Chapter 3
Cape Fear River Subbasin 03-06-03
Including: Little Alamance Creek, Big Alamance Creek and Stinking Quarter Creek

3.1 Subbasin Overview

Subbasin 03-06-03 at a Glance

Land and Water Area

Total area:	263 mi²
Land area:	262 mi²
Water area:	1 mi²

Population Statistics

2000 Est. Pop.: 132,837 people
Pop. Density: 508 persons/mi²

Land Cover (percent)

Forest/Wetland:	59.4%
Surface Water:	0.2%
Urban:	5.8%
Cultivated Crop:	2.2%
Pasture/ Managed Herbaceous:	32.4%

Counties

Alamance, Guilford and Randolph

Municipalities

Alamance, Burlington, Elon and Graham

Subbasin 03-06-03 is a piedmont watershed characterized by highly erodible soils. Most of the watershed is forested with extensive agriculture present. Development is occurring along the I-85/40 corridor in and around Burlington. Population is expected to grow by 120,000 people in counties with portions or all of their areas in this subbasin by 2020.

There are six individual NPDES wastewater discharge permits in this subbasin with a permitted flow of 12.1 MGD (Figure 6). The largest is South Burlington WWTP (12 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 3.3 for Impaired waters and in Section 3.4 for other waters.

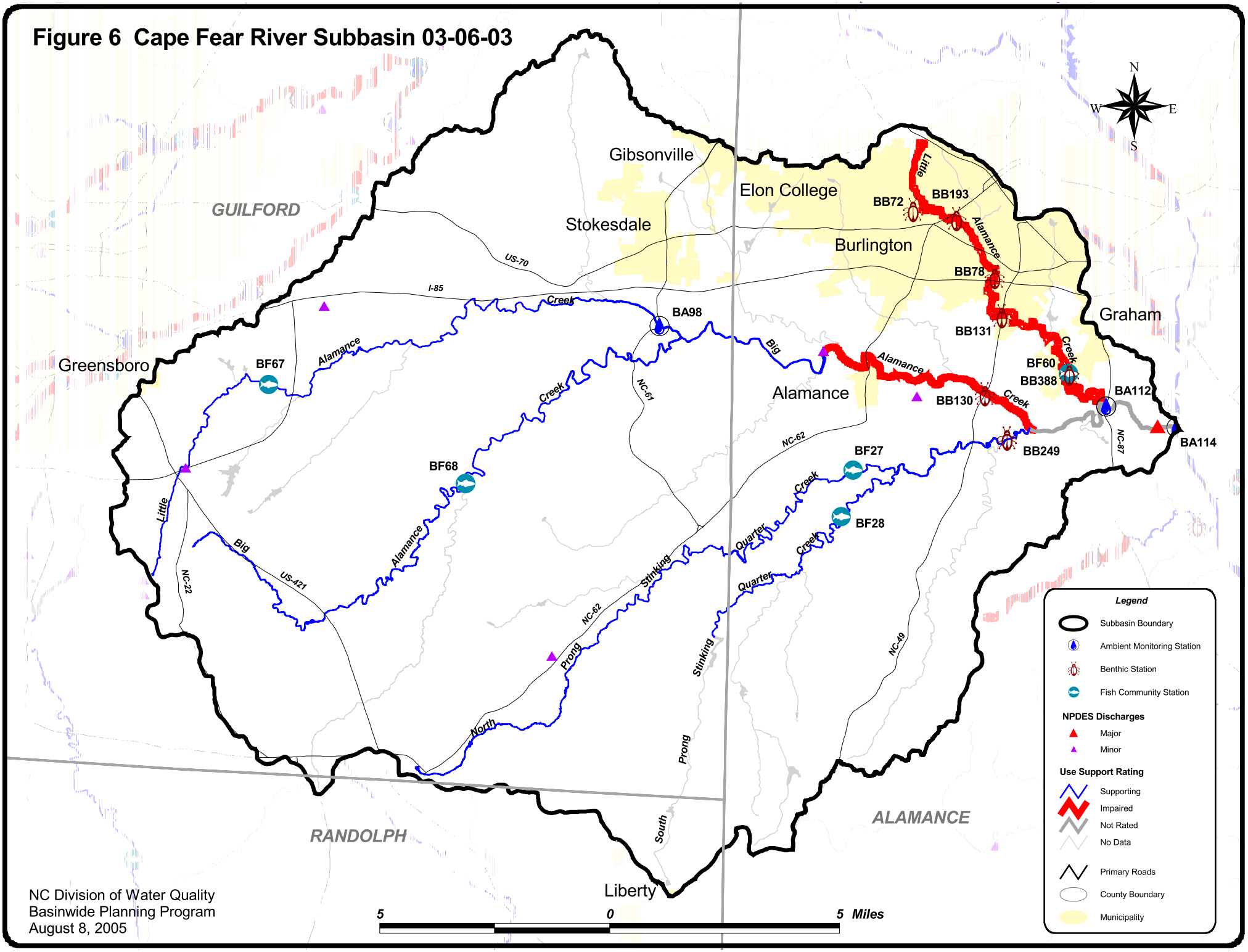
Burlington and Graham are the only municipal areas in this subbasin required to develop stormwater programs (Chapter 31).

