# Chapter 3 Roanoke River Subbasin 03-02-03 Including: Dan River, Smith River, Hogans Creek and Wolf Island Creek

### 3.1 Subbasin Overview

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

#### Land and Water Area

Total area:	340 mi <sup>2</sup>
Land area:	335 mi <sup>2</sup>
Water area:	5 mi <sup>2</sup>

#### **Population Statistics**

2000 Est. Pop.: 48,270 people Pop. Density: 142 persons/mi<sup>2</sup>

#### Land Cover (percent)

Land Cover (percent)								
Forest/Wetland:	74%							
Surface Water:	1.2%							
Urban:	2.1%							
Cultivated Crop:	3.3%							
Pasture/								
Managed Herbaceous:	19.4%							
<u>Counties</u> Rockingham and Casw	ell							
<b>Municipalities</b>								
Eden, Reidsville and								
Wentworth								
Monitored Stream Stat	istics							
Aquatic Life								
Total Streams:	105.1 mi							
Total Supporting:	76.1 mi							
Total Impaired:	29.0 mi							
Recreation								
Total Streams:	29.0 mi							
Total Impaired:	29.0 mi							
1								

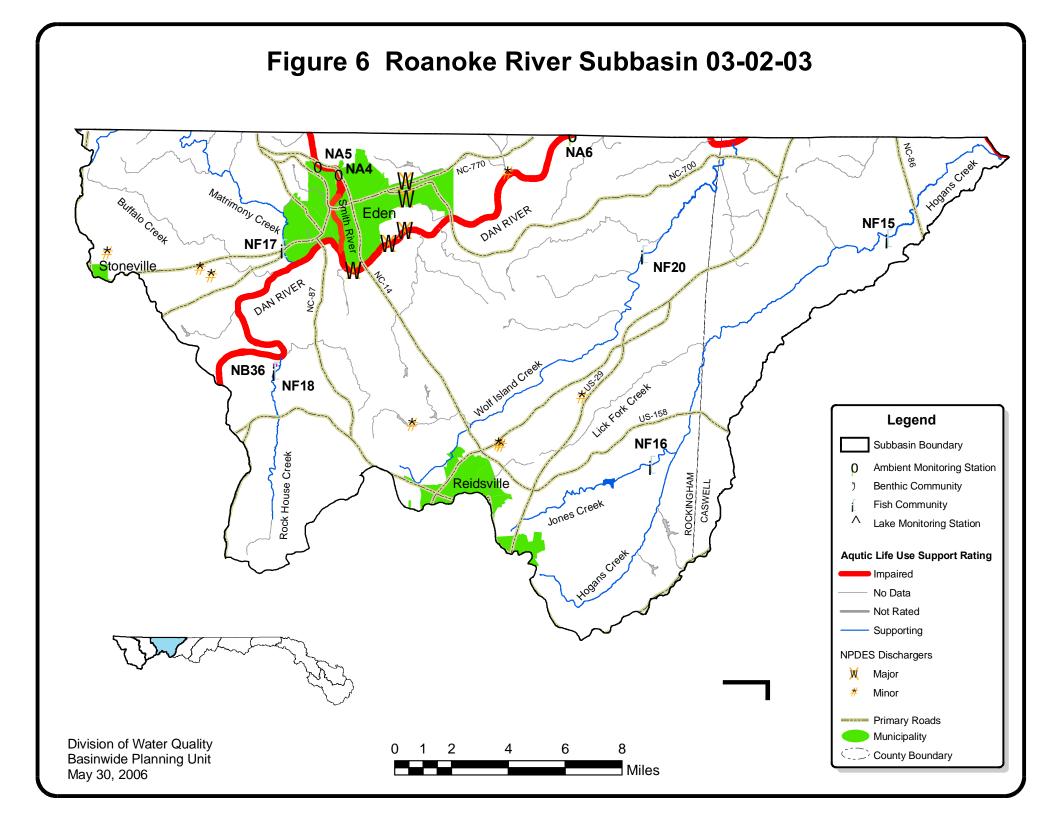
This subbasin contains approximately 25 river miles of the Dan River, prior to it flowing back into Virginia. The Smith River is a major tributary of the Dan River in this subbasin, but most of its watershed is in Virginia and its flow is regulated by upstream releases primarily from Philpott Reservoir and secondarily from Martinsville Reservoir. Other smaller tributaries include Matrimony Creek, Rock House Creek, Wolf Island Creek and Hogans Creek. Approximately three-fourths of this subbasin is forested. By the year 2020, overall county population is expected to increase by 8.5 percent and 16 percent in Rockingham and Caswell counties, respectively. Refer to Appendix I for more information for population growth and trends.

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 \$118,375 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 the watershed discussion throughout this chapter as well as in Chapters 16 and 20.

