

Section B: Chapter 16

Yadkin-Pee Dee River Subbasin 03-07-16

Includes the Pee Dee River below Blewett Falls Dam, Ledbetter Lake, Hitchcock Creek and Marks Creek

16.1 Water Quality Overview

Subbasin 03-07-16 at a Glance

Land and Water

Total area:	331 mi ²
Stream miles:	217.1
Lake acres:	371.9

Population Statistics

1990 Est. Pop.:	41,561 people
Pop. Density:	127 persons/mi ²

Land Cover (%)

Forest/Wetland:	82.2
Surface Water:	2.2
Urban:	1.5
Cultivated Crop:	8.0
Pasture/ Managed Herbaceous:	6.1

South Carolina forms the southern border of this subbasin, and it contains the last segment of the Pee Dee River mainstem from the dam at Blewett Falls to the state line. Major tributaries which are discussed here include Hitchcock Creek and Marks Creek. McKinney and Ledbetter Lakes are also included. The subbasin is contained almost entirely within Richmond County; the largest municipalities are Rockingham and Hamlet.

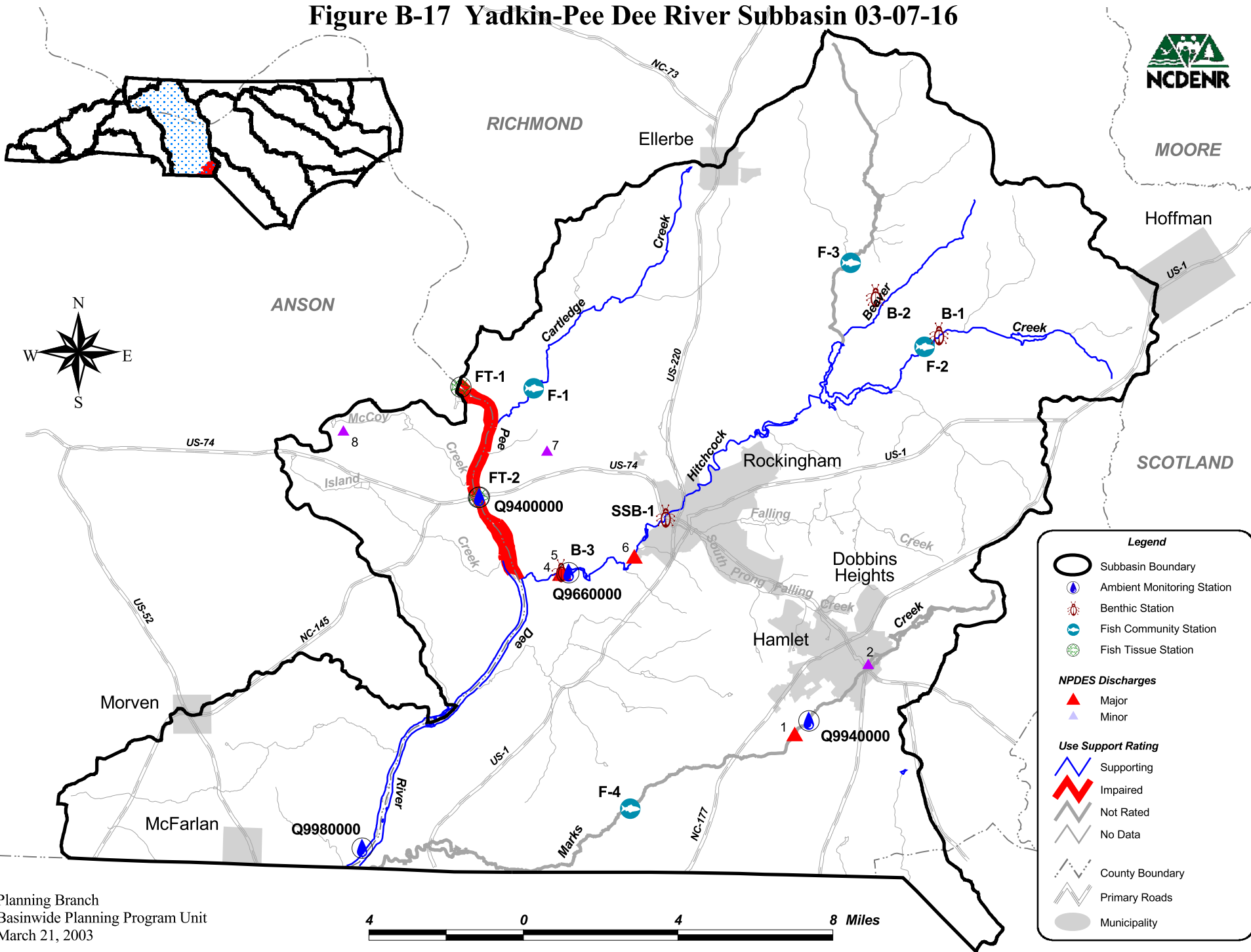
A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure B-17. Table B-32 contains a summary of monitoring data types, locations and results. Use support ratings for waters in this subbasin are summarized in Table B-33. Appendix I provides a key to discharge identification numbers. Refer to Appendix III for a complete listing of monitored waters and more information about use support ratings.

