

## Chapter 8

### Roanoke River Subbasin 03-02-08

Including: Roanoke Rapids Lake, Roanoke River, Chockoyotte Creek, Quankey Creek, Conoconnara Swamp, Occonechee Creek and Kehukee Swamp

#### 8.1 Subbasin Overview

##### *Subbasin 03-02-08 at a Glance*

###### **Land and Water Area**

Total area:	513 mi <sup>2</sup>
Land area:	473 mi <sup>2</sup>
Water area:	40 mi <sup>2</sup>

###### **Population Statistics**

2000 Est. Pop.:	30,274 people
Pop. Density:	59 persons/mi <sup>2</sup>

###### **Land Cover (percent)**

Forest/Wetland:	65.2%
Surface Water:	2.8%
Urban:	1.5%
Cultivated Crop:	28.4%
Pasture/ Managed Herbaceous:	2.0%

###### **Counties**

Halifax, Northampton, Martin and Bertie

###### **Municipalities**

Roanoke Rapids, Gaston, Weldon, Garysburg, Halifax, Jackson, Scotland Neck, Rich Square, Roxobel, Lewiston Woodville

###### **Monitored Stream Statistics**

###### **Aquatic Life**

Total Streams:	152.6 mi/4185.0 ac
Total Supporting:	152.6 mi
Total Not Rated:	4185.0 ac

###### **Recreation**

Total Streams:	76.6 mi
Total Not Rated:	76.6 mi

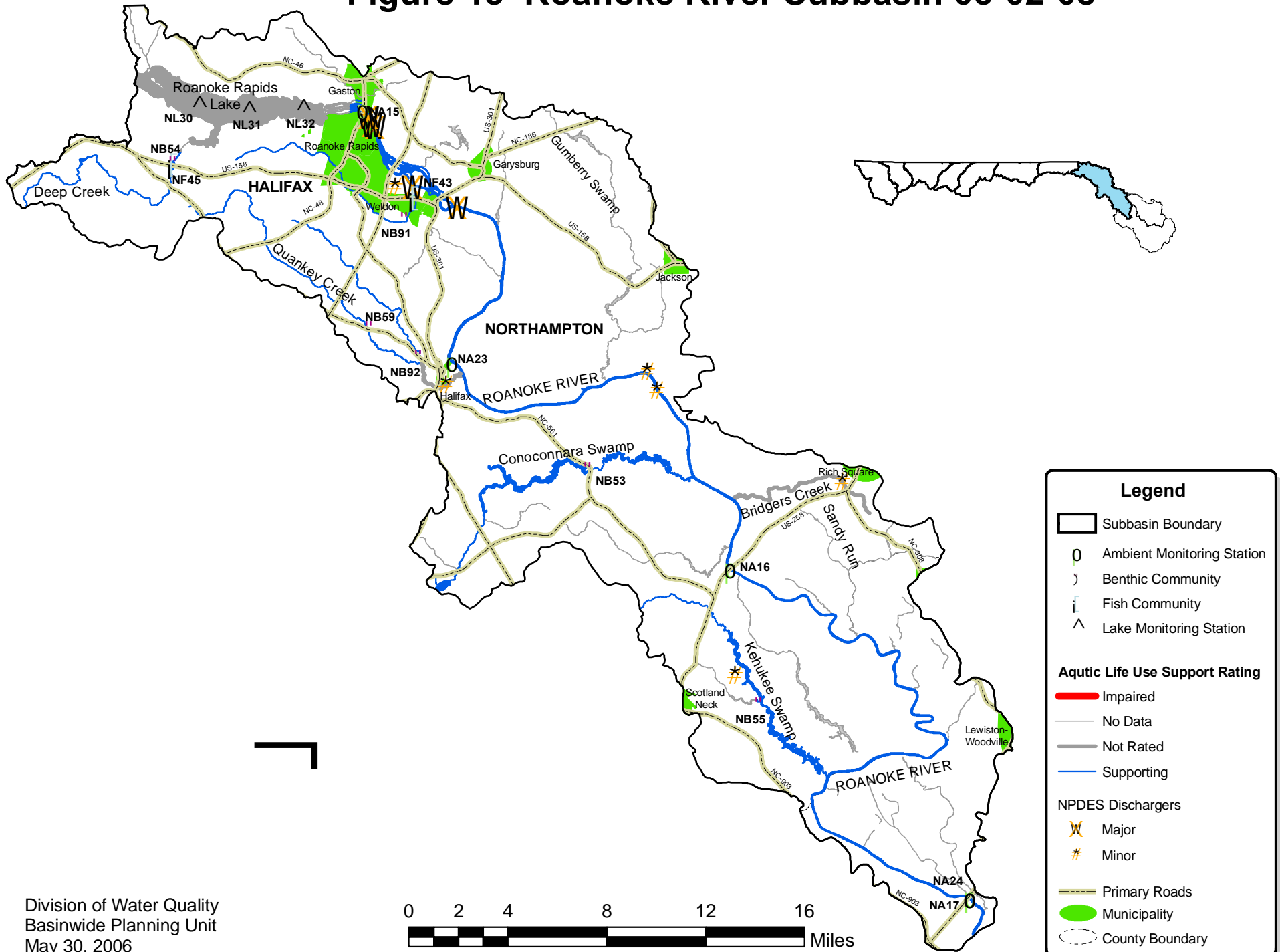
This subbasin contains the largest intact and least-disturbed bottomland hardwood forest floodplain in the mid-Atlantic region and encompasses subbasins 03-02-09 and 03-02-10. The lower Roanoke River is one of five major brownwater ecosystems in the Southeast. By the year 2020, population in Halifax, Northampton and Martin counties are expected to increase by 3, 6 and 0.6 percent respectively. Bertie County is estimated to experience an 8 percent decrease in population by 2020. For more information regarding population growth and trends, refer to Appendix I.

