Chapter 1
Roanoke River Subbasin 03-02-01

Including: Dan River, Big Creek, Town Fork, Belews Creek and Snow Creeks

1.1 Subbasin Overview

Subbasin 03-02-01 at a Glance

Land and Water Area

Total area:	453 mi²
Land area:	445 mi²
Water area:	8 mi²

Population

2000 Est. Pop.: 108,615 people
Pop. Density: 240 persons/mi²

Land Cover (percent)

Forest/Wetland:	72.8%
Water:	1.9%
Urban:	0.6%
Cultivated Crop:	2.9%
Pasture:	21.8%

Counties

Surry, Stokes, Rockingham, Guilford and Forsyth

Municipalities

Danbury, Kernersville, Rural Hall, Walkertown and Walnut Cove

Monitored Stream Statistics

Aquatic Life

Total Streams:	153.7 mi/2867.7 ac
Total Supporting:	142.1 mi/2668.1 ac
Total Impaired:	11.6 mi
Total Not Rated:	46.1 mi

Recreation

Total Streams:	11.6 mi
Total Supporting:	11.6 mi

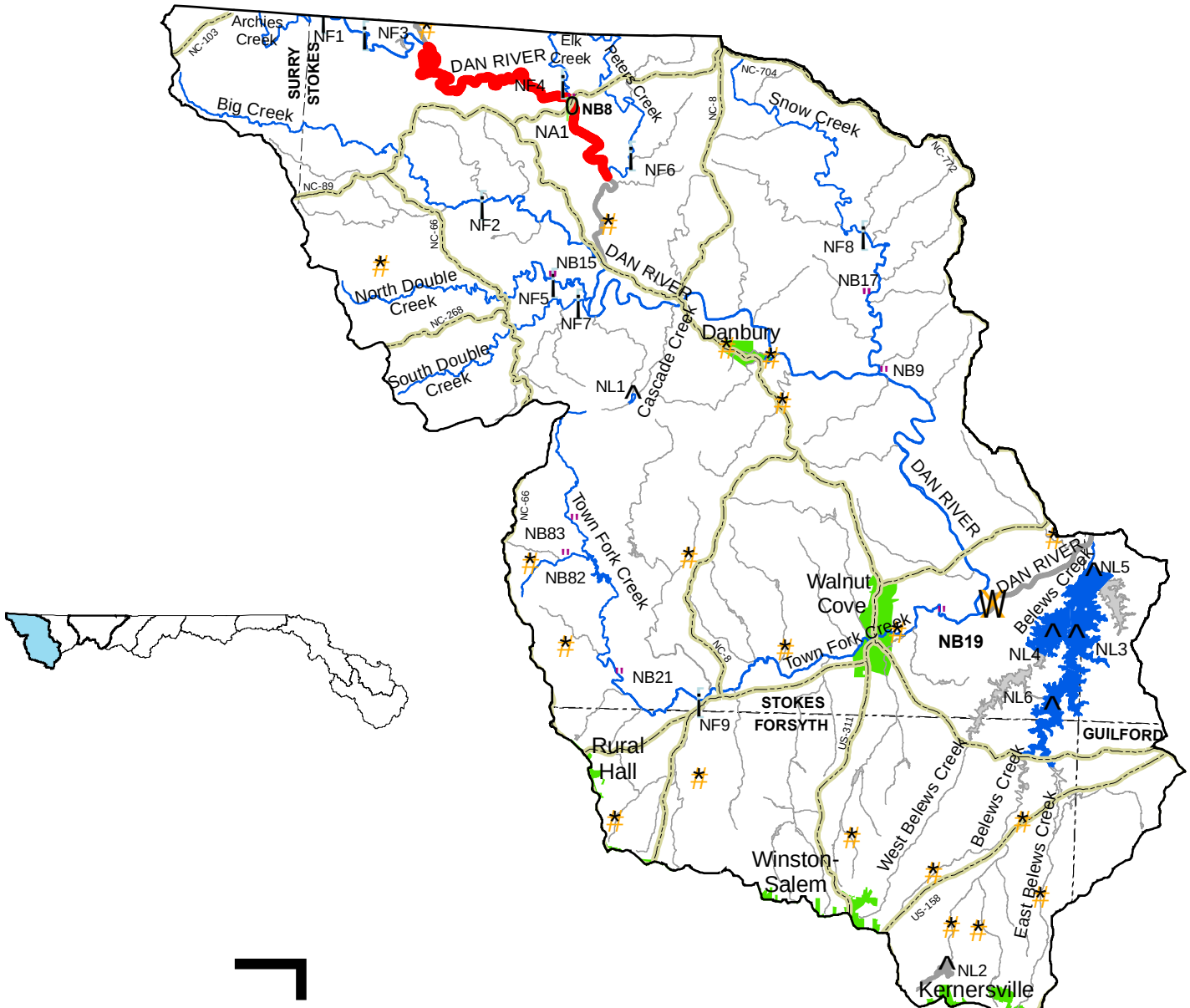
Although the headwaters of the Dan River originate in Virginia, this subbasin contains the uppermost reaches of the Dan River in North Carolina. More than seventy percent of this subbasin is forested, and less than three percent is in cultivated crop, the lowest percentage of this type land use in any of the subbasins. The percentage of the subbasin utilized for pasture was the greatest of any of the subbasins. Hanging Rock State Park is the largest publicly owned property in this subbasin.