More than 80 percent of the subbasin is forested and 2 percent is surface water, reflecting the large, wide nature of the Pee Dee River. Cultivated cropland and pasture comprise about 14 percent of the land use. Population of the basin is estimated at more than 40,000 and the population density is higher than in surrounding subbasins. The population of Richmond County is expected to increase by 7 percent between 2000 and 2020.

There are seven NPDES permitted discharges and one registered animal operation in this subbasin. Two facilities were in significant noncompliance over the most recent review period: Anson County Regional WWTP and Hamlet WWTP. Swine production capacity from all farms (small and large) increased by 175 percent between 1994 and 1998. This capacity is a negligible percent of the state's total capacity for swine production, but it indicates a significant shift in the agricultural community.

Water quality is generally Good-Fair across this subbasin. Although only a few waters are Impaired, most have some notable water quality impacts. The headwaters of Marks Creek, including Water Lake, are the only waters classified as High Quality Waters.

Figure B-17 Yadkin-Pee Dee River Subbasin 03-07-16



Legend

- Subbasin Boundary
- Ambient Monitoring Station
- Benthic Station
- Fish Community Station
- Fish Tissue Station

NPDES Discharges

- Major
- Minor

Use Support Rating

- Supporting
- Impaired
- Not Rated
- No Data

County Boundary

Primary Roads

Municipality



Table B-32 DWQ Monitoring Locations, Bioclassifications and Notable Chemical Parameters (1998-2002) for Yadkin-Pee Dee River Subbasin 03-07-16

Site	Stream	County	Road	Bioclassification or Noted Parameter ²
<i>Benthic Macroinvertebrate Community Monitoring</i>				
B-1	Hitchcock Creek ¹	Richmond	SR 1486	Good
B-2	Beaverdam Creek ¹	Richmond	SR 1486	Not Impaired
SSB-1	Hitchcock Creek	Richmond	US 74	Good
B-3	Hitchcock Creek	Richmond	SR 1109	Good-Fair
<i>Fish Community Monitoring</i>				
F-1	Cartledge Creek	Richmond	SR 1142	Good
F-2	Hitchcock Creek	Richmond	SR 1486	Not Rated
F-3	Rocky Fork Creek	Richmond	SR 1424	Not Rated
F-4	Marks Creek	Richmond	SR 1104	Not Rated
<i>Fish Tissue Monitoring</i>				
FT-1	Pee Dee River	Richmond/ Anson	Blewett Falls Dam	Mercury in one fish
FT-2	Pee Dee River	Richmond/ Anson	US 74	None
<i>Ambient Monitoring</i>				
Q9400000	Pee Dee River	Richmond/ Anson	US 74	Dissolved oxygen
Q9660000	Hitchcock Creek	Richmond	SR 1109	pH
Q9940000	Marks Creek	Richmond	SR 1812	None
Q9980000	Pee Dee River	South Carolina	SC Hwy 9	None
<i>Yadkin-Pee Dee River Basin Association Monitoring</i>				
Q9400000	Pee Dee River ³	Richmond/ Anson	US 74	Dissolved oxygen
<i>Lakes Assessment</i>				
--	Roberdel Lake	Richmond	2 stations	None
--	Rockingham City Lake	Richmond	1 station	Dissolved oxygen
--	Water Lake	Richmond	2 stations	% DO saturation
--	Hamlet City Lake	Richmond	2 stations	Dissolved oxygen

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

² Parameters are noted if in excess of state standards in more than 10 percent of samples collected within the assessment period (9/1996-8/2001).

