creek
Sweetwater Creek
Robbinsville
West Buffalo Creek
Franks Creek
Long Creek
Tulula Creek
Bear Creek
Snowbird Creek
Little Snowbird Creek
Tellico River
2 0 2 4 6 8 10 12 Miles
NCDENR
Division Of Water Quality
This map was produced on Feb. 15, 2002
by the NC Division of Water Quality
Wetlands Restoration Program. Data
provided by the NC Center for Geographic
Information & Analysis.
The map is based on
Projection: Stateplane
Zone: 4901
Datum: NAD83
Spheroid: GRS1980
Units: Meters.

Targeted Local Watersheds in Subbasin 04

Of the eight local watersheds which comprise this subbasin, two have been selected as Targeted Local Watersheds for stream and wetlands restoration: the Sweetwater Creek watershed; and the Atoah and Long Creeks watershed. Table 4.3 summarizes important information for these watersheds, and Figures 4.8 and 4.9 depict their major hydrologic and natural resource features.

<u>Sweetwater Creek Watershed</u> (HU 060102040 10020) and

<u>Atoah Creek and Long Creek Watershed</u> (HU 060102040 10030)

These two relatively small watersheds (each less than 14 square miles in area) include water supply [WS-] designated waters serving the town of Robbinsville [see map below]. Resource professionals noted that the major streams in these two watersheds have been adversely affected by channelization, loss of riparian vegetation, cattle on stream banks and in streams, and associated erosion and sedimentation. The Sweetwater Creek watershed is almost entirely in private ownership, and this could pose a challenge in piecing together stream restoration project sites. The lower section of Long Creek receives urban runoff from the Town of Robbinsville. Any stream or wetland restoration opportunities in these watersheds will require close coordination with local farming interests and the Graham County Soil & Water Conservation District.

