

**SURVEY FOR ENDANGERED MUSSELS IN LITTLE
TALLAPOOSA RIVER AND BIG INDIAN CREEK AT PROPOSED
WATER INTAKES, CARROLL COUNTY, GEORGIA**

Prepared for:

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DBC Project 1156

SECTION 1

INTRODUCTION

For this contract, Dinkins Biological Consulting (DBC) conducted a survey for endangered freshwater mussels in two reaches of the Little Tallapoosa River and one reach of Big Indian Creek in Carroll County, Georgia. The three study reaches are being considered by Carroll County as potential sites for a water supply intake.

Proposed intake locations on the Little Tallapoosa River are located a few hundred feet upstream of the County Road (CR) 821 bridge at the mouth of Garrett Creek (upper location), and immediately downstream of the State Route (SR) 100 bridge (lower location). The proposed intake on Big Indian Creek is located at the confluence with Indian Branch. The upper location on the Little Tallapoosa River occurs on the southwest quadrant of the Bowdon East, Georgia quadrangle map (quad). The lower location on the Little Tallapoosa River occurs on the northeast quadrant of the Graham, Georgia quad. The intake location on Big Indian Creek occurs on the northeast quadrant of the Bowdon West, Georgia quad. Based on information provided by the Georgia Department of Natural Resources (GDNR) – Natural Heritage Program, there are no historical records of federally protected mussel species in Carroll County or in any of these three map quadrants (Tables 1-1 and 1-2). However, there are numerous historical and recent records of the federally threatened Finelined pocketbook (*Hamiota altilis*) just to the north in the Tallapoosa River and in several small tributaries in Haralson County (Williams et al., 2008).

Big Indian Creek arises from numerous headwater streams originating near the Haralson/Carroll County divide. Flowing generally in a southern direction, it joins with the Little Tallapoosa River at the point where the river leaves Georgia and flows westward into Alabama. The Little Tallapoosa River originates in northeast Carroll County, and flows generally southwestern to its confluence with the Tallapoosa River in Randolph County, Alabama. Big Indian Creek and the Little Tallapoosa River are situated in the southwestern portion of the Central Uplands District of the Piedmont physiographic province. Stream valleys in this portion of the district are not as open as those to the northeast. They exhibit a rectangular drainage pattern and are only 100-150 feet below the surrounding area (Clark and Zisa, 1976).

Table 1-1
Protected Mussel Species Historically Occurring in Carroll County

Common Name	Scientific Name	Federal Status	State Status
None			

Source: Georgia Department of Natural Resources Website, searched September 2008.

Table 1-2
Protected Aquatic Species Reported in Quarter Quadrangles of the Three Survey Reaches in Carroll County, Georgia

Study Reach	Quadrangle	Quadrant	Protected Aquatic Species
Little Tallapoosa River (upper)	Bowdon East	Southwest	None
Little Tallapoosa River (lower)	Graham	Northeast	None
Big Indian Creek	Bowdon West	Northeast/ Southeast	None

Source: Georgia Department of Natural Resources Website for protected species by USGS quadrangle map, searched September 2008.

SECTION 2

METHODS

Fieldwork for this project was conducted on 22 and 23 July 2008. Prior to the field effort, recent precipitation, streamflow and gage height data were examined using the U.S. Geological Survey (USGS) network of monitoring gages via the Internet to ensure conditions were appropriate for surveying. Based on information from the USGS gage on the Little Tallapoosa River near Newell, Alabama, the river ranged from 27 – 41 cubic feet/second during the sampling effort, well below the median daily flow for the time period. Weather during the survey was clear and the daytime air temperature reached approximately 29° Centigrade (85° Fahrenheit). Both streams were moderately turbid and at low level. Physical characteristics and general habitat data for both streams are provided in Tables 2-1, 2-2, and 2-3, respectively.

The mussel survey was conducted by grubbing the bottom in search of live and dead shells. Four experienced mussel surveyors searched all available habitats in each reach from bank to bank until it was felt all habitats had been sufficiently examined. In addition, both stream banks and all exposed substrate (gravel/sand bars) were examined for shell remains. Principal habitat characteristics (e.g., substrate composition, channel width, depths) were recorded on a field sheet. Upstream and downstream search boundaries and the proposed intake location were recorded using a hand-held Global Positioning System unit (Garmin E-Trex Legend). Live mussels were kept in a submerged mesh bag until the search was completed, and then identified to species, counted, and returned to the collection site. All fresh dead valves were retained and deposited in the DBC mollusk collection.

A summary of the upstream and downstream coordinates and length of each stream reach is provided in Table 2-1. Exact survey length was measured using a Fieldranger Distance Measurer. Water temperature and flow were estimated at the time of the survey. Survey location maps are provided in Appendix A, and color photographs of the three survey reaches are presented in Appendix B. A copy of the field team's data sheets is provided in Appendix C. Streamflow characteristics of the Little Tallapoosa River during the study period as reported by the U.S. Geological Survey flow gauges near Newell, Alabama and Carrollton, Georgia are provided in Appendix D.

Table 2-1
Stream Reaches Surveyed for Carroll County Water Intake

Stream	GPS Coordinates at Intake	Upstream GPS Coordinates	Downstream GPS Coordinates	Upstream Survey Reach (ft)	Downstream Survey Reach (ft)
Little Tallapoosa River-upper	N33.49391° W85.27988°	N33.51181° W85.23037°	N33.51355° W85.23392°	515	980
Little Tallapoosa River-lower	N33.49358° W85.27998°	N33.49173° W85.27954°	N33.49261° W85.28371°	540	1380
Big Indian Creek	N33.55697° W85.28337°	N33.55618° W85.28246°	N33.55544° W85.28515°	620	1000

Table 2-2
Physical Characteristics of Study Reaches Examined for Carroll County Water Intake

Stream	Upstream of Intake			Downstream of Intake			Estimated Water Temp (F°)	Estimated Flow (ft ³ /sec)
	Min/max/avg water depth (ft)	Min/max/avg channel width (ft)	Min/max/avg wetted width (ft)	Min/max/avg water depth (ft)	Min/max/avg channel width (ft)	Min/max/avg wetted width (ft)		
Little Tallapoosa River- upper	0.5/3/1.5	50/70/60	35/50/40	0.5/3/1.5	50/70/60	35/50/40	80	25
Little Tallapoosa River- lower	0.5/3/1.5	60/80/60	40/50/45	0.5/8/1.5	60/60/60	40/50/45	80	30
Big Indian Creek	0.5/4/1	25/40/30	10/20/15	0.5/3/1	30/50/40	15/30/20	80	8

Table 2-3
General habitat data for Little Tallapoosa River and Big Indian Creek

		Little Tallapoosa River-upper	Little Tallapoosa River-lower	Big Indian Creek
Habitats	Riffle	X	X	X
	Run	X	X	X
	Pool	X	X	X
	Margin	X	X	X
	Slackwater			
Physical Characteristics	Flow Conditions	Low	Low	Low
	Current Velocity	Moderate	Moderate	Moderate
	Channel Morphology	Natural	Natural	Natural
	Bank Erosion	Moderate	Moderate	Severe
	Riffle Development	Fair	Fair	Poor
	Riffle Quality	Poor	Poor	Poor
	Embedded	Yes	Yes	Yes
	Clarity	Fair	Fair	Fair
	Color	Brown	Brown	Brown
	Canopy	Fringing	Fringing	Closed
Predominant Land Use	Building/roads		X	
	Maintained lawn		X	
	Wetland		X	X
	Forest	X	X	
	Shrub			X
	Row Crop			
	Open Pasture	X	X	X
	Active construction			
	Residential/Park		X	
Riparian Vegetation	Large Trees	X	X	X
	Small Trees			
	Shrubs	X	X	X
	Grass/Weeds		X	X
Margin Habitats	Undercut Banks			
	Grass			
	Shallows	X	X	X
	Rip/Rap			
	Root Mats	X	X	X
	Water Willow			
	Clay/Hardpan			
	Rock Ledge		X	
	Woody Debris Pile	X	X	X
	Concrete			
	Margin Quality	Fair	Fair	Poor

