

# Chapter 22

## Cape Fear River Subbasin 03-06-22

Including: Northeast Cape River, Rockfish Creek, Muddy Creek and Limestone Creek

### 22.1 Subbasin Overview

#### *Subbasin 03-06-22 at a Glance*

##### **Land and Water Area**

Total area:	829 mi <sup>2</sup>
Land area:	828 mi <sup>2</sup>
Water area:	1 mi <sup>2</sup>

##### **Population Statistics**

2000 Est. Pop.:	54,835 people
Pop. Density:	66 persons/mi <sup>2</sup>

##### **Land Cover (percent)**

Forest/Wetland:	58.6%
Surface Water:	0.3%
Urban:	1.3%
Cultivated Crop:	30.3%
Pasture/Managed Herbaceous:	9.6%

##### **Counties**

Duplin, Jones, Lenoir, Onslow,  
Pender, Sampson and Wayne

##### **Municipalities**

Beulaville, Calypso, Faison,  
Greenevers, Harrells, Kenansville,  
Pink Hill, Rose Hill, Teachey and  
Wallace

Subbasin 03-06-22 is in the coastal plain with many streams draining wetland areas. Most of the watershed is forested with extensive agriculture present. Population is expected to grow by 100,000 people in counties with portions or all of their areas in this subbasin by 2020.

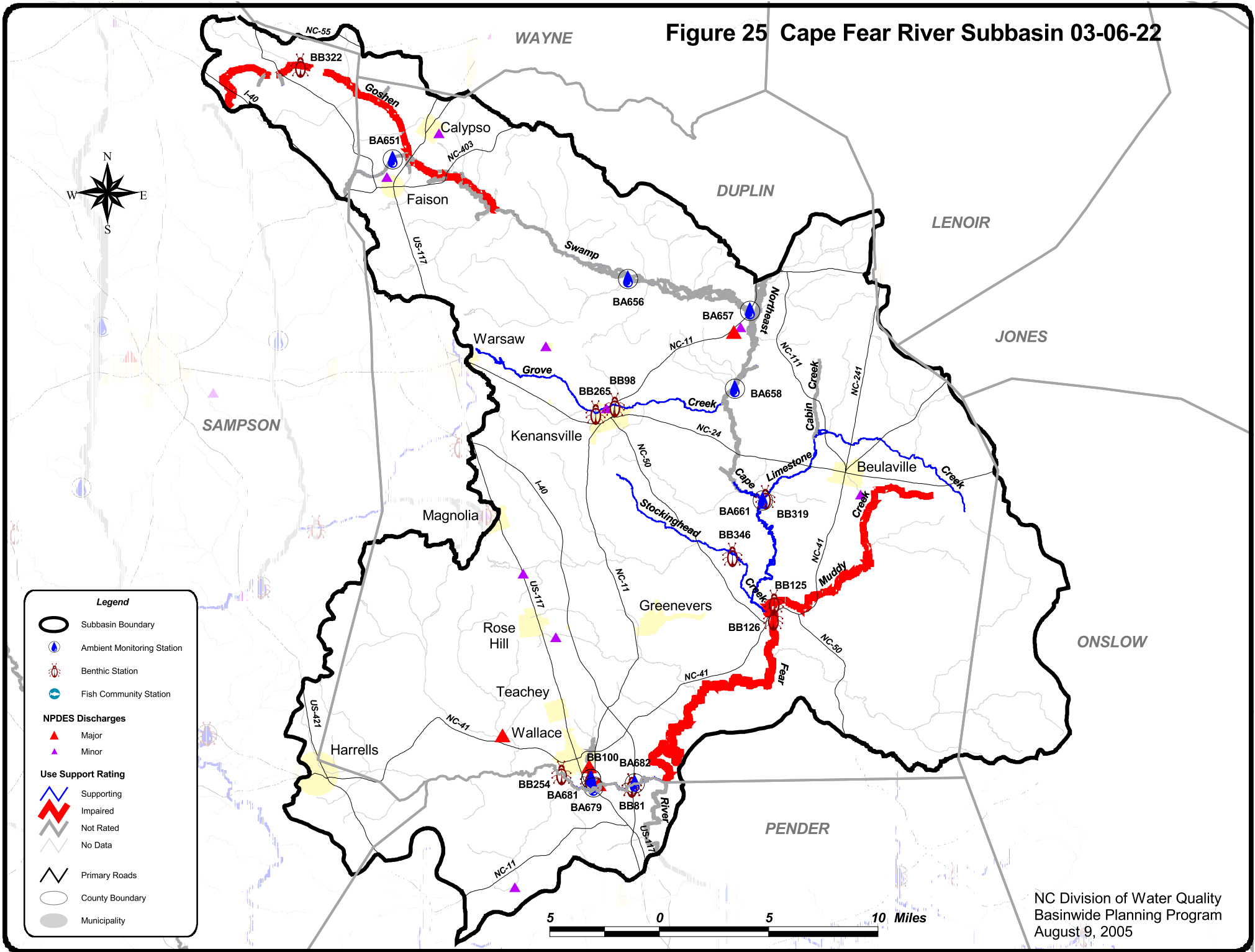
There are 13 individual NPDES wastewater discharge permits in this subbasin with a permitted flow of 9.9 MGD (Figure 25). The largest is Wallace WWTP#1 (1 MGD), Wallace WWTP#2 (4.4 MGD) and Guilford East Mill WWTP (1.5 MGD). Refer to Appendix VI and Chapter 30 for more information on NPDES permit holders. Issues related to compliance with NPDES permit conditions are discussed below in Section 22.3 for Impaired waters.

