

**RECONNAISSANCE SURVEY  
OF THE FRESHWATER MUSSEL  
FAUNA OF THE LOWER SALUDA  
AND CONGAREE RIVERS, LAKE  
MURRAY, AND SELECTED  
TRIBUTARIES**

**Prepared for**

**Kleinschmidt Associates  
West Columbia, SC**

by

**John M. Alderman  
Alderman Environmental Services, Inc.  
Pittsboro, NC**

31 October 2006

## **Table of Contents**

Introduction.....	3
Methods.....	3
Results.....	6
Discussion.....	6
Acknowledgements.....	8
References.....	8
Figures.....	9
Tables.....	28
Appendix - station-by-station survey results .....	38

## **Introduction**

More than 300 recognized species and subspecies of freshwater mussels are known from North America north of Mexico. Nearly 72% of these taxa are considered endangered, threatened, or of special concern to the scientific community (Williams et al. 1992).

Within the Santee-Cooper River Basin, Johnson (1970) lists 21 species from the basin. Because of incorrect synonymies, *Lasmigona decorata*, *Villosa vaughaniana*, *Elliptio producta*, *E. angustata*, and *E. fisheriana* are now known to occur within the basin; and *E. arctata* is considered not present on the Atlantic Slope. During recent studies, *Ligumia nasuta* and *Leptodea ochracea* have been documented from the basin. Therefore, there are currently 24 recognized freshwater mussel species from the Santee-Cooper River Basin.

Alderman Environmental Services, Inc. was hired to complete a reconnaissance survey of selected sites within Lake Murray, its tributaries, the lower Saluda River, and the Congaree River.

## **Methods**

Survey conditions were excellent during the survey period. Waters were clear to slightly turbid at nearly all survey stations. Emphasis was placed upon surveying as many areas as practical to better understand mussel diversity, range, distribution, abundances, and evidence of recent reproduction within populations. Sixty-one areas were surveyed for

freshwater mussels (Figures 1 - 4). Specific sites within survey areas were selected based upon John Alderman's understanding of various mussel species' microhabitat needs. Kleinschmidt Associates personnel provided boat transportation and other significant assistance throughout the study period.

### **Major Study Areas:**

#### **1) Lake Murray in South Carolina – 25 areas surveyed (Figure 2).**

As many microhabitats as possible were surveyed during a 4 day period from June 19 – 22, 2006. Particular attention was placed upon the examination of potential *Toxolasma pullus* habitat along shore.

#### **2) Lake Murray tributaries in South Carolina – 23 areas surveyed (Figure 3)**

As many microhabitats as possible were surveyed during a 4 day period from July 7 – 10, 2006. Particular attention was placed upon the examination of potential *Toxolasma pullus* habitat along shore. Bush River was not surveyed, since recent surveys by Alderman Environmental Services, Inc. within the lower reaches of this river documented poor habitat with no freshwater mussels observed. However, a tributary of Bush River, Timothy Creek, was surveyed for this project.

#### **3) Saluda, Broad, and Congaree rivers in South Carolina – 17 areas surveyed, including 2 tributaries of the Saluda River – Rawls and 12 Mile creeks (Figure 4)**

As many microhabitats as possible were surveyed during a 3 day period from July 11 – 12, 2006 and August 4, 2006. Particular attention was placed upon the examination of potential *Toxolasma pullus* habitat within backwater areas.

From 1 to 5 biologists surveyed each site. Depending upon depths, wading, batiscope, snorkeling, or SCUBA was used to conduct timed surveys:

- Wading – Where water is relatively shallow, clear, and flat (no disturbances by wind), a biologist walks over an area to visually survey an area for live mussels and shells. Since water levels were down in Lake Murray, surveys at most sites were focused upon examinations of exposed near-shore habitats.
- Batiscope or snorkeling – In clear to slightly turbid waters up to 2 meters deep, or in waters with wind-disturbed surfaces, a batiscope or snorkeling is used to visually survey an area for live mussels and shells.
- SCUBA – In survey areas of the Saluda River and Lake Murray with depths from 1 to 8+ meters, a biologist maintains his position on the river or lake bottom to facilitate surveys for live mussels and shells.

Unless otherwise noted, all live mussels were collected, length measured (range documented for larger samples), and returned to appropriate locations from which they were removed. Locations were determined by use of a Garmin 72 GPS unit.

Photographs of mussels and habitats were taken for most survey stations.

## **Results**

Fifteen freshwater mussel species were documented as extant within the areas surveyed for this project: common elliptio (*Elliptio complanata*), variable spike (*Elliptio icterina*), Carolina lance (*Elliptio angustata*), northern lance (*Elliptio fisheriana*), Atlantic spike (*Elliptio producta*), Roanoke slabshell (*Elliptio roanokensis*), Carolina slabshell (*Elliptio congaraea*), Florida pondhorn (*Uniomerus carolinianus*), paper pondshell (*Utterbackia imbecillis*), eastern floater (*Pyganodon cataracta*), creeper (*Strophitus undulatus*), eastern creekshell (*Villosa delumbis*), yellow lampmussel (*Lampsilis cariosa*), rayed pink fatmucket (*Lampsilis splendida*), and Savannah lilliput (*Toxolasma pullus*). Figures 5 – 19, Tables 1 – 4, and the Appendix provide site specific data for the surveys.

## **Discussion**

Many Atlantic Slope rivers have lost significant mussel fauna during past centuries. The effects of point and non-point sources of pollution and other impacts have reduced or eliminated many populations.

Most of the species within Lake Murray are adapted to backwater areas of rivers, thus, they are able to tolerate, and in some cases, flourish within the lentic habitats associated with this lake. This is particularly true for animals such as *Utterbackia imbecillis*, *Pyganodon cataracta*, and *Uniomerus carolinianus*. However, one species – *Toxolasma pullus* – appears to occupy a small area within the upper lake reaches. Other taxa, such as the *Elliptio* species and *Lampsilis splendida*, appear to have limited populations within

the lake. The *Elliptio* species are best adapted to lotic habitats, such as those present within the Congaree River and some of the Lake Murray tributaries.

As seen in Table 4, 13 species within the Santee-Cooper River Basin are considered federal species of concern. Of these, 6 species – *Elliptio congaraea*, *Elliptio roanokensis*, *Elliptio angustata*, *Toxolasma pullus*, *Lampsilis cariosa*, and *Lampsilis splendida* – are found within the general project area. Survey results suggest that *Elliptio congaraea*, *Elliptio roanokensis*, and *Lampsilis cariosa* are largely limited to the Broad and Congaree rivers. *Elliptio congaraea* and *Elliptio roanokensis* are not found above the Lake Murray Dam, since each species probably requires a presently undetermined anadromous fish host. *Toxolasma pullus* appears to be limited to the Little Saluda River arm of Lake Murray and to upper Clouds Creek (a Little Saluda River tributary) and is only represented by 4 shells found at 2 sites during the study.

One federally listed freshwater mussel species, the Carolina heelsplitter (*Lasmigona decorata*), is known to occur within Red Bank Creek, a Little Saluda River tributary within Saluda County. This species was discovered during July 2006 by The Catena Group (T. Savidge, personal communication). The location is upcreek from areas surveyed for the current project.

For undetermined reasons, freshwater mussels within the upper Congaree River are mostly distributed along the Broad River side of the river. Mussel diversity and abundances along the Saluda River side of the river are relatively low.

## **Acknowledgements**

C. Shane Boring and Jennifer M. Summerlin with Kleinschmidt Associates provided exceptional transportation and other assistance throughout the study period.

Coordination and other efforts provided by Alan W. Stuart with Kleinschmidt Associates are greatly appreciated. Jeffrey C. West, SC Department of Transportation biologist, and Joseph D. Alderman with Alderman Environmental Services, Inc. provided valuable survey assistance throughout the study.

## **References**

Alderman, J.M. 2006. 1994-2006 survey data records.

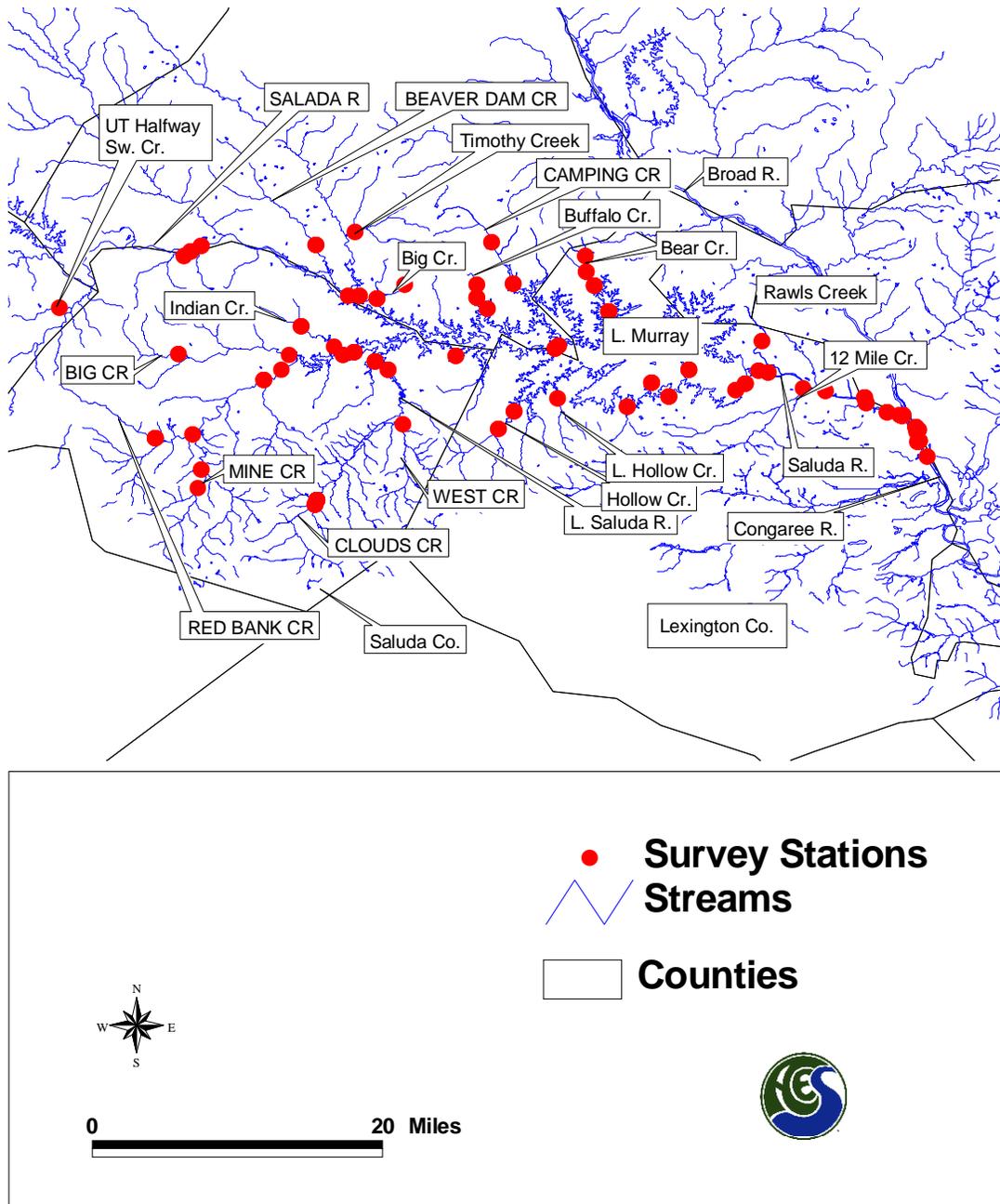
Bogan, A.E. and J.M. Alderman. 2004. Workbook and key to the freshwater bivalves of South Carolina. North Carolina Museum of Natural Sciences, Raleigh, NC 64 pp, 5 color plates.

Johnson, R.I. 1970. The systematics and zoogeography of the Unionidae (Mollusca: Bivalvia) of the Southern Atlantic Slope region. Bull. Mus. Comp. Zoo. 140(6):263-449.

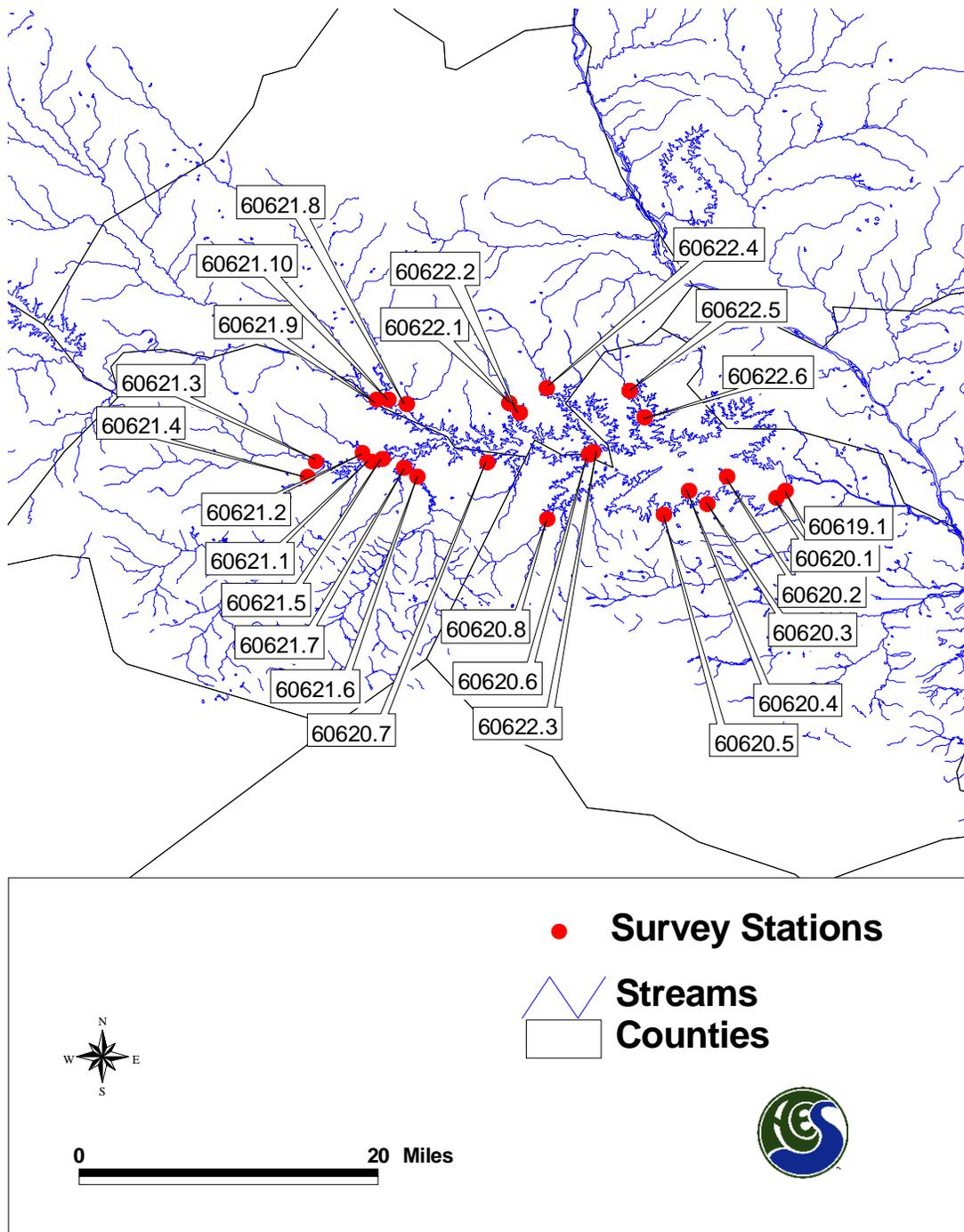
NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.5. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: October 10, 2005 ).

Savidge, T. August 7, 2006. Personal Communication.