There are three registered swine operations and two registered dairy operations in this subbasin. Issues related to agricultural activities are discussed below in Section 3.3 for Impaired waters.

There were six benthic macroinvertebrate community samples and five fish community samples (Figure 6 and Table 6) collected during this assessment period. Data were also collected from three ambient monitoring stations including one DWQ station, one UCFRBA (Appendix V) station, and one shared ambient station. One reservoir 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 6 Cape Fear River Subbasin 03-06-03



NC Division of Water Quality
Basinwide Planning Program
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Table 6 CAPE FEAR Subbasin 03-06-03

AU Number	Classification	Length/Area	Description	Aquatic Life Assessment					Recreation Assessment			Stressors	Sources
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result		
Big Alamance Creek (Alamance Cr)(Lk Macintoch)													
16-19-(2.5)	WS-IV NS	67.7 FW Acres	From a point 2.4 miles downstream of Guilford County SR 3045 to dam at Lake Macintosh	**S**	BL8 BL9	NCE NCE			ND				
16-19-(4.5)a	C NSW	5.6 FW Miles	From Dam at Lake Macintosh to confluence with Stinking Quarter Creek	**I**	BB130	F	2003		ND			Habitat Degradation Habitat Degradation	Agriculture MS4 NPDES
16-19-(4.5)b	C NSW	4.6 FW Miles	From confluence with Stinking Quarter Creek to Haw River	**NR**	BA112 BA114	NCE NCE	Turbidity	7.3	**NR***	BA112	NCE		
Big Alamance Creek (Alamance Creek)													
16-19-(1)	WS-IV NS	18.0 FW Miles	From source to a point 2.4 miles downstream of Guilford County SR 3045	**S**	BF68 BF68 BF68	G F GF	1999 1999 2003		ND				
Little Alamance Creek (Gant Lake, Mays Lake)(Alamance County													
16-19-11	C NSW	12.6 FW Miles	From source to Big Alamance Creek	**I**	BB131 BB193 BB388 BB78 BF60	P P F P G	2003 2003 2003 2003 2003		ND			Habitat Degradation	MS4 NPDES
Little Alamance Creek (Guilford County)													
16-19-3-(0.5)	WS-IV NS	15.0 FW Miles	From source to a point 0.3 mile downstream of Guilford County SR 3073	**S**	BF67	GF	2003		ND				
Little Alamance Creek(Guilford County)													
16-19-3-(4.5)	WS-IV NS	3.6 FW Miles	From a point 0.3 mile downstream of Guilford County SR 3073 to Lake Macintosh, Big Alamance Creek	**S**	BA98	NCE			**S**	BA98	NCE		

Table 6 CAPE FEAR Subbasin 03-06-03

AU Number / Description	Classification	Length/Area	Aquatic Life Assessment: AL Rating	Station	Result	Year/ Parameter	% Exc	Recreation Assessment: REC Rating	Station	Result	Stressors	Sources
North Prong Stinking Quarter Creek												
16-19-8-1	C NSW	18.3 FW Miles	**S**					ND				
From source to Stinking Quarter Creek				BF27	G	2003						
South Prong Stinking Quarter Creek												
16-19-8-2-(2)	C NSW	8.3 FW Miles	**S**					ND				
From dam at Kimesville Lake to Stinking Quarter Creek				BF28	E	2003						
Stinking Quarter Creek												
16-19-8	C NSW	4.6 FW Miles	**S**					ND			Habitat Degradation	
from source to Big Alamance Creek				BB249	GF	2003						
				BB249	F	2003						

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	**Results**
		NI - Not Impaired	CE-Criteria Exceeded > 10% and more than 10 samples
	Miles/Acres	S- Severe Stress	NCE-No Criteria Exceeded
	FW- Fresh Water	M-Moderate Stress	
	S- Salt Water	N- Natural	

Aquatic Life Rating Summary

S	m	67.8	FW Miles
NR	m	4.6	FW Miles
I	m	18.2	FW Miles
S	m	67.7	FW Acres
ND		110.4	FW Miles
ND		3.0	FW Acres

Recreation Rating Summary

S	m	3.6	FW Miles
NR*	m	4.6	FW Miles
ND		192.9	FW Miles
ND		70.7	FW Acres

Fish Consumption Rating Summary

I	e	201.1	FW Miles
I	e	70.7	FW Acres

3.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-06-03 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 (70.7 acres and 77 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 90.6 stream miles (45.1 percent) and 67.6 freshwater acres (95.7 percent) monitored during this assessment period in the aquatic life category. There were 18.2 miles (9.1 percent) of Impaired waters in this category.

3.3 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.

