

Chapter 15 -

Cape Fear River Subbasin 03-06-15

Includes Cape Fear River, Cross Creek and Rockfish Creek

15.1 Water Quality Overview

Subbasin 03-06-15 at a Glance

Land and Water Area (sq. mi.)

Total area:	600
Land area:	595
Water area:	5

Population Statistics

1990 Est. Pop.:	247,765 people
Pop. Density:	416 persons/mi ²

Land Cover (%)

Forest/Wetland:	64.2
Surface Water:	1.6
Urban:	9.9
Cultivated Crop:	14.2
Pasture/ Managed Herbaceous:	10.0

Use Support Ratings

Freshwater Streams:

Fully Supporting:	283.8 mi.
Partially Supporting:	7.8 mi.
Not Supporting:	13 mi.
Not Rated:	84.0 mi.

Lakes:

Bonnie Doone Lake - Fully Supporting
Glenville Lake - Fully Supporting
Hope Mills Lake - Fully Supporting
Kornbow Lake - Fully Supporting
Mintz Pond - Fully Supporting

This subbasin contains the City of Fayetteville as well as the majority of the Fort Bragg Military Reservation. The Cape Fear River flows through Fayetteville in this subbasin, but most of the subbasin is made up of the Rockfish Creek and Little Rockfish Creek watersheds. A map of the subbasin, including water quality sampling locations, is presented in Figure B-15.

Biological ratings for these sample locations are presented in Table B-15. The current sampling resulted in impaired ratings for two streams in this subbasin. Refer to Appendix III for a complete listing of monitored waters and use support ratings. See Section A, Chapter 3, Table A-31 for a summary of lakes and reservoirs use support data.

The upper Rockfish Creek site is below the Raeford WWTP, and benthos bioclassifications improved from Good-Fair in 1990 to Good in 1993 to Excellent in 1998. Upgrades in treatment at the WWTP are believed to be responsible for this improved water quality. The downstream Rockfish Creek site has been Excellent, based on benthos data since 1983, except for a slight decrease to Good in 1993. Little Rockfish Creek was also sampled above the confluence with Rockfish Creek. Even though the watershed is urban and agricultural, benthos ratings in both 1993 and 1998 were Good.

For more detailed information on water quality in this subbasin, refer to *Basinwide Assessment Report – Cape Fear River Basin – June 1999*, available from DWQ Environmental Sciences Branch at (919) 733-9960.