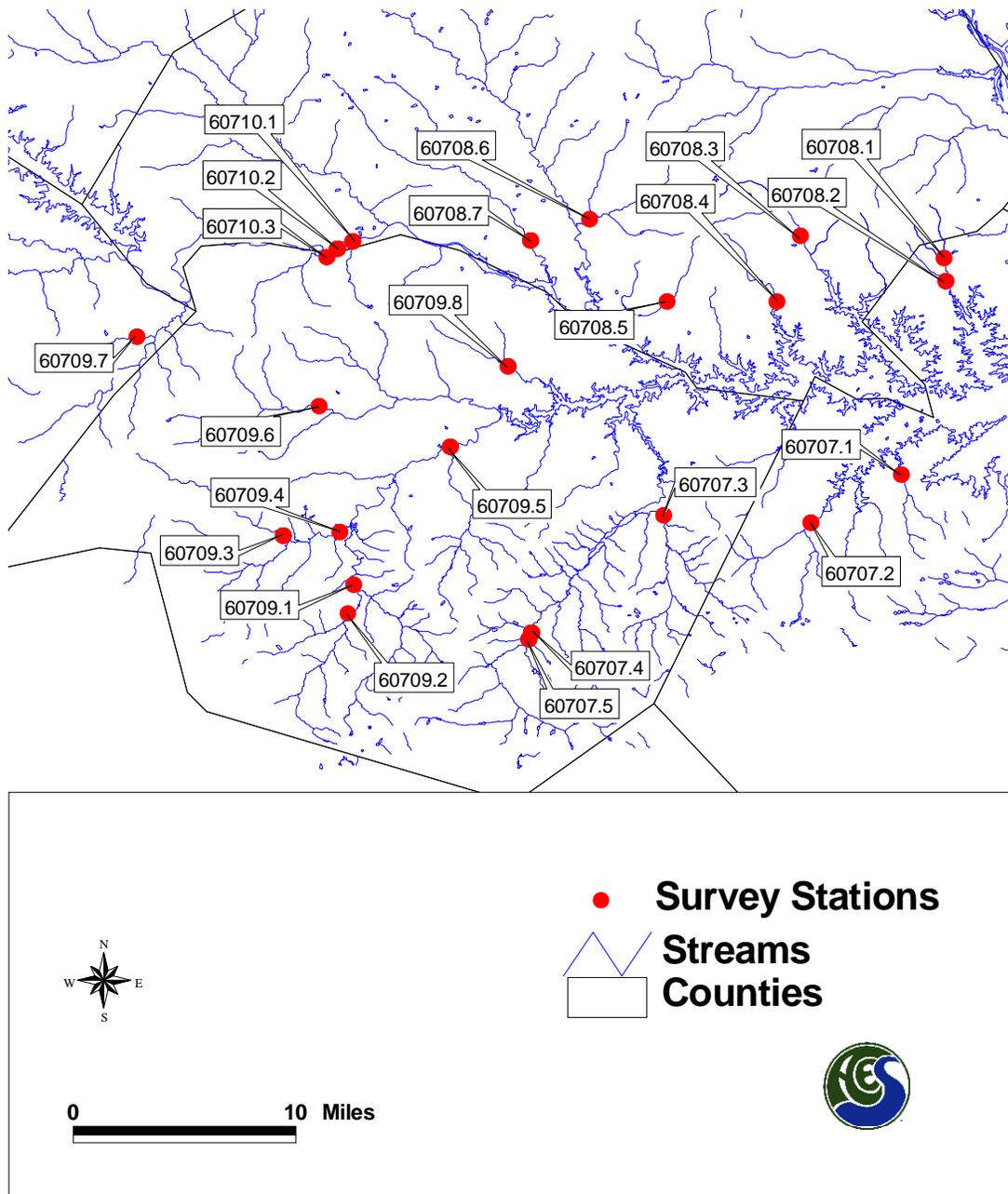
Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1992. Conservation status of freshwater mussels of the United States and Canada. Fisheries. 18(9):6-22.



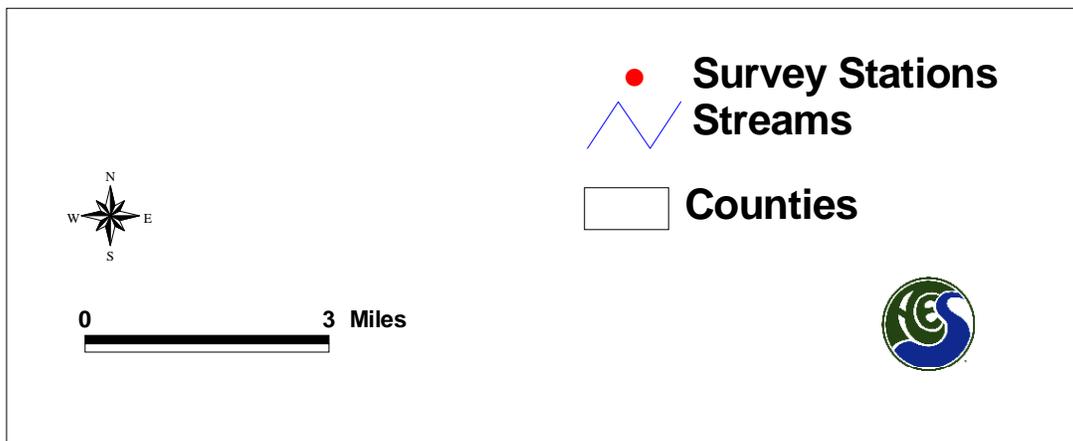
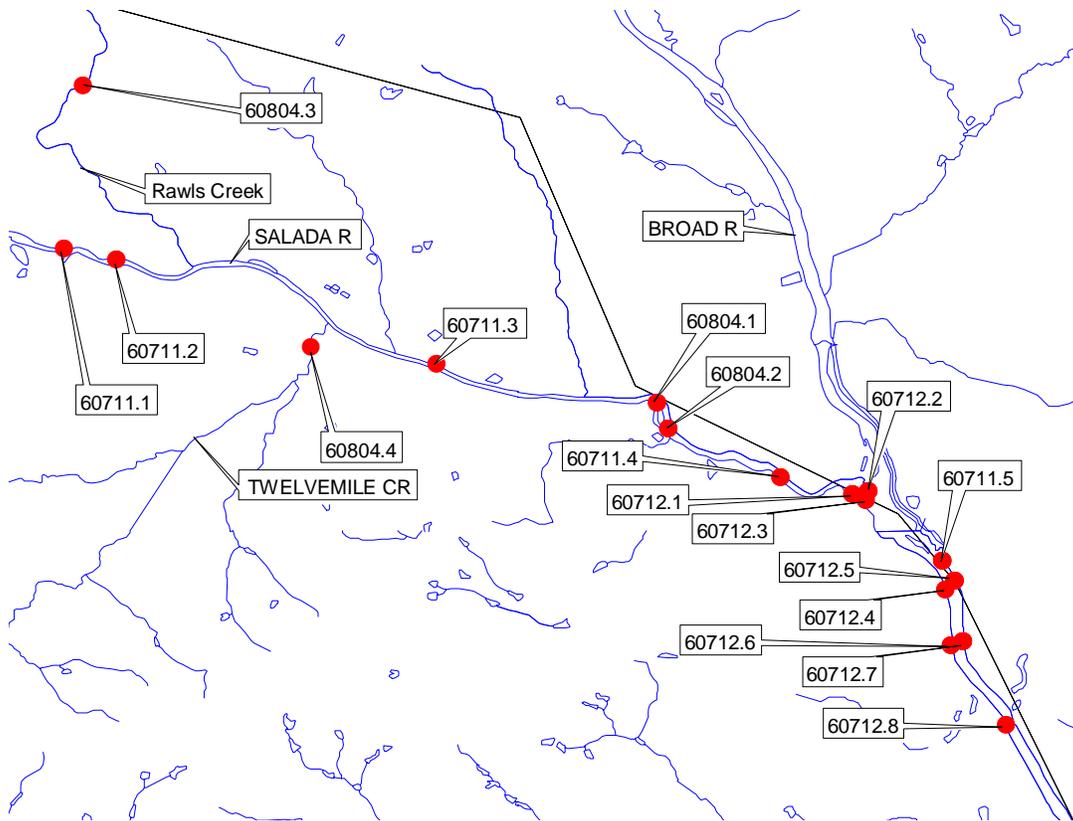
**Figure 1.** The South Carolina freshwater mussel study area and survey stations



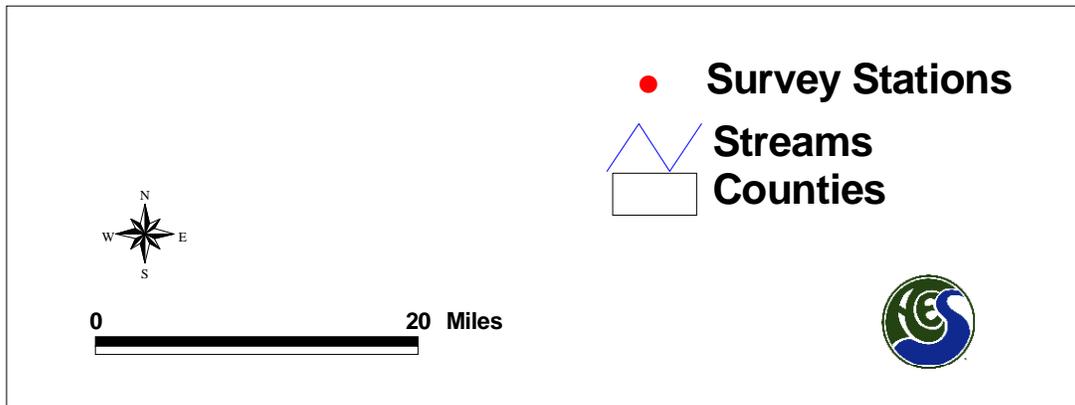
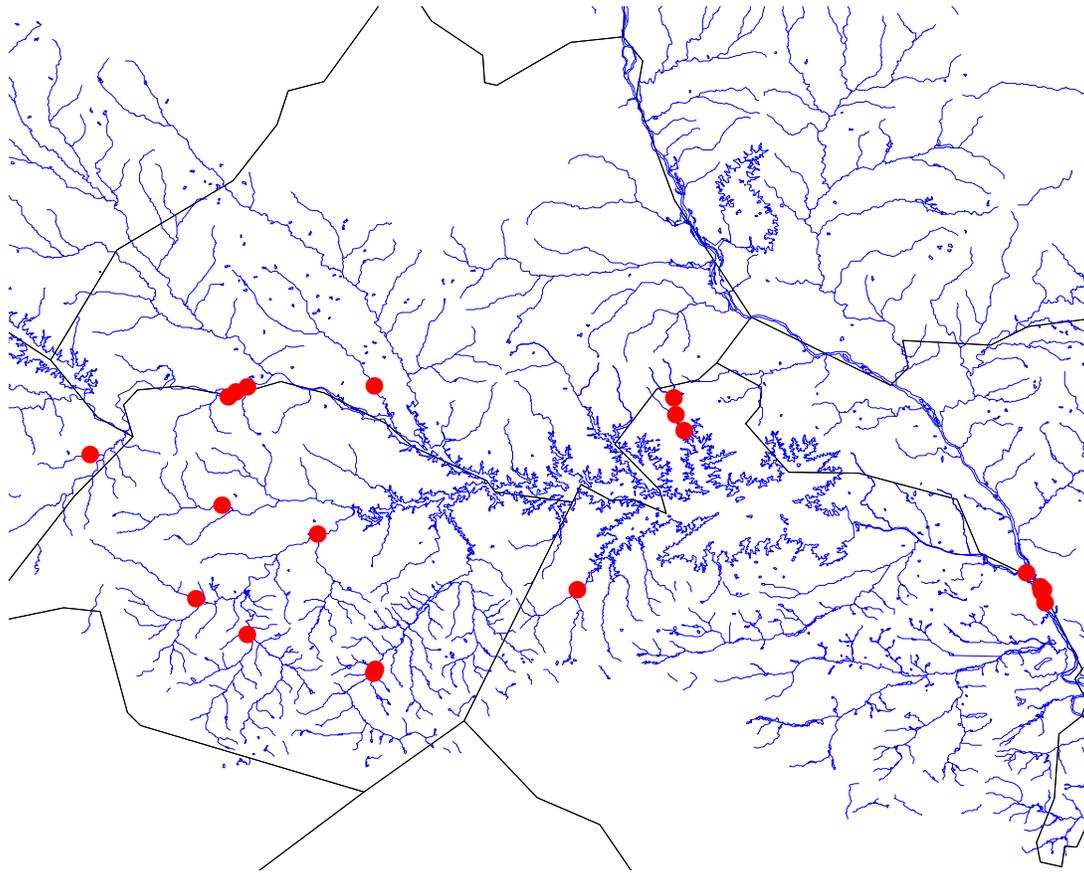
**Figure 2.** Freshwater mussel survey stations within Lake Murray, South Carolina (station numbers abbreviated to allow placement within figure)



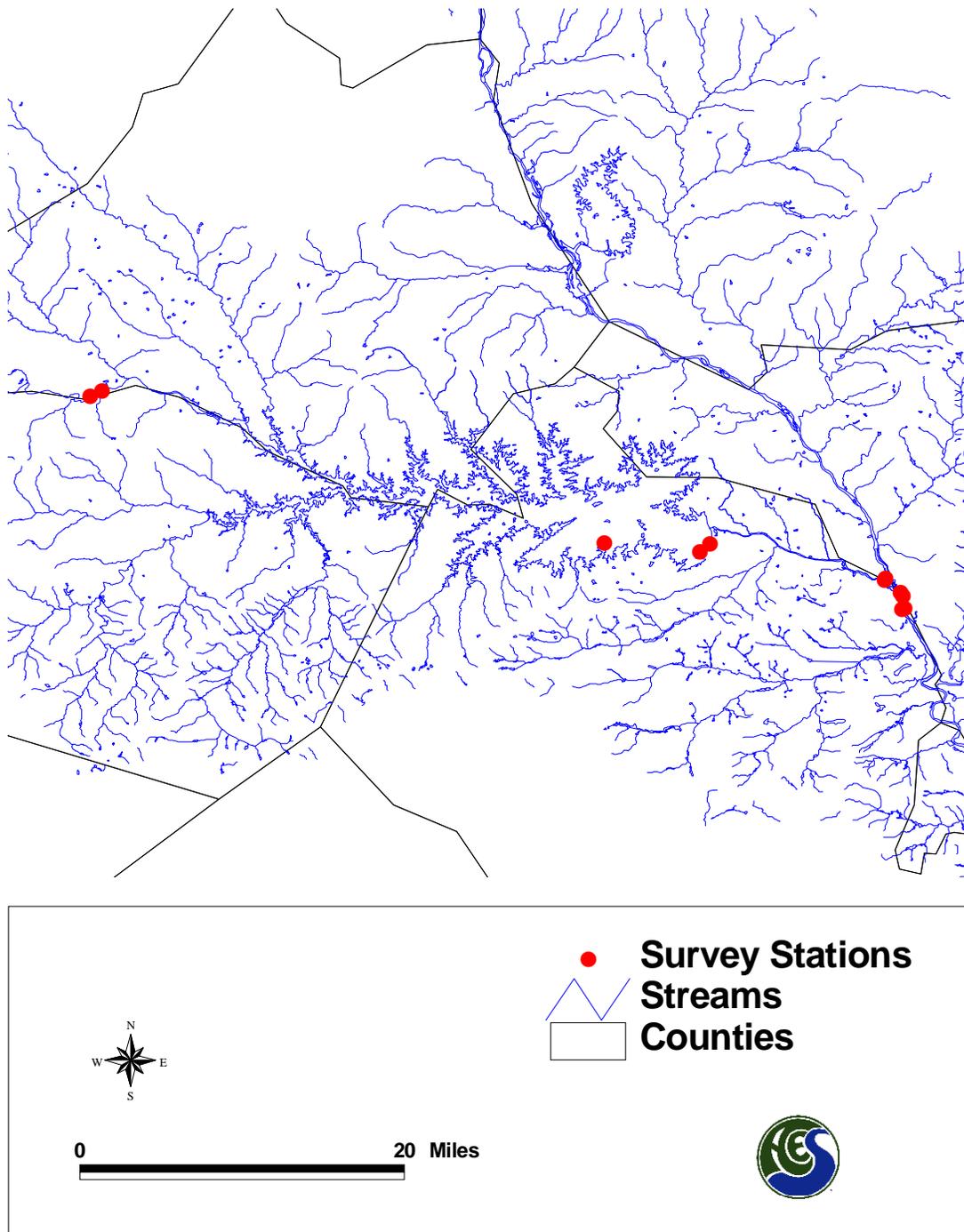
**Figure 3.** Freshwater mussel survey stations within Lake Murray tributaries, South Carolina (station numbers abbreviated to allow placement within figure)



