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Appendix F. Fish Supplemental Existing Environment Information

Correlates with the following Sections:

Fish community data were compiled by Duke Energy as part of the Catawba-Wateree Hydro Project Aquatic-01 report (Coughlan 2005). Sites included the Mountain Island Lake tailrace, the Mountain Island Lake bypass reach, Long Creek upstream of the project site (Figure 5.7b). A combined total of 26 species were collected in the tailrace site and in the Lake Wylie site. The fish community at these locations is centracid dominated with abundant blue gill (*Lepomis macrochirus*), redbreast sunfish (*Lepomis auritus*), and largemouth bass. Other species found in abundance included alewife (*Alosa pseudoharengus*), threadfin shad (*Dorosoma petenense*), whitefin shiner (*Cyprinella nivea*), and white perch.

The bypass reach had only 5 species and was dominated by mosquito fish (*Gambusia holbrooki*) with warmouth, bluegill, and pumpkinseed present as well. Long Creek had a diverse assemblage with 21 species represented. Species found in abundance included greenfin shiner (*Cyprinella chloristia*), bluehead chub (*Nocomis leptocephalus*), spottail shiner (*Notropis hudsonius*), with several species of ictaluridae, cyprinidae, catostomidae, centrarcidae, and percidae present. Detailed fish community data for the DUKE FERC study can be viewed at the following website: (http://www.duke-energy.com/pdfs/Aquatics_01_Report.pdf).

Fish community data has also been compiled by the NCDWQ Biological Assessment Unit for Long Creek in Mecklenburg County and Dutchmans Creek in Gaston County (NCDWQ 2007). Seventeen species were collected in Long Creek in July 2004, including abundant redbreast sunfish, bluegill, bluehead chub (*Nocomis leptocephalus*), swallowtail shiner (*Notropis procne*), and sandbar shiner (*Notropis scepticus*). The last survey conducted on Dutchmans Creek occurred in June 1993. Fifteen species were collected in Dutchmans Creek including abundant greenfin shiner (*Cyprinella chlorista*), redbreast sunfish, and bluehead chub (NCDWQ 2007).

In addition to the previously mentioned surveys Charlotte-Mecklenburg's Land Use and Environmental Services Agency (LUESA) conducts regular fish surveys at a number of locations throughout the County. Data sheets are provided here for the locations sampled within the proposed service area.

MECKLENBURG COUNTY - FISH IDENTIFICATION SHEET

STREAM	BASIN 96 -GAR CREEK	**SURVEY DATE**
	AT BEATTIES FORD ROAD (UP & DOWNSTREAM)	9/11/2009
LOCATION	MC50	
TAXONOMIST	Tony Roux	

FAMILY	**GENUS/SPECIES**	**COUNT**
CENTRARCHIDAE	LEPOMIS AURITUS	17
CENTRARCHIDAE	LEPOMIS GIBBOSUS	2
CENTRARCHIDAE	LEPOMIS GULOSUS	4
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	7
CENTRARCHIDAE	MICROPTERUS SALMOIDES	5
CYPRINIDAE	CLINOSTOMUS FUNDULOIDES	5
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	11
CYPRINIDAE	SEMOTILUS ATROMACULATUS	56
ICTALURIDAE	AMEIURUS MELAS	1
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	37
PERCIDAE	ETHEOSTOMA OLMSTEDI	40

IBI SCORE	**36**
WQ RATING	**FAIR**

MECKLENBURG COUNTY - FISH IDENTIFICATION SHEET

STREAM	BASIN 62 - PAW CREEK AT WILKINSON BLVD (UPSTREAM)	**SURVEY DATE** 9/25/2007
LOCATION	MC17	
TAXONOMIST	Tony Roux	

FAMILY	GENUS/SPECIES	COUNT
CATOSTOMIDAE	ERIMYZON OBLONGUS	3
CENTRARCHIDAE	LEPOMIS AURITUS	61
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	245
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	22
CYPRINIDAE	NOTROPIS PROCNE	74
ICTALURIDAE	AMEIURUS CATUS	11
ICTALURIDAE	AMEIURUS MELAS	1
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	142

IBI SCORE	**30**
WQ RATING	**POOR**

FISH IDENTIFICATION SHEET

LOG NO: 2006 -01259 **SURVEY DATE:** 10/03/2006
SITE: BASIN 69 BASIN 69 - LONG CREEK
STATION: MC14A LONG CREEK AT PINE ISLAND DRIVE
BASIN: 69
LOCATION: MC14A

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux
Corey T. Priddy
Shannon D. Wheat

FAMILY	GENUS/SPECIES	NO.	TOT WT	LENGTHS
CATOSTOMIDAE	SCARTOMYZON sp. Cl. LACHNERI	2	0	19(1), 23(1)
CENTRARCHIDAE	LEPOMIS AURITUS	20	0	4(2), 6(1), 7(4), 7.5(2), 8(3), 8.5(1), 9(2), 9.5(1), 10(3), 12(1)
CENTRARCHIDAE	LEPOMIS CYANELLUS	6	0	6.5(1), 7.5(2), 10(1), 12.5(1), 14(1)
CENTRARCHIDAE	LEPOMIS GIBBOSUS	1	0	15.5(1)
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	5	0	5.5(1), 8(2), 9.5(1), 10.5(1)
CYPRINIDAE	CYPRINELLA CHLORISTIA	34	0	4.5(1), 5(6), 5.5(12), 6(13), 7(2)
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	3	0	11.5(2), 14(1)
CYPRINIDAE	NOTROPIS HUDSONIUS	4	0	6(2), 6.5(1), 7(1)
CYPRINIDAE	NOTROPIS PROCNE	21	0	3.5(3), 4.5(4), 5(9), 5.5(5)
CYPRINIDAE	NOTROPIS SCEPTICUS	38	0	4(1), 4.5(1), 5(7), 5.5(11), 6(11), 6.5(3), 7(3), 8(1)
ICTALURIDAE	AMEIURUS PLATYCEPHALUS	1	0	21(1)
PERCIDAE	ETHEOSTOMA OLMSTEDI	11	0	4(1), 4.5(5), 5(3), 5.5(1), 6(1)
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	17	0	2.5(2), 3(8), 3.5(4), 4(3)

IBI SCORE: 44 **WATER QUALITY RATING:** 5 FAIR

FISH IDENTIFICATION SHEET

LOG NO: 2004 -01017 SURVEY DATE: 09/22/2004
SITE: BASIN 96 BASIN 96 - GAR CREEK
TATION: MC50 GAR CREEK AT BEATTIES FORD RD
BASIN: 96
LOCATION: MC50

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux
Chris F. Elmore
Isaac J. Hinson

FAMILY	GENUS/SPECIES	NO.	TOT WT	LENGTHS
CENTRARCHIDAE	LEPOMIS AURITUS	43	0	5(1), 6(1), 7(2), 7.5(2), 8(2), 9(1), 9.5(4), 10(4), 10.5(4), 11(6), 11.5(2), 12(4), 12.5(4), 13(5), 14(1)
CENTRARCHIDAE	LEPOMIS GIBBOSUS	30	0	6(2), 6.5(4), 7(3), 7.5(9), 8(3), 8.5(1), 9(2), 9.5(1), 10(2), 10.5(1), 11(1), 11.5(1)
CENTRARCHIDAE	LEPOMIS GULOSUS	9	0	6(1), 8(1), 8.5(2), 9.5(2), 10.5(1), 12(1), 13.5(1)
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	182	0	4(10), 4.5(19), 5(57), 5.5(34), 6(16), 6.5(4), 7(8), 7.5(11), 8(7), 8.5(4), 9(5), 9.5(3), 10(1), 10.5(2), 14(1)
CENTRARCHIDAE	MICROPTERUS SALMOIDES	20	0	5.5(1), 6(6), 6.5(2), 7(5), 7.5(3), 8(1), 9(1), 10(1)
CENTRARCHIDAE	POMOXIS NIGROMACULATUS	3	0	7(1), 7.5(2)
CLUPEIDAE	DOROSOMA CEPEDIANUM	1	0	8.5(1)
CYPRINIDAE	CLINOSTOMUS FUNDULOIDES	1	0	11.5(1)
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	1	0	7.5(1)
CYPRINIDAE	SEMOTILUS ATROMACULATUS	6	0	10(1), 12(3), 12.5(1), 13.5(1)
ICTALURIDAE	AMEIURUS CATUS	1	0	19.5(1)
PERCIDAE	ETHEOSTOMA FUSIFORME	1	0	5(1)
PERCIDAE	ETHEOSTOMA OLMSTEDI	9	0	4(1), 4.5(2), 5(1), 5.5(1), 6(2), 6.5(1), 7(1)
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	17	0	4(1), 4.5(8), 5(4), 5.5(4)

IBI SCORE: 46 WATER QUALITY RATING: 4 FAIR-GOOD

FISH IDENTIFICATION SHEET

LOG NO: 2003 -01364
SURVEY DATE: 10/15/2003
SITE: BASIN 62 BASIN 62 - PAW CREEK
STATION: MC17 PAW CREEK AT WILKINSON BLVD
BASIN: 62
LOCATION: MC17

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux
Brian G. Sikes

FAMILY	GENUS/SPECIES	NO.	TOT WT	LENGTHS
CATOSTOMIDAE	CATOSTOMUS COMMERSONI	1	0	23(1)
CATOSTOMIDAE	ERIMYZON OBLONGUS	2	0	15(1), 16(1)
CENTRARCHIDAE	LEPOMIS AURITUS	24	0	4(1), 6(3), 7(10), 8(1), 9(1), 11(3), 12(2), 13(3)
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	54	0	4(3), 5(2), 6(6), 7(8), 8(8), 9(8), 10(10), 11(8), 13(1)
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	3	0	4(1), 10(1), 14(1)
CYPRINIDAE	NOTEMIGONUS CRYSOLEUCAS	1	0	12(1)
ICTALURIDAE	AMEIURUS CATUS	17	0	6(1), 7(2), 11(1), 12(4), 13(4), 14(3), 15(1), 19(1)
ICTALURIDAE	AMEIURUS NATALIS	2	0	8(1), 10(1)
ICTALURIDAE	AMEIURUS NEBULOSUS	6	0	8(1), 11(1), 12(1), 14(1), 15(2)
PERCIDAE	ETHEOSTOMA OLMSTEDI	4	0	5(2), 6(2)

IBI SCORE: 38 WATER QUALITY RATING: 6 POOR-FAIR

FISH IDENTIFICATION SHEET

LOG NO: 2002 -01892
SITE: BASIN 67 BASIN 67 - LONG CREEK
STATION: MC10 LONG CREEK AT OAKDALE RD
BASIN: 67
LOCATION: MC10

SURVEY DATE: 11/15/2002

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux
Jonathan Beller
Brad Loveland

FAMILY	GENUS/SPECIES	NO.	TOT WT	LENGTHS
CATOSTOMIDAE	ERIMYZON OBLONGUS	2	0	7(1), 8(1)
CENTRARCHIDAE	LEPOMIS AURITUS	21	0	3(5),4(1), 5(3), 6(5), 8(2), 9(2), 10(2), 11(1)
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	1	0	6(1)
CENTRARCHIDAE	MICROPTERUS SALMOIDES	1	0	6(1)
CYPRINIDAE	CLINOSTOMUS FUNDULOIDES	62	0	4(27), 5(24), 6(6), 7(5)
CYPRINIDAE	CYPRINELLA CHLORISTIA	11	0	3(1), 4(4), 5(2), 6(2), 7(2)
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	90	0	3(12), 4(16), 5(29), 6(11), 7(5), 8(1), 9(5), 10(6), 11(4), 16(1)
CYPRINIDAE	NOTROPIS CHILITICUS	39	0	4(11), 5(19), 6(5), 7(4)
CYPRINIDAE	NOTROPIS PROCNE	39	0	3(9), 4(17), 5(13)
CYPRINIDAE	NOTROPIS SCEPTICUS	32	0	3(1), 4(2), 5(4), 6(21), 7(4)
CYPRINIDAE	SEMOTILUS ATROMACULATUS	45	0	4(10), 5(22), 6(8), 7(1) 8(1), 9(3)
PERCIDAE	ETHEOSTOMA OLMSTEDI	37	0	3(8), 4(10), 5(12), 6(7)
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	28	0	3(12), 4(11), 5(5)

IBI SCORE: 42 WATER QUALITY RATING: 5 FAIR

FISH IDENTIFICATION SHEET

LOG NO: 2002 -01893 **SURVEY DATE:** 11/15/2002
SITE: BASIN 69 BASIN 69 - LONG CREEK
STATION: MC14A LONG CREEK AT PINE ISLAND DRIVE
BASIN: 69
LOCATION: MC14A
TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux
Jonathan Beller

FAMILY	GENUS/SPECIES	NO.	TOT WT	LENGTHS
CATOSTOMIDAE	ERIMYZON OBLONGUS	1	0	19(1)
CATOSTOMIDAE	SCARTOMYZON RUPISCARTES	3	0	9(1), 16(1), 18(1)
CENTRARCHIDAE	LEPOMIS AURITUS	51	0	2(1), 3(12), 4(8), 5(4), 6(4), 7(5), 8(6), 9(4), 10(2), 11(2), 12(1), 13(1), 15(1)
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	1	0	9(1)
CYPRINIDAE	CYPRINELLA CHLORISTIA	44	0	2(5), 3(27), 4(3), 5(3), 6(6)
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	28	0	3(1), 4(5), 5(7), 6(2), 7(4), 9(5), 10(2), 12(1), 14(1)
CYPRINIDAE	NOTROPIS PROCNE	62	0	2(12), 3(25), 4(12), 5(10), 6(3)
CYPRINIDAE	NOTROPIS SCEPTICUS	5	0	5(2), 6(1) 7(2)
ICTALURIDAE	AMEIURUS PLATYCEPHALUS	3	0	11(1), 12(1), 16(1)
ICTALURIDAE	NOTURUS INSIGNIS	2	0	7(1), 10(1)
PERCIDAE	ETHEOSTOMA OLMSTEDI	5	0	4(1), 5(2), 6(2)
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	31	0	2(8), 3(19), 4(4)

IBI SCORE: 44 **WATER QUALITY RATING:** 5 FAIR

FISH IDENTIFICATION SHEET

LOG NO: 2002 -01789 **SURVEY DATE:** 10/17/2002
SITE: BASIN 68 BASIN 68 - LONG CREEK
STATION: MC13 GUM BRANCH AT GUM BRANCH RD
BASIN: 68
LOCATION: MC13

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux
Jonathan Beller
Jeff S. Price

FAMILY	GENUS/SPECIES	NO.	TOT WT	LENGTHS
CATOSTOMIDAE	ERIMYZON OBLONGUS	10	0	7(1), 8(3), 9(1), 11(3), 12(1), 16(1)
CENTRARCHIDAE	LEPOMIS AURITUS	125	0	3(25), 4(33), 5(17), 6(16), 7(6), 8(13), 9(5), 10(8), 11(1), 13(1)
CENTRARCHIDAE	LEPOMIS GULOSUS	1	0	11(1)
CENTRARCHIDAE	LEPOMIS MACROCHIRUS	7	0	7(1), 8(1), 9(2), 10(2), 14(1)
CENTRARCHIDAE	MICROPTERUS SALMOIDES	3	0	10(1), 12(1), 22(1)
CYPRINIDAE	CYPRINELLA CHLORISTIA	4	0	4(1), 5(1), 6(2)
CYPRINIDAE	NOCOMIS LEPTOCEPHALUS	91	0	4(26), 5(16), 6(12), 7(10), 8(6), 9(12), 10(4), 11(3), 12(1), 13(1)
CYPRINIDAE	NOTROPIS PROCNE	97	0	3(11), 4(41), 5(25), 6(20)
CYPRINIDAE	NOTROPIS SCEPTICUS	2	0	5(1), 7(1)
CYPRINIDAE	SEMOTILUS ATROMACULATUS	3	0	4(2), 12(1)
PERCIDAE	ETHEOSTOMA OLMSTEDI	2	0	5(1), 6(1)
POECILIDAE	GAMBUSIA HOLBROOKI (AFFINIS)	55	0	2(18), 3(17), 4(11), 5(8), 6(1)

IBI SCORE: 42 **WATER QUALITY RATING:** 5 FAIR

The Catena Group

410-B Millstone Drive
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Freshwater Mussel & Fish Survey Report for

Proposed Regional Wastewater Treatment Plant Environmental Impact Statement

Gaston & Mecklenburg Counties, North Carolina

Prepared For:

ENTRIX, Inc
3141 John Humphries Wynd, Suite 265
Raleigh, NC 27619

Prepared By:

The Catena Group
Hillsborough, North Carolina

February 27, 2008

Thomas E. Dickinson

Thomas E. Dickinson

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1.0 INTRODUCTION

Charlotte-Mecklenburg Utilities has proposed the construction of a new regional wastewater treatment facility to serve a significant portion of northwest Mecklenburg and northeastern Gaston counties (the service area, as shown in Figures). As part of the Environmental Impact Statement (EIS) for the project the NC Wildlife Resources Commission (NCWRC) requested that comprehensive mussel and fish surveys be conducted in potentially impacted streams within the service area. In order to establish a current baseline of freshwater mussel and fish assemblages in the service area, The Catena Group, Inc (TCG) was contracted by ENTRIX to conduct qualitative surveys at twenty sites for freshwater mussels and ten sites for freshwater fish.

