Chapter 8
Cape Fear River Subbasin 03-06-08

Including: East Fork Deep River, West Fork Deep River, Deep River, Randleman Reservoir, Richland Creek, Hickory Creek, Muddy Creek and Oak Hollow Lake

8.1 Subbasin Overview

Subbasin 03-06-08 at a Glance

Land and Water Area

Total area:	179 mi²
Land area:	177 mi²
Water area:	2 mi²

Population Statistics

2000 Est. Pop.: 91,181people
Pop. Density: 510 persons/mi²

Land Cover (percent)

Forest/Wetland:	58.4%
Surface Water:	1.7%
Urban:	13.0%
Cultivated Crop:	1.5%
Pasture/ Managed Herbaceous:	25.4%

Counties

Forsyth, Guilford and Randolph

Municipalities

Archdale, Greensboro, Highpoint, Kernersville and Randleman

Subbasin 03-06-08 is a piedmont watershed containing the headwaters of the Deep River. The watershed is forested in the south, but has large developed areas in the northern portion. Development is occurring between Greensboro and High Point. Population is expected to grow by 265,000 people in counties with portions or all of their areas in this subbasin by 2020.

There are 23 individual NPDES wastewater discharge permits in this subbasin with a permitted flow of 29.4 MGD (Figure 11). The largest are Eastside WWTP (16 MGD), Ward WTP (10 MGD) and Randleman WWTP (1.7 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 8.3 for Impaired waters and in Section 8.4 for other waters.

There are five registered dairy operations in this subbasin.

There were 16 benthic community samples and five fish community samples (Figure 11 and Table 11) collected during this assessment period. Data were also collected from 14 ambient monitoring stations including four UCFRBA (Appendix V) stations, four DWQ stations, three DWQ special study stations, two Greensboro stations, and two shared ambient stations. 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.

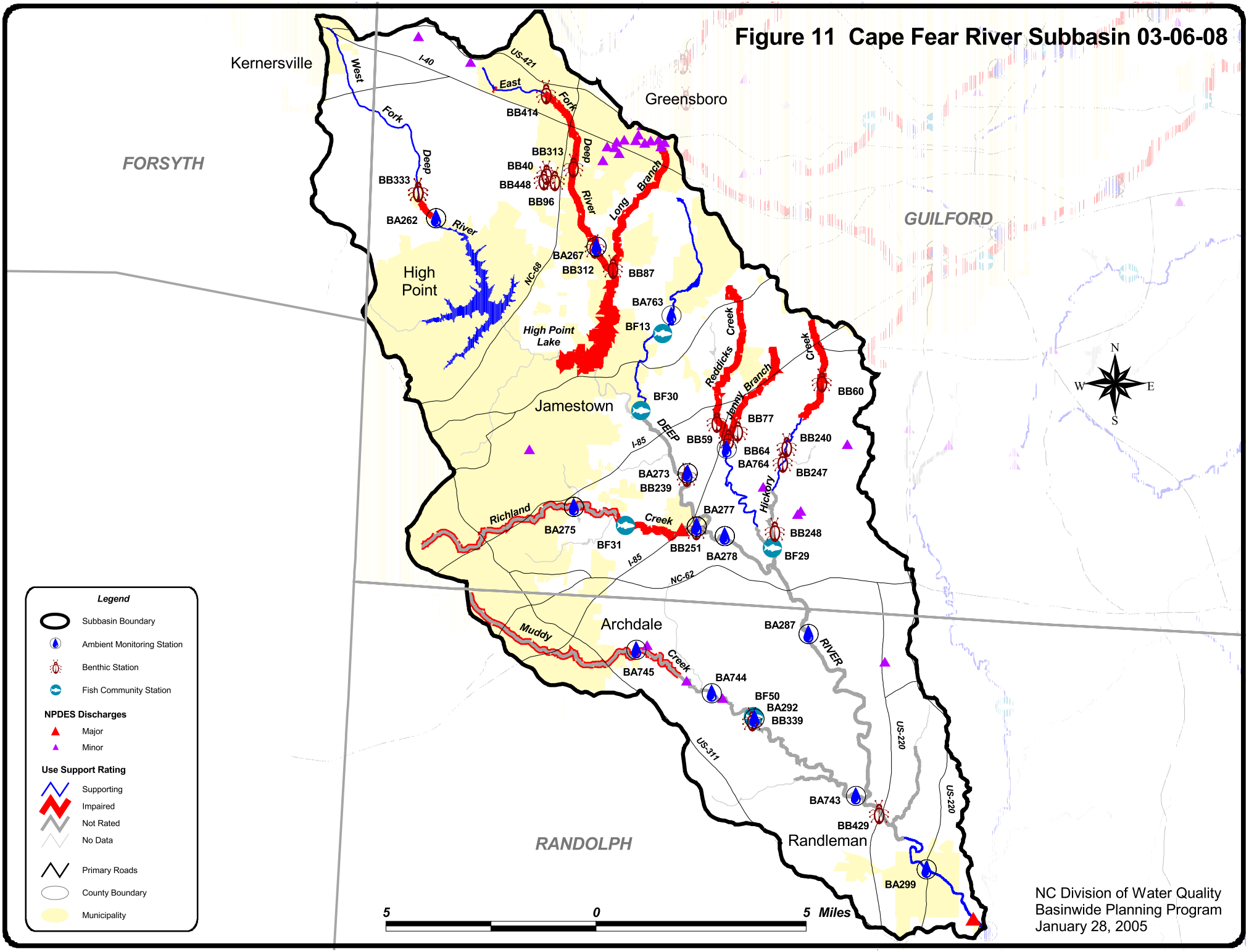
Figure 11 Cape Fear River Subbasin 03-06-08
Kernersville
Greensboro
High Point
Jamestown
Archdale
Randleman
FORSYTH
GUILFORD
RANDOLPH
West Fork Deep River
East Fork Deep River
Long Branch
Reddicks Creek
Jenny Branch
Hickory Creek
Richland Creek
Muddy Creek
High Point Lake
I-40
US-421
NC-68
I-85
NC-62
US-311
US-220
BB414
BB313
BB40
BB448
BB96
BB333
BA262
BA267
BB312
BB87
BA763
BF13
BF30
BB60
BB77
BB59
BB64
BA764
BB240
BB247
BA273
BB239
BA277
BB248
BF29
BA275
BF31
BB251
BA278
BA745
BA744
BF50
BA292
BB339
BA287
BA743
BB429
BA299
N
S
E
W
5 0 5 Miles
Legend
Subbasin Boundary
Ambient Monitoring Station
Benthic Station
Fish Community Station
NPDES Discharges
Major
Minor
Use Support Rating
Supporting
Impaired
Not Rated
No Data
Primary Roads
County Boundary
Municipality
NC Division of Water Quality
Basinwide Planning Program
January 28, 2005