By the year 2020, populations within Stokes and Forsyth counties are expected to increase by 24 percent and 21 percent, respectively. Of particular concern is residential and urban development occurring in the suburbanizing areas of northeastern Winston-Salem. Consequently, streams in these areas may be negatively impacted by sediment and streambank erosion commonly associated with development activities. Information regarding population growth, trends and impacts can be found in Chapter 12 and 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 best management practices, is one of these programs. The NCACSP provided $164,929 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 watershed discussion throughout this chapter as well as in Chapters 16 (Agriculture and Water Quality) and 20 (Water Quality Initiatives).

Twenty-one individual NPDES discharge permits are issued in this subbasin, five of which are required to conduct whole effluent toxicity testing. Refer to Appendix VI for more information on NPDES permit holders. Two registered cattle and one registered swine operations are located in this subbasin. Refer to Chapter 16 for more information regarding animal operations within this basin.

Figure 3 Roanoke River Subbasin 03-02-01



Division of Water Quality
Basinwide Planning Unit
May 30, 2006

0 1.5 3 6 9 12
Miles

Legend

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

Aqutic Life Use Support Rating

- Impaired
- No Data
- Not Rated
- Supporting

NPDES Dischargers

- Major
- Minor

- Primary Roads
- Municipality
- County Boundary

Table 3 ROANOKE Subbasin 03-02-01

AU Number	Classification	Length/Area	Description	Aquatic Life Assessment					Recreation Assessment				
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	Stressors	Sources
Archies Creek													
22-2	C;Tr	7.3 FW Miles	North Carolina portion	**S**	NF1	E	'2004		ND				
Belews Creek (including Belews Lake below elevation 725) (1)													
22-27-(7)	C	789.7 FW Acres	From Southern Railroad Bridge to to a point 1.8 mile downstream of Forsyth-Stokes County Line	**S**	NL6	NCE			ND				
22-27-(7.5)	WS-IV	1,283.8 FW Acres	From a point 1.8 mile downstream of the Forsyth-Stokes County Line to Dan River, excluding the Arm of Belews Lake described below which are classified "WS-IV&B"	**S**	NL5 NL3	NCE NCE			ND				
Belews Creek (Kernersville Lake)													
22-27-(1.5)	WS-IV;CA	46.1 FW Acres	From a point 0.5 mile upstream of backwaters of Kernersville Lake to Town of Kernersville Water Supply Dam	**NR**	NL2	ID			ND				
Big Creek													
22-9	C;Tr	19.9 FW Miles	From source to Dan River	**S**	NF2	G	'2004		ND				
Brushy Fork Creek													
22-25-1	C	3.0 FW Miles	From source to Town Fork Creek	**S**	NB82	G	'2004		ND				
Cascade Creek (Hanging Rock Lake)													
22-12-(2)a	B	12.2 FW Acres	From backwaters to dam at swimming lake	**S**	NL1	NCE			ND				

