

Section B - Chapter 4

Catawba River Subbasin 03-08-33

Dutchmans Creek, McDowell Creek and Mountain Island Lake

4.1 Subbasin Overview

Subbasin 03-08-33 at a Glance

Land and Water Area

Total area:	220 mi ²
Land area:	216 mi ²
Water area:	4 mi ²

Population Statistics

2000 Est. Pop.:	117,621 people
Pop. Density:	546 persons/mi ²

Land Cover (percent)

Forest/Wetland:	69%
Surface Water:	2%
Urban:	2%
Agriculture:	27%

Counties

Catawba, Gaston, Lincoln and Mecklenburg

Municipalities

Cornelius, Huntersville, Mount Holly and Stanley

This subbasin is located in the Southern Outer Piedmont ecoregion. The largest watershed in this subbasin is Dutchmans Creek, formed by the confluence of Leepers and Killian Creeks. Dutchman's Creek flows into the Catawba River just downstream of Mountain Island Lake. Streams in the subbasin are often sandy, low gradient streams. Land use is primarily forested. The largest discharger in this subbasin is the Charlotte/Mecklenburg Utilities District which discharges 3 MGD into McDowell Creek.

Urbanization is a significant threat to water quality in this basin as some of the fastest growing communities in the state are located within it (Table A-7). Recognizing this threat, local governments have begun implementation of innovative management strategies to reduce urbanization's negative impact on water quality.

There are six facilities in this subbasin required to monitor effluent toxicity. Five facilities have passed all required toxicity tests. The CMUD/McDowell Creek WWTP has had three failing tests since 1997. The most recent failings were in 2000 and thought to be due to sample contamination. Otherwise, there have been no toxicity

failures since the plant disinfection process was converted from chlorine to ultra-violet (UV) in 1998.

There are three ambient monitoring sites located in this subbasin: Mountain Island Lake above Gar Creek, Dutchmans Creek at SR 1918, and the Catawba River at NC 27. All three sites have exhibited elevated conductivity since the middle and late 1990s.

There were four benthic macroinvertebrate community samples and four fish community samples (Figure B-4 and Table B-7) collected during this assessment period. Three sites had lower bioclassifications, and one site was 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.

