

Chapter 4

Roanoke River Subbasin 03-02-04

Including: Dan River, Country Line Creek, Rattlesnake Creek and Moon Creek

4.1 Subbasin Overview

Subbasin 03-02-04 at a Glance

Land and Water Area

Total area:	239 mi ²
Land area:	236 mi ²
Water area:	3 mi ²

Population Statistics

2000 Est. Pop.:	13,495 people
Pop. Density:	57 persons/mi ²

Land Cover (percent)

Forest/Wetland:	75.9%
Surface Water:	1%
Urban:	0.5%
Cultivated Cropland:	2.3%
Pasture/ Managed Herbaceous:	20.4%

Counties

Rockingham, Caswell and Person

Municipalities

Yanceyville and Milton

Monitored Stream Statistics

Aquatic Life

Total Streams:	65.0 mi/361.8 ac
Total Supporting:	55.4 mi
Total Impaired:	9.6 mi
Total Not Rated:	361.8 ac

Recreation

Total Streams:	9.6 mi
Total Impaired:	9.6 mi

This subbasin contains an eight-mile reach of the Dan River, from Virginia at Danville to North Carolina near Milton, before it flows into the Roanoke River. The subbasin is mostly rural. By the year 2020, population in Caswell County is expected to increase by 16 percent.

Four individual NPDES wastewater discharge permits are issued in this subbasin with a total permitted flow of 0.66 MGD (only 2 of the 4 permits are currently active). Refer to Appendix VI for identification and more information on individual NPDES permit holders. Refer to Appendix I for more information regarding population growth and trends. Two cattle operations are registered in this subbasin. Refer to Chapter 16 for more information regarding animal operations within this basin.

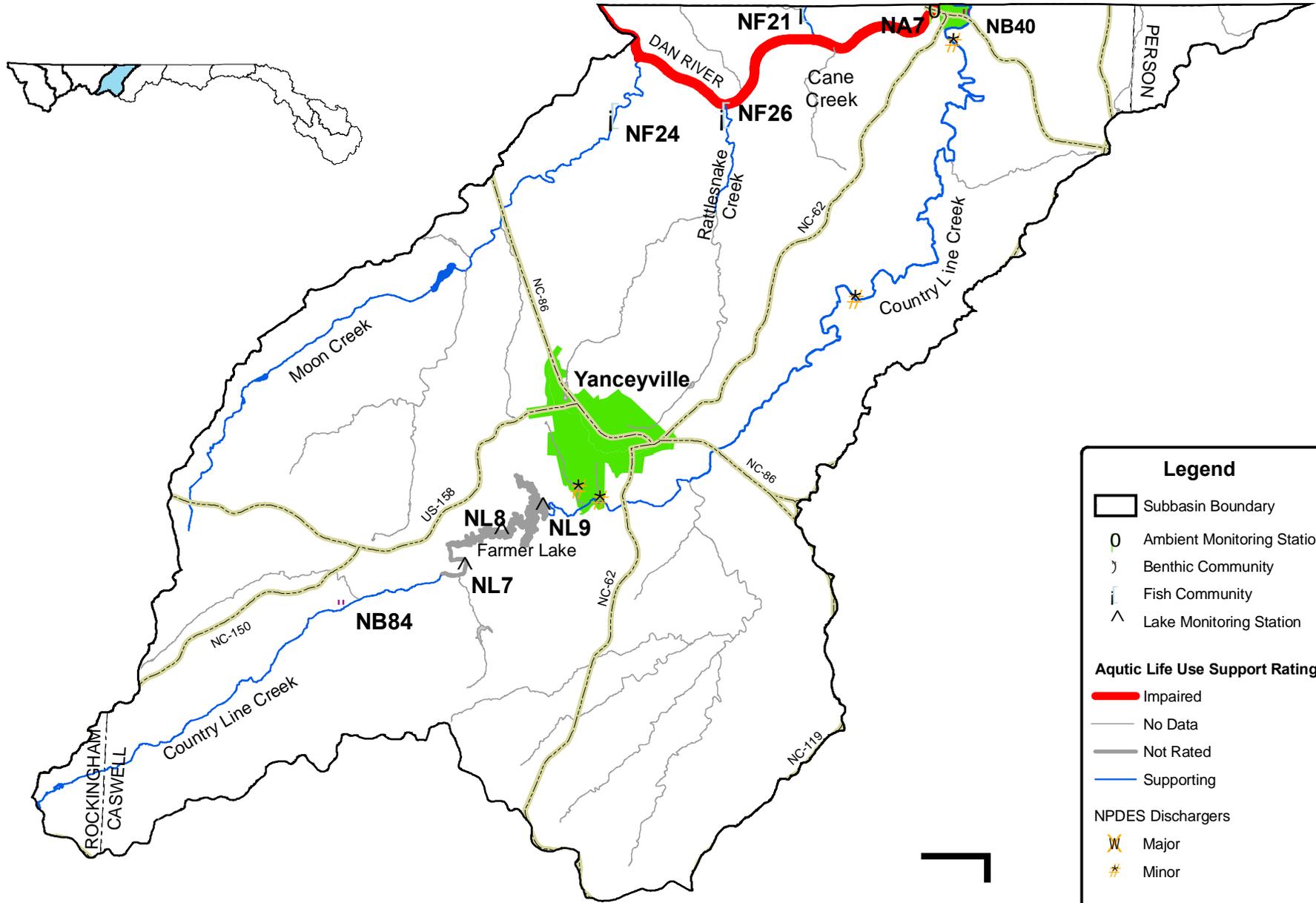
Several water quality improvement programs have been implemented in this subbasin. The NC Agriculture Cost Share Program (NCACSP), which helps reduce agricultural runoff by helping farmers implement best management practices, is one of these programs. The NCACSP provided \$169,139 towards implementing sediment and nutrient reduction practices, and livestock stream access elimination within this subbasin. For more information on this and other programs, refer to watershed discussion throughout this chapter as well as in Chapters 16 and 20.