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 BMPs, is one of these programs. The NCACSP provided \$472,693 towards implementing sediment and nutrient reduction practices, animal waste management and livestock stream access elimination within this subbasin. For more information on this and other programs, refer to recommendations throughout this chapter as well as in Chapters 16 and 20.

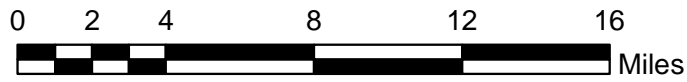
Ten individual NPDES wastewater discharge permits are issued in this subbasin with a total permitted flow of 41.9 MGD; three are major dischargers. Seven facilities are required to conduct whole effluent toxicity testing. Five individual stormwater permits are issued in this subbasin. Refer to Appendix VI for identification and more information on individual NPDES permit holders. Sixteen registered animal operations (4 cattle, 1 poultry and 11 swine) are located in this subbasin. Refer to Chapter 16 for more information regarding animal operations within this basin.

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure 13. Table 10 contains a summary of assessment units and lengths, streams monitored, monitoring data types, locations and results,

# Figure 13 Roanoke River Subbasin 03-02-08



Division of Water Quality  
Basinwide Planning Unit  
May 30, 2006



**Table 10 ROANOKE Subbasin 03-02-08**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
<b>Chockoyotte Creek</b>										
23-29	C	10.6 FW Miles	<b>S</b>					ND		
	From source to Roanoke River			NB91	M	2004			Habitat Degradation	Impervious Surface
				NF43	NR	2004			Habitat Degradation	Impoundment
									Habitat Degradation	Land Clearing
<b>Conoconnara Swamp</b>										
23-33	C	17.7 FW Miles	<b>S</b>					ND		
	From source to Roanoke River			NB53	M	2004				
<b>Deep Creek</b>										
23-24-(1)	WS-IV	11.6 FW Miles	<b>S</b>					ND		
	From source to a point 0.5 mile upstream of mouth			NB54	N	2004				
				NF45	G	2004				
<b>Kehukee Swamp (White Millpond)</b>										
23-42	C	10.6 FW Miles	<b>S</b>					ND		
	From source to Roanoke River			NB55	M	2004				
<b>Little Quankey Creek</b>										
23-30-1	C	9.5 FW Miles	<b>S</b>					ND		
	From source to Quankey Creek			NB92	M	2004				
<b>Quankey Creek</b>										
23-30a	C	16.0 FW Miles	<b>S</b>					ND		
	From source to Little Quankey Creek			NB59	N	2004				