Table 3 ROANOKE Subbasin 03-02-01

AU Number	Classification	Length/Area	Description	Aquatic Life Assessment					Recreation Assessment			Stressors	Sources
				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result		
DAN RIVER													
22-(8)	WS-V	25.9 FW Miles		S					ND				
	From Big Creek to to a point 0.2 mile downstream of Town Fork Creek				NB9	G	'2004						
DAN RIVER (North Carolina portion)													
22-(1)a	C;Tr	5.1 FW Miles		S					ND				
	From North Carolina-Virginia State Line to Little Dan River				NF3	G	'2004						
22-(1)b	C;Tr	11.6 FW Miles		I	NA1	CE	Turbidity	24.1	S	NA1	NCE	Turbidity	
	From Little Dan River to Peters Creek				NB8	E	'2004						
Elk Creek													
22-5	C;Tr	2.9 FW Miles		S					ND			Habitat Degradation	Land Clearing
	From North Carolina-Virginia State Line to Dan River				NF4	GF	'2004						
North Double Creek													
22-10	C	14.0 FW Miles		S					ND			Habitat Degradation	Impervious Surface
	From source to Dan River				NB15	G	'2004					Nutrient Impacts	Unknown
					NF5	GF	'2004						
Peters Creek													
22-6	C;Tr	9.1 FW Miles		S					ND				
	From North Carolina-Virginia State Line to Dan River				NF6	E	'2004						
Snow Creek													
22-20	C	18.9 FW Miles		S					ND				
	From source to Dan River				NB17	G	'2000						
					NB17	G	'2004						
					NF8	G	'2004						
South Double Creek													
22-11	B	9.9 FW Miles		S					ND				
	From source to Dan River				NF7	G	'2004						

Table 3 ROANOKE Subbasin 03-02-01

AU Number	Classification	Length/Area		Aquatic Life Assessment					Recreation Assessment				
Description				AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	Stressors	Sources
Town Fork Creek													
22-25a	C	8.0	FW Miles	S					ND				
From source to Timmons Cr.					NB83	G	'2004						
22-25b	C	18.0	FW Miles	S					ND			Habitat Degradation	Unknown
From Timmons Cr. to Dan River					NB19	G	'2004						
					NB21	GF	'2004						
					NF9	G	'2004						
West Belews Creek (West Belews Creek Arm of of Belews Lake below elevation 725)													
22-27-9-(4)	WS-IV	582.4	FW Acres	S	NL4	NCE			ND				
From a point 0.4 mile downstream of Powerplant to Belews Creek													

Table 3 ROANOKE Subbasin 03-02-01

AU Number / Classification / Length/Area / Description	Aquatic Life Assessment					Recreation Assessment				
	AL Rating	Station	Result	Year/ Parameter	% Exc	REC Rating	Station	Result	Stressors	Sources

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

S	m	142.1	FW Miles
I	m	11.6	FW Miles
S	m	2,668.1	FW Acres
NR	m	46.1	FW Acres
NR	e	13.8	FW Miles
ND		262.9	FW Miles
ND		326.5	FW Acres

Recreation Rating Summary

S	m	11.6	FW Miles
NR	e	18.2	FW Miles
ND		400.5	FW Miles
ND		3,040.7	FW Acres

Fish Consumption Rating Summary

I	e	430.3	FW Miles
I	e	3,040.7	FW Acres

Nine benthic macroinvertebrate community samples and nine fish community samples (Figure 3 and Table 3) were collected during this assessment period in this subbasin. Data were also collected at one ambient monitoring station and three lakes. 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.

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure 3. Table 3 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.

Waters in the following sections and tables are identified by assessment unit number(s) (AU#). This number is used to track defined segments in the water quality assessment database and 303(d) Impaired waters list. The AU# is a subset of the DWQ classification identification segment number or index number. A letter attached to the end of the AU# indicates that the assessment is a smaller segment than the DWQ index number. No letter indicates that the AU# and the DWQ index numbers are the same.