SECTION 3

RESULTS AND DISCUSSION

Mussel sampling in two reaches of the Little Tallapoosa River revealed a total of three live and four dead mussels representing one species (Table 3-1). This species, the Southern rainbow (*Villosa vibex*) is not listed as a state or federally protected species. The American Fisheries Society considers the Southern rainbow to be **Currently Stable** across its range (Williams, et al.; 1993). The Southern rainbow is found in small creeks to large rivers throughout the Mobile Basin usually in slight to moderate current. It typically occurs in substrates of various combinations of sand, clay, and gravel. *Villosa vibex* appears to have some tolerance of silty conditions but is typically not found in pure mud substrates (Williams, et al., 2008). No live mussels or dead shells were found in Big Indian Creek.

One species of native aquatic snail, the Rippled elimia (*Elimia caelatura*), was infrequently encountered in both reaches of the Little Tallapoosa River. The Rippled elimia is a common and widespread species complex, with subspecies occurring in many streams in the Coosa and Alabama River basins of Georgia and Alabama (Burch, 1982). No aquatic snails were found in Big Indian Creek.

The target species for this survey, the federally threatened Finelined pocketbook (*Hamiota altilis*) was not found. Like the Southern rainbow, it occurs in small creeks to large rivers, and is typically found in areas with at least some current, though usually not in swift current. Substrates in which the Finelined pocketbook usually occurs include sand and mixtures of sand and gravel without heavy silt accumulations (Williams, et al., 2008). Direct observations of the habitat at each of the three proposed intake locations revealed all are impacted by excessive sedimentation attributable to local land uses, particularly Big Indian Creek. The Finelined pocketbook, like most, if not all rare native mussels, is particularly sensitive to excessive sedimentation. Thus, it is unlikely this species occurs within the study area but was overlooked by the survey team.

Table 3-1
Mussels Collected in Little Tallapoosa River and Big Indian Creek
Carroll County, Georgia (22, 23 July 2008)

Scientific Name	Common Name	Little Tallapoosa River-upper		Little Tallapoosa River-lower		Big Indian Creek	
		Live	Dead	Live	Dead	Live	Dead
<i>Villosa vibex</i>	Southern rainbow	0	1	3	3	0	0
Total:		1		6		0	

SECTION 4

REFERENCES

- Burch, J. B. 1982. Freshwater snails (Mollusca: Gastropoda) of North America. EPA-600/3-82-026.
- Turgeon, E. E., J. F. Quinn, Jr., A. E. Bogan, E. V. Coan, F. G. Hochberg, W. G. Lyons, P. M. Mikkelsen, R. J. Neves, C. F. E. Roper, G. Rosenberg, B. Roth, A. Scheltema, F. G. Thompson, M. Vecchione, and J. D. Williams. 1998. Common and scientific names of aquatic invertebrates from the United States and Canada: mollusks, 2nd edition. American Fisheries Society, Special Publication 26, Bethesda, Maryland. 526 pp.
- U. S. Fish and Wildlife Service. 1994b. Endangered and threatened wildlife and plants. Federal Register 50 CFR 17.11 and 17.12.
- U. S. Fish and Wildlife Service. 1994c. Endangered and threatened wildlife and plants; animal candidate review for listing as endangered or threatened species; proposed rule. Federal Register 59(219): 58982-59028.
- Williams, J.D., A. E. Bogan, J. T. Garner. 2008. Freshwater mussels of Alabama and the Mobile Basin in Georgia, Mississippi, and Tennessee. University of Alabama Press, Tuscaloosa. 908 pp.
- Williams, J. D., M. L. Warren, Jr., K. S. Cummings, J. L. Harris, R. J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18 (9):6-22.

APPENDIX A

SURVEY LOCATION MAPS

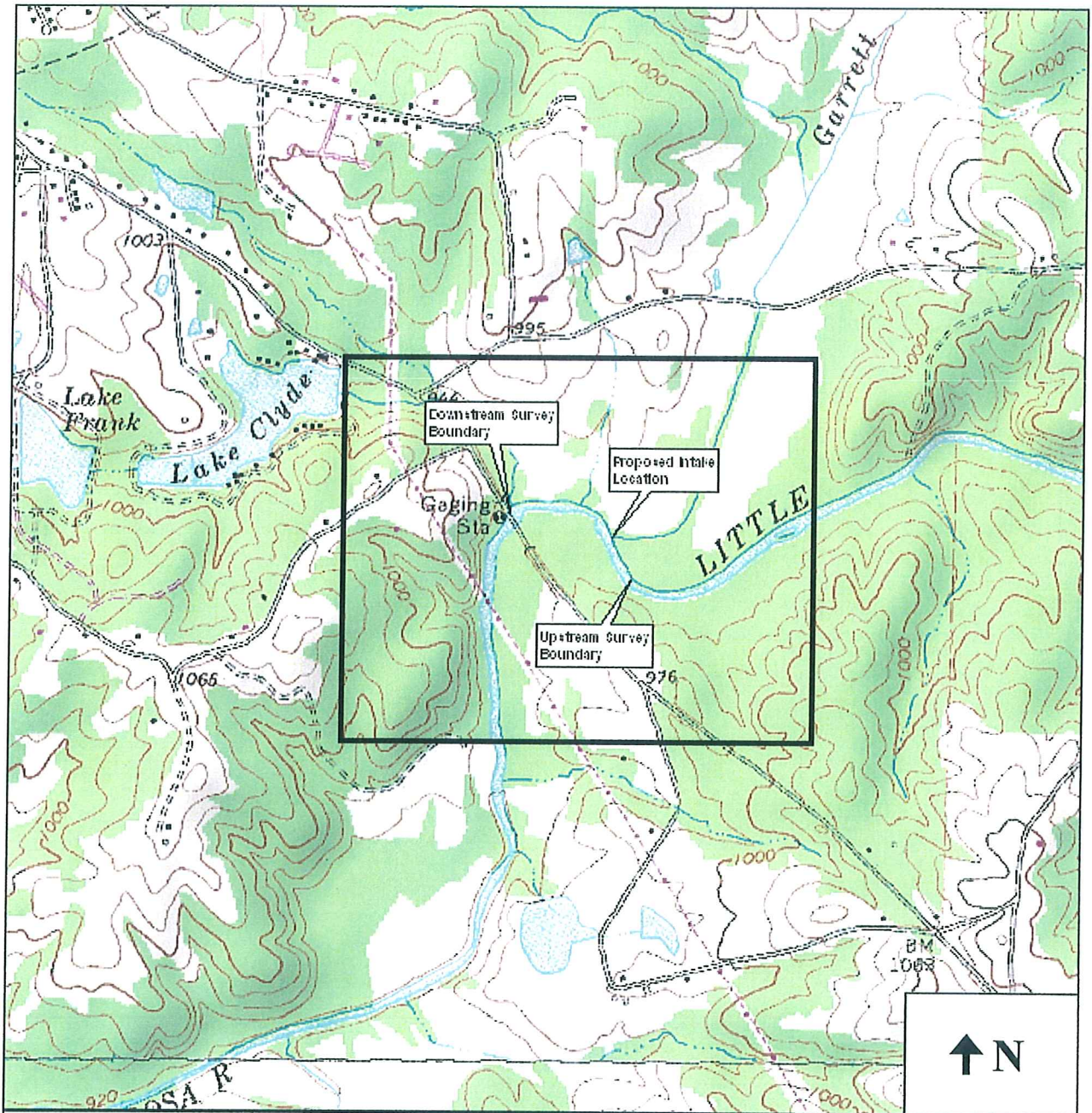
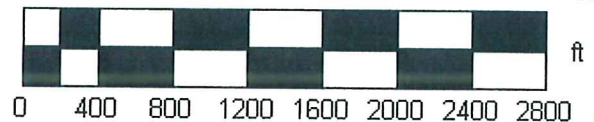