**Table 10 ROANOKE Subbasin 03-02-08**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment				
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors	Sources
<b>ROANOKE RIVER</b>											
23-(25.5)	WS-IV;CA	1.7 FW Miles	<b>S</b>	NA15	NCE			<b>S</b>	NA15	NCE	
From a point 0.6 mile upstream of N.C. Hwy. 48 bridge to a line across river 50 feet downstream of N.C. Hwy. 48 (City of Roanoke Rapids, Town of Weldon water supply intakes)											
23-(26)a	C	50.1 FW Miles	<b>S</b>	NA16	NCE			<b>S</b>	NA16	NCE	Total Suspended Solids Habitat Degradation
From a line across the river 50 ft downstream of NC Hwy 48 bridge to the confluence of Sandy Run Cr at the Bertie											
23-(26)b1	C	24.8 FW Miles	<b>S</b>	NA17	NCE			<b>S</b>	NA17	NCE	Impoundment
From the confluence of Sandy Run Cr at the Bertie/Northampton/Halifax Co. line to subbasin 8/9 boundary											
<b>ROANOKE RIVER (Lake Gaston below normal full power pool elevation 200 MSL and Roanoke Rapids Lake below normal full power pool elevation 132 feet MSL)</b>											
23-(22.5)	WS-IV,B;CA	4,185.0 FW Acres	<b>NR</b>	NL30	ID			ND			
From a line across Lake Gaston 0.5 mile upstream of Lake Gaston Dam to Roanoke Rapids Dam											

**Table 10 ROANOKE Subbasin 03-02-08**

AU Number	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
<b>Use Categories:</b>		<b>Monitoring data type:</b>		<b>Results:</b>		<b>Use Support Ratings 2005:</b>				
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						
<b>Miles/Acres</b>		m- Monitored		N- Natural		<b>Results</b>				
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 152.6 FW Miles  
 NR m 4,185.0 FW Acres  
 NR e 11.2 FW Miles  
 ND 142.7 FW Miles

S m 76.6 FW Miles  
 NR e 3.4 FW Miles  
 ND 226.4 FW Miles  
 ND 4,185.0 FW Acres

I e 306.4 FW Miles  
 I e 4,185.0 FW Acres

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

Benthic biocriteria for swamp streams have been developed since the previous basin plan (2001). Where appropriate, those criteria have been applied to sites that were previously Not Rated (Deep Creek, Quankey Creek, Conoconnara Swamp and Kehukee Swamp). Six benthic macroinvertebrate community samples, two fish community samples (Figure 13 and Table 10) and one fish tissue sample were collected during this assessment period. Data were collected from three ambient monitoring stations and one lake (3 monitoring stations). 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.

The following sections identify waters by their 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.

## **8.2 Use Support Assessment Summary**

Use support ratings were assigned for waters in subbasin 03-02-08 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 basin wide fish consumption advice. 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 152.6 stream miles (50 percent) and 4,185 freshwater acres (100 percent) monitored during this assessment period in the aquatic life category. Of these, all 152.6 stream miles (50 percent) were Supporting. In the recreation category, all of the 76.6 monitored stream miles (25 percent) were Supporting. Refer to Table 10 for a summary of use support ratings for waters in subbasin 03-02-08.

## **8.3 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 is identified by an assessment unit number (AU#). Information regarding 303(d) listing and reporting methodology is presented in Appendix VII.

### **8.3.1 Roanoke Rapids Lake (Roanoke River) [AU# 23-(22.5)]**

#### 2001 Recommendations

DWQ will work the Roanoke Rapids Lake Management Council and DWR to reduce aquatic weeds. Water quality could also benefit from nutrient reduction in this lake. Additionally, a public education campaign is recommended so that introduction of additional aquatic macrophytes from boats that have been in other waters is minimized.