Table 11 CAPE FEAR Subbasin 03-06-08

AU Number	Classification	Length/Area	Description	Aquatic Life Assessment						Recreation Assessment					
				AL Rating	Station	Result	Year/ Parameter	% Exc		REC Rating	Station	Result		Stressors	Sources
Bull Run															
17-5-(1)	WS-IV *	7.2 FW Miles	From a source to a point 0.5 mile upstream of mouth	S	BA763	NCE				S	BA763	NCE			
					BF13	GF	1999								
17-5-(2)	WS-IV CA	0.6 FW Miles	From a point 0.5 mile upstream of mouth to Randleman Reservoir, Deep River	S						ND					
					BF30	GF	2003								
DEEP RIVER															
17-(10.5)a	C	1.6 FW Miles	From dam at Randleman Reservoir to US 220 Business	S	BA299	NCE	Turbidity	7.3		NR*	BA299	NCE		Fecal Coliform Bacteria	Unknown
														Turbidity	Unknown
17-(10.5)b	C	2.2 FW Miles	From US 220 business to Subbasin 03-06-08 and 03-06-09 boundary	S	BA301	NCE	Turbidity	8.3		NR*	BA301	NCE		Fecal Coliform Bacteria	Unknown
														Turbidity	Unknown
17-(4)a	WS-IV CA	2.0 FW Miles	From dam at Oakdale Cotton Mills, Inc. to SR 1113	NR	BA273	NCE				NR*	BA273	NCE		Fecal Coliform Bacteria	Unknown
					BB239	F	1998							Low Dissolved Oxygen	Unknown
17-(4)b	WS-IV CA	6.6 FW Miles	From Kivett Drive to Coltrane Mill Road	NR	BA277	CE	Arsenic	17.6		NR*	BA277	CE		Low Dissolved Oxygen	Unknown
					BA278	CE	Low DO	10.1			BA277	NCE		Fecal Coliform Bacteria	Unknown
					BB248	GF	2003							Arsenic	Unknown
					BB251	F	2003								
17-(4)c	WS-IV CA	7.4 FW Miles	From Coltrane Mill Road to dam at Randleman Reservoir (located 1.6 mile upstream of US Hwy 220 Business)	NR	BA287	NCE				NR*	BA287	NCE		Fecal Coliform Bacteria	Unknown
											BA292	NCE			
											BA743	CE			
											BA744	CE			
					BB429	GF	2003								
DEEP RIVER(including High Point Lake at normal pool elevation)															
17-(1)	WS-IV CA	263.3 FW Acres	From source in backwaters of High Point Lake to dam at High Point Lake(City of High Point water supply intake)	I	BL19	CE	Chlor a	20		ND				Chlorophyll a	Pasture
														Chlorophyll a	Agriculture
														Chlorophyll a	MS4 NPDES