Cape Fear River 030615

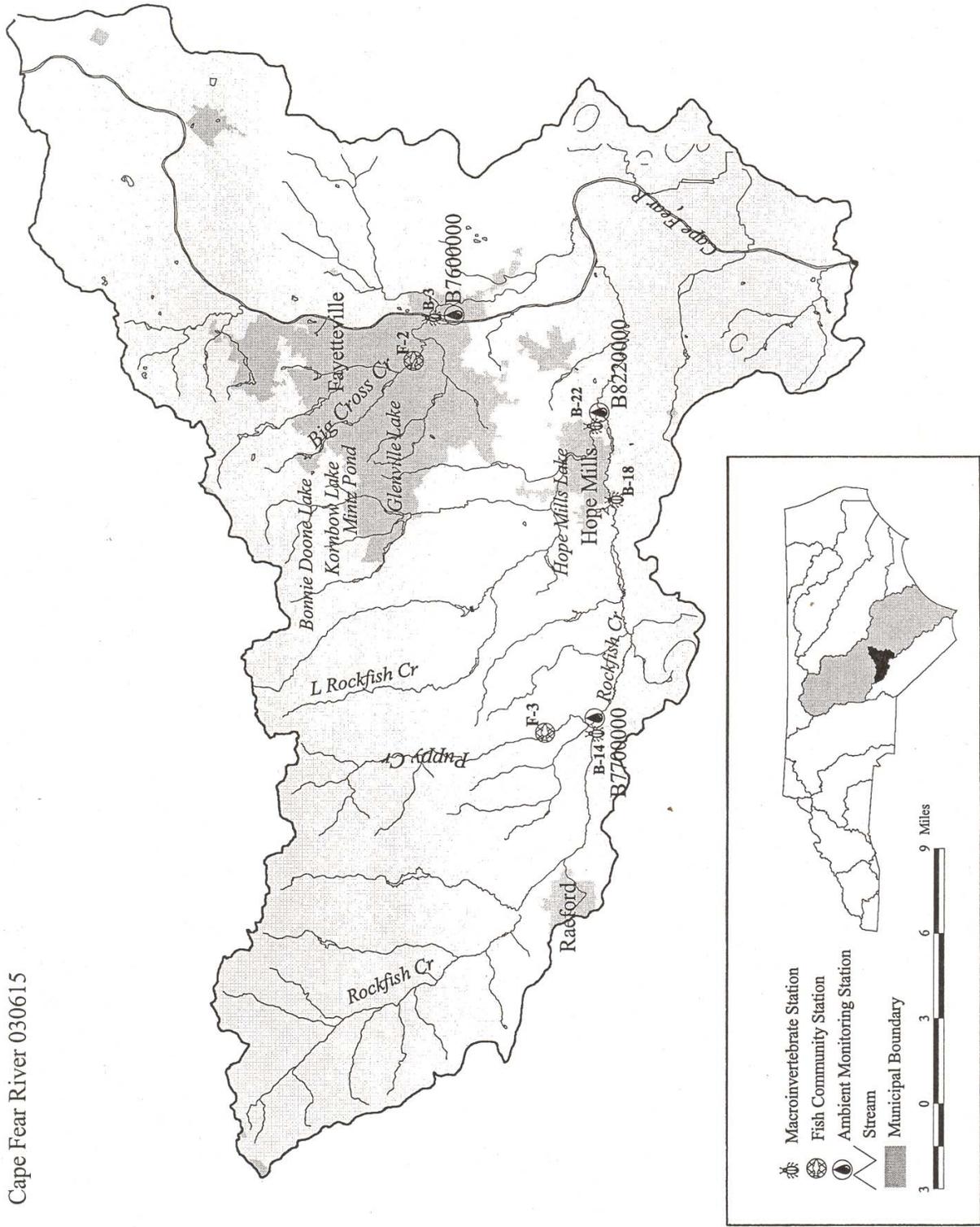


Figure B-15 Sampling Locations within Subbasin 03-06-15

Table B-15 Biological Assessment Sites in Cape Fear River Subbasin 03-06-15

<i>BENTHOS</i>				<i>Bioclassification</i>	
Site #	Stream	County	Location	1993	1998
B-3	Cape Fear River	Cumberland	Person Street	Good-Fair	Not Rated
B-17	Rockfish Creek	Hoke	SR 1432	Good	Excellent
B-21	Rockfish Creek	Cumberland	NC 87	Good	Excellent
B-25	Little Rockfish Creek	Cumberland	NC 59	Good	Good
<i>FISH</i>				<i>Bioclassification</i>	
Site #	Stream	County	Location	1994	1998
F-2	Big Cross Creek	Cumberland	NC 87/210/24	no sample	Poor
F-3	Puppy Creek	Hoke	SR 1406	no sample	Good-Fair

15.2 Impaired Waters

Portions of Cross Creek, Little Cross Creek, Pedler Branch and an unnamed tributary to Bones Creek were identified as impaired in the 1996 Cape Fear River Basinwide Water Quality Plan. Portions of Cross Creek and Little Cross Creek are currently rated as impaired according to recent DWQ monitoring. Current status of each of these streams is discussed below. Prior recommendations, future recommendations and projects aimed at improving water quality for these waters are also discussed when applicable. 303(d) listed waters are summarized in Part 15.3 and waters with other issues, recommendations or projects are discussed in Part 15.4.

Cross Creek

Current Status

Cross Creek was partially supporting (PS) in the 1996 plan. Cross Creek (13 miles from source to Cape Fear River) is not supporting according to recent DWQ monitoring because of an impaired biological community. Instream habitat degradation associated with urban nonpoint sources is a possible cause of impairment to this stream.

2000 Recommendations

The City of Fayetteville is implementing a state permitted stormwater program. Cross Creek is in heavily urbanized areas and should benefit from the city stormwater program (see Section A, Chapter 4, Part 4.7.1). DWQ will work with the stormwater program, where possible, to improve water quality in this creek. The 303(d) list approach for this stream will be to resample for biological and chemical data to attempt to determine potential problem parameters.

The Cape Fear River Botanical Garden is stabilizing the streambanks of Cross Creek where it meets the Cape Fear River main channel. For more information on this project, refer to Section C, Chapter 1, Part 1.5.3.