Figure B-4 Catawba River Subbasin 03-08-33

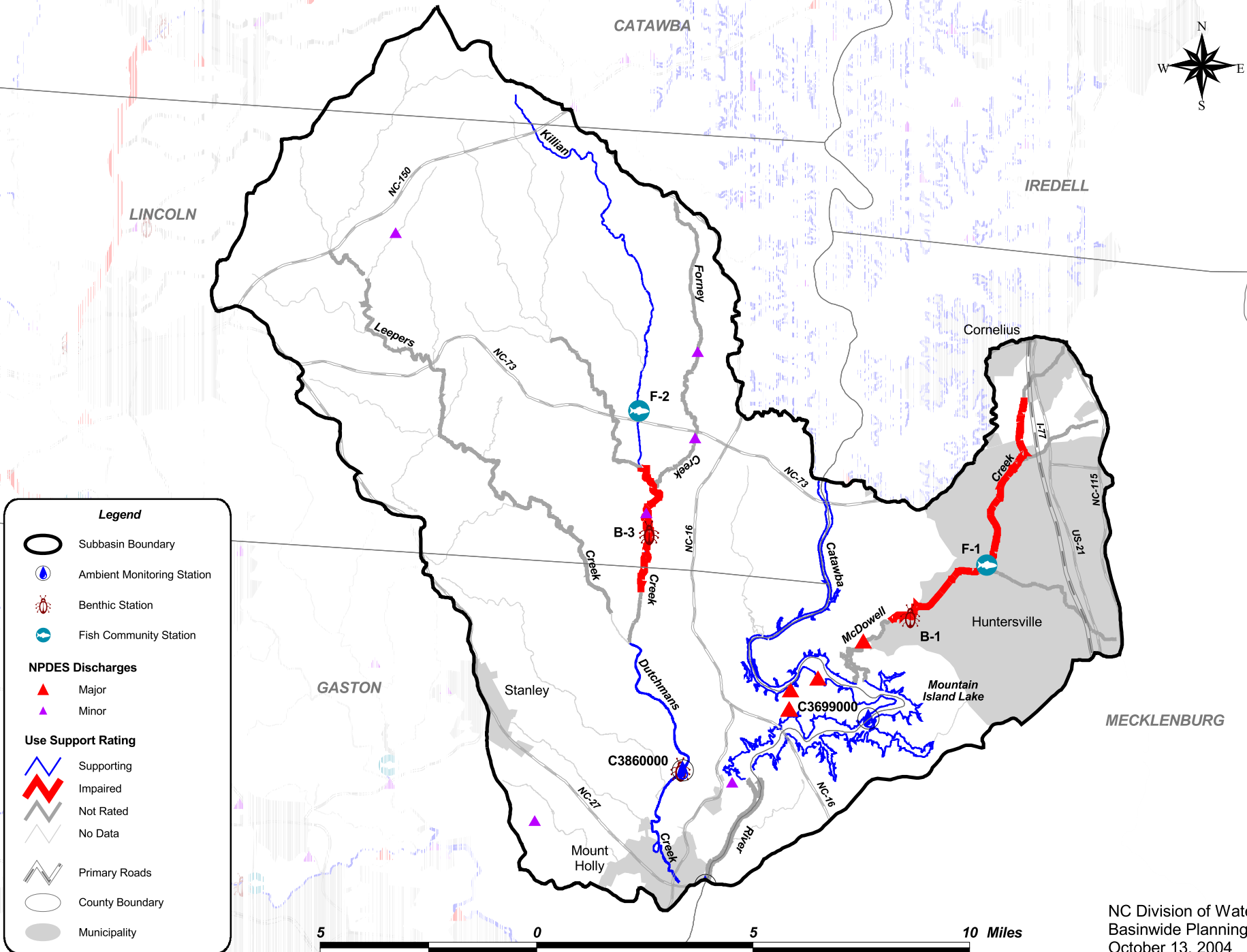


Table B-7 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 03-08-33

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
CATAWBA RIVER (Lake Wylie below elevation 570)	11-(117)	WS-IV CA	375.3 ac.	AL		C3900000 nce	L-1 nce	NR	FS
CATAWBA RIVER (Mountain Island Lake below elevation 648)	11-(112)	WS-IV CA	389.4 ac.	AL		C3699000 nce	L-1 nce	S	FS
CATAWBA RIVER (Mountain Island Lake below elevation 648)	11-(114)	WS-IV & B CA	1,937.1 ac.	AL		C3699000 nce	L-1 nce	S	FS
Dutchmans Creek	11-119-(0.5)	WS-IV	7.4 mi.	AL		C3860000 nce		S	FS
Killian Creek	11-119-2-(0.5)a	C	11.6 mi.	AL	F-2 G--97 F-2 GF--02			S	FS
Killian Creek	11-119-2-(0.5)b	C	3.2 mi.	AL	B-3 G--97 B-3 F--02			I	FS
McDowell Creek	11-115-(1.5)a	WS-IV	4.4 mi.	AL	F-1 F--97 F-1 P--02			I	PS
McDowell Creek	11-115-(1.5)b	WS-IV	2.9 mi.	AL	B-1 F--02			I	PS
CATAWBA RIVER (Lake Wylie below elevation 570)	11-(117)	WS-IV CA	375.3 ac.	REC		C3900000 nce		S	-
CATAWBA RIVER (Mountain Island Lake below elevation 648)	11-(114)	WS-IV & B CA	1,937.1 ac.	REC		C3699000 nce		S	-
Dutchmans Creek	11-119-(0.5)	WS-IV	7.4 mi.	REC		C3860000 nce		S	-

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 L - Lakes Assessment	Bioclassifications: E - Excellent G - Good GF - Good-Fair F - Fair P - Poor	Use Support Ratings 2004: S - Supporting, I - Impaired, NR - Not Rated
			Use Support Ratings 1998: FS - fully supporting PS - partially supporting, NS - not supporting
			Ambient Data nce - no criteria exceeded ce - criteria exceeded