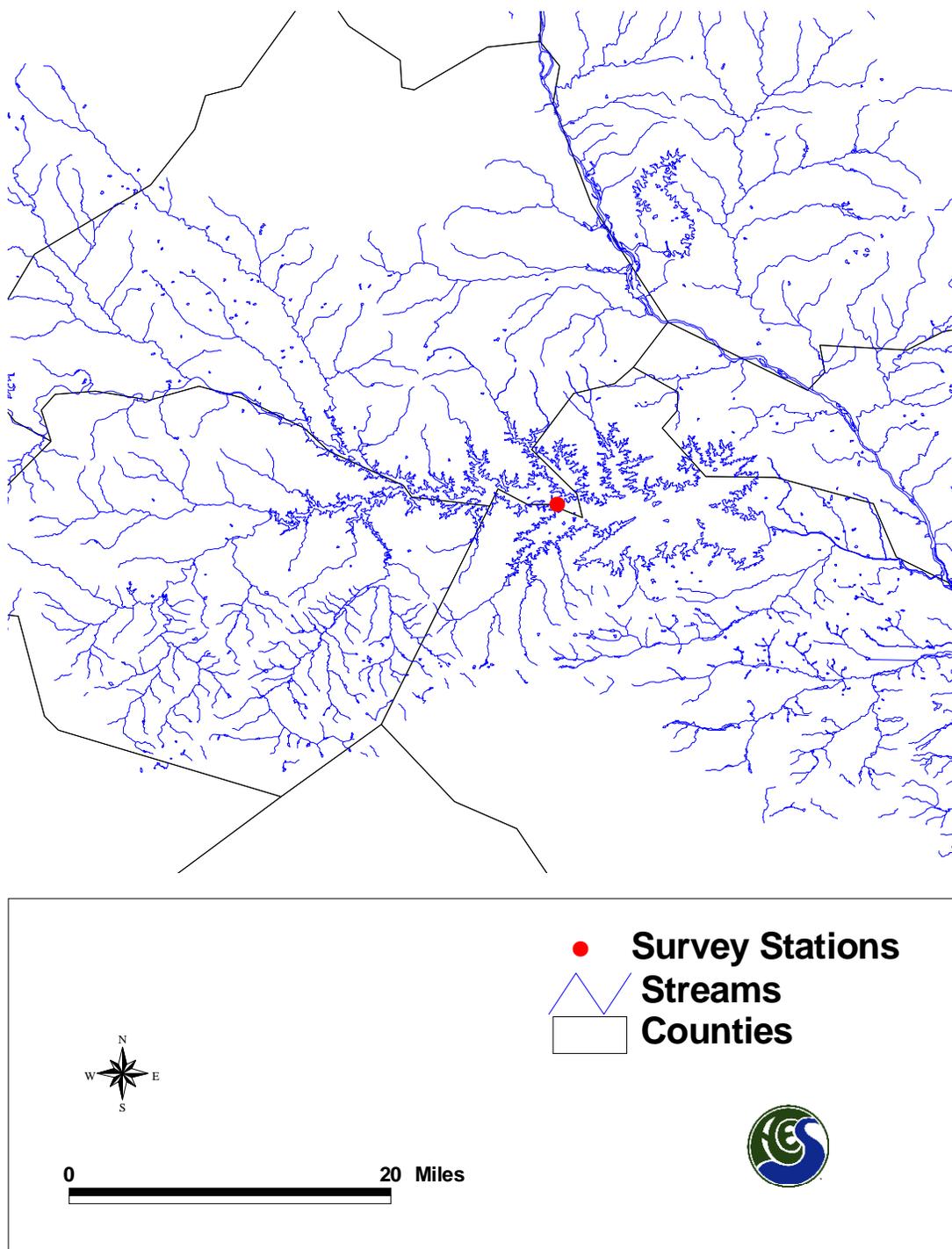
**Figure 4.** Freshwater mussel survey stations downriver from L. Murray Dam, South Carolina (station numbers abbreviated to allow placement within figure)



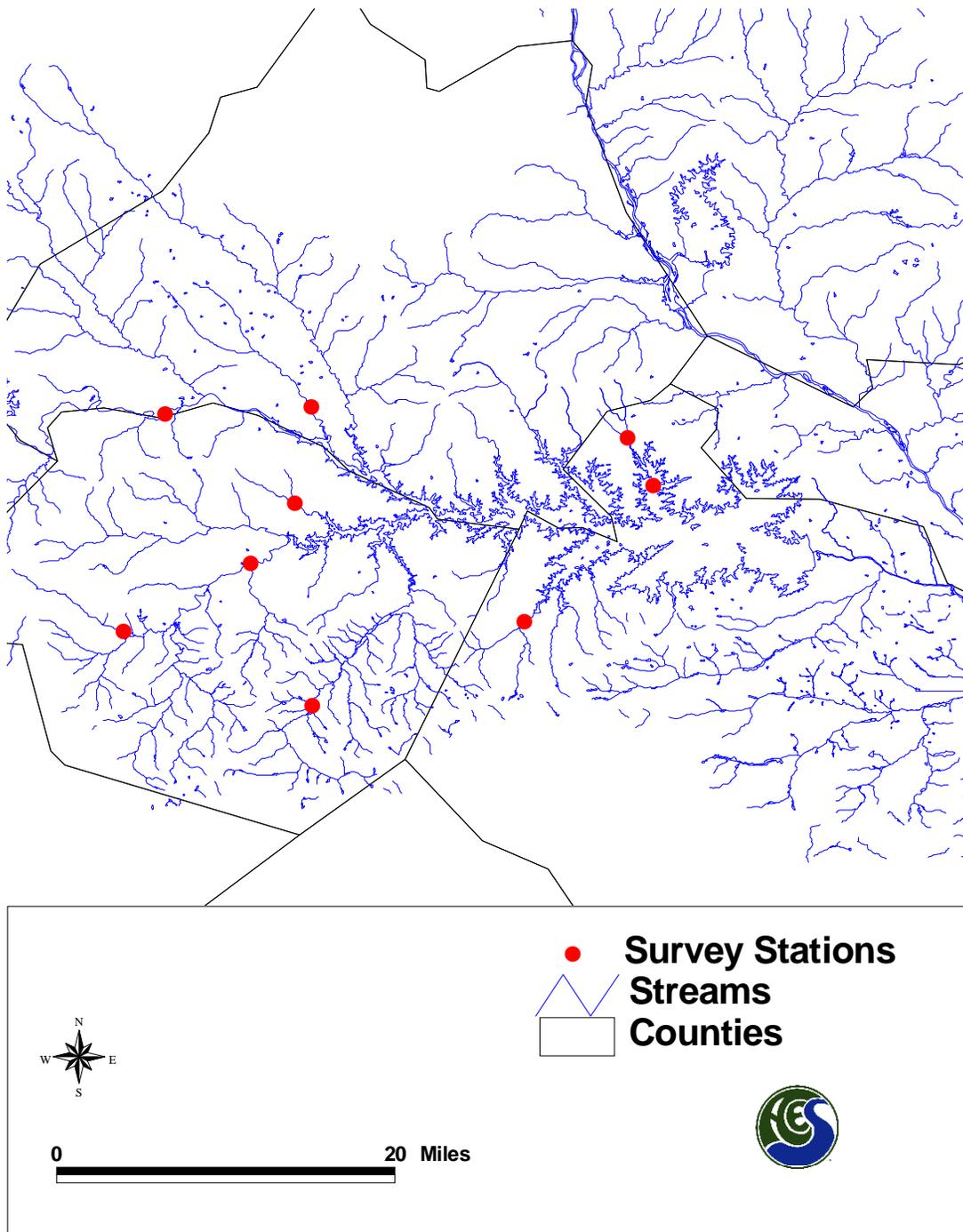
**Figure 5.** Survey stations with evidence of *Elliptio complanata*



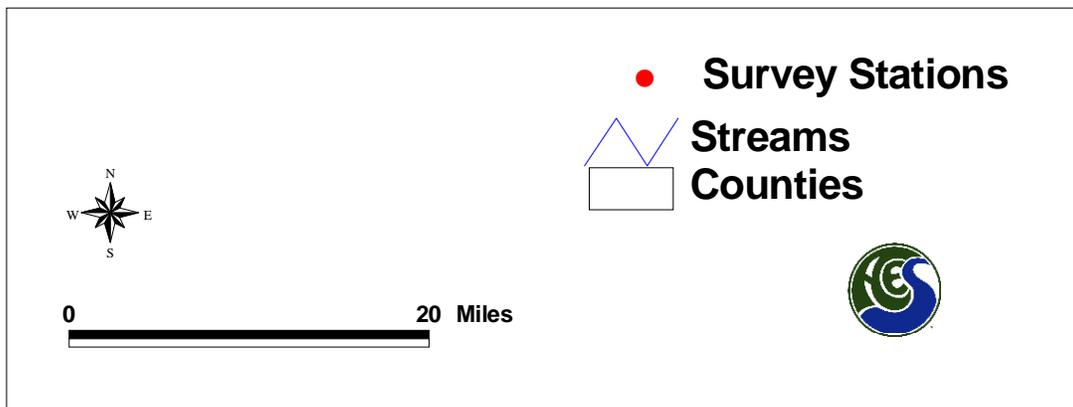
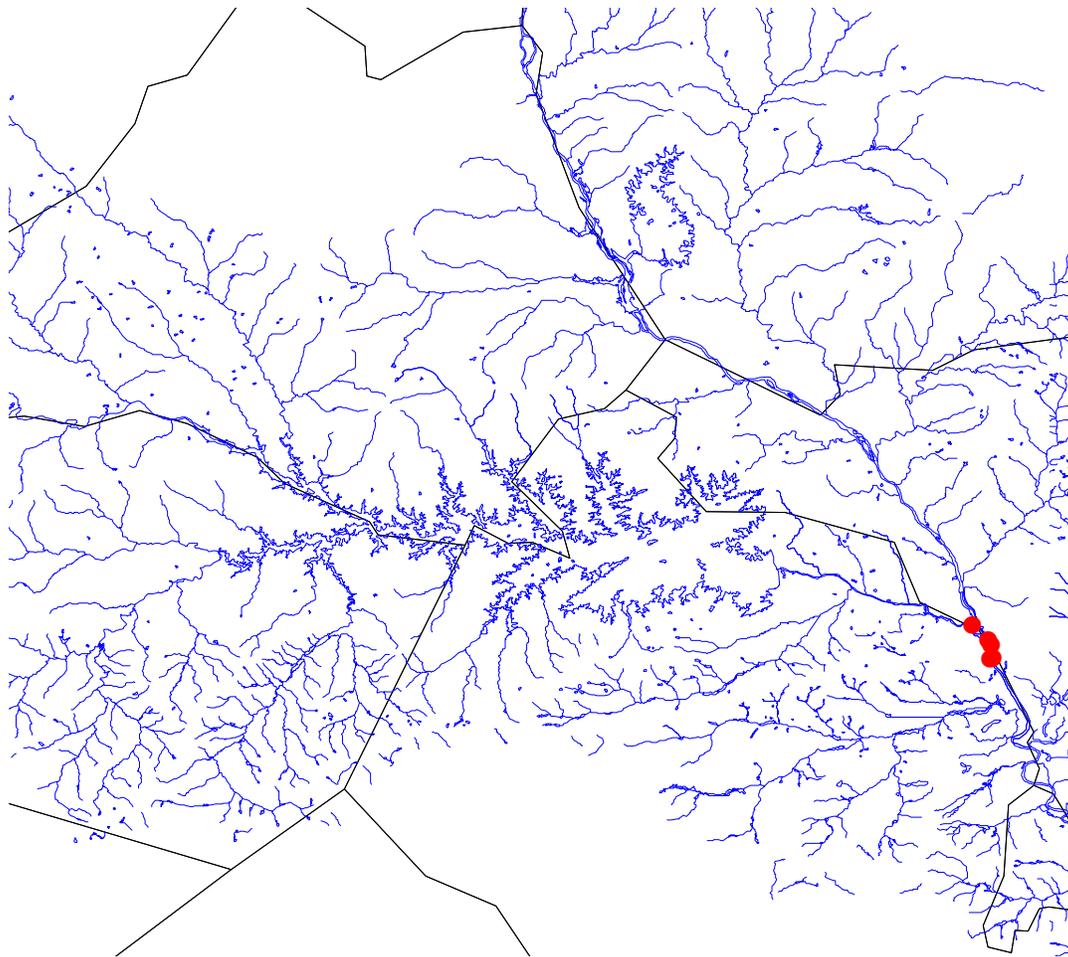
**Figure 6.** Survey stations with evidence of *Elliptio angustata*



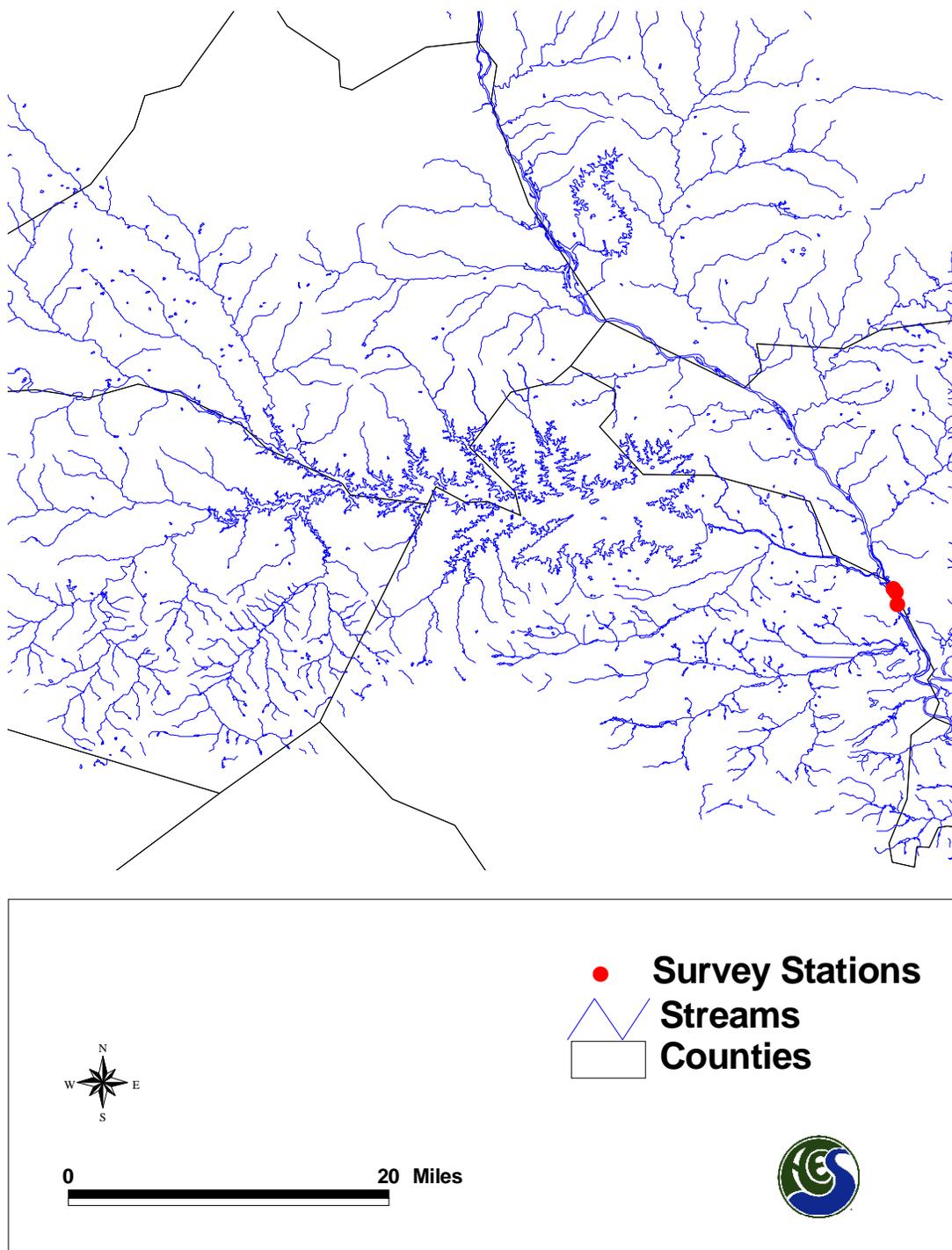
**Figure 7.** Survey stations with evidence of *Elliptio fisheriana*



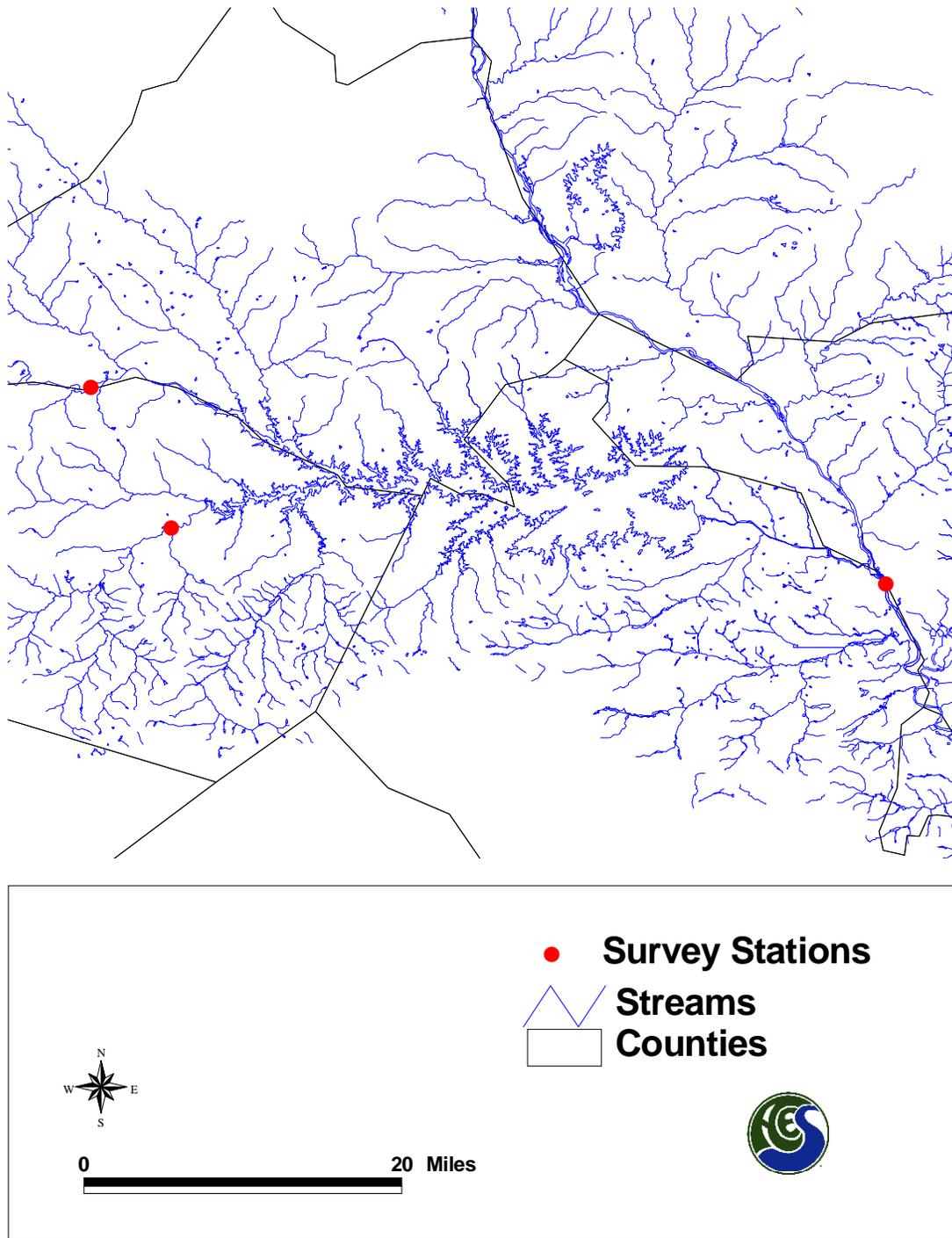
**Figure 8.** Survey stations with evidence of *Elliptio producta*