Table 11 CAPE FEAR Subbasin 03-06-08

AU Number / Description	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Stressors	Sources
			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result		
East Fork Deep River												
17-2-(0.3)a	WS-IV *	1.9 FW Miles	S					ND			Habitat Degradation	MS4 NPDES
From source to Thatcher Road				BB414	GF	2003						
17-2-(0.3)b	WS-IV *	4.8 FW Miles	I	BA267	CE	Turbidity	10.9	I	BA267	CE	Fecal Coliform Bacteria	MS4 NPDES
From Thatcher Road to a point 0.4 mile downstream of Guilford County SR 1541				BB312	F	2003					Turbidity	MS4 NPDES
				BB313	F	2003						
17-2-(0.7)	WS-IV CA	0.8 FW Miles	I	BA267	CE	Turbidity	10.9	ND	BA267	CE		
From a point 0.4 mile downstream of Guilford County SR 1541 to High Point Lake, Deep River												
Hickory Creek												
17-8.5-(1)a	WS-IV *	3.0 FW Miles	I					ND				
From source to Rolling Brook Drive				BB60	F	2003						
17-8.5-(1)b	WS-IV *	1.3 FW Miles	S					ND				
From Rolling Brook Drive to a point 0.6 mile upstream of mouth				BB240	GF	2003						
17-8.5-(3)	WS-IV CA	0.9 FW Miles	S					ND			Habitat Degradation	
From a point 0.6 mile upstream of mouth to Randleman Reservoir, Deep River				BB247	GF	2003						
Jenny Branch												
17-8-2	WS-IV *	3.2 FW Miles	I					ND				
From source to Reddicks Creek				BB64	F	2003						
Long Branch												
17-2-1-(1)	WS-IV *	3.5 FW Miles	I					ND				
From source to a point 0.5 mile downstream of Guilford County SR 1541				BB87	F	2003						
17-2-1-(2)	WS-IV CA	0.5 FW Miles	I					ND				
From a point 0.5 mile downstream of Guilford County SR 1541 to East Fork Deep River				BB87	F	2003						

Table 11 CAPE FEAR Subbasin 03-06-08

AU Number / Description	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Stressors	Sources
			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result		
Muddy Creek												
17-9-(1)	WS-IV *	6.9 FW Miles	**NR**					**I**	BA745	CE	Habitat Degradation	MS4 NPDES
From source to a point 0.5 mile upstream of mouth											Fecal Coliform Bacteria	MS4 NPDES
17-9-(2)	WS-IV CA	0.8 FW Miles	**NR**					**NR***				
From a point 0.5 mile upstream of mouth to Randleman Reservoir				BB339	F	2003						
				BF50	G	2003						
Reddicks Creek												
17-8-(0.5)a	WS-IV *	5.1 FW Miles	**I**					ND			Habitat Degradation	MS4 NPDES
From source to Groomtown Road				BB59	F	2003						
17-8-(0.5)b	WS-IV *	1.8 FW Miles	**S**	BA764	NCE			**S**	BA764	NCE		
From Groomtown Road to a point 0.9 mile upstream of mouth				BB77	GF	2003						
17-8-(3)	WS-IV CA	1.6 FW Miles	**S**	BA764	NCE			**S**	BA764	NCE		
From a point 0.9 mile upstream of mouth to Randleman Reservoir, Deep River												
Richland Creek												
17-7-(0.5)	WS-IV *	6.4 FW Miles	**NR**	BA275	NCE	Turbidity	7.3	**I**	BA275	CE	Fecal Coliform Bacteria	MS4 NPDES
									BA275	NCE	Turbidity	MS4 NPDES
From source to a point 0.4 mile upstream of Guilfors												
17-7-(4)	WS-IV CA	1.7 FW Miles	**I**					ND			Habitat Degradation	WWTP NPDES
From a point 0.4 mile upstream of Guilford County SR 1154 to Randleman Reservoir, Deep River				BF31	F	2003					Habitat Degradation	MS4 NPDES
West Fork Deep River												
17-3-(0.3)	WS-IV *	5.4 FW Miles	**S**					ND			Habitat Degradation	MS4 NPDES
From source to a point 0.3 mile downstream of Guilford County SR 1850				BB333	GF	2003						
				BB333	GF	2003						
				BB333	GF	1998						

