

Chapter 10 -

Roanoke River Subbasin 03-02-10

Includes the Cashie River, Roquist Creek and tributaries

10.1 Water Quality Overview

Subbasin 03-02-10 at a Glance

Land and Water Area

Total area:	307 mi ²
Land area:	290 mi ²
Water area:	17 mi ²

Population Statistics

1990 Est. Pop.:	17,300 people
Pop. Density:	60 persons/mi ²

Land Cover (%)

Forest/Wetland:	79.2
Surface Water:	0.6
Urban:	0.3
Cultivated Crop:	19.4
Pasture/ Managed Herbaceous:	0.6

The Cashie River and its tributaries including Roquist, Hoggard Mill and Wading Place Creeks are contained within this coastal plain subbasin. All streams, including the Cashie River itself, are slow moving and swampy in nature. Windsor, Askewville and a portion of Lewiston-Woodville are the only municipalities. A map of this subbasin including water quality sampling locations is presented in Figure B-10.

Bioclassifications for sample sites in this subbasin are presented in Table B-25. Use support ratings for each applicable category in this subbasin are summarized in Table B-26. Refer to Appendix III for a complete listing of monitored waters and further information about use support ratings.

Land use in the area is primarily forest with a mixture of agricultural activities. Several animal operations are

located in the upper section of the Cashie River watershed. Timber is harvested in portions of the watershed as well.

There are four dischargers in the subbasin. Only the Town of Windsor's WWTP discharge, flowing into an unnamed tributary to the Cashie River, is considered major; this WWTP is also the only facility required to perform toxicity testing on its effluent. Toxicity problems have been identified over recent review periods. The Cashie River and this facility are discussed in more detail in the following sections.

Extensive evaluation, conducted by DWQ, of swamp streams across eastern North Carolina suggests that different criteria should be used to assess the condition of water quality in these systems. Swamp streams are characterized by slower flow, lower dissolved oxygen, lower pH, and sometimes very complex braided channels and dark-colored water. DWQ has developed draft biological criteria that may be used in the future to assign bioclassifications to these streams (as is currently done for other streams and rivers across the state). However, DWQ believes that there has been insufficient sampling of reference swamp streams to assign these bioclassifications and use them for use support determinations in the Roanoke River basin. DWQ continues to work toward preparing these criteria for future use.