There are 449 registered swine operation in this subbasin.

There were ten benthic community samples (Figure 25 and Table 25) collected during this assessment period. Data were also collected from seven ambient monitoring stations including four LCFRP (Appendix V) stations, two DWQ ambient stations and one shared station. One lake was also monitored. Refer to the *2003 Cape Fear River Basinwide Assessment Report* at <http://www.esb.enr.state.nc.us/bar.html> and Appendix IV for more information on monitoring.

Waters in the following sections are identified by assessment unit number (AU#). This number is used to track defined segments in the water quality assessment database, 303(d) Impaired waters list and the various tables in this basin plan. The assessment unit number is a subset of the DWQ index number (classification identification number). A letter attached to the end of the AU# indicates that the assessment is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segment are the same.

Figure 25 Cape Fear River Subbasin 03-06-22



**Table 25 CAPE FEAR Subbasin 03-06-22**

AU Number	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment				
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	Stressors	Sources
Description													
<b>Cabin Creek</b>													
18-74-23-2	B Sw	4.0	FW Miles	<b>NR</b>	BL35	NCE	Chlor a	33	ND			Chlorophyll a	Unknown
From source to Limestone Creek													
<b>Goshen Swamp</b>													
18-74-19a	C Sw	16.6	FW Miles	<b>I</b>					ND				
From source to Bear Swamp													
18-74-19b	C Sw	13.4	FW Miles	<b>NR</b>	BA656	NCE	Low DO	50	<b>S</b>	BA656	NCE	Low Dissolved Oxygen	Unknown
From Bear Swamp to Northeast Cape Fear River													
<b>Grove Creek</b>													
18-74-21	C Sw	15.4	FW Miles	<b>S</b>					ND				
From source to Northeast Cape Fear River													
BB265 M 2001													
BB98 N 2001													
<b>Limestone Creek</b>													
18-74-23	C Sw	16.4	FW Miles	<b>S</b>					ND			Habitat Degradation	Land Clearing
From source to Northeast Cape Fear River													
BB319 GF 2003													
<b>Little Rock Fish Creek (Boney Mill Pond)</b>													
18-74-29-6	C Sw	3.0	FW Miles	<b>NR</b>	BA681	NCE			<b>NR*</b>	BA681	NCE	Fecal Coliform Bacteria	Unknown
From source to Rock Fish Creek													
BB100 NR 2003													
<b>Muddy Creek</b>													
18-74-25	C Sw	14.0	FW Miles	<b>I</b>					ND				
From source to Mortheast Cape Fear River													
BB125 F 2003													
<b>Northeast Cape Fear River</b>													
18-74-(1)c2	C Sw	11.9	FW Miles	<b>NR</b>	BA658	NCE	Low DO	12.5	<b>S</b>	BA658	NCE	Low Dissolved Oxygen	Unknown
From Subbasin 03-06-21 03-06-22 boundary to Persimmon Branch													
18-74-(25.5)	C Sw HQW	19.5	FW Miles	<b>I</b>					ND				
From Muddy Creek to Rock Fish Creek													
BB126 P 1998													
18-74-(29.5)	C Sw	35.7	FW Miles	<b>NR</b>	BA683	NCE	Low DO	10.5	<b>S</b>			Low Dissolved Oxygen	Unknown
From Rock Fish Creek to NC Hwy 210													