#### Current Status

Roanoke Rapids Lake, from a line across Lake Gaston 0.5 mile upstream of Lake Gaston Dam to Roanoke Rapids Dam (4,768.0 acres), is Not Rated for aquatic life due to insufficient number of samples taken at sites NL30, NL31 and NL32. Roanoke Rapids Lake was monitored by DWQ in June, July and August of 2004. Low nutrient and chlorophyll *a* concentrations found indicated low biological productivity with respect to algal activity. Assessment of parameters related to biological productivity indicated this low biological productivity with slightly oligotrophic conditions. Water clarity was generally good. Large areas of invasive aquatic weeds were observed in 2004, primarily in the center of the lake. These weeds were *Hydrilla sp.*, Brazilian Elodea (*Egeria densa*) and Eurasian Watermilfoil (*Myriophyllum spicatum* L.). No aquatic weed control measures have been conducted at this reservoir due to economic reasons (Rob Emens, N.C. Division of Water Resources, personal communication).

Roanoke Rapids Lake is on the 303(d) list for impaired aquatic life due to aquatic weeds. A draft management strategy plan for aquatic weeds has been developed for Roanoke Rapids Lake and five other lakes and has been sent to EPA for approval.

Two largemouth bass and two common carp samples were collected from Roanoke Rapids Lake at site NT3 during 2003 and analyzed for pesticide and PCB contaminants. The samples were collected as part of an ongoing statewide organics assessment. Both carp and one bass sample contained trace amounts of DDE, a DDT metabolite, but concentrations were well below EPA, FDA, and State of North Carolina criteria. PCB contaminants were not detected in any samples.

#### 2006 Recommendations

The draft aquatic weeds management strategy plan recommends development of an implementation plan since aquatic weed control is an ongoing concern that requires long-term commitment. The plan should focus on regular evaluations of the control measures and allow for modification as conditions change. Integration of control measures and modification should be sought through evaluating program effectiveness, organizing public outreach for a noxious and invasive weed prevention program and developing funding strategies. Roanoke Rapids Lake will be moved to a lower priority category, removing it from the 303(d) list, pending approval of the draft management strategy plan by the EPA. DWQ will continue to monitor Roanoke Rapids Lake.

### **8.3.2 Quankey Creek [AU #23-30a & b]**

#### 2001 Recommendations

DWQ will continue to work with the Town of Halifax to resolve problems with the WWTP discharge. The town received a grant in March 2000 to begin addressing the most critical

maintenance problems at the facility. More funding is needed to complete collection system rehabilitation and construction of new sewer lines to eliminate failing septic systems in the Town of Halifax.

Additionally, DWQ will continue to monitor Quankey Creek and, as resources allow, sample Little Quankey Creek during the next basinwide cycle to assess its contribution to degraded water quality in this watershed.

#### Current Status

Quankey Creek [AU# 23-30a], from source to Little Quankey Creek is Supporting aquatic life based on a Natural benthic community bioclassification at site NB59. Quankey Creek [AU 23-30b], from Little Quankey Creek to Roanoke River is No Data because it was not resampled in 2004. This segment of Quankey Creek will remain on the 303(d) list for impaired biological integrity.

#### 2006 Recommendations

DWQ will resample Quankey Creek in the next basinwide assessment. The Town of Halifax WWTP has chronic problems with exceeding their discharge limits for BOD, DO and fecal coliform bacteria. There have been numerous NOV's and civil penalties levied against the WWTP. The Town was granted an SOC to relax their BOD limits in March 2006. The Town paid an upfront SOC penalty of \$16,166. The SOC requires the Town of Halifax to complete construction and eliminate discharge by tying into the Town of Weldon's WWTP by April 2007.

## **8.4 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.

### **8.4.1 Bridgers Creek [AU #23-34]**

#### Current Status and Recommendation

Bridgers Creek, from source to Roanoke River (7.8 miles) is Not Rated on an Evaluated basis for aquatic life. The Rich Square WWTP is currently completing construction for a land application discharge system. In early 2004, DWQ Regional Office staff discovered an illegal bypass from their spray irrigation lagoon. DWQ is working with Rich Square to get them under a SOC that will provide for a schedule for a properly engineered removal of the bypass. In June 2004, Rich Square had received a Clean Water Bond grant for sewer rehabilitation including inflow and infiltration for the spray irrigation system but not for the bypass. DWQ will continue to work with Rich Square.