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure 7. Table 6 contains a summary of assessment units and lengths, streams monitored, monitoring data types, locations and results, along with use support ratings for

waters in this subbasin. Refer to Appendix IX for more information about use support ratings.

Two benthic macroinvertebrate community samples and three fish community samples (Figure 7 and Table 6) were collected during this assessment period. Data were also collected from one ambient monitoring station and one lake. Refer to the *2005 Roanoke River Basinwide Assessment Report* at <http://www.esb.enr.state.nc.us/bar.html> and Appendix IV for more information on monitoring.

Figure 7 Roanoke River Subbasin 03-02-04



Legend

- Subbasin Boundary
- Ambient Monitoring Station
- Benthic Community
- Fish Community
- Lake Monitoring Station

Aquatic Life Use Support Rating

- Impaired
- No Data
- Not Rated
- Supporting

NPDES Dischargers

- Major
- Minor

- Primary Roads
- Municipality
- County Boundary



Division of Water Quality
 Basinwide Planning Unit
 May 30, 2006



Table 6 ROANOKE Subbasin 03-02-04

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment						
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources		
Cane Creek													
22-54	C	0.8 FW Miles	S										
From North Carolina-Virginia State Line to Dan River				NF21	G	2004							
Country Line Creek													
22-56-(1)	WS-II;HQW	10.5 FW Miles	S										
From source to a point 0.5 mile upstream of mouth of Nats Fork				NB84	G	2004							
22-56-(3.7)	C	24.5 FW Miles	S						NR				
From dam at Farmer Lake to Dan River				NB40	G	2004							
Country Line Creek (Farmers Lake)													
22-56-(3.5)	WS-II;HQW,CA	361.8 FW Acres	NR	NL7	ID					Turbidity	Unknown		
				NL9	ID					Nutrient Impacts	Unknown		
				NL8	ID								
From a point 0.5 mile upstream of mouth Nats Fork to dam at Farmer Lake (Town of Yanceyville water supply intake located 1.8 mile upstream of N.C. Hwy. 62)													
DAN RIVER (North Carolina portion)													
22-(39)b	C	9.6 FW Miles	I	NA7	CE	Turbidity	16.1		I	NA7	CE	Fecal Coliform Bacteria	Unknown
From NC/VA crossing downstream of Wolf Island Creek to last crossing of North Carolina-Virginia State Line												Turbidity	Unknown
Moon Creek (Wildwood Lake)													
22-51	C	17.0 FW Miles	S										
From source to Dan River				NF24	G	2004							
Rattlesnake Creek													
22-52	C	2.7 FW Miles	S										
From source to Dan River				NF26	G	2004							