Figure A-1
 Little Tallapoosa River—Upper Survey Reach
 Carroll County, GA

Source: XMap 5.2
 USGS Bowdon East and Roopville, GA
 Quadrangle Maps

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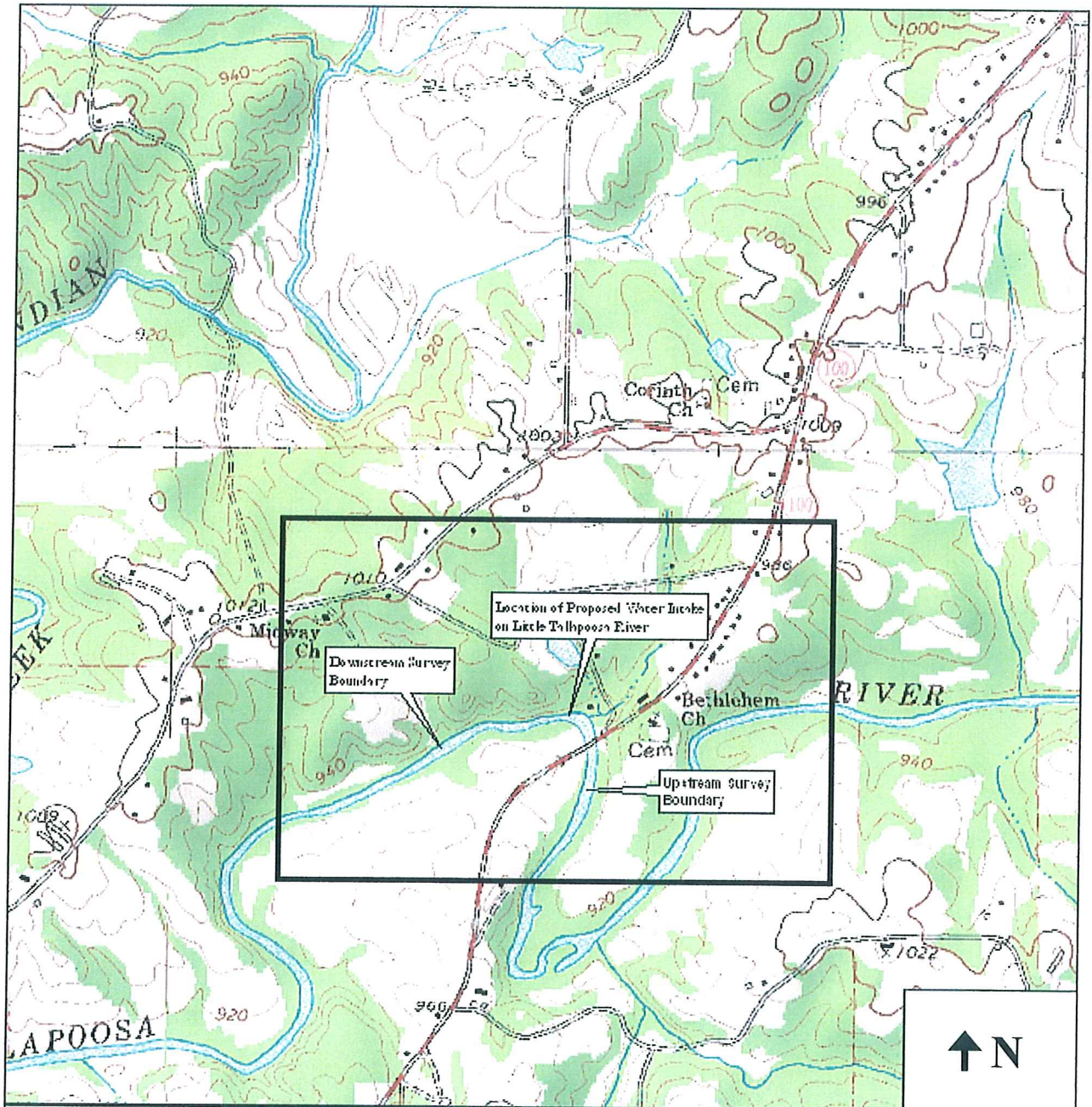
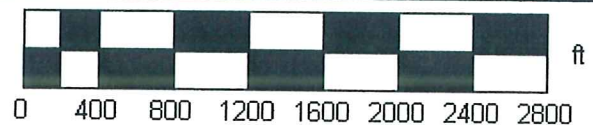