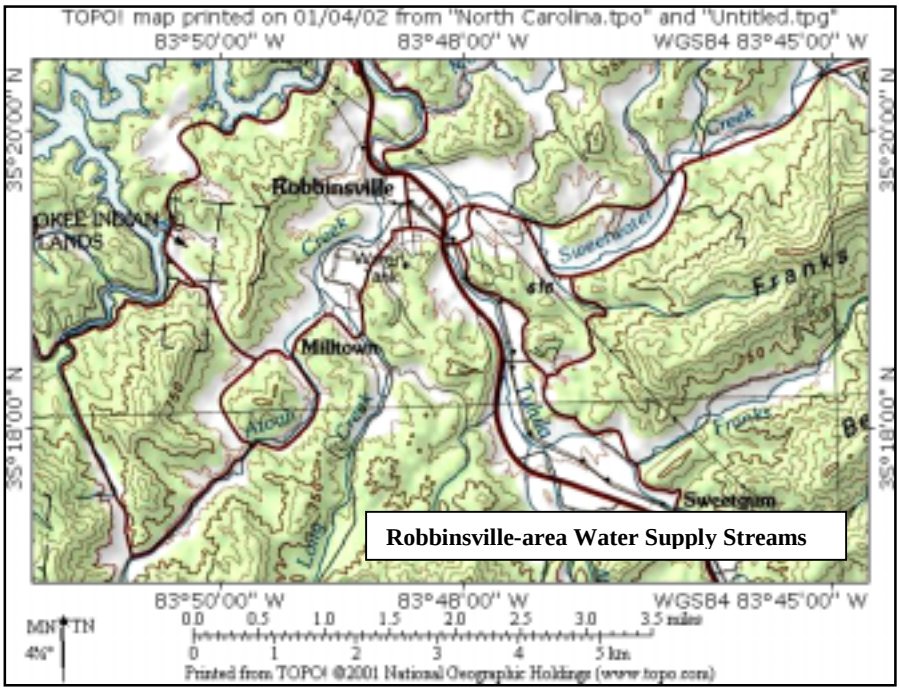
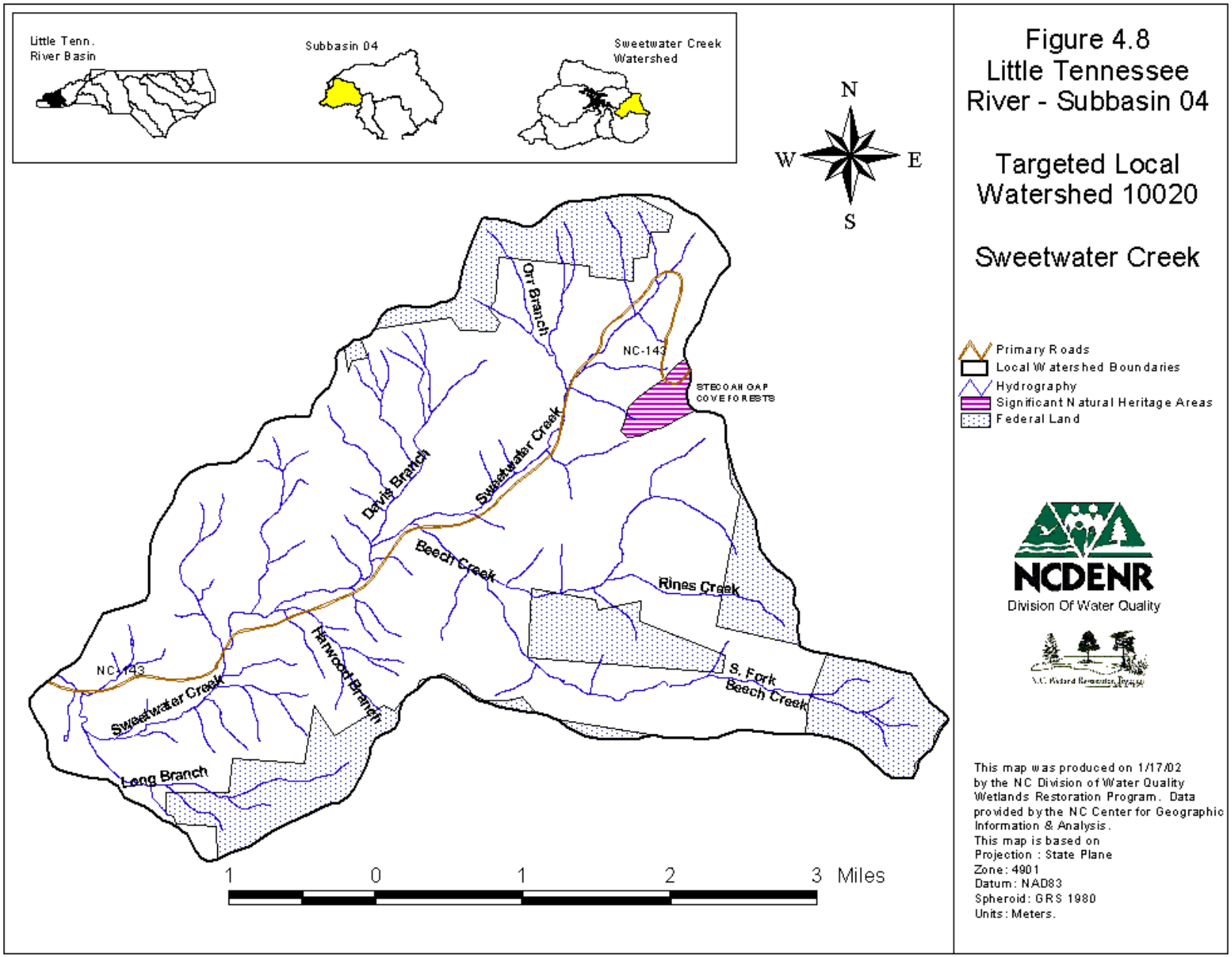