Table 11 CAPE FEAR Subbasin 03-06-08

AU Number	Classification	Length/Area	Description	Aquatic Life Assessment					Recreation Assessment			Stressors	Sources
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result		
West Fork Deep River(Oak Hollow Reservoir)													
17-3-(0.7)a	WS-IV CA	0.5 FW Miles	From a point 0.3 mile downstream of Guilford County SR 1850 to SR 1818	I	BA262	CE	Turbidity	22.9	NR*	BA262	NCE	Fecal Coliform Bacteria	MS4 NPDES
17-3-(0.7)b	WS-IV CA	705.4 FW Acres	From SR 1818 to dam at Oak Hollow Reservoir	S	BL22	NCE			ND				

AL - Aquatic Life
REC - Recreation

BF - Fish Community Survey
BB - Benthic Community Survey
BA - Ambient Monitoring Site
BL- Lake Monitoring
S- DEH RECMON

Miles/Acres
FW- Fresh Water
S- Salt Water

E - Excellent
G - Good
GF - Good-Fair
F - Fair
P - Poor
NI - Not Impaired
S- Severe Stress
M-Moderate Stress
N- Natural

S - Supporting, I - Impaired
NR - Not Rated
NR*- Not Rated for Recreation (screening criteria exceeded)
ND-No Data Collected to make assessment

Results
CE-Criteria Exceeded > 10% and more than 10 samples
NCE-No Criteria Exceeded

Aquatic Life Rating Summary

S	m	24.3	FW Miles
NR	m	30.1	FW Miles
I	m	23.1	FW Miles
S	m	705.4	FW Acres
I	m	263.3	FW Acres
ND		28.3	FW Miles

Recreation Rating Summary

S	m	10.5	FW Miles
NR*	m	21.1	FW Miles
I	m	18.1	FW Miles
ND		56.1	FW Miles
ND		968.7	FW Acres

Fish Consumption Rating Summary

I	e	105.8	FW Miles
I	e	968.7	FW Acres

8.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-06-08 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 (968.7 acres and 107.2 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 77.5 stream miles (73.3 percent) and 968.7 freshwater acres (100 percent) monitored during this assessment period in the aquatic life category. There are 23.1 stream miles (21.8 percent) and 263.3 acres (27.2 percent) identified as Impaired in this same category. There were also 18.1 miles (17.1percent) Impaired for recreation in this subbasin.

8.3 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.

8.3.1 Deep River [AU# 17-(3.3), (3.7), (4)a, b, c, (10.5)a and b]

2000 Recommendations
The 2000 basin plan recommended that the Deep River be resampled and that a TMDL for fecal coliform bacteria be developed.

Current Status
The Deep River [17-(4)a] from dam at Oakdale Cotton Mill to SR 1113 (2 miles) is Not Rated for aquatic life because this segment will be inundated by Randleman Reservoir. The fish community rating at site BB239 was Fair, and dissolved oxygen was low 24 percent of samples collected at site BA273. Data from these sites suggest water quality problems that would result in an Impaired rating for a flowing stream in the piedmont.

The Deep River [17-(4)b] from SR 1113 (Kivett Drive) to SR 1921 (Coltrane Mill Road) (6.6 miles) is Not Rated for aquatic life because this segment will be inundated by Randleman Reservoir. Dissolved oxygen violated the standard in 10 percent of samples collected at site BA278. Data from this site suggest water quality problems that would result in an Impaired rating for a flowing stream in the piedmont. This segment is Not Rated for recreation, although the fecal coliform bacteria standard was violated.