Figure A-2
 Little Tallapoosa River—Lower Survey Reach
 Carroll County, GA

Source: XMap 5.2
 USGS Graham and Bowdon West, GA
 Quadrangle Maps

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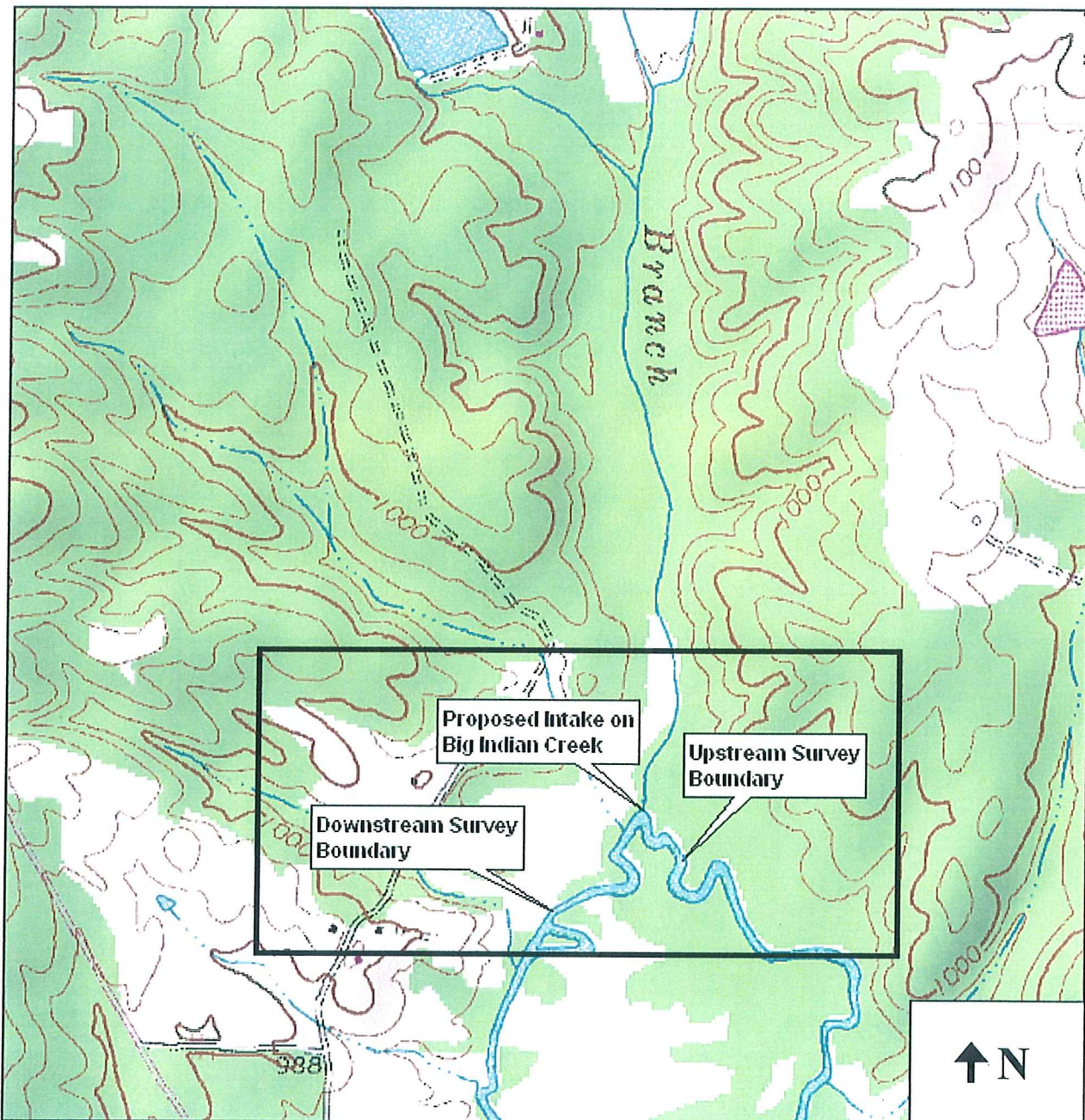
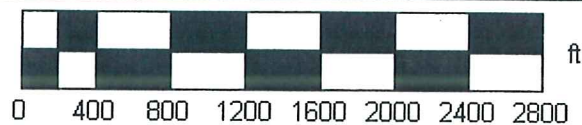


Figure A-3
Big Indian Creek Survey Reach
Carroll County, GA

Source: XMap 5.2
USGS Bowdon West, GA Quadrangle Map

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APPENDIX B

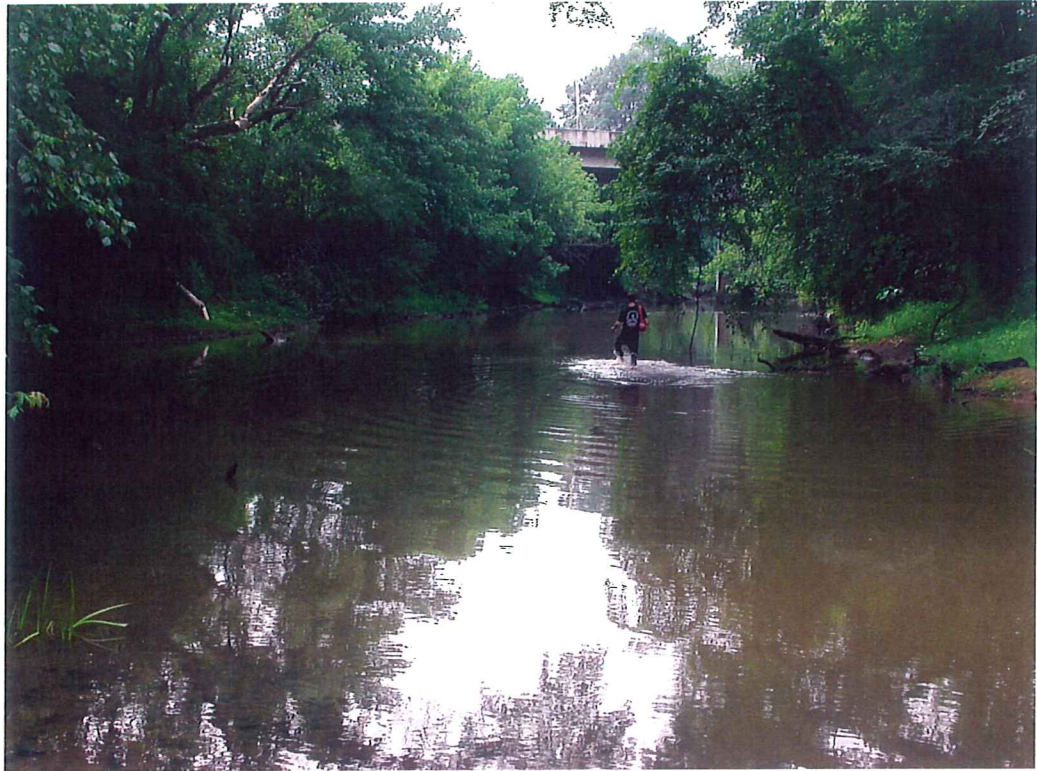
PHOTOGRAPHS OF SURVEY REACHES



Picture B-5: Big Indian Creek, approximately 1,000 ft downstream of proposed intake, Carroll County, Georgia. View looking upstream from center of channel. 23 July 2008.



Picture B-6: Big Indian Creek, approximately 1,000 ft downstream of proposed intake, Carroll County, Georgia. View looking downstream from center of channel. 23 July 2008.



Picture B-3: Little Tallapoosa River at site of proposed intake (lower study reach), Carroll County, Georgia. View looking upstream from center of channel. 22 July 2008.



Picture B-4: Little Tallapoosa River at site of proposed intake (lower study reach), Carroll County, Georgia. View looking downstream from center of channel. 22 July 2008.



Picture B-1: Little Tallapoosa River at site of proposed intake (upper study reach), Carroll County, Georgia. View looking upstream from center of channel. 22 July 2008.