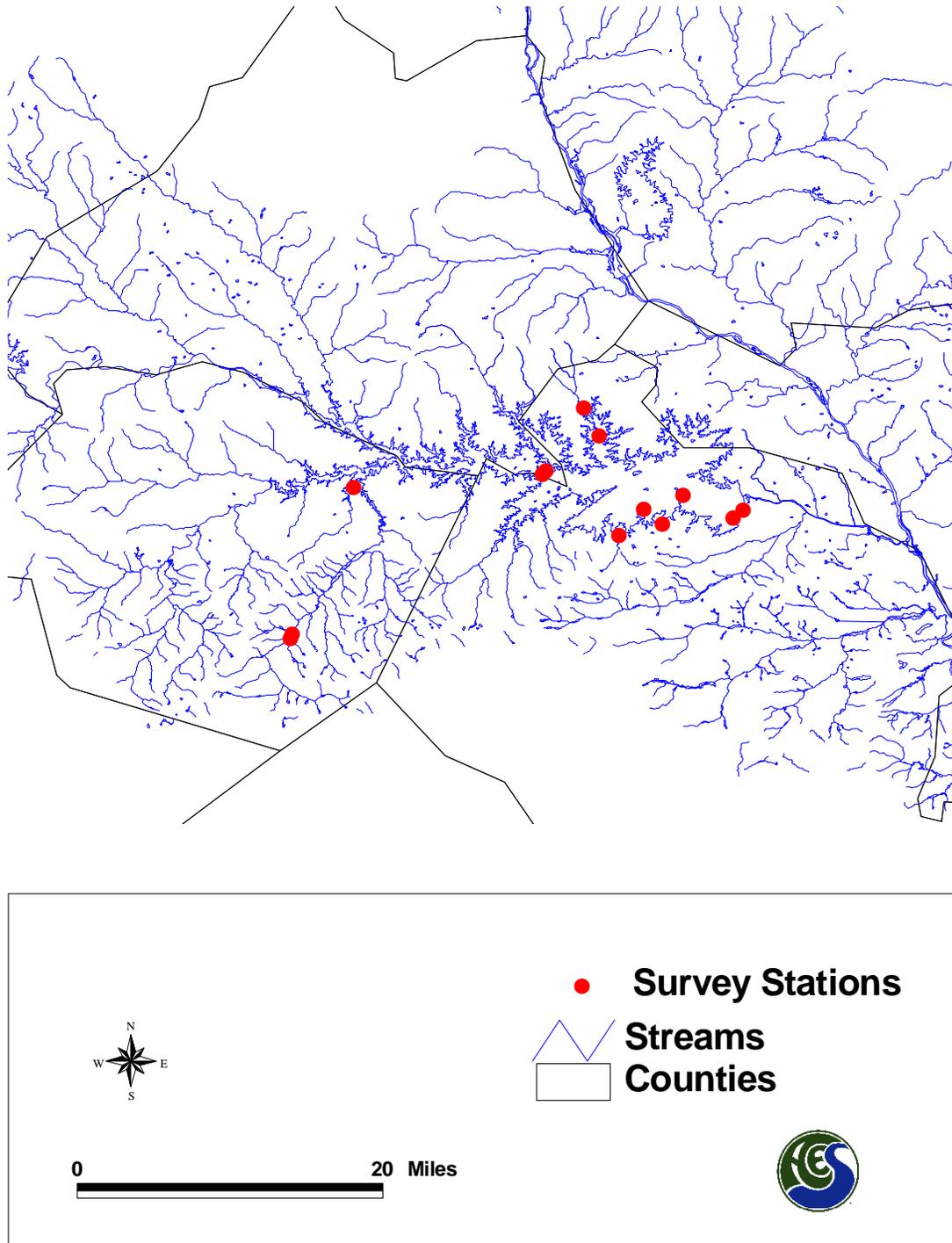
**Figure 9.** Survey stations with evidence of *Elliptio roanokensis*



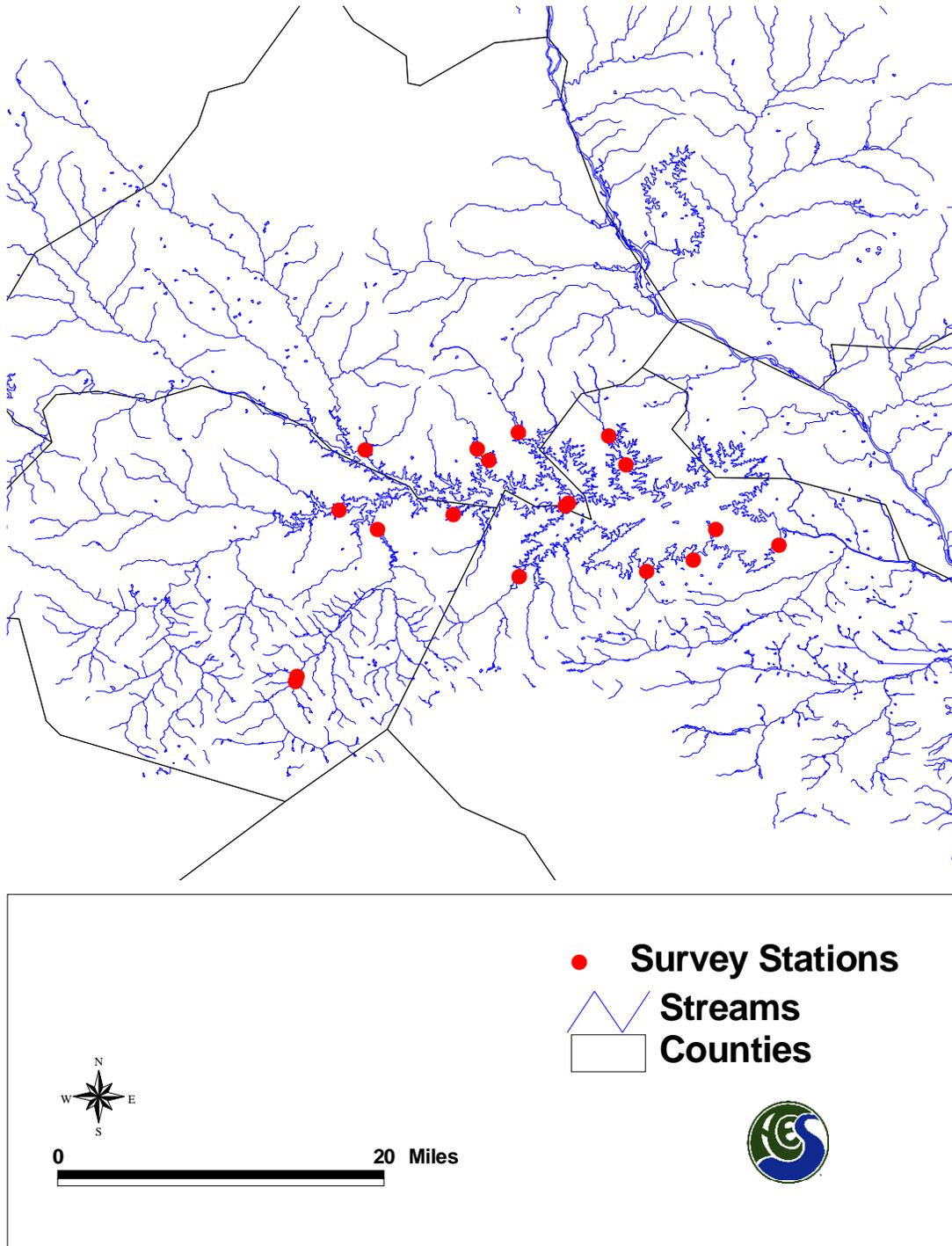
**Figure 10.** Survey stations with evidence of *Elliptio congaraea*



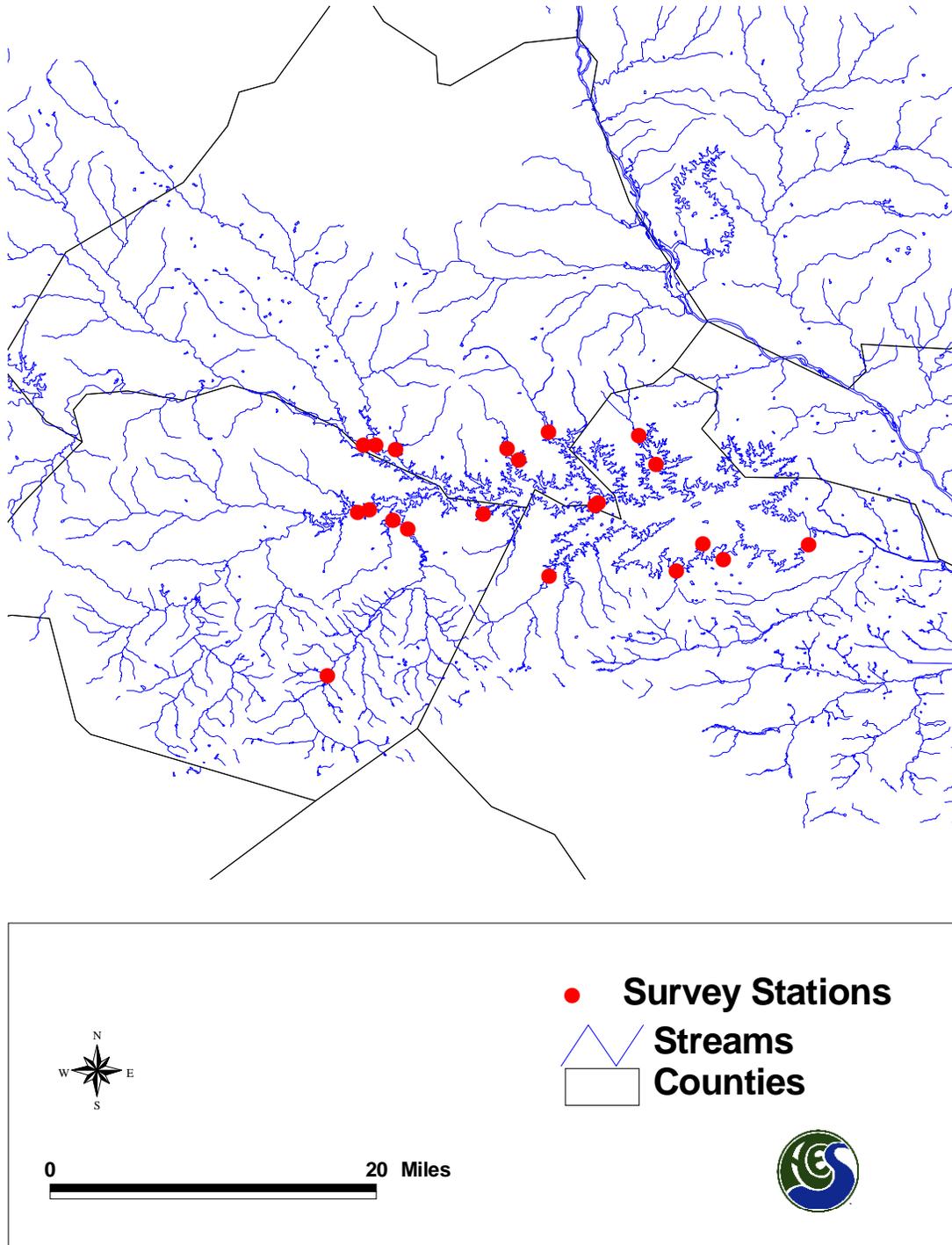
**Figure 11.** Survey stations with evidence of *Elliptio icterina*



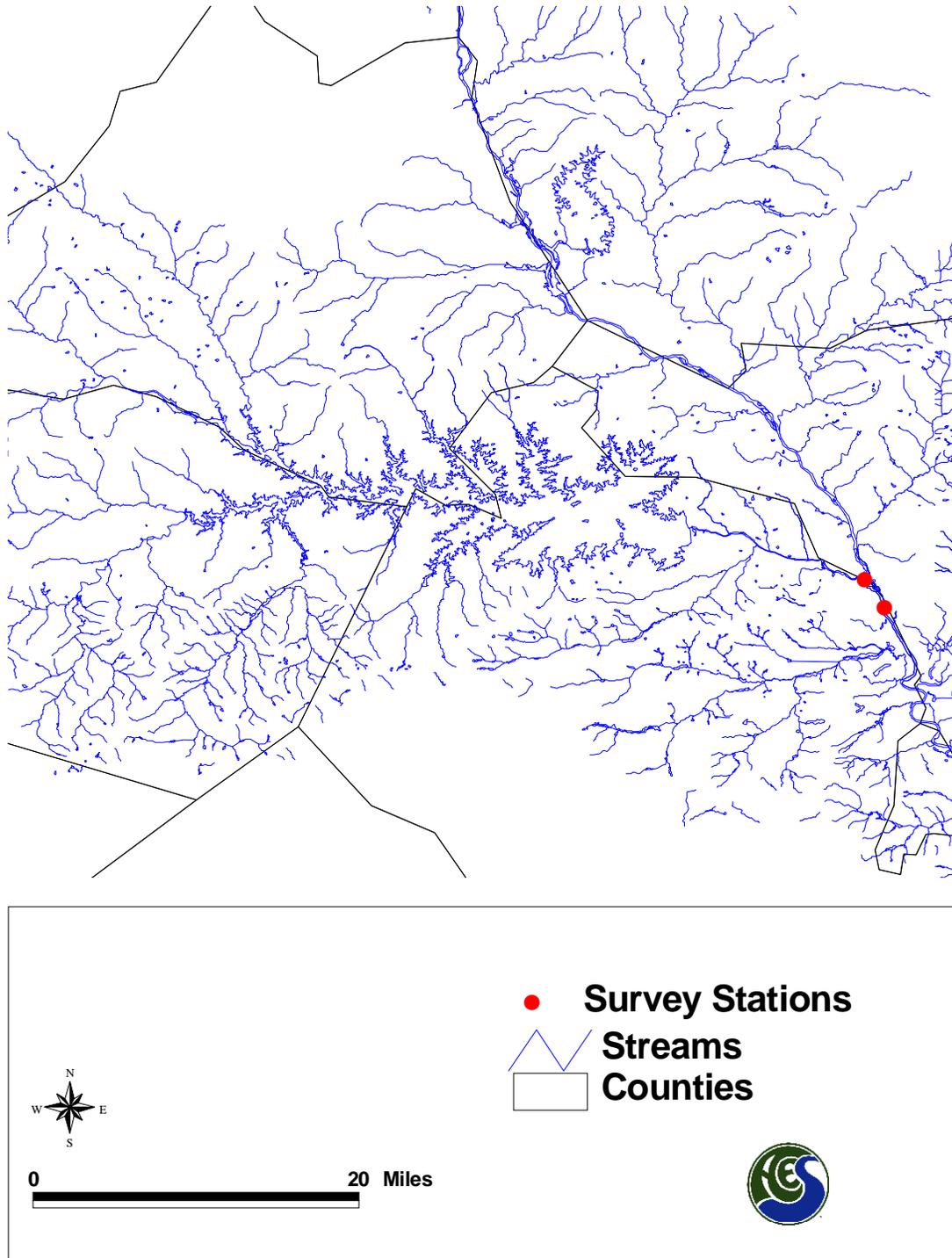
**Figure 12.** Survey stations with evidence of *Uniomerus carolinianus*



