

# Chapter 7

## Cape Fear River River Subbasin 03-06-07

Including: Cape Fear River, Neills Creek and Parkers Creek

### 7.1 Subbasin Overview

#### *Subbasin 03-06-07 at a Glance*

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

Total area:	415 mi <sup>2</sup>
Land area:	403 mi <sup>2</sup>
Water area:	12 mi <sup>2</sup>

##### **Population Statistics**

2000 Est. Pop.:	106,866 people
Pop. Density:	257 persons/mi <sup>2</sup>

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

Forest/Wetland:	69.6%
Surface Water:	2.9%
Urban:	1.6%
Cultivated Crop:	21.4%
Pasture/ Managed Herbaceous:	4.6%

##### **Counties**

Chatham, Harnett, Lee and Wake

##### **Municipalities**

Angier, Broadway, Coats, Erwin,  
Fuquay-Varina, Holly Springs,  
Lillington and Sanford

Subbasin 03-06-07 contains streams that drain Triassic basin soils, the coastal plain and the Piedmont. The Cape Fear River starts in this subbasin at the confluence of the Haw and Deep Rivers. Most of the watershed is forested, with extensive agriculture present. Development is occurring in the northern portion near Fuquay-Varina. Population is expected to grow by 435,000 people in counties with portions or all of their areas in this subbasin by 2020. Most growth is expected in Wake County.

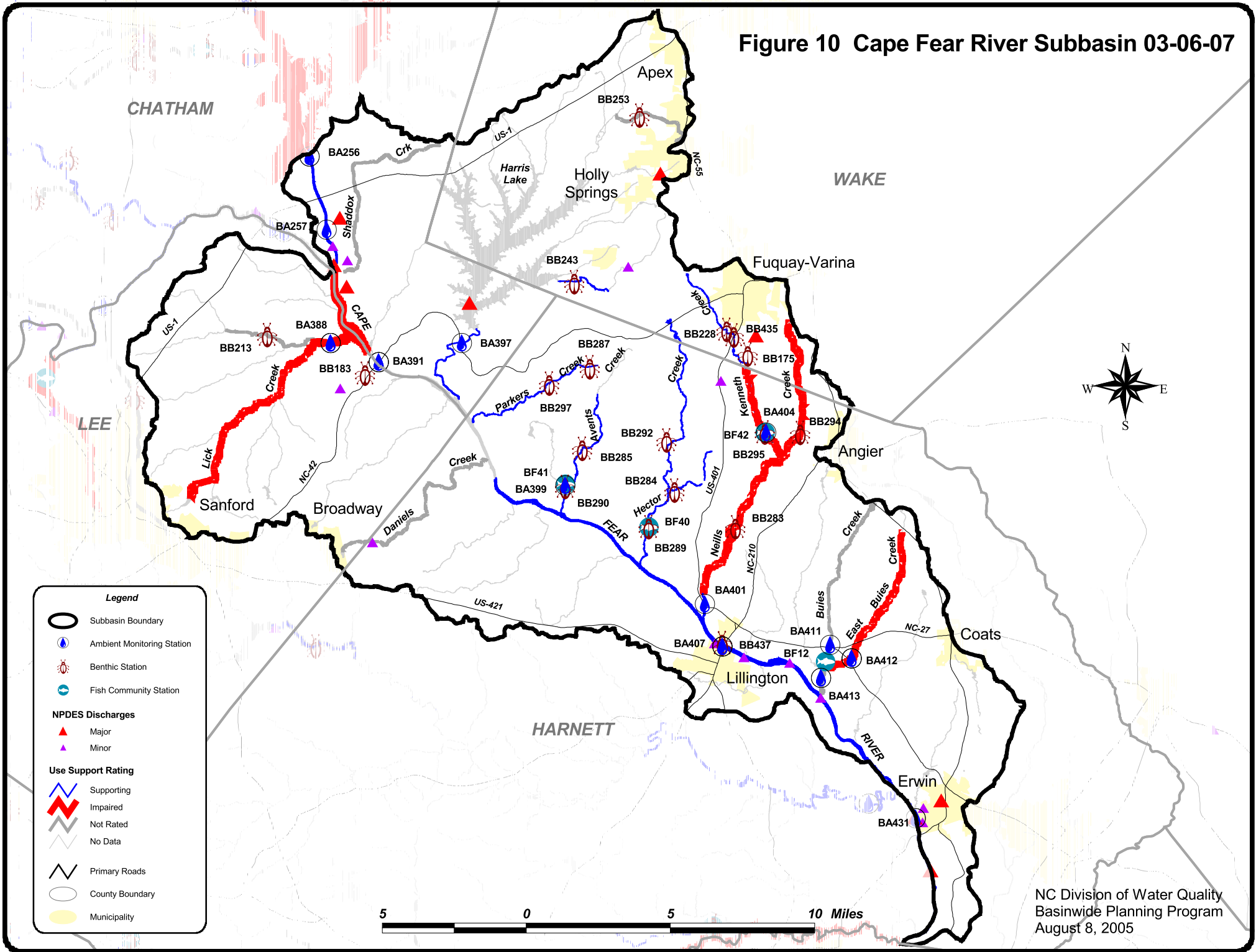
There are 16 individual NPDES wastewater discharge permits in this subbasin with a permitted flow of 17.6 MGD (Figure 10). The largest are Progress Energy (10 MGD), Holly Springs WWTP (2.4 MGD), Erwin Mills (2.5 MGD), Shearon Harris (1.6 MGD) and Kenneth Creek WWTP (1.2 MGD). Refer to Appendix VI and Chapter 30 for more information on NPDES permit holders. Issues related to compliance with NPDES permit conditions are discussed below in Section 7.3 for Impaired waters and in Section 7.4 for other waters.