The freshwater mussel survey efforts focused particularly on the Federally Endangered Carolina heelsplitter (*Lasmigona decorata*), which is known from drainages in the Catawba River basin in Mecklenburg County. In addition to the Carolina heelsplitter, there are several other rare freshwater mussel species known to occur in Mecklenburg County that may also occur in Gaston County. These include the Carolina creekshell (*Villosa vaughaniana*), eastern creekshell (*V. delumbis*), creeper (*Strophitus undulatus*), and notched rainbow (*V. constricta*). The Carolina creekshell is a Federal Species of Concern (FSC)[1] and is considered Endangered (E)[2] in North Carolina. The creeper, notched rainbow, and eastern creekshell are considered Threatened (T), Special Concern (SC) and Significantly Rare (SR) respectively, in North Carolina. Additionally, the Carolina elktoe (*Alasmidonta robusta*), a species believed to be extinct, was described from Long Creek, a stream within the identified service area. The FSC Carolina darter (*Etheostoma collis*) is a fish species that is known from Mecklenburg County that may also occur in Gaston County. Habitats typical of where these rare species are known to occur were targeted during these survey efforts.

2.0 FEDERALLY PROTECTED SPECIES DESCRIPTION (Carolina heelsplitter)

2.1.Species Characteristics

The Carolina heelsplitter (*Lasmigona decorata*), originally described as *Unio decoratus* by (Lea 1852), synonymized with *Lasmigona subviridis* (Conrad 1835, Johnson 1970), and later separated as a distinct species (Clarke 1985), is a federally Endangered freshwater mussel, historically known from several locations within the Catawba and Pee Dee River systems in North Carolina and the Pee Dee, Savannah, and possibly the Saluda River systems in South Carolina.

[1] **Federal Species of Concern (FSC)** are defined as a species that is under consideration for listing for which there is insufficient information to support listing. FSCs are not afforded federal protection under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. However, the status of these species is subject to change, and so should be included for consideration.

[2] **North Carolina Endangered, Threatened and Special Concern** species have legal protection status in North Carolina under the State Endangered Species Act administered and enforced by the North Carolina Wildlife Resources Commission. Species listed as Significantly Rare are not afforded any protection.

The Carolina heelsplitter is characterized as having an ovate, trapezoid-shaped, unsculptured shell. The outer surface of the shell ranges from greenish brown to dark brown in color, with younger specimens often having faint greenish brown or black rays. The shell's nacre is often pearly white to bluish white, grading to orange in the area of the umbo (Keferl 1991). The hinge teeth are well developed and heavy and the beak sculpture is double looped (Keferl and Shelly 1988). Morphologically, the shell of the Carolina heelsplitter is very similar to the shell of the green floater (Clarke 1985), with the exception of a much larger size and thickness in the Carolina heelsplitter (Keferl and Shelly 1988).

Prior to collections in 1987 and 1990, by Keferl (1991), the Carolina heelsplitter had not been collected in the 20th century and was known only from shell characteristics. Because of its rarity, very little information of this species biology, life history, and habitat requirements was known. Feeding strategy and reproductive cycle of the Carolina heelsplitter have not been documented, but are likely similar to other native freshwater mussels (USFWS 1996).

The feeding processes of freshwater mussels are specialized for the removal (filtering) of suspended microscopic food particles from the water column (Pennak 1989). Documented food sources for freshwater mussels include detritus, diatoms, phytoplankton, and zooplankton (USFWS 1996).

Freshwater mussels have complex reproductive cycles, which include a larval stage (glochidium) that is an obligatory parasite on a fish. The glochidia develop into juvenile mussels and detach from the "fish host" and sink to the stream bottom where they continue to develop, provided suitable substrate and water conditions are available (USFWS 1996). Many species of freshwater mussels require a particular species of fish to serve as the host. The host species(s) for the Carolina heelsplitter is unknown (USFWS 1996). McMahon and Bogan (2001) and Pennak (1989) should be consulted for a general overview of freshwater mussel reproductive biology.

2.2.Distribution and Habitat Requirements

Currently the Carolina heelsplitter has a very fragmented, relict distribution. Until recently, it was known to be surviving in only six streams and one small river (USFWS 1996); however, recent discoveries have increased the number of known populations to eleven:

Pee Dee River Basin:

1. Duck Creek/Goose Creek - Mecklenburg/Union counties, NC

2. Flat Creek/Lynches River - Lancaster/Chesterfield/Kershaw counties, SC

Catawba River Basin:

3. Sixmile Creek (Twelvemile Creek Subbasin) - Lancaster County, SC

4. Waxhaw Creek - Union County, NC and Lancaster County, SC

5. Cane Creek - Lancaster County, SC

6. Gills Creek - Lancaster County, SC

7. Fishing Creek Subbasin - Chester County, SC

8. Rocky Creek Subbasin (Bull Run Creek/UT Bull Run Creek/Beaverdam Creek - Chester County, SC

Saluda River Basin:

9. Redbank Creek - Saluda County, SC

Savannah River Basin:

10. Little Stevens Creek/Mountain Creek/Sleepy Creek /Turkey Creek (Stevens Creek Subbasin) - Edgefield/McCormick counties, SC.

11. Cuffytown Creek (Stevens Creek Subbasin) - Greenwood/McCormick counties, SC

Habitat for this species has been reported from small to large streams and rivers as well as ponds. These ponds are believed to be millponds on some of the smaller streams within the species' historic range (Keferl 1991). Keferl and Shelly (1988) and Keferl (1991) reported that most individuals have been found along well-shaded streambanks with mud, muddy sand, or muddy gravel substrates, however, numerous individuals in several of the populations have been found in cobble and gravel dominated substrate, usually in close proximity to bedrock outcroppings (personal observations). The stability of stream banks appears to be very important to this species (Keferl 1991).

2.3.Threats to Species

The low numbers of individuals and the restricted range of each of the surviving populations make them extremely vulnerable to extirpation from a single catastrophic event or activity (USFWS 1996). The cumulative effects of several factors, including sedimentation, point and non-point discharge, and stream modification (impoundments, channelization, etc.) has contributed to the decline of this species throughout its range (USFWS 1996).

Siltation resulting from improper sedimentation control of various land usage practices, including agricultural, forestry, and development activities, has been recognized as a major contributing factor to degradation of mussel populations (USFWS 1996). Siltation has been documented to be extremely detrimental to mussel populations by degrading substrate and water quality, increasing potential exposure to other pollutants, and by direct smothering of mussels (Ellis 1936), (Markings and Bills 1979). Sediment accumulations of less than 1 inch have been shown to cause high mortality in most mussel species (Ellis 1936).

Sewage treatment effluent has been documented to significantly affect the diversity and abundance of mussel fauna (Goudreau et al. 1988). Goudreau et al. (1988) found that

recovery of mussel populations might not occur for up to 2 miles below points of chlorinated sewage effluent.

The impact of impoundments on freshwater mussels has been well-documented (USFWS 1992a; Neves 1993). Construction of dams transforms lotic habitats into lentic habitats, which results in changes in the aquatic community composition. Muscle Shoals on the Tennessee River in northern Alabama, once the richest site for mussels in the world, is now at the bottom of the Wilson Reservoir and covered with 19 feet of muck (USFWS 1992b). Large portions of all of the river basins within the Carolina heelsplitter's range have been impounded and this is believed to be a major factor contributing to the species decline (USFWS 1996).

The introduction of exotic species such as the Asian clam (*Corbicula fluminea*) and zebra mussel (*Dreissena polymorpha*) has also been shown to pose significant threats to native freshwater mussels. The Asiatic clam is now established in most of the major river systems in the United States (Fuller and Powell 1973); including those streams still supporting surviving populations of the Carolina heelsplitter (USFWS 1996). Concern has been raised over competitive interactions for space, food and oxygen with this species and native mussels, possibly at the juvenile stages (Neves and Widlack 1987; Alderman 1995). The zebra mussel is not known from any waterbodies supporting the Carolina heelsplitter (USFWS 1996).

3.0 MUSSEL SURVEY EFFORTS

3.1.Mussel Survey Methodology

Survey locations were chosen based on mapping and pre-survey investigations as provided by ENTRIX, accessibility, and appropriate habitat for the target species as determined in the field. Efforts were made to avoid known recently surveyed areas.

Surveys of the twenty sites were conducted as indicated by TCG personnel on the following dates; January 29-31, 2008 (Tom Dickinson and Chris Sheats, Sites 1-11), February 5, 2008 (Tom Dickinson and Shay Garriock, Site 12), February 6, 2008 (Tim Savidge and Chris Sheats (Sites 13-16), Tom Dickinson and Shay Garriock (Sites 17-19)), and February 20, 2008 (Tom Dickinson and Shay Garriock, Site 20). The respective mussel survey segments are reported as Sites 1-20, in chronological order, and are depicted in Figure 1.

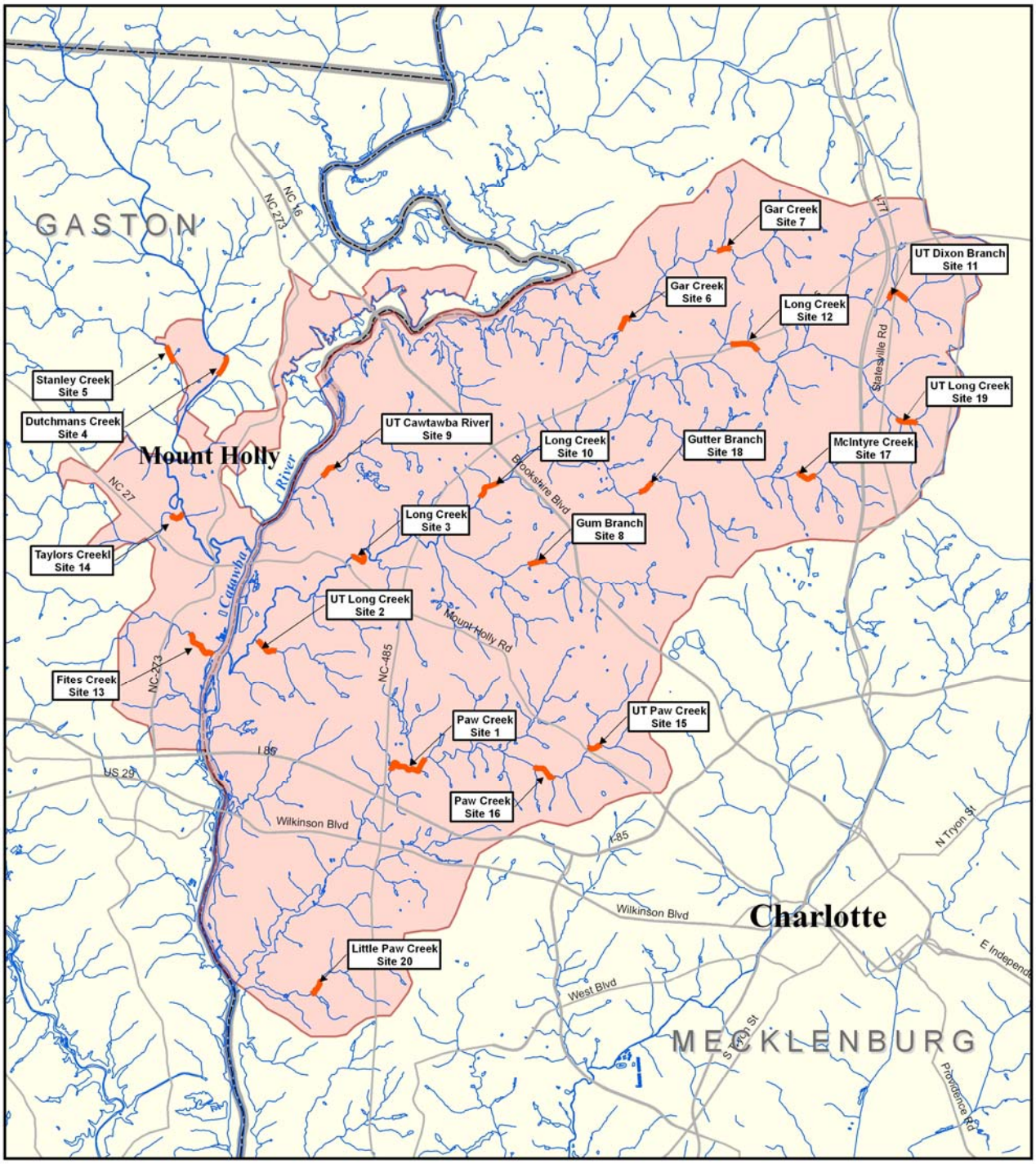

Figure 1. Freshwater Mussel Survey Locations for Proposed Regional Wastewater Treatment Plant EIS

An approximate survey length of 500 meters was followed for each site. Within the surveyed reaches, all habitat types (riffle, run, pool, slack-water, etc.) were sampled with a two-person team. The survey team began at the downstream end of the survey reach and proceeded upstream, with the team spread across the stream into survey lanes. A combination of visual, bathyscope (glass-bottom view buckets) and tactile methodologies were employed where appropriate. Upstream and downstream survey limits were recorded using a hand-held Garmin 12 or e-trex Vista GPS unit. Timed searches were employed in each reach. Searches were also conducted for relict shells. Habitat notes were recorded at each collection site. The buffer width of these habitat notes are defined as narrow (<10 m), moderate (10-100 m), and/or wide (>100 m).

3.2.Mussel Survey Results

No native freshwater mussels were located in any of the twenty sites surveyed as part of this study. Potentially suitable habitat for freshwater mussels was present in most of the survey reaches although it was usually limited due to various forms of degradation. A survey site description and results are summarized below.

Site 1 Paw Creek

This site was located upstream of the I-85 crossing of the stream and was accessed from the adjacent sewerline cooridor. The stream channel ranged from 5-8 meters wide and stream banks ranged from 1-2 meters high. Stream banks were generally vertical and unstable. The surveyed reach consisted mostly of shallow run and pool habitat. Substrate was dominated by unconsolidated sand and silt, with limited areas of gravel, cobble, and boulder. The surrounding area consisted of variably narrow to moderate forested buffer and residential areas. Timed mussel searches were conducted for 1.5 person hours. The Asian clam (*Corbicula fluminea*) was uncommon.