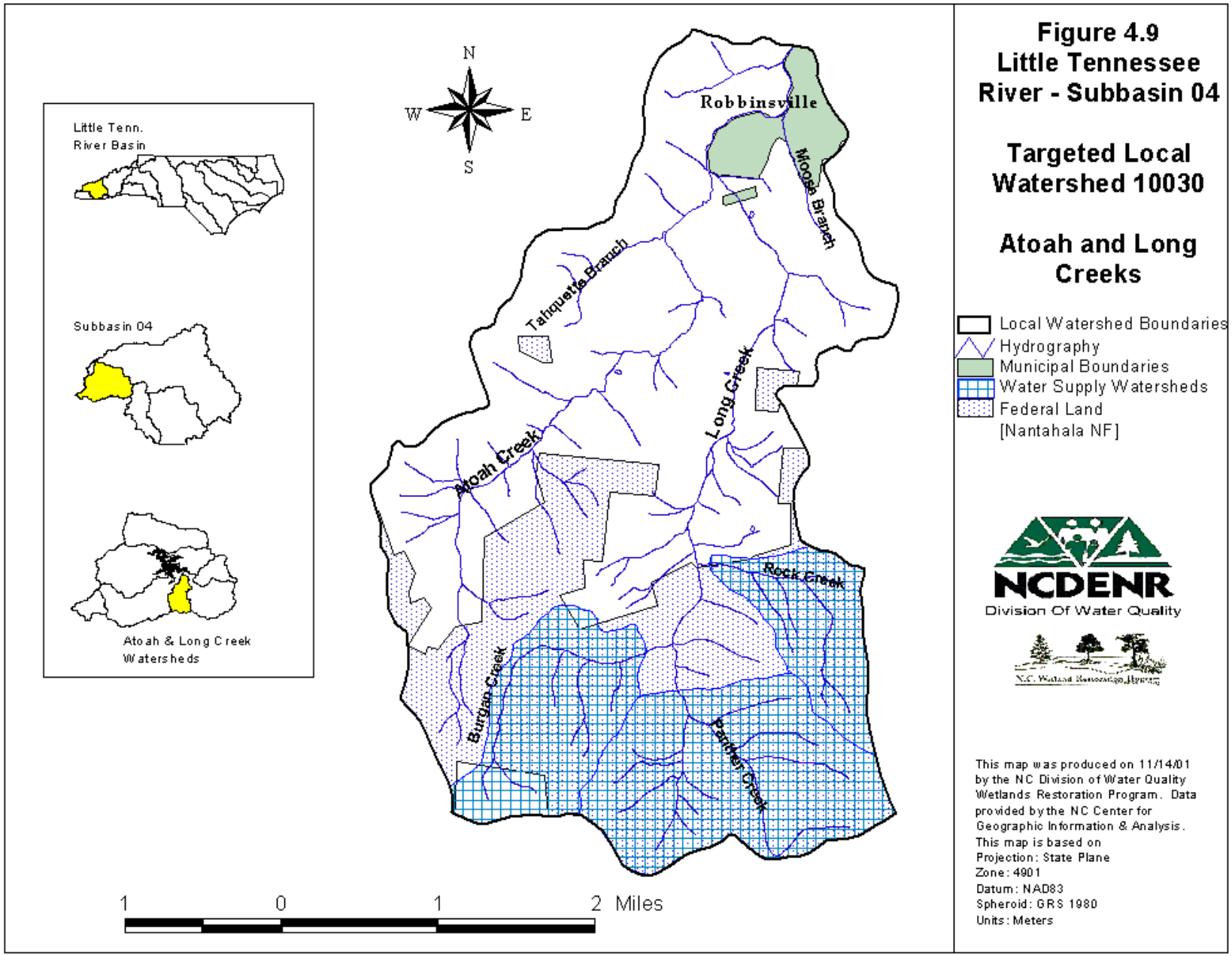


