FINAL REPORT

A Survey of the Freshwater Mussel Fauna at the Proposed Upgrade of a Water Intake Facility on the Rivanna River off U.S. Route 618, Fluvanna County, Virginia

Prepared by

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For

Lake Monticello Service Company

c/o Gilbert W. Clifford and Associates, Inc.

150C Olde Greenwich Drive

P.O. Box 781

Fredericksburg, VA 22401

June 1995

SURVEY PROCEDURES

The reach of the Rivanna River at the proposed upgrade of a water intake facility off U.S. Route 618, Fluvanna County, Virginia was surveyed by myself (Matthew Winston) and an assistant (Mary Winston). On June 5-6, 1995, the stream reach beginning 450 m downstream of the proposed upgrade and extending to 100 m upstream of the proposed upgrade was surveyed for freshwater mussels (see Figure 1). Survey procedures consisted of snorkeling the stream within the designated reach to collect and identify shells and live mussels. The stream banks and shallow areas were also checked for shells to help complete the list of mussel species. Due to the large size of the river, transects were surveyed rather than trying to survey the entire bottom of the river within the reach. Approximate locations of transects can be seen in Figure 2. When mussels were found, surveying was intensified within the immediate area. In general, mussels were pulled from the substrate, identified, and replaced in the exact location and orientation in which they were found. Mussels that could not be identified on the spot were taken to a nearby boat and compared to a dichotomous key and a reference collection of shells of species known to occur in the James River drainage. These mussels were then replaced into the substrate near where they were collected. I spent a total of 9.75 hours surveying for mussels (Surveying includes snorkling and identifying species). Mary Winston spent an equivalent amount of time recording data, searching the shoreline for shells, and guiding the boat.

At this site, the Fluvanna River averaged about 30 m wide. There were two large pools with depths over 1.75 m, two long runs with depths of 0.5 m to 1.25 m, and an extensive rock shelf with depths of 0.25 to 1.0 m (Figure 2). Substrate consisted of mud/silt in the pools, coarse sand and gravel in the runs, and bedrock in the shelf. Substrate was more silty along the southern bank. Towards the lower end of the designated reach, along the southern bank, substrate consisted of boulders and cobble covered with silt. The riparian zone looked intact, and no bank erosion was evident. Mussels in the substrate could be clearly seen from as far away as 50 cm (Turbidity was 8.5 NTU). Distances were determined by topographic map.

RESULTS AND DISCUSSION

Four species of mussels were found in this reach of the Rivanna River: eastern elliptio (Elliptio complanata), northern lance (Elliptio fisheriana), squawfoot (Strophitus undulatus), and triangle floater (Alasmidonta undulata). No living or dead individuals of the federally endangered James spinymussel (Pleurobema collina) were found in this reach.

A particularly dense assemblage of mussels was found along the southern bank between 200 m and 450 m below the existing water intake structure. A total of 423 live mussels were found in this relatively small area, compared to 48 live mussels in the remainder of the designated reach. No mussels were found in the center or on the northern side of the river. Locations, counts of

live mussels, effort, substrate, depth, and relative water velocity are summarized in Table 1. Nine shells (dead mussels) were found: 4 eastern elliptio, 5 northern lance, and 1 squawfoot.

The area 200 m to 450 m downstream of the existing intake structure, along the south bank out to about 10 m from the bank, with boulder/cobble/silt substrate and relatively low water velocities, contains relatively high densities of mussels (Figure 2). Two deep pools and a rock shelf separate this mussel bed from the existing water intake structure. If the proposed upgrade for the water intake facility is located near to the present one, it should have little adverse impact on mussels in this section of the Rivanna River.

Table 1. Summary of Survey Findings.

Location	Live Mussels Found	Effort	Substrate	Depth	Water Velocity
450 m to 200 m below intake structure (small stream to 50 m upstream of rock island, see Figure 2)		420 min total			
Along north shore and in center of river	None	5 transects along shore; 7 transects across the river (see Figure 2)	Coarse sand and gravel	0.75 to 1.0 m	Higher
Along south shore out to 10 m from south shore	eastern elliptio - 307 northern lance - 107 squawfoot - 8 triangle floater - 1	Zig-zag transect along shore (see Figure 2)	Boulder and cobble covered with silt	0.5 to 1.25 m	Lower
200 m to 175 m below intake structure (south side of deep pool)	eastern elliptio - 15 northern lance - 5	45 min	Mud/silt	>1.75 m	Low

175 m to 100 m below intake structure (bedrock shelf)		110 min total			
Along north shore and in center of river	None	2 transects along shore; 4 transects across the river	Coarse sand and gravel on top of bedrock	0.25 to 0.75 m	Higher
Along south shore	eastern elliptio - 12 northern lance - 4	Zig-zag transect along shore	Silt on top of bedrock	0.25 to 0.75 m	Lower
100 m to 10 m below intake structure (deep pool)	Did not search		mud/silt	1.5 to >1.75 m	
10 m below to 10 m above intake structure (along south side)	eastern elliptio - 11 northern lance - 9	10 min	Silt on top of boulders and cobble	0.75 to 1.75 m	Low