Picture B-2: Little Tallapoosa River at site of proposed intake (upper study reach), Carroll County, Georgia. View looking downstream from center of channel. 22 July 2008

APPENDIX C

FIELD DATA SHEETS

Stream Survey Field Form

GRD 08-87

Task Order	P.I. Number:	Location: Mouth of Garrett Creek										
Upper Lat:	Long:	Lower Lat:	Long:									
Stream Name and Crossing Number: Little Tallapoosa River - Upper		County: Carroll										
Date: 07-22-08	River Basin and HUC Code: Coosa											
Investigators: GRD, ENG, TCD, ZCD												
<input type="checkbox"/> Fish <input type="checkbox"/> 4X6'seine <input type="checkbox"/> 6X10'seine <input type="checkbox"/> Dipnet <input type="checkbox"/> BP shocker <input type="checkbox"/> Boat shocker <input checked="" type="checkbox"/> Mussels <input checked="" type="checkbox"/> Grubbing <input type="checkbox"/> Diving <input type="checkbox"/> Snail												
Weather Conditions	<input type="checkbox"/> storm heavy <input type="checkbox"/> mostly cloudy <input type="checkbox"/> rain (steady) <input checked="" type="checkbox"/> partly cloudy <input type="checkbox"/> rain (intermittent) <input type="checkbox"/> clear		Has there been rain in the past 7 days? Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/> Approx. amount= 0.2 in									
Stream Characterization	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Tidal	Stage <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Flooding <input checked="" type="checkbox"/> Low	Channel <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Straigtened <input type="checkbox"/> Deepened									
Watershed Features	Predominant Surrounding Landscape (circle three most dominant) <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Agricultural <input checked="" type="checkbox"/> Field/Pastures <input type="checkbox"/> Industrial <input type="checkbox"/> Residential Other (explain)		Flow Calculations <table border="1"> <tr> <th>Length</th> <th>Depths</th> <th>Times</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <th>Width:</th> <td></td> <td></td> </tr> </table>	Length	Depths	Times				Width:		
	Length	Depths	Times									
Width:												
Riparian Vegetation (Observe 18m from Streambank)	Buffer Type Trees/shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Other Herbaceous <input type="checkbox"/>	RDB - Up <input checked="" type="checkbox"/> LDB - UP <input checked="" type="checkbox"/> RDB-Down <input checked="" type="checkbox"/> LDB-Down <input checked="" type="checkbox"/>	UPPER RDB Buffer width= LDB buffer width LOWER RDB Buffer width= LDB Buffer width									
Bank Description	UPPER Slope <input type="checkbox"/> Gently sloping <input type="checkbox"/> Moderately sloping <input checked="" type="checkbox"/> Steeply sloping Bank Stability <input type="checkbox"/> Stable <input type="checkbox"/> Unstable, eroding <input checked="" type="checkbox"/> Moderately stable	LOWER Slope <input type="checkbox"/> Gently sloping <input type="checkbox"/> Moderately sloping <input checked="" type="checkbox"/> Steeply sloping Bank Stability <input type="checkbox"/> Stable <input type="checkbox"/> Unstable, eroding <input checked="" type="checkbox"/> Moderately stable										
Canopy Cover	Upper <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Fringing <input type="checkbox"/> Closed		Lower <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Fringing <input type="checkbox"/> Closed									
Instream Features Taken at centerline	Min/Max/Avg Depths 0.5' / 3' / 1.5' Min./Max/Avg channel width 50 / 70 / 60 Wetted widths (min/max/avg) 35 / 50 / 40		Min/Max/Avg Depths 0.5' / 3' / 1.5' Min./Max/Avg channel width 50 / 70 / 60 Wetted widths (min/max/avg) 35 / 50 / 40									
	Estimated discharge 2.5 cfs		Water Temp: 80° F Air Temp: 85° F									
Reach Features- Reach is defined as 450 ft upstream and 1000 ft downstream	Riffle: Run Systems # riffles 4	Glide: Pool Systems # bends 2 pool variability (low-high)	Beaver dam present? Yes? <input type="checkbox"/> No? <input checked="" type="checkbox"/>									
			Beaver sign present? Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/>									

Fauna Present: ☐ Fish ☒ Mussels ☒ Snails ☒ Corbicula ☐ Crayfish ☐ NoneSamples Kept: ☐ Fish ☐ Live Mussels ☒ Relic Mussels ☒ Snails ☐ Crayfish ☐ None

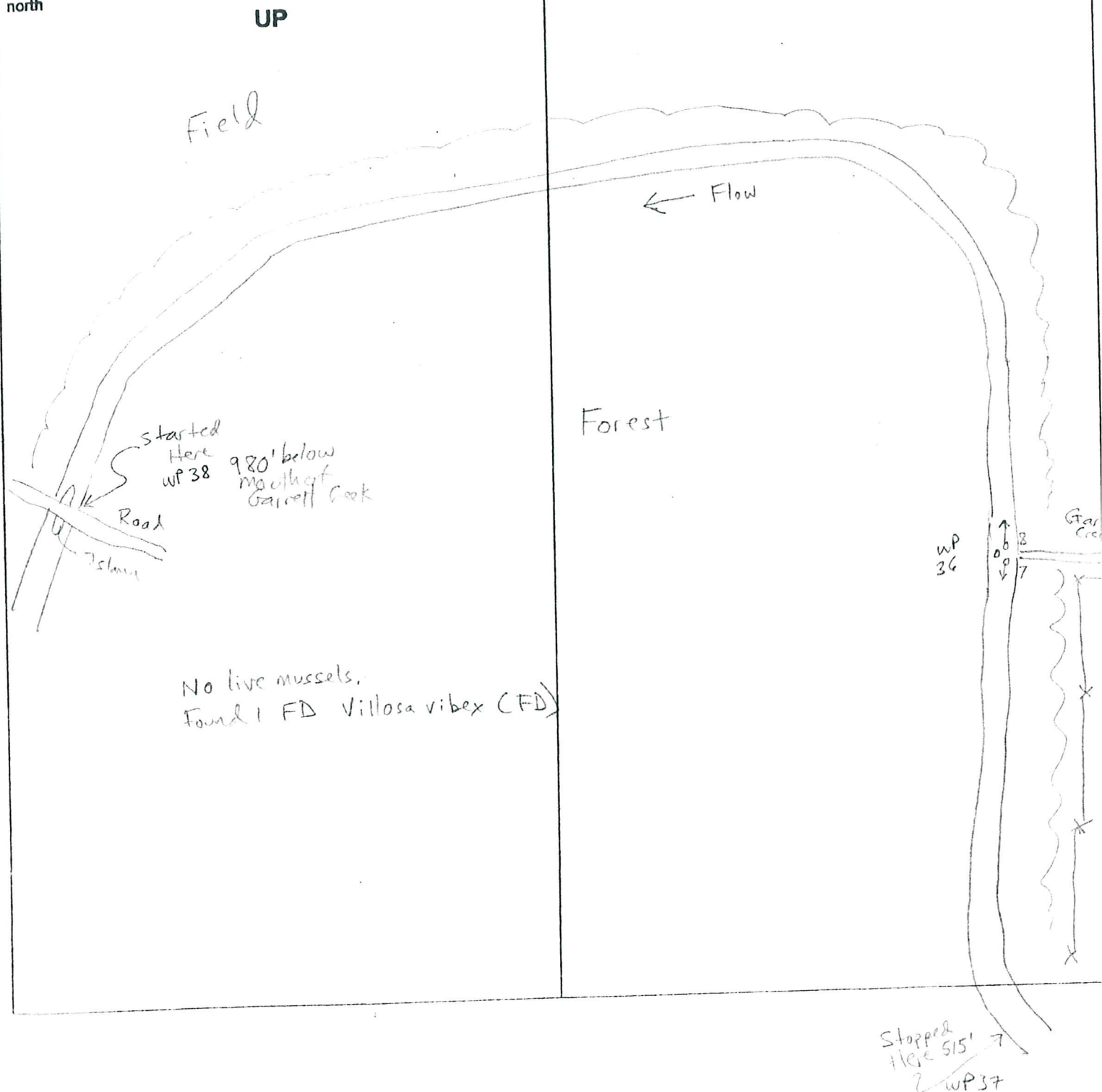
Habitat/Substrate Characterization in Reach - Describe the streambank habitat and stream substrate. Include descriptions of woody debris, leaf packs, algae, undercut banks, embeddedness, etc. in addition to describing the substrate types.