Site 2 UT Long Creek

This site was located near the U.S. White Water Center on a small UT to lower Long Creek. The stream channel was approximately 2 meters wide and stream banks ranged from 0-.5 meters high. Stream banks were generally stable although they exhibited some areas of erosion and undercutting. The surveyed reach consisted mostly of shallow pool and slack water habitat. Substrate was dominated by unconsolidated sand with areas of clay and muck bottom and clay banks. The surrounding area consisted of an extensive bottomland forest and wetland system. Timed mussel searches were conducted for 1.0 person hour. The Asian clam was abundant.

Site 3 Long Creek

This site was located upstream of the NC 27 crossing and was accessed from the adjacent sewerline cooridor. The stream channel ranged from 8-12 meters wide and stream banks ranged from 1-2 meters high. Banks ranged from stable to exhibiting some areas of erosion and undercutting. The surveyed reach consisted of an extensive rock fall riffle/run area transitioning into pool and slackwater habitats towards the upstream extent.

Substrate was dominated by unconsolidated sand and boulder, with areas of clay banks, silt, gravel, cobble, and bedrock also common. The surrounding area consisted of variably narrow to moderate forested buffer and residential areas. Timed mussel searches were conducted for 2.0 person hours. The Asian clam was common and a physid snail (*Physella* sp.) was uncommon.

Site 4 Dutchmans Creek

This site was located upstream of the Sandy Ford Road crossing. The stream channel was approximately 15 meters wide and incised, with stream banks ranging from 4-5 meters high. Banks were generally unstable and undercut. The surveyed reach mostly consisted of a long moderately deep pool with some riffle and run areas towards the upstream extent. Substrate was dominated by unconsolidated sand and silt, with a minor component of gravel, cobble, and boulder in the riffle/run area. The surrounding area consisted of a moderate to wide forested buffer and residential areas. Timed mussel searches were conducted for 2.0 person hours. The Asian clam was common.

Site 5 Stanley Creek

This site was located upstream of the Lowland Dairy Road crossing. The incised stream channel ranged from 3-7 meters wide and stream banks ranged from 1.5-2.5 meters high. Stream banks were generally unstable and undercut. The surveyed reach consisted of a very shallow pool/slack water habitat and run sequence. Substrate was dominated by unconsolidated sand and clay banks with limited areas of gravel in run habitat. The surrounding area consisted of a wide forested buffer towards the upstream extent and large residential developments towards the downstream extent of the survey. Timed mussel searches were conducted for 1.5 person hours. The Asian clam was common.

Site 6 Gar Creek

This site was located just upstream of the impoundment effects of Mountain Island Lake, as accessed off private land on River Circle Road. The stream channel ranged from 3-5 meters wide and stream banks ranged from 1-2 meters high. Stream banks exhibited some signs of erosion and undercutting. The surveyed reach consisted of a very shallow riffle/run and pool/slack water sequence. Substrate was dominated by unconsolidated sand with some areas of clay and silt deposition. The surrounding area consisted mostly of a wide hardwood forested buffer. A beaver impoundment was located near the upstream extent of the survey. Timed mussel searches were conducted for 1.33 person hours. The Asian clam was abundant.

Site 7 Gar Creek

This site was located upstream of the McCoy Road crossing of the stream within the upper portion of the watershed. The stream channel ranged from 2-4 meters wide and stream banks ranged from 0.5-1.5 meters high. Stream banks exhibited some signs of erosion and undercutting. The surveyed reach consisted of a very shallow alternating sequence of riffle/run and pool/slack water habitats. Substrate was dominated by unconsolidated sand with some areas of clay, gravel, and cobble. The surrounding area

consisted mostly of a wide hardwood forested buffer with an area of active pasture near the downstream extent of the survey. Timed mussel searches were conducted for 1.17 person hours. No mollusks were observed in the surveyed reach.

Site 8 Gum Branch

This site was located upstream of the Valley Dale Road crossing. The incised stream channel ranged from 3-5 meters wide and stream banks ranged from 3-5 meters high. Stream banks were generally vertical, unstable, and actively eroding. The surveyed reach consisted of a very shallow riffle/run and pool/slack water habitat sequence. Substrate was dominated by unconsolidated sand and silt, clay banks, and limited areas of cobble and boulder. The surrounding area consisted of variably narrow to moderate forested buffer and residential areas. Timed mussel searches were conducted for 1.17 person hours. The Asian clam was uncommon in the reach.

Site 9 UT Catawba River

This site was located approximately ½ mile from its confluence with the Catawba River as accessed from a power line corridor off Riverside Drive. The small stream channel ranged from 1-3 meters wide and stream banks ranged from 0-0.5 meters high. Stream banks ranged from stable to exhibiting some erosion and undercutting. The surveyed reach consisted of a very shallow riffle/run and pool/slack water habitat sequence. Substrate was dominated by unconsolidated sand and clay banks. The surrounding area consisted of variably narrow to moderate hardwood forested buffer and residential areas. Timed mussel searches were conducted for 1.17 person hours. No mollusks were observed in the surveyed reach.

Site 10 Long Creek

This site was located through the Bellhaven Blvd crossing of the stream. The stream channel ranged from 5-8 meters wide and the generally unstable stream banks ranged from 1.5-2 meters high. The surveyed reach consisted mostly of alternating shallow pool and run habitats. Substrate was dominated by unconsolidated sand, with areas of clay and silt common. A few areas of rip-rap cobble were also present. The surrounding area consisted of variably narrow to moderate natural buffer and residential areas. A beaver impoundment was located near the upstream extent of the survey. Timed mussel searches were conducted for 1.83 person hours. The Asian clam was uncommon.

Site 11 UT to Dixon Branch

This site was located upstream of its I-77 crossing, as accessed off US 21. The incised stream channel ranged from 3-4 meters wide and stream banks ranged from 2.5-3.5 meters high. Stream banks were generally vertical, unstable, and actively eroding. The surveyed reach consisted of a very shallow riffle/run and pool habitat sequence. Substrate was dominated by unconsolidated sand and hard packed clay, with some areas of gravel and cobble. The surrounding area consisted of a narrow natural buffer to an extensive urban development zone. Timed mussel searches were conducted for 1.17 person hours. No mollusks were observed in the surveyed reach.

Site 12 Long Creek

This site was located upstream of the Beatties Ford Road crossing to the I-485 corridor. The stream channel ranged from 5-8 meters wide and stream banks ranged from 0.5-2 meters high. Banks ranged from stable to exhibiting some areas of erosion and undercutting. The surveyed reach consisted of a bedrock outcrop riffle/run area transitioning into lower gradient sequence with more pool habitat towards the upstream extent. Substrate was dominated by unconsolidated sand, bedrock, and cobble with areas of clay banks, silt, gravel, and boulder also common. The surrounding area consisted of variably narrow to moderate forested buffer, residential area, and road. Timed mussel searches were conducted for 2.0 person hours. The Asian clam was common.

Site 13 Fites Creek

This site extended from the confluence with the Catawba River upstream of the Tuckaseegee Road crossing. The stream channel ranged from 6-7 meters wide and stream banks ranged from 0.5-2 meters high. The stream below the bridge is bordered by a fairly wide bottomland forest on the left descending bank, and residential development with narrow riparian buffers along the right descending bank. The stream channel is actively eroding, and the substrate is dominated by shifting coarse sand. An approximately 100 meter long high gradient area of mostly bedrock substrate occurs just upstream of the bridge crossing. This bedrock area serves as a grade control for the section of stream above, which is dominated by rock, boulder and sand. Timed mussel searches were conducted for 1.67 person hours. The Asian clam and a physid snail are common with patchy distributions.

Site 14 Taylors Creek

This section of Taylors occurs in an urbanized area extending from the confluence with Dutchman's Creek upstream of the Woodlawn Avenue crossing. The stream ranges from 5 -7 meters wide with incised and very unstable banks 2-3 meters high. Substrate consists of shifting sand over rock and boulder, with clay banks. A large beaver dam (*Castor canadensis*) is located approximately 240 meters upstream of the bridge crossing. Habitat below the bridge consists of shallow runs and flowing pools. Above the large beaverdam, the stream flows through a series of smaller dams, for the remainder of the evaluated reach. Timed mussel searches were conducted for 1.0 person hours. The Asian clam is present but relatively uncommon.

Site 15 UT Paw Creek

This UT to Paw Creek flows through an old residential development and elementary school property. The survey reach extended from the confluence with Paw Creek to upstream of the Arrowood Road crossing. The stream ranges from 1-1.5 meters wide with banks 1.5 feet high. The banks have been stabilized throughout much of the reach by various rock and timber retaining walls. Habitat consists of a series of small riffle/run/pool sequences. Substrate consists of cobble and sand. No mollusk species were found in 1.0 person hours of survey time.

Site 16 Paw Creek

This site extends from approximately 375 meters downstream of the Toddville Road crossing to a point approximately 150 meters upstream of the bridge. Below the bridge the stream is bordered by a sewer line along the left descending bank and a low density residential development on the right and a residential development borders both sides of the creek upstream of the bridge. The channel ranges from 5-7 meters wide, and the very unstable banks range from 1-2.5 meters high. Substrate consists of sand and cobble with occasional rock outcroppings. A strong odor of chlorinated effluent was noted. Timed mussel searches were conducted for 1.73 person hours. The Asian clam was common.

Site 17 McIntyre Creek

This site was located upstream of the Beatties Ford Road crossing. The small, incised stream channel ranged from 2-5 meters wide with approximately 2 meter high stream banks. Stream banks were generally vertical, and either unstable, and actively eroding or stabilized with cobble-sized rip-rap. The surveyed reach consisted of a shallow riffle/run and pool habitat sequence. Substrate was dominated by unconsolidated sand and hard packed clay banks, with some areas of silt deposition and cobble rip-rap. The surrounding area consisted of a variably narrow to moderate natural buffer and residential area. Timed mussel searches were conducted for 1.83 person hours. The Asian clam was uncommon.

Site 18 Gutter Branch

This site was located downstream of the Oakdale Road crossing. The stream channel ranged from 2-5 meters wide and stream banks ranged from 1-2 meters high. Banks exhibited some areas of erosion and undercutting. The surveyed reach consisted of a typical riffle/run/pool sequence of habitat. Substrate was dominated by clay, sand, and gravel, with areas of silt deposition and cobble also present. The surrounding area consisted of a moderate forested buffer and residential area. Timed mussel searches were conducted for 1.83 person hours. The Asian clam was common.

Site 19 UT Long Creek

This headwater tributary to Long Creek was located upstream of its US 21 crossing. The small stream channel ranged from 1-2 meters wide with approximately 1 meter high stream banks. Banks exhibited some areas of erosion and undercutting. The surveyed reach consisted of a very shallow riffle/run and pool habitat sequence. Substrate was dominated by clay, with some areas of sand and peat detritus. The surrounding area consisted of a variably narrow to moderate natural buffer to a residential area and road. Timed mussel searches were conducted for 1.0 person hour. No mollusks were observed in the surveyed reach.

Site 20 Little Paw Creek

This site was located downstream of the Mount Olive Church Road crossing. The incised stream channel ranged from 3-5 meters wide and stream banks ranged from 1.5-2.5

meters high. Stream banks were generally unstable and actively eroding. The surveyed reach consisted of a very shallow riffle/run and pool habitat sequence. Substrate was dominated by unconsolidated clay, silt, and sand, with some areas of gravel, cobble, bedrock and boulder also present. The surrounding area consisted of a moderate to wide natural buffer, residential area, and road. Timed mussel searches were conducted for 1.83 person hours. The Asian clam was uncommon.

3.3.Mussel Survey Discussion

The survey results indicate that a viable freshwater mussel fauna may not be present in the surveyed stream reaches and suggest that mussel fauna may have been extirpated from many of the streams in the study area. While it is possible that low numbers of individuals may be present in the surveyed reaches and were not located due to the time of year of the surveys and life history attributes of some potential species (i.e., they are completely buried in substrate). Most of the streams in the study area have been subject to anthropomorphic alteration that has significantly degraded the habitats from which the mussel fauna were historically known.

It is important to note that native mussel fauna have been recently found along the main stem of the Catawba River below Mountain Island Lake during survey efforts contracted by Duke Energy in 2005. The details of these finds can be found in the report, "Mussel Surveys for Catawba Relicensing" (Alderman 2005). This resource has connectivity to most of the streams surveyed as part of this project and currently serves as a potential re-colonization source of mussel fauna for streams in this service area.

4.0 FISH SURVEY EFFORTS

4.1.Fish Survey Methodology

Survey locations for fish surveys were chosen based on mapping and pre-survey investigations as provided by ENTRIX, accessibility, and appropriate habitat for a diverse fish assemblage, as determined in the field. Efforts were made to avoid known recently surveyed areas.

Surveys of the ten sites were conducted as indicated by TCG and ENTRIX personnel on the following dates; January 12, 2008 (Tom Dickinson, Chris Sheats, and Alan Moore, Sites 1-5), January 13, 2008 (Tom Dickinson and Chris Sheats, Sites 6-7), and January 20, 2008 (Tom Dickinson and Shay Garriock (Sites 8-10). The respective fish survey sites are reported as Sites 1-10, in chronological order, and the starting points of each are depicted in Figure 2.

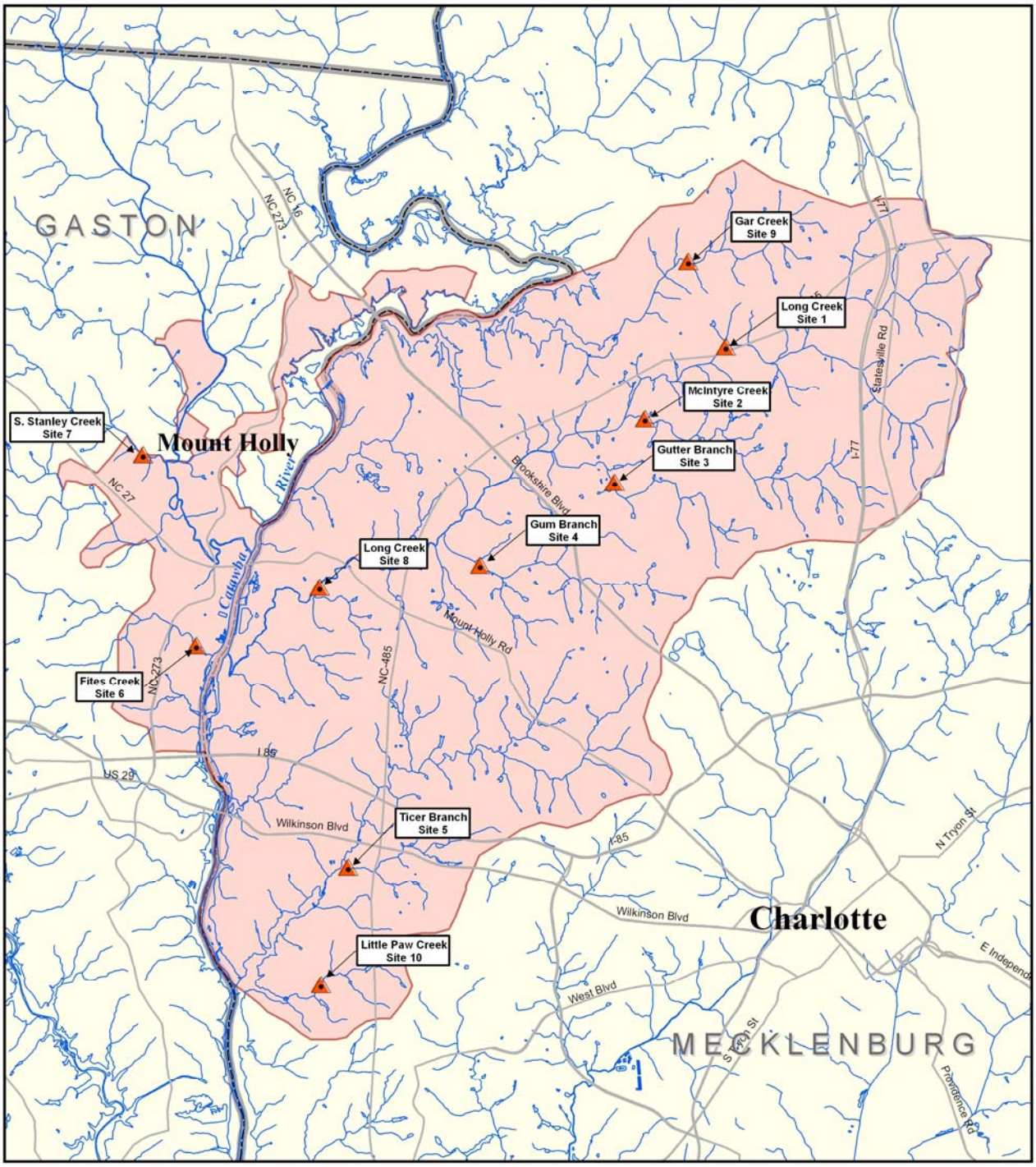

Figure 2. Freshwater Fish Survey Locations for Proposed Regional Wastewater Treatment Plant EIS

Fish inventory surveys were conducted using electroshocking methods. This was found to be the most effective method for sampling the study area streams, as fish were generally not active and holding tight to cover, which precluded effective seine net hauls. All of the habitat types in the survey reach were sampled at least once. A minimum of a two-person survey team was used with one operating a backpack electroshocker unit and a dipnet, and the other person using a dipnet. Riffle and run habitats were sampled in this manner, moving upstream until the entire length of riffle/run was sampled. This process was performed in the middle of the channel and close to each bank, in order to traverse the entire habitat. Pools were also sampled using backpack shockers and dipnets.