10 m to 100 m above intake structure (up to small stream)			30 min total			
Along north shore and in center of river	None		2 transects along shore; 4 transects across the river	Coarse sand/ gravel on bedrock	0.5 to 0.75 m	Higher
Along south shore	eastern elliptio - northern lance -	11 1	Zig-zag transect along shore	silt/mud in some places; sand/gravel in others	0.5 to 0.75 m	Lower

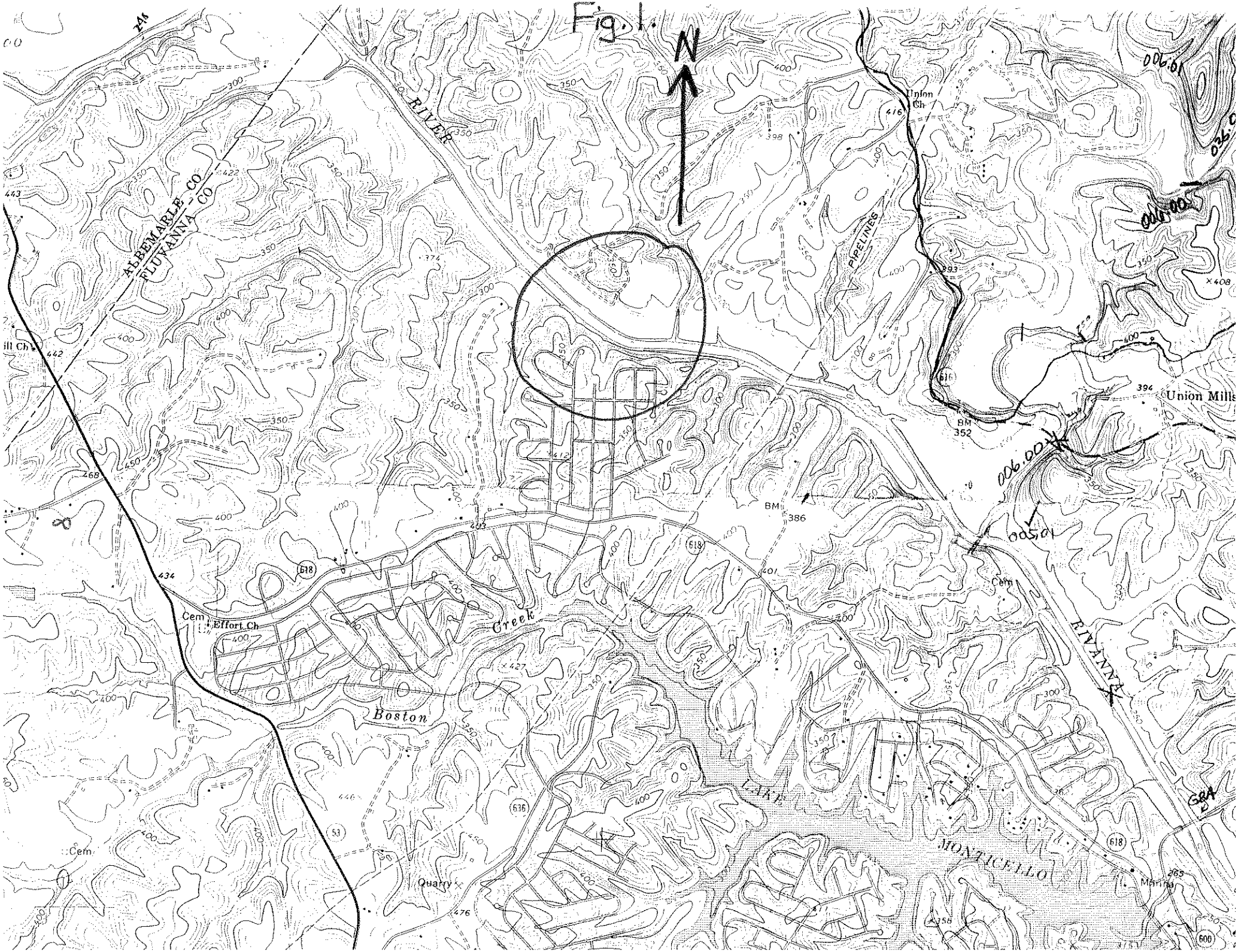
Fig. 1
N
ALBEMARLE CO
FLUVANNA CO
RIVER
PIPELINES
Union Ch
Union Mills
BM 352
BM 386
Cem
Effort Ch
Creek
Boston
Quarry
MONTICELLO
Marina
FLUVANNA
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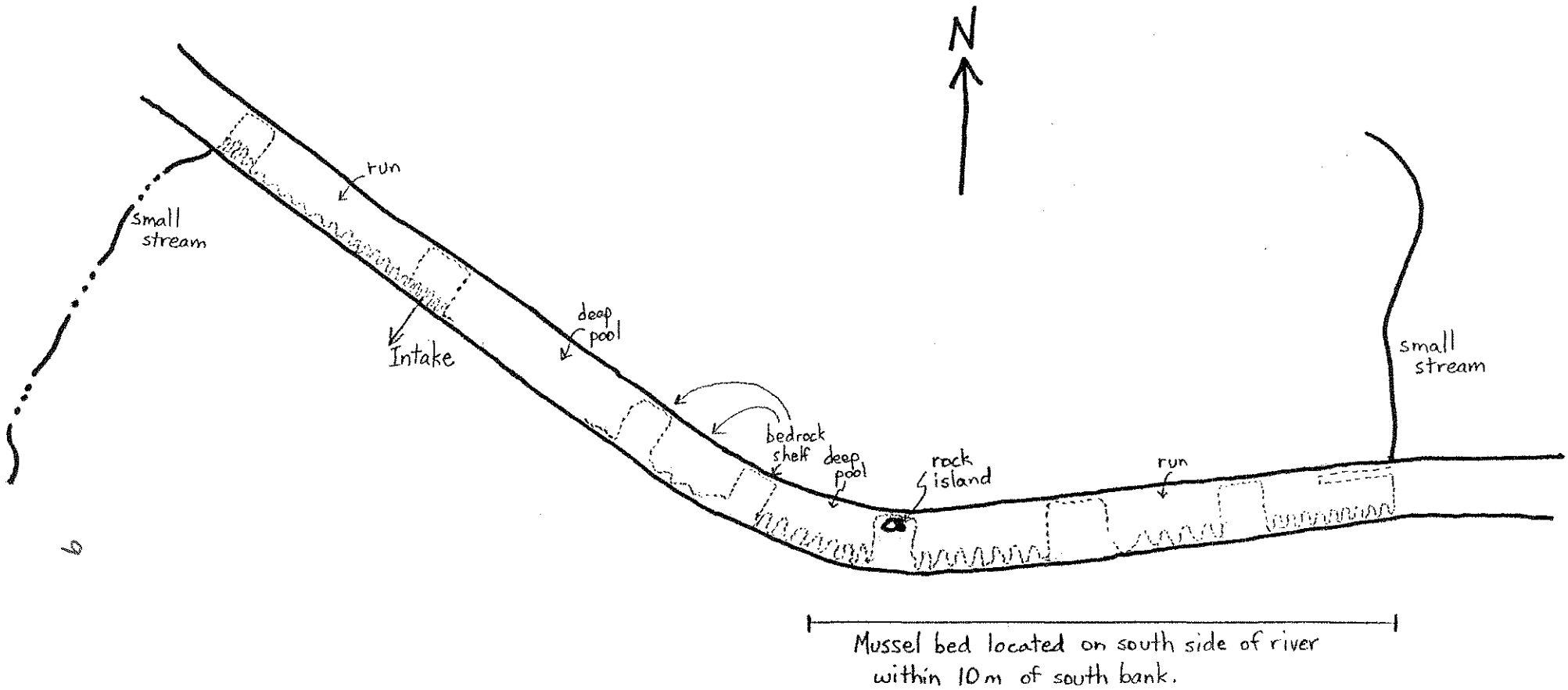
Fig. 2.