There are two registered swine operations in this subbasin.

There were 16 benthic community samples and four fish community samples (Figure 10 and Table 10) collected during this assessment period. Data were also collected from 15 ambient monitoring stations including eight MCFRBA (Appendix V) stations, one UCFRBA (Appendix V) station, one DWQ station, and two shared ambient stations. 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 10 Cape Fear River Subbasin 03-06-07



**Table 10 CAPE FEAR Subbasin 03-06-07**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment					
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources	
<b>Avents Creek</b>												
18-13-(2)	WS-IV HQ	5.5 FW Miles	<b>S</b>	BA399	NCE			<b>NR*</b>	BA399	NCE	Fecal Coliform Bacteria	Unknown
	From a point 1.3 miles upstream of Harnett County SR 1418 to Cape Fear River			BB285	G	2000						
				BB290	E	2003						
				BF41	GF	2003						
<b>Buckhorn Creek</b>												
18-7-(2)	B	2.2 FW Miles	<b>S</b>									
	From Norfolk Southern Railroad to backwaters of Harris Lake			BB243	G	2003						
<b>Buckhorn Creek (Harris Lake)</b>												
18-7-(11)	C	4.3 FW Miles	<b>S</b>	BA397	NCE							
	From dam at Harris Lake to Cape Fear River											
<b>Buies Creek</b>												
18-18	WS-IV	8.2 FW Miles	<b>NR</b>	BA411	NCE	Low pH	9.1	<b>NR*</b>	BA411	NCE	Low pH	Unknown
	From source to Cape Fear River			BF12	NR	2003			BA413	NCE	Fecal Coliform Bacteria	Unknown