Table 6 ROANOKE Subbasin 03-02-04

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
Use Categories:		Monitoring data type:		Results:		Use Support Ratings 2005:				
AL - Aquatic Life		NF - Fish Community Survey		E - Excellent		S - Supporting	I - Impaired			
REC - Recreation		NB - Benthic Community Survey		G - Good		NR - Not Rated				
		NA - Ambient Monitoring Site		GF - Good-Fair		NR*- Not Rated for Recreation (screening criteria exceeded)				
		NL- Lake Monitoring		F - Fair		ND-No Data Collected to make assessment				
				P - Poor						
				NI - Not Impaired						
Miles/Acres		m- Monitored		N- Natural		Results				
FW- Fresh Water		e- Evaluated		M - Moderate		CE-Criteria Exceeded > 10% and more than 10 samples				
				S-Severe		NCE-No Criteria Exceeded				
						ID- Insufficeint Data Available				

Aquatic Life Rating Summary				Recreation Rating Summary				Fish Consumption Rating Summary			
S	m	55.4	FW Miles	I	m	9.6	FW Miles	I	e	148.7	FW Miles
I	m	9.6	FW Miles	NR	e	24.5	FW Miles	I	e	361.8	FW Acres
NR	m	361.8	FW Acres	ND		114.6	FW Miles				
ND		83.7	FW Miles	ND		361.8	FW Acres				

Waters in the following sections are identified by assessment unit number(s) (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 unit is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segment are the same.

4.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-02-04 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 waters are Supporting on an evaluated basis based on reports from DEH regional water treatment plant consultants.

There were 65 stream miles (43.7 percent) and 361.8 freshwater acres (100 percent; Farmers Lake) monitored during this assessment period in the aquatic life category. In the recreation category, 9.6 stream miles (6.5 percent) were monitored. A total of 9.6 stream miles (6.5 percent) are Impaired, for both the aquatic life and recreational use categories. Refer to Table 6 for a summary of use support rating by category for waters in subbasin 03-02-04.

4.3 Status and Recommendations of Previously and Newly Impaired Waters

The following waters were either identified as Impaired in the previous basin plan (2001) 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 2008 303(d) list. The current status and recommendations for addressing these waters are presented below, and each are identified by an assessment unit number (AU#). Information regarding 303(d) listing and reporting methodology is presented in Appendix VII.

4.3.1 Dan River [AU # 22-(39)b]

Current Status

The Dan River (North Carolina portion), from NC/VA crossing downstream of Wolf Island Creek to the last crossing of North Carolina-Virginia State Line (9.6 miles), is Impaired for aquatic life due to turbidity standard violations at site NA7. The turbidity standard was violated in 16.1 percent of samples in this assessment period. This segment will be added to the 303(d) list of impaired waters.

This section of the Dan River is also Impaired for recreation because the fecal coliform bacteria standard was exceeded at site NA7. Intensive fecal coliform bacteria monitoring in 2004 was also part of supporting an interstate TMDL with Virginia since the Dan River is 303(d) listed in Virginia for bacteria. This segment will be added to North Carolina's 303(d) list for fecal coliform bacteria.

2006 Recommendations

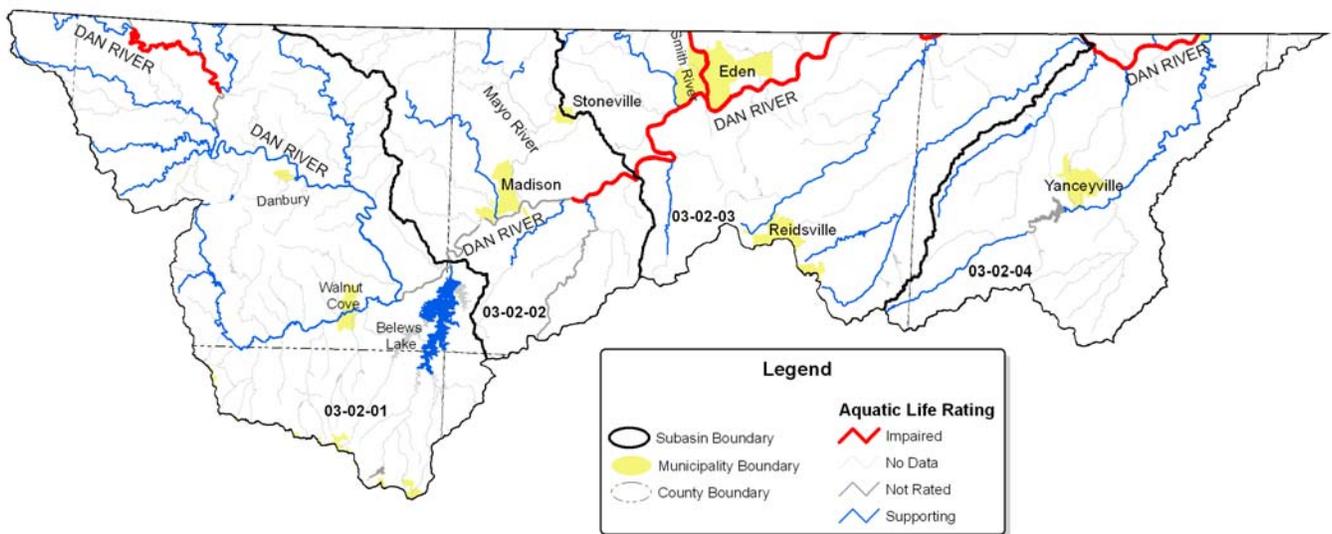
DWQ will continue to monitor the Dan River. Local agencies are encouraged to secure funding opportunities for restoration projects in controlling nonpoint sources of pollution.

