

# Chapter 7 - Cape Fear River Subbasin 03-06-07 Including Cape Fear River, Parkers and Neills Creeks

## 7.1 Water Quality Overview

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

#### **Land and Water Area (sq. mi.)**

Total area:	415
Land area:	403
Water area:	12

#### **Population Statistics**

1990 Est. Pop.:	39,713 people
Pop. Density:	99 persons/mi <sup>2</sup>

#### **Land Cover (%)**

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

#### **Use Support Ratings**

##### *Freshwater Streams:*

Fully Supporting:	239.4 mi.
Partially Supporting:	2.9 mi.
Not Supporting:	10.2 mi.
Not Rated:	44.8 mi.

##### *Lakes:*

Harris Lake - Fully Supporting

This subbasin contains approximately 25-river miles of the Cape Fear River from near the confluence of Lick Creek in Lee County to near Buies Creek in Harnett County. This subbasin contains many tributary streams that are completely contained within the Sand Hills, although other streams within this subbasin have piedmont or coastal plain characteristics as well. The sandy soils and high permeability rates of Sandhill soils allow for greater groundwater recharge than Slate Belt or Triassic Basin streams. Many streams within this ecoregion typically have 7Q10 flow rates greater than zero. A map of the subbasin, including water quality sampling locations, is presented in Figure B-7.

Biological ratings for these sample locations are presented in Table B-7. The current sampling resulted in impaired ratings for one stream 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 subbasin is primarily forested, although agriculture (including pasture and cultivated cropland) accounts for a significant amount of land use. The towns of Sanford, Fuquay-Varina and Lillington are the largest urban areas in the subbasin. Parkers Creek, Avents Creek and Hector Creek in Raven Rock State Park are rated as HQW. There are 16 permitted dischargers in the subbasin. Six of these facilities have permitted flows of 0.5 MGD or greater.

Bioclassifications based on benthic macroinvertebrate data for the Cape Fear River at Lillington have been Good, with only one exception, since the first survey in 1983. This includes basinwide surveys in 1993 and 1998. Fish tissue samples also were collected from the Cape Fear River at Lillington during 1998. Twenty-six specimens were analyzed for metal contaminants. Only one bowfin had mercury exceeding the EPA screening value. The Cape Fear River near Erwin had an Excellent benthos bioclassification in 1998 and in 1993.

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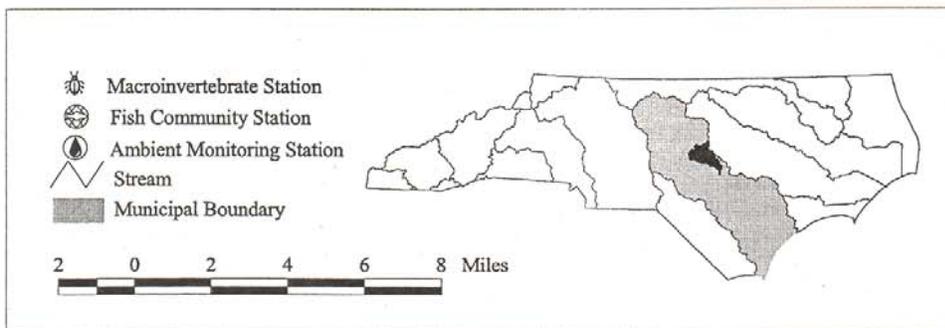
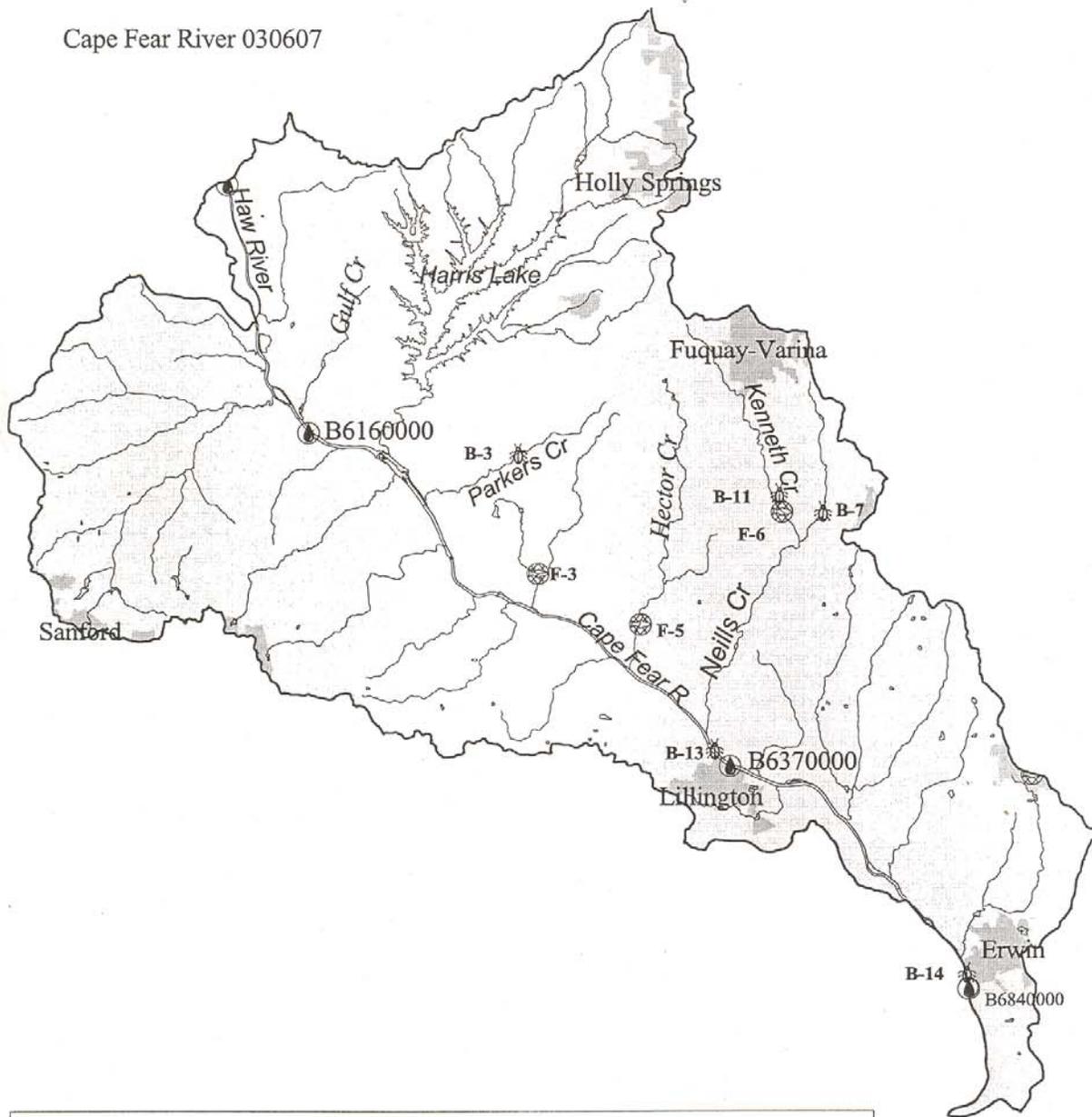