Based on past benthic macroinvertebrate data, Dutchmans and Killian Creeks received either Excellent or Good bioclassifications, and McDowell Creek a Good-Fair. In 2002, benthic macroinvertebrate data from Dutchmans Creek declined to Good-Fair, and Killian and McDowell Creeks declined to Fair. Similar trends were observed for the fish community at McDowell Creek, which declined from Fair in 1997 to Poor in 2002; and in Killian Creek, which declined from Good in 1997 to Good-Fair in 2002. The lower benthic macroinvertebrate and fish bioclassifications were likely the result of the prolonged drought in Killian Creek, while the lower bioclassifications in McDowell Creek were likely the result of expanding urbanization surrounding the City of Charlotte. Remaining benthic macroinvertebrate sites which declined in 2002 from previous samples were likely due to extended low flows from the drought.

Mountain Island Lake is located on the Catawba River downstream of Lake Norman. In 2002, it was classified as oligotrophic and received the lowest trophic scores since 1981. Nutrient levels in 2002 were generally lower than measured in the past, and lakewide Secchi depths were correspondingly high. These improved conditions might have been due to decreased runoff as a result of the drought. The noxious exotic macrophyte, *Hydrilla*, is established and covers more than 600 acres. To manage it, grass carp were stocked in 2000 and 2002.

Waters in Parts 4.3 and 4.4 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.

Use support ratings are summarized in Part 4.2 below. Recommendations, current status and future recommendations for waters that were Impaired in 1999 and newly Impaired waters are discussed in Part 4.3 below. Supporting waters with noted water quality impacts are discussed in Part 4.4 below. Water quality issues related to the entire subbasin are discussed in Part 4.5. Refer to Appendix III for use support methods and more information on all monitored waters.

4.2 Use Support Assessment Summary

Use support ratings in subbasin 03-08-33 were assigned for aquatic life, fish consumption, recreation and water supply. All water supply waters are Supporting on an Evaluated basis based on reports from DEH regional water treatment plant consultants. Refer to Table B-8 for a summary of use support ratings by use support category for waters in the subbasin.

Table B-8 Summary of Use Support Ratings by Use Support Category in Subbasin 03-08-33

Use Support Rating	Aquatic Life	Fish Consumption	Recreation	Water Supply
Monitored Waters				
Supporting	18.93 mi 2,701.7 ac	0	7.4 mi 2,312.4 ac	0
Impaired	10.4 mi	0	0	0
Not Rated	3.4 mi	0	0	0
Total	32.7 mi 2,701.7 ac	0	7.4 mi 2,312.4 ac	0
Unmonitored Waters				
Supporting	0.0 mi	0	0	53.5 mi 2,701.7 ac
Impaired	0.0 mi	133.88 mi 375.29 ac	0	0
Not Rated	37.2 mi	0	0	0
No Data	92.2 mi	28.2 mi 2,326.41 ac	154.8 mi 389.3 ac	0
Total	129.4 mi	162.1 mi 2,701.7 ac	154.8 mi 389.3 ac	53.5 mi 2,701.7 ac
Totals				
All Waters	162.1 mi 2,701.7 ac	162.1 mi 2,701.7 ac	162.1 mi 2,701.7 ac	53.5 mi 2,701.7 ac

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

4.3 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.

4.3.1 McDowell Creek [AU# 11-115-(1.5)a and 11-115-(1.5)b]

Current Status and 2004 Recommendations

McDowell Creek is a tributary to the upper reaches of Mountain Island Lake and drains the rapidly growing suburban areas of the towns of Cornelius and Huntersville and the lands between Interstate 77 and Lake Norman.

In 1999, DWQ noted that bank erosion in McDowell Creek was severe and instream habitat was generally poor. The basinwide plan also mentioned that upgrades to the Charlotte-Mecklenburg

Utilities WWTP had resulted in reduced nutrient loads. DWQ suggested that local initiatives be pursued to find solutions to habitat degradations.