1.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 03-02-01 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 153.7 stream miles (35.7 percent) and 2714.2 freshwater acres (89.3 percent) monitored during this assessment period in the aquatic life category. Of this, 142.1 stream miles (33 percent) and 2,668.1 freshwater acres (87.8 percent) were supporting and 11.6 stream miles (2.7 percent) were impaired for aquatic life. In the recreation category, all 11.6 monitored stream miles (2.7 percent) were supporting. Refer to Table 3 for a summary of use support ratings for waters in subbasin 03-02-01.

1.3 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 the assessment unit number (AU#). Information regarding 303(d) listing and reporting methodology is presented in Appendix VII.

1.3.1 Town Fork Creek Watershed [AU# 22-25a & b & 22-25-1]

2001 Recommendation

The 2001 Basinwide Plan identified 8 miles of Town Fork Creek [AU# 22-25a], from source to Timmons Creek, as partially supporting for aquatic life due to a Poor benthic community bioclassification in 1995 at SR 1700 located less than 500 meters downstream from an impoundment. The plan recommended that more field investigation was needed in order to determine the actual sources of pollution in the watershed.

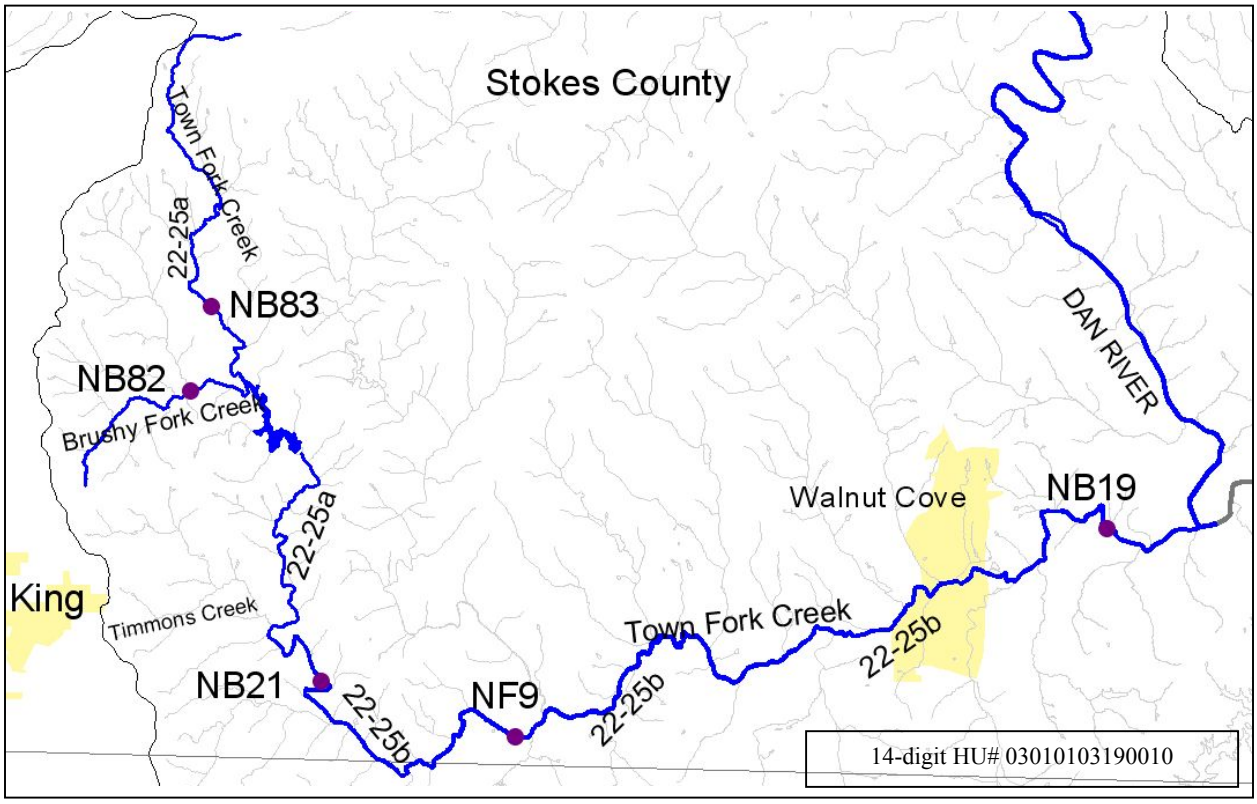


Figure 4 - Upper Town Fork Creek Watershed

Current Status

Town Fork Creek (AU# 22-25a & b), from source to Dan River is Supporting aquatic life due to Good and Good-Fair benthic community bioclassifications at sites NB83 and NB21. A TMDL stressor study was conducted in 2004 in the upper Town Fork Creek watershed, see Figure 4. One benthos site NB83 was sampled upstream and another site NB21 was sampled well below the impoundment. In addition, Town Fork Creek (AU#22-25b) received a Good fish community bioclassification at site NF9, and a Good benthic community rating at site NB19, see Figure 3 and 4. Both sites NB83 and NB21 indicated the portion of the stream sampled in close proximity to the impoundment in 1995 was not representative of conditions in the upper Town Fork Creek watershed.

Brushy Fork Creek (AU# 22-25-1), from source to Town Fork Creek, was also sampled as part of the stressor study and is Supporting aquatic life due to a Good benthic community bioclassification at site NB82.

2006 Recommendation
Town Fork Creek [AU# 22-25a] will be removed from the 303(d) list due to the Good-Fair benthic community bioclassification.

Water Quality Initiatives