³ This site duplicates a DWQ ambient monitoring station.

For more detailed information on sampling and assessment of streams in this subbasin, refer to the *Basinwide Assessment Report - Yadkin-Pee Dee River Basin* (NCDENR-DWQ, June 2002), available from DWQ Environmental Sciences Branch at <http://www.esb.enr.state.nc.us/bar.html> or by calling (919) 733-9960.

Table B-33 Use Support Ratings Summary (2002) for Monitored and Evaluated Freshwater Streams (miles) and Lakes (acres) in Yadkin-Pee Dee River Subbasin 03-07-16

Use Support Category	Units	Supporting	Impaired	Not Rated	No Data	Total ¹
Aquatic Life/Secondary Recreation	miles	69.4	6.3	30.7	110.7	217.1
	acres	98.9	0.0	273.0	0.0	371.9
Fish Consumption²	miles	0.0	217.1	0.0	0.0	217.1
	acres	0.0	371.9	0.0	0.0	371.9
Primary Recreation	miles	0.0	0.0	0.0	4.5	4.5
	acres	0.0	0.0	0.0	0.0	0.0
Water Supply	miles	67.9	0.0	0.0	0.0	67.9
	acres	231.7	0.0	0.0	0.0	231.7

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 With the exception of Ledbetter Lake (100 acres), these waters are impaired based on fish consumption advice issued for three species of freshwater fish due to mercury contamination. Refer to page 104 of Section A for details.

16.2 Status and Recommendations for Previously Impaired Waters

This section reviews use support and recommendations detailed in the 1998 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 1998 Yadkin-Pee Dee River basin plan identified four Impaired waters in this subbasin. Cartledge Creek, Hitchcock Creek, Rockingham City Lake and Hamlet City Lake are discussed below.

16.2.1 Cartledge Creek (10.5 miles from source to Pee Dee River)

1998 Recommendations

Cartledge Creek was Impaired based on a Fair bioclassification in 1996. Sedimentation and bank erosion were observed at the time of the biological survey. The 1998 basin plan stated that further investigation was needed into the causes and sources of impacts, and general recommendations for reducing nonpoint source pollution were given.

Status of Progress

Cartledge Creek flows generally southwest from Ellerbe into the Pee Dee River. The watershed is mostly forested with some agricultural land use and very little developed area. The fish community received a Good bioclassification in 2001. It is likely that streamflow in the Cartledge Creek watershed is naturally very low in the summer months (which is when benthic macroinvertebrate communities are typically sampled) and smaller tributaries often stop flowing completely. Cartledge Creek is no longer considered Impaired.

2002 Recommendations

Currently, there are no NPDES permitted discharges in the Cartledge Creek watershed. Any new NPDES permit applications should be carefully scrutinized in light of DWQ's zero flow policy.

16.2.2 Hitchcock Creek (10.0 miles from dam at Roberdel Lake to Pee Dee River)

1998 Recommendations

The 1998 basin plan recommended no new discharges of oxygen-consuming wastes be permitted in Hitchcock Creek below the existing Rockingham WWTP discharge due to model predictions that assimilative capacity in the stream is extremely limited. The stream also contained habitat impacts from nonpoint source pollution, including sedimentation, as well as high concentrations of fecal coliform bacteria. Steeles Mill Pond also contained high concentrations of fecal coliform bacteria. General recommendations for reducing nonpoint source pollution were also included.

Status of Progress

Biological surveys of Hitchcock Creek were conducted at three locations in 2001. The most upstream location was below McKinney Lake and Bones Fork Creek and received a Good bioclassification. Habitat was relatively good at this location; however, impacts from flow fluctuation were obvious. Another location below Ledbetter and Roberdel Lakes, but above the old Rockingham WWTP discharge, also received Good bioclassification. Below the City of Rockingham and the Burlington Industries discharge, the stream received a Good-Fair bioclassification. At this most downstream location, heavy sedimentation and bank erosion were observed.

More than 14 percent of water chemistry samples were below the water quality standard for pH, and a few were below the standard for dissolved oxygen as well. The geometric mean of fecal coliform concentrations for 2001 and for the five-year assessment period was well below 200 colonies/100ml. In 2000, the Rockingham WWTP relocated its discharge to the Pee Dee River. In addition, Burlington Industries has reduced production, and therefore, reduced stress on the WWTP. Hitchcock Creek is current Supporting designated uses.