Substrate coarse sand, fine sand, gravel. Woody debris occasional. Stream moderately impacted by sedimentation, otherwise relatively undisturbed. Gravel bars occasional, but somewhat silty.

Task Order _____ Stream: Little Tallapoosa River-Upper GRD 08-87
Date: 07-22-08 Location: Confluence of Garrett Creek

General Description of Habitat and Morphology; Describe water quality (turbidity) and note obvious point/non-point discharges; Describe Type and Road Crossing (bridge, culvert etc.). Describe any past alterations of stream reach.
Water more clear here than downstream. Visibility spp. 1 1/2 ft @ surface. Fish not observed except for *Lepomis auritus*, *Micropterus coosae*, and *Fundulus* sp. Snails occasional, *Corbicula* abundant.

Map of Crossing: Draw Reach and label centerline, direction of flow, and north



Stream Survey Field Form

GRD 08-86

Task Order	P.I. Number:	Location: SR 100	
Upper Lat:	Long:	Lower Lat:	Long:
Stream Name and Crossing Number: Little Tallapoosa River - Lower		County: Carroll	
Date: 7-22-08	River Basin and HUC Code:		
Investigators: GRD, EWG, TCD, ZCD			
<input type="checkbox"/> Fish <input type="checkbox"/> 4X6'seine <input type="checkbox"/> 6X10'seine <input type="checkbox"/> Dipnet <input type="checkbox"/> BP shocker <input type="checkbox"/> Boat shocker <input checked="" type="checkbox"/> Mussels <input checked="" type="checkbox"/> Grubbing <input type="checkbox"/> Diving <input type="checkbox"/> Snail			
Weather Conditions	<input type="checkbox"/> storm heavy <input checked="" type="checkbox"/> mostly cloudy <input type="checkbox"/> rain (steady) <input type="checkbox"/> partly cloudy <input type="checkbox"/> rain (intermittent) <input type="checkbox"/> clear		Has there been rain in the past 7 days? Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/> Approx. amount= 0.2 in
Stream Characterization	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Tidal	Stage <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Flooding <input checked="" type="checkbox"/> Low	Channel <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Straigtened <input type="checkbox"/> Deepened
Watershed Features	Predominant Surrounding Landscape (circle three most dominant) Forest Commercial Agricultural Field/Pastures Industrial Residential Other (explain)		Flow Calculations
			Length Width:
			Depths Times
Riparian Vegetation (Observe 18m from Streambank)	Buffer Type Trees/shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Other Herbaceous <input checked="" type="checkbox"/>	RDB - Up <input checked="" type="checkbox"/> LDB - Up <input checked="" type="checkbox"/> RDB - Down <input checked="" type="checkbox"/> LDB - Down <input type="checkbox"/>	UPPER RDB Buffer width= 5m LDB buffer width 5m
			LOWER RDB Buffer width= 0-710 LDB Buffer width 0-5
Bank Description	UPPER		LOWER
	Slope <input type="checkbox"/> Gently sloping <input checked="" type="checkbox"/> Moderately sloping <input type="checkbox"/> Steeply sloping	Bank Stability <input type="checkbox"/> Stable <input type="checkbox"/> Unstable, eroding <input checked="" type="checkbox"/> Moderately stable	Slope <input type="checkbox"/> Gently sloping <input checked="" type="checkbox"/> Moderately sloping <input type="checkbox"/> Steeply sloping
			Bank Stability <input type="checkbox"/> Stable <input type="checkbox"/> Unstable, eroding <input checked="" type="checkbox"/> Moderately stable
Canopy Cover	Upper <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Fringing <input type="checkbox"/> Closed		Lower <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Fringing <input type="checkbox"/> Closed
Instream Features Taken at centerline	Min/Max/Avg Depths 0.5 / 3' / 1.5' Min./Max/Avg channel width 60 / 80 / 60 Wetted widths (min/max/avg) 40 / 50 / 45		Min/Max/Avg Depths 0.5 / 2' / 1.5' Min./Max/Avg channel width 60 / 60 / 60 Wetted widths (min/max/avg) 40 / 50 / 45
	Estimated discharge 30 cfs		Water Temp: 80°F
			Air Temp: 85°F
Reach Features- Reach is defined as 450 ft upstream and 1000 ft downstream	Riffle: Run Systems # riffles 5	Glide: Pool Systems # bends pool variability (low/high)	Beaver dam present? Yes? <input type="checkbox"/> No? <input checked="" type="checkbox"/>
			Beaver sign present? Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/>
Fauna Present: <input type="checkbox"/> Fish <input checked="" type="checkbox"/> Mussels <input checked="" type="checkbox"/> Snails <input checked="" type="checkbox"/> Corbicula <input type="checkbox"/> Crayfish <input type="checkbox"/> None			
Samples Kept: <input type="checkbox"/> Fish <input checked="" type="checkbox"/> Live Mussels <input checked="" type="checkbox"/> Relic Mussels <input checked="" type="checkbox"/> Snails <input type="checkbox"/> Crayfish <input type="checkbox"/> None			

Habitat/Substrate Characterization in Reach - Describe the streambank habitat and stream substrate. Include descriptions of woody debris, leaf packs, algae, undercut banks, embeddedness, etc. in addition to describing the substrate types.

Substrate coarse sand, angular cobble, silt, boulders. Fairly impacted by sedimentation and poor water quality. Native mussels rare; Corbicula abundant. Rock outcrops common along RDB. Several low bluffs. Downed trees occasional. Numerous gravel bars consisting of angular cobble and coarse sand. Small Elinia occasional (several kept).

Task Order _____ Stream: Little Tallapoosa River - Lower GRD 08-86
Date: 7-22-08 Location: SR100

General Description of Habitat and Morphology; Describe water quality (turbidity) and note obvious point/non-point discharges; Describe Type and Road Crossing (bridge, culvert etc.). Describe any past alterations of stream reach.

Water turbid; less than one ft visibility. RDB heavily impacted by livestock operation.