**Table 25 CAPE FEAR Subbasin 03-06-22**

AU Number	Classification	Length/Area		Aquatic Life Assessment				Recreation Assessment					
				AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources	
Description													
<b>Panther Creek</b>													
18-74-19-3a	C Sw	2.4	FW Miles	NR	BA651	NCE	Low DO	23.2	S	BA651	NCE	Low Dissolved Oxygen	Unknown
From source to NC 50													
18-74-19-3b	C Sw	1.8	FW Miles	NR	BA651	NCE	Low DO	23.2	S	BA651	NCE	Low Dissolved Oxygen	Unknown
From NC 50 to Goshen Swamp													
<b>Rock Fish Creek (New Kirk Pond)</b>													
18-74-29c	C Sw	3.4	FW Miles	S	BA679	NCE			S	BA679	NCE		
From SR 1165 to Little Rockfish Creek													
18-74-29d	C Sw	4.7	FW Miles	S	BA682	NCE			S	BA682	NCE		
From Little Rockfish Creek to Northeast Cape Fear River													
<b>Stockinghead Creek</b>													
18-74-24	C Sw	11.2	FW Miles	S					ND				
From source to Northeast Cape Fear River													

AL - Aquatic Life	BF - Fish Community Survey	E - Excellent	S - Supporting, I - Impaired
REC - Recreation	BB - Benthic Community Survey	G - Good	NR - Not Rated
	BA - Ambient Monitoring Site	GF - Good-Fair	NR*- Not Rated for Recreation (screening criteria exceeded)
	BL- Lake Monitoring	F - Fair	ND-No Data Collected to make assessment
	S- DEH RECMON	P - Poor	<b>Results</b>
		NI - Not Impaired	CE-Criteria Exceeded > 10% and more than 10 samples
	<b>Miles/Acres</b>	S- Severe Stress	NCE-No Criteria Exceeded
	FW- Fresh Water	M-Moderate Stress	
	S- Salt Water	N- Natural	

**Aquatic Life Rating Summary**

S	m	51.1	FW Miles
NR	m	72.1	FW Miles
I	m	50.1	FW Miles
ND		408.8	FW Miles

**Recreation Rating Summary**

S	m	73.2	FW Miles
NR*	m	3.0	FW Miles
ND		505.9	FW Miles

**Fish Consumption Rating Summary**

I	e	582.1	FW Miles
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## 22.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-06-22 in the aquatic life, recreation, fish consumption and water supply categories. All waters are Impaired on an evaluated basis in the fish consumption category because of fish consumption advice that applies to the entire basin. In the water supply category, all waters are Supporting on an evaluated basis based on reports from DEH regional water treatment plant consultants. Refer to Appendix X for a complete list of monitored waters and more information on Supporting monitored waters.