Eleven individual NPDES wastewater discharge permits are issued in this subbasin, four of which are major dischargers. Refer to Appendix VI for identification and more information on individual NPDES permit holders. One registered animal operation is 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 6. Table 5 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.

One benthic macroinvertebrate community sample and five fish community samples (Figure 6 and Table 5) were collected during this assessment period. Data were also collected from four



# Table 5ROANOKESubbasin 03-02-03

AU Numl	ber Classification	Length/Area	А	quatic L	ife Ass	sessment	<b>Recreation Assessment</b>		nent	
D	Description	_	AL Rating	Station	Result	Year/ Parameter % Exc	<b>REC Rating</b>	Station	Result	Stressors Sources
DAN RIV	/ER									
22-(31.5)b	WS-IV	9.4 FW Miles	I	NA3	CE	Turbidity 16.4	I	NA3	CE	Fecal Coliform Bacteria Unknown
	om 03-02-02 boundary to a poin atrimony Creek	t 0.8 mile downstream o	f							Turbidity Unknown
22-(38.5)	WS-IV;CA	0.6 FW Miles	I	NA6	CE	Turbidity 17.5	I	NA6	CE	Turbidity Unknown
	om a point 0.8 mile downstream ill Branch (Town of Eden water									Fecal Coliform Bacteria Unknown
DAN RIV	/ER (North Carolina por	·tion)								
22-(39)a	С	13.8 FW Miles	I	NA6	CE	Turbidity 17.5	I	NA6	CE	Fecal Coliform Bacteria
	om Mill Branch to NC/VA cross and Creek	sing downstream of Wol	lf							Turbidity
Hogans C	Creek									
22-50	С	29.1 FW Miles	S				ND			
Fre	om source to Dan River			NF15	G	2004				
Jones Cre	eek (Lake Wade)									
22-50-3	С	7.6 FW Miles	S				ND			
Fre	om source to Hogans Creek			NF16	G	2004				
Matrimor	ny Creek (North Carolin	a portion)								
22-38	WS-IV	11.2 FW Miles	S				ND			
Fre	om source to Dan River			NF17	G	2004				
Rock Hou	ıse Creek									
22-34-(2)	WS-IV	6.5 FW Miles	S				ND			Habitat Degradation
Fre	om Rockingham Countly SR 238	31 to Dan River		NB36	GF	2001				
				NF18	G	2004				

# Table 5ROANOKESubbasin 03-02-03

AU Num	iber Classification	on Length/Area	Α	quatic Li	fe Ass	sessment Year/	Recreation	Assessr	nent		
]	Description		AL Rating	Station 1	Result	Parameter % Exc	<b>REC Rating</b>	Station	Result	Stressors Sour	ces
Smith R	iver										
22-40-(1)	WS-IV	2.8 FW Miles	I.	NA4	CE	Turbidity 12.5	I	NA4	NCE	Turbidity	Unknown
				NA5	ID			NA5	CE	Fecal Coliform Bacteria	Unknown
	From North Carolina-Virginia lownstream of Rockingham C									Habitat Degradation	Impervious Surface
22-40-(2.5)	) WS-IV;CA	0.5 FW Miles	I	NA4	CE	Turbidity 12.5	I	NA4	NCE	Turbidity	Unknown
				NA5	ID			NA5	CE	Fecal Coliform Bacteria	Unknown
S	From a point 0.8 mile downstr SR 1714 (Aiken Road) to Fiel ntake		y							Habitat Degradation	Impervious Surface
22-40-(3)	С	1.8 FW Miles	I	NA4	CE	Turbidity 12.5	I	NA4	NCE	Turbidity	Unknown
				NA5	ID			NA5	CE	Fecal Coliform Bacteria	Unknown
F	From Fieldcrest Mills Water S	Supply Intake to Dan River								Habitat Degradation	Impervious Surface
Wolf Isla	and Creek										
22-48	С	21.8 FW Miles	S				ND				
F	From source to Dan River			NF20	G	2004					

AU Number	Classific	ation	Length/A	Area A	quatic Life Assessmo Year/	ent	Recreation	Assess	ment		
Descrip	otion			AL Rating	Station Result Parame	eter % Exc	<b>REC Rating</b>	Station	Result	Stressors	Sources
Use Categories:	M	onitoring	data type:		Results:	Use	Support Ratin	igs 2005:			
AL - Aquatic Life	NI	F - Fish Co	ommunity Su	urvey	E - Excellent	S - 3	Supporting, I - I	Impaired			
REC - Recreation	NI	3 - Benthi	c Community	y Survey	G - Good	NR	- Not Rated				
	NA	A - Ambie	nt Monitorir	ng Site	GF - Good-Fair	NR	*- Not Rated for	r Recreat	ion (screenin	ng criteria exceeded)	
	NI	L- Lake M	onitoring		F - Fair	ND	-No Data Colle	ected to	make asses	sment	
					P - Poor						
					NI - Not Impaired						
Miles/Acres	m-	Monitore	ed		N- Natural	Res	ults				
FW-Fresh Water	e-	Evaluated			M - Moderate		CE-Criteria Exceeded > 10% and more than 10 samples				
					S-Severe	NC	E-No Criteria Ez	xceeded			
						ID-	Insufficeint Da	ata Ava	ilable		
Aquatic Life Ratin	ng Summary	y R	ecreation R	ating Summary	Fish Consumption I	Rating Summ	ary				
S m 76	6.1 FW Miles	s I	m	29.0 FW Miles	I e 250	.0 FW Miles					
I m 29	9.0 FW Miles	s N	Re	11.1 FW Miles							
NR e 11	1.1 FW Miles	s N	D	210.0 FW Miles							
ND 133	3.9 FW Miles	3									