All fish captured were placed into a water bucket until they could be identified, counted, and released. The length of time necessary to identify, count, and release the fish depended on the number of fish in the bucket and their condition. Habitat notes were recorded at each collection site. The buffer width of these habitat notes are defined as narrow (<10 m), moderate (10-100 m), and/or wide (>100 m).

4.2 Fish Survey Results

Fish species typical of the size of the tributaries sampled for this portion of the Catawba River basin were found at each of the ten survey sites selected. A short survey site description and results in corresponding table form are summarized below.

Site 1 Long Creek

This site was located upstream of the Beatties Ford Road crossing. The stream channel ranged from 5-8 meters wide and stream banks ranged from 0.5-2 meters high. The surveyed reach consisted of a bedrock outcrop riffle/run area of a relatively high gradient with some pool habitat also present. Substrate was dominated by unconsolidated sand, bedrock, and cobble with areas of clay banks, silt, gravel, and boulder also common. A moderate natural buffer was present on the sampled portion of the stream. Fish surveys were conducted for a total of 855 seconds of electroshock time.

Table 1. Site 1: Fish Species Collected

Scientific Name	Common Name	Abundance
Ameiurus platycephalus	flat bullhead	1
Catostomus commersonii	white sucker	2
Clinostomus funduloides	rosyside dace	34
Etheostoma olmstedi	tesseslated darter	10
Lepomis auritus	redbreast sunfish	4
Lepomis gibbosus	pumpkinseed	1
Lepomis gulosus	warmouth	1
Lepomis macrochirus	bluegill	14
Micropterus salmoides	largemouth bass	2
Nocomis leptocephalus	bluehead chub	21
Notropis chiliticus	redlip shiner	6
Notropis procne	swallowtail shiner	7
Notropis scepticus	sandbar shiner	1
Semotilus atromaculatus	creek chub	1

Site 2 McIntyre Creek

This site was accessed from the Oakdale golf course off Oakdale Road. The stream channel ranged from 3-5 meters wide and stream banks were approximately 2 meters high. The surveyed reach consisted of a typical sequence of lower gradient riffle/run and pool habitat. Substrate was dominated by unconsolidated sand with areas of clay banks, silt, gravel, cobble and boulder also present. There was a moderate natural buffer on the sampled portion of the stream. Fish surveys were conducted for a total of 438 seconds of electroshock time.

Table 2. Site 2: Fish Species Collected

Scientific Name	Common Name	Abundance
Catostomus commersonii	white sucker	1
Clinostomus funduloides	rosyside dace	14
Etheostoma olmstedi	tesseslated darter	10
Lepomis auritus	redbreast sunfish	5
Lepomis macrochirus	bluegill	2
Micropterus salmoides	largemouth bass	1
Nocomis leptocephalus	bluehead chub	25
Notropis chiliticus	redlip shiner	3
Notropis procne	swallowtail shiner	37
Notropis scepticus	sandbar shiner	1
Scartomyzon sp. cf. lachneri	brassy jumprock	6
Semotilus atromaculatus	creek chub	7

Site 3 Gutter Branch

This site was located upstream of the Kelly Road crossing. The stream channel ranged from 3-4 meters wide and stream banks ranged from 1.5-2.5 meters high. The surveyed reach consisted typical sequence of riffle/run, pool, and slack water habitats. Substrate was dominated by unconsolidated sand with areas of clay banks, silt, and gravel also present. A moderate natural buffer was present on the sampled portion of the stream. Fish surveys were conducted for a total of 431 seconds of electroshock time.

Table 3. Site 3: Fish Species Collected

Scientific Name	Common Name	Abundance
Catostomus commersonii	white sucker	2
Clinostomus funduloides	rosyside dace	44
Etheostoma olmstedi	tesseslated darter	2
Lepomis macrochirus	bluegill	12
Micropterus salmoides	largemouth bass	1
Nocomis leptocephalus	bluehead chub	1
Notropis procne	swallowtail shiner	1
Semotilus atromaculatus	creek chub	9

Site 4 Gum Branch

This site was located upstream of the Gum Branch Road crossing in an older residential neighborhood. The stream channel ranged from 6-7 meters wide and stream banks ranged from 2-3 meters high. The surveyed reach consisted mostly of a long pool habitat with some run areas and slack water habitats. Substrate was dominated by unconsolidated sand with areas of silt and rip-rap-size cobble also present. Heavy algal growth was observed. Rip-rap stabilization was present along most of the reach. There was a moderate natural buffer on the left descending side of the stream at the start of the survey that diminished as the team moved upstream. The remaining surrounding area was completely open to the surrounding residential subdivision. Fish surveys were conducted for a total of 437 seconds of electroshock time.

Table 4. Site 4: Fish Species Collected

Scientific Name	Common Name	Abundance
Catostomus commersonii	white sucker	3
Erimyzon oblongus	creek chubsucker	9
Etheostoma olmstedi	tesseslated darter	6
Lepomis auritus	redbreast sunfish	57
Lepomis cyanellus	green sunfish	1
Lepomis gibbosus	pumpkinseed	4
Lepomis gulosus	warmouth	1
Lepomis macrochirus	bluegill	5
Micropterus salmoides	largemouth bass	2
Nocomis leptocephalus	bluehead chub	4
Notropis procne	swallowtail shiner	93
Notropis scepticus	sandbar shiner	1
Semotilus atromaculatus	creek chub	1

Site 5 Ticer Branch

Ticer Branch is a tributary to Paw Creek. This site was accessed from a maintenance road off Old Dowd Road. The stream channel ranged from 3-5 meters wide and stream banks ranged from 1.5-2 meters high. The surveyed reach of the small stream consisted of a typical sequence of run, pool, and slack water habitats. Substrate was dominated by unconsolidated sand with areas of clay banks, silt, and pebble also present. A moderate to wide bottomland forested buffer was present on the sampled portion of the stream. Fish surveys were conducted for a total of 464 seconds of electroshock time.

Table 5. Site 5: Fish Species Collected

Scientific Name	Common Name	Abundance
Clinostomus funduloides	rosyside dace	3
Erimyzon oblongus	creek chubsucker	1
Etheostoma olmstedi	tesseslated darter	8
Lepomis auritus	redbreast sunfish	2
Lepomis gibbosus	pumpkinseed	1
Lepomis macrochirus	bluegill	5
Micropterus salmoides	largemouth bass	1
Nocomis leptocephalus	bluehead chub	4
Semotilus atromaculatus	creek chub	1

Site 6 Fites Creek

This site was located downstream of NC 273. The stream channel ranged from 4-5 meters wide and stream banks ranged from 1-2 meters high. The surveyed reach consisted of a bedrock outcrop riffle/run area of relatively high gradient with some pool habitat also present. Substrate was dominated by unconsolidated sand, boulder, and bedrock, with areas of clay banks, silt, gravel, and cobble also common. A narrow to moderate natural buffer was present to the surrounding residential area on the sampled portion of the stream. Fish surveys were conducted for a total of 546 seconds of electroshock time.

Table 6. Site 6: Fish Species Collected

Scientific Name	Common Name	Abundance
Catostomus commersonii	white sucker	12
Clinostomus funduloides	rosyside dace	38
Cyprinella chloristia	greenfin shiner	1
Etheostoma olmstedi	tesseslated darter	16
Etheostoma thalassinum	seagreen darter	1
Lepomis auritus	redbreast sunfish	15
Lepomis cyanellus	green sunfish	2
Nocomis leptocephalus	bluehead chub	29
Notropis chiliticus	redlip shiner	8
Scartomyzon rupiscartes	striped jumprock	1
Semotilus atromaculatus	creek chub	5

Site 7 South Stanley Creek

This site was located upstream of the Woodlawn Road crossing. The stream channel ranged from 4-6 meters wide and stream banks ranged from 2-3 meters high. The surveyed reach consisted of shallow riffle/run and scoured pool habitats. Substrate was dominated by unconsolidated sand and silt with areas of clay banks and gravel also present. A narrow to moderate natural buffer to surrounding residential area was present on the sampled portion of the stream. Fish surveys were conducted for a total of 465 seconds of electroshock time.

Table 7. Site 7: Fish Species Collected

Scientific Name	Common Name	Abundance
Catostomus commersonii	white sucker	3
Clinostomus funduloides	rosyside dace	19
Etheostoma olmstedi	tesseslated darter	12
Lepomis cyanellus	green sunfish	4
Lepomis macrochirus	bluegill	6
Nocomis leptocephalus	bluehead chub	7
Notemigonus crysoleucas	golden shiner	1
Notropis chiliticus	redlip shiner	10
Notropis scepticus	sandbar shiner	2
Semotilus atromaculatus	creek chub	7

Site 8 Long Creek

This site was accessed off a spur road to and downstream of the Mount Holly Road crossing. The stream channel ranged from 10-15 meters wide and stream banks ranged from 1-2 meters high. The surveyed reach consisted of a typical riffle/run and pool habitat. Substrate was dominated by unconsolidated sand, gravel, and cobble with areas of clay banks and silt also common. A narrow to moderate natural buffer to surrounding residences was present on the sampled portion of the stream. Fish surveys were conducted for a total of 1042 seconds of electroshock time.

Table 8. Site 8: Fish Species Collected

Scientific Name	Common Name	Abundance
Catostomus commersonii	white sucker	2
Cyprinella chloristia	greenfin shiner	14
Etheostoma olmstedi	tesseslated darter	13
Erimyzon oblongus	creek chubsucker	4
Lepomis cyanellus	green sunfish	1
Lepomis auritus	redbreast sunfish	2
Lepomis gibbosus	pumpkinseed	6
Lepomis macrochirus	bluegill	5
Micropterus salmoides	largemouth bass	5
Nocomis leptocephalus	bluehead chub	11
Notropis chiliticus	redlip shiner	3
Notropis hudsonius	spottail shiner	10
Notropis procne	swallowtail shiner	2
Notropis scepticus	sandbar shiner	17
Noturus insignis	margined madtom	4
Percina crassa	Piedmont darter	1
Pomoxis annularis	white crappie	1
Scartomyzon rupiscartes	striped jumprock	2
Semotilus atromaculatus	creek chub	1

Site 9 Gar Creek

This site was accessed from a spur road off of and upstream of the Beatties Ford Road crossing. The stream channel ranged from 3-5 meters wide and stream banks ranged from 1-1.5 meters high. The surveyed reach consisted of a typical sequence of riffle/run, pool, and slack water habitats. Substrate was dominated by unconsolidated sand, gravel, and cobble, with areas of clay banks, silt, and boulder also present. A wide hardwood forested buffer was present on the sampled portion of the stream. Fish surveys were conducted for a total of 862 seconds of electroshock time.

Table 9. Site 9: Fish Species Collected

Scientific Name	Common Name	Abundance
Etheostoma olmstedi	tesseslated darter	1
Lepomis auritus	redbreast sunfish	1
Lepomis macrochirus	bluegill	1
Semotilus atromaculatus	creek chub	11

Site 10 Little Paw Creek

This site was located downstream of the Mount Olive Church Road crossing. The incised stream channel ranged from 3-5 meters wide and stream banks ranged from 1.5-2.5 meters high. The surveyed reach consisted of a very shallow riffle/run and pool habitat sequence. Substrate was dominated by unconsolidated clay, silt, and sand, with some areas of gravel, cobble, bedrock and boulder also present. The surrounding area consisted of a moderate to wide natural buffer, residential area, and road. Fish surveys were conducted for a total of 418 seconds of electroshock time.

Table 10. Site 10: Fish Species Collected

Scientific Name	Common Name	Abundance
Cyprinella chloristia	greenfin shiner	1
Etheostoma olmstedi	tesseslated darter	6
Lepomis gibbosus	pumpkinseed	1
Lepomis macrochirus	bluegill	3
Micropterus salmoides	largemouth bass	1
Nocomis leptocephalus	bluehead chub	10
Semotilus atromaculatus	creek chub	38

4.3.Fish Survey Discussion

All of the streams surveyed contained a community of common fish species typical of similar sized water bodies in this portion of the Catawba River Basin. As these surveys were conducted in the winter months, it can be expected that the abundance and diversity of fish species may increase in these streams as various species move upstream with typically higher water levels during the breeding season. However, the data collected here does, for the most part, reflect assemblages similar to those previously collected in the same streams within the service area during other seasons.

5.0 CONCLUSIONS

These survey efforts represent updated and mostly new location survey data targeting freshwater mussel and fish within the service area of the proposed regional wastewater treatment plant.

The only federally protected species targeted by these survey efforts, the Carolina heelsplitter, was not found during the survey effort, and, given the degraded conditions of most of the streams surveyed, is unlikely to occur within the study area.

6.0 LITERATURE CITED

Alderman, J. M. (1995). Monitoring the Swift Creek Freshwater mussel community. Unpublished report presented at the UMRCC symposium on the Conservation and Management of Freshwater Mussels II Initiative for the Future. Rock Island, IL, UMRCC.

Alderman, J. M. (2005). Mussel Surveys for Catawba-Wateree Relicensing. Accessed from Duke Energy website on 28 Feb. 2008. <http://www.duke-energy.com/pdfs/Aquatics_06_Report.pdf>.

Clarke, A. H. 1985. The tribe Alasmidontini (Unionidae: Anodontinae), Part II: Lasmigona and Simpsonaias.

Conrad, T.A. (1835). Additions to, and corrections of, the Catalogue of species of American Naiades, with descriptions of new species and varieties of Fresh Water Shells. Pp. 1–8, pl. 9. Appendix to: *Synoptical table to New freshwater shells of the United States, with coloured illustrations; and a monograph of the genus Anculotus of Say; also a synopsis of the American naiades.* J. Dobson, 108 Chestnut Street, Philadelphia, Pennsylvania.

Ellis, M. M. (1936). Erosion Silt as a Factor in Aquatic Environments. Ecology 17: 29-42.

Fuller, S. L. H. and C. E. Powell (1973). Range extensions of *Corbicula manilensis* (Philippi) in the Atlantic drainage of the United States. Nautilus 87(2): 59.

Goudreau, S. E., R. J. Neves, and R.J. Sheehan (1988). Effects of Sewage Treatment Effluents on Mollusks and Fish of the Clinch River in Tazewell County, Virginia. USFWS: 128.