#### **8.4.2 Chockoyotte Creek [AU #23-29]**

##### Current Status

Chockoyotte Creek, from source to Roanoke River (10.6 miles) is Supporting aquatic life due to a Moderate Stress benthic community bioclassification at site NB91. The habitat was severely impacted at this site. Sedimentation, bank erosion, partial shading, inadequate riparian zones and an absence of instream habitat were all noted. It appeared that the stream had once been dammed at the sampling location and there were remains of large concrete blocks and rocks. Although Chockoyotte Creek received a Moderate Stress bioclassification, it has a highly degraded habitat due to urban impacts from the cities of Roanoke Rapids and Weldon. The Roanoke Rapids Sanitary District relocated their discharge pipe from Chockoyotte Creek to the Roanoke River in winter 2004/2005 and received new permit limits. Chockoyotte Creek was not rated in the fish community bioclassification due to questions regarding the applicability of the Piedmont or Coastal Plain regional criteria at site NF43. The overall community was abundant, diverse (19 species including 5 species of sunfish) and the species were well represented by multiple age groups. Multiple species were found from both regional criteria. The American eel and the redbreast sunfish represented the most abundant species making up 74 percent of all the fish collected. This is the only site where the American eel was collected. This is likely the case because of the numerous dams on the Roanoke River impeding upstream migrations and the colonization of historical habitats.

##### 2006 Recommendations

DWQ will continue to monitor Chockoyotte Creek. The towns of Roanoke Rapids and Weldon are encouraged to develop a stormwater program to address the severe habitat degradation from lack of controlling stormwater runoff.

#### **8.4.3 Conoconnara Swamp [AU # 23-33]**

##### Current Status and 2006 Recommendations

Conoconnara Swamp, from source to Roanoke River (17.7 miles), is Supporting aquatic life due to a Moderate Stress benthic community bioclassification at site NB53. In comparing this 2004 sample to the previous 1999 sample, which would have received a Natural bioclassification, the 2004 data indicated a decline in the benthic community. A narrow riparian zone was noted on the left bank and an open canopy slightly decreased the habitat score. The decline in the benthic community could be a sign of increasing stress in the watershed and warrants future monitoring.

#### **8.4.4 Kehukee Swamp (White Millpond) [AU # 23-42]**

##### Current Status and 2006 Recommendations

Kehukee Swamp, from source to Roanoke River (10.6 miles), is Supporting aquatic life due to a Moderate Stress benthic bioclassification at site NB55. The benthic community resembled mostly pollution-tolerant species. In addition, undercut banks and root mats were rare. However, the riparian zone was wide and intact on both sides of the stream. DWQ will continue to monitor Kehukee Swamp.

#### **8.4.5 Little Quankey Creek [AU # 23-30-1]**

##### Current Status and 2006 Recommendations

Little Quankey Creek, from source to Quankey Creek (9.5 miles), is Supporting aquatic life due to a Moderate Stress benthic community bioclassification at site NB92. High erosion potential and a narrow riparian zone were observed at this site. A slightly more pollution-tolerant benthic community was collected, indicating signs of water quality stress. DWQ will continue to monitor Little Quankey Creek.

#### **8.4.6 Roanoke River [AU# 23-(26)a & 23-(26)b1]**

##### Current Status and 2006 Recommendations

Roanoke River [AU# 23-(26)a], from a line across the river 50 ft downstream of NC Hwy 48 bridge to the confluence of Sandy Run Creek at the Bertie/Northampton/Halifax Co. line (50.1 miles) (sites NA16 and NA 23) and Roanoke River [23-(26)b1], from the confluence of Sandy Run Creek at the Bertie/Northampton/Halifax Co. line to subbasin 08/09 boundary (24.8 miles) (sites NA17 and NA24), is Supporting aquatic life due to DWQ and USGS concurrent ambient monitoring at these sites. During this assessment period no benthic or fish community sites were sampled on the Roanoke River due to resource constraints and high flows. The two historic sites (at Halifax and US 258) should be sampled in future basinwide assessments.