Table 4.3 Summary Information for Subbasin 04 Targeted Local Watersheds

TARGETED LOCAL WATERSHED	SWEETWATER CREEK	ATOAH CREEK & LONG CREEK
County	Graham	Graham
14-digit Hydrologic Unit #	060102040 10020	060102040 10030
Land Area [sq. mi.s]	13.7	11.6
Impaired Waters? [NS or PS use support rating][1]	Not Monitored	Not Monitored
Possible Causes/Sources of Degradation[2]	Agric. runoff and road construction impacts likely	loss of riparian buffer; channelization; cattle in streams; urban runoff
Land Cover - % Cleared	8	8
Land Cover - % Developed	1	2
Land Cover - % Forested	91	90
WS; HQW, ORW or Tr Waters?[3]	Yes (WS and Tr)	Yes (WS)
Aquatic Natural Heritage Element(s)?[4]	No	Yes (e.g., the Hellbender)
Current Watershed Projects (319, CWMTF, NCWRP)?[5]	No	No

1 See Section 2 for a brief explanation of use impairment. See the ***DWQ Little Tennessee River Basinwide Water Quality Plan*** (DWQ, 2002) for a more complete explanation of DWQ stream classifications & standards and use support ratings.
2 Information on possible **causes** [e.g., habitat degradation, sediment & nutrient inputs] and **sources** [e.g., non-point source runoff from agricultural/logging areas] of water quality degradation and use support impairment is obtained primarily from the ***DWQ Basinwide Water Quality Plan*** and ***Basinwide Assessment Report*** (DWQ, 2000) for the Little Tennessee basin. **Habitat degradation** includes instream sedimentation, bank erosion, channelization, lack of riparian vegetation, loss of pools/riffles, removal of woody habitat, and streambed scour.
3 WS = Water Supply waters. **ORW** = outstanding resource waters. **HQW** = high quality waters. **Tr** = DWQ-designated Trout streams and/or WRC-designated public trout waters.
4 Aquatic Natural Heritage elements are unique or threatened aquatic species, habitats, or community types identified by the NC Natural Heritage Program. This designation includes Significant Natural Heritage Areas and/or Priority Areas identified by the Natural Heritage Program.
5 These include past and/or ongoing watershed and water quality-related projects funded by EPA/State nonpoint source program grants (319), the Clean Water Management Trust Fund (CWMTF), and the Wetlands Restoration Program (NCWRP). These projects often represent a mix of federal, state and local funding sources.


Little Tenn.
River Basin
Subbasin 04
Sweetwater Creek
Watershed
N
W
E
S
Figure 4.8
Little Tennessee
River - Subbasin 04
Targeted Local
Watershed 10020
Sweetwater Creek
Orr Branch
NC-143
STECOAH GAP
COVE FORESTS
Davis Branch
Sweetwater Creek
Beech Creek
Rines Creek
Hanwood Branch
NC-143
Sweetwater Creek
S. Fork
Beech Creek
Long Branch
1 0 1 2 3 Miles
Primary Roads
Local Watershed Boundaries
Hydrography
Significant Natural Heritage Areas
Federal Land
NCDENR
Division Of Water Quality
This map was produced on 1/17/02
by the NC Division of Water Quality
Wetlands Restoration Program. Data
provided by the NC Center for Geographic
Information & Analysis.
This map is based on
Projection : State Plane
Zone: 4901
Datum: NAD83
Spheroid: GRS 1980
Units: Meters.


Little Tenn.
River Basin
Subbasin 04
Atoah & Long Creek
Watersheds
N
W
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Robbinsville
Moose Branch
Tahquette Branch
Long Creek
Atoah Creek
Rock Creek
Burgan Creek
Panther Creek
1
0
1
2 Miles
Figure 4.9
Little Tennessee
River - Subbasin 04
Targeted Local
Watershed 10030
Atoah and Long
Creeks
Local Watershed Boundaries
Hydrography
Municipal Boundaries
Water Supply Watersheds
Federal Land
[Nantahala NF]
NCDENR
Division Of Water Quality
This map was produced on 11/14/01
by the NC Division of Water Quality
Wetlands Restoration Program. Data
provided by the NC Center for
Geographic Information & Analysis.
This map is based on
Projection: State Plane
Zone: 4901
Datum: NAD83
Spheroid: GRS 1980
Units: Meters

