Section B - Chapter 8
Catawba River Subbasin 03-08-37
Catawba Creek and Crowders Creek

8.1 Subbasin Overview

Subbasin 03-08-37 at a Glance

Land and Water Area

Total area:	106mi²
Land area:	105mi²
Water area:	1mi²

Population Statistics

2000 Est. Pop.:	55,232 people
Pop. Density:	516 persons/mi²

Land Cover (percent)

Forest/Wetland:	63%
Surface Water:	1%
Urban:	15%
Agriculture:	21%

Counties
Cleveland and Gaston

Municipalities
Bessemer City, Gastonia and Kings Mountain

This subbasin contains the Catawba and Crowders Creek watersheds which flow through Kings Mountain and the Southern Outer Piedmont ecoregions. Much of the subbasin is forested, but there are also substantial urban areas. The population in this area is not expected to grow as rapidly as in other areas of the Catawba River basin (Table A-6), but urban stormwater remains a significant concern.

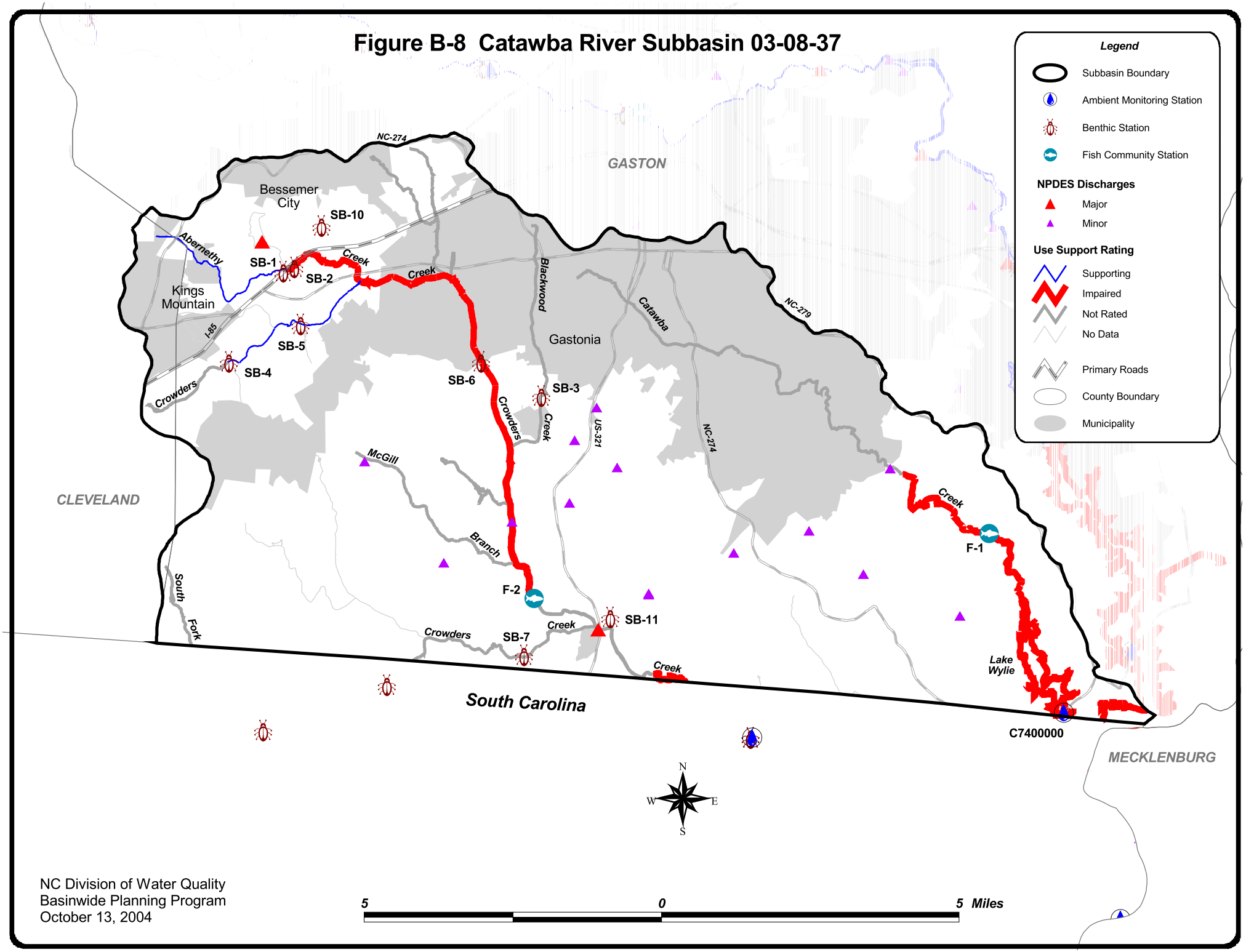
There are six facilities in this subbasin required to monitor effluent toxicity. Five of these facilities have had one or more failing tests since 1997: Gastonia/Catawba Creek WWTP (3 failures), FMC Corp. (formerly Lithium Corp. (3)), Rhodia Inc. (4), CR Industries (3), and Textron, Inc. (7).