Johnson, R. I. (1970). The Systematics and Zoogeography of the Unionidae (Mollusca: Bivalva) of the Southern Atlantic Slope Region. Bulletin of the Museum of Comparative Zoology 140(6): 263-449.

Keferl, E. P. (1991). A status survey for the Carolina heelsplitter (*Lasmigona decorata*). A freshwater mussel endemic to the Carolinas. Unpublished report to US Fish and Wildlife Service.

Keferl, E. P. and R. M. Shelly (1988). The Final Report on a Status Survey of the Carolina Heelsplitter, *Lasmigona decorata*, and the Carolina elktoe, *Alasmidonta robusta*, Unpublished Report to the U.S. Dept of the Interior, Fish and Wildlife Service: 47.

Lea, I. (1852). Description of a new species of the family Unionidae. Transactions of the American Philosophical Society 10: 253-294.

Markings, L. L. and T. D. Bills (1979). Acute Effects of Silt and Sand Sedimentation on Freshwater Mussels. UMRCC Symposium on the Upper Mississippi River bivalve Mollusks, Rock Island, IL, UMRCC.

McMahon, R.F. and A.E. Bogan. (2001). Mollusca: Bivalvia. Pp. 331-429. IN: J.H. Thorpe and A.P. Covich. Ecology and classification of North American freshwater invertebrates. 2nd edtiion. Academic Press.

Neves, R. J. and J. C. Widlak (1987). Habitat Ecology of Juvenile Freshwater Mussels (Bivalva: Unionidae) in a Headwater Stream in Virginia. American Malacological Bulletin 1(5): 1-7.

Neves, R.J. 1993. A state of the Unionids address. Pp. 1-10 in K.S. Cummings, A.C.

Pennak, R. W. (1989). Fresh-water Invertebrates of the United States, Protozoa to Mollusca. New York, John Wiley & Sons, Inc.

USFWS (1992a). Special report on the status of freshwater mussels.

USFWS (1992b). Endangered and Threatened species of the southeast United States (The Red Book). FWS, Ecological Services, Div. of Endangered Species, Southeast Region. Govt Printing Office, Wash, DC: 1,070.

USFWS (1996). Revised Technical/Agency Draft Carolina Heelsplitter Recovery Plan, Atlanta, GA: 47.

Table of Contents

Appendix G. Benthic Macroinvertebrate Supplemental Existing Environment Information

Correlates with the following Sections:

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM BASIN 96 - GAR CREEK AT BEATTIES FORD ROAD

SURVEY DATE 6/24/2009

LOCATION MC50

TAXONOMIST Tony Roux

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.	ABUNDANCE	EPT	TV*N
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	2	1	1	7
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	1	1	1	7
EPHEMEROPTERA	BAETIDAE	BAETIS PLUTO	4.3	1	1	1	4.3
EPHEMEROPTERA	BAETIDAE	PSEUDOCLOEON PROPINQUUM	5.8	1	1	1	5.8
EPHEMEROPTERA	BAETIDAE	PARACLOEODES SPP.	8.7	1	1	1	8.7
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	9	3	1	20.7
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	32	10	1	55
PLECOPTERA	PERLIDAE	PERLESTA SPP.	4.7	1	1	1	4.7
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	32	10	1	62
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	13	10	1	78
TRICHOPTERA	PHILOPOTAMIDAE	CHIMARRA SPP.	2.8	2	1	1	2.8
TRICHOPTERA	POLYCENTROPODIDAE	NYCTIOPHYLAX MOESTUS	3.3	2	1	1	3.3
TRICHOPTERA	UENOIDAE	NEOPHYLAX OLIGIUS	2.2	8	3	1	6.6
COLEOPTERA	DYTISCIDAE	NEOPORUS SPP.	8.6	8	3		25.8
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	6	3		12.3
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	2	1		5.1
COLEOPTERA	HALIPLIDAE	PELTODYTES SPP.	8.7	7	3		26.1
COLEOPTERA	PSEPHENIDAE	PSEPHENUS HERRICKI	2.4	2	1		2.4
COLEOPTERA	PSEPHENIDAE	ECTOPRIA NERVOSA	4.2	1	1		4.2
COLEOPTERA	PTILODACTYLIDAE	ANCHYTARSUS BICOLOR	3.6	1	1		3.6
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	22	10		72
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	8	3		25.2
DIPTERA	CHIRONOMIDAE	DICROTENDIPES FUMIDUS	8.9	4	3		26.7
DIPTERA	CHIRONOMIDAE	LABRUNDINIA SPP.	5.9	1	1		5.9
DIPTERA	CHIRONOMIDAE	MICROTENDIPES SPP.	5.5	6	3		16.5
DIPTERA	CHIRONOMIDAE	NATARSIA SPP.	10.0	1	1		10
DIPTERA	CHIRONOMIDAE	PARAMERINA SPP.	4.3	1	1		4.3
DIPTERA	CHIRONOMIDAE	PARAMETRIOCNEMUS SPP.	3.7	3	3		11.1
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	5	3		19.5
DIPTERA	CHIRONOMIDAE	POLYPEDILUM AVICEPS	3.7	2	1		3.7
DIPTERA	CHIRONOMIDAE	POLYPEDILUM FALLAX	6.4	1	1		6.4

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.	ABUNDANCE	EPT	TV*N
DIPTERA	CHIRONOMIDAE	POLYPEDILUM FLAVUM	4.9	6	3		14.7
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	8	3		27
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	14	10		84
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	2	1		5.9
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	3	3		20.4
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA SPP.	5.9	2	1		5.9
DIPTERA	CHIRONOMIDAE	XYLOTOPUS PAR	6.0	1	1		6
DIPTERA	CHIRONOMIDAE	ZAVRELIMYIA SPP.	9.1	3	3		27.3
DIPTERA	DIXIDAE	DIXELLA INDIANA	2.5	4	3		7.5
DIPTERA	DIXIDAE	DIXA SPP.	2.6	2	1		2.6
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	2	1		6
HETEROPTERA	CORIXIDAE	SIGARA SPP.	9.1	7	3		27.3
MEGALOPTERA	CORYDALIDAE	NIGRONIA SERRICORNIS	5.0	4	3		15
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	10	10		72
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	14	10		59
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	2	1		8.2
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	1	1		8.9
ODONATA	CORDULIIDAE	SOMATOCHLORA SPP.	9.2	4	3		27.6
AMPHIPODA	TALITRIDAE	HYALLELA AZTECA	7.8	1	1		7.8
GASTROPODA	PLANORBIDAE	HELISOMA ANCEPS	6.2	1	1		6.2
GASTROPODA	PHYSIDAE	PHYSELLA SPP.	8.8	1	1		8.8
OLIGOCHAETA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	2	1		7
OLIGOCHAETA	TUBIFICIDAE	TUBIFEX TUBIFEX	10.0	1	1		10

TOTAL ORGANISMS	**281**	**BIOTIC INDEX**	**0.03**	**13**	**1011.8**
TOTAL TAXA	**54**				**40141**
TOTAL EPT	**13**	**RATING**	**FAIR**		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2006 - 00528
SURVEY DATE: 07/22/2005

BASIN:
LOCATION: MC50

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux, Brian G. Sikes, Jonathan Beller, Michael Burkhard

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	1	R
COLEOPTERA	DYTISCIDAE	NEOPORUS SPP.	8.6	6	C
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	2	R
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	6	C
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	5	C
COLEOPTERA	EUBRIIDAE	ECTOPRIA NERVOSA	4.2	7	C
COLEOPTERA	GYRINIDAE	GYRINUS SPP.	6.2	1	R
COLEOPTERA	PSEPHENIDAE	PSEPHENUS HERRICKI	2.4	1	R
DIPTERA	CERATOPOGONIDAE	ALLUAUDOMYIA SPP.	6.0	1	R
DIPTERA	CHIRONOMIDAE	BRILLIA SPP.	5.2	1	R
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	1	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	6	C
PTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	2	R
DIPTERA	CHIRONOMIDAE	DICROTENDIPES NEOMODESTUS	8.1	5	C
DIPTERA	CHIRONOMIDAE	MICROTENDIPES SPP.	5.5	14	A
DIPTERA	CHIRONOMIDAE	NATARSIA SPP.	10.0	1	R
DIPTERA	CHIRONOMIDAE	PARAMERINA SPP.	4.3	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	5	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	2	R
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	1	R
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	1	R
DIPTERA	CHIRONOMIDAE	STICTOCHIRONOMUS SPP.	6.5	1	R
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	1	R
DIPTERA	DIXIDAE	DIXA SPP.	2.6	1	R
DIPTERA	DIXIDAE	DIXELLA INDIANA	2.6	3	C
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	2	R
DIPTERA	TABANIDAE	CHRYSOPS SPP.	6.7	3	C
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	1	R
DIPTERA	TIPULIDAE	HEXATOMA SPP.	4.3	4	C
PTERA	TIPULIDAE	TIPULA SPP.	7.3	6	C

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2006 - 00528
SURVEY DATE: 07/22/2005

BASIN:
LOCATION: MC50

EPHEMEROPTERA	BAETIDAE	BAETIS EPHIPPIATUS	3.7	3	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	1	R
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	2	R
EPHEMEROPTERA	CAENIDAE	CAENIS SPP.	7.4	13	A
EPHEMEROPTERA	HEPTAGENIIDAE	LEUCROCUTA APHRODITE	2.4	9	C
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	27	A
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	84	A
EPHEMEROPTERA	OLIGONEURIIDAE	ISONYCHIA SPP.	3.5	1	R
HAPLOTAXIDA	TUBIFICIDAE	LIMNODRILUS HOFFMEISTERI	9.5	1	R
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	10	A
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	3	C
MEGALOPTERA	CORYDALIDAE	NIGRONIA SERRICORNIS	5.0	5	C
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	7	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	23	A
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	4	C
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	3	C
ODONATA	CORDULEGASTRIDAE	CORDULEGASTER SPP.	5.7	3	C
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	11	A
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	1	R
ODONATA	GOMPHIDAE	STYLOGOMPHUS ALBISTYLUS	4.7	3	C
ODONATA	MACROMIIDAE	MACROMIA GEORGINA	6.2	2	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	5	C
PLECOPTERA	PERLIDAE	PERLESTA SPP.	4.7	5	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	49	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	29	A
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	3	C
TRICHOPTERA	LEPTOCERIDAE	TRIAENODES IGNITUS	4.6	1	R
TRICHOPTERA	PHILOPOTAMIDAE	CHIMARRA SPP.	2.8	36	A
TRICHOPTERA	POLYCENTROPODIDAE	NYCTIOPHYLAX MOESTUS	3.3	2	R
TRICHOPTERA	PSYCHOMYIIDAE	LYPE DIVERSA	4.1	1	R
TRICHOPTERA	UENOIDAE	NEOPHYLAX OLIGIUS	2.2	33	A

TOTAL # ORGANISMS: 486
TOTAL TAXA: 64
TOTAL EPT: 18
SPECIES DIVERSITY: 4.8

METHOD: STD
BIOTIC INDEX: 5.93
WATER QUALITY RATING: 3 FAIR-GOOD

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM BASIN 96 - GAR CREEK AT BEATTIES FORD ROAD

SURVEY DATE 7/7/2006

LOCATION MC50

TAXONOMIST Tony Roux

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	1
EPHEMEROPTERA	BAETIDAE	BAETIS PLUTO	4.3	1
EPHEMEROPTERA	HEPTAGENIIDAE	LEUCROCUTA APHRODITE	2.4	5
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	15
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	90
EPHEMEROPTERA	LEPTOPHLEBIIDAE	PARALEPTOPHLEBIA SPP.	0.9	1
PLECOPTERA	PERLIDAE	PERLESTA SPP.	4.7	7
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	88
TRICHOPTERA	HYDROPSYCHIDAE	DIPLECTRONA MODESTA	2.2	1
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	37
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	3
TRICHOPTERA	LIMNEPHILIDAE	NEOPHYLAX OLIGIUS	2.2	27
TRICHOPTERA	PHILOPOTAMIDAE	CHIMARRA SPP.	2.8	64
TRICHOPTERA	POLYCENTROPODIDAE	NYCTIOPHYLAX MOESTUS	3.3	3
TRICHOPTERA	POLYCENTROPODIDAE	POLYCENTROPUS SPP.	3.5	1
TRICHOPTERA	PSYCHOMYIIDAE	LYPE DIVERSA	4.0	6
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	3
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	1
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	3
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	7
COLEOPTERA	HALIPLIDAE	PELTODYTES LENGI	8.0	1
COLEOPTERA	PSEPHENIDAE	ECTOPRIA NERVOSA	4.2	1
COLEOPTERA	PSEPHENIDAE	PSEPHENUS HERRICKI	2.4	4
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	5
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	3
DIPTERA	CHIRONOMIDAE	CARDIOCLADIUS SPP.	5.8	1
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	7
DIPTERA	CHIRONOMIDAE	DICROTENDIPES NEOMODESTUS	8.1	1
DIPTERA	CHIRONOMIDAE	MICROTENDIPES SPP.	5.5	5
DIPTERA	CHIRONOMIDAE	PARALAUTERBORNIELLA NIGROHALTERALIS	4.7	1
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	3
DIPTERA	CHIRONOMIDAE	POLYPEDILUM AVICEPS	3.6	2
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	2
DIPTERA	CHIRONOMIDAE	PROCLADIUS SPP.	9.1	1
DIPTERA	CHIRONOMIDAE	RHEOCRICOTOPUS ROBACKI	7.3	3
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	1
DIPTERA	CHIRONOMIDAE	STICTOCHIRONOMUS SPP.	6.5	1
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	2
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA XENA	5.9	1

DIPTERA	EMPIDIDAE	EMPIDIDAE	7.6	1
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.2	1
DIPTERA	TIPULIDAE	HEXATOMA SPP.	4.3	2
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	9
MEGALOPTERA	CORYDALIDAE	NIGRONIA SERRICORNIS	5.0	6
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	2
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	17
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	1
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	3
ODONATA	GOMPHIDAE	STYLOGOMPHUS ALBISTYLUS	4.7	1
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	4
GASTROPODA	PHYSIDAE	PHYSELLA SPP.	8.8	2
GASTROPODA	PLANORBIDAE	HELISOMA ANCEPS	6.2	1
OLIGOCHAETA	TUBIFICIDAE	LIMNODRILUS SPP.	9.5	1

TOTAL ORGANISMS	**461**	**BIOTIC INDEX**	**5.53**
TOTAL TAXA	**54**		
TOTAL EPT	**16**		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2005 - 00364
SURVEY DATE: 06/04/2004

\SIN:
LOCATION: MC50

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux, Michael Burkhard, Olivia J. Hutchins, Brian G. Sikes

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	HYDROPHILIDAE	BEROSUS SPP.	8.4	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	5	C
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	27	A
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	17	A
DIPTERA	CHIRONOMIDAE	DICROTENDIPES NEOMODESTUS	8.1	4	C
DIPTERA	CHIRONOMIDAE	MICROTENDIPES SPP.	5.5	51	A
DIPTERA	CHIRONOMIDAE	NILOTANYPUS SPP.	3.9	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM FALLAX	6.4	3	C
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	11	A
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	2	R
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA SPP.	5.9	1	R
?PTERA	CHIRONOMIDAE	XYLOTOPUS PAR	6.0	8	C
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	1	R
DIPTERA	DIXIDAE	DIXELLA INDIANA	2.6	1	R
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	4	C
DIPTERA	TIPULIDAE	PSEUDOLIMNOPHILA SPP.	7.2	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	10	A
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	1	R
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	7	C
EPHEMEROPTERA	CAENIDAE	CAENIS SPP.	7.4	7	C
EPHEMEROPTERA	EPHEMERIDAE	HEXAGENIA SPP.	4.9	4	C
EPHEMEROPTERA	HEPTAGENIIDAE	LEUCROCUTA APHRODITE	2.4	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	2	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	72	A
HAPLOTAXIDA	TUBIFICIDAE	LIMNODRILUS HOFFMEISTERI	9.5	2	R
HETEROPTERA	CORIXIDAE	SIGARA SPP.	9.1	1	R
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	9	C
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	2	R
MEGALOPTERA	CORYDALIDAE	NIGRONIA SERRICORNIS	5.0	1	R
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	4	C
?ONATA	AESHNIDAE	BOYERIA VINOSA	5.9	1	R