Several agricultural BMPs were installed in the upper Town Fork Creek watershed during this basinwide cycle. These practices include the installation of 22.8 acres of conservation tillage, 0.3 acres of critical area plantings, 0.5 acres of grassed waterways, and 0.8 acres of field borders. In addition, a stormwater management system, 2 tanks, 3,645 feet of livestock exclusion fencing, 2 heavy use areas, and a stock trail were also installed. Funding was provided by the NCACSP for a total cost of $46,504. In addition, there is one Environmental Quality Incentives Program (EQIP) contract planned for this watershed for $26,283. This project would include one well, one stock trail for 415 linear feet, one large heavy use area protection (approx. 2,500 sq. ft.), three watering facilities, three small (20' x 20') heavy use areas under the waterers, 2,550 feet pipeline, fencing (livestock exclusion from streams) for 8,340 linear feet and one roof runoff management system.

Refer to Chapter 16 for more information about the NCACSP and EQIP or contact the Stokes County Soil and Water Conservation District (SWCD) for more information.

1.3.2 Dan River [AU# 22-(1)b]

2001 Recommendation
The 2001 Basinwide Plan identified this segment of the Dan River as exceeding the turbidity standard in 35 percent of the samples collected from 1995 to 1999 at NC 704. However, this segment of the river was Supporting aquatic life due to a Good benthic community bioclassification at the same site location.

Current Status
The Dan River from Little Dan River to Peters Creek (11.6 miles), is Impaired for aquatic life because the turbidity standard of 10 NTUs was exceeded in 24 percent of the samples at site NA1. This segment is classified as Trout (Tr) waters, which are "suitable for natural trout propagation and maintenance of stocked trout" (15A NCAC02B.0301). A concurrent site (NB8) received an Excellent benthic community bioclassification. However, because each data type is assessed independently, the segment will remain Impaired for aquatic life. Refer to Appendix IX for more information.

This segment of the Dan River is Supporting for recreation because the fecal coliform bacteria screening criteria was not exceeded at site NA1.

DWQ conducted a trends and annual load analysis on data collected from 1990 to 2004 at site NA1. The analysis included trends on total nitrogen (TN), defined as the sum of total Kjeldahl nitrogen and nitrate-nitrogen, total phosphorus (TP), water temperature, turbidity and total suspended solids (TSS). Results indicated that average TN and TP concentrations peaked in February and August respectively and decreased to a minimum in October. TSS and turbidity

levels peaked in the late spring and early summer months. There were no trends significant at the 95 percent confidence level.