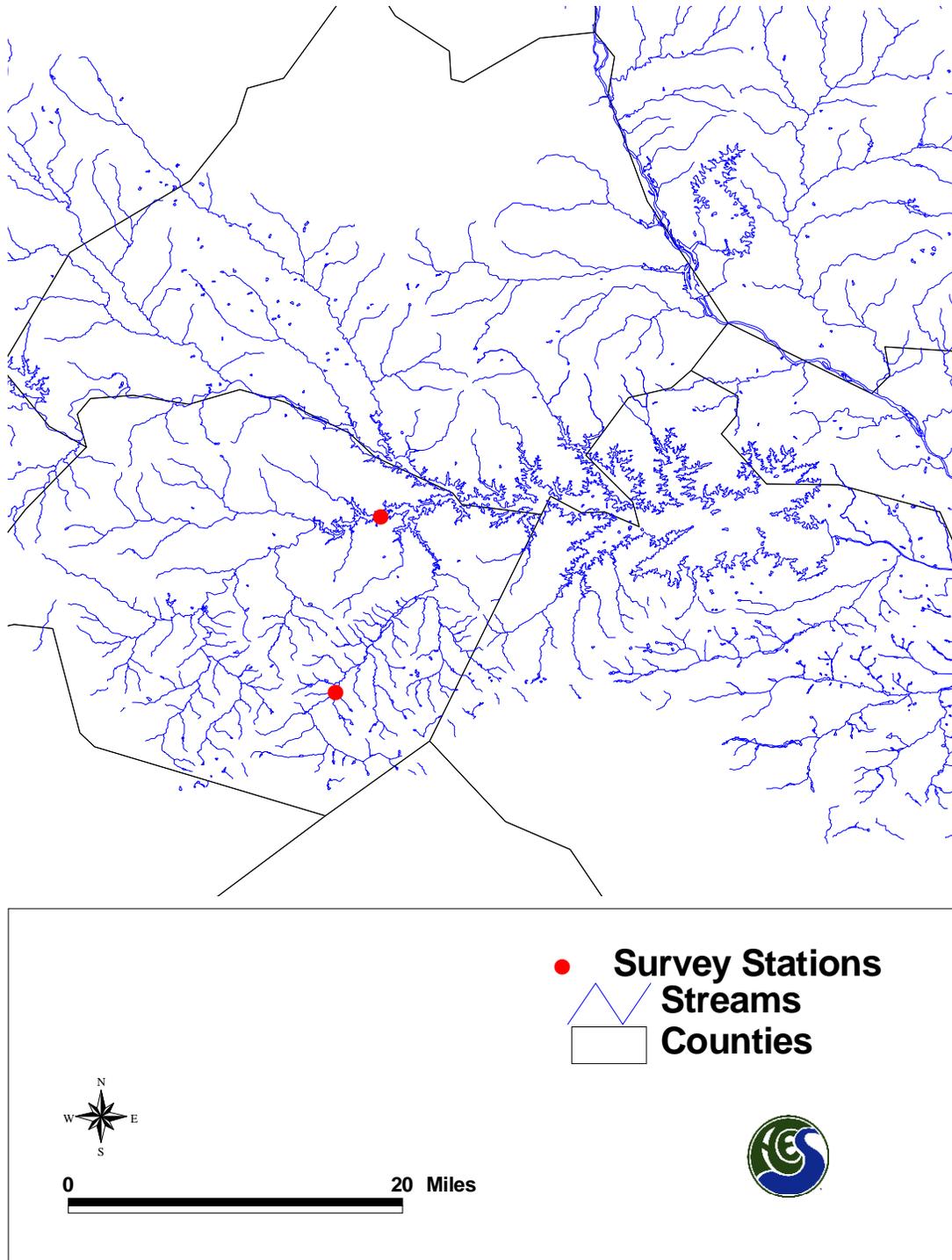
**Figure 13.** Survey stations with evidence of *Pyganodon cataracta*



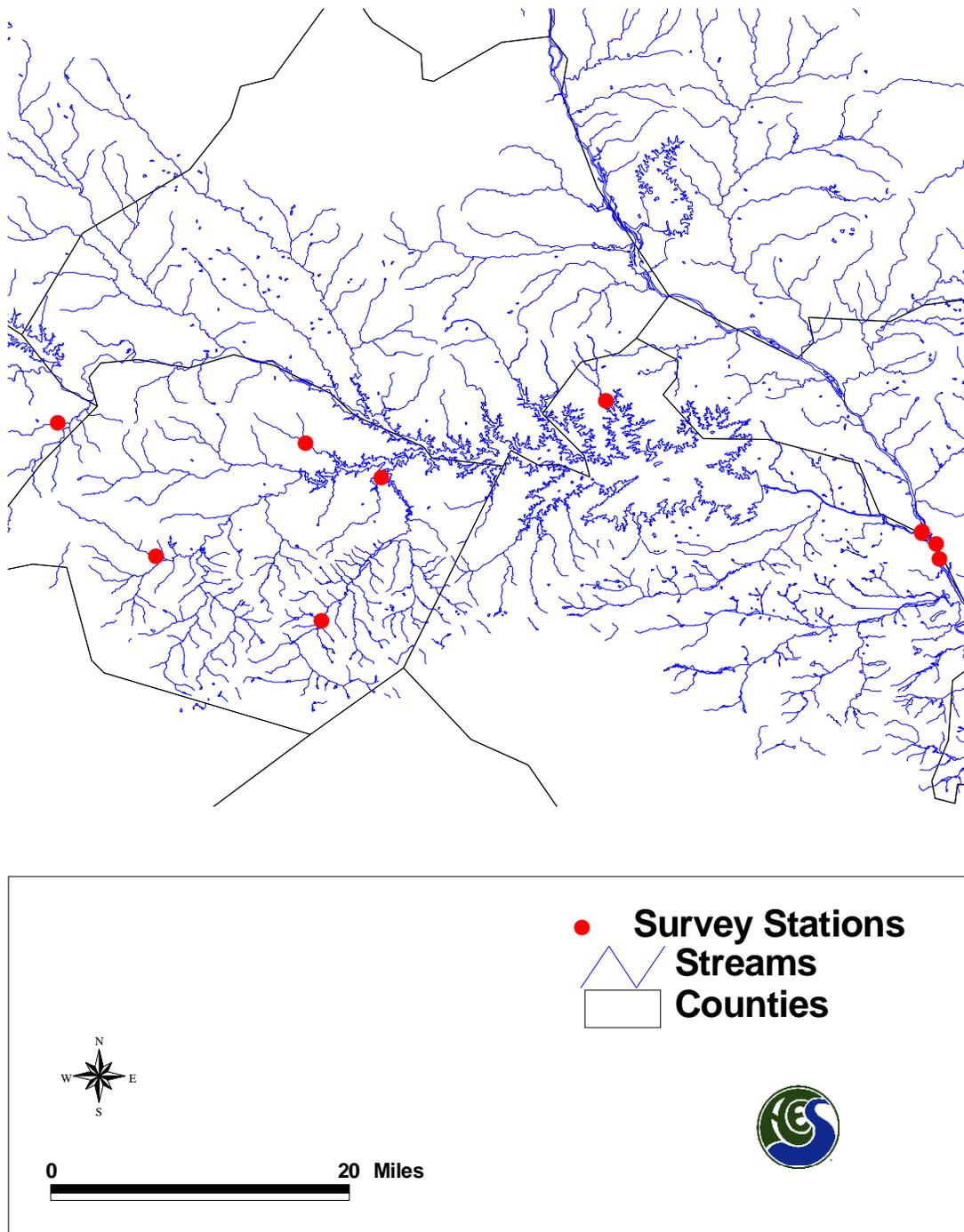
**Figure 14.** Survey stations with evidence of *Utterbackia imbecillis*



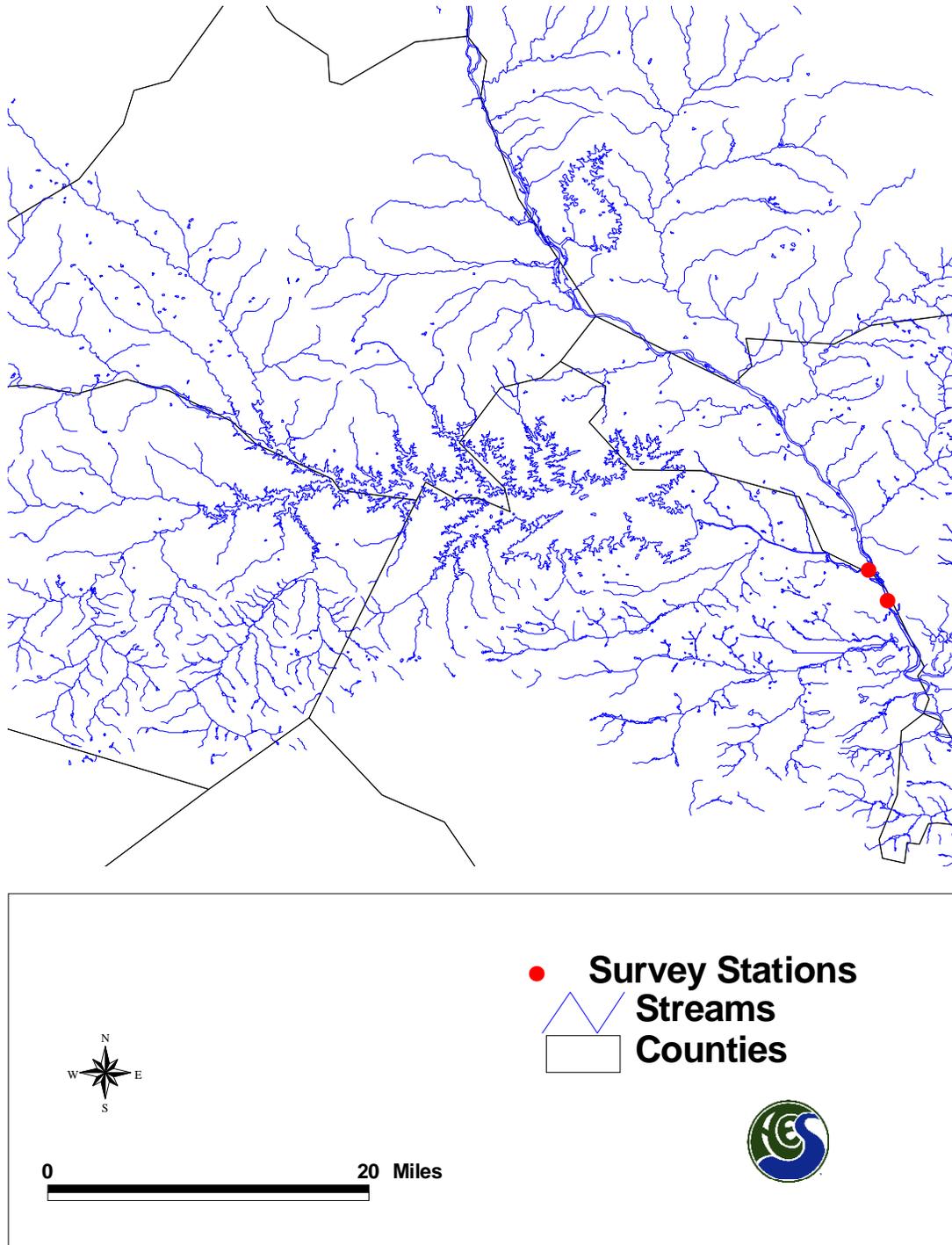
**Figure 15.** Survey stations with evidence of *Strophitus undulatus*



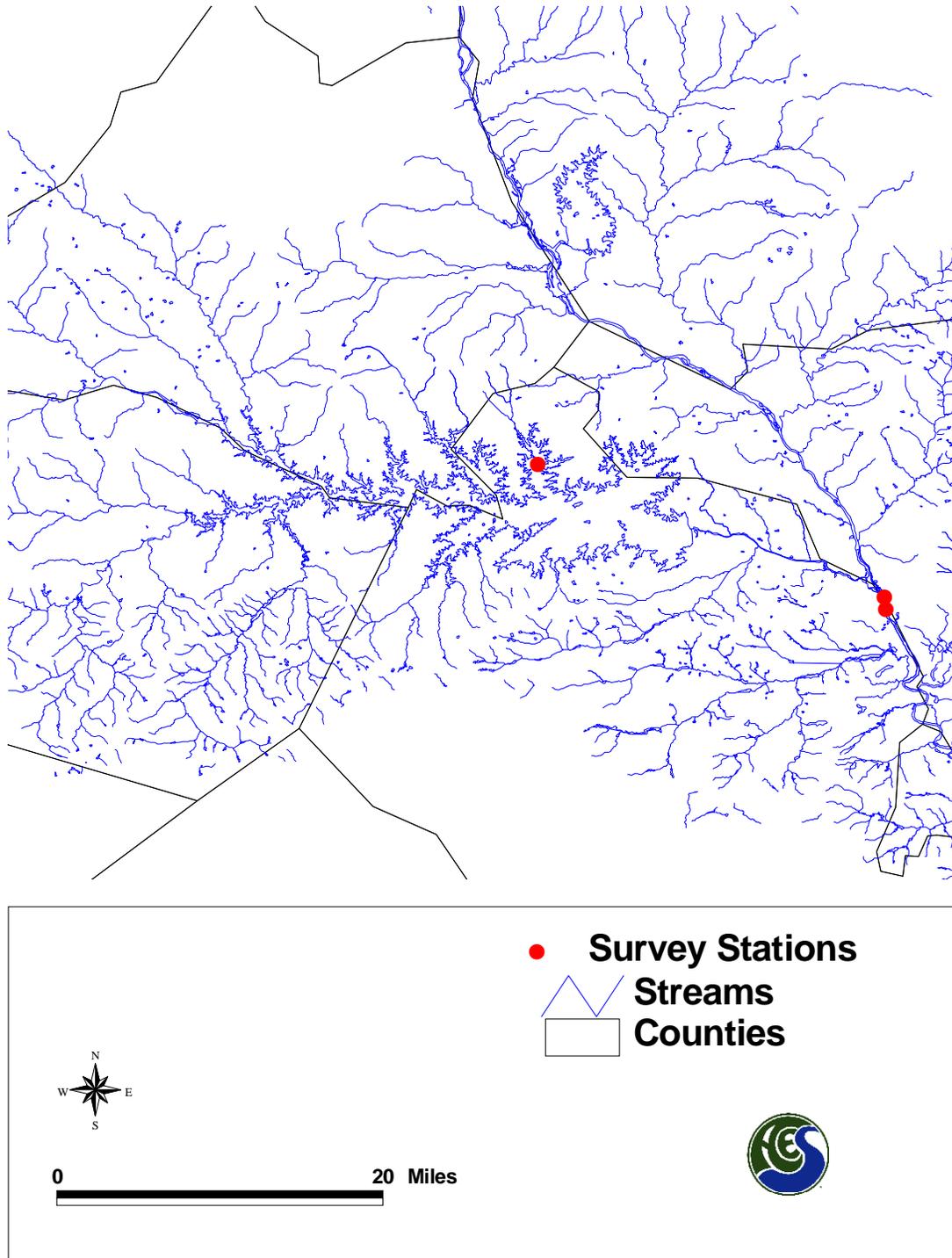
**Figure 16.** Survey stations with evidence of *Toxolasma pullus*



**Figure 17.** Survey stations with evidence of *Villosa delumbis*



**Figure 18.** Survey stations with evidence of *Lampsilis cariosa*



**Figure 19.** Survey stations with evidence of *Lampsilis splendida*

**Table 1.** Freshwater mussels of Lake Murray

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060619.1	34.03765 N 81.21896 W	<i>Utterbackia imbecillis</i> <i>Pyganodon cataracta</i> <i>Uniomerus carolinianus</i> <i>Elliptio angustata</i>	0,5 0, 2 0, 3 0, 16	s,sa,g,co,bo
20060620.1	34.03109 N 81.22803 W	<i>Uniomerus carolinianus</i> <i>Elliptio angustata</i>	0,4 0,4	c,s,sa,g,co,bo,b
20060620.2	34.05159 N 81.27549 W	<i>Uniomerus carolinianus</i> <i>Pyganodon cataracta</i>	0,9 0,6	s,sa,g,co,bo,b
20060620.3	34.02459 N 81.29502 W	<i>Uniomerus carolinianus</i> <i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0, 1 0, 6 0, 12	s,sa,g
20060620.4	34.03548 N 81.31274 W	<i>Elliptio angustata</i> <i>Utterbackia imbecillis</i> <i>Uniomerus carolinianus</i>	0,1 0, 1 0,1	s,sa,g,co,bo,b
20060620.5	34.01466 N 81.33643 W	<i>Uniomerus carolinianus</i> <i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0, 5 0, 16 0,20	s,sa,g,co
20060620.6	34.07250 N 81.40881 W	<i>Uniomerus carolinianus</i> <i>Utterbackia imbecillis</i> <i>Pyganodon cataracta</i> <i>Elliptio fisheriana</i>	3,5 3,16 1,0 0,1	s,sa,g,co,bo,b