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2005 - 00364
SURVEY DATE: 06/04/2004

BASIN:
LOCATION: MC50

ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	4	C
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	1	R
ODONATA	MACROMIIDAE	MACROMIA GEORGINA	6.2	1	R
PLECOPTERA	PERLIDAE	PERLESTA PLACIDA	4.7	4	C
PLECOPTERA	PERLIDAE	PERLESTA SPP.	4.7	30	A
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	49	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	18	A
TRICHOPTERA	HYDROPSYCHIDAE	SYMPHITOPSYCHE SPARNA	2.7	3	C
TRICHOPTERA	PHILOPOTAMIDAE	CHIMARRA SPP.	2.8	33	A
TRICHOPTERA	PSYCHOMYIIDAE	LYPE DIVERSA	4.1	2	R
TRICHOPTERA	UENOIDAE	NEOPHYLAX OLIGIUS	2.2	13	A

TOTAL # ORGANISMS: 424
TOTAL TAXA: 43
TOTAL EPT: 15
SPECIES DIVERSITY: 4.3

METHOD: STD
BIOTIC INDEX: 6.16
WATER QUALITY RATING: 3 FAIR-GOOD

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2004 - 00270
SURVEY DATE: 08/08/2003

BASIN:
LOCATION: MC50

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux, David Buetow, David J. Rimer, Michael Burkhard

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	3	C
COLEOPTERA	DYTISCIDAE	NEOPORUS SPP.	8.6	5	C
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	6	C
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	11	A
COLEOPTERA	EUBRIIDAE	ECTOPRIA NERVOSA	4.2	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	6	C
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	11	A
DIPTERA	CHIRONOMIDAE	CRICOTOPUS BICINCTUS	8.5	2	R
DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	1	R
DIPTERA	CHIRONOMIDAE	MICROTENDIPES SPP.	5.5	2	R
DIPTERA	CHIRONOMIDAE	PARAMETRIOCNEMUS SPP.	3.7	4	C
DIPTERA	CHIRONOMIDAE	PARATANYTARSUS SPP.	8.5	2	R
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	2	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	6	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM AVICEPS	3.7	7	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	23	A
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	10	A
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	21	A
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	8	C
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA SPP.	5.9	1	R
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	10	A
DIPTERA	DIXIDAE	DIXELLA INDIANA	2.6	3	C
DIPTERA	EMPIDIDAE	EMPIDIDAE	7.6	1	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	99	A
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	9	C
EPHEMEROPTERA	BAETIDAE	BAETIS EPHIPPIATUS	3.7	10	A
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	39	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	3	C
EPHEMEROPTERA	BAETIDAE	BAETIS PLUTO	4.3	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	7	C
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	6	C

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2004 - 00270
SURVEY DATE: 08/08/2003

BASIN:
LOCATION: MC50

EPHEMEROPTERA	CAENIDAE	CAENIS SPP.	7.4	20	A
EPHEMEROPTERA	HEPTAGENIIDAE	LEUCROCUTA APHRODITE	2.4	3	C
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	65	A
EPHEMEROPTERA	LEPTOPHLEBIIDAE	HABROPHLEBIODES SPP.	1.0	1	R
EPHEMEROPTERA	OLIGONEURIIDAE	ISONYCHIA SPP.	3.5	7	C
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	2	R
MEGALOPTERA	CORYDALIDAE	NIGRONIA FASCIATUS	5.6	1	R
MEGALOPTERA	CORYDALIDAE	NIGRONIA SERRICORNIS	5.0	12	A
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	2	R
ODONATA	AESHNIDAE	BASIAESCHNA JANATA	7.4	2	R
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	2	R
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	10	A
ODONATA	CORDULEGASTRIDAE	CORDULEGASTER SPP.	5.7	2	R
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	4	C
ODONATA	GOMPHIDAE	LANTHUS SPP.	1.8	1	R
PLECOPTERA	PERLIDAE	ECCOPTURA XANTHENES	3.7	14	A
PLECOPTERA	PERLIDAE	PERLESTA SPP.	4.7	3	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	88	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	13	A
TRICHOPTERA	PHILOPOTAMIDAE	CHIMARRA SPP.	2.8	6	C
TRICHOPTERA	UENOIDAE	NEOPHYLAX CONSIMILIS	1.5	35	A

TOTAL # ORGANISMS: 620
TOTAL TAXA: 54
TOTAL EPT: 18
SPECIES DIVERSITY: 4.6

METHOD: STD
BIOTIC INDEX: 5.85
WATER QUALITY RATING: 4 GOOD

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

LOG NO: 2003 - 00470
SURVEY DATE: 06/14/2002

ASIN:
LOCATION: MC50

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux, David J. Rimer, David Buetow, Will Autry

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	4	C
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	2	R
COLEOPTERA	EUBRIIDAE	ECTOPRIA NERVOSA	4.2	8	C
COLEOPTERA	PSEPHENIDAE	PSEPHENUS HERRICKI	2.3	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	7	C
DIPTERA	CHIRONOMIDAE	APEDILUM SPP.	1.0	3	C
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	22	A
DIPTERA	CHIRONOMIDAE	DICROTENDIPES NEOMODESTUS	8.1	18	A
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	12	A
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	7	C
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	2	R
DIPTERA	CULICIDAE	CULEX SPP.	10.0	1	R
?HEMEROPTERA	HEPTAGENIIDAE	LEUCROCUTA APHRODITE	2.4	10	A
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	29	A
EPHEMEROPTERA	ISONYCHIIDAE	ISONYCHIA SPP.	3.4	2	R
LIMNOPHILA	ANCYLIDAE	FERRISSIA SPP.	6.6	1	R
LIMNOPHILA	LYMNAEIDAE	PSEUDOSUCCINEA COLUMELLA	7.6	1	R
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	20	A
LIMNOPHILA	PLANORBIDAE	HELISOMA ANCEPS	6.2	15	A
LIMNOPHILA	PLANORBIDAE	MENETUS DILATUS	8.3	6	C
MEGALOPTERA	CORYDALIDAE	NIGRONIA SERRICORNIS	4.9	5	C
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	10	A
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	2	R
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	3	C
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	2	R
ODONATA	GOMPHIDAE	LANTHUS SPP.	1.7	6	C
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	1	R
ODONATA	GOMPHIDAE	STYLOGOMPHUS ALBISTYLUS	4.7	1	R
ODONATA	MACROMIIDAE	MACROMIA GEORGINA	6.2	2	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	18	A
TRICHOPTERA	HELICOPSYCHIDAE	HELICOPSYCHE BOREALIS	0.0	1	R
?ICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	8	C

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 96 - GAR CREEK
GAR CREEK AT BEATTIES FORD RD

BASIN:

LOCATION: MC50

LOG NO: 2003 - 00470
SURVEY DATE: 06/14/2002

TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	11	A
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	21	A
TRICHOPTERA	LIMNEPHILIDAE	NEOPHYLAX OLIGIUS	2.2	6	C
TRICHOPTERA	LIMNEPHILIDAE	NEOPHYLAX ORNATUS	1.5	2	R
TRICHOPTERA	POLYCENTROPODIDAE	NYCTIOPHYLAX MOESTUS	0.3	4	C

TOTAL # ORGANISMS: 274
TOTAL TAXA: 37
TOTAL EPT: 10
SPECIES DIVERSITY: 4.6

METHOD: STD
BIOTIC INDEX: 6.08
WATER QUALITY RATING: 3 FAIR-GOOD

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM BASIN 69 - LONG CREEK AT PINE ISLAND DRIVE

SURVEY DATE 7/14/2009

LOCATION MC14A

TAXONOMIST Tony Roux

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.	ABUNDANCE	EPT	TV*N
EPHEMEROPTERA	BAETIDAE	ACENTRELLA SPP.	4.0	2	1	1	4
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	15	10	1	70
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	25	10	1	70
EPHEMEROPTERA	BAETIDAE	BAETIS PLUTO	4.3	6	3	1	12.9
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	2	1	1	6.6
EPHEMEROPTERA	BAETIDAE	PARACLOEODES SPP.	8.7	2	1	1	8.7
EPHEMEROPTERA	BAETIDAE	PSEUDOCLOEON PROPINQUUM	5.8	6	3	1	17.4
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	1	1	1	6.9
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	42	10	1	55
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	32	10	1	62
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	43	10	1	78
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	2	1	1	6.2
TRICHOPTERA	LEPTOCERIDAE	MYSTACIDES SEPULCHRALUS	2.7	1	1	1	2.7
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	1	1		4.1
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	20	10		51
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	5	3		25.2
DIPTERA	CHIRONOMIDAE	CRICOTOPUS BICINCTUS	8.5	11	10		85
DIPTERA	CHIRONOMIDAE	CRICOTOPUS TRIANNULATUS GROUP	9.0	3	3		27
DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	1	1		6.4
DIPTERA	CHIRONOMIDAE	POLYPEDILUM FLAVUM	4.9	7	3		14.7
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	5	3		27
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	1	1		8.4

BASIN 69 - LONG CREEK **AT PINE ISLAND DRIVE** **7/14/2009**

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.	ABUNDANCE	EPT	TV*N
DIPTERA	CHIRONOMIDAE	PROCLADIUS SPP.	9.1	1	1		9.1
DIPTERA	CHIRONOMIDAE	TRIBELOS JUCUNDUM	6.3	3	3		18.9
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	1	1		8.6
DIPTERA	DIXIDAE	DIXELLA INDIANA	2.5	1	1		2.5
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	11	10		60
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	1	1		4.3
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	22	10		73
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	1	1		7.8
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	1	1		8.2
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	4	3		26.7
ODONATA	CORDULIIDAE	SOMATOCHLORA SPP.	9.2	1	1		9.2
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	2	1		5.8
ODONATA	GOMPHIDAE	STYLOGOMPHUS ALBISTYLUS	4.7	1	1		4.7
ODONATA	MACROMIIDAE	MACROMIA GEORGINA	6.2	1	1		6.2
GASTROPODA	PHYSIDAE	PHYSELLA SPP.	8.8	3	3		26.4
OLIGOCHAETA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	15	10		70
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	12	10		61

TOTAL ORGANISMS	**314**	**BIOTIC INDEX**	**6.74**	**13**	**1051.6**
TOTAL TAXA	**40**				**156**
TOTAL EPT	**13**	**RATING**	**FAIR**		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

LOG NO: 2003 - 00734
SURVEY DATE: 08/09/2002

ASIN:

LOCATION: MC13

TAXONOMIST: David Buetow
COLLECTORS: David Buetow, Will Autry, David M. Caldwell, David J. Rimer

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	DUBIRAPHIA VITTATA	4.1	1	R
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	16	A
COLEOPTERA	HYDROPHILIDAE	BEROSUS SPP.	8.4	8	C
COLEOPTERA	HYDROPHILIDAE	HYDROCHUS SPP.	6.6	3	C
COLEOPTERA	HYDROPHILIDAE	TROPISTERNUS SPP.	9.6	2	R
COLEOPTERA	PSEPHENIDAE	PSEPHENUS HERRICKI	2.3	8	C
DIPTERA	CERATOPOGONIDAE	ALLUAUDOMYIA SPP.	6.0	2	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	4	C
DIPTERA	CHIRONOMIDAE	APEDILUM SPP.	1.0	3	C
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	9	C
DIPTERA	CHIRONOMIDAE	CLINOTANYPUS PINGUIS	8.7	1	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.3	11	A
PTERA	CHIRONOMIDAE	CRICOTOPUS/ORTHOCLADIUS GROUP	9.9	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	14	A
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	5	C
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.7	7	C
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	1	R
DIPTERA	STRATIOMYIDAE	STRATIOMYS SPP.	8.1	1	R
DIPTERA	TIPULIDAE	LIMONIA SPP.	9.6	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	8	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	6.6	14	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	5.0	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.7	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS SPP.	5.0	6	C
EPHEMEROPTERA	BAETIDAE	CALLIBAETIS SPP.	9.8	1	R
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	1	R
EPHEMEROPTERA	BAETIDAE	PROCLOEON SPP.	5.0	8	C
EPHEMEROPTERA	CAENIDAE	CAENIS SPP.	7.4	7	C
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	4	C
LEPIDOPTERA	PYRALIDAE	PETROPHILA SPP.	2.1	1	R
NOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	2	R
EGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.1	1	R

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

BASIN:

LOCATION: MC13

LOG NO: 2003 - 00734
SURVEY DATE: 08/09/2002

ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	1	R
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	2	R
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	15	A
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	7	C
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	1	R
ODONATA	GOMPHIDAE	OPHIOGOMPHUS SPP.	5.5	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	9	C
ODONATA	MACROMIIDAE	MACROMIA SPP.	6.2	2	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	5	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	23	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	3	C
TRICLADIDA	PLANARIIDAE	DUGESIA TIGRINA	7.2	14	A

TOTAL # ORGANISMS: 240
TOTAL TAXA: 44
TOTAL EPT: 11
SPECIES DIVERSITY: 4.9

METHOD: STD
BIOTIC INDEX: 6.72
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

LOG NO: 2004 - 00466
SURVEY DATE: 08/15/2003

BASIN:
LOCATION: MC13

TAXONOMIST: David Buetow
COLLECTORS: Will Autry, Olivia J. Hutchins, Michael Burkhard, Crystal A. Taylor

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	11	A
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	6	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	2	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	6	C
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	3	C
EPHEMEROPTERA	BAETIDAE	BAETIS SPP.	5.0	3	C
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	1	R
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	3	C
)ONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	10	A
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	1	R
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	96	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	27	A

TOTAL # ORGANISMS: 175
TOTAL TAXA: 16
TOTAL EPT: 6
SPECIES DIVERSITY: 2.4

METHOD: STD
BIOTIC INDEX: 6.60
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

LOG NO: 2005 - 00583
SURVEY DATE: 08/20/2004

BASIN:
LOCATION: MC13

TAXONOMIST: David Buetow
COLLECTORS: Mark Popinchalk
Chris F. Elmore
Randall D Moore

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	17	A
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	2	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	1	R
DIPTERA	CHIRONOMIDAE	CRICOTOPUS/ORTHOCLADIUS GROUP	9.9	2	R
DIPTERA	CHIRONOMIDAE	DICROTENDIPES SPP.	8.1	4	C
DIPTERA	CHIRONOMIDAE	ORTHOCLADIUS SPP.	6.0	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	7	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	5	C
DIPTERA	CHIRONOMIDAE	RHEOCRICOTOPUS SPP.	7.3	2	R
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	2	R
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	1	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	3	C
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS EPHIPPIATUS	3.7	4	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	46	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS SPP.	5.0	4	C
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	39	A
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	1	R
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	2	R
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.2	3	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	1	R
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	4	C
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	6	C
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	3	C
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	6	C
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	6	C
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	3	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	21	A

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

LOG NO: 2005 - 00583
SURVEY DATE: 08/20/2004

ASIN:

LOCATION: MC13

TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	50	A
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	1	R

TOTAL # ORGANISMS:	266	**METHOD:**	STD
TOTAL TAXA:	34	**BIOTIC INDEX:**	6.69
TOTAL EPT:	9	**WATER QUALITY RATING:**	2 FAIR
SPECIES DIVERSITY:	4.0		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

LOG NO: 2006 - 00498
SURVEY DATE: 08/05/2005

BASIN:

LOCATION: MC13

TAXONOMIST: David Buetow
COLLECTORS: Isaac J. Hinson, Brian G. Sikes, David Buetow, Jonathan Beller

