Chapter 10
Cape Fear River River Subbasin 03-06-10
Including: Deep River, McLendons Creek, Bear Creek, Cabin Creek and Mill Creek

10.1 Subbasin Overview

Subbasin 03-06-10 at a Glance

Land and Water Area

Total area:	448 mi²
Land area:	446 mi²
Water area:	2 mi²

Population Statistics

2000 Est. Pop.: 45,209 people
Pop. Density: 101 persons/mi²

Land Cover (percent)

Forest/Wetland:	80.0%
Surface Water:	0.9%
Urban:	0.4%
Cultivated Crop:	0.9%
Pasture/ Managed Herbaceous:	17.9%

Counties

Chatham, Montgomery, Moore and Randolph

Municipalities

Biscoe, Carthage, Robbins and Star

Subbasin 03-06-10 is primarily in the Carolina slate belt, with some streams draining Triassic basin soils and the Sandhills. Almost the entire watershed is forested with very few urban areas. Population is expected to grow by 105,000 people in counties with portions or all of their areas in this subbasin by 2020; however, most of the growth will be in portions of the counties outside of this subbasin.

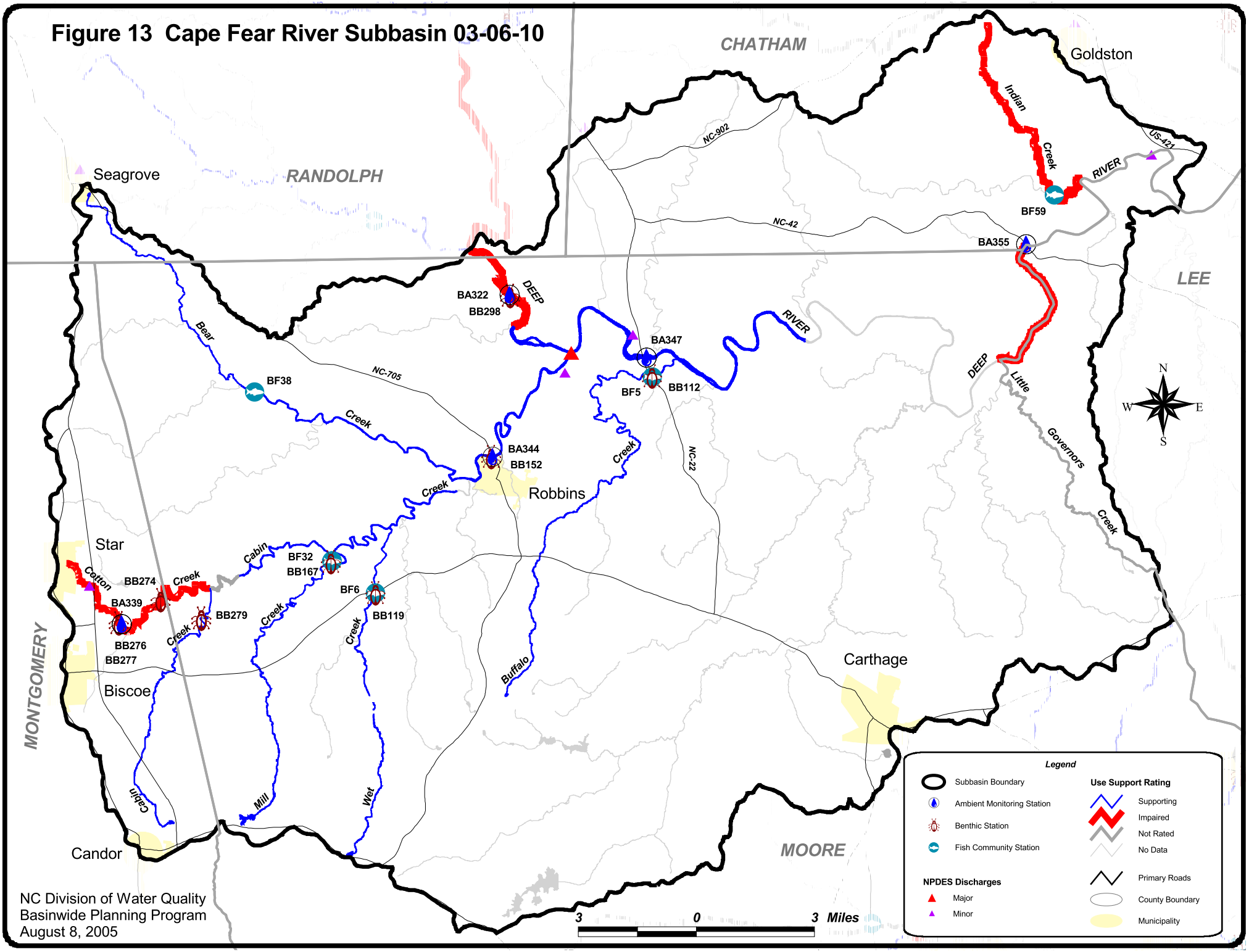
There are three individual NPDES wastewater discharge permits in this subbasin with a permitted flow of 1.9 MGD (Figure 13). The largest is Robbins WWTP (1.3 MGD). Refer to Appendix VI and Chapter 30 for more information on NPDES permit holders. Issues related to compliance with NPDES permit conditions are discussed below in Section 10.3 for Impaired waters.