There were 11 benthic macroinvertebrate community samples and two fish community samples (Figure B-8 and Table B-16) collected during this assessment period. Two sites remained the same and 11 sites were sampled for the first time during this assessment period. Refer to *2003 Catawba River Basinwide Assessment Report* at http://www.esb.enr.state.nc.us/bar.html and Section A, Chapter 3 for more information on monitoring.

There are two ambient monitoring sites located in this subbasin: Lake Wylie at NC 49 and Crowders Creek at SC 564. Catawba Creek has shown a steady decrease in conductivity since the middle 1980s; whereas, Crowders Creek has shown elevated conductivity and nitrogen levels since the early 1990s. Catawba Creek has shown slightly decreased total phosphorus concentrations since the late 1970s, while dissolved oxygen concentrations have decreased since the late 1970s. Point source dischargers have historically contributed to severe problems in Crowders Creek.

Waters in Part 8.3 are identified by assessment unit number (AU#). This number is used to track defined segments in the water quality assessment database, 303(d) Impaired waters list, and the various tables in this basin plan. The assessment unit number is a subset of the DWQ index number (classification identification number). A letter attached to the end of the AU# indicates that the assessment is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segment are the same.

Figure B-8 Catawba River Subbasin 03-08-37



NC Division of Water Quality
Basinwide Planning Program
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Table B-16 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 03-08-37

Waterbody	Assessment Unit Number	DWQ Classification	Length / Area	Category	Data Type with Map Number and Data Results			Use Support Rating	
					Biological	Ambient	Other	2004	1998
Abernethy Creek	11-135-4a	C	3.2 mi.	AL	SB-1 NI--02			S	ST
Abernethy Creek	11-135-4b	C	1.8 mi.	AL	SB-2 F--02			I	ST
Blackwood Creek	11-135-7	C	4.4 mi.	AL	SB-3 NR--02			NR	-
Catawba Creek	11-130c	C	4.9 mi.	AL	F-1 F--02			I	NS
Crowders Creek	11-135a	C	1.9 mi.	AL	SB-4 NR--02			NR	PS
Crowders Creek	11-135b	C	3.1 mi.	AL	SB-5 GF--02			S	PS
Crowders Creek	11-135c	C	3.3 mi.	AL	SB-6 F--02			I	PS
Crowders Creek	11-135d	C	7.3 mi.	AL	F-2 F--02			I	PS
Crowders Creek	11-135g	C	1.5 mi.	AL	B-1 F--02	C8660000 nce		I	PS
South Fork Crowders Creek	11-135-10	C	5.7 mi.	AL	SB-7 GF--02 SB-8 F--02 SB-9 GF--02			NR	PS
Blackwood Creek	11-135-7	C	4.4 mi.	REC			Special Fecal Coliform TMDL Study	I	-
Crowders Creek	11-135a	C	1.9 mi.	REC			Special Fecal Coliform TMDL Study	I	-
Crowders Creek	11-135b	C	3.1 mi.	REC			Special Fecal Coliform TMDL Study	I	-
Crowders Creek	11-135c	C	3.3 mi.	REC			Special Fecal Coliform TMDL Study	I	-
Crowders Creek	11-135d	C	7.3 mi.	REC			Special Fecal Coliform TMDL Study	I	-
Crowders Creek	11-135e	C	1.5 mi.	REC			Special Fecal Coliform TMDL Study	I	-