# Table 5ROANOKESubbasin 03-02-03

ambient monitoring stations. Refer to the 2005 Roanoke River Basinwide Assessment Report at <u>http://www.esb.enr.state.nc.us/bar.html</u> and Appendix IV for more information on monitoring data.

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 is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segments are the same.

# 3.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-02-03 in the aquatic life, recreation, fish consumption and water supply categories. All waters are Impaired on an evaluated basis in the fish consumption category because of fish consumption advice that applies to the entire basin. In the water supply category, all waters are Supporting on an evaluated basis based on reports from DEH regional water treatment plant consultants.

There were 102.7 stream miles (41.1 percent) monitored during this assessment period in the aquatic life category. In the recreation category, 26.6 stream miles (10.6 percent) were monitored. A total of 26.6 stream miles (10.6 percent) are Impaired, for both the aquatic life and recreational use categories. Refer to Table 5 for a summary of use support ratings by use category for waters in subbasin 03-02-03.

# 3.3 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.

# 3.3.1 Dan River [AU# 22-(31.5)b]

## 2001 Recommendations

The Dan River, from a point 0.7 miles upstream of Jacobs Creek to Mill Branch (14.8 miles; includes both 22-(31.5)a & b), was Impaired for aquatic life due to a turbidity standard violation at site NA3 (N2300000). The site exceeded the standard in 18 percent of samples. The 2001 basin plan recommended that DWQ work with the Division of Land Resources to evaluate and reduce turbidity from permitted instream mining operations in the Dan River. As permits are renewed, monitoring upstream and downstream of mining operations and instream BMPs (such as those used by the NC Department of Transportation during bridge construction) could be required. In addition, DWQ will notify local agencies of water quality concerns regarding these

waters and work with them to conduct further monitoring and to locate sources of water quality protection funding.

### Current Status

The Dan River [AU#22-(31.5)b], from the 03-02-02 boundary to a point 0.8 miles downstream of Matrimony Creek (9.4 miles), is Impaired for aquatic life due to turbidity standard violation at site NA3. The turbidity standard was violated in 16.4 percent of samples in this assessment period. This segment will remain on the 303(d) list (category 4a; for more information on 303(d) listing and reporting, see appendix VII). DWQ developed a TMDL for turbidity for this section of the Dan River. The TMDL was finalized by the USEPA on January 11, 2005 and recommended that a 59 percent total suspended solids reduction distributed over both point and nonpoint sources should be achieved in order to meet the turbidity standard. Since the 2001 basin plan, several instream mining operations have become inactive and permits have been rescinded to the Division of Land Resources mostly due to permit modifications of required upstream and downstream monitoring.

This section of the Dan River is also Impaired for recreation because the fecal coliform bacteria standard was exceeded at site NA3. 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 section will be added to North Carolina's 303(d) list for fecal coliform bacteria.

### 2006 Recommendations

Local agencies are encouraged to secure funding opportunities for restoration projects to control nonpoint sources of pollution.

See Chapter 4, section 4.3.1 for Dan River summary.

## 3.3.2 Dan River [AU # 22-(38.5) & 22-(39)a]

## Current Status

The Dan River (North Carolina portion) [AU#22-(38.5)], from a point 0.8 miles downstream of Matrimony Creek to Mill Branch (Town of Eden water supply intake) (0.6 miles), and [AU# 22-(39)a] from Mill Branch to NC/VA crossing downstream of Wolf Island Creek (13.8 miles), is Impaired for aquatic life due to turbidity standard violation at site NA6. The turbidity standard was violated in 17.5 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 NA6. 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 fecal coliform 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 to control nonpoint sources of pollution.