**Table 10 CAPE FEAR Subbasin 03-06-07**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment					
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources	
<b>CAPE FEAR RIVER</b>												
18-(1)	WS-IV	3.2 FW Miles	<b>I</b>	BA391	NCE	High pH	9.59	<b>S</b>	BA391	NCE	High pH	
				BA391	CE	Chlor a	23.5				Chlorophyll a	
From junction of Haw River and Deep River to a point												
18-(10.5)	WS-IV	9.5 FW Miles	<b>S</b>					ND				
		From a point 0.6 mile downstream of mouth of Daniels Creek to a point 0.2 mile dwonstream of Neils Creek		BB437	GF	2003						
				BB437	NR	2002						
				BB437	GF	2003						
18-(16.3)	WS-IV CA	0.5 FW Miles	<b>S</b>					ND				
		From a point 0.2 mile downstream of Neills Creek to Lillington water supply		BB437	GF	2003						
				BB437	NR	2002						
				BB437	GF	2003						
18-(16.7)	WS-IV	9.0 FW Miles	<b>S</b>	BA407	NCE	Turbidity	10	<b>S</b>	BA407	NCE	Turbidity	Unknown
		From Lillington water supply intake to Upper Little River		BB437	GF	2003						
				BB437	NR	2002						
				BB437	GF	2003						
18-(20.7)a	WS-V	5.4 FW Miles	<b>S</b>	BA431	NCE			<b>S</b>	BA431	NCE		
From Dunn water supply intake to Lower Little River												
18-(4.5)a	WS-IV CA	0.5 FW Miles	<b>I</b>	BA391	NCE	High pH	9.59	<b>S</b>	BA391	NCE	Chlorophyll a	Unknown
				BA391	CE	Chlor a	23.5				High pH	Unknown
From a point 0.5 mile upstream of NC Hwy 42 to NC												
<b>Coopers Branch</b>												
18-15-1	WS-IV HQ	2.9 FW Miles	<b>S</b>					ND				
		From source to Hector Creek		BB284	G	2003						
<b>East Buies Creek</b>												
18-18-1-(2)	WS-IV	6.2 FW Miles	<b>I</b>	BA412	CE	Low DO	21.7	<b>NR*</b>	BA412	NCE	Fecal Coliform Bacteria	Unknown
				BA412	NCE	Low pH	8.7				Low Dissolved Oxygen	Unknown
		From a point 0.2 mile downstream of NC Hwy 55 to Buies Creek									Low pH	Unknown

**Table 10 CAPE FEAR Subbasin 03-06-07**

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>HAW RIVER</b>												
16-(42)	WS-IV	4.3	FW Miles	<b>S</b>	BA256	NCE	25	<b>S</b>	BA256	NCE		
					BA257	NCE	13.6		BA257	NCE		
From dam at B. Everett Jordan Lake to Cape Fear River (junction with Deep River)												
<b>Hector Creek</b>												
18-15-(0.7)	WS-IV HQ	8.9	FW Miles	<b>S</b>				ND				
From a point 1.1 miles upstream of Harnett County SR 1415 to Cape Fear River					BB289	E	2003					
					BB292	G	2003					
					BF40	E	2003					
<b>Hughes Creek</b>												
18-4-7	WS-IV	3.9	FW Miles	<b>NR</b>				ND				
From source to Lick Creek					BB213	NR	2003					
<b>Kenneth Creek</b>												
18-16-1-(1)	C	4.9	FW Miles	<b>S</b>				ND				
From source to Wake-Harnett County Line					BB228	G	2003					
					BB435	NR	1998					
18-16-1-(2)	WS-IV	3.9	FW Miles	<b>I</b>	BA404	NCE		<b>S</b>	BA404	NCE	Habitat Degradation	
From Wake-Harnett County Line to Neils Creek					BB295	P	2003				Habitat Degradation	
					BF42	G	2003				WWTP NPDES	
<b>Lick Creek</b>												
18-4-(2)	WS-IV	10.3	FW Miles	<b>I</b>	BA388	CE	Low DO	15.6	<b>NR*</b>	BA388	NCE	Fecal Coliform Bacteria
					BA388	NCE	Turbidity	7.8				MS4 NPDES
From dam at Olhams Lake to Cape Fear River												Turbidity
												MS4 NPDES
												Low Dissolved Oxygen
												MS4 NPDES
<b>Little Branch</b>												
18-7-6-1-1	C	3.4	FW Miles	<b>NR</b>				ND				
From source to Big Branch					BB253	NR	2003					