Table B-16 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 03-08-37

Waterbody	Assessment Unit Number	DWQ Classification	Length / Area	Category	Data Type with Map Number and Data Results			Use Support Rating	
					Biological	Ambient	Other	2004	1998
Crowders Creek	11-135f	C	1.4 mi.	REC			Special Fecal Coliform TMDL Study	I	-
Crowders Creek	11-135g	C	1.5 mi.	REC		C8660000 ce	Special Fecal Coliform TMDL Study	I	-

Assessment Unit Number - Portion of DWQ Classified Index where monitoring is applied to assign a use support rating.

Use Categories:
AL - Aquatic Life
REC - Recreation

Monitoring data type:
F - Fish Community Survey
B - Benthic Community Survey
SB - Special Benthic Community Study

Bioclassifcations:
E - Excellent NI - Not Impaired
G - Good
GF - Good-Fair
F - Fair
P - Poor

Ambient Data
nce - no criteria exceeded
ce - criteria exceeded

Use Support Ratings 2004:
S - Supporting, I - Impaired, NR - Not Rated

Use Support Ratings 1998:
FS - fully supporting, ST - supporting but threatened
PS - partially supporting, NS - not supporting

Use support ratings are summarized in Part 8.2 below. Recommendations, current status and future recommendations for waters that were Impaired in 1999 and newly Impaired waters are discussed in Part 8.3 below. Waters with notable impacts and water quality issues related to the entire subbasin are discussed in Parts 8.4 and 8.5. Refer to Appendix III for use support methods and more information on all monitored waters.

8.2 Use Support Assessment Summary

Use support ratings in subbasin 03-08-37 were assigned for aquatic life, fish consumption, recreation and water supply. All waters in the subbasin are considered Impaired on an Evaluated basis because of a fish consumption advice (Section A, Chapter 4, Part 4.10). Refer to Table B-17 for a summary of use support ratings by use support category for waters in the subbasin. Table B-17 does not include freshwater acreage associated with Lake Wylie to avoid duplication between subbasins. Lake Wylie's entire acreage is included in Table B-10.

Table B-17 Summary of Use Support Ratings by Use Support Category in Subbasin 03-08-37

Use Support Rating	Aquatic Life	Fish Consumption	Recreation	Water Supply
Monitored Waters				
Supporting	6.3 mi	0	0	0
Impaired	18.8 mi	0	24.4 mi.	0
Not Rated	23.6 mi	0	0	0
Total	**48.7 mi**	**0**	**24.4 mi**	**0**
Unmonitored Waters				
Supporting	0	0	0	0.
Impaired	0	84.4 mi	0	0
Not Rated	11.4 mi	0	0	0
No Data	24.2 mi	0	59.9 mi	0
Total	**35.6 mi**	**84.4 mi**	**59.9 mi**	**0**
Totals				
All Waters	**84.4 mi**	**84.4 mi**	**84.4 mi**	**0**

Note: All waters include monitored, evaluated and waters that were not assessed.

8.3 Status and Recommendations of Previously and Newly Impaired Waters

The following waters were identified in the 1999 basin plan as Impaired or are newly Impaired based on recent data. The current status and recommendations for addressing these waters are

presented below. These waters are identified by assessment unit number (AU#). Refer to the overview above for more information on AUs.

8.3.1 Catawba Creek [AU# 11-130a, 11-130b, and 11-130c]

Current Status and 2004 Recommendations
Catawba Creek, a tributary to Lake Wylie, drains the south and southeast area of the City of Gastonia and southeastern Gaston County. The 13.5 miles from its source to Lake Wylie appear on the state's 303(d) list as Impaired because of urban runoff, storm sewers and municipal point source discharges.

The City of Gastonia's 9 MGD WWTP, which previously discharged to Catawba Creek, no longer discharges into this watershed. Eliminating this discharge decreased the conductivity in the stream from 293 μmhos/cm in 1997 to 148 μmhos/cm in 2002. Four smaller NPDES permitted dischargers continue to operate, but there are no longer any major (>1 MGD) dischargers in the watershed. At site F-1, the stream and riparian zones are degraded by poor land use and livestock have access to the stream.