This section of the Roanoke River is also Supporting recreation because the fecal coliform bacterial screening criteria was not exceeded at sites NA16 or NA17.

A 74-stream mile portion of the Roanoke River mainstem from Roanoke Rapids (at hwy NC-48) to Hamilton (at the wildlife boat ramp) was modeled for a dissolved oxygen TMDL. A model was used to determine the assimilative capacity of this section of the Roanoke River under critical low flow/warm weather conditions. This water quality management tool allows DWQ to develop allocations for oxygen consuming wastes and established an oxygen-consuming TMDL. The USEPA approved the TMDL in November 1996. This section of the Roanoke includes just above AU# 23-(26)a, 23-(26)b1 and part of 23-(26)b2 in subbasin 03-02-09.

It is noted that severe bank erosion is occurring on the Roanoke River. River flows are managed for flood control by the US Army Corp of Engineers and for hydropower generation by private industries. These managed flows are not similar to natural seasonal flow conditions and subsequently extend the length of time flooding occurs on the floodplain and in backswamps. In addition, frequent managed high flows at bankfull heights further accelerate river bank erosion.

The NC Department of Corrections, Caledonia WWTP was granted an SOC in October 2003 for fecal coliform bacteria. They were required to have an upgrade to their system by March 31, 2005; however they continued to have fecal coliform violations. DWQ will continue to pursue corrections to these violations.

##### Water Quality Initiatives

The NCEEP purchased two tracts on the Roanoke River [23-(26)b1] in coordination with The Nature Conservancy. This acquisition protects 25,718 feet on one side of the river, 23,572 feet of

streams in the interior of the tracts and 523 acres of riverine cypress gum swamp and bottomland hardwood wetlands. The two tracts lie approximately three miles apart, with the Roanoke River Wetlands Game Lands situated between. With the exception of one mile of privately owned land, this acquisition creates a 9-mile block of protected land along the north shore of this segment of the Roanoke River.

## **8.5 Additional Water Quality Issues within Subbasin 03-02-08**

The following section discusses water quality topics downstream from the major reservoirs; J.H. Kerr, Gaston and Roanoke Rapids. The topics discussed may be related to water quality protection primarily concerning flow fluctuations from upstream dam releases.

### **8.5.1 Primary Nursery Area**

The Roanoke River, from the Roanoke Rapids Dam to US 258 is designated as a Primary Nursery Area (PNA) by the Wildlife Resources Commission (WRC), per rules set forth in the NC Administrative Code 15ANCAC 10C.0501. Inland PNAs “are defined as those areas inhabited by the embryonic, larval or juvenile life stages of marine or estuarine fish or crustacean species due to favorable physical, chemical or biological factors”. These rules are “to establish and protect fragile inland waters which support embryonic, larval or juvenile populations of marine or estuarine fish or crustacean species. Nursery areas are necessary for the early growth and development of virtually all of North Carolina’s important marine or estuarine fish or crustacean species. Nursery areas need to be maintained, as much as possible, in their natural state, and the fish and crustacean populations within them must be permitted to develop in a normal manner with as little interference from man as possible”. This designation is based primarily upon evidence that this section of the Roanoke River, approximately 35 miles, is the spawning reach for the Roanoke River/Albemarle Sound striped bass stock.

Because the continued health and reproduction of many aquatic species and wildlife is directly linked to good water quality, the WRC goal of conservation, management and enhancement of these species and habitats is key in protecting this valuable and complex ecosystem. WRC frequently conducts research and survey projects in the Roanoke River basin to assure that resource management decisions are based upon current data. The results of these projects demonstrate the diversity of aquatic species within portions of the basin as well as the importance of the Roanoke River as a spawning and nursery area to anadromous fish species. Because of the significance of diadromous fishes throughout the entire river basin including upper reaches extending into Virginia, a Diadromous Fish Restoration Technical Advisory Committee (DFRTAC) was formed as part of the Federal Energy Regulatory Commission, relicensing project number 2009. This is a multi-agency, collaborative effort between the United States Fish and Wildlife Service, National Marine Fisheries Service, United States Geological Survey, North Carolina Wildlife Resources Commission, North Carolina Division of Marine Fisheries, Virginia Department of Game and Inland Fisheries, United States Army Corps of Engineers, local universities, and Dominion Power. Initial efforts are focusing on restoration of American eel and American shad in the upper portions of the Roanoke River basin, in which historical migration paths have been blocked by dams in the lower portion of the river basin. Projects have been conducted in subbasins 03-02-08, 03-02-09 and 03-02-10. These projects included analysis of striped bass and American Shad spawning stock attributes and evaluations