Site B-1 was added in 2002 by DWQ as a basinwide monitoring site to track this rapidly developing portion of Mecklenburg County. The site was previously monitored in 1990 and was given a Good-Fair bioclassification. In 2002, the bioclassification declined to Fair. Upstream at site F-1, the bioclassification declined from Fair in 1997 to Poor in 2002. The upper 7.2 miles of McDowell Creek (US Hwy 21 to SR 2136) are Impaired for aquatic life because of the bioclassifications at site B-1. The downstream 2.7 miles (SR 2136 to Mountain Island Lake) are Not Rated because there is no sample site on this segment. It should be noted that no visible difference in stream quality exists between the up and downstream segments.

Water quality data collected by the Mecklenburg County Water Quality Program (MCWQP) since 1988 also indicates a significant decline in water quality conditions in McDowell Creek and the cove in Mountain Island Lake where the creek drains. These declining water quality conditions are being caused by the increased discharge of pollutants carried in stormwater runoff from rapidly increasing impervious cover (parking lots, roads, houses, etc.) and construction activities in the McDowell Creek watershed. Sediment from construction sites, nutrients from lawn fertilizers, and heavy metals (lead, chromium and zinc) from parking lot and road runoff are the primary culprits. Currently, water quality in McDowell Creek Cove is ranked as "POOR" by Mecklenburg County and consistently ranks as one of the lowest water quality sites in the county.

To assess the impacts from future development in this watershed, MCWQP completed a water quality model for the McDowell Creek watershed that indicates a significant increase in pollutant loads as the area approaches build out. If left unchecked, the poor water quality conditions in McDowell Creek and McDowell Creek Cove will persist and could impact the quality of the water at Charlotte-Mecklenburg Utilities (CMUD) drinking water intake located downstream. The quality and usability of McDowell Creek Cove as a recreational area are also threatened by sediment depositions that decrease water depth and impair navigation.

Town of Huntersville Role:

In October 2002, the Huntersville Town Board adopted a "non-degradation" goal for the McDowell Creek watershed to halt the declining water quality trends. The board later expanded this goal to include all the surface waters within its jurisdiction. The board further requested that the MCWQP work with town staff to develop a post-construction ordinance to ensure that this was fulfilled. In response to this request, a Low Impact Development (LID) Ordinance was drafted by staff and approved by the Town Board in February 2003.

Huntersville's decision to adopt LID standards is based on the fact that a developed site can be designed as an integral part of the environment, and thus, serves to protect existing water quality conditions through the careful use of design principles that seek to mimic natural site hydrology. In some applications, LID designs can also significantly reduce development costs with the reduction of impervious surfaces (roadways), curb and gutters; use of less storm drain piping; and elimination of large stormwater ponds. Reducing site development infrastructure also reduces associated project, bonding and maintenance costs. Refer to Section A, Chapter 4, Part 4.11.

Mecklenburg County's Role:

Mecklenburg County's Water Quality Program is providing support to the Town of Huntersville through plan reviews and inspections to ensure compliance with the new ordinance. In addition, Mecklenburg County has agreed to install BMPs in critical areas of the McDowell Creek watershed to remove nonpoint source pollutants from development activities that occurred prior to the adoption of the Huntersville ordinance. The combination of the implementation of Huntersville's new water quality ordinance and the installation of retrofit BMPs will work toward reversing negative water quality trends in McDowell Creek and result in the ultimate improvement of overall water quality conditions. Mecklenburg County has already purchased properties at several locations in the watershed and is currently working to secure Clean Water Management Trust Fund grants to install BMPs at these sites.

Charlotte-Mecklenburg Utilities Role:

Charlotte-Mecklenburg Utilities (CMUD) received a permit modification to expand the McDowell Creek WWTP (NC0036277) located in the lower reaches of the watershed near Mountain Island Lake. In its plans for stepped plant expansion to 12 MGD (6.6, 9.0, 12.0 MGD), CMUD has included the treatment systems necessary to prevent an increase in existing pollutant loads. In addition, CMUD will be expanding current nutrient removal systems at the plant. The schedule is to complete construction to treat 9.0 MGD in 2005 and finish construction to treat 12.0 MGD in 2007.