There is one registered dairy, one registered cattle operation and three registered swine operations in this subbasin.

There were 10 benthic community samples and six fish community samples (Figure 13 and Table 13) collected during this assessment period. Data were also collected from five ambient monitoring stations including one UCFRBA (Appendix V) station, two DWQ stations and two 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 13 Cape Fear River Subbasin 03-06-10



NC Division of Water Quality
Basinwide Planning Program
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Table 13 CAPE FEAR Subbasin 03-06-10

AU Number / Description	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment				
			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	Stressors	Sources
Bear Creek												
17-26-(1)	WS-III	14.9 FW Miles	S					ND				
From a source to a point 0.5 mile upstream of Cabin Creek				BF38	G	'2003						
17-26-(4.5)	WS-III CA	0.2 FW Miles	S	BA344	NCE			S	BA344	NCE		
From a point 0.5 mile upstream of Cabin Creek to Robbins water supply intake				BB152	G	'2003						
17-26-(6)	C	6.3 FW Miles	S	BA344	NCE			S	BA344	NCE	Habitat Degradation	Unknown
From Robbins water supply intake to Deep River				BB152	G	'2003						
Buffalo Creek												
17-28	C	16.5 FW Miles	S					ND				
From source to Deep River				BB112	GF	'2003						
				BF5	G	'2003						
Cabin Creek												
17-26-5-(1)a	WS-III	8.7 FW Miles	S					ND				
From source to Cotton Creek				BB279	G	'2003						
				BB279	NR	'2002						
				BB279	GF	'2003						
17-26-5-(1)c	WS-III	10.5 FW Miles	S					ND				
From SR 1281 to Moore County SR 1434				BF32	E	'1999						
				BF32	E	'1999						
				BF32	G	'1999						
				BF32	GF	'2003						