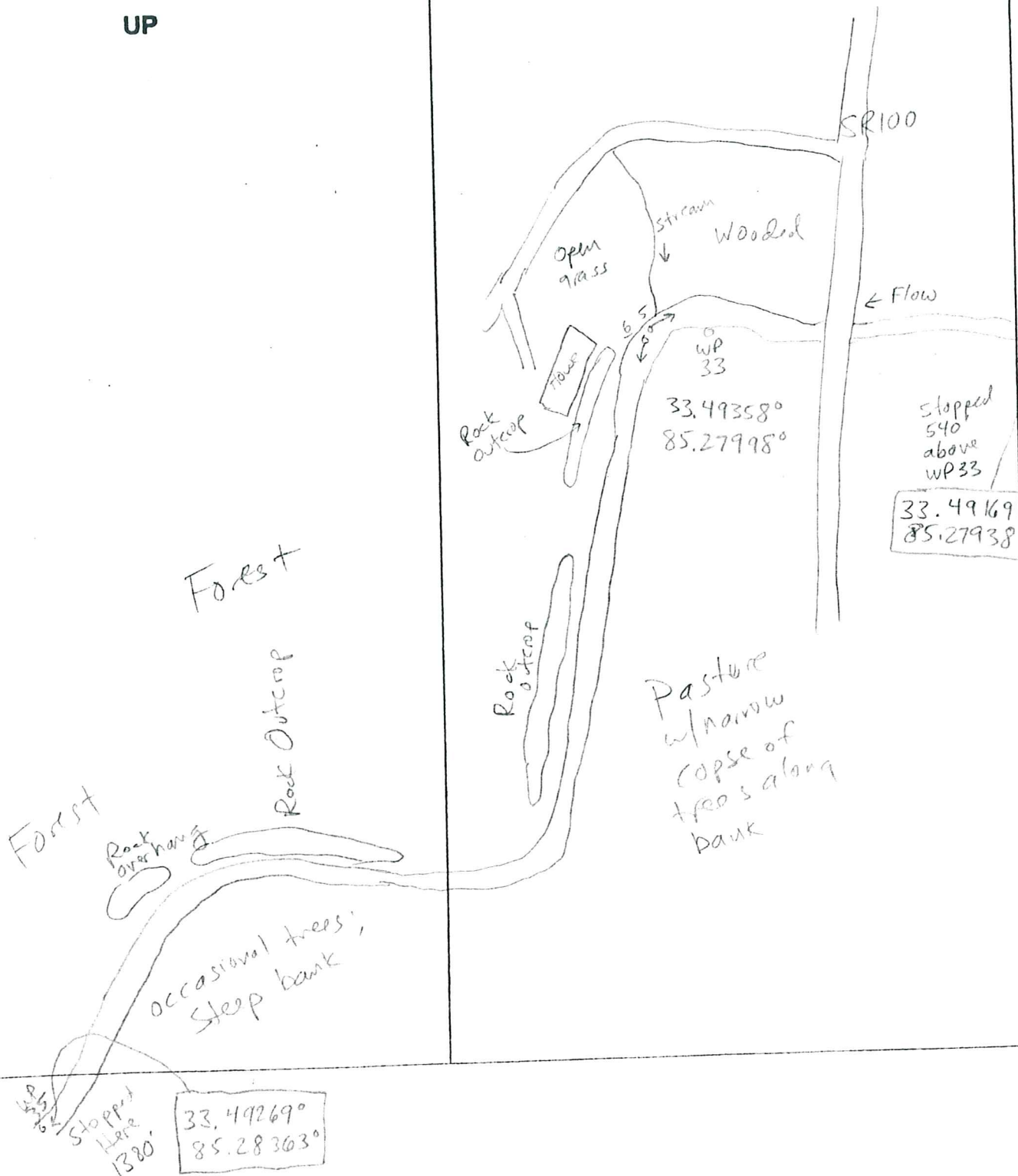
Villosa vibex - 3 L + 3 FD

Map of Crossing: Draw Reach and label centerline, direction of flow, and north

ZCD 1200
TCD 1149
ENG 1150
GRD 1250

UP

DOWN



Stream Survey Field Form

GRD 08-88

Task Order	P.I. Number:	Location: Mouth of Indian Branch	
Upper Lat:	Long:	Lower Lat:	Long:
Stream Name and Crossing Number: Big Indian Creek		County: Carroll	
Date: 7-23-08	River Basin and HUC Code: Coosa		
Investigators: GRD, TCD, ZCD, EWG			
<input type="checkbox"/> Fish <input type="checkbox"/> 4X6'seine <input type="checkbox"/> 6X10'seine <input type="checkbox"/> Dipnet <input type="checkbox"/> BP shocker <input type="checkbox"/> Boat shocker <input checked="" type="checkbox"/> Mussels <input checked="" type="checkbox"/> Grubbing <input type="checkbox"/> Diving <input type="checkbox"/> Snail			
Weather Conditions	<input type="checkbox"/> storm heavy <input type="checkbox"/> mostly cloudy <input type="checkbox"/> rain (steady) <input type="checkbox"/> partly cloudy <input type="checkbox"/> rain (intermittent) <input checked="" type="checkbox"/> clear		Has there been rain in the past 7 days? Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/> Approx. amount= 0.3 in
Stream Characterization	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Tidal	Stage <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Flooding <input checked="" type="checkbox"/> Low	Channel <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Straigtened <input type="checkbox"/> Deepened
Watershed Features	Predominant Surrounding Landscape (circle three most dominant) Forest Commercial Agricultural Field/Pastures Industrial Residential Other (explain)		Flow Calculations
			Length
			Depths
			Width:
Riparian Vegetation (Observe 18m from Streambank)	Buffer Type Trees/shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Other Herbaceous <input checked="" type="checkbox"/>	RDB-Up <input checked="" type="checkbox"/> LDB-Up <input checked="" type="checkbox"/> RDB-Down <input type="checkbox"/> LDB-Down <input type="checkbox"/> RDB-Down <input type="checkbox"/> LDB-Down <input type="checkbox"/>	UPPER RDB Buffer width= 710m LDB buffer width 2-5m
			LOWER RDB Buffer width= >10m LDB Buffer width 2-5m
Bank Description	UPPER Slope <input type="checkbox"/> Gently sloping <input type="checkbox"/> Moderately sloping <input checked="" type="checkbox"/> Steeply sloping	Bank Stability <input type="checkbox"/> Stable <input checked="" type="checkbox"/> Unstable, eroding <input type="checkbox"/> Moderately stable	LOWER Slope <input type="checkbox"/> Gently sloping <input type="checkbox"/> Moderately sloping <input checked="" type="checkbox"/> Steeply sloping
			Bank Stability <input type="checkbox"/> Stable <input checked="" type="checkbox"/> Unstable, eroding <input type="checkbox"/> Moderately stable
Canopy Cover	Upper <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Fringing <input checked="" type="checkbox"/> Closed		Lower <input type="checkbox"/> Open <input type="checkbox"/> Partly Open <input checked="" type="checkbox"/> Fringing <input checked="" type="checkbox"/> Closed
Instream Features Taken at centerline	Min/Max/Avg Depths 0.5 / 4 / 1' Min./Max/Avg channel width 25 / 40 / 30 Wetted widths (min/max/avg) 10 / 20 / 15		Min/Max/Avg Depths 0.5 / 3 / 1' Min./Max/Avg channel width 30 / 50 / 40 Wetted widths (min/max/avg) 15 / 30 / 20
	Estimated discharge 8 cfs		Water Temp: 80°F
			Air Temp: 85°F
Reach Features- Reach is defined as 450 ft upstream and 1000 ft downstream	Riffle: Run Systems # riffles 2	Glide: Pool Systems # bends 8 pool variability (low-high)	Beaver dam present? Yes? <input type="checkbox"/> No? <input checked="" type="checkbox"/>
			Beaver sign present? Yes? <input checked="" type="checkbox"/> No? <input type="checkbox"/>

Fauna Present: ☒ Fish ☐ Mussels ☐ Snails ☒ Corbicula ☐ Crayfish ☐ NoneSamples Kept: ☐ Fish ☐ Live Mussels ☐ Relic Mussels ☐ Snails ☐ Crayfish ☒ None

Habitat/Substrate Characterization in Reach - Describe the streambank habitat and stream substrate. Include descriptions of woody debris, leaf packs, algae, undercut banks, embeddedness, etc. in addition to describing the substrate types.

Substrate coarse sand, fine sand, pea gravel, clay. Moderately impacted by sedimentation. Most of study reach is a glide, presumably because sedimentation has evened out the pools. Corbicula abundant. No native mussels or snails. No large substrate. Banks eroding in some reaches. Downed woody debris common, but stream very workable.