Dissolved oxygen also violated water quality standards in 10 percent of samples, and arsenic violated water quality standards in 17.6 percent of samples at site BA277. The benthic community rating at site BB251 was also Fair. High Point Eastside WWTP (NC0024210) had significant violations of the biological oxygen demand permit limit during the assessment period, which may have contributed to the low dissolved oxygen levels noted above. High Point Eastside has nearly completed an expansion and upgrade of the facility to 26 MGD and experienced much better operations in 2004. This discharge will be relocated to the main body of the reservoir and sites BB251 and BA277 will be inundated by Randleman Reservoir; therefore, these sites were not used to assign use support ratings to Richland Creek or the Deep River.

The Deep River [17-(4)c] from SR 1921 to Randleman dam (7.4 miles) is Not Rated for aquatic life because this segment will be inundated by Randleman Reservoir. The benthic community rating at site BB429 has been Good-Fair since 1983. The smell of sewage has been noted at this site and the water is turbid after heavy rains. There were also indicators of low dissolved oxygen at this site. Hidden Forest Estates WWTP (NC0065358) had significant violations of fecal coliform bacteria permit limits during the last two years of the assessment period. This segment is Not Rated for recreation, although the fecal coliform bacteria standard was violated. The WWTP has had only one violation since 2003.

A TMDL developed for these three segments called for a 75 percent reduction in fecal coliform bacteria in order the meet the standard. Sources of fecal coliform bacteria include the Greensboro and High Point MS4s.

The Deep River [17-(10.5)a] from dam at Randleman Reservoir to US 220 Business (1.6 miles) is Not Rated for recreation because fecal coliform bacteria screening criteria were exceeded at site BA299.

These segments of the Deep River were Fully Supporting in the 2000 plan. The Deep River [17-(10.5)b] from US 220 to subbasin boundary (2.2 miles) is Supporting aquatic life because no criteria were exceeded at site BA301. The Randleman WWTP (NC0025445) had significant violations of fecal coliform bacteria permit limits during the last two years of the assessment period.

2005 Recommendations

DWQ will monitor Randleman Reservoir as part of the lakes monitoring program, collecting appropriate data to assign use support ratings in reservoirs. It is recommended that High Point and Greensboro address water quality problems identified above through their respective stormwater programs, including the reductions in fecal coliform bacteria specified in the TMDL. The NPDES compliance process will be used to address the significant permit violations noted above.

Segments 17-(3.3), (3.7), (4)a, b and c will be inundated by the Randleman Reservoir project. These segments will be considered for removal from the 303(d) list of Impaired waters because the sites used to initially assign use support ratings will not be resampled due to inundation.

8.3.2 Deep River (High Point Lake) [AU#17-(1)]

Current Status
High Point Lake was Fully Supporting in the 2000 basin; however, High Point Lake (263.3 acres) is currently Impaired for aquatic life because 20 percent of chlorophyll *a* samples violated the water quality standard. Nutrient levels in the reservoir were high, and the lake has been hypereutrophic as noted in previous years. Dissolved oxygen has been low in the lake, and High Point has installed a forced air destratification system to address the problem. Algal blooms have been noted and numerous complaints have been received of taste, odor and aesthetic problems in treated drinking water. Filamentous algae have formed in thick mats that have clogged water intakes and fouled boat motors. Pesticides have also been a noted problem in the lake.

2005 Recommendations
DWQ will continue to monitor High Point Lake. It is recommended that High Point and Greensboro address water quality problems identified above through their respective stormwater programs, including reductions in nutrient loading that are driving algal blooms in High Point Lake.

High Point Lake will be added to the 303(d) list, which will require TMDL development within 8-13 years of listing. Once a TMDL is developed and approved, Greensboro and High Point will be required to address the pollutant(s) through their stormwater and collection systems permits.

8.3.3 East Fork Deep River [AU# 17-2-(0.3)a and b and (0.7)]

2000 Recommendations
The 2000 basin plan recommended that the East Fork Deep River be resampled and TMDLs be developed for fecal coliform bacteria and turbidity and to work with the City of Greensboro stormwater program to improve water quality.

Current Status
The East Fork Deep River [17-2-(0.3)a] from source to Thatcher Road (1.9 miles) is Supporting aquatic life because of a Good-Fair benthic community rating at site BB414. This segment is Impaired for recreation because the fecal coliform bacteria standard was violated at sites monitored by PTCOG (discussed below).