Table 13 CAPE FEAR Subbasin 03-06-10

AU Number / Description	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment			Stressors	Sources
			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result		
Cotton Creek												
17-26-5-3a	WS-III	0.3 FW Miles	I	BA339	NCE			NR*	BA339	NCE	Fecal Coliform Bacteria	Unknown
From source to Center Street				BB276	P	2001					Toxic Impacts	WWTP NPDES
17-26-5-3b	WS-III	2.5 FW Miles	I	BA339	NCE			NR*	BA339	NCE	Fecal Coliform Bacteria	Unknown
From Center Street to SR 1371				BB276	P	2001					Toxic Impacts	WWTP NPDES
				BB277	P	1998						
17-26-5-3c	WS-III	3.7 FW Miles	I					ND			Toxic Impacts	WWTP NPDES
From SR 1371 to Cabin Creek				BB274	F	2001						
				BB275	F	1998						
DEEP RIVER												
17-(10.5)e2	C	2.8 FW Miles	I	BA322	CE	Turbidity	10.9	S	BA322	NCE	Turbidity	Unknown
From Subbasin 03-06-09 and 03-06-10 boundary to Grassy Creek				BB298	G	2002						
				BB298	E	2003						
17-(25.7)	C HQW	12.4 FW Miles	S	BA347	NCE	Turbidity	7.94	S	BA347	NCE	Turbidity	Unknown
From Grassy Creek to a point 1.0 mile upstream of Tysons Creek												
17-(32.5)a	WS-IV	4.0 FW Miles	I	BA355	NCE	Low DO	6.8	ND	BA355	NCE	Chlorophyll a	Unknown
				BA355	CE	Chlor a	13.2					
From mouth of Big Governors Creek to Carbonton Dam												
Indian Creek												
17-35	WS-IV	7.4 FW Miles	I					ND			Habitat Degradation	Land Clearing
From source to Deep River				BF59	F	2003						
Killets Creek												
17-30-3-(1)	WS-III CA	8.0 FW Acres	NR	BL23	NCE	Low pH	100	ND			Low pH	
From source to dam at Carthages water supply reservoir												
Mill Creek												
17-26-5-4	WS-III	11.7 FW Miles	S					ND				
From source to Cabin Creek				BB167	G	2003						

Table 13 CAPE FEAR Subbasin 03-06-10

AU Number / Description	Classification	Length/Area	Aquatic Life Assessment					Recreation Assessment				
			AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	Stressors	Sources
Wet Creek												
17-26-5-5	WS-III	10.6 FW Miles	**S**					ND				
From source to Cabin Creek				BB119	G	2003						
				BF6	NR	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	91.9	FW Miles
I	m	20.7	FW Miles
NR	m	8.0	FW Acres
NR	e	1.2	FW Miles
ND		283.3	FW Miles

Recreation Rating Summary

S	m	21.7	FW Miles
NR*	m	2.8	FW Miles
ND		372.5	FW Miles
ND		8.0	FW Acres

Fish Consumption Rating Summary

I	e	397.1	FW Miles
I	e	8.0	FW Acres

10.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-06-10 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 (8 acres and 165.4 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 112.6 stream miles (28.4 percent) and 8 freshwater acres (100 percent) monitored during this assessment period in the aquatic life category. There are 20.7 stream miles (5.2 percent) identified as Impaired in this same category.

10.3 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.

10.3.1 Cabin Creek [AU#17-26-5-(1)b and c]

Current Status
Cabin Creek [17-26-5-(1)b] from Cotton Creek to SR 1281 (1.2 miles) is Not Rated on an evaluated basis for aquatic life because it is impacted by the Star WWTP discharging to Cotton Creek (see below). The conductivity has been up to ten times higher than in nearby streams.

Cabin Creek [17-26-5-(1)c] from SR 1281 to SR 1434 (10.5 miles) is Supporting aquatic life because of Good-Fair fish community rating at site BF32. The fish community has been rated Excellent in the past and is expected to recover after the drought and high flows in 2003.

2005 Recommendations
DWQ will continue to monitor Cabin Creek to evaluate recovery of the fish community and the reduced impacts of the Star WWTP. Segment 17-26-5-(1)b will remain on the 303(d) list.

10.3.2 Cotton Creek [AU#17-26-5-3a,b and c]

2000 Recommendations
The 2000 basinwide plan recommended that Star WWTP maintain the highest quality effluent possible to protect aquatic life in Cotton Creek, and a 303(d) sampling approach would be conducted by DWQ.

Current Status
Cotton Creek from source to Cabin Creek (6.5 miles) is Impaired for aquatic life because of Poor and Fair benthic community ratings at sites BB276 and BB274. The Star WWTP (NC0058548) had significant violations of cyanide permit limits and many whole effluent toxicity test failures during the last two years of the assessment period. The Star WWTP has decreased flow and improved effluent quality after a significant industrial user ceased discharging to the plant in 2003. Due to changes in the influent to the Star WWTP, the facility was in compliance in 2004. The downstream benthic community site was severely stressed by the WWTP toxicity. Segment [17-26-5-3b] is Not Rated for recreation because the fecal coliform bacteria screening criteria were exceeded at site BA339.