3.3.1 Little Alamance Creek [AU# 16-19-11]

2000 Recommendations
The 2000 basinwide plan recommended that Little Alamance Creek be resampled and the City of Burlington address stormwater issues in the creek as part of the Phase II stormwater program.

Current Status
Little Alamance Creek from source to Big Alamance Creek (12.6 miles) is Impaired because of Fair and Poor benthic community ratings at sites BB388, BB193, BB131 and BB78. A DWQ TMDL stressor study found that urban runoff from large impervious surface areas in the watershed have caused stream channelization with associated habitat degradation. Pollutants associated with urban runoff as well as riparian area removals are also noted stressors to the benthic community. Streambank erosion was noted and many storm sewers discharge into the stream. In the lower watershed, land clearing was noted associated with many residential developments.

2005 Recommendations
DWQ will continue to monitor water quality in the Little Alamance Creek watershed and work with the Burlington and Graham stormwater programs to reduce further impacts due to new development and to implement BMPs and restore instream habitat in Little Alamance Creek.

Further recommendations to protect streams in urbanizing areas and to restore streams in existing urban areas are discussed in Chapter 31.

Little Alamance Creek will remain on the 303(d) list of Impaired waters. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

3.3.2 Big Alamance Creek [AU# 16-19-(4.5)a and b]

Current Status
Big Alamance Creek was Fully Supporting in the 2000 basin plan; however, Big Alamance Creek [16-19-(4.5)a] from dam at Lake Macintosh to Stinking Quarter Creek (5.6 miles) is currently Impaired because of a Fair benthic community rating at site BB130. Runoff from agriculture and urbanizing areas in the watershed are impacting water quality in Big Alamance Creek. The channel is entrenched and severe streambank erosion was noted. Effects of drought and high flows late in the assessment period may have impacted the benthic community as well.

Big Alamance Creek [16-19-(4.5)b] from Stinking Quarter Creek to the Haw River (4.6 miles) is Not Rated for recreation because fecal coliform bacteria screening criteria were exceeded at site BA112. This segment is Supporting aquatic life, although turbidity exceeded the standard in 7 percent of samples collected at site BA112. Burlington Southside WWTP (NC0023876) had significant violations of biological oxygen demand permit limits during the last two years of the assessment period. The violation occurred during a period of extremely wet weather and likely did not impact water quality at that time. There has been only one violation since the installation of new equipment.

2005 Recommendations
DWQ will continue to monitor water quality in the Big Alamance Creek watershed and work with the Burlington stormwater programs to reduce further impacts due to new development and to implement BMPs and restore instream habitat in Big Alamance Creek. The NPDES compliance process will be used to address the significant permit violations noted above. DWQ will determine if intensive sampling is needed to assess the fecal coliform bacteria standard in this creek (Appendix X). DWQ will continue to work with DSWC staff to assure that agricultural impacts are minimized in this watershed.

Big Alamance 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.

3.4 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.

3.4.1 North Prong Stinking Quarter Creek [AU# 16-19-8-1]

Current Status and 2005 Recommendations
North Prong Stinking Quarter Creek from source to Stinking Quarter Creek (18.3 miles) is Supporting aquatic life because of a Good fish community rating at site BF27. Nathaniel Greene Elementary School (NC0038164) had significant violations of pH limits during the last two years of the assessment period that may have adversely impacted water quality in this creek. The NPDES compliance process will be used to address the permit violations. The school is planning to move the discharge point further downstream. DWQ will work with the school to evaluate the effectiveness of the treatment plant and make any changes needed to maintain compliance with permit limits. DWQ will continue to monitor water quality in this watershed.

3.5 Additional Water Quality Issues within Subbasin 03-06-03

The following section discusses issues that may threaten water quality in the subbasin that are not specific to particular streams, lakes or reservoirs. The issues discussed may be related to waters near certain land use activities or within proximity to different pollution sources. This section also identifies those surface waters given an Excellent bioclassification, and therefore, may be eligible for reclassification to a High Quality Water (HQW) or an Outstanding Resource Water (ORW). For more information regarding water quality standards and classifications, please refer to Chapter 25.

3.5.1 Jordan Haw River Watershed Nutrient Sensitive Waters Strategy

All land uses and discharges of wastewater and stormwater in subbasin 03-06-03 potentially contribute nutrients to Jordan Reservoir in subbasins 03-06-04 and 03-06-05. The reservoir is Impaired for aquatic life because chlorophyll *a* violated the standard in all segments of the reservoir. Refer to Chapter 36 for more information on this strategy.

3.5.2 Surface Waters Identified for Potential Reclassification

South Prong Stinking Quarter Creek [AU# 16-19-8-2-(2)]
South Prong Stinking Quarter Creek from dam at Kimesville Lake to Stinking Quarter Creek (8.3 miles) is Supporting because of an Excellent fish community rating at site BF28. DWQ will consider pursuing reclassification of this creek to include a supplemental classification of ORW (Chapter 25).