2006 Recommendation
High levels of turbidity over a sustained period of time have the potential to negatively impact aquatic communities. In 1991, trout buffer language was added to the NC Sedimentation Pollution Control Act, stating that waters classified as trout waters shall have an undisturbed buffer zone of 25 feet wide or of sufficient width to confine siltation within the twenty-five percent of the buffer zone nearest the land disturbing activity. This law also pertains to all unnamed tributaries that drain to classified trout waters. DWQ will continue to monitor the Dan River. DWQ will also work with local agencies to identify sediment sources and assist agency personnel to locate resources for water quality protection funding. It is recommended that local agencies work to install BMPs and implement a sediment and erosion control program.

The NC Wildlife Resources Commission (WRC) has identified this portion of the Dan River as an area that supports listed and otherwise rare and sensitive aquatic species. The James spinymussel (*Pleurobema collina*) was listed as federally endangered in 1988 and at the time of listing was known only from the James River drainage in Virginia and West Virginia. Primary threats to the James spinymussel include: habitat loss and modification; siltation due to agriculture, forestry, and urban development; interactions with the non-native Asiatic clam (*Corbicula fluminea)*; impoundments; and pollution by municipal, industrial, and agricultural sources (USFWS 1990). The first collection of the James spinymussel in North Carolina occurred in 2000 from the Dan River in Stokes County. As of 2006, a comprehensive surveys has not been completed in the Dan River drainage by WRC.

The Green floater (*Lasmigona subviridis*) is classified as a federal species of concern and state endangered species and is also found in the Dan River drainage. Future surveys into tributaries and additional mainstem surveys may yield further data regarding species populations within the area. Based on known occurrences, the Dan River in Stokes County and the Mayo River in Rockingham County currently support a diversity of rare mussel species. Good environmental management decision should be made to protect these species and their aquatic habitats (WRC, memo August 2005).

See Chapter 4, section 4.3.1 for Dan River summary.

1.4 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.

1.4.1 Elk Creek [AU# 22-5]

Current Status and 2006 Recommendation
Elk Creek, from North Carolina-Virginia State Line to Dan River (2.9 miles) is Supporting due to a Good-Fair fish community bioclassification at site NF4. Despite the occurrence of wild brown trout, five species of darters, and three endemic species including one cutlip minnow, this site and its fish community suffer from altered riparian habitats (narrow zones that offer minimal shading; riparian zones that have been periodically burned and riparian zones with numerous breaks that contribute nonpoint source nutrients and sediment to the stream). Stream restoration activities are desirable along Elk Creek to stabilize and improve the overall creek habitat.

1.4.2 North Double Creek [AU# 22-10]

Current Status and 2006 Recommendation
North Double Creek, from source to Dan River (14.0 miles), is Supporting aquatic life because of a Good-Fair fish community bioclassification at site NF5 and a Good benthic community bioclassification at site NB15. Site NF5 was one of only two sites in Stokes and Rockingham counties where no intolerant fish species were collected (the other site being Pawpaw Creek in subbasin 03-02-02). However, the intolerant chainback darter was collected upstream in 2002 - 2003 by the NCWRC (Hodges 2004). The predominant land use is agricultural and nonpoint sources of nutrients from upstream sources may have contributed to the abundance of the bluehead chub; 43 percent of all the fish collected were this species. This site and others within the watershed should be resampled to determine what is preventing the community from being rated Good or Excellent.

1.4.3 Snow Creek [AU# 22-20]

Current Status and 2006 Recommendation
Snow Creek, from source to Dan River (18.9 miles) is Supporting aquatic life based on Good fish and benthic community bioclassifications at sites NF8 and NB17. The 2001 Roanoke River Basinwide Water Quality Plan identified nonpoint source pollution impacts in this watershed. Sedimentation, infrequent riffle areas and a significant lack of riparian vegetation were observed. DWQ will continue to monitor Snow Creek.

