

Chapter 6 -

Roanoke River Subbasin 03-02-06

Includes a portion of Kerr Reservoir and Nutbush Creek

6.1 Water Quality Overview

Subbasin 03-02-06 at a Glance

Land and Water Area

Total area:	329 mi ²
Land area:	295 mi ²
Water area:	34 mi ²

Population Statistics

1990 Est. Pop.:	21,604 people
Pop. Density:	73 persons/mi ²

Land Cover (%)

Forest/Wetland:	75.0
Surface Water:	6.4
Urban:	1.1
Cultivated Crop:	8.6
Pasture/ Managed Herbaceous:	9.0

John H. Kerr Reservoir (Kerr Lake) straddles the North Carolina/Virginia state line at the border of Granville and Vance counties. This subbasin contains many small to medium-sized tributaries of John H. Kerr Reservoir that generally flow northward to Virginia. These tributaries include Aarons Creek, Grassy Creek, Island Creek and Nutbush Creek. A large portion of Henderson and the Town of Stovall are the major municipal areas. A map of this subbasin including water quality sampling locations is presented in Figure B-6.

Bioclassifications for these sample sites are presented in Table B-14. Use support ratings for each applicable category in this subbasin are summarized in Tables B-15 and B-16. Refer to Appendix III for a complete listing of monitored waters and further information about use support ratings.

This land is characterized by low rolling hills and low gradient streams. Seventy-five percent of the land is forested. Row crops and pasture are the most prevalent agricultural land uses (18 percent). Several registered animal operations are also located in this subbasin. Over six percent of the area is surface water reflecting in part the nearly 21,700 acres of the Nutbush Creek Arm of Kerr Reservoir. The estimated subbasin population, based on the 1990 census, is 21,604. The population of Granville County is expected to increase 25 percent and Vance County 11 percent between 1998 and 2018.

There are only four NPDES permitted dischargers in this subbasin. The Henderson WWTP is the largest discharge. During dry months, this discharge is more than 97 percent of the total flow in Nutbush Creek. This facility is required to monitor its effluent's toxicity. Toxicity problems with this discharge have been identified and are discussed further in the following sections. The wastewater discharge in the Gills Creek/Island Creek watershed from a Granville County school near Stovall exceeded permit limits for ammonia in 1999. However, the school hooked into a new spray irrigation system in Stovall and the discharge has since been eliminated.

The Nutbush Creek Arm of Kerr Reservoir is monitored by DWQ. This portion of the lake is currently fully supporting aquatic life/secondary recreation and primary recreation.