Little Cross Creek

Current Status

Little Cross Creek was not supporting (NS) in the 1996 plan. Little Cross Creek (7.8 miles from source to Cross Creek) is currently partially supporting (PS) according to recent DWQ monitoring because of an impaired biological community. Instream habitat degradation associated with urban nonpoint sources is a possible cause of impairment to this stream.

2000 Recommendations

The City of Fayetteville is implementing a state permitted stormwater program. Little Cross Creek is in heavily urbanized areas and should benefit from the city stormwater program (see Section A, Chapter 4, Part 4.7.1). DWQ will work with the stormwater program, where possible, to improve water quality in this creek. The 303(d) list approach for this stream will be to resample for biological and chemical data to attempt to determine potential problem parameters.

The Fayetteville PWC has established buffers on 101 acres of easements around two of its water supply reservoirs. The city is also applying for funds to assess pollution hazards in the Little Cross Creek watershed. Refer to Section C, Chapter 1, Part 1.5.3 for more information on these projects.

Pedler Branch

Current Status

Pedler Branch (2.6 miles) was not supporting (NS) in the 1996 plan. This stream is currently not rated (NR), although it may be severely impacted by urban nonpoint source pollution including stormwater surges associated with impervious surfaces in the Town of Raeford. Using new biological information, DWQ has determined that the previous rating was inappropriate because of the small size of the stream. This stream is no longer on the 303(d) list.

Unnamed Tributary to Bones Creek

Current Status

UT to Bones Creek was not supporting (NS) in the 1996 plan. This stream is currently not rated (NR). New biological information has determined that the previous rating was inappropriate because of the small size of the stream. This stream is no longer on the 303(d) list.

15.3 303(d) Listed Waters

There are two streams (20.8 stream miles) in the subbasin that are impaired and on the state's year 2000 303(d) list (not yet EPA approved). Cross Creek and Little Cross Creek are discussed above. For information on 303(d) listing requirements and approaches, refer to Appendix IV.

15.4 Other Issues, Recommendations and Projects

The following surface water segments are rated as fully supporting using recent DWQ monitoring data. However, these data revealed some impacts to water quality. Although no action is required for these surface waters, continued monitoring is recommended. Enforcement of sediment and erosion control laws will help to reduce impacts on these streams and lakes. DWQ encourages the use of voluntary measures to prevent water quality degradation. Education on local water quality issues is always a useful tool to prevent water quality problems and to promote restoration efforts. For information on water quality education programs, workshops and nonpoint source agency contacts, see Appendix V.

The Cape Fear River in this subbasin is downstream of many discharges and is affected by tributaries draining urban areas of the City of Fayetteville.

Puppy Creek is downstream of Fort Bragg and is potentially affected by land-disturbing activities on the military reservation. Continued monitoring of this stream is recommended to assess the extent of impacts from land-disturbing activities.

Bonnie Doone Lake is the first in a series of four lakes formed as impoundments of Little Cross Creek. Fort Bragg Military Base is located in close proximity to Bonnie Doone Lake. Firebreaks located on the base and the general soil type of the area contribute large amounts of sediment into the lake through stormwater runoff. To preserve water quality, work has been done to remove stormwater outlets which had drained into Bonnie Doone Lake.

Kornbow Lake is the second and largest in the series of four impoundments located on Little Cross Creek. The immediate shoreline of the lake is forested with residential developments beyond that buffer. Kornbow Lake is 90% infested with variable-leaf water milfoil. However, because this lake and its watershed are monitored by the North Carolina Natural Heritage Program, the city is discouraged from removing this plant. To protect Kornbow Lake, 150 acres in the headwaters have been purchased by the City of Fayetteville with money received from the Clean Water Management Trust Fund (see Section C, Chapter 1, Part 1.5.3). Sanitary sewers and construction activities have been a threat to the water quality of this lake.

Mintz Pond is a small auxiliary water supply reservoir for the City of Fayetteville located in Cumberland County. The lake is the third in a series of four impoundments located on Little Cross Creek and is not open to the public. The immediate shoreline is forested and surrounded by residential and urban development. Algal blooms have occurred in the past, along with public complaints regarding odor due to these blooms. Nutrients have entered the lake from a tributary which drains a small irrigation pond. To correct this problem, the City of Fayetteville has

purchased the pond and is modifying it to prevent future algal blooms. In addition to nutrients and algal blooms, pesticides and herbicides from the watershed also threaten this lake.