Table 1 (continued). Freshwater mussels of Lake Murray

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060620.7	34.06458 N 81.50776 W	<i>Utterbackia imbecillis</i> <i>Pyganodon cataracta</i>	0,15 0,1	s,sa,g,co
20060620.8	34.00980 N 81.44938 W	<i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0,7 0,2	s,sa,g,co
20060621.1	34.06615 N 81.61959 W	<i>Utterbackia imbecillis</i>	0, 2	s,sa,g
20060621.2	34.07444 N 81.62840 W	None	--	s,sa,g
20060621.3	34.06673 N 81.67332 W	None	--	--
20060621.4	34.05217 N 81.68131 W	None	--	s,sa,d,m
20060621.5	34.06898 N 81.60913 W	<i>Toxolasma pullus</i> <i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0, 3 0, 2 0, 12	s,sa,g,v,d,m
20060621.6	34.05125 N 81.57506 W	<i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0,1 0,12	s,sa,g,v
20060621.7	34.05979 N 81.58765 W	<i>Utterbackia imbecillis</i> <i>Uniomerus carolinianus</i> <i>Villosa delumbis</i>	0,14 0,2 0,1	s,sa,g,v
20060621.8	34.12221 N 81.58581 W	<i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0,3 0,24	s,sa,g,co,v
20060621.9	34.12575 N 81.61440 W	<i>Utterbackia imbecillis</i>	0,21	s,sa,g,v
20060621.10	34.12569 N 81.60326 W	<i>Utterbackia imbecillis</i>	0,35	s,sa,g,co,v

**Table 1 (continued).** Freshwater mussels of Lake Murray

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060622.1	34.12299 N 81.48659 W	<i>Utterbackia imbecillis</i> <i>Pyganodon cataracta</i>	0, 11 0, 1	s,sa,g,v
20060622.2	34.11279 N 81.47639 W	<i>Utterbackia imbecillis</i> <i>Pyganodon cataracta</i>	0,41 0,4	c,s,sa,g,v
20060622.3	34.07514 N 81.40534 W	<i>Uniomerus carolinianus</i> <i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	1, 6 0, 1 2, 3	c,s,sa,g,co,bo,b
20060622.4	34.13755 N 81.45027 W	<i>Utterbackia imbecillis</i> <i>Pyganodon cataracta</i>	0, 7 0, 1	s,sa,g,v
20060622.5	34.13498 N 81.36966 W	<i>Elliptio complanata</i> <i>Uniomerus carolinianus</i> <i>Villosa delumbis</i> <i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i>	0, 1 0, 1 0, 1 0, 8 0, 24	s,sa,g,v
20060622.6	34.10896 N 81.35474 W	<i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i> <i>Elliptio producta</i> <i>Lampsilis splendida</i> <i>Uniomerus carolinianus</i>	1,1 2,0 38,11 0,1 1,3	s,sa,g,co,bo,b

\* s-silt, sa- sand, c-clay, co-cobble, b-bedrock, bo-boulder, g-gravel, r-roots, v-vegetation, d-detritus, m-mud

**Table 2.** Freshwater mussels of Lake Murray tributaries

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060707.1 L. Hollow Cr.	34.02296 N 81.40607 W	None	--	s,sa,g,co,bo,b
20060707.2 Hollow Cr.	33.99216 N 81.46473 W	<i>Elliptio producta</i> <i>Elliptio complanata</i>	0, 4 0, 1	S,Sa,g,bo
20060707.3 West Cr.	33.99685 N 81.56001 W	None	--	S,Sa,g
20060707.4 Clouds Cr.	33.92067 N 81.64599 W	<i>Elliptio complanata</i> <i>Elliptio producta</i> <i>Villosa delumbis</i> <i>Pyganodon cataracta</i> <i>Utterbackia imbecillis</i> <i>Unio merus</i> <i>carolinianus</i>	297, -- 3,-- 3, -- 0,2 0,2 0,1	c,s,sa,g,bo
20060707.5 Asbill Pond	33.91636 N 81.64787 W	<i>Toxolasma pullus</i> <i>Pyganodon cataracta</i> <i>Unio merus</i> <i>carolinianus</i> <i>Elliptio complanata</i>	0,1 1,0 10, 0 10,0	s,sa,v,d,m
20060708.1 Bear Cr.	34.16412 N 81.37868 W	<i>Elliptio complanata</i>	0,1	c,s,sa,g,co,bo,b
20060708.2 Bear Cr.	34.14915 N 81.37726 W	<i>Elliptio complanata</i> <i>Elliptio producta</i>	1,0 8, 15	c,s,sa,g,co,bo,b
20060708.3 Camping Cr.	34.17832 N 81.47152 W	None	--	s,sa,g

**Table 2 (continued).** Freshwater mussels of Lake Murray tributaries

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060708.4 Buffalo Cr.	34.13546 N 81.48669 W	None	--	c,s,sa,g,co,bo,b
20060708.5 Big Cr.	34.13547 N 81.55822 W	None	--	c,s,sa,g,co,bo,b
20060708.6 Timothy Cr.	34.18895 N 81.60812 W	None	--	c,s,Sa,g,co,bo,b
20060708.7 Beaver Dam Cr.	34.17532 N 81.64681 W	<i>Elliptio complanata</i> <i>Elliptio producta</i>	0,1 1,0	S,Sa,g,co,bo,b
20060709.1 Mine Cr.	33.95210 N 81.76142 W	<i>Elliptio complanata</i>	0,1	s,Sa,G,co,bo,b
20060709.2 Mine Cr.	33.93305 N 81.76508 W	None	--	c,s,sa,g,co,bo,b
20060709.3 Red Bank Cr.	33.98348 N 81.80713 W	<i>Elliptio complanata</i> <i>Elliptio producta</i> <i>Villosa delumbis</i>	44,-- 1,-- 3,--	s,Sa,G,co,bo,B
20060709.4 Red Bank Cr.	33.98663 N 81.77013 W	None	--	sa,G,co,Bo,B
20060709.5 L. Saluda River	34.04162 N 81.69854 W	<i>Elliptio complanata</i> <i>Elliptio producta</i> <i>Elliptio icterina</i>	1,2 0,1 1,0	s,sa,g,co,bo,b
20060709.6 Big Cr.	34.06770 N 81.78398 W	<i>Elliptio complanata</i>	2,1	--
20060709.7 UT Halfway Swamp Cr.	34.11296 N 81.90200 W	<i>Elliptio complanata</i> <i>Villosa delumbis</i>	0,1 0,1	s,sa,g,co,bo,B

**Table 2 (continued).** Freshwater mussels of Lake Murray tributaries

<b>Station</b>	<b>Latitude Longitude</b>	<b>Species</b>	<b>Live, Shells</b>	<b>Substrate*</b>
20060709.8 Indian Cr.	34.09388 N 81.66126 W	<i>Villosa delumbis</i> <i>Elliptio producta</i>	0,1 1,1	s,sa,g,co,bo,b
20060710.1 Saluda R.	34.17483 N 81.76151 W	<i>Elliptio complanata</i> <i>Elliptio angustata</i>	9,-- 2,--	sa,g,co,bo,b
20060710.2 Saluda R.	34.16979 N 81.77180 W	<i>Elliptio angustata</i> <i>Elliptio complanata</i> <i>Elliptio producta</i> <i>Elliptio icterina</i>	4, -- 127, -- 2,-- 2,--	c,s,sa,g,co,bo,b
20060710.3 Saluda R.	34.16478 N 81.77854 W	<i>Elliptio complanata</i>	2,0	sa,g,co,bo,b

\* s-silt, sa- sand, c-clay, co-cobble, b-bedrock, bo-boulder, g-gravel, r-roots, v-vegetation, d-detritus, m-mud

**Table 3.** Freshwater mussels of the Saluda River (below L. Murray Dam), lower Broad River, and upper Congaree River

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060711.1 Saluda R.	34.05037 N 81.20573 W	None		sa,g,Co,Bo
20060711.2 Saluda R.	34.04843 N 81.19653 W	None		s,Sa,G,co,bo,b
20060711.3 Saluda R.	34.02978 N 81.13944 W	None		s,Sa,G,co,bo
20060711.4 Saluda R.	34.00969 N 81.07800 W	None		s,sa,g,co,bo,b
20060712.1 Saluda R.	34.00639 N 81.06508 W	None		s,sa,g,co
20060712.2 Broad R.	34.00714 N 81.06232 W	<i>Elliptio roanokensis</i> <i>Elliptio complanata</i> <i>Villosa delumbis</i> <i>Elliptio angustata</i> <i>Lampsilis cariosa</i>	0,2 0,5 0,1 1,1 1,0	s,sa,g,co,bo,b
20060712.3 Saluda R. (Broad R. washout area)	34.00541 N 81.06282 W	<i>Elliptio angustata</i> <i>Villosa delumbis</i> <i>Strophitus undulatus</i>	1,2 0,2 0,1	s,Sa,g
20060712.4 Congaree R. (Saluda R. side)	33.98949 N 81.04859 W	<i>Elliptio complanata</i>	1,0	s,sa,g,co,bo,b
20060711.5 Congaree R. (Broad R. side)	33.99461 N 81.04913 W	<i>Elliptio complanata</i> <i>Elliptio congaraea</i> <i>Elliptio roanokensis</i> <i>Villosa delumbis</i> <i>Elliptio angustata</i>	23,-- 1,0 1,0 0,1 8,--	s,sa,g,co,bo

**Table 3 (continued).** Freshwater mussels of the Saluda River (below L. Murray Dam), lower Broad River, and upper Congaree River

Station	Latitude Longitude	Species	Live, Shells	Substrate*
20060712.5 Congaree R. (Broad R. side)	33.99111 N 81.04692 W	<i>Elliptio angustata</i> <i>Elliptio congaraea</i> <i>Elliptio icterina</i> <i>Elliptio complanata</i> <i>Lampsilis splendida</i> <i>Elliptio roanokensis</i>	2,0 1,0 1,0 3,0 1,0 13,0	s,sa,go,co,bo,b
20060712.6 Congaree R. (Saluda R. side)	33.97967 N 81.04757 W	<i>Elliptio roanokensis</i> <i>Elliptio angustata</i>	2,0 1,0	s,Sa,G,co,bo
20060712.7 Congaree R. (Borad R. side)	33.98031 N 81.04546 W	<i>Elliptio complanata</i> <i>Elliptio congaraea</i> <i>Strophitus undulatus</i> <i>Elliptio roanokensis</i> <i>Elliptio angustata</i> <i>Lampsilis splendida</i> <i>Lampsilis cariosa</i> <i>Villosa delumbis</i>	5,0 2,0 1,0 19,0 9,0 1,0 2,0 0,1	S,Sa,G,co,bo
20060712.8 Congaree R. (Saluda R. side)	33.96535 N 81.03777 W	None	--	s,sa,g
20060804.1 Saluda R.	34.02287 N 81.10009 W	None	--	s,sa,g,co,bo,B
20060804.2 Saluda R.	34.01835 N 81.09807 W	None	--	s,sa,g,co,bo,b
20060804.3 Rawls Cr.	34.07949 N 81.20251 W	None	--	c,s,sa,g,co,bo,b
20060804.4 12 Mile Cr.	34.03275 N 81.16173 W	None	--	s,sa,g,co,bo

\* s-silt, sa- sand, c-clay, co-cobble, b-bedrock, bo-boulder, g-gravel, r-roots, v-vegetation, d-detritus, m-mud

**Table 4.** The freshwater mussels of the Santee-Cooper River Basin

<b>Species</b>	<b>Within L. Murray</b>	<b>Within L. Murray Tributaries</b>	<b>Within Broad or Congaree Rivers (general project area)</b>	<b>2005 Status (NatureServe, FWS)*</b>
<i>Elliptio congaraea</i>			X	G4, FSC
<i>E. complanata</i>	X	X	X	G5
<i>E. roanokensis</i>			X	G2G3, FSC
<i>E. icterina</i>		X	X	G4
<i>E. angustata</i>	X	X	X	G4, FSC
<i>E. fisheriana</i>	X			G4
<i>E. producta</i>	X	X	X	G4
<i>Unio merus carolinianus</i>	X	X		G4
<i>Fusconaia masoni</i>				G2, FSC
<i>Lasmigona decorata</i>		X		G1, Fed. E
<i>Alasmidonta undulata</i>				G4, FSC
<i>A. triangulata</i>				G2
<i>A. varicosa</i>				G3, FSC
<i>Ligumia nasuta</i>				G4G5, FSC
<i>Pyganodon cataracta</i>	X	X		G5
<i>Utterbackia imbecillis</i>	X	X		G5
<i>Anodonta couperiana</i>				G4
<i>Anodonta implicata</i>				G5
<i>Strophitus undulatus</i>			X	G5
<i>Toxolasma pullus</i>	X	X		G3, FSC
<i>Villosa vibex</i>				G4
<i>V. delumbis</i>	X	X		G4

**Table 4 (continued).** The freshwater mussels of the Santee-Cooper River Basin

Species	Within L. Murray	Within L. Murray Tributaries	Within Broad or Congaree Rivers (general project area)	2005 Status (NatureServe, FWS)*
<i>V. constricta</i>		X		G3, FSC
<i>V. vaughaniana</i>				G2, FSC
<i>Leptodea ochracea</i>				G3, FSC
<i>Lampsilis cariosa</i>			X	G3G4, FSC
<i>L. splendida</i>	X		X	G3, FSC

**\* Species statuses according to NatureServe or U.S. Fish and Wildlife Service (FWS):**

NatureServe G Ranks:

G1 Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2 Imperiled—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

G3 Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 Secure—Common; widespread and abundant.

FWS: Federal Species of Concern (FSC) as recommended by USFWS Asheville Field Office; E – federally listed endangered species

## **APPENDIX – Survey station results from the lower Saluda River Basin and upper Congaree River Basin**

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060619.1jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Lexington County, South Carolina; 34.03765 N, 81.21896 W; see Figure 2**

**SURVEY DATE: June 19, 2006**

**SITE COMMENTS: Walked along shoreline**

### **HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, boulder
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY: -  
BUFFER WIDTH: Narrow and wide  
RIPARIAN VEGETATION: Wooded, shrub-brush, grass  
LAND USE: Park  
PERCENT COVER: -  
WOODLAND EXTENT: -  
NATURAL LEVEES: None  
VISIBILITY: Clear  
WATER LEVEL: Low  
WEATHER: Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES: Visual  
SURVEY TIME: 2.0 person hours

**FRESHWATER MUSSELS:**

*Elliptio angustata* – 16 shells  
*Pyganodon cataracta* – 2 shells  
*Utterbackia imbecillis* – 5 shells  
*Unio carolinianus* – 3 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - abundant

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.1jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Lexington County, South Carolina; 34.03109 N, 81.22803 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: -**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Lake
<b>FLOW:</b>	Pool
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	50
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Compact and normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	None
<b>WINDTHROW:</b>	None
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	-
<b>BANK HEIGHT:</b>	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	-
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Batiscope and snorkel
SURVEY TIME:	0.83 person hours

**FRESHWATER MUSSELS:**

*Unio merus carolinianus* – 4 shells

*Pyganodon cataracta* – 8 shells

*Elliptio angustata* – 4 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - common

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.2jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Lexington County, South Carolina; 34.05159 N, 81.27549 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: Around island**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	None
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, grass
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	-
NATURAL LEVEES:	-
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.83 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 6 shells  
*Unio merus carolinianus* – 9 shells

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum* – 1 shells  
*Corbicula fluminea* - common

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.3jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, 20 Mile Creek Cove, Lexington County, South Carolina;  
34.02459 N, 81.29502 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: Residential**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	None to moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Suburban
PERCENT COVER:	-
WOODLAND EXTENT:	Not extensive
NATURAL LEVEES:	None
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.42 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 6 shells  
*Unio merus carolinianus* – 1 shell  
*Utterbackia imbecillis* – 12 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.4jma**

**BIOLOGISTS: John M. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Bundrick Island, Lexington County, South Carolina;  
34.03848 N, 81.31274 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Compact and normal
SAND/GRAVEL BARS:	Abundant
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

*Elliptio angustata* – 1 shell  
*Utterbackia imbecillis* – 1 shell  
*Unio merus carolinianus* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - abundant

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.5jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Rocky Creek Cove, Lexington County, South Carolina;  
34.01466 N, 81.33643 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, gravel, cobble
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting, stabilization present
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Natural, timber, rural, suburban
PERCENT COVER:	-
WOODLAND EXTENT:	Intermediate to not extensive
NATURAL LEVEES:	None
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.83 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 16 shells  
*Unio merus carolinianus* – 5 shell  
*Utterbackia imbecillis* – 20 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.6jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Lexington County, South Carolina; 34.07250 N, 81.40881 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: No unionids seen below 15 feet depth**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (%<2 FEET):	N/A (0-22 feet deep)
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal to unconsolidated
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	None
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	SCUBA, batiscope
SURVEY TIME:	0.5 person hours SCUBA, 0.5 person hours batiscope

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 1 live  
*Elliptio fisheriana* – 1 shell  
*Utterbackia imbecillis* – 3 live, 16 shells  
*Unio carolinianus* – 3 live, 5 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.7jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Lexington County, South Carolina; 34.06458 N, 81.50776 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: Along shore**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting, stabilization present
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.42 person hours

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* – 15 shells

*Pyganodon cataracta* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* – rare

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060620.8jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Hollow Creek Cove, Lexington County, South Carolina;  
34.00980 N, 81.44938 W; see Figure 2**

**SURVEY DATE: June 20, 2006**

**SITE COMMENTS: along shore**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble
COMPACTNESS:	Normal to unconsolidated
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.42 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 7 shells  
*Utterbackia imbecillis* – 2 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - *rare*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.1jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Little Saluda River Cove, Saluda County, South Carolina;  
34.06615 N, 81.61959 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel
COMPACTNESS:	Compact to normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural, suburban
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	0.2 person hours