**Table 10 CAPE FEAR Subbasin 03-06-07**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
<b>Neills Creek (Neals Creek)</b>										
18-16-(0.3)	C	2.6 FW Miles	<b>I</b>					ND		
From source to a point 0.3 mile upstream of Wake-Harnett County Line				BB294	P	2003			Habitat Degradation	Impervious Surface
									Habitat Degradation	Pasture
									Habitat Degradation	Agriculture
									Habitat Degradation	MS4 NPDES
18-16-(0.7)a	WS-IV	2.0 FW Miles	<b>I</b>					ND		
From a point 0.3 mile upstream of Wake-Harnett County Line to SR 1441				BB294	P	2003			Habitat Degradation	Impervious Surface
									Habitat Degradation	Pasture
									Habitat Degradation	Agriculture
									Habitat Degradation	MS4 NPDES
18-16-(0.7)b	WS-IV	1.3 FW Miles	<b>I</b>					ND		
From SR 1441 to Kenneth Creek				BB294	P	2003			Habitat Degradation	Impervious Surface
									Habitat Degradation	Pasture
									Habitat Degradation	Agriculture
									Habitat Degradation	MS4 NPDES
18-16-(0.7)c1	WS-IV	6.7 FW Miles	<b>I</b>					ND		
From Kenneth Creek to 0.4 miles upstream of US 401				BB283	F	2003				
18-16-(0.7)c2	WS-IV	1.6 FW Miles	<b>S</b>					<b>S</b>	BA401	NCE
From US 401 to the Cape Fear River										
<b>Parkers Creek</b>										
18-9	CHQW	6.0 FW Miles	<b>S</b>					ND		
From source to Cape Fear River				BB287	NI	2003			Turbidity	Unknown
				BB297	G	2003				

**Table 10 CAPE FEAR Subbasin 03-06-07**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment					
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources	
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>			
	<b>Miles/Acres</b>				NI - Not Impaired				CE-Criteria Exceeded > 10% and more than 10 samples			
	FW - Fresh Water				S- Severe Stress				NCE-No Criteria Exceeded			
	S- Salt Water				M-Moderate Stress							
					N- Natural							

**Aquatic Life Rating Summary**

S	m	65.1	FW Miles
NR	m	15.5	FW Miles
I	m	36.7	FW Miles
S	e	2.9	FW Miles
NR	e	16.6	FW Miles
ND		174.2	FW Miles
ND		4,154.2	FW Acres

**Recreation Rating Summary**

S	m	27.9	FW Miles
NR*	m	30.2	FW Miles
ND		252.9	FW Miles
ND		4,154.2	FW Acres

**Fish Consumption Rating Summary**

I	e	311.0	FW Miles
I	e	4,154.2	FW Acres

## 7.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-06-07 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 WS classified waters (4,4145.7 acres and 199.8 miles) 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 117.4 stream miles (37.7 percent) monitored during this assessment period in the aquatic life category. There are 36.7 stream miles (11.8 percent) Impaired in this same category.

## 7.3 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.

### 7.3.1 Cape Fear River [AU# 18-(1), (4.5a), (10.5), (16.3), (16.7) and (20.7)]

#### Current Status

The Cape Fear River was Fully Supporting in the 2000 basinwide plan; however, the Cape Fear River [18-(1) and (4.5a)] from confluence of the Haw and Deep Rivers to NC 42 (3.7 miles) is Impaired for aquatic life because chlorophyll *a* exceeded the standard in 24 percent of samples at site BA391. Algal blooms have been common in this segment of the river upstream of Buckhorn Dam and pH levels were commonly elevated at site BA391 as well. Discharges in the Haw and Deep Rivers, as well as nutrient laden runoff from upstream urban and agricultural land uses, are contributing nutrients into this slow-moving segment. Algal activity was especially high during the summer of 2002 when flow was extremely low due to drought conditions.