Water Quality Initiative

The NCEEP is developing a project along the Dan River [22-(39)b] that has the potential to restore 82 acres of riverine wetland. This project will also include the preservation of approximately 3 acres of bottomland hardwood wetlands.

Dan River Summary

Figure 8 - Dan River



There are a total of 49.8 miles of the Dan River impaired for turbidity standard violations as well as 38.2 miles impaired for fecal coliform bacteria standard violations.

Subbasin No.	Distance Impaired (miles)	Turbidity Impairment (% exceeded)	New Turbidity Impairment	Fecal Impairment	New Fecal Impairment
03-02-01	11.6	24 %	Yes	No	
03-02-02	4.8	16.4 %	No	Yes	Yes
03-02-03	9.4	16.4 %	No	Yes	Yes
	15.6	17.5 %	Yes	Yes	Yes
03-02-04	9	16.1 %	Yes	Yes	Yes

The 11.6 miles in the upper Dan River (subbasin 01) are in trout waters where the allowable turbidity levels are at or below 10 NTUs. These same waters received an Excellent and a Good benthic bioclassification during the last two basin cycles. This segment of the Dan River had elevated turbidity during the last assessment period as well, however each data type was not assessed independently unlike during this assessment period.

The remaining 38.2 miles of the Dan River are impaired for both turbidity and fecal coliform bacteria. Of these, 14.2 miles were impaired for turbidity during that last basin cycle (4.8 miles in subbasin 02 and 9.4 miles in subbasin 03). A TMDL for this 14.2 miles segment was approved by the USEPA in January 2005, which recommends a 59 percent reduction in Total Suspended Solids distributed over both point and nonpoint sources in order to achieve acceptable water quality levels in this area. A TMDL will have to be developed for the remaining 24 miles. This new segment will be added to the 2008 303(d) list of impaired waters and a TMDL will be completed within 13 years of listing. The entire 38.2 miles will also be added to the impaired waters list for fecal coliform and a TMDL will also be required.

In the past, the Dan River was often called the “Muddy Dan” by locals. The river almost always ran brown due to sediment in the river. There were several instream sand mining operations as well as a lot of agricultural activity along the river. All of the mining operations are gone and many of the tobacco fields in this area have been converted to other agricultural practices such as cattle farming. Many of these fields have also been converted to permanent grasslands or to natural vegetation with help from the NC agriculture cost share program. While more environmentally friendly agricultural practices have started to occur in this area, a lot more timber harvesting is occurring in both North Carolina and Virginia. Since the Dan River flows back and forth across the state line, timber harvesting practices in one state ultimately affects the water quality in the other. Development of single family homes have increased in this area as well. Sediment and erosion controls are generally lacking on these smaller size lots. The use of ATV’s was also noted as an activity in this area that is likely contributing to the sediment load in the small tributaries that flow into the Dan River. With a continued push to improve agricultural and forestry BMPs in the area as well as better sediment and erosion control ordinances along the Dan River, improvements should be achievable.

4.4 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 were documented for these waters during this assessment. Attention and resources should be focused on these waters to prevent additional degradation and facilitate water quality improvements. DWQ will notify local agencies of these water quality concerns and work with them to conduct further assessments and to locate sources of water quality protection funding. Additionally, education on local water quality issues and voluntary actions are useful tools to prevent water quality problems and to promote restoration efforts. Nonpoint source program agency contacts are listed in Appendix VIII.