2002 Recommendations

The majority of water quality impacts in the Hitchcock Creek watershed are currently from nonpoint source pollution. Samples in 2001 were following an extended drought, which tends to lessen the effects of nonpoint source pollution. Local actions are needed to reduce the effects of nonpoint source pollution, particularly from stormwater runoff, and to restore habitat in the lower portion of the watershed.

Water Quality Improvement Initiatives

The Hitchcock Creek watershed (03040201 010020) is one of 55 watersheds in the Yadkin-Pee Dee River basin that has been identified by the NC Wetlands Restoration Program (NCWRP) as an area with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than a nontargeted watershed for the implementation of NCWRP restoration projects. Refer to page 278 in Section C for details.

16.2.3 Rockingham City Lake (Old City Pond) (27 acres)

1998 Recommendations

Sedimentation and heavy growths of aquatic plants were discussed in the 1998 basin plan as problems for Rockingham City Lake. General recommendations for reducing nonpoint source pollution in the watershed were given.

Status of Progress

Old City Pond is positioned directly above Hinson Lake in the Falling Creek watershed near Rockingham. It is a secondary drinking water supply for the City of Rockingham. Only one station was sampled on this small lake in 2001, and the lake is currently not rated due to the extremely small data set. Thick stands of aquatic vegetation were present at the time of sampling and, as is not uncommon, dissolved oxygen levels were depressed. Nutrient concentrations ranged from low to moderate.

2002 Recommendations

The City of Rockingham plans to expand the treatment plant on Roberdel Lake in the future and eliminate Old City Pond as a drinking water supply source. DWQ will likely discontinue monitoring of this lake in the future due to its small size. Local actions are needed to minimize or prevent the spread of the aquatic weeds to Hinson Lake downstream. Aquatic weeds can lead to impairment of primary and secondary recreation uses.

16.2.4 Hamlet City Lake (100 acres)

1998 Recommendations

Sedimentation and heavy growths of aquatic plants were discussed in the 1998 basin plan as problems for Hamlet City Lake. The plan discusses a proposed project by the US Army Corps of Engineers (USCOE) to remove sediment from Hamlet City Lake. General recommendations for reducing nonpoint source pollution in the watershed were also given.

Status of Progress

In 1998, the USCOE completed the dredging project on Hamlet City Lake and it was refilled. Sampling in 2000 by DWQ indicated that aquatic vegetation was again becoming a problem, and dissolved oxygen levels were depressed. Nutrient concentrations ranged from low to moderate. The lake is currently not rated due to a very small data set on which to base an assessment. Hamlet City Lake is currently not classified for primary recreation or drinking water supply.

16.3 Status and Recommendations for Newly Impaired Waters

Ledbetter Lake and a portion of the Pee Dee River are Impaired based on recent DWQ monitoring (1998-2001). This section outlines the potential causes and sources of impairment and provides recommendations for improving water quality.

16.3.1 Ledbetter Lake (100 acres)

Current Status

Fish consumption is Impaired in Ledbetter Lake based on elevated mercury levels in largemouth bass. A fish consumption advisory is currently in effect for the lake: "Largemouth bass in Ledbetter Lake contain higher than normal levels of mercury. Consumption of largemouth bass should be limited to no more than two meals per person per month. Women of childbearing age and children should eat no largemouth bass taken from this area until further notice."

2002 Recommendations

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. The NC Department of Environment and Natural Resources (NCDENR) has established a Mercury Task Force that includes staff from DWQ, Division of Air Quality, Hazardous Waste, Pollution Prevention and Wildlife Resources. In addition, DWQ has established an internal Water Quality Section Work Group to stay abreast of mercury issues. Section A, page 104 provides more details about mercury in the environment.

16.3.2 Pee Dee River (6.3 miles from the dam at Blewett Falls to Hitchcock Creek)

1998 Recommendations

The 1998 basin plan discusses problems with low dissolved oxygen (DO) levels below the Blewett Falls dam. The recommendation was for DWQ to coordinate efforts to improve water quality with the Division of Water Resources during the hydropower project relicensing process.