The Cape Fear River [18-(10.5), (16.3) and (16.7)] from downstream of Daniels Creek to the Upper Little River (19 miles) is Supporting aquatic life because of a Good-Fair benthic community rating at site BB437; however, turbidity was above the water quality standard in 10 percent of samples collected at site BA407. Runoff from upstream land uses in the Haw and Deep River watersheds are the likely source of the increased turbidity.

The Cape Fear River [18-(20.7)a)] from Dunn water supply intake to Lower Little River (5.4 miles) is Supporting aquatic life because no criteria were exceeded at site BA431. This segment of the Cape Fear River is Not Rated on an evaluated basis for recreation because the Erwin WWTP (NC0064521) had significant violations of fecal coliform bacteria permit limits.



### 2005 Recommendations

DWQ and MCFRBA (Appendix V) will continue to monitor water quality in this segment of the Cape Fear River. The NPDES compliance process will be used to address the significant permit violations noted above.

Segments 18-(1) and (4.5) will be added to the 303(d) list of Impaired waters. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

### Water Quality Initiatives

In 2000, Erwin received a \$300,000 CWMTF (Chapter 34) grant to upgrade the WWTP including a new inflow channel, clarifier baffles, aeration equipment and sludge digestion storage equipment.

## **7.3.2 East Buies Creek [AU#18-18-1-(2)]**

### Current Status

East Buies Creek was Not Rated in the 2000 basinwide plan; however, East Buies Creek from NC 55 to Buies Creek (6.2 miles) is currently Impaired for aquatic life because dissolved oxygen was below the standard in 21.7 percent of samples at site BA412. Samples collected at site BA412 were also below the pH standard in 8.7 percent of samples. This segment is Not Rated for recreation because the fecal coliform bacteria screening criteria were exceeded at site BA412.

### 2005 Recommendations

It is recommended that MCFRBA (Appendix V) continue to monitor water quality in East Buies Creek and work with DWQ to determine if the low dissolved oxygen levels are natural in this watershed. Station BA412 has been moved because the previous location ceased flowing during summer months. DWQ will reassess data at the new station during the next assessment period to determine if dissolved levels exceed criteria.

East Buies Creek will be added to the 303(d) list of Impaired waters. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

## **7.3.3 Gulf Creek [AU#18-18-1-(2)]**

### 2000 Recommendations

The 2000 basin plan recommended that DWQ would resample Gulf Creek. Gulf Creek was Partially Supporting and Not Supporting in the 2000 plan. The benthic community ratings on Gulf Creek have been changed to Not Rated because criteria have not been developed to assign ratings to Triassic basin streams. This stream will remain on the 303(d) list of Impaired waters.

## **7.3.4 Kenneth Creek [AU#18-16-1-(1) and (2)]**

### 2000 Recommendations

The 2000 basin plan recommended that local programs work to protect Kenneth Creek and that DWQ would resample the creek. It was also recommended that any new or expanding discharges to Kenneth Creek meet permit limits of 5 mg/l BOD5 and 2 mg/l NH3-N.

### Current Status

Kenneth Creek [18-16-1-(1)] from source to Wake-Harnett county line (4.9 miles) is Supporting aquatic life because of a Good benthic community rating at site BB228. However, Kenneth Creek WWTP (NC0028118) had significant violations of biological oxygen demand permit limits, which could have adversely impacted aquatic life in this segment and in the downstream segments.

Kenneth Creek [18-16-1-(2)] from Wake-Harnett county line to Neills Creek (3.9 miles) is Impaired for aquatic life because of a Poor benthic community rating at site BB295. No criteria were exceeded at site BA404, and there was a Good fish community rating at site BF42. This segment is Supporting recreation because fecal coliform bacteria screening criteria were not exceeded at site BA295; however, Senters Rest Home (NC0048101) had significant violations of fecal coliform bacteria permit limits during the last two years of the assessment period. Senters is under a special order consent (SOC# S94026) that expires in March 2006.

### 2005 Recommendations

It is recommended that MCFRBA (Appendix V) continue to monitor water quality in Kenneth Creek. The NPDES compliance process will be used to address the significant permit violations noted above.