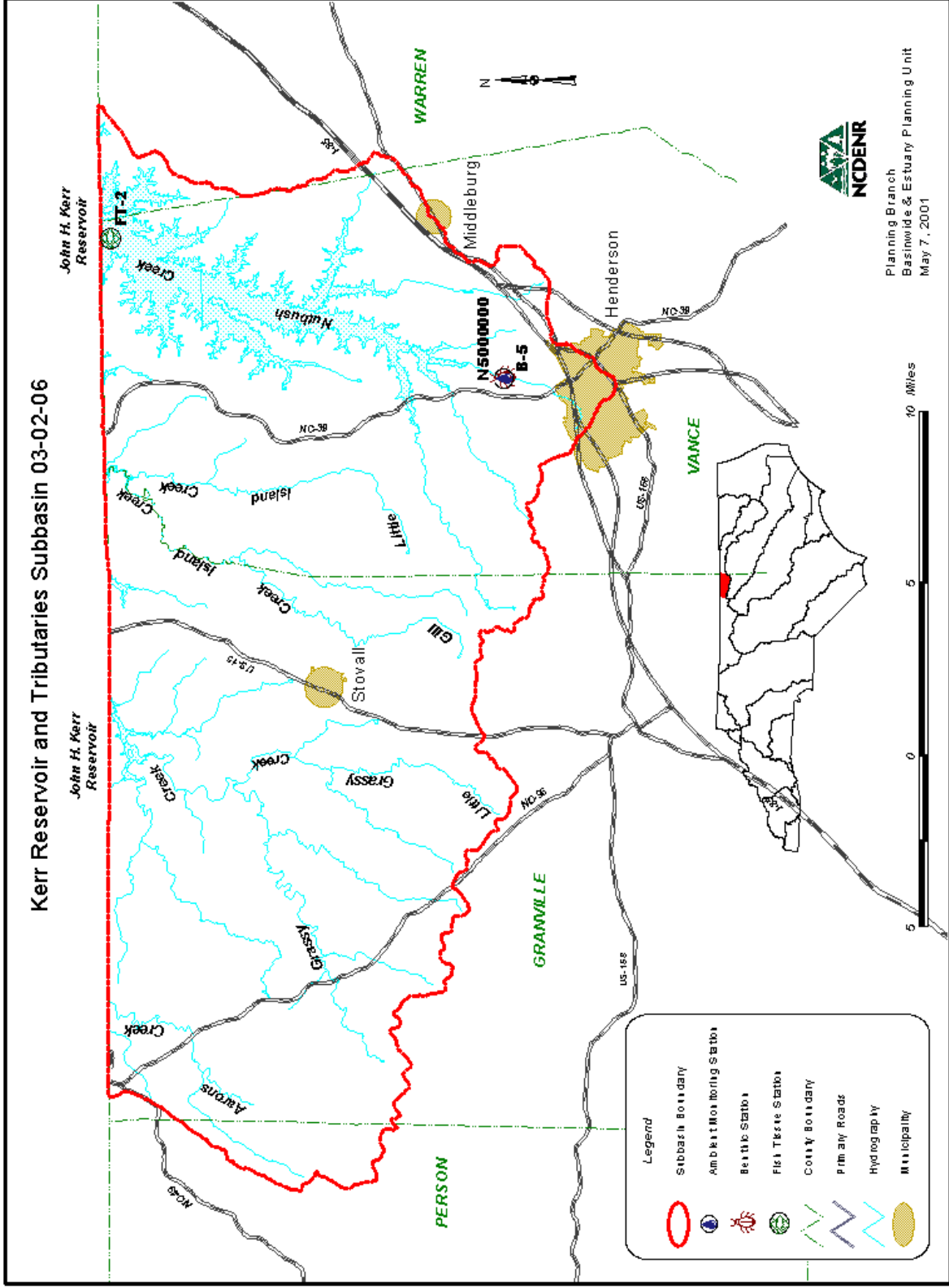


Figure B-6 Sampling Locations within Subbasin 03-02-06

Table B-14 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (1999) for Roanoke River Subbasin 03-02-06

Site	Stream	County	Location	Bioclassification
<i>Benthic Macroinvertebrates</i>				
B-5*	Nutbush Creek	Vance	SR 1317	Fair
<i>Fish Community</i>				
F-1	Grassy Creek	Granville	SR 1300	Good
F-2	Island Creek	Granville	SR 1445	Excellent
<i>Fish Tissue</i>				
FT-2	Kerr Reservoir	Vance	Near NC/VA line	N/A
<i>Ambient Monitoring</i>				
N5000000	Nutbush Creek	Vance	SR 1317	N/A

* Historical data are available; refer to Appendix II.

Observations during the very dry summer of 1999 indicated that many streams in this subbasin stopped flowing during the severe drought conditions. This seasonal intermittent flow may limit the diversity of fish and macroinvertebrate communities. The only stream sampled in this subbasin in 1999 for benthic macroinvertebrates was Nutbush Creek. Nutbush Creek improved over a ten-year period from Poor in 1983 to Fair in 1994, but the biological community again received a Fair bioclassification based on the most recent DWQ sampling. This stream is impaired and is discussed in more detail in the following sections.

Grassy and Island Creeks were sampled as potential fish community regional reference sites in 1999. The fish communities of both streams were also sampled in 1994. Grassy Creek maintained a Good bioclassification and Island Creek improved to Excellent. The fish community of Island Creek was very diverse; 24 species were observed (DENR-DWQ, April 3, 2001). Refer to Appendix II for fish community data.