Glenville Lake is a small, backup water supply reservoir for the City of Fayetteville. The lake is the last in a series of four impoundments of Little Cross Creek. The immediate shoreline is forested with residential development located along the western side of the lake just beyond the forest buffer. Sedimentation has been a problem in this lake, and the lake is gradually filling in. There has also been a problem with unsupervised public access to the lake and removal of riparian buffers in a city park located in the upstream region of the lake. A stormwater management program is operated by the City of Fayetteville; however, stormwater continues to present a water quality problem for this lake.

Hope Mills Lake is a small, shallow, recreational reservoir located on Little Rockfish Creek in the Town of Hope Mills. The lake drainage area is mostly forested with some urban and agricultural uses. There have been numerous public complaints regarding odor at the dam and at the swimming beach, although there have been no reports of human health problems due to swimming in the lake. Fecal coliform bacteria may be a problem at the swimming beach and boat dock area due to waterfowl in these areas.

Approximately 7% of the waters in this subbasin are impaired by nonpoint source pollution (mostly urban). All the waters of the subbasin are affected by nonpoint sources. DENR, other state agencies and environmental groups have programs and initiatives underway to address water quality problems associated with nonpoint sources. DWQ will notify local agencies of water quality concerns in this subbasin and work with these various agencies to conduct further monitoring, as well as assist agency personnel with locating sources of funding for water quality protection.

The Middle Cape Fear River Basin Association (MCFRBA)

The Middle Cape Fear River Basin Association (MCFRBA) started sampling at seven stations in this subbasin (30 stations total) in July 1998. This data will be used to give a higher resolution picture of water quality conditions in the Cape Fear River mainstem and Rockfish Creek. The data will also be analyzed to support various studies and will be used with DWQ data to develop use support ratings for waters in the Cape Fear River basin during the upcoming basinwide cycle.

Cape Fear River from Erwin to Lock and Dam #3

1996 Recommendations

A field-calibrated QUAL2E model developed during the first basinwide planning cycle indicated that assimilative capacity for oxygen-consuming wastes had been reached in the segment of the Cape Fear River from Erwin to Lock and Dam #3. It was recommended that new and expanding discharges conduct engineering alternatives and economic analyses. If no alternatives were feasible, then limits would be required as follows:

New and expanding municipal/domestic discharges <1 MGD: BOD₅ = 12 mg/l, NH₃-N = 2 mg/l
New and expanding municipal/domestic discharges ≥1 MGD: BOD₅ = 5 mg/l, NH₃-N = 2 mg/l
New industrial discharges: BOD₅ = 5 mg/l, NH₃-N = 2 mg/l
Expanding industrial discharges: best available technology or BOD₅ = 5 mg/l, NH₃-N = 2 mg/l

2000 Recommendations

Limits recommended in the 1996 plan were made to protect dissolved oxygen (DO) levels in the river. These limits will continue to be recommended with the exception that new and expanding municipal/domestic discharges ≥1 MGD will be given limits of BOD₅ = 5 mg/l and NH₃-N = 1 mg/l. This is now considered BAT for this discharger category. Recommended limits for other facilities are as follows:

New and expanding municipal/domestic discharges <1 MGD: BOD₅ = 12 mg/l, NH₃-N = 2 mg/l
New and expanding municipal/domestic discharges ≥1 MGD: BOD₅ = 5 mg/l, NH₃-N = 1 mg/l
New industrial discharges ≥1 MGD: BOD₅ = 5 mg/l, NH₃-N = 1 mg/l
New industrial discharges <1 MGD: BOD₅ = 5 mg/l, NH₃-N = 2 mg/l
Expanding industrial discharges: site specific best available technology or
BOD₅ = 5 mg/l, NH₃-N = 2 mg/l

The Middle Cape Fear River Basin Association (MCFRBA) and DWQ continue to collect data in this segment of the Cape Fear River. There are indications that algal productivity influences dissolved oxygen (DO) dynamics in this segment of the Cape Fear River.

DWQ will be reviewing the existing QUAL2E model for the Cape Fear River mainstem (from Buckhorn Dam to Lock and Dam #1) to determine if improvements in the calibration can be made.