The East Fork Deep River [17-(0.3)b and (0.7)] from Thatcher Road to High Point Lake (5.6 miles) is Impaired for aquatic life because of Fair benthic community ratings at sites BB313 and BB312. Also the turbidity standard was violated in 10.9 percent samples at site BA267. A TMDL stressor study completed in 2003 found that sedimentation, habitat degradation and scour from storm flows were stressors to the benthic community.

This lower segment is also Impaired for recreation because the fecal coliform bacteria standard was violated at site BA267 and at sites in the watershed sampled as part of a bacteria source tracking study by PTCOG (Appendix V). The approved TMDL called for between a 63 and 75 percent reduction in fecal coliform bacteria and a 62 percent reduction in total suspended solids in order to meet the turbidity standard. Sources of fecal coliform include the Greensboro and High Point sewer systems and other urban watershed inputs.

A stressor survey conducted in 2003 found habitat degradation caused by modified watershed hydrology resulting in streambank erosion and sedimentation continues to stress the benthic community in East Fork Deep River. The survey also noted storm sewer discharges into the stream. The watershed drains heavily urbanized areas of Greensboro including the Piedmont Triad International Airport as well many petroleum storage sites.

DWQ performed a statistical trend analysis at site BA267 using total nitrogen, total phosphorus and total suspended solids data collected from 1990 to 2004. There was a significant decrease in total phosphorus of 0.0033 mg/l per year in East Fork of Deep River. There were no trends noted in the other parameters.

Two unnamed tributaries to East Fork Deep River were sampled in 2000 to evaluate impacts from the Millwood School Road construction. The sites were Not Rated, but comparisons of upstream and downstream sites indicated a significant decline in water quality downstream of the construction.

2005 Recommendations
DWQ and the UCFRBA will continue to monitor these segments of the East Fork Deep River. It is recommended that High Point and Greensboro address water quality problems identified above through their respective stormwater programs, including the reductions in fecal coliform bacteria and turbidity specified in the TMDL. Greensboro and High Point will be required to submit information on outfalls and other potential sources of TSS and fecal coliform bacteria, as well as a monitoring plan to DWQ as required in their stormwater permits.

Segment 17-2-(0.3)a will be removed from the 303(d) list. Segments 17-2-(0.3)b and 17-2-(0.7) will remain on the 303(d) list. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

8.3.4 Hickory Creek [AU# 17-8.5-(1)a, b and (3)]

Current Status
Hickory Creek was Not Rated in the 2000 plan; however, Hickory Creek [17-8.5-(1)a] from source to Rolling Brook Drive (3 miles) is currently Impaired for aquatic life because of a Fair benthic community rating at site BB60.

Hickory Creek [17-8.5-(1)b and (3)] from Rolling Brook Drive to the Deep River (2.2 miles) is Supporting aquatic life because of a Good-Fair benthic community rating at sites BB240, BB247 and BB248, and a Good fish community rating at site BF29. Southern Elementary School (NC0038091) and Crown Mobile WWTP (NC0055255) had significant violations of dissolved oxygen permit limits, and Southern Guilford High School (NC0038229) had significant violations of pH permit limits during the last two years of the assessment period. These facilities discharge into unnamed tributaries of Hickory Creek upstream of BB248. Southern Guilford High School is under a special order of consent (SOC# S91039) that expires in June 2005. The schools are expected to be connected to the City of Greensboro collection system and cease discharging by March 2005. Crown Mobile WWTP has had operational problems and has made recent upgrades to help improve treatment. While these facilities are small in size, they could have negative impacts on water quality especially during low flow years.

A stressor survey conducted in 2003 found that high flows after rain events were impacting aquatic habitat in Hickory Creek. The survey also noted large amounts of periphyton on rocks in the upper watershed and high dissolved oxygen levels indicated algal activity. Conductivity was also high in the creek.

2005 Recommendations
DWQ will continue to monitor Hickory Creek. The NPDES compliance process will be used to address the significant permit violations noted above. It is recommended that Crown Mobile continue to improve treatment to avoid permit violations. The lower segment of Hickory Creek (sites BB248 and BF29) will be inundated by Randleman Reservoir and will be sampled by the lake monitoring program in the future.