There were 173.3 stream miles (29.8 percent) monitored during this assessment period in the aquatic life category. There are 50.1 stream miles (8.6 percent) identified as Impaired in this same category.

## 22.3 Status and Recommendations of Previously and Newly Impaired Waters

The following waters were either identified as Impaired in the previous basin plan (2000) or are newly Impaired based on recent data. If previously identified as Impaired, the water will either remain on the state's 303(d) list or will be delisted based on recent data showing water quality improvements. If the water is newly Impaired, it will likely be placed on the 2006 303(d) list. The current status and recommendations for addressing these waters are presented below, and each is identified by an assessment unit number (AU#). Refer to the overview for more information on AUs. Information regarding 303(d) listing and reporting methodology is presented in Appendix VII.

### 22.3.1 Goshen Swamp [AU#18-74-19a and b]

#### 2000 Recommendations

The 2000 basinwide plan recommended that Goshen Swamp be resampled to further assess the Dean Pickle and Specialty Products discharge into Panther Creek (see below) as efforts continue to reduce chloride levels. Goshen Swamp was Not Rated in the 2000 plan.

#### Current Status

Goshen Swamp [18-74-19a] from source to Bear Swamp (16.6 miles) is Impaired for aquatic life because of a Severe benthic community rating at site BB322. Site BB322 is upstream of the Dean Pickle and Specialty Products discharge. Aquatic habitat was good at the site, suggesting that the water quality is degraded. There are three registered swine operations in the watershed above BB322.

Goshen Swamp [18-74-19b] from Bear Swamp to Northeast Cape Fear River (13.4 miles) is Not Rated for aquatic life because dissolved oxygen was below 4 mg/l in 50 and 29 percent of samples collected at sites BA656 and BA657. Goshen Swamp is classified as C Sw, which acknowledges natural characteristics of swamps such as low dissolved oxygen. A study of a clear cut in Goshen Swamp just upstream of the Northeast Cape Fear River suggested that a 30-foot buffer was insufficient to protect Goshen Swamp from adverse water quality impacts during forest harvesting. Higher suspended solids, nutrients and bacteria levels, and lower dissolved oxygen levels were found downstream of the site (Ensign and Mallin, 2001).

### 2005 Recommendations

DWQ will continue to monitor the Goshen Swamp watershed. Dean Pickle and Specialty Products will be required to continue efforts to reduce the discharge of chlorides and monitor chloride levels.

### **22.3.2 Muddy Creek [AU#18-74-25]**

#### 2000 Recommendations

The 2000 basinwide plan recommended that Muddy Creek be resampled using the 303(d) approach.

#### Current Status

Muddy Creek from source to Northeast Cape Fear River (14 miles) is Impaired for aquatic life because of a Fair benthic community rating at site BB125. Aquatic habitat was good at the site, suggesting that the water quality is degraded. There are 41 animal operations and one NPDES wastewater discharger in the watershed that may be the sources of the degraded water quality.

#### 2005 Recommendations

DWQ will continue to monitor the Muddy Creek watershed to determine stressors to water quality. For more information on animal operations and NPDES permits, refer to Chapter 30.

### **22.3.3 Northeast Cape Fear River [AU#18-74-(1)c2, (25.5) and (29.5)]**

#### Current Status

The Northeast Cape Fear River [18-74-(1)c2] from the subbasin boundary to Persimmon Branch (11.9 miles) is Not Rated for aquatic life because Guilford East Mill WWTP (NC0002305) had significant violations of biological oxygen demand permit limits and eight whole effluent toxicity test failures during the last two years of the assessment period.

The Northeast Cape Fear River was Fully Supporting in the 2000 plan; however, the Northeast Cape Fear River [18-74-(25.5)] from Muddy Creek to Rock Fish Creek (19.5 miles) is currently Impaired for aquatic life because of a Poor benthic community rating at site BB126. This segment of the Northeast Cape Fear River is classified as C Sw HQW.