Water chemistry samples are collected monthly from Nutbush Creek near Henderson, downstream of the WWTP. During this monitoring cycle, most conventional water quality parameters did not show any violations of water quality standards. Long-term monitoring at this site has shown an increase in dissolved oxygen and declines in fecal coliform bacteria, turbidity, nitrogen and phosphorus concentrations. These positive water quality changes are likely the result of improvements at the Henderson WWTP that began in 1988.

Thirty-six fish tissue samples were collected from Kerr Reservoir during January and May 1999 and analyzed for PCBs (19 striped bass) and metal contaminants (17 largemouth bass, sunfish and catfish). The PCB analyses were performed at the request of the North Carolina Wildlife Resources Commission (WRC). WRC was concerned about PCB concentrations in striped bass in the North Carolina portion of the reservoir after detectable concentrations were measured in

the Virginia portion of the reservoir. Only two of nineteen striped bass samples contained PCBs at concentrations greater than the EPA screening value of 0.01 µg/g (Appendix II).

Only one of seventeen largemouth bass, catfish and sunfish samples had mercury concentrations exceeding the EPA screening value of 0.6 µg/g. All other metals concentrations were less than the federal and state screening criteria. DWQ works closely with the NC Department of Health and Human Services to make citizens aware of any risk to human health from consumption of fish. Currently, there is no fish consumption advisory specifically for Kerr Reservoir in North Carolina.

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-15 Use Support Ratings Summary (1999) for Monitored Lakes (acres) in Roanoke River Subbasin 03-02-06

Use Support Category	FS	PS	NS	Total ¹
Aquatic Life/ Secondary Recreation	21,700	0	0	21,700
Fish Consumption³	0	21,700	0	21,700
Primary Recreation	21,700	0	0	21,700
Water Supply	0	0	0	0

Table B-16 Use Support Ratings Summary (1999) for Monitored and Evaluated² Freshwater Streams (miles) in Roanoke River Subbasin 03-02-06

Use Support Category	FS	PS	NS	NR	Total ¹
Aquatic Life/ Secondary Recreation	127.0	4.6	0	53.0	184.6
Fish Consumption³	0	0	0	0	0
Primary Recreation	4.1	0	0	28.2	32.3
Water Supply	4.7	0	0	0	4.7

¹ Total stream miles/acres assigned to each use support category in this subbasin. Column is not additive because some stream miles are assigned to more than one category.

² For the fish consumption use support category, only monitored stream miles are presented.

³ These waters are impaired because of a statewide fish consumption advisory for bowfin. Refer to Section A, Part 4.8.4 for further information.

6.2 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 two impaired streams in this subbasin: Nutbush and Anderson Swamp Creeks. This stream is discussed below.

6.2.1 Nutbush Creek (4.6 miles from source to Crooked Run)

1996 Recommendation(s)

Benthic macroinvertebrates were sampled intensively in the Nutbush Creek watershed in 1994 and rated Fair at all locations, including one site above the Henderson WWTP. The Henderson WWTP had significant problems with toxicity in their discharge, resulting from industries in Henderson that were sending inadequately pretreated waste to the facility. The recommendations in the 1996 basin plan were to monitor improvements to Henderson WWTP and investigate extent of other nonpoint source pollution problems.

Status of Progress

Aquatic life in Nutbush Creek again received a Fair bioclassification in 1999 and is only partially supporting the aquatic life/secondary recreation use support category. The Henderson WWTP discharge continues to have toxicity problems, although the town has made substantial progress in identifying which industries may be the sources of these problems. Some collection system problems have also been identified, and the town is actively working to correct them.

In addition, the headwaters of Nutbush Creek and several tributaries originate in the Town of Henderson. Most of the stormwater runoff from this urban area flows into the Nutbush Creek arm of Kerr Reservoir. There is significant sedimentation over the entire length of the creek, which likely resulted from streambank erosion, scouring, runoff from urban areas and construction sites, and agricultural activities (in the lower portion of the watershed).