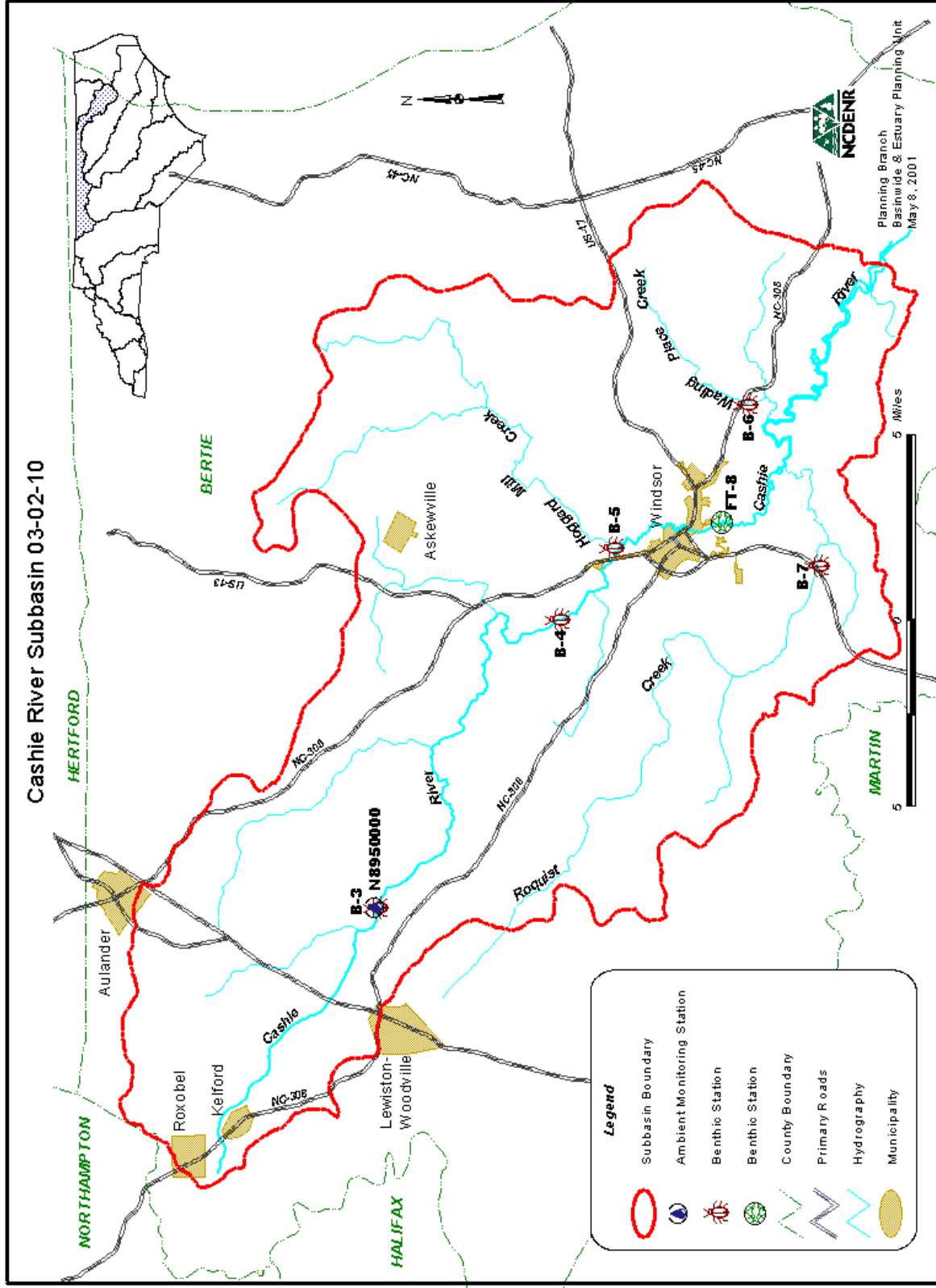


Figure B-10 Sampling Locations within Subbasin 03-02-10

Table B-25 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (1999) for Roanoke River Subbasin 03-02-10

Site	Stream	County	Location	Bioclassification
<i>Benthic Macroinvertebrates</i>				
B-3*	Cashie River	Bertie	SR 1219	Not Rated
B-4	Cashie River	Bertie	SR 1257	Not Rated
B-5	Hoggard Mill Creek	Bertie	SR 1301	Not Rated
B-6	Wading Place Creek	Bertie	NC 308	Not Rated
B-7	Roquist Creek	Bertie	US 13/17	Not Rated
<i>Fish Tissue</i>				
FT-8	Cashie River	Bertie	Windsor	N/A
<i>Ambient Monitoring</i>				
N8950000	Cashie River	Bertie	SR 1219	N/A

* Historical data are available; refer to Appendix II.

Historical data are only available for sites along the Cashie River in this subbasin. All of the tributaries sampled by DWQ in 1999 were sampled for the first time. The lower Cashie River and Hoggard Mill Creek sites showed little deviation from natural swamp conditions. The upper Cashie River site, Roquist Creek and Wading Place Creek showed some signs of impacts to water quality from the watershed.

Water chemistry samples are collected monthly from the Cashie River near Lewiston-Woodville. Low dissolved oxygen concentrations occurred frequently; 55 percent of samples over the past five years were less than 4.0 mg/l. Lower pH was also observed. Iron exceeded the reference value in over 81 percent of samples; however, water passed chronic toxicity tests conducted by DWQ in July 2000. Fecal coliform exceeded the 200 colonies/100ml water quality standard in almost 22 percent of samples. Nitrogen, phosphorus and turbidity were also elevated compared to other Roanoke River coastal plain stations.