Water Quality Initiatives
The Ecosystems Enhancement Program conducted a stream restoration project on Snow Creek from Snow Hill Church Rd to Moir Farm Road, just upstream of site NF8. The project was completed in January 2005 and restored 3,400 linear feet of Snow Creek and over 650 linear feet on two tributaries. The project also included a conservation easement of 970 feet. In addition, 9,300 ft of fencing was installed for cattle exclusion and 2,200 ft as alternative pasture management. Additional BMPs are planned and will be installed through the federally funded Environmental Quality Incentives Program (EQIP).

1.4.4 Dan River [AU# 22-(25.5)]

Current Status and 2006 Recommendation
Dan River, from a point 0.2 mile downstream of Town Fork Creek to a point 0.3 mile upstream of Reed Creek, in subbasin 03-02-02 (9.2 miles) is Not Rated on an evaluated basis for aquatic life. KobeWieland Copper Products, Inc experienced noncompliance with their whole effluent toxicity (WET) testing permit requirement in early 2004. DWQ worked with the facility to identify and correct the toxicity problem. The facility has since been in compliance with the WET requirement and will continue to conduct WET testing per their permit requirement.

See Chapter 4, section 4.3.1 for Dan River summary.

1.5 Additional Water Quality Information within Subbasin 03-02-01

The following section discusses lakes assessments, other water quality issues and identifies those surface waters given an Excellent bioclassification, and therefore, may be eligible for reclassification to a High Quality Water (HQW) or an Outstanding Resource Water (ORW). It should be noted that these are streams that were sampled by DWQ during this basinwide cycle. There may be other tributaries eligible for reclassification in addition to the ones listed below. For more information regarding water quality standards and classifications, refer to Chapter 11.

1.5.1 Cascade Creek (Hanging Rock Lake) [AU# 22-12-(2)a]

Current Status and 2006 Recommendation
Hanging Rock Lake (12.2 acres) is Supporting aquatic life due to lakes assessment data from site NL1. This small reservoir located inside Hanging Rock State Park was sampled in the summers of 2000, 2001, 2002 and 2004. Low chlorophyll *a* and nutrient concentrations were found throughout the summers of 2002 and 2004 indicating low biological productivity. Assessment of parameters related to biological productivity indicated low biological productivity and oligotrophic status. Water clarity was good and Hanging Rock Lake exhibits excellent water quality.

1.5.2 Belews Creek (Kernersville Lake) [AU#22-27-(1.5)]

Current Status and 2006 Recommendation
Kernersville Lake (Belews Creek), from a point 0.5 mile upstream of backwaters of Kernersville Lake to Town of Kernersville Water Supply Dam (46.1 acres), is Not Rated for aquatic life due to the small number of samples (less than 10) taken at site NL2. Kernersville Lake is a backup water supply for the Town of Kernersville, and was sampled in 2000, 2001 and 2004. Water quality monitoring indicated moderately high nutrient and chlorophyll *a* levels. Assessment of parameters related to biological productivity indicated eutrophic conditions. Water clarity was somewhat reduced and typical of a eutrophic lake. Manganese levels were slightly elevated, probably due to bottom disturbances resuspending manganese in the sediments. This is expected in a small, fairly shallow reservoir such as Kernersville. There were no drinking water problems associated with these levels of manganese reported by the Town of Kernersville.

1.5.3 Belews Lake [AU# 22-27-(7), 22-27-(7.5), (West Belews Creek) 22-27-9-(4)]

Current Status and 2006 Recommendation

Belews Lake (Belews Creek) [AU# 22-27-(7)], from Southern Railroad Bridge to a point 1.8 mile downstream of Forsyth-Stokes County Line (789.7 acres) is Supporting aquatic life based on data from samples taken at site NL6. Belews Lake (Belews Creek) [AU# 22-27-(7.5)], from a point 1.8 mile downstream of the Forsyth-Stokes County Line to Dan River, excluding the Arm of Belews Lake described below which are classified "WS-IV&B" (1,283.8 acres), is Supporting aquatic life based on data from samples collected at sites NL3 and NL5. It was noted that the percent dissolved oxygen saturation exceeded the target of 120 percent in 9 percent of the samples taken, indicating potential algal activity. However, no other parameters were elevated in this segment. Belews Lake (West Belews Creek) [AU# 22-27-9-(4)], from a point 0.4 mile downstream of Power plant to Belews Creek (582.4 acres), is Supporting aquatic life based data from samples taken at site NL 4.