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* – 2 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - rare

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.2jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Indian Creek Cove, Saluda County, South Carolina;  
34.07444 N, 81.62840 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	None
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural, suburban
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.6 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

None

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.3jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Big Creek Cove, Saluda County, South Carolina; 34.06673 N, 81.67332 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: Boated up creek, steep banks, no *Toxolasma pullus* habitat observed**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Moderate
DEPTH (%<2 FEET):	-
SUBSTRATE:	-
COMPACTNESS:	-
SAND/GRAVEL BARS:	None
WOODY DEBRIS:	High
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Moderate
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	5
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	1.0 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

None observed

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.4jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Little Saluda River Cove, Saluda County, South Carolina;  
34.05217 N, 81.68131 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: Boated up river, noodled in substrate, much algae in water**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Lake/river
<b>FLOW:</b>	Pool, slack
<b>RELATIVE DEPTH:</b>	-
<b>DEPTH (%&lt;2 FEET):</b>	-
<b>SUBSTRATE:</b>	Silt, sand, detritus, mud
<b>COMPACTNESS:</b>	Normal and unconsolidated
<b>SAND/GRAVEL BARS:</b>	None
<b>WOODY DEBRIS:</b>	High
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Moderate
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	25+ meters
<b>BANK HEIGHT:</b>	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	20
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	N/A

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* – 2 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* – rare

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.5jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Little Saluda River Cove, Saluda County, South Carolina;  
34.06898 N, 81.60913 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, gravel, vegetation, detritus, mud
COMPACTNESS:	Normal to unconsolidated
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	1.33 person-hours

**FRESHWATER MUSSELS:**

*Toxolasma pullus* – 3 old right valves

*Utterbackia imbecillis* – 12 shell

*Pyganodon cataracta* – 2 shells

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum* - uncommon

*Corbicula fluminea* – rare

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.6jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Clouds Creek Cove, Saluda County, South Carolina;  
34.05125 N, 81.57506 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, vegetation
COMPACTNESS:	Normal and unconsolidated
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	-
BEAVER ACTIVITY:	None
WINDTHROW:	-
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, <b>hot</b>

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 1 shell  
*Utterbackia imbecillis* – 12 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.7jma**

**BIOLOGISTS: Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Beaver Dam Creek Cove, Saluda County, South Carolina;  
34.05979 N, 81.58765 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.25 person hours

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* – 14 shells  
*Unio carolinianus* – 2 shells  
*Villosa delumbis* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum*  
*Corbicula fluminea* – 1 shell

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.8jma**

**BIOLOGISTS: Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Newberry County, South Carolina; 34.12221 N, 81.58581 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.25 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 3 shells  
*Utterbackia imbecillis* – 24 shell

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum*  
*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.9jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Saluda River Cove, Newberry/Saluda county line, South Carolina; 34.12575 N, 81.61440 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.25 person hours

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* – 21 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060621.10jma**

**BIOLOGISTS: Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Bush River Cove, Newberry County, South Carolina;  
34.12569 N, 81.60326 W; see Figure 2**

**SURVEY DATE: June 21, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	-
DEPTH (<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	None
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.25 person hours

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* – 35 shell

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum* – 4 shells

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060622.1jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Newberry County, South Carolina; 34.12299 N, 81.48659 W; see Figure 2**

**SURVEY DATE: June 22, 2006**

**SITE COMMENTS: In water and along shore**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, gravel, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Narrow to wide
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Natural, timber, rural, suburban
PERCENT COVER:	-
WOODLAND EXTENT:	Not extensive to intermediate
NATURAL LEVEES:	None
VISIBILITY:	-
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

*Utterbackia imbecillis* –11 shell

*Pyganodon cataracta* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060622.2jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Newberry County, South Carolina; 34.11279 N, 81.47639 W; see Figure 2**

**SURVEY DATE: June 22, 2006**

**SITE COMMENTS: In water and along shore**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Lake
<b>FLOW:</b>	Pool
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	100
<b>SUBSTRATE:</b>	Clay, silt, sand, gravel, vegetation
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	None
<b>TEMPORARY POOLS:</b>	None
<b>CHANNEL WIDTH:</b>	-
<b>BANK HEIGHT:</b>	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural, suburban
PERCENT COVER:	0
WOODLAND EXTENT:	Intermediate to extensive
NATURAL LEVEES:	None
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 4 shell  
*Utterbackia imbecillis* – 41 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060622.3jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Newberry County, Dreher Island, South Carolina; 34.07514 N, 81.40534 W; see Figure 2**

**SURVEY DATE: June 22, 2006**

**SITE COMMENTS: Live mussels found between 5 to 15 feet deep, dove to 25 feet**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Deep
DEPTH (%<2 FEET):	0
SUBSTRATE:	Clay, silt, sand, gravel, cobble, bolder, bedrock
COMPACTNESS:	Normal to compact
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	SCUBA and visual/tactile
SURVEY TIME:	0.67 person hours SCUBA, 0.17 visual/tactile along shore

**FRESHWATER MUSSELS:**

*Unio merus carolinianus* – 1 live (46 mm); 6 shells  
*Utterbackia imbecillis* – 2 live (66, 66 mm); 3 shells  
*Pyganodon cataracta* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* – common, many dead

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060622.4jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Camping Creek Cove, Newberry County, South Carolina;  
34.13755 N, 81.45027 W; see Figure 2**

**SURVEY DATE: June 22, 2006**

**SITE COMMENTS: In water near shoreline and along shore**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, gravel, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.53 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 1 shell  
*Utterbackia imbecillis* – 7 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060622.5jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Lexington County, South Carolina; 34.13498 N, 81.36966 W; see Figure 2**

**SURVEY DATE: June 22, 2006**

**SITE COMMENTS: In water near shore and along shore**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, gravel, vegetation
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural, suburban
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.8 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 8 shells  
*Utterbackia imbecillis* – 24 shells  
*Elliptio complanata* – 1 shell  
*Unio merus carolinianus* – 1 shell  
*Villosa delumbis* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060622.6jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West – SCUBA safety  
Joseph D. Alderman  
Jennifer M. Summerlin – SCUBA safety**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Lake Murray, Island, Lexington County, South Carolina; 34.10896 N,  
81.35474 W; see Figure 2**

**SURVEY DATE: June 22, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Lake
FLOW:	Pool
RELATIVE DEPTH:	Moderate
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	SCUBA
SURVEY TIME:	0.88 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 1 shell

*Utterbackia imbecillis* – 2 live (61, 59 mm)

*Lampsilis splendida* – 1 live (67 mm)

*Elliptio producta* – 38 live (56, 89, 75, 85, 55, 58, 64, 68, 71, 66, 82, 63, 63, 72, 67, 58, 54, 63, 78, 63, 69, 77, 75, 76, 62, 68, 77, 70, 70, 47, 70, 68, 69, 48, 72, 66, 69, 53 mm), 11 shells

*Unio merus carolinianus* – 1 live (68 mm), 3 shells

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum*

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060707.1jma**

**BIOLOGISTS: Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION:** Little Hollow Creek, S-24+-, Lexington County, South Carolina;  
34.02296 N, 81.40607 W; **see Figure 3**

**SURVEY DATE:** July 7, 2006

**SITE COMMENTS:** Very little flow, probably completely dries up during droughts;  
300 meters upcreek to 100 meters downcreek; heavy sediment load

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool (when flowing)
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Abundant
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	Present
CHANNEL WIDTH:	~ 6 meters
BANK HEIGHT:	1.75+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	98
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, cool

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.33 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060707.2jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION:** Hollow Creek, S-54-, Lexington County, South Carolina; 33.99216 N, 81.46473 W; see **Figure 3**

**SURVEY DATE:** July 7, 2006

**SITE COMMENTS:** From S-54 up to major trib, cattle in creek up and down creek, shells found upcreek above cattle area

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	99
SUBSTRATE:	<b>Silt, sand,</b> gravel
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Abundant
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	9+ meters
BANK HEIGHT:	2.75+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting to unstable
BUFFER WIDTH:	None, narrow, moderate, and wide
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Natural, timber, active pasture, active crop, rural
PERCENT COVER:	80
WOODLAND EXTENT:	Not extensive to intermediate
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	2.0 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 shell

*Elliptio producta* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060707.3jma**

**BIOLOGISTS: John M. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: West Creek, S-189-, Saluda County, South Carolina; from 33.99685 N,  
81.56001 W; see Figure 3**

**SURVEY DATE: July 7, 2006**

**SITE COMMENTS: Extremely heavy sediment load**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	98
SUBSTRATE:	<b>Silt, sand,</b> gravel
COMPACTNESS:	Normal and unconsolidated
SAND/GRAVEL BARS:	<b>Abundant</b>
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.25 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060707.4jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Clouds Creek, S-449+ (below mill dam), Saluda County, South Carolina;  
33.92067 N, 81.64599 W; see Figure 3**

**SURVEY DATE: July 7, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	99
SUBSTRATE:	Clay, silt, sand, gravel, boulder
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	High
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Moderate
TEMPORARY POOLS:	None
CHANNEL WIDTH:	10+ meters
BANK HEIGHT:	1.75+ meters

**HABITAT (cont.):**

BANK STABILITY:	Unstable and some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	1.0 person hours

**FRESHWATER MUSSELS:**

*Pyganodon cataracta* – 2 shells found upcreek  
*Utterbackia imbecillis* – 2 shells found upcreek  
*Unio carolinianus* – 1 shell found upcreek  
*Elliptio complanata* – 297 live (range 51 - 88 mm)  
*Elliptio producta* – 3 live (46, 62, 79 mm)  
*Villosa delumbis* – 3 live (47 mm female; 46, 24 mm male)

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum* – 1 live  
*Corbicula fluminea* - abundant

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060707.5jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Asbill Pond, S-449-, Saluda County, South Carolina; 33.91636 N,  
81.64787 W; see Figure 3**

**SURVEY DATE: July 7, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Pond
FLOW:	Pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, sand, vegetation, detritus, mud
COMPACTNESS:	Normal and <b>unconsolidated</b>
SAND/GRAVEL BARS:	None
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	None
WINDTHROW:	None
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Turbid
WATER LEVEL:	Normal
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Tactile
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

*Uniomerus carolinianus* – 10 live

*Elliptio complanata* – 10 live

*Pyganodon cataracta* – 1 live

*Toxolasma pullus* – 1 old shell

**OTHER DOCUMENTED TAXA:**

None observed

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.1jma**

**BIOLOGISTS: Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Bear Creek, S-268+-, Lexington County, South Carolina; 34.16412 N,  
81.37868 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Clay, silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	High
BEAVER ACTIVITY:	Dams in stream
WINDTHROW:	Moderate
TEMPORARY POOLS:	None
CHANNEL WIDTH:	~6 meters
BANK HEIGHT:	1.75 meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting to unstable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, cool

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	0.5 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 valve

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.2jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Bear Creek, S-29+, Lexington County, South Carolina; 34.14915 N,  
81.37726 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	98
SUBSTRATE:	Clay, silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	1.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Varies
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Natural, timber, yard, rural
PERCENT COVER:	80
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, cool

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	1.17 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 live (60 mm)

*Elliptio producta* – 8 live (65, 66, 70, 50, 65, 70, 67, 70 mm); 15 shells

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.3jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Camping Creek, Newberry County, South Carolina; 34.17832 N,  
81.47152 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: Nice stream, no evidence of unionids**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	98
SUBSTRATE:	Silt, sand, gravel
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Abundant
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None observed
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	1.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.4jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Buffalo Creek, S-187-, Newberry County, South Carolina; 34.13546 N,  
81.48669 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: Heavy sediment load; degraded stream**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Stream
<b>FLOW:</b>	Run, slack, pool
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	95
<b>SUBSTRATE:</b>	Clay, silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Normal and unconsolidated
<b>SAND/GRAVEL BARS:</b>	Abundant
<b>WOODY DEBRIS:</b>	Average
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Moderate
<b>TEMPORARY POOLS:</b>	None observed
<b>CHANNEL WIDTH:</b>	8+ meters
<b>BANK HEIGHT:</b>	1.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting to unstable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.5jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Big Creek, S-756-; Newberry County, South Carolina; 34.13547 N,  
81.55822 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: Has yellowfin shiners, probably with mussels during past centuries, now a nice stream, may have provided habitat for *Lasmigona decorata* in the past**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	99
SUBSTRATE:	Clay, silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	None
TEMPORARY POOLS:	None
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable to some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	98
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	None
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	1.0 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.6jma**

**BIOLOGISTS: John M. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Timothy Creek, Cannon Swamp Road, Newberry County, South Carolina; 34.18875 N, 81.60812 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: Visual**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	99
SUBSTRATE:	Silt, <b>sand</b> , gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal and unconsolidated
SAND/GRAVEL BARS:	Abundant
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	2.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	80
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.33 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060708.7jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Beaver Dam Creek, Newberry County, South Carolina; 34.17532 N,  
81.64681 W; see Figure 3**

**SURVEY DATE: July 8, 2006**

**SITE COMMENTS: Visual/tactile**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Stream
<b>FLOW:</b>	Run, slack
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	99
<b>SUBSTRATE:</b>	Clay, silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Normal and unconsolidated
<b>SAND/GRAVEL BARS:</b>	Abundant
<b>WOODY DEBRIS:</b>	Average
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	None observed
<b>CHANNEL WIDTH:</b>	8+ meters
<b>BANK HEIGHT:</b>	1.75+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.75 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 shell

*Elliptio producta* – 1 live

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria*

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.1jma**

**BIOLOGISTS: Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Mine Creek, S-165+, Saluda County, South Carolina; 33.95210 N,  
81.76142 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: Nice stream**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	70
SUBSTRATE:	Silt, <b>sand, gravel</b> , cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None observed
CHANNEL WIDTH:	12+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	80
WOODLAND EXTENT:	Intermediate to extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.38 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 old shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.2jma**

**BIOLOGIST: Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Mine Creek, Old Charleston Road, Saluda County, South Carolina;  
33.93305 N, 81.76508 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: Very little flow**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, slack, pool
RELATIVE DEPTH:	Very Shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Clay, silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Compact to normal to unconsolidated
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Dams in stream
WINDTHROW:	Moderate
TEMPORARY POOLS:	-
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	70
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.08 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

None observed

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.3jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Red Bank Creek, Pen Creek Road, Saluda County, South Carolina;  
33.98348 N, 81.80713 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: Slate belt stream with vertical layers of bedrock extending perpendicular across creek; very similar to Sleepy Creek habitat; little flow**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	99
SUBSTRATE:	Silt, <b>sand, gravel</b> , cobble, boulder, <b>bedrock</b>
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Moderate
TEMPORARY POOLS:	None
CHANNEL WIDTH:	8+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable with some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	1.33 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 44 live (range: 57 – 79 mm)

*Elliptio producta* – 1 live (68 mm)

*Villosa delumbis* – 3 live males (55, 49, 32 mm)

**OTHER DOCUMENTED TAXA:**

*Campeloma decisum*

*Helisoma anceps*

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.4jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Red Bank Creek, US 121+-, Saluda County, South Carolina; 33.98663 N,  
81.77013 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: Very little flow**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Stream
<b>FLOW:</b>	Run, riffle, slack
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	100
<b>SUBSTRATE:</b>	Sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Compact
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	None observed
<b>CHANNEL WIDTH:</b>	~ 30 meters
<b>BANK HEIGHT:</b>	Varies

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.17 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.5jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION:** Little Saluda River, S-39+-, Saluda County, South Carolina; 34.04162 N, 81.69854 W; see **Figure 3**

**SURVEY DATE:** July 9, 2006

**SITE COMMENTS:** Nice substrate, extremely low diversity and abundances for this size stream with such quality substrates

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, slack
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	99
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Compact and normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Average
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Moderate
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	25+ meters
<b>BANK HEIGHT:</b>	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	50
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 live, 2 shells

*Elliptio producta* – 1 old shell

*Elliptio icterina* – 1 live (90 mm)

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.6jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Big Creek, John J. Rushton Road, Saluda County, South Carolina;  
34.06770 N, 81.78398 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: Quick recon, no habitat data recorded**

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES: Visual

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 2 live (60, 65 mm), 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.7jma**

**BIOLOGISTS: Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Unnamed tributary to Halfway Swamp Creek, Clay Pit Road, Saluda County, South Carolina; 34.11296 N, 81.90200 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	90
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, <b>bedrock</b>
COMPACTNESS:	Compact to normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	~ 8 meters
BANK HEIGHT:	1.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	95
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.13 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 shell  
*Villosa delumbis* – 1 shell

**OTHER DOCUMENTED TAXA:**

None observed

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060709.8jma**

**BIOLOGISTS: Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Indian Creek, SC 194-, Saluda County, South Carolina; 34.09388 N,  
81.66126 W; see Figure 3**

**SURVEY DATE: July 9, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	-
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	6+ meters
BANK HEIGHT:	1.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	95
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.5 person hours

**FRESHWATER MUSSELS:**

*Elliptio producta* –1 live (80 mm), 1 shell

*Villosa delumbis* – 1 old female shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060710.1jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Saluda/Newberry county line, South Carolina; 34.17483 N,  
81.76151 W; see Figure 3**