### See Chapter 4, section 4.3.1 for Dan River summary.

### 3.3.3 Smith River [AU # 22-40-(1), 22-40-(2.5) & 22-40-(3)]

### 2001 Recommendations

The 2001 basin plan recommended that DWQ work with the NC Division of Water Resources, the Virginia Department of Environmental Quality (VADEQ) and the Town of Martinsville, Virginia to address flow fluctuation issues. However, nonpoint source pollution in the North Carolina portion of the watershed may also contribute to degradation of habitat and water quality downstream. It is imperative that, in addition to citizen and municipality lead actions in Virginia, citizens and municipalities in North Carolina implement best management practices as well. Of particular concern are urban areas and construction activities in and around Eden.

### Current Status

Smith River, from North Carolina-Virginia State Line to the Dan River (5.1 miles) is Impaired for aquatic life because 12.5 percent of the samples taken at site NA4 exceeded the turbidity standard.

This same section of the Smith River is Impaired for recreation due to fecal coliform bacteria standard violation at site NA5. 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.

The entire North Carolina segment of the Smith River will be added to North Carolina's 303(d) list for fecal coliform bacteria and turbidity standard violations. This section is already on the 303(d) list for impaired biological integrity due to a Fair benthic rating in 1999.

The Eden WWTP has experienced significant inflow and infiltration problems during this assessment period. As of January 2004, Eden was under a Special Order of Consent for their collection system and upgrading including resizing pump stations. Eden is starting a four million dollar sewer line rehabilitation project, which will be followed up with an anticipated two million dollar sewer pump station upgrade.

The Philpott Reservoir located on the Smith River approximately 33 miles from the Virginia-North Carolina State line is owned and operated by the US Army Corps of Engineers (ACOE). The minimum flow out of Philpott dam is 59 cubic feet per second (cfs) and can reach maximum flow releases of 1,400 cfs during power generation operation. In 2003, the ACOE proposed to conduct a reconnaissance study under Section 216 of the Flood Control Act of 1970. Unfortunately funds were cut in federal fiscal year 2005 and the study was not funded. The study would have begun to identify the needs and opportunities for improvements to the Philpott Dam and Reservoir. From Philpott Reservoir the river flows to the Martinsville Reservoir near Martinsville, Virginia. The Martinsville Reservoir (Smith River) is a small hydropower operation with minimal holding capacity. This hydropower is exempt from obtaining a Federal Energy Regulatory Commission license because they generate less than five megawatts of power (VADEQ, B. LaRoche pers. comm.).

### 2006 Recommendations

DWQ will continue to monitor the Smith River and work with the town of Eden on discharge requirements. It is also recommended that VADEQ and NCDWQ support future ACOE studies, including a Section 216 study for Philpott Reservoir and Dam.

# 3.4 Status and Recommendations for Waters with Noted Impacts

The surface waters discussed in this section are not Impaired. However, notable water quality problems and concerns 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.

## 3.4.1 Hogans Creek [AU #22-50]

### Current Status

Hogans Creek, from source to Dan River (29.1 miles) is Supporting aquatic life due to a Good fish community bioclassification at site NF15.

#### Water Quality Initiative

In 1997, the Caswell County Soil and Water Conservation District and the Wetlands Restoration Program conducted a stream restoration project on an unnamed tributary of Hogans Creek. Approximately, 900 feet of stream was restored to 1,800 feet. DWQ conducted pre and post stream project data collections in 1996 and 1998. Since then, beavers have populated the restored area. Due to the lack of flow, primarily from beaver ponding activity, DWQ was not able to sample for post mitigation comparison in 2004.

#### 2006 Recommendations

DWQ does not have a state standard regarding beaver activities on streams. Best management practices do exist to reduce ponding activities.

## **3.4.2 Rock House Creek [AU#22-34-(2)]**

#### Current Status and 2006 Recommendations

Rock House Creek, from Rockingham County SR 2381 to Dan River (6.5 miles) is Supporting aquatic life due to Good fish community and Good-Fair benthic community bioclassifications at sites NF18 and NB36. Most of the land use is predominantly agriculture and during sampling it was noted that the stream exhibited substantial nonpoint source erosion impacts such as sedimentation and riparian bank instability problems. Also, nonpoint nutrients from upstream sources may have contributed to the abundance of the bluehead chub; 37 percent of all the fish collected were this species. It is recommended that local agencies work with landowners to assess the need for and prioritize the installation of BMPs to improve the riparian zones and restore the streambanks along this creek.

# 3.5 Additional Water Quality Issues within Subbasin 03-02-03

The following section discusses issues that may threaten water quality in the subbasin that are not specific to particular streams, lakes or reservoirs. The issues discussed may be related to waters near certain land use activities or within proximity to different pollution sources.

### 3.5.1 Land Clearing Activities

Most of the terrain is hilly in this subbasin. Therefore sedimentation problems are more intense during land clearing and grading activities. Sediment when not properly controlled by BMPs frequently cause excessive damage to the aquatic ecosystems. As land is converted from forest or agriculture to residential developments, the proper enforcement and oversight of BMPs is necessary for avoiding water quality impacts and impairments.