SECTION 5: CONTACT INFORMATION FOR THE LITTLE TENNESSEE RIVER BASIN

The NCWRP can implement restoration projects cooperatively with other state or federal programs or environmental groups. The NCWRP believes that integrating wetland or stream restoration with other projects such as storm water management practices, agricultural BMPs, or pollutant source studies will often increase the overall water quality benefits of the project. In selecting Targeted Local Watersheds, the NCWRP considers completed and current restoration efforts in the watershed to determine if there are opportunities to link NCWRP projects with these efforts through the watershed approach. ***Section C*** of the *Little Tennessee River Basinwide Water Quality Plan* (DWQ, 2002) -- *Current and Future Water Quality Initiatives* -- provides a comprehensive overview of current and planned water quality initiatives and projects in the Little Tennessee River Basin, some of which may act as building blocks for current or future NCWRP project efforts. Many of these projects are highlighted in the discussion of Targeted Local Watersheds (Section 4) in this Plan.

The following tables provide contact information for some of the key projects and programs discussed in Section 4 of this Plan. It also provides federal, state, and local agency contacts that have some jurisdiction or interest in the Basin.

Table 5.1 Contacts for **Federal** water quality programs and initiatives in the Little Tennessee River Basin.

Organization/Agency	*Contact*	*Address*	*Phone*	*Email*
US Fish & Wildlife Service	Erin Bronk	2010 Flat Mtn. Road Highlands, NC 28741	828-526-3765	ebronk@fs.fed.us
US Fish & Wildlife Service	Jeff Owenby	2010 Flat Mtn. Road Highlands, NC 28741	828-526-3765	jowenby@fs.fed.us
US Fish & Wildlife Service	Lorie Lewis	" " "	" " "	Lorielewis@fs.fed.us
US Fish & Wildlife Service	Richard Burns	PO Box 2750 Asheville, NC 28802	828-257-4200	rgburns@fs.fed.us
US Environmental Protection Agency	Becky Fox	1349 Firefly Road Whittier, NC 28789	828-497-3531	
US Environmental Protection Agency - Wetlands Section	Jennifer Derby	61 Forsyth Street, S.W. Atlanta, GA 30303	404-562-9401	
US Environmental Protection Agency - NPS Section	Tony Able	61 Forsyth Street, S.W. Atlanta, GA 30303	404-562-9273	
Natural Resources Conservation Service-Eastern Band of Cherokee	Arthur Wade	PO Box 1067 Whittier, NC 28789		arthur.wade@nc.usda.gov
Natural Resources Conservation Service - Jackson and Swain Counties	Kayla Hudson	538 Scotts Creek Rd. Sylva, NC 28779	828-586-6344	khudson@nc.usda.gov
Natural Resources Conservation Service - Macon County	Levourn Wiggins	203 Sloan Road Franklin, NC 28734	828-524-3311	james.wiggins@nc.usda.gov
US Fish and Wildlife	Mark Cantrell	160 Zillicoa Street Asheville, NC 28801		Mark_A_Cantrell@fws.gov
Tennessee Valley Authority	Gary Williams	Hwy. 441 Norris, TN 37828	423-632-1436	ggwilliams2@tva.gov
Tennessee Valley Authority	Steve Akers	Ste 300, 804 Hwy. 321 N Lenoir City, TN 37771	865-988-2430	slakers@tva.gov
Southwest Natural Resource Conservation and Development	Tim Garrett	PO Box 1230 Waynesville, NC 28786	828-452-2519	swrcd@dnet.net
Coweeta Hydrologic Lab	Dr. Wayne Swank	999 Coweeta Lab Road Otto, NC 28763	828-524-2128	

Table 5.2 Contacts for **State** water quality programs and initiatives in the Little Tennessee River Basin.