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	3	C
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	1	R
COLEOPTERA	ELMIDAE	MACRONYCHUS GLABRATUS	4.6	1	R
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	8	C
DIPTERA	CHIRONOMIDAE	ABLABESMYIA PARAJANTA/JANTA	7.4	1	R
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	7	C
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	11	A
DIPTERA	CHIRONOMIDAE	CRICOTOPUS BICINCTUS	8.5	5	C
DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	2	R
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	19	A
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	5	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	4	C
DIPTERA	CHIRONOMIDAE	RHEOCRICOTOPUS SPP.	7.3	2	R
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	7	C
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	3	C
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	6	C
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA SPP.	5.9	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	4	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	31	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	4	C
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	69	A
EPHEMEROPTERA	TRICORYTHIDAE	TRICORYTHODES SPP.	5.1	1	R
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	4	C
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	4	C
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.2	6	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	18	A
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	32	A
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	6	C
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	2	R
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	14	A

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 68 - LONG CREEK
GUM BRANCH AT GUM BRANCH RD

LOG NO: 2006 - 00498
SURVEY DATE: 08/05/2005

ASIN:
LOCATION: MC13

ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	3	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	79	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	183	A
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	4	C

TOTAL # ORGANISMS:	557	**METHOD:**	STD
TOTAL TAXA:	36	**BIOTIC INDEX:**	6.92
TOTAL EPT:	8	**WATER QUALITY RATING:**	2 FAIR
SPECIES DIVERSITY:	3.6		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 67 - LONG CREEK
GUTTER BRANCH AT KELLY RD
BASIN:
LOCATION: MC11

LOG NO: 99-01690
SURVEY DATE: 09/18/98

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux, David J. Rimer, Richard L. Farmer, David M. Caldwell

ORDER/FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
BAETIDAE	BAETIS PLUTO	4.2	13	A
BAETIDAE	CENTROPTILUM SPP.	6.6	1	R
CAENIDAE	CAENIS SPP.	7.4	2	R
EPHEMERIDAE	HEXAGENIA SPP.	4.9	2	R
HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	48	A
ISONYCHIIDAE	ISONYCHIA SPP.	3.4	3	C
PERLIDAE	ECCOPTURA XANTHENES	3.7	15	A
PERLIDAE	NEOPERLA SPP.	1.5	14	A
HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	27	A
HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	24	A
LIMNEPHILIDAE	NEOPHYLAX OLIGIUS	2.2	27	A
PHILOPOTAMIDAE	CHIMARRA SPP.	2.7	56	A
POLYCENTROPODID	NYCTIOPHYLAX SPP.	0.8	5	C
DRYOPIDAE	HELICHUS SPP.	4.6	1	R
ELMIDAE	ANCYRONYX VARIEGATUS	6.5	6	C
ELMIDAE	DUBIRAPHIA VITTATA	4.1	4	C
ELMIDAE	STENELMIS SPP.	5.1	53	A
PSEPHENIDAE	PSEPHENUS HERRICKI	2.3	15	A
PTILODACTYLIDAE	ANCHYTARSUS BICOLOR	3.6	3	C
CULICIDAE	ANOPHELES SPP.	8.6	8	C
CULICIDAE	CULEX SPP.	10.0	1	R
TIPULIDAE	HEXATOMA SPP.	4.3	1	R
TIPULIDAE	TIPULA SPP.	7.3	5	C
CORYDALIDAE	CORYDALUS CORNUTUS	5.1	2	R
CORYDALIDAE	NIGRONIA SERRICORNIS	4.9	2	R
SIALIDAE	SIALIS SPP.	7.2	3	C
AESHNIDAE	BOYERIA VINOSA	5.9	9	A
CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	10	A
COENAGRIONIDAE	ARGIA SPP.	8.2	37	A
COENAGRIONIDAE	ENALLAGMA SPP.	8.9	50	A
GOMPHIDAE	GOMPHUS SPP.	5.8	7	C
GOMPHIDAE	OPHIOGOMPHUS SPP.	5.5	3	C
GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	1	R
MACROMIIDAE	MACROMIA GEORGINA	6.2	1	R
CORBICULIDAE	CORBICULA FLUMINEA	6.1	11	A
PHYSIDAE	PHYSELLA SPP.	8.8	3	C

TOTAL # ORGANISMS...:	473	METHOD.....:	EPT
TOTAL TAXA.....:	36	BIOTIC INDEX.....:	2.17
TOTAL EPT.....:	13	WATER QUALITY RATING:	0
SPECIES DIVERSITY...:	4.3		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 65 - LONG CREEK
MCINTYRE CREEK AT MIRANDA RD
BASIN:
LOCATION: MC8A-1

LOG NO: 99-01704
SURVEY DATE: 07/31/98

TAXONOMIST: Anthony J. Roux
COLLECTORS: Anthony J. Roux, David M. Caldwell, Richard L. Farmer, Anne Loftin

ORDER/FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
CAENIDAE	CAENIS SPP.	7.4	28	A
HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	4	C
HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	108	A
ISONYCHIIDAE	ISONYCHIA SPP.	3.4	11	A
HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	66	A
HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	58	A
DRYOPIDAE	HELICHUS SPP.	4.6	1	R
DYTISCIDAE	HYDROPORUS SPP.	8.6	1	R
ELMIDAE	ANCYRONYX VARIEGATUS	6.5	8	C
ELMIDAE	DUBIRAPHIA VITTATA	4.1	1	R
ELMIDAE	STENELMIS SPP.	5.1	2	R
TIPULIDAE	ANTOCHA SPP.	4.2	10	A
TIPULIDAE	HEXATOMA SPP.	4.3	2	R
TIPULIDAE	TIPULA SPP.	7.3	1	R
CORYDALIDAE	CORYDALUS CORNUTUS	5.1	82	A
CORYDALIDAE	NIGRONIA SERRICORNIS	4.9	19	A
SIALIDAE	SIALIS SPP.	7.2	3	C
AESHNIDAE	BOYERIA VINOSA	5.9	1	R
CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	1	R
COENAGRIONIDAE	ARGIA SPP.	8.2	9	A
GOMPHIDAE	GOMPHUS SPP.	5.8	1	R
GOMPHIDAE	OPHIOGOMPHUS SPP.	5.5	2	R
MACROMIIDAE	MACROMIA GEORGINA	6.2	1	R
CORBICULIDAE	CORBICULA FLUMINEA	6.1	13	A
PHYSIDAE	PHYSELLA SPP.	8.8	2	R

TOTAL # ORGANISMS...:	435	METHOD.....:	EPT
TOTAL TAXA.....:	25	BIOTIC INDEX.....:	1.66
TOTAL EPT.....:	6	WATER QUALITY RATING:	0
SPECIES DIVERSITY...:	3.3		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 67 - LONG CREEK
LONG CREEK AT OAKDALE RD

BASIN:

LOCATION: MC10

LOG NO: 2003 - 00733
SURVEY DATE: 06/14/2002

TAXONOMIST: David Buetow
COLLECTORS: David Buetow
Will Autry
David J. Rimer
David M. Caldwell

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.3	3	C
DIPTERA	CHIRONOMIDAE	CRICOTOPUS BICINCTUS	8.5	2	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	1	R
DIPTERA	CHIRONOMIDAE	RHEOCRICOTOPUS SPP.	7.3	2	R
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	1	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	5	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	6.6	15	A
EPHEMEROPTERA	BAETIDAE	BAETIS SPP.	5.0	1	R
EPHEMEROPTERA	BAETIDAE	CLOEON SPP.	7.4	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	35	A
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	1	R
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	3	C
MEGALOPTERA	SIALIDAE	SIALIS SPP.	7.2	1	R
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	4	C
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	1	R
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	8	C
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	2	R
ODONATA	CORDULIIDAE	SOMATOCHLORA SPP.	9.1	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	2	R
ODONATA	MACROMIIDAE	MACROMIA GEORGINA	6.2	2	R
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	32	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	26	A

TOTAL # ORGANISMS: 151
TOTAL TAXA: 23
TOTAL EPT: 6
SPECIES DIVERSITY: 3.4

METHOD: STD
BIOTIC INDEX: 6.90
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 67 - LONG CREEK
LONG CREEK AT OAKDALE RD

LOG NO: 2004 - 00465
SURVEY DATE: 08/15/2003

ASIN:

LOCATION: MC10

TAXONOMIST: David Buetow
COLLECTORS: Will Autry, Brian G. Sikes, Gina Hodges, Olivia J. Hutchins

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM FALLAX	6.4	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	1	R
DIPTERA	CHIRONOMIDAE	RHEOSMITTIA SPP.	7.0	1	R
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	1	R
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	1	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	44	A
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	8	C
EPHEMEROPTERA	BAETIDAE	BAETIS SPP.	5.0	2	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	5	C
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	1	R
)MBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	1	R
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	3	C
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	8	C
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	3	C
ODONATA	MACROMIIDAE	MACROMIA GEORGINA	6.2	1	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	5	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	21	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	1	R

TOTAL # ORGANISMS: 116
TOTAL TAXA: 21
TOTAL EPT: 6
SPECIES DIVERSITY: 3.1

METHOD: STD
BIOTIC INDEX: 6.64
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 67 - LONG CREEK
LONG CREEK AT OAKDALE RD

LOG NO: 2005 - 00584
SURVEY DATE: 08/20/2004

BASIN:
LOCATION: MC10

TAXONOMIST: David Buetow
COLLECTORS: Mark Popinchalk
Chris F. Elmore
Randall D Moore

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	2	R
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	3	C
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	2	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	2	R
DIPTERA	CHIRONOMIDAE	NATARSIA SPP.	10.0	2	R
DIPTERA	CHIRONOMIDAE	ORTHOCLADIUS SPP.	6.0	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	4	C
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	3	C
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	5	C
EPHEMEROPTERA	BAETIDAE	BAETIS EPHIPPIATUS	3.7	19	A
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	36	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	12	A
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	15	A
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	32	A
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	1	R
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.2	6	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	2	R
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	3	C
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	2	R
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	2	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	7	C
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	3	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	7	C
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	14	A
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	5	C

TOTAL # ORGANISMS: 193
TOTAL TAXA: 27
TOTAL EPT: 8
SPECIES DIVERSITY: 4.0

METHOD: STD
BIOTIC INDEX: 6.45
WATER QUALITY RATING: 3 FAIR-GOOD

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 67 - LONG CREEK
LONG CREEK AT OAKDALE RD

LOG NO: 2006 - 00501
SURVEY DATE: 08/05/2005

ASIN:
LOCATION: MC10

TAXONOMIST: David Buetow
COLLECTORS: David Buetow, Isaac J. Hinson, Brian G. Sikes, Jonathan Beller

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	1	R
COLEOPTERA	ELMIDAE	MACRONYCHUS GLABRATUS	4.6	1	R
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	1	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	10	A
DIPTERA	CHIRONOMIDAE	CRICOTOPUS/ORTHOCLADIUS GROUP	9.9	2	R
DIPTERA	CHIRONOMIDAE	ORTHOCLADIUS SPP.	6.0	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	14	A
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	2	R
DIPTERA	CHIRONOMIDAE	RHEOCRICOTOPUS SPP.	7.3	15	A
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	3	C
DIPTERA	CHIRONOMIDAE	SAETHERIA TYLUS	7.1	1	R
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	1	R
PTERA	TIPULIDAE	ANTOCHA SPP.	4.3	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS EPHIPPIATUS	3.7	9	C
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	15	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	4	C
EPHEMEROPTERA	BAETIDAE	BAETIS PLUTO	4.3	3	C
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	3	C
EPHEMEROPTERA	BAETIDAE	CALLIBAETIS SPP.	9.8	2	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	30	A
HAPLOTAXIDA	TUBIFICIDAE	LIMNODRILUS HOFFMEISTERI	9.5	1	R
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.2	1	R
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	2	R
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	12	A
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	2	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	1	R
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	46	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	42	A

TOTAL # ORGANISMS: 226
TOTAL TAXA: 28
TOTAL EPT: 9
ECIES DIVERSITY: 3.7

METHOD: STD
BIOTIC INDEX: 7.01
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 69 - LONG CREEK
LONG CREEK AT PINE ISLAND DRIVE

LOG NO: 2003 - 00870
SURVEY DATE: 05/24/2002

BASIN:
LOCATION: MC14A

TAXONOMIST: Mark Popinchalk
COLLECTORS: David J. Rimer, Will Autry, David Buetow

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	MACRONYCHUS GLABRATUS	4.5	1	R
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	3	C
COLEOPTERA	HYDROPHILIDAE	BEROSUS SPP.	8.4	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	1	R
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	10	A
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	10	A
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	1	R
DIPTERA	CHIRONOMIDAE	PROCLADIUS SPP.	9.1	7	C
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	15	A
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.2	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	2	R
EPHEMEROPTERA	BAETIDAE	ACENTRELLA AMPLA	3.6	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	6.6	1	R
EPHEMEROPTERA	BAETIDAE	CALLIBAETIS SPP.	9.8	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	40	A
EPHEMEROPTERA	ISONYCHIIDAE	ISONYCHIA SPP.	3.4	8	C
EPHEMEROPTERA	TRICORYTHIDAE	TRICORYTHODES SPP.	5.0	5	C
HETEROPTERA	CORIXIDAE	SIGARA SPP.	9.1	4	C
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	2	R
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.1	2	R
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	4	C
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	2	R
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	4	C
ODONATA	COENAGRIONIDAE	ENALLAGMA SPP.	8.9	2	R
ODONATA	GOMPHIDAE	HAGENIUS BREVISTYLUS	3.9	1	R
ODONATA	GOMPHIDAE	OPHIOGOMPHUS SPP.	5.5	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	4	C
ODONATA	MACROMIIDAE	MACROMIA SPP.	6.2	1	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	1	R
PLECOPTERA	PERLIDAE	PERLESTA PLACIDA	4.7	2	R
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	81	A

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 69 - LONG CREEK
LONG CREEK AT PINE ISLAND DRIVE

LOG NO: 2003 - 00870
SURVEY DATE: 05/24/2002

BASIN:

LOCATION: MC14A

TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	13	A
TRICHOPTERA	LEPTOCERIDAE	NECTOPSYCHE CANDIDA	5.4	1	R

TOTAL # ORGANISMS:	234	**METHOD:**	STD
TOTAL TAXA:	34	**BIOTIC INDEX:**	6.74
TOTAL EPT:	10	**WATER QUALITY RATING:**	2 FAIR
SPECIES DIVERSITY:	3.6		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 69 - LONG CREEK
LONG CREEK AT PINE ISLAND DRIVE

LOG NO: 2004 - 00559
SURVEY DATE: 08/15/2003

BASIN:
LOCATION: MC14A

TAXONOMIST: Anthony J. Roux
COLLECTORS: Brian G. Sikes, Will Autry, Crystal A. Taylor, Michael Burkhard

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	1	R
COLEOPTERA	ELMIDAE	MACRONYCHUS GLABRATUS	4.6	1	R
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	32	A
COLEOPTERA	HYDROPHILIDAE	TROPISTERNUS SPP.	9.7	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	2	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	2	R
DIPTERA	CHIRONOMIDAE	CRICOTOPUS BICINCTUS	8.5	1	R
DIPTERA	CHIRONOMIDAE	NANOCLADIUS SPP.	7.1	1	R
DIPTERA	CHIRONOMIDAE	NATARSIA SPP.	10.0	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	3	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	4	C
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	3	C
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	3	C
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	1	R
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	6	C
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	5	C
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	24	A
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	4	C
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.2	3	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	2	R
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	4	C
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	1	R
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	2	R
ODONATA	GOMPHIDAE	LANTHUS SPP.	1.8	3	C
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	3	C
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	11	A
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	107	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	7	C
TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA SPP.	6.2	1	R