Current Status

More than 18 percent of samples collected from the Pee Dee River at US 74 contained concentrations of dissolved oxygen that were less than 5.0 mg/l; nearly 10 percent were less than 4.0 mg/l.

2002 Recommendations

DWQ will work with CP&L to better evaluate water quality in the Pee Dee River below Blewett Falls during the hydropower relicensing process. In addition to the license application, CP&L must also obtain a 401 Water Quality Certification for the project. DWQ will ensure, through the 401 Water Quality Certification review, that project operations will not result in violations of water quality standards. DWQ should require NPDES permit limits no less stringent than 15.0 mg/l BOD₅, 4.0 mg/l NH₃-N, and 5.0 mg/l DO for new and expanding discharges into this portion of the Pee Dee River.

16.4 Section 303(d) Listed Waters

Currently, portions of eight waters in this subbasin are listed on the state's draft 2002 303(d) list. Cartledge Creek and Hitchcock Creek (discussed above) will likely be removed from the 303(d) list in the future. The Pee Dee River, Ledbetter Lake, Rockingham City Lake and Hamlet City Lake were also discussed above. Marks Creek is discussed below. Appendix IV contains more information on the state's 303(d) list and listing requirements.

16.5 Status and Recommendations for Waters with Notable Impacts

Based on DWQ's most recent use support assessment, the surface waters discussed below are not Impaired. However, notable water quality impacts were documented. While these waters are not considered Impaired, attention and resources should be focused on them over the next basinwide planning cycle to prevent additional degradation or facilitate water quality improvement. A discussion of how impairment is determined can be found in Appendix III.

Although no action is required for these streams, voluntary implementation of BMPs is encouraged and continued monitoring is recommended. DWQ will notify local agencies and others of water quality concerns discussed below and work with them to conduct further monitoring and to locate sources of water quality protection funding. Additionally, education on local water quality issues is always a useful tool to prevent water quality problems and to promote restoration efforts. Nonpoint source agency contacts are listed in Appendix VI.

16.5.1 Marks Creek

The 1998 basin plan describes Marks Creek as "slow moving" with "swamp-like" characteristics. The plan recommends that no additional loading of oxygen-consuming wastes be permitted and that an expansion of the Hamlet WWTP not be permitted without a field-calibrated model for dissolved oxygen. Dissolved oxygen fell below 5.0 mg/l in 26 percent of ambient monitoring samples over the last basinwide planning cycle (1997-2001); concentrations were below 4.0 mg/l in 20 percent of samples. Data also reveal low pH in a significant percent of samples. These data, as well as fish community data collected in 2001, are consistent with eastern Coastal Plain streams which carry the supplemental classification of Sw.

A special study is needed to determine whether Marks Creek stream should receive the supplemental classification of Sw. DWQ is currently working to refine criteria for making this determination. Once these criteria are approved, Marks Creek will be a high priority for assessment. Swamp waters are discussed in more detail on page 113. Marks Creek is currently Not Rated; however, runoff from developed areas in the upper portion of the watershed is a water quality concern.

The Marks Creek watershed (03040201 010060) is one of 55 watersheds in the Yadkin-Pee Dee River basin that has been identified by the NC Wetlands Restoration Program (NCWRP) as an area with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than a nontargeted watershed for the implementation of NCWRP restoration projects. Refer to page 278 in Section C for details.

16.5.2 Falling Creek South Prong Falling Creek

The upper half of Falling Creek flows through agricultural lands in eastern Richmond County. The stream is impounded twice near Rockingham. The first dam is at the Old City Pond which still serves as a drinking water supply. The lake is discussed in more detail in Part 16.2.3 above. The second dam is for Hinson Lake, directly below the Old City Pond. The lower portion of

Falling Creek (below Hinson Lake) drains a heavily developed portion of Rockingham and is likely impacted by stormwater runoff.

South Prong Falling Creek begins in Hamlet and flows generally northwest into Falling Creek in Rockingham. Highway 74 flows the stream for much of its length, and much of this corridor between the two towns is developed. DWQ has not sampled the Falling Creek watershed, and the lowest sample on Hitchcock Creek is above the confluence of the two streams. As resources allow, DWQ will sample Falling Creek over the next basinwide planning cycle. However, local actions are needed to reduce the effects of nonpoint source pollution, particularly from stormwater runoff, throughout the watershed.