**SURVEY DATE: July 10, 2006**

**SITE COMMENTS: 150 meter long shoal area; clean, coarse substrate**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run
RELATIVE DEPTH:	Shallow
DEPTH (%<2 FEET):	30
SUBSTRATE:	Sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	None
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	-
WINDTHROW:	Moderate
TEMPORARY POOLS:	-
CHANNEL WIDTH:	75+ meters
BANK HEIGHT:	3.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Unstable and some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	1
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	1.25 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 9 live (98, 88, 81, 69, 78, 85, 87, 77, 78 mm)

*Elliptio angustata* – 2 live (81, 90 mm)

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060710.2jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Newberry/Saluda county line, South Carolina; 34.16979 N,  
81.77180 W; see Figure 3**

**SURVEY DATE: July 10, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run, slack
RELATIVE DEPTH:	Shallow
DEPTH (%<2 FEET):	50
SUBSTRATE:	Clay, silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Compact, <b>normal</b> , and unconsolidated
SAND/GRAVEL BARS:	None
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Moderate
TEMPORARY POOLS:	Present
CHANNEL WIDTH:	90+ meters
BANK HEIGHT:	3.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Unstable and some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	3
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, warm

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	SCUBA and batiscope
SURVEY TIME:	2.02 person hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 127 live (range: 46 to 105 mm)

*Elliptio angustata* – 4 live (86, 101, 80, 78 mm)

*Elliptio producta* – 2 live (78, 85 mm)

*Elliptio icterina* – 2 live (82, 75 mm)

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060710.3jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West (SCUBA safety)  
Joseph D. Alderman (SCUBA safety)  
Christopher S. Boring (SCUBA safety)**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Newberry/Saluda county line, South Carolina; 34.16478 N,  
81.77854 W; see Figure 3**

**SURVEY DATE: July 10, 2006**

**SITE COMMENTS: High flow; clean, coarse substrate**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run
RELATIVE DEPTH:	Moderate
DEPTH (%<2 FEET):	0
SUBSTRATE:	Sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	-
WINDTHROW:	Moderate
TEMPORARY POOLS:	-
CHANNEL WIDTH:	60 meters
BANK HEIGHT:	2.75+ meters

**HABITAT (cont.):**

BANK STABILITY:	Unstable with some erosion/undercutting
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	<1
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	SCUBA
SURVEY TIME:	0.33 person-hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 2 live (64, 74 mm)

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060711.1jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington County, South Carolina; 34.05037 N, 81.20573 W; see Figure 4**

**SURVEY DATE: July 11, 2006**

**SITE COMMENTS: Downriver from dam; cold water; fog above water**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run, slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	75
SUBSTRATE:	Sand, gravel, <b>cobble, boulder</b>
COMPACTNESS:	Compact
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	80+ meters
BANK HEIGHT:	3+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	0
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.5 person hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060711.2jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington County, South Carolina; 34.04843 N, 81.19653 W; see Figure 4**

**SURVEY DATE: July 11, 2006**

**SITE COMMENTS: Increasing amount of sand in substrate; improving potential mussel habitat**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run, slack
RELATIVE DEPTH:	Shallow
DEPTH (%<2 FEET):	50
SUBSTRATE:	Silt, <b>sand, gravel</b> , cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	80+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot
TEMPERATURE:	9.5°C

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.75 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Physa* sp.  
*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060711.3jma**

**BIOLOGISTS: Joseph D. Alderman  
John M. Alderman (safety)  
Jennifer M. Summerlin (safety)**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington County, South Carolina; 34.02978 N, 81.13944 W; see Figure 4**

**SURVEY DATE: July 11, 2006**

**SITE COMMENTS: -**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Slack
RELATIVE DEPTH:	Moderate
DEPTH (%<2 FEET):	0 (up to 7 feet deep)
SUBSTRATE:	Silt, <b>sand, gravel</b> , cobble, boulder
COMPACTNESS:	-
SAND/GRAVEL BARS:	None
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	90+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	-
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Snorkel
SURVEY TIME:	0.25 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060711.4jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington/Richland county line, South Carolina; 34.00969 N, 81.07800 W; see Figure 4**

**SURVEY DATE: July 11, 2006**

**SITE COMMENTS: Snorkel and batiscoopes**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run, slack
RELATIVE DEPTH:	Shallow
DEPTH (%<2 FEET):	5 (~6 feet average)
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Rare
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	-
CHANNEL WIDTH:	>100 meters
BANK HEIGHT:	Varies

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate to wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, urban
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear to slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Snorkel, batiscofes
SURVEY TIME:	0.5 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Physa* sp.

*Helisoma anceps*

*Corbicula fluminea* – very abundant

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060711.5jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Congaree River, Lexington/Richland county line, South Carolina;  
33.99461 N, 81.04913 W; see Figure 4**

**SURVEY DATE: July 11, 2006**

**SITE COMMENTS: -**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, slack, pool
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	90
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder
<b>COMPACTNESS:</b>	Compact and normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	None
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	None
<b>CHANNEL WIDTH:</b>	300+ meters
<b>BANK HEIGHT:</b>	Varies

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Narrow to moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Urban
PERCENT COVER:	0
WOODLAND EXTENT:	Not extensive
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.5 person-hours

**FRESHWATER MUSSELS:**

*Elliptio roanokensis* – 1 live (93 mm)

*Elliptio complanata* – 23 live (78, 74, 71, 53, 66, 76, 60, 58, 63, 56, 55, 61, 62, 53, 55, 59, 58, 56, 58, 62, 48, 50, 36 mm)

*Elliptio congaraea* – 1 live (55 mm)

*Elliptio angustata* – 8 live (80, 69, 58, 67, 67, 58, 57, 58 mm)

*Villosa delumbis* – 1 old shell

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria* - common

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.1jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington/Richland county line, South Carolina; 34.00630 N, 81.06508 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: Clean, coarse substrate**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, slack
<b>RELATIVE DEPTH:</b>	Shallow
<b>DEPTH (%&lt;2 FEET):</b>	50
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	90+ meters
<b>BANK HEIGHT:</b>	Varies

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	3
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual, snorkel
SURVEY TIME:	1.0 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria* – abundant

*Physa* sp.

*Helisoma anceps*

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.2jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Broad River, Lexington/Richland county line, South Carolina; 34.00714 N, 81.06232 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: -**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, riffle, slack
<b>RELATIVE DEPTH:</b>	Shallow
<b>DEPTH (%&lt;2 FEET):</b>	50
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	50+ meters (near island)
<b>BANK HEIGHT:</b>	Varies

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.83 person-hours

**FRESHWATER MUSSELS:**

*Elliptio roanokensis* – 2 shells  
*Elliptio complanata* – 5 shells  
*Elliptio angustata* – 1 live (110 mm), 1 shell  
*Villosa delumbis* – 1 male shell  
*Lampsilis cariosa* – 1 live male (131 mm)

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria* - common  
*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.3jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda/Broad mixing area (shells washed in from Broad River),  
Lexington/Richland county line, South Carolina; 34.00541 N, 81.06282 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: Sand island, checked for shells**

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	100
SUBSTRATE:	Silt, <b>sand</b> , gravel
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	-
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	None
WINDTHROW:	None
TEMPORARY POOLS:	-
CHANNEL WIDTH:	-
BANK HEIGHT:	-

**HABITAT (cont.):**

BANK STABILITY:	-
BUFFER WIDTH:	-
RIPARIAN VEGETATION:	-
LAND USE:	-
PERCENT COVER:	0
WOODLAND EXTENT:	-
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	-

**FRESHWATER MUSSELS:**

*Elliptio angustata* – 1 live, 2 shells

*Villosa delumbis* – 2 male shells

*Strophitus undulatus* – 1 shell

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.4jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Congaree River, Lexington/Richland county line, South Carolina;  
33.98949 N, 81.04859 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: -**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, slack
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	80
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	None
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	300+ meters
<b>BANK HEIGHT:</b>	3+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Narrow to moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush, grass
LAND USE:	Urban
PERCENT COVER:	0
WOODLAND EXTENT:	Not extensive
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.83 person-hours

**FRESHWATER MUSSELS:**

*Elliptio complanata* – 1 live (72 mm)

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria* - common  
*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.5jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Congaree River, Lexington/Richland county line, South Carolina;  
33.99111 N, 81.04692 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: Broad River side of Congaree River**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, slack
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	75
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	300+ meters
<b>BANK HEIGHT:</b>	2.5+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate to wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Urban
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.83 person-hours

**FRESHWATER MUSSELS:**

*Elliptio roanokensis* – 13 live (100, 111, 89, 91, 95, 108, 105, 95, 102, 107, 110, 89, 91 mm)

*Elliptio complanata* – 3 live (93, 78, 73 mm)

*Elliptio congaraea* – 1 live (61 mm)

*Elliptio angustata* – 2 live (63, 66 mm)

*Elliptio icterina* – 1 live (72 mm)

*Lampsilis splendida* – 1 live male (67 mm)

*Villosa delumbis* – 1 old shell

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria* - common

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.6jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Congaree River, Lexington/Richland county line, South Carolina;  
33.97967 N, 81.04757 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: Saluda River side of Congaree River**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run
<b>RELATIVE DEPTH:</b>	Shallow
<b>DEPTH (%&lt;2 FEET):</b>	50
<b>SUBSTRATE:</b>	Silt, <b>sand, gravel</b> , cobble, boulder
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	None
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	275+ meters
<b>BANK HEIGHT:</b>	3+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Urban
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.83 person-hours

**FRESHWATER MUSSELS:**

*Elliptio roanokensis* – 2 live (90, 105 mm)

*Elliptio angustata* – 1 live (58 mm)

**OTHER DOCUMENTED TAXA:**

*Elimia catenaria*

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.7jma**

**BIOLOGISTS: John M. Alderman  
Joseph D. Alderman  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Congaree River, Lexington/Richland county line, South Carolina;  
33.98031 N, 81.04546 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: Broad River side of Congaree River**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Slack
<b>RELATIVE DEPTH:</b>	Shallow
<b>DEPTH (%&lt;2 FEET):</b>	20
<b>SUBSTRATE:</b>	<b>Silt, sand, gravel, cobble, boulder, bedrock</b>
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	275+ meters
<b>BANK HEIGHT:</b>	3+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Urban
PERCENT COVER:	0
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.5 person-hours

**FRESHWATER MUSSELS:**

*Elliptio roanokensis* – 19 live (120, 106, 109, 118, 107, 88, 83, 102, 117, 111, 97, 91, 100, 113, 116, 89, 91, 92, 87 mm)

*Elliptio complanata* – 5 live (77, 68, 73, 65, 55 mm)

*Elliptio congaraea* – 2 live (65, 68 mm)

*Strophitus undulatus* – 1 live (53 mm)

*Elliptio angustata* – 9 live (92, 82, 78, 70, 69, 66, 82, 77, 65 mm)

*Villosa delumbis* – 1 male shell (37 mm)

*Lampsilis splendida* – 1 live female (66 mm)

*Lampsilis cariosa* – 2 live males (98, 90 mm)

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060712.8jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Joseph D. Alderman  
Christopher S. Boring  
Jennifer M. Summerlin**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Congaree River, Lexington/Richland county line, South Carolina;  
33.96535 N, 81.03777 W; see Figure 4**

**SURVEY DATE: July 12, 2006**

**SITE COMMENTS: Saluda River side of Congaree River**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run
<b>RELATIVE DEPTH:</b>	Shallow
<b>DEPTH (%&lt;2 FEET):</b>	75
<b>SUBSTRATE:</b>	Silt, sand, gravel
<b>COMPACTNESS:</b>	Normal
<b>SAND/GRAVEL BARS:</b>	None
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	Evidence (gnawed sticks)
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	None
<b>CHANNEL WIDTH:</b>	275+ meters
<b>BANK HEIGHT:</b>	4+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Narrow
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Urban
PERCENT COVER:	1
WOODLAND EXTENT:	Not extensive
NATURAL LEVEES:	-
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sun-Cloud, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.67 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - rare

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060804.1jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington/Richland county line, South Carolina; 34.02287 N, 81.10009 W; see Figure 4**

**SURVEY DATE: August 4, 2006**

**SITE COMMENTS: Around islands**

**HABITAT:**

<b>WATERBODY TYPE:</b>	River
<b>FLOW:</b>	Run, slack
<b>RELATIVE DEPTH:</b>	Very Shallow
<b>DEPTH (%&lt;2 FEET):</b>	90
<b>SUBSTRATE:</b>	Silt, sand, gravel, cobble, boulder, Bedrock
<b>COMPACTNESS:</b>	Compact and Normal
<b>SAND/GRAVEL BARS:</b>	Present
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	None
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	--
<b>CHANNEL WIDTH:</b>	Varies
<b>BANK HEIGHT:</b>	Varies

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Narrow
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, urban
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual/tactile
SURVEY TIME:	1.5 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* – abundant

*Physa* sp. – common

*Helisoma anceps* - abundant

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060804.2jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Saluda River, Lexington/Richland county line, South Carolina; 34.01835 N, 81.09807 W; see Figure 4**

**SURVEY DATE: August 4, 2006**

**SITE COMMENTS: Good mix of substrates in places, relatively warm water at base of large area of rapids; potential stocking site for *Elliptio complanata***

**HABITAT:**

WATERBODY TYPE:	River
FLOW:	Run, riffle, slack
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	90
SUBSTRATE:	Silt, sand, gravel, cobble, boulder, bedrock
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Low
BEAVER ACTIVITY:	Evidence (gnawed sticks)
WINDTHROW:	Low
TEMPORARY POOLS:	None
CHANNEL WIDTH:	Varies
BANK HEIGHT:	Varies

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, urban
PERCENT COVER:	1
WOODLAND EXTENT:	Intermediate
NATURAL LEVEES:	-
VISIBILITY:	Clear
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	1.75 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea*

*Helisoma anceps*

*Physa* sp.

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060804.3jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Rawls Creek, Lexington County, South Carolina; 34.07949 N, 81.20251 W; see Figure 4**

**SURVEY DATE: August 4, 2006**

**SITE COMMENTS: Very poor water quality; odor of sewage and effluent**

**HABITAT:**

<b>WATERBODY TYPE:</b>	Stream
<b>FLOW:</b>	Run, riffle, slack, pool
<b>RELATIVE DEPTH:</b>	Very shallow
<b>DEPTH (%&lt;2 FEET):</b>	99
<b>SUBSTRATE:</b>	Clay, silt, sand, gravel, cobble, boulder, bedrock
<b>COMPACTNESS:</b>	Normal and unconsolidated
<b>SAND/GRAVEL BARS:</b>	Rare
<b>WOODY DEBRIS:</b>	Low
<b>BEAVER ACTIVITY:</b>	None
<b>WINDTHROW:</b>	Low
<b>TEMPORARY POOLS:</b>	-
<b>CHANNEL WIDTH:</b>	8+ meters
<b>BANK HEIGHT:</b>	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Some erosion/undercutting
BUFFER WIDTH:	Narrow to moderate
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Urban
PERCENT COVER:	80
WOODLAND EXTENT:	Not extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.75 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

*Corbicula fluminea* - rare

**PROJECT: Reconnaissance Survey of the Freshwater Mussel Fauna of the Lower Saluda and Congaree River, Lake Murray, and Selected Tributaries**

**STATION: 20060804.4jma**

**BIOLOGISTS: John M. Alderman  
Jeffrey West  
Christopher S. Boring**

**U.S. FISH AND WILDLIFE SERVICE ES PERMIT: TE065756-0**

**S.C. DEPARTMENT OF NATURAL RESOURCES AUTHORIZATION:  
November 25, 2002**

**LOCATION: Twelve Mile Creek, Lexington County, South Carolina; 34.03275 N,  
81.16173 W; see Figure 4**

**SURVEY DATE: August 4, 2006**

**SITE COMMENTS: Effluent odor, very poor water quality**

**HABITAT:**

WATERBODY TYPE:	Stream
FLOW:	Run, riffle, slack, pool
RELATIVE DEPTH:	Very shallow
DEPTH (%<2 FEET):	98
SUBSTRATE:	Silt, sand, gravel, cobble, boulder
COMPACTNESS:	Normal
SAND/GRAVEL BARS:	Present
WOODY DEBRIS:	Average
BEAVER ACTIVITY:	None
WINDTHROW:	Low
TEMPORARY POOLS:	--
CHANNEL WIDTH:	10+ meters
BANK HEIGHT:	2+ meters

**HABITAT (cont.):**

BANK STABILITY:	Very stable
BUFFER WIDTH:	Wide
RIPARIAN VEGETATION:	Wooded, shrub-brush
LAND USE:	Natural, timber, rural
PERCENT COVER:	90
WOODLAND EXTENT:	Extensive
NATURAL LEVEES:	At least one
VISIBILITY:	Slightly turbid
WATER LEVEL:	Low
WEATHER:	Sunny, hot

**TECHNIQUES AND SURVEY TIME:**

TECHNIQUES:	Visual
SURVEY TIME:	0.5 person-hours

**FRESHWATER MUSSELS:**

None

**OTHER DOCUMENTED TAXA:**

None (no *Corbicula fluminea*!)