Organization/Agency	*Contact*	*Address*	*Phone*	*Email*
DWQ Basinwide Planning	Callie Dobson	1617 Mail Service Center Raleigh, NC27699	919-733-5083	callie.dobson@ncmail.net
DWQ-Asheville Regional Office	Laurie Moorhead	59 Woodfin Place Asheville, NC28801	828-251-6208	laurie.moorhead@ncmail.net
DWQ-Raleigh (NPS Program)	Sean Groom	1617 Mail Service Center Raleigh, NC 27699	919-733-5083	sean.groom@ncmail.net
Wildlife Resources Commission	Mickey Clemmons	20830 Great Smoky Mtns. Expressway Waynesville, NC 28786	828-452-6191	
Wildlife Resources Commission-Habitat Conservation	Owen Anderson	20830 Great Smoky Mtns. Expressway Waynesville, NC 28786	828-452-2546	andersof@brinet.com
NC Cooperative Extension Service-Jackson County	Jeff Seiler	538 Scotts Creek Rd. Sylva, NC 28779	828-586-4009	Jeff_Seiler@ncsu.edu
NC Cooperative Extension Service - Swain County	Jeff Seiler	Swain County Center, P.O. Box 2329 60 Almond School Road Bryson City NC 28713	828-488-3848	
NC Cooperative Extension Service-Macon County	Kenneth McCaskill	5 W. Main Street Franklin, NC 28734	828-349-2052	Kenneth_McCaskill@ncsu.edu
NC Cooperative Extension-Asheville	Jon Calabria	100 Frederick Law Olmstead Way Asheville, NC 28806	828-665-2492	Jon_calabria@ncsu.edu
NC Cooperative Extension	Randy Collins	P.O. Box 486 Robbinsville, NC 28771	828-479-7979	
NC Division of Forest Resources- Jackson County	Andrea Oliver	443 Hwy. 116 Sylva, NC 28779	828-586-4007	andrea.oliver@ncmail.net
NC Division of Forest Resources -Macon County	Donnie Seagle	543 Iotla Church Road Franklin, NC 28734	828-369-8677	smokey955@juno.com
NC Division of Land Resources-Asheville Office	Mike Goodson	59 Woodfin Place Asheville, NC 28801	828-251-6208	mike.goodson@ncmail.net
NCDOT-Hwy. Division 14	Mark Davis	PO Box 37 Sylva, NC 28779	828-586-2141	markdavis@dot.state.nc.us
NCDOT-Jackson/Swain Counties	Rick Styles	PO Box 250 Bryson City, NC 28713	828-488-2131	rstyles@dot.state.nc.us
NCDOT-Macon/Graham Counties	Brian Burch	PO Box 1551 Andrews, NC 28901	828-321-4105	brianburch@dot.state.nc.us
Soil and Water Conservation District-Jackson County	Bentley Robison	538 Scotts Creek Rd. Sylva, NC 28779	828-586-5465	bentleyrobison@jacksonnc.org
Soil and Water Conservation District- Macon County	Mike Breedlove	203 Sloan Road Franklin, NC 28734	828-524-3311	
Soil and Water Conservation District- Swain County	Billy Dills	PO Box 731 Bryson City, NC 28713	828-488-3785	bdills@nc.usda.gov
Clean Water Management Trust Fund	Tom Massie	P.O. Box 595 Sylva, NC 28779	828-586-4133	
Western Carolina University	Gary Smith	Health Sciences/132 Moore Hall Cullowhee, NC 28723	828-227-3506	smithg@wpoff.wcu.edu

Table 5.3 Contacts for **Local, Private and Regional Non-Profit** Water Quality Programs and Initiatives in the Little Tennessee River Basin.