Northeast Cape Fear River [18-74-(29.5)] from Rock Fish Creek to NC 210 (35.7 miles) is Not Rated for aquatic life because dissolved oxygen was below 4 mg/l in 11 percent of samples collected at site BA683. Northeast Cape Fear River is classified as C Sw, which acknowledges natural characteristics of swamps such as low dissolved oxygen.

#### 2005 Recommendations

DWQ will continue to monitor the Northeast Cape Fear River watershed. The NPDES compliance process will be used to address the significant permit violations noted above.

#### Water Quality Initiatives

In 2003, Wallace received a \$1,037,000 CWMTF (Chapter 34) grant to reroute the WWTP to an upgraded industrial facility. Approximately 1,000 failing septic systems or straight pipes will be connected to the system along the HQW segment of the Northeast Cape Fear River.

#### **22.3.4 Panther Creek [AU#18-74-19-3a and b]**

##### 2000 Recommendations

The 2000 basinwide plan recommended that Panther Creek be resampled to continue monitoring the Dean Pickle and Specialty Products discharge as efforts continue to reduce chloride levels. Panther Creek was Not Rated in the 2000 plan.

##### Current Status

Panther Creek from source to Goshen Swamp (4.2 miles) is Not Rated for aquatic life because dissolved oxygen was below 4 mg/l in 23 percent of samples collected at site BA651. Panther Creek is classified as C Sw, which acknowledges natural characteristics of swamps such as low dissolved oxygen. Conductivity was very high at site BA651, suggesting the Dean Pickle and Specialty Products discharge is impacting water quality.

##### 2005 Recommendations

DWQ will continue to monitor the Panther Creek watershed. Dean Pickle and Specialty Products will be required to continue efforts to reduce the discharge of chlorides and monitor chloride levels.

### **22.4 Status and Recommendations for Waters with Noted Impacts**

The surface waters discussed in this section are not Impaired. However, notable water quality problems and concerns have been documented for some waters based on this assessment. While these waters are not Impaired, attention and resources should be focused on these waters to prevent additional degradation or facilitate water quality improvement. Waters in the following section are identified by assessment unit number (AU#). See overview for more information on AU#s.

#### **22.4.1 Cabin Creek [AU#18-74-23-2]**

##### Current Status and 2005 Recommendations

Cabin Creek from source to Limestone Creek (4 miles) is Not Rated for aquatic life because 33 percent of chlorophyll *a* samples exceeded the water quality standard. However, not enough samples were collected to assign a use support rating. Nutrient levels in the reservoir were extremely elevated. DWQ will determine if increased monitoring efforts in this lake are warranted to better assess water quality.

#### **22.4.2 Little Rockfish Creek [AU#18-74-29-6]**

##### Current Status and 2005 Recommendations

Little Rockfish Creek from source to Rockfish Creek (3 miles) is Not Rated for aquatic life because a benthic community rating could not be assigned at site BB100. There were signs of degradation in Little Rockfish Creek. The creek is Not Rated for recreation because fecal coliform bacteria screening criteria were exceeded at site BA681. DWQ will resample Little Rockfish Creek using Coastal A criteria so that a benthic community rating can be assigned. DWQ will also determine if more intensive sampling of the creek is warranted to assess the bacteria standard.

### **22.4.3 Limestone Creek [AU#18-74-23]**

#### *Current Status and 2005 Recommendations*

Limestone Creek from source to Northeast Cape Fear River (16.4 miles) is Supporting aquatic life because of a Good-Fair benthic community rating at site BB319. The creek had been recently de-snagged. The streambanks were eroding and the bottom was unstable sand. There were no pools and little riparian vegetation. The stream had an Excellent benthic community rating in 1993 that fell to Poor after a chicken waste spill in 1995. Limestone Creek has not fully recovered because of the habitat problems.