In 1999, 24 samples, representing largemouth bass, bowfin, black crappie, sunfishes and catfishes, were collected from the Cashie River above Windsor and analyzed for metals contaminants. Thirteen samples (of mainly largemouth bass and bowfin) or 54 percent of samples contained mercury concentrations exceeding EPA or FDA screening values of 0.6 µg/g and 1.0 µg/g, respectively. All other metal contaminant concentrations were less than the federal or state criteria. Refer to Appendix II for details about fish tissue collections.

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

Table B-26 Use Support Ratings Summary (1999) for Monitored and Evaluated¹ Freshwater Streams (miles) in Roanoke River Subbasin 03-02-10

Use Support Category	FS	PS	NS	NR	Total ²
Aquatic Life/ Secondary Recreation	0	0	0	149.1	149.1
Fish Consumption	0	47.6	0	0	47.6
Primary Recreation	0	0	0	2.3	2.3
Water Supply	0	0	0	0	0

¹ For the fish consumption use support category, only monitored stream miles are presented.

² Total stream miles assigned to each use support category in this subbasin. Column is not additive because some stream miles are assigned to more than one category.

10.2 Status and Recommendations for Previously Impaired Waters

This section reviews use support and recommendations detailed in the 1996 basinwide plan, reports status of progress, gives recommendations for the next five-year cycle, and outlines current projects aimed at improving water quality for each water. The 1996 Roanoke River basin plan identified one impaired stream in this subbasin. The Cashie River is discussed below.

10.2.1 Cashie River (24.3 miles from source to SR 1257)

1996 Recommendation(s)

The 1996 basin plan listed the Cashie River as partially supporting. However, DWQ has since determined that this site was inappropriately rated due to the swamp characteristics of the river. The recommended strategy was to evaluate the contribution of agricultural runoff in the upper portion of the watershed and implement BMPs as needed.

Status of Progress

In 1999, verification of swamp stream characteristics at SR 1219 in Bertie County was made, and the previous bioclassifications that were inappropriately assigned to the benthic community were adjusted. Since benthos data are not currently used to determine impairment in the biological communities of swamp streams, the benthic community in the Cashie River is not rated. Therefore, aquatic life is no longer considered impaired. However, the Cashie River is impaired because of a fish consumption advisory and is discussed further in the following section.

10.3 Status and Recommendations for Newly Impaired Waters

The Cashie River was rated as impaired (partially supporting) based on the statewide bowfin consumption advisory and recent DWQ fish tissue monitoring (1995-1999). This section outlines the potential causes and sources of impairment and provides recommendations for improving water quality.

10.3.1 Cashie River (54.6 miles from source to the Roanoke River)

Current Status

Bowfin with levels of mercury that exceed the NC action level for consumption were collected by DWQ in the Cashie River above Windsor in 1999. Because of the statewide bowfin consumption advisory, this portion of the river is only partially supporting the fish consumption use support category. (Note: This is not a new advisory, but improved use support methodology now bases impairment for the fish consumption use support category on fish consumption advisories. See Appendix III for more information regarding use support ratings.)

2001 Recommendation(s)

DWQ will continue to monitor fish tissue in the Cashie River and will work to identify sources of mercury. Given the global scale of mercury cycling, it may be difficult for DWQ to recognize significant reductions of mercury in fish over the short-term. Section A, Part 4.8 provides more details about mercury in the environment.

10.4 Section 303(d) Listed Waters

Currently in this subbasin, there are no waters listed on the state's year 2000 §303(d) list (not yet EPA approved). All waters in the state will likely be added to the list in 2002 as partially supporting because of the statewide bowfin consumption advisory. Appendix IV contains more information on the state's §303(d) list and listing requirements.

10.5 Other Issues and Recommendations

There are no specific other issues for surface waters in this subbasin; however, recent DWQ monitoring revealed habitat degradation impacts to aquatic life resulting from nonpoint source pollution. Although no action is required, voluntary implementation of BMPs is encouraged and continued monitoring is recommended. Section A, Chapter 4 contains general information and recommendations about habitat degradation and other water quality problems that affect more than one watershed in the basin. 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 descriptions and agency contacts are listed in Appendix VI.