North Carolina's Role:

Without state assistance, Huntersville and Mecklenburg County will be unable to fund the efforts necessary to reverse the negative water quality trends in McDowell Creek. Funding from programs such as the Clean Water Management Trust Fund and the Section 319 Program is essential. State support is needed to ensure that this funding is made available.

DWQ applauds the cooperation, foresight and initiative demonstrated by all the parties involved in the effort to reverse water quality impairment in McDowell Creek. The McDowell Creek watershed offers several unique opportunities. MCWQP has over 20 years worth of water quality data for McDowell Creek and Cove and continues to maintain a very extensive monitoring network to measure the effectiveness of efforts to restore water quality. This provides an opportunity to test the effectiveness of LID on a watershed scale and also to test the effectiveness of regional BMPs as a retrofit in a developing watershed. This also creates a unique opportunity to evaluate modeling as a tool for ordinance development and implementation.

Over the next basin cycle, DWQ will work to provide Huntersville and Mecklenburg County with the necessary support to continue their BMP implementation program. Additionally, DWQ will seek guidance from Huntersville and Mecklenburg County as it encourages the development of similar programs across the Catawba River basin.

4.3.2 Killian Creek [AU# 11-119-2-(0.5)b***Current Status and 2004 Recommendations***

Killian Creek is a tributary to upper Dutchmans Creek in southeastern Lincoln County. In 1992 and 1994, the stream received an Excellent bioclassification, Good in 1997, and Fair in 2002. Because of the Fair bioclassification at site B-3 in 2002, 3.2 miles (from Anderson Creek to a

point 1.2 miles upstream of mouth) are Impaired. Flows were less than 20 percent of historical median flow during the 2002 sampling and likely influenced the water quality decline. The decrease in bioclassification may also be due to reduced dilution of instream wastes from the Forney Creek and Fa Be Enterprises WWTPs. These facilities discharge to Forney Creek, a tributary to Killian Creek. There is no evidence to suggest these facilities are operating improperly or violating their current permits. DWQ will continue to monitor this creek in the next basin cycle.

4.4 Status and Recommendations for Waters with Noted Impacts

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

4.4.1 Mountain Island Lake [AU# 11-(112) and 11-(114)]

Current Status and 2004 Recommendations

Mountain Island Lake is operated by Duke Power and is located on the Catawba River downstream from Lake Norman. The reservoir is used as a water supply for the City of Charlotte and to generate electricity at the Riverbend Steam and Mountain Island Stations.

The reservoir was most recently monitored by DWQ in 2002. The lake was classified as oligotrophic; nutrient concentrations were generally lower than those observed in the past, and lake-wide Secchi depths indicated good water clarity. Decreased nutrient concentrations and greater water clarity may have been due to the drought conditions, which decreased nonpoint source runoff throughout the basin. Prior to 2002, the most recent monitoring was conducted in 1997.

Hydrilla is established in the reservoir and covers approximately 625 acres (Bonham, 2001). The exotic macrophyte was observed in the upper end of the reservoir in 2002. Grass carp were first stocked in 2000 as a possible biological control agent for this plant. In 2002, an additional 20,000 fish were stocked. Duke Power, along with stakeholders and DWQ, will continue to develop and implement an invasive plant management program for the reservoir.

Extensive management efforts are underway in the McDowell Creek Cove area of Mountain Island Lake. Please refer to the discussion of McDowell Creek (Section B, Chapter 4, Part 4.3.1) for a detailed description of those activities.

4.5 Additional Water Quality Issues within Subbasin 03-08-33

4.5.1 Water Quality Threats to Streams in Urbanizing Watersheds

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 basins. 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, Parts 4.11 and 4.13 for a description of urban stream water quality problems and recommendations for reducing impacts and restoring water quality.