Figure B-7 Sampling Locations within Subbasin 03-06-07

Table B-7 Biological Assessment Sites in Cape Fear River Subbasin 03-06-07

<b>BENTHOS</b>				<b>Bioclassification</b>		
Site #	Stream	County	Location	1993	1998	
B-3	Parkers Creek	Harnett	SR 1450	Good (w) Good (s)	Good-Fair (w) Good-Fair (s)	
B-7	Neills Creek	Harnett	SR 1441	Fair (w)	Good-Fair (w)	
B-11	Kenneth Creek	Harnett	SR 1441	Poor (w)	Poor (w)	
B-13*	Cape Fear River	Harnett	US 401	Good (s)	Good (s)	
B-14	Cape Fear River	Harnett	NC 217	Excellent	Excellent	
<b>FISH</b>				<b>Bioclassification</b>		
Site #	Stream	County	Location	1994	1998	
F-5	Hector Creek	Harnett	SR 1412	no sample	Fair	
F-6	Kenneth Creek	Harnett	SR 1441	Poor	Poor	
<b>FISH TISSUE</b>				<b>No. Samples Exceeding Criteria</b>		
Station	Description	Year Sampled	Total Samples	Metals	Organics	Comments
FT-1	Cape Fear River at Lillington	1998	22	1	0	EPA mercury limit exceeded in 1 bowfin sample

(w) Winter collection (s) Summer collection

A 5-year decline in water quality was found at Parkers Creek based on basinwide benthos surveys conducted in 1993 and 1998. This decline was evident during surveys conducted during both winter and summer surveys at this location. Changes in land use activities and/or nonpoint source runoff in the watershed above the collection location may have accounted for the decline in water quality. There are no permitted point source facilities in the watershed. A 5-year improvement in bioclassification is noted at Neills Creek, although only one additional EPT taxa was collected during the 1998 survey to account for the change in bioclassification. The only Poor water quality indicated by macroinvertebrates and the fish community in this subbasin was for Kenneth Creek at a location below the Fuquay-Varina WWTP.

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.

## 7.2 Impaired Waters

Portions of Kenneth Creek, Gulf Creek and Neills Creek were identified as impaired in the 1996 Cape Fear River Basinwide Water Quality Plan. Portions of Kenneth 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 7.3 and waters with other issues, recommendations or projects are discussed in Part 7.4.

## **Kenneth Creek**

### 1996 Recommendations

Kenneth Creek (6.5 miles) was rated not supporting (NS) and partially supporting (PS) in the 1996 plan. The stream is a low flow stream that receives urban nonpoint source pollution and a 1.2 MGD discharge from the Fuquay-Varina WWTP. It was recommended that any new or expanding discharges to Kenneth Creek meet limits of 5 mg/l BOD<sub>5</sub> and 2 mg/l NH<sub>3</sub>-N.