4.4.1 Moon Creek [AU# 22-51]

Current Status and 2006 Recommendations

Moon Creek, from source to Dan River (17.0 miles), is Supporting aquatic life due to a Good fish community bioclassification at site NF24. The fish community was noted as very unstable, which was likely related to the instream and riparian habitats and lingering effects from the 2002 drought. The land use is predominantly agriculture and like other streams in subbasins 02 - 04, Moon Creek appeared to have been impacted by very substantial nonpoint source erosion including sedimentation, a shifting sand substrate, bank “blowouts”, scour pools, and channel

and riparian bank instabilities. DWQ will continue to monitor water quality in Moon Creek. It is recommended that local agencies work with landowners to install BMPs to improve the riparian areas.

4.4.2 Rattlesnake Creek [AU# 22-52]

Current Status and 2006 Recommendations

Rattlesnake Creek, from source to Dan River (0.8 miles), is Supporting aquatic life due to a Good fish community bioclassification at site NF26. Rattlesnake Creek appeared to have been impacted by very substantial nonpoint source erosion including sedimentation, bank “blowouts”, deep scour pools, entrenchment, and channel and riparian bank instabilities. DWQ will continue to monitor water quality in this segment of the river. It is recommended that local agencies work with landowners to install BMPs to improve the riparian areas.

4.4.3 Cane Creek [AU# 22-54]

Current Status and 2006 Recommendations

Cane Creek, from the North Carolina-Virginia State Line to the Dan River (0.8 miles), is Supporting aquatic life due to a Good fish community bioclassification at site NF21. The majority of the creek’s watershed lies in southwestern Pittsylvania County, Virginia. The monitoring site was located at the State line, approximately 0.8 miles above its mouth. Like other streams in the area, the banks are sloughing, the substrate is sand, and a large quantity of sediment is transported during high flow events. DWQ will continue to monitor water quality in Cane Creek. It is recommended that local agencies in North Carolina and Virginia work with landowners to install BMPs to improve the riparian areas.

4.4.4 Country Line Creek [AU# 22-56-(3.7)]

Current Status and 2006 Recommendations

Country Line Creek, from dam at Farmer Lake to the Dan River (24.5 miles), is Supporting aquatic life for a Good benthic community bioclassification at site NB40. At this site, there were indications of deeply incised banks and signs of moderate erosion; the channel was filled with sediment and sand bar development was noted. Habitat deficiencies included sandy substrate, marginal instream habitat, bank vegetation, canopy and insufficient pools and riffles. It is recommended that local agencies work with landowners to install BMPs to improve the riparian area along Country Line Creek.

4.4.5 Country Line Creek (Farmer Lake) [AU# 22-56-(3.5)]

Current Status and 2006 Recommendations

Farmer Lake (Country Line Creek), from a point 0.5 mile upstream of mouth of Nats Fork to the dam at Farmer Lake (Town of Yanceyville water supply intake located 1.8 mile upstream of N.C. Hwy. 62) (361.8 acres), is Not Rated for aquatic life. Farmer Lake was monitored at sites NL7, NL8 and NL9.in 2000, 2001, 2002, and 2004. Moderate nutrient and chlorophyll *a* levels were generally found each year, indicating biological productivity. Assessment of parameters related to biological productivity indicated eutrophic conditions confirming biological productivity. High dissolved oxygen saturation values were also noted, indicating algal activity.

Algal analyses of samples collected in August 2004 at the upper lake and in mid-lake indicated a moderate to severe blue-green algal bloom at both stations. The algal bloom was composed primarily of the blue-green algae *Cylindrospermopsis*. Some strains of this species have the ability to produce toxins, but there are no reports in North Carolina of humans becoming ill from blue-green toxins or evidence that this strain exhibited toxicity. Water clarity in this lake is somewhat reduced due to sedimentation, especially at the most upstream station.

While surface water quality standards were not exceeded in more than 10 percent of the samples taken on Farmer Lake, this lake is not being rated due to concerns related to the elevated turbidity, low water clarity and elevated percent dissolved oxygen saturation. If resources are available, further study of this lake will be conducted.

Water Quality Initiatives

The NCEEP is working with a landowner to place a conservation easement with 300 foot buffers along 2,304 feet of two unnamed tributaries to Country Line Creek [22-56-(3.5)].