2005 Recommendations
DWQ will continue to monitor Cotton Creek. Fayetteville Regional Office staff will continue to monitor improvements at the Town of Star WWTP. DWQ recommends that Star pursue other wastewater disposal options to Cotton Creek. Cotton Creek will remain on the 303(d) list and closely evaluated during the next assessment period.

10.3.3 Deep River [AU#17-(10.5)e2, (25.7) and (32.5)a]

Current Status
These segments of the Deep River were Fully Supporting in the 2000 basin; however, NPDES permit limits were recommended in this segment (Chapter 30). The Deep River [17-(10.5)e2] from the subbasin boundary to Grassy Creek (2.8 miles) is Impaired for aquatic life because the turbidity standard was violated in 10.9 percent samples at site BA322. The benthic community was rated Excellent at site BB298.

The Deep River [17-(25.7)] from Grassy Creek to upstream of Tysons Creek (12.4 miles) is Supporting aquatic life because no criteria were exceeded at site BA347; however, turbidity was above the standard in 7.9 percent samples at site BA347. The Robbins WWTP (NC0062855) also had significant violations of mercury permit limits during the last two years of the assessment period. Robbins conducted mercury investigations during 2002 and isolated several sources. A review of data for 2003 and 2004 indicated no violations of mercury permit limits.

The Deep River [17-(32.5)a] from Big Governors Creek to Carbonton Dam (4 miles) is Impaired for aquatic life because the chlorophyll *a* standard was violated in 13 percent of samples at site BA355. Site BA355 is in the backwaters of Carbonton Dam. Nutrient loading from upstream land uses has caused increased algal growth behind other dams in the Deep River as well.

2005 Recommendations
DWQ and UCFRBA (Appendix V) will continue to monitor the Deep River.
Segments 17-(10.5)e2 and 17-(32.5)a 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 1998, Triangle Land Conservancy received a $1,189,000 CWMTF grant to acquire 563 acres along the Deep River (Chapter 34).

10.3.4 Indian Creek [AU#17-35]

Current Status
Indian Creek was Not Rated in the 2000 basin plan; however, Indian Creek from source to Deep River (7.4 miles) is currently Impaired for aquatic life because of a Fair fish community rating at site BF59. Indian Creek was a regional reference site because of habitat characteristics and was rated Excellent in 1998. The habitat has been extremely degraded since 1998 due to extensive land clearing in the immediate watershed that has left only a narrow buffer of mature trees. High flows and drought conditions during the assessment period have also impacted the fish community in Indian Creek. The land clearing was to establish pastureland and was not related to forest harvesting.

2005 Recommendations
DWQ will continue to monitor Indian Creek and work with DSWC staff to identify BMPs to minimize further degradation to the creek. Land clearing activities should use forestry BMPs (Chapter 29) to minimize impacts to local streams. Adequate buffers should be maintained for all land clearing activities.

10.4 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.

10.4.1 Killets Creek (Carthage City Lake)[AU#17-30-3-(1)]

Current Status and 2005 Recommendations
Carthage City Lake (8 acres) is Not Rated for aquatic life because 100 percent of pH samples were below the water quality standard. However, not enough samples were collected to assign a use support rating. Increased nutrient and turbidity levels were noted in the lake compared to previous monitoring. DWQ will determine if increased monitoring efforts in this lake are warranted to better assess water quality.

10.4.2 McLendons Creek [AU#17-30]

Current Status and Water Quality Initiatives
McLendons Creek (28 acres) from source to the Deep River was not assessed during this assessment period. Previous biological assessments indicated that the low summer flow of this Triassic basin stream did not meet criteria to assign use support ratings. McLendons Creek has been impacted by nutrients and sediment from agriculture land uses. In 1996, NCSU received a $198,000 Section 319 grant (Chapter 34) to implement BMPs on dry litter poultry farms, exclude cattle from streambanks, and to start a volunteer monitoring program.