2001 Recommendation(s)

DWQ will continue to work with the Town of Henderson's WWTP to correct remaining problems from their discharge and collection system. However, it is likely that aquatic life will remain impaired because of habitat degradation in the stream. Urban stormwater issues need to be addressed by the Town of Henderson. Best management practices to prevent further degradation by runoff from urban areas and construction sites should be installed. DWQ will continue to monitor the stream and work with local agencies to restore water quality.

6.2.2 Anderson Swamp Creek (4.0 miles from source to 0.6 miles upstream of SR 1374)

1996 Recommendation(s)

Anderson Swamp Creek was rated as impaired during the last basin cycle by using benthic macroinvertebrate data that resulted in a Fair bioclassification. An unnamed tributary below the Vulcan Materials-Greystone Quarry was also rated impaired based on a Poor benthic

macroinvertebrate bioclassification. The recommendation was to identify and address sedimentation in the watershed.

Status of Progress

In 1999, DWQ biologists determined that both of these streams are too small to rate using current benthic macroinvertebrate criteria, and the streams were not resampled during this basinwide cycle. The benthic macroinvertebrate bioclassification in this particular stream will remain not rated unless assessment criteria for small streams (<1.0 meter wide) are developed. This stream is not currently considered impaired. Refer to Section A, Chapter 4 for a more detailed discussion of habitat degradation.

6.3 Status and Recommendations for Newly Impaired Waters

No stream segments were rated as impaired based on recent DWQ monitoring (1995-1999); however, as mentioned previously, some impacts to water quality were observed. Refer to Part 6.5 of this chapter, as well as Section A, Chapter 4 for further discussion of potential water quality problems.

6.4 Section 303(d) Listed Waters

Currently in this subbasin, Nutbush Creek is listed on the state's year 2000 §303(d) list. The stream is a biologically impaired water, and pollution sources are both point and nonpoint. Nutbush Creek is discussed in detail above. Refer to Appendix IV for more information on the state's §303(d) list and listing requirements.

6.5 Other Issues and Recommendations

The surface waters discussed in this section are fully supporting designated uses (or not rated) based on recent DWQ monitoring; however, data revealed some impacts to water quality. Although no action is required for these streams, voluntary implementation of BMPs is encouraged and continued monitoring is recommended. 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.

6.5.1 Projected Population Growth

The population of Granville County is projected to increase 25 percent and Vance County 11 percent over a twenty-year period (1998-2018). Growth management within the next five years will be imperative in order to maintain good water quality in this subbasin. Growth management can be defined as the application of strategies and practices that help achieve sustainable development in harmony with the conservation of environmental qualities and features of an area. On a local level, growth management often involves planning and development review requirements that are designed to maintain or improve water quality. Refer to Section A, Chapter 4 for more information about minimizing impacts to water quality from development.

Local Programs

Vance and Granville counties both have planning departments with full-time planning staff. Vance County, in particular, has taken pro-active steps toward minimizing water quality impacts during development. Additionally, the City of Henderson adopted a local sediment-erosion control ordinance in order to minimize water quality impacts from construction activities. These local governments are commended for their planning initiatives. These programs should be supported, expanded and improved in the future.

6.5.2 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 discharges associated with storm sewer systems. Part of Phase II requires some municipal storm sewer systems serving populations under 100,000, which are located in larger urbanized areas and/or that have a high population density to obtain an NPDES stormwater permit. The municipal permitting requirements are designed to lead into the formation of comprehensive stormwater management programs for municipal areas. The Town of Henderson will be considered for inclusion under the Phase II rules because of a population greater than 10,000 and/or a population density greater than 1000 persons per square mile. DWQ is currently developing criteria that will be used to determine whether this and other municipalities will be required to obtain a NPDES permit. Refer to Section A, Part 2.7.2 for further information.