Catawba Creek is in a very similar condition to Long Creek (subbasin 03-08-36) prior to the restoration activities described in Section B, Chapter 7. Poor land use activities, livestock access, and an urbanizing watershed all suggest that Catawba Creek would benefit from a restoration program modeled after the Long Creek project. DWQ will work with interested parties to provide guidance and secure funding for such a project.

8.3.2 Crowders Creek [AU# 11-135a, 11-135b, 11-135c, 11-135d, 11-135e, 11-135f, and 11-135g]

Current Status and 2004 Recommendations
Crowders Creek, also a tributary to Lake Wylie, drains the south and western region of the City of Gastonia, the Interstate 85 corridor, and the eastern area of the Town of Kings Mountain. The entire 15.8-mile creek is listed as Impaired in the state's 303(d) list due to high fecal coliform concentrations from urban runoff, storm sewers and point source discharges. Data also indicate the biological community is Impaired. The South Carolina portions of the creek are Impaired because of poor biological communities and high fecal coliform concentrations. SCDHEC is providing information to assist DWQ in this TMDL development. As a by-product of this project, SCDHEC will receive an updated version of the Catawba WARMF model.

DWQ met with representatives of the City of Gastonia and the Gaston County Cooperative Extension Services in 2001 to discuss the development of a Crowders Creek TMDL. As a result of that meeting, the organizations agreed to conduct two intensive surveys of fecal coliform in the Crowders Creek watershed. The studies concluded that widespread water quality problems exist in the watershed and fecal coliform concentrations exceed the state standard in many locations. However, because of upgrades to a lithium ore processing plant and the removal of the Kings Mountain WWTP, Bessemer City WWTP and a chicken rendering plant, the studies did not note the severe water quality problems documented in the late 1980s.

A benthic macroinvertebrate sample at the SC 564 site in 1988 was rated Poor. Although the rating improved to Fair in 1989 and Good-Fair in 1992, site B-1 has been rated Fair since 1997.

One facility implicated in the degraded water quality was the Carolina and Southern Processing plant. Approximately three years ago, this facility tied onto the City of Gastonia's WWTP and has ceased its direct discharge to Crowders Creek. Additionally, in the spring of 2002, the Bessemer City WWTP ceased its 1.5 MGD discharge to Abernethy Creek (a tributary to Crowders Creek) and now sends waste to Gastonia's recently upgraded WWTP. These changes may have been responsible for the slight improvement in the biological community in Crowders Creek.

The final product of these studies is a fecal coliform TMDL scheduled for public notice in the first quarter of 2004. The TMDL evaluates the contribution of both point and nonpoint sources and attempts to determine the percentage by which various types of sources (urban, agriculture, WWTP, etc.) contribute to the degradation of Crowders Creek. Initial results show that urban runoff contributes nearly two-thirds of the total fecal coliform load, versus one-third by agriculture and WWTPs combined. This finding indicates that Crowders Creek would likely benefit from a management plan that reduces the detrimental effects of urbanization. For more information on management suggestions for urbanizing watersheds, please refer to Section A, Chapter 4, Part 4.11. Additionally, DWQ encourages implementation of agriculture BMPs wherever possible. Even though agriculture does not constitute the largest source of fecal coliform bacteria in this watershed, eliminating cattle access to streams will provide substantial protection to stream habitat and assist in the reduction of overall fecal coliform concentrations (see Section C, Chapter 1 for funding assistance sources).

8.3.3 Unnamed Tributary to Crowders Creek [AU# 11-135-8.5]

Current Status and 2004 Recommendations

The entire 0.4-mile segment of this stream from its source to Crowders Creek is listed as Impaired for unknown causes. The biological sampling strategy for the Crowders Creek TMDL described above included a site on this stream. DWQ biologists noted poor instream habitat, possible toxicity, and evidence of nutrient enrichment. Given its direct connection to Crowders Creek, DWQ feels improvements to this stream will be best addressed through implementation plans developed for the Crowders Creek TMDL.