The lake provides condenser cooling water for the Belews Creek Duke Power Steam Station. Water quality sampling during the summers of 2000, 2001, 2002 and 2004 indicated low concentrations of nutrients and chlorophyll *a*. Assessment of parameters related to biological productivity indicated low biological productivity and oligotrophic conditions, as has been seen in historical sampling. Water temperatures were above the state water quality standard for temperature on some sampling visits but this has been seen in historical sampling and is due to the discharge from Duke Power's Belews Creek Steam Station coal-fired power plant. Duke Power has a temperature variance for the lake that allows exceedance of the state temperature standard above the dam.

Duke Power has performed chemical treatment on about 100 acres in 2004 to control *Hydrilla sp.* in Belews Lake (Rob Emens, N.C. Division of Water Resources, personal communication) in the vicinity of NC 158 outside the area where DWQ sampling sites are located.

A fish consumption advisory against eating fish contaminated with selenium due to a now closed coal ash disposal basin at the power plant was rescinded in August 2000 as selenium levels in the fish were below concentrations of concern (Luanne Williams, NC Division of Public Health, personal communication). This reduction resulted in the removal of Belews Lake from the 303(d) list of impaired waters.

Duke Power also conducts water quality sampling and benthic macroinvertebrate and fisheries monitoring of Belews Lake (Duke Power, 2001). This monitoring has shown that Belews Lake water chemistry has improved since the mid 1980's. The dry fly ash discharge from the Belews Creek Steam Station was rerouted from Belews Lake to the Dan River in 1985. Sediment arsenic and selenium levels in the lake have remained elevated relative to non-impacted sites but have gradually declined. Selenium levels in benthic macroinvertebrates have also declined but levels in macroinvertebrates collected in the downstream portion of the lake were higher than those collected in the upstream portion of the lake. The benthic macroinvertebrate species diversity indicates that the Belews Creek Steam Station is not impacting the benthic macroinvertebrate community. Selenium concentrations in the fish in Belews Lake are not high enough to pose a threat to fish or human populations. The fish community in Belews Lake was

found to be typical of that in a piedmont lake of similar productivity and indicates no impact from the power plant.

1.5.4 Archies Creek [AU# 22-2]

Current Status and 2006 Recommendation
Archies Creek, North Carolina portion (7.3 miles), is Supporting aquatic life due to an Excellent fish community bioclassification at site NF1 making it eligible for reclassification to HQW or ORW. At site NF1, five species of darters and three endemic species including eleven cutlip minnows were collected. The current DWQ classification is class C Tr.

1.5.5 Peters Creek [AU# 22-6]

Current Status and 2006 Recommendation
Peters Creek, from North Carolina-Virginia State Line to Dan River (9.1 miles), is Supporting aquatic life due to an Excellent fish community bioclassification at site NF6 making it eligible for reclassification to HQW or ORW. At site NF6, the instream and riparian habitats were of exceptional high quality and was qualified as a new fish community regional reference site by DWQ biologists. At site NF6, twenty-four species (the second greatest number of species collected from any site in the basin), six species of darters (the most number of species collected from any site in the basin) and three endemic species including two bigeye jumprocks were collected. This was the only site in the basin where the State Threatened bigeye jumprock (*Scartomyzon ariommus*) was collected and was the only site in the basin where five intolerant species were collected. The current DWQ classification is class C Tr.

1.6 Additional Water Quality Issues within Subbasin 03-02-01

The following section discusses issues that affect 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.

1.6.1 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 causes 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 to avoid water quality impacts and impairment. Local governments are encouraged to implement a stricter local sediment and erosion control ordinance, which would target land clearing activities that are less than a half acre.