of American shad restoration techniques. For more information regarding these WRC studies contact WRC, Division of Inland Fisheries.

### **8.5.2 US Army Corps of Engineers**

The US Army Corps of Engineers (ACOE) owns and operates John H. Kerr Reservoir. The project is located in Mecklenburg County, Virginia; 20.3 miles downstream from Clarksville, Virginia and 18 miles upstream from the Virginia-North Carolina State line. The main purpose of the reservoir is for reduction of flood damage, generation of hydroelectric power and low water control for pollution abatement and conservation of fish and wildlife.

The flow regime from the dam is managed. How the flow is released has the potential to affect water quality downstream. Carelessly managing a high flow release to a lower flow, especially in hot weather, could have significant potential to reduce downstream dissolved oxygen. High flow releases inundate the adjacent downstream back swamps. The surface of these areas is high in organic material, which when decomposed by bacteria, will strip dissolved oxygen from the downstream waters. As these swamps continue to flood, their slope is generally less, increasing the time required for them to drain. New flood flow to these areas will then cover more land per unit volume of water in contact with oxygen removing materials. The subsequent drainage of these waters into the river can increase the risk of anoxic or hypoxic conditions downstream.

In a cooperative effort with state and federal fish and wildlife agencies, the ACOE Wilmington District formed a water management group to discuss water quality conditions in the lower Roanoke River. These regular discussions also include immediate weather forecasts, river and reservoir conditions and forecast lake levels. This effort has been very useful in avoiding potentially devastating fish kill events. A key resource tool in the decision making process has been the water quality gage stations which are maintained by USGS. These water quality gage stations provide real-time data of dissolved oxygen levels in the Roanoke River mainstream.

### **8.5.3 Dominion Power Generation**

Dominion Power Generation owns and operates Lake Gaston and Dam and Roanoke Rapids Lake and Dam for the purpose of hydropower generation. Lake Gaston and Roanoke Rapids Lake are located directly downstream from John H. Kerr Reservoir. Per the Federal Energy Regulatory Commission (FERC) license requirements, Dominion Power is to conduct water quality monitoring for dissolved oxygen when the dissolved oxygen standard is not met at the Roanoke Rapids Dam. Subsequent reporting of the standard violation and water quality data results are required to be submitted to DWQ.

### **8.5.4 Conservation Tillage**

Conservation tillage is a practice that has been implemented throughout the Roanoke River Basin, with particular success in this subbasin. Conservation tillage practices produce environmental benefits that may include reduced soil erosion, sedimentation, and pollution from dissolved and sediment-attached substances.

Through the NCACSP, there were three eligible practices that provided cost share assistance to farmers utilizing conservation tillage: long-term no-till (5 year), conservation tillage (3 year) and conservation tillage (1 year). The one-year contract was removed from the program in 2003. According to the NCACSP, the three-year conservation tillage practice means any tillage and planting system in which at least 60 percent of the at-plant soil surface is covered by plant residue. The long-term no-till practice means planting all crops for five consecutive years with at least 80 percent of the at-plant soil surface covered by plant residue from preceding crops. The goal of implementing these practices is to improve water quality.

During this basinwide cycle, 1999-2004, the following conservation tillage BMPs were installed in this subbasin through the NCACSP:

<b>Practice</b>	<b>Acres Enrolled</b>	<b>Cost</b>
Conservation Tillage (1 year)	166.68 acres	\$17,719
Conservation Tillage (3 years)	1,257.1 acres	\$158,674
Long-term No-Till (5 years)	547.4 acres	\$52,291