Segment 17-8.5-(1)b will be removed from the 303(d) list of Impaired waters because of the improved benthic community rating and 17-8.5-(3) will be removed because of the Good fish community rating. Segement 17-8.5-(1)a will be added to the 303(d) list. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

8.3.5 Jenny Branch [AU# 17-8-2]

Current Status
Jenny Branch was Not Rated in the 2000 plan; however, Jenny Branch from source to Reddicks Creek (3.2 miles) is currently Impaired for aquatic life because of a Fair benthic community rating at site BB64. A TMDL stressor study completed in 2003 found that sedimentation, habitat degradation and urban runoff were stressors to the benthic.

2005 Recommendations
DWQ will continue to monitor Jenny Branch and it will be added to the 303(d) list. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

8.3.6 Long Branch [AU# 17-2-1-(1) and (2)]

Current Status
Long Branch was Not Rated in the 2000 plan; however, Long Branch from source to East Fork Deep River (4 miles) is currently Impaired for aquatic life because of a Fair benthic community rating at site BB87. Greensboro Colonial Pipeline Terminal (NC0031046) and Williams Terminals (NC0074578) had significant violations of the total phenolics permit limit during the assessment period, which could have adversely affected water quality in Long Branch. Colonial Pipeline may have been experiencing reporting problems. Williams Terminals did not experience any violations in 2004.

2005 Recommendations
DWQ will continue to monitor Long Branch. The NPDES compliance process will be used to address the significant permit violations noted above. DWQ will work with Colonial Pipeline to evaluate reporting and data entry procedures to assure that phenolics permit limits are being properly assessed. Long Branch will be added the 303(d) list of Impaired waters. TMDLs (Chapter 35) will be developed for identified stressors within 8-13 years of listing.

8.3.7 Muddy Creek [AU# 17-9-(1) and (2)]

Current Status
Muddy Creek was Fully Supporting in the 2000 plan; however, Muddy Creek from source to Randleman Reservoir (7.7 miles) is currently Not Rated for aquatic life because of a Fair benthic community rating at site BB339. Instream habitat was sparse; banks eroded, and the water was turbid at BB339. Some improvements were noted in the fish community, rated Good at site BF50. Sites BB339, BF50, BA743, BA744 and BA292 will be inundated by Randleman Reservoir.

Muddy Creek is Impaired for recreation because the fecal coliform bacteria standard was violated at site BA745 during a special study of Muddy Creek.

2005 Recommendations
DWQ will continue to monitor Muddy Creek and it will be added to the 303(d) list of Impaired waters because of the recreation impairment. A TMDL (Chapter 35) was approved in May 2004 that recommended an 80 percent reduction in fecal coliform bacteria loading into Muddy Creek.

8.3.8 Reddicks Creek [AU# 17-8-(0.5) a]

Current Status
Reddicks Creek was Not Rated in the 2000 plan; however, Reddicks Creek from source to Groomtown Road (5.1 miles) is currently Impaired for aquatic life because of a Fair benthic community rating at site BB59. A TMDL stressor study completed in 2003 found that sedimentation, habitat degradation and urban runoff were stressors to the benthic community.

2005 Recommendations
DWQ will continue to monitor Reddicks Creek and it 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.

8.3.9 Richland Creek [AU# 17-7-(0.5) and (4)]

2000 Recommendations
DWQ recommended resampling of Richland Creek to determine stressors to the biological community. It was also recommended that a TMDL be developed for fecal coliform bacteria.

Current Status
Richland Creek from source to Randleman Reservoir (8.1 miles) is Impaired for aquatic life because of a Fair fish community rating at site BF31. Streambanks were steep and habitat was sparse. These segments are also Impaired for recreation because the fecal coliform bacteria standard was violated at site BA275.

A TMDL (Chapter 35) was approved in May 2004 that recommended an 82 percent reduction in fecal coliform bacteria loading into Richland Creek.

2005 Recommendations

DWQ will continue to monitor Richland Creek and it will remain on the 303(d) list. DWQ will further investigate the sources of arsenic in the watershed. The NPDES compliance process will be used to address the significant permit violations noted above. DWQ recommends that High Point Eastside continue to improve operations and treatment at this facility.

8.3.10 West Fork Deep River [AU# 17-3-(0.7)a]

Current Status

The West Fork Deep River was Fully Supporting in the 2000 basin plan; however, West Fork Deep River [17-3-(0.7)a] from SR 1850 to SR 1818 (0.5 miles) is Impaired for aquatic life because the turbidity standard was violated in 23 percent of samples at site BA262.

2005 Recommendations

DWQ will continue to monitor West Fork Deep River and it will be added to the 303(d) list.