Segment 18-16-1-(1) will be removed from the 303(d) list of Impaired waters because of the improved biological community. Segment 18-16-1-(2) will remain on the 303(d) list. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

### Water Quality Initiatives

The NCEEP Local Watershed Plan for Harris Lake and Tributaries, completed in 2004, includes Kenneth Creek. This plan area encompasses three local watersheds that are parallel drainages to the Cape Fear River and are located within portions of Chatham, Wake, and Harnett Counties in the North Carolina Piedmont. The total land area is approximately 180 square miles. The watersheds include parts of the towns of Apex, Holly Springs, and Fuquay-Varina and the portion of Raven Rock State Park north and east of the Cape Fear River.

This watershed is approximately 46 square miles in size, extending south from the Town of Fuquay-Varina to Lillington, and east from US 401 to the Town of Angier. It is the most urbanized of the three watersheds in the study area. Kenneth Creek is a tributary to Neills Creek, which flows to the Cape Fear River near Lillington. A portion of Kenneth Creek was rated as impaired on the 2000 303(d) list.

The water resources in the study area exhibit signs of stress with future development likely to cause additional impacts. Given the vulnerable condition of these natural resources, it is vital to expedite implementation of the recommended efforts. The Local Watershed Plan for Middle Cape Fear and Kenneth/Harris Creeks may be viewed at:

<http://www.nceep.net/services/lwps/Harris-Kenneth/Harris-Kenneth.htm>

### **7.3.5 Lick Creek [AU#18-4-(2)]**

#### Current Status

Lick Creek was Fully Supporting in the 2000 basinwide plan; however, Lick Creek from Olhams Lake Dam to the Cape Fear River (10.3 miles) is currently Impaired for aquatic life because dissolved oxygen was below the standard in 16 percent of samples at site BA388. Turbidity was also above the standard in 8 percent of samples. Lick Creek is Not Rated for recreation because the fecal coliform bacteria screening criteria were exceeded at site BA388.

#### 2005 Recommendations

It is recommended that MCFRBA (Appendix V) continue to monitor water quality in Lick Creek and work with DWQ to determine if the low dissolved oxygen levels are natural in this watershed.

Lick Creek will be added to the 303(d) list of Impaired waters. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

### **7.3.6 Neills Creek [AU#18-16-(0.3), (0.7)a, b and c1]**

#### Current Status

Neills Creek was Fully Supporting and Not Rated in the 2000 basin plan; however, Neills Creek [18-16-(0.3), (0.7)a, b and c1] from source to US 401 (12.6 miles) is Impaired for aquatic life because of Poor and Fair benthic community ratings at sites BB294 and BB283. Site BB294 declined from Good-Fair to Poor in 2003. This decline was initially thought to be due to the drought in 2002, but other area streams did not show this decline. The stream may have been impacted by a toxic spill or other disturbance that prevented recovery of the benthic community. Neills Creek [18-16-(0.7)c2] from US 401 to the Cape Fear River (1.6 miles) is Supporting aquatic life and recreation because no criteria were exceeded at site BA401.

#### 2005 Recommendations

DWQ will continue to monitor Neills Creek to evaluate recovery and investigate other disturbances that may have caused the decline in benthic community rating. It is recommended that MCFRBA (Appendix V) continue to monitor water quality in Neills Creek.

Segments 18-16-(0.3), (0.7)a, b and c1 will be added to the 303(d) list of Impaired waters. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

#### Water Quality Initiatives

The NCEEP Local Watershed Plan for Harris Lake and Tributaries, completed in 2004, includes Neills Creek. The plan findings are discussed under Kenneth Creek. The Final Local Watershed Plan for Middle Cape Fear and Kenneth/Harris Creeks may be viewed at:

<http://www.nceep.net/services/lwps/Harris-Kenneth/Harris-Kenneth.htm>

## 7.4 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.

### 7.4.1 Avents Creek [AU# 18-13-(2)]

#### Current Status and 2005 Recommendations

Avents Creek from upstream of SR 1418 to the Cape Fear River (5.5 miles) is Not Rated for recreation because the fecal coliform bacteria screening criteria were exceeded at site BA399. DWQ will determine if intensive sampling is needed to assess the fecal coliform bacteria standard in this creek (Appendix X).