8.3.4 McGill Creek [AU#11-135-2]

Current Status and 2004 Recommendations

McGill Creek, a tributary to Crowders Creek, is listed on the state's 303(d) list as Impaired for unknown causes (2.4 miles). Kings Mountain has ceased operation of a wastewater treatment plant that once discharged into this creek and had an instream waste concentration limit of 100 percent. This means that, at times, the discharge from the WWTP could have comprised the entire flow in the stream. Biologists attempting to sample McGill Creek for inclusion in the Crowders Creek TMDL study were unable to locate any water in the stream, instead finding only a dry ditch. McGill Creek was therefore not sampled. Because the WWTP no longer operates and the stream appears to be intermittent, DWQ has no plans to sample this creek again and will recommend it be removed from the 303(d) list.

8.3.5 Abernethy Creek [AU# 11-135-4b]

Current Status and 2004 Recommendations
Abernethy Creek receives runoff from I-85 and discharges from a lithium ore processing plant. The stream was originally rated Fair in 1987, but improved to Good-Fair as upgrades to the plant were completed. Site SB-2 may have been rated Fair in 2002 because of the drought and consequent reduction in dilution of the plant discharge. Therefore, 1.75 miles from First Creek to Crowders Creek are currently Impaired in support of aquatic life. DWQ should continue to monitor the impacts of the discharge on the biological community in Abernethy Creek and work with the discharger to determine if any additional upgrades are necessary. Installation of BMPs to reduce the impact of land use activities along the upper section may also help restore this stream.

8.3.6 Lake Wylie [AU# 11-(117), 11-(122), and 11-(123.5)]

The area covered by Lake Wylie overlaps the boundaries of subbasins 03-08-34, 03-08-36 and 03-08-37. Therefore, a detailed discussion on Lake Wylie can be found in Section A, Chapter 4, Part 4.7.3. This reservoir was most recently monitored in 2001 and 2002 and was classified as eutrophic. Percent oxygen saturation at the surface exceeded 120 percent in approximately 50 percent of the measurements lake wide. Nutrient concentrations ranged from moderate to elevated with particularly high levels of total phosphorus and total Kjeldahl nitrogen in the Crowders Creek arm. This arm also had elevated total phosphorus concentrations in 1997. However, as a result of the City of Gastonia decommissioning its Catawba Creek WWTP and redirecting this effluent to the improved Long Creek WWTP, the Crowders Creek arm has shown an overall decrease in total phosphorus and total nitrogen. Despite these improvements, there are still severe nutrient and dissolved oxygen concerns in the reservoir. Because chlorophyll *a* concentrations violate the state standards, Lake Wylie is considered Impaired for aquatic life.

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 have been documented for some waters based on this assessment. While these waters are not Impaired, attention and resources should be focused on these waters to prevent additional degradation or facilitate water quality improvement. Waters in the following section are identified by assessment unit number (AU#). See overview for more information on AUs.

8.4.1 South Fork Crowders Creek [AU# 11-135-10]

Current Status and 2004 Recommendations
South Fork Crowders Creek was sampled as part of an intensive sampling effort to support TMDL development for Crowders Creek. Sites SB-7, SB-8 and SB-9 received Good-Fair, Fair and Good-Fair bioclassifications, respectively. The use support rating for this stream is Not Rated because of the inconclusive bioclassifications. However, the habitat at all these sites showed significant impact from non point source runoff. The riparian buffer is narrow and the stream substrate is heavily embedded by sand and silt. The conditions in this stream will not

improve and may further decline is nonpoint sources of pollution in the watershed are not reduced. This stream should be included in any management strategy developed for Crowders Creek. See section 8.3.2 above.

8.5 Additional Water Quality Issues within Subbasin 03-08-37

Subbasins in and around the Greater Charlotte Metropolitan Area are experiencing rapid growth as new homes and businesses sprout up on old farms and forests. This development places intense pressure on the sensitive stream communities within those watersheds. In order to prevent aquatic habitat degradation and Impaired biological communities, protection measures should be put in place immediately. Refer to Section A, Chapter 4, Part 4.11 for a description of urban stream water quality problems and recommendations for reducing impacts and restoring water quality.