Organization/Agency	*Contact*	*Address*	*Phone*	*Email*
Eastern Band of Cherokee	Carmen Horne-McIntyre	PO Box 455 Cherokee, NC 28719		carmen_ebc@yahoo.com
Eastern Band of Cherokee	Tom McCabe	P.O. Box 547 Cherokee, NC 28719	828-497-6824	
Eastern Band of Cherokee	Cherise Maples	P.O. Box 547 Cherokee, NC 28719		Chermapl@hotmail.com
Land-of-Sky Regional COG	Bill Eaker	25 Heritage Drive Asheville, NC 28803	828-251-6622	bill@landofsky.org
Jackson County Planning	Mary Yonce	PO Box 3030 Cullowhee, NC 28723	828-586-7575	maryyonce@hotmail.com
Jackson County Erosion Control	Jeff McCall	401 Grindstaff Cove Road, Suite 110 Sylva, NC 28779	828-586-7560	
Town of Franklin Planner	Mike Decker	188 W. Main Street Franklin, NC 28734	828-524-2516	Townfkln@smnet.net
Town of Highlands	Buck Trott	P.O. Box 460, Highlands, NC 28741	828-526-5266	Santa@dnet.net
Town of Highlands	Chris Shook	" " " "		Highplan@earthlink.net
Macon County Planning	Joe Stark	5 West Main Street Franklin, NC 28734	828-349-2024	jrstark23@hotmail.com
Macon County Watershed Council	George Sweet	80 Tisit Drive Franklin, NC 28734	828-524-3416	
The Nature Conservancy	Este Stifel	P.O. Box 297 Saluda, NC 28773	828-749-1700	
Little Tennessee Watershed Assoc.	Carla Norwood	5 West Main Street Franklin, NC 28734	828-369-3105	Carla11@duke.edu
Save Our Rivers	Peg Jones	PO Box 122 Franklin, NC 28744		rivers@dnet.net
Southwestern Commission	Bill Gibson	PO Drawer 850 Bryson City, NC 28713	828-488-9211	bill@regiona.org
Streets of Franklin Heritage Assoc.	Ed Broyles	12 E. Main Street Franklin, NC 28734	828-349-4112	
Watershed Assoc. of Tuckasegee R	David Wheeler	269 Running Creek Cove Whittier, NC 28729	828-586-3146	dwheeler@jackson.main.nc.us
Western North Carolina Tomorrow	Phillip Gibson	PO Box 222 Cullowhee, NC 28723	828-227-7492	pgibson@wcu.edu
Upper Cullasaja Watershed Assoc.	Bob Wright	P.O Box 2785 Highlands, NC 28741	828-526-0001	Twodogs01@earthlink.net
Land Trust for the Little Tennessee	Paul Carlson	P.O. Box 1148 Franklin, NC 28744	828-524-2711	

Western NC Alliance	Roger Turner	16 Stewart Street Franklin, NC 28734	828-524-3899	
Duke Power	Jon Knight	13339 Hagers Ferry Road Huntersville, NC 28078		
Duke Power Company	Barbara McRae	NP&L Loop Franklin, NC 28744	828-369-4525	bamcrae@duke-energy.com

REFERENCES CITED

NC Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section. *Little Tennessee River Basinwide Water Quality Plan*. 2002.

NC Department of Environment and Natural Resources, Division of Water Quality, Wetlands Restoration Program [NCWRP]. *Guide to North Carolina Wetlands Restoration Program's Watershed Restoration Strategy*. Version 1, April 2001.

NC Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section, Environmental Sciences Branch. *Basinwide Assessment Report, Little Tennessee River Basin*. April 2000.

NC Department of Environment and Natural Resources, Division of Water Quality, Wetlands Restoration Program [NCWRP]. *Basinwide Wetlands and Riparian Restoration Plan for the Little Tennessee River Basin.* September 1998.

William O. McLarney, PhD., Consulting Biologist. Personal Communication to NCWRP, November 2001.

APPENDIX 1

LIST OF TARGETED LOCAL WATERSHEDS

The following is a complete list of local watersheds targeted by the NCWRP in the Little Tennessee River Basin. Other agencies, individuals and private groups are encouraged to target their search for restoration sites within these local watersheds. The watershed codes are the fourteen-digit codes for each local watershed in the state that have been designated by the USDA Natural Resources Conservation Service (NRCS).

DWQ Subbasin	Local Watershed Name	14-Digit HU Code
01	Upper Little Tennessee River & Middle Creek	060102020 **20010**
	Upper Cullasaja River & Mill Creek	060102020 **30010**
	Iotla Creek, Crawford Branch & Little Tennessee R.	060102020 **40020**
02	Cullowhee Creek	060102030 **10070**
	Lower Scott Creek & the Tuckasegee River	060102030 **20010**
	Savannah Creek	060102030 **20030**
	Soco Creek	060102030 **30080**
04	Sweetwater Creek	060102040 **10020**
	Atoah and Long Creeks	060102040 **10030**