Latitude: 385705
Longitude: 782000
Rivanna River
Boyd Tavern Quadrangle
8cm = 200 m
------ = approx. locations of transects snorkeled

FIELD COLLECTION RECORD (MUSSELS)

COLLECTORS Matt & Mary Winston COLLECTION NO. _____

DATE: DAY 5, 6 MONTH June YEAR 1995

SPECIFIC LOCALITY Rivanna River, 100 m above to 450 m below the Lake Monticello community water intake structure. Lat: 38°57'05" Long: 78°20'00".

DRAINAGE James QUADRANGLE Boyd Tavern

COUNTY Fluvanna STATE VA TOWN Lake Monticello

COMMENTS most live mussels found 200 m to 450 m below water intake structure on south side of river 9 man-hours of effort

Species	Abundance	No. of Specimens Live	Fresh Dead	Subfossil
Elliptio complanata	349	345	4	
Elliptio fisheriana	130	125	5	
Strophitus undulatus	9	8	1	
Alasmidonta undulata	1	1		

June 9, 1995

Lake Monticello Service Company
c/o Gilbert W. Clifford and Associates, Inc.
150C Olde Greenwich Drive
P.O. Box 781
Fredericksburg, VA 22401

RE: Report

Dear Sirs:

Attached is the report for the survey undertaken to locate any living individuals of the federally endangered James spinymussel (Pleurobema collina) at the proposed water intake facility on the Rivanna River of U.S. Route 618, Fluvanna County. I have sent an identical report to Karen L. Mayne of the U.S. Fish and Wildlife Service in White Marsh, Virginia.

As we agreed, my charge for this work is $1000.00. Please make the check out in my name.

If you should have any questions, please contact me. My home phone is (703)552-1360. I am usually not available at my work phone, but I can return your call promptly.

I hope that I can be of service to you again in the future.

Sincerely,

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