#### Water Quality Initiatives

The NCEEP Local Watershed Plan for Harris Lake and Tributaries includes Avents Creek, Parkers Creek and Hector Creek. This watershed is approximately 54 square miles in size, and is located almost entirely within Harnett County. Raven Rock State Park is located along the Cape Fear River on the southern boundary of the watershed. There are no municipalities within the watershed. Most of the land area is part of the water supply watershed for the Town of Lillington, located farther downstream along the Cape Fear River. The three mainstem streams in this watershed, Parkers Creek, Avents Creek and Hector Creek, all have High Quality Waters designations. The Final Local Watershed Plan for Middle Cape Fear and Kenneth/Harris Creeks may be viewed at: <http://www.nceep.net/services/lwps/Harris-Kenneth/Harris-Kenneth.htm>

### 7.4.2 Daniels Creek [AU# 18-10-(2)]

#### Current Status and 2005 Recommendations

Daniels Creek from the source to the Cape Fear River (8.5 miles) is Not Rated for aquatic life on an evaluated basis because Broadway WWTP (NC0059242) had significant violations of dissolved oxygen permit limits, which could have adversely impacted aquatic life in the creek. The NPDES compliance process will be used to address the significant permit violations noted above.

### 7.4.3 Haw River [AU# 16-(42)]

#### Current Status and 2005 Recommendations

The Haw River from the Jordan Dam to the Cape Fear River (4.3 miles) is Supporting aquatic life because no criteria were exceeded at sites BA256 or BA257. However, Moncure Plywood (NC0023442) had significant violations of dissolved oxygen permit limits, which could have adversely impacted aquatic life in this segment. The NPDES compliance process will be used to address the significant permit violations noted above.

#### **7.4.4 Shaddox Creek [AU# 16-43]**

##### Current Status and 2005 Recommendations

Shaddox Creek from source to Haw River (8.1 miles) is Not Rated for aquatic life on an evaluated basis because Sierrapine Limited (NC0040701) had significant violations of total suspended solids permit limits, which could have adversely impacted aquatic life in this stream. The facility installed screens that have solved the TSS violations. The NPDES compliance process will be used to address the significant permit violations noted above.

#### **7.4.5 Utley Creek [AU# 18-7-5.5]**

##### Current Status and 2005 Recommendations

Utley Creek from source to Harris Lake (4.6 miles) was Not Rated in the 2000 plan, and no data were collected to assign a use support rating during this assessment period. Earlier studies indicated the Holly Springs WWTP was a significant contributor of nutrients to the creek that could cause algal blooms and subsequent fish kills downstream. Because of the water quality problems noted above, the 2000 basin plan recommended that Holly Springs pursue other alternatives to a discharge into Utley Creek. It was also recommended that land use planning be used to prevent further increases in nutrient loading from the developing watershed. DWQ continues to recommend that Holly Springs find another wastewater disposal alternative. Further recommendations to protect streams in urbanizing areas and to restore streams in existing urban areas are discussed in Chapter 31.

##### Water Quality Initiatives

The NCEEP Local Watershed Plan for Harris Lake and Tributaries includes Utley Creek. This watershed is approximately 80 square miles in size, extending south from the Town of Apex to the Cape Fear River and east from the Chatham/Wake County line to the Town of Holly Springs. Both Apex and Holly Springs span the ridgeline that separates the Neuse and Cape Fear River basins. The watershed contains Harris Lake, an impoundment of Buckhorn Creek, which is used by Progress Energy's Shearon Harris Nuclear Plant for cooling. The Local Watershed Plan for Middle Cape Fear and Kenneth/Harris Creeks may be viewed at:

<http://www.nceep.net/services/lwps/Harris-Kenneth/Harris-Kenneth.htm>