### Current Status

There have been no new or expanding discharges to Kenneth Creek. Kenneth Creek (7.3 miles from source to Neills Creek) is currently not supporting (NS) according to recent DWQ monitoring because of an impaired biological community. Urban nonpoint source pollution from Fuquay-Varina and a discharge from the Fuquay-Varina WWTP are possible sources of impairment. There are also indications of nutrient enrichment in this stream. Kenneth Creek is on the state's year 2000 303(d) list (not yet EPA approved).

### 2000 Recommendations

Local initiatives are needed to improve water quality in Kenneth Creek. DWQ encourages development of a land use plan and stormwater program that protects water quality in this stream. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

## **Gulf Creek**

### Current Status

Gulf Creek (5.1 miles) was not supporting (NS) in the 1996 plan. The stream is currently partially supporting (PS) and not supporting (NS) according to 1993 DWQ monitoring data because of instream habitat degradation, possibly associated with nonpoint source runoff from a clay pit mine. The clay pit mine has BMPs in place as required in the general permit; however, there are indications that the BMPs are not protecting water quality. Gulf Creek is on the state's year 2000 303(d) list (not yet EPA approved).

### 2000 Recommendations

DWQ will continue to monitor implementation of BMPs to assess their ability to protect water quality. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

## **Neills Creek**

### Current Status

Neills Creek (2.4 miles) was partially supporting (PS) in the 1996 plan. This stream was sampled during recent DWQ monitoring, but was not rated below the confluence with Kenneth Creek. The upper segments are currently fully supporting (FS). Neills Creek has improved in water quality, but monitoring should be continued to assess sources of instream habitat degradation.

## **7.3 303(d) Listed Waters**

There are two streams (13.1 stream miles) in the subbasin that are impaired and on the state's year 2000 303(d) list (not yet EPA approved). Kenneth Creek and Gulf Creek are discussed above. For information on 303(d) listing requirements and approaches, refer to Appendix IV.

## **7.4 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.

Approximately 3% 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.

Parkers Creek is in an agricultural area, and streams in this watershed are subject to erosion and habitat degradation. DWQ encourages implementation of agricultural best management practices (BMPs), including fencing cattle out of streams that reduce potential impacts to surface waters.

## **Development in Harris Lake Watershed**

Harris Lake watershed is in an area that is experiencing rapid growth. Harris Lake will be increasingly impacted by nonpoint sources. As land in the watershed is converted from forest and agricultural land uses to residential and commercial land uses, the streams feeding Harris Lake will be subjected to higher flows during rain events and increased delivery of pollutants and

nutrients. This may result in streambank erosion, habitat degradation and increased potential for algal blooms in slow-flowing sections of the streams and in Harris Lake.

Communities in western Wake County are pursuing a discharge into the Cape Fear River in this subbasin. A model approach is needed that takes into account algal activity upstream of Buckhorn dam to determine wasteload allocation in this segment of the Haw/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.

### **The Middle Cape Fear River Basin Association (MCFRBA)**

The Middle Cape Fear River Basin Association (MCFRBA) started sampling at eight 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 as well as in Lick, Buckhorn, Avents and Buies Creeks. 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.

### **Utley Creek**

#### 1996 Recommendations

Utley Creek had recommendations that were not specifically linked to an impaired stream. Because of the high instream waste concentration of Holly Springs WWTP, it was recommended that a survey be conducted below the discharge to determine water quality impacts.

#### Current Status

Utley Creek is a low flow stream (7Q10 = 0.11cfs) that currently receives a 0.5 MGD discharge from the Town of Holly Springs. Water quality data has been collected from a site just below Thomas Mill Pond (approximately 1 mile below discharge point) as well as other areas of the watershed. Calculated dissolved oxygen (DO) saturation values exceeded the state standard of 110% in 91 of 218 samples (42%) evaluated from January 1994 to May 1997. In July 1996, DWQ staff documented an algal bloom in Thomas Mill Pond and a fish kill further downstream. Dissolved oxygen (DO) levels at the fish kill site ranged from 0.2 to 0.5 mg/l. In summer 1997, DWQ staff noted a large algal bloom in a waterfowl impoundment downstream of Thomas Mill Pond. Total phosphorus (TP) and total nitrogen (TN) levels are higher below the Holly Springs WWTP discharge than in the stream above the discharge. Because of the mostly forested nature of the Utley Creek watershed and the observations noted above, it is believed that the Holly Springs WWTP is the major contributor of nutrients to this stream. In summer months, this discharge can greatly increase the potential for algal blooms and subsequent fish kills.

### 2000 Recommendations

Utley Creek is currently not rated. Water quality in Utley Creek is marginal with the current discharge and low impact land uses. Increased flow from the WWTP, as well as the expected stormwater flow, has the potential to not only increase nutrient loading but also increase sedimentation and streambank erosion. Land use planning in the watershed that considers water quality concerns is needed prior to large-scale development projects to minimize runoff effects. Because of water quality concerns in Utley Creek and the expected urbanization of the Harris Lake watershed, DWQ recommends that Holly Springs explore other means of sewage disposal including connection to existing facilities in the area.