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 69 - LONG CREEK
LONG CREEK AT PINE ISLAND DRIVE

LOG NO: 2004 - 00559
SURVEY DATE: 08/15/2003

ASIN:

LOCATION: MC14A

TOTAL # ORGANISMS:	244	**METHOD:**	STD
TOTAL TAXA:	32	**BIOTIC INDEX:**	6.23
TOTAL EPT:	7	**WATER QUALITY RATING:**	2 FAIR
SPECIES DIVERSITY:	3.3		

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM BASIN 69 - LONG CREEK
LONG CREEK AT PINE ISLAND DRIVE

SURVEY DATE 7/23/04

LOCATION MC14A

TAXONOMIST BRIAN SIKES
TONY ROUX

ORDER	FAMILY	SPECIES	TOLERANCE	NO.	ABUNDANCE
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	6	3
EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON INTERPUNCTATUM	6.9	1	1
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	84	10
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	7	3
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	50	10
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	6	3
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	16	10
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	2	1
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	8	3
DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	1	1
DIPTERA	CHIRONOMIDAE	DICROTENDIPES NEOMODESTUS	8.1	6	3
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	1	1
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	5	3
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	3	3
DIPTERA	CULICIDAE	ANOPHELES SPP.	8.6	2	1
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	3	3
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	3	3
MEGALOPTERA	CORYDALIDAE	CORYDALUS CORNUTUS	5.2	1	1
ODONATA	AESHNIDAE	BASIAESCHNA JANATA	7.4	1	1
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	2	1
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	7	3
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	3	3
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	3	3
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	4	3
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	1	1

TOTAL ORGANISMS	226	**BIOTIC INDEX**	6.74
TOTAL TAXA	25	**WATER QUALITY RATING**	POOR
TOTAL EPT	5		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 69 - LONG CREEK
LONG CREEK AT PINE ISLAND DRIVE

LOG NO: 2006 - 00696

SURVEY DATE: ~~07/03/2006~~ 7/22/05

BASIN:

LOCATION: MC14A

TAXONOMIST: Brian G. Sikes

COLLECTORS: Mark Popinchalk, David Buetow, Olivia J. Hutchins, Monique D. LaPierre

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	ELMIDAE	ANCYRONYX VARIEGATUS	6.5	2	R
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	9	C
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	1	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	1	R
DIPTERA	CHIRONOMIDAE	DICROTENDIPES SPP.	8.1	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	2	R
DIPTERA	TIPULIDAE	ANTOCHA SPP.	4.3	9	C
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	12	A
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	104	A
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	58	A
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	30	A
EPHEMEROPTERA	TRICORYTHIDAE	TRICORYTHODES SPP.	5.1	5	C
JMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	3	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	9	C
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	7	C
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	3	C
ODONATA	MACROMIIDAE	MACROMIA SPP.	6.2	3	C
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	27	A

TOTAL # ORGANISMS: 287
TOTAL TAXA: 18
TOTAL EPT: 5
SPECIES DIVERSITY: 3.0

METHOD: STD
BIOTIC INDEX: 6.72
WATER QUALITY RATING: ~~2-FAIR~~ Poor

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM BASIN 69 - LONG CREEK AT PINE ISLAND DRIVE

SURVEY DATE 8/18/2006

LOCATION MC14A

TAXONOMIST Brian Sikes

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	1
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	11
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	10
EPHEMEROPTERA	BAETIDAE	PARACLOEODES SPP.	8.7	1
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	3
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	16
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	35
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	5
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	1
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	2
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	9
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	2
DIPTERA	CHIRONOMIDAE	RHEOCRICOTOPUS ROBACKI	7.3	1
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	1
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	2
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	5
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	2
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	1
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	1
OLIGOCHAETA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	3
OLIGOCHAETA	TUBIFICIDAE	BRANCHIURA SOWERBYI	8.3	2
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	3

TOTAL ORGANISMS 117 **BIOTIC INDEX** 6.77

TOTAL TAXA 22

TOTAL EPT 7

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM BASIN 62 - PAW CREEK

BASIN 62 - PAW CREEK

SURVEY DATE

7/14/2009

LOCATION MC17

TAXONOMIST Tony Roux

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.	ABUNDANCE	EPT	TV*N
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	8	3	1	21
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	6	3	1	21
EPHEMEROPTERA	BAETIDAE	PROCLOEON SPP.	5.0	8	3	1	15
EPHEMEROPTERA	BAETIDAE	PARACLOEODES SPP.	8.7	3	3	1	26.1
EPHEMEROPTERA	BAETIDAE	PSEUDOCLOEON PROPINQUUM	5.8	16	10	1	58
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	42	10	1	55
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	52	10	1	62
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	25	10	1	78
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE VENULARIS	5.0	1	1	1	5
COLEOPTERA	DYTISCIDAE	LACCOPHILUS SPP.	10.0	1	1		10
COLEOPTERA	ELMIDAE	STENELMIS SPP.	5.1	1	1		5.1
COLEOPTERA	HALIPLIDAE	PELTODYTES SPP.	8.7	1	1		8.7
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	16	10		72
DIPTERA	CHIRONOMIDAE	ABLABESMYIA RHAMPHE	7.4	3	3		22.2
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	3	3		28.8
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	10	10		84
DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	2	1		6.4
DIPTERA	CHIRONOMIDAE	LARSIA SPP.	9.3	1	1		9.3
DIPTERA	CHIRONOMIDAE	PARATANYTARSUS SPP.	8.5	2	1		8.5
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1	1		5.1
DIPTERA	CHIRONOMIDAE	POLYPEDILUM FLAVUM	4.9	1	1		4.9
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	5	3		27

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.	ABUNDANCE	EPT	TV*N
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	14	10		84
DIPTERA	CHIRONOMIDAE	PROCLADIUS SPP.	9.1	3	3		27.3
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	2	1		5.9
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	14	10		68
DIPTERA	CHIRONOMIDAE	TRIBELOS JUCUNDUM	6.3	3	3		18.9
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	3	3		21.9
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	1	1		5.9
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	1	1		8.2
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	3	3		17.4
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	12	10		82
MOLLUSCA	PHYSIDAE	PHYSELLA SPP.	8.8	1	1		8.8
OLIGOCHAETA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	4	3		21
OLIGOCHAETA	TUBIFICIDAE	LIMNODRILUS SPP.	9.5	1	1		9.5
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	3	3		18.3

TOTAL ORGANISMS	**273**	**BIOTIC INDEX**	**0.03**	**9**	**1030.2**
TOTAL TAXA	**36**				**40151**
TOTAL EPT	**9**	**RATING**	**FAIR**		

MECKLENBURG COUNTY - MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM	BASIN 62 - PAW CREEK AT WILKINSON BLVD	**SURVEY DATE** 8/18/2006
LOCATION	MC17	
TAXONOMIST	Brian Sikes	

ORDER	FAMILY	GENUS/SPECIES	TOLERANCE	NO.
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	5
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	3
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	8
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	17
COLEOPTERA	ELMIDAE	MACRONYCHUS GLABRATUS	4.5	1
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	2
DIPTERA	CHIRONOMIDAE	NATARSIA SPP.	9.9	1
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	5
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	1
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	1
DIPTERA	CHIRONOMIDAE	TRIBELOS JUCUNDUS	6.3	2
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	8
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	7
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	3
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	2

TOTAL ORGANISMS	**66**	**BIOTIC INDEX**	**6.91**
TOTAL TAXA	**15**		
TOTAL EPT	**4**		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 62 - PAW CREEK
PAW CREEK AT WILKINSON BLVD

LOG NO: 2006 - 00493
SURVEY DATE: 07/22/2005

BASIN:
LOCATION: MC17

TAXONOMIST: David Buetow
COLLECTORS: David Buetow, Michael Burkhard, Olivia J. Hutchins, Monique D. LaPierre

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	2	R
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	2	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	5	C
DIPTERA	CHIRONOMIDAE	CRICOTOPUS BICINCTUS	8.5	1	R
DIPTERA	CHIRONOMIDAE	LABRUNDINIA SPP.	5.9	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM ILLINOENSE	9.0	9	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	9	C
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	3	C
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	7	C
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	5	C
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA SPP.	5.9	4	C
DIPTERA	CHIRONOMIDAE	XYLOTOPUS PAR	6.0	1	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS EPHIPPIATUS	3.7	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	5	C
EPHEMEROPTERA	BAETIDAE	BAETIS INTERCALARIS	7.0	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS PLUTO	4.3	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	15	A
EPHEMEROPTERA	BAETIDAE	CENTROPTILUM SPP.	6.6	2	R
EPHEMEROPTERA	BAETIDAE	PROCLOEON SPP.	5.0	1	R
EPHEMEROPTERA	CAENIDAE	CAENIS SPP.	7.4	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	77	A
HAPLOTAXIDA	TUBIFICIDAE	LIMNODRILUS HOFFMEISTERI	9.5	1	R
LIMNOPHILA	PHYSIDAE	PHYSELLA SPP.	8.8	2	R
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	9	C
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	22	A
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	1	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	2	R

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 62 - PAW CREEK
PAW CREEK AT WILKINSON BLVD

LOG NO: 2006 - 00493
SURVEY DATE: 07/22/2005

SIN:

LOCATION: MC17

TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	3	C
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	2	R
TRICHOPTERA	LEPTOCERIDAE	TRIAENODES IGNITUS	4.6	1	R
TRICHOPTERA	PSYCHOMYIIDAE	LYPE DIVERSA	4.1	1	R

TOTAL # ORGANISMS:	207	**METHOD:**	STD
TOTAL TAXA:	36	**BIOTIC INDEX:**	6.64
TOTAL EPT:	13	**WATER QUALITY RATING:**	2 FAIR
SPECIES DIVERSITY:	3.7		

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 62 - PAW CREEK
PAW CREEK AT WILKINSON BLVD
BASIN:
LOCATION: MC17

LOG NO: 2005 - 00582
SURVEY DATE: 07/23/2004

TAXONOMIST: David Buetow
COLLECTORS: David M. Caldwell, Brian G. Sikes, David J. Rimer, Wanda M Comfort

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DYTISCIDAE	HYDROPORUS SPP.	8.6	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	6	C
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	3	C
DIPTERA	CHIRONOMIDAE	CRICOTOPUS/ORTHOCLADIUS GROUP	9.9	3	C
DIPTERA	CHIRONOMIDAE	ORTHOCLADIUS SPP.	6.0	1	R
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	6	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	5	C
DIPTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	1	R
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	1	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	1	R
EPHEMEROPTERA	CAENIDAE	CAENIS SPP.	7.4	1	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	22	A
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	3	C
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	10	A
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	12	A
ODONATA	GOMPHIDAE	STYLOGOMPHUS ALBISTYLUS	4.7	1	R
ODONATA	LIBELLULIDAE	LIBELLULA SPP.	9.6	1	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	16	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	1	R

TOTAL # ORGANISMS: 97
TOTAL TAXA: 21
TOTAL EPT: 3
SPECIES DIVERSITY: 3.6

METHOD: STD
BIOTIC INDEX: 7.18
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 62 - PAW CREEK
PAW CREEK AT WILKINSON BLVD

LOG NO: 2004 - 00467
SURVEY DATE: 07/11/2003

ASIN:
LOCATION: MC17

TAXONOMIST: David Buetow
COLLECTORS: Brian G. Sikes, David J. Rimer, David M. Caldwell, Crystal A. Taylor

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DYTISCIDAE	NEOPORUS SPP.	8.6	1	R
DIPTERA	CHIRONOMIDAE	ABLABESMYIA MALLOCHI	7.2	7	C
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	2	R
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.4	5	C
DIPTERA	CHIRONOMIDAE	CRICOTOPUS SPP.	6.0	5	C
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	1	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SPP.	5.8	2	R
DIPTERA	CHIRONOMIDAE	RHEOSMITTIA SPP.	7.0	1	R
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	29	A
PTERA	CHIRONOMIDAE	STENOCHIRONOMUS SPP.	6.5	1	R
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.8	8	C
DIPTERA	CHIRONOMIDAE	THIENEMANNIELLA SPP.	5.9	2	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	1	R
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS FLAVISTRIGA	7.0	1	R
EPHEMEROPTERA	BAETIDAE	BAETIS PROPINQUUS	5.8	2	R
EPHEMEROPTERA	BAETIDAE	BAETIS SPP.	5.0	2	R
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	16	A
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	6	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	2	R
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	3	C
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	10	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	3	C

TOTAL # ORGANISMS: 117
TOTAL TAXA: 27
TOTAL EPT: 6
SPECIES DIVERSITY: 3.9

METHOD: STD
BIOTIC INDEX: 6.43
WATER QUALITY RATING: 2 FAIR

MACROINVERTEBRATE IDENTIFICATION SHEET

STREAM: BASIN 62 - PAW CREEK
PAW CREEK AT WILKINSON BLVD
BASIN:
LOCATION: MC17

LOG NO: 2003 - 00732
SURVEY DATE: 05/24/2002

TAXONOMIST: David Buetow
COLLECTORS: David Buetow
Shawn T Ralston
Will Autry

ORDER	FAMILY	GENUS/SPECIES	TV	NO.	ABUNDANCE
COLEOPTERA	DRYOPIDAE	HELICHUS SPP.	4.6	1	R
COLEOPTERA	DYTISCIDAE	HYDROPORUS SPP.	8.6	1	R
DIPTERA	CERATOPOGONIDAE	ALLUAUDOMYIA SPP.	6.0	1	R
DIPTERA	CHIRONOMIDAE	CHIRONOMUS SPP.	9.6	4	C
DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA GROUP	8.3	3	C
DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS SPP.	6.4	4	C
DIPTERA	CHIRONOMIDAE	PARATENDIPES SPP.	5.1	1	R
DIPTERA	CHIRONOMIDAE	PHAENOPSECTRA SPP.	6.5	12	A
DIPTERA	CHIRONOMIDAE	POLYPEDILUM AVICEPS	3.6	4	C
DIPTERA	CHIRONOMIDAE	POLYPEDILUM CONVICTUM/FLAVUM	4.9	2	R
DIPTERA	CHIRONOMIDAE	POLYPEDILUM SCALAENUM	8.4	15	A
DIPTERA	CHIRONOMIDAE	RHEOTANYTARSUS SPP.	5.9	1	R
DIPTERA	CHIRONOMIDAE	TANYTARSUS SPP.	6.7	2	R
DIPTERA	SIMULIIDAE	SIMULIUM SPP.	6.0	8	C
DIPTERA	TIPULIDAE	TIPULA SPP.	7.3	10	A
EPHEMEROPTERA	HEPTAGENIIDAE	STENONEMA MODESTUM	5.5	7	C
LUMBRICULIDA	LUMBRICULIDAE	LUMBRICULIDAE	7.0	3	C
ODONATA	AESHNIDAE	BOYERIA VINOSA	5.9	10	A
ODONATA	CALOPTERYGIDAE	CALOPTERYX SPP.	7.8	1	R
ODONATA	COENAGRIONIDAE	ARGIA SEDULA	8.5	9	C
ODONATA	COENAGRIONIDAE	ARGIA SPP.	8.2	1	R
ODONATA	CORDULIIDAE	SOMATOCHLORA SPP.	9.1	1	R
ODONATA	GOMPHIDAE	GOMPHUS SPP.	5.8	1	R
ODONATA	GOMPHIDAE	PROGOMPHUS OBSCURUS	8.2	10	A
PELECYPODA	CORBICULIDAE	CORBICULA FLUMINEA	6.1	2	R
PLECOPTERA	PERLIDAE	PERLESTA SPP.	4.7	1	R
TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE SPP.	6.2	32	A
TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE BETTENI	7.8	2	R

TOTAL # ORGANISMS: 149
TOTAL TAXA: 28
TOTAL EPT: 4
SPECIES DIVERSITY: 4.0

METHOD: STD
BIOTIC INDEX: 6.95
WATER QUALITY RATING: 2 FAIR