Task Order _____ Stream: Big Indian Creek GRD 08-88
Date: 7-23-08 Location: Mouth of Indian Branch

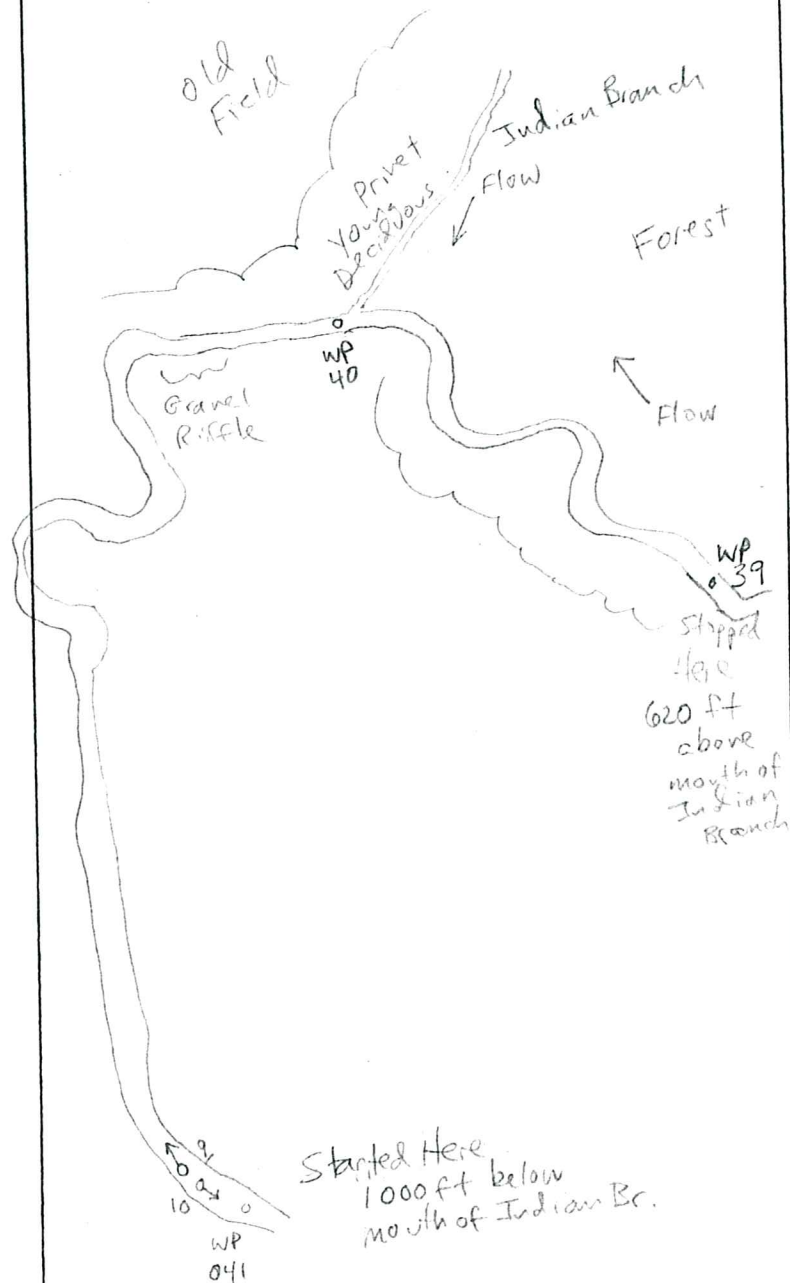
General Description of Habitat and Morphology; Describe water quality (turbidity) and note obvious point/non-point discharges; Describe Type and Road Crossing (bridge, culvert etc.). Describe any past alterations of stream reach.

Water moderately clear, U/W V/S N 1.5 ft. Water quality appears good. Very little anthropogenic debris present. Good buffer zone, but stream still impacted by upstrm sources.

Map of Crossing: Draw Reach and label centerline, direction of flow, and north

UP

DOWN



APPENDIX D

**STREAMFLOW CHARACTERISTICS PROVIDED BY THE
U.S. GEOLOGICAL SURVEY FOR NOONDAY CREEK
AND ETOWAH RIVER**



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PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site

Time-series: Real-time data

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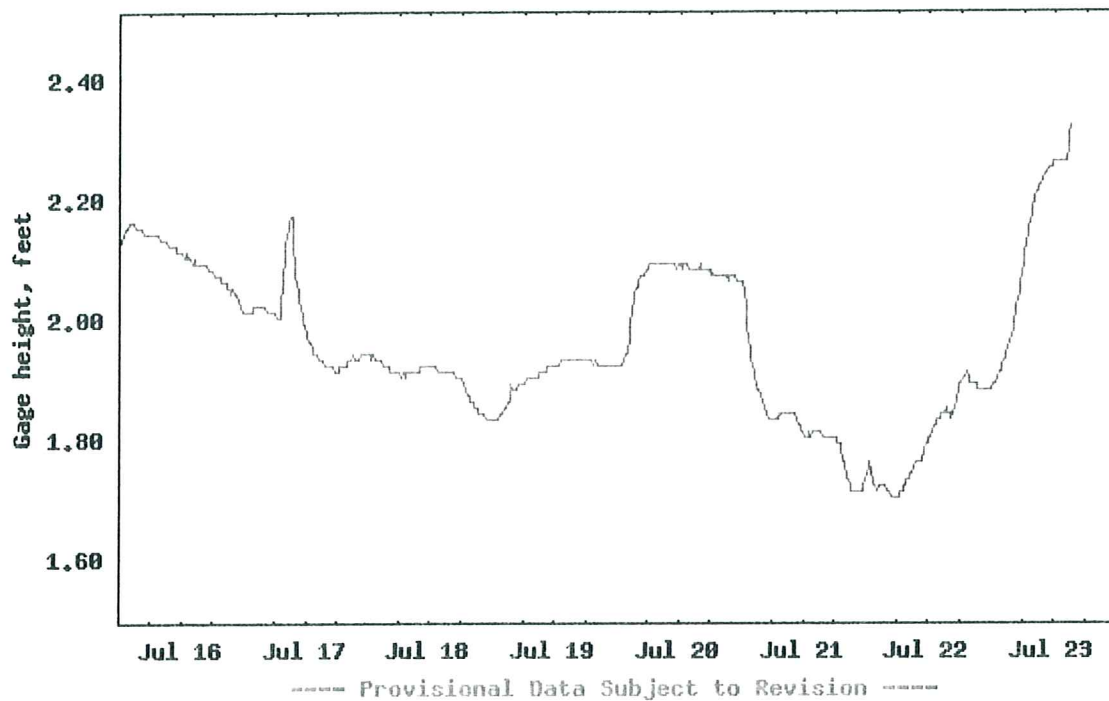
Available Parameters	Output format	Days	
<input type="checkbox"/> All 2 Available Parameters for this site <input checked="" type="checkbox"/> 00065 Gage height <input checked="" type="checkbox"/> 00045 Precipitation	Graph Graph w/ stats Graph w/o stats Table Tab-separated	7 (1-60)	GO

Summary of all available data for this site

Gage height, feet

Most recent instantaneous value: 2.32 07-23-2008 15:00

USGS 02413000 LITTLE TALLAPOOSA RIVER (US 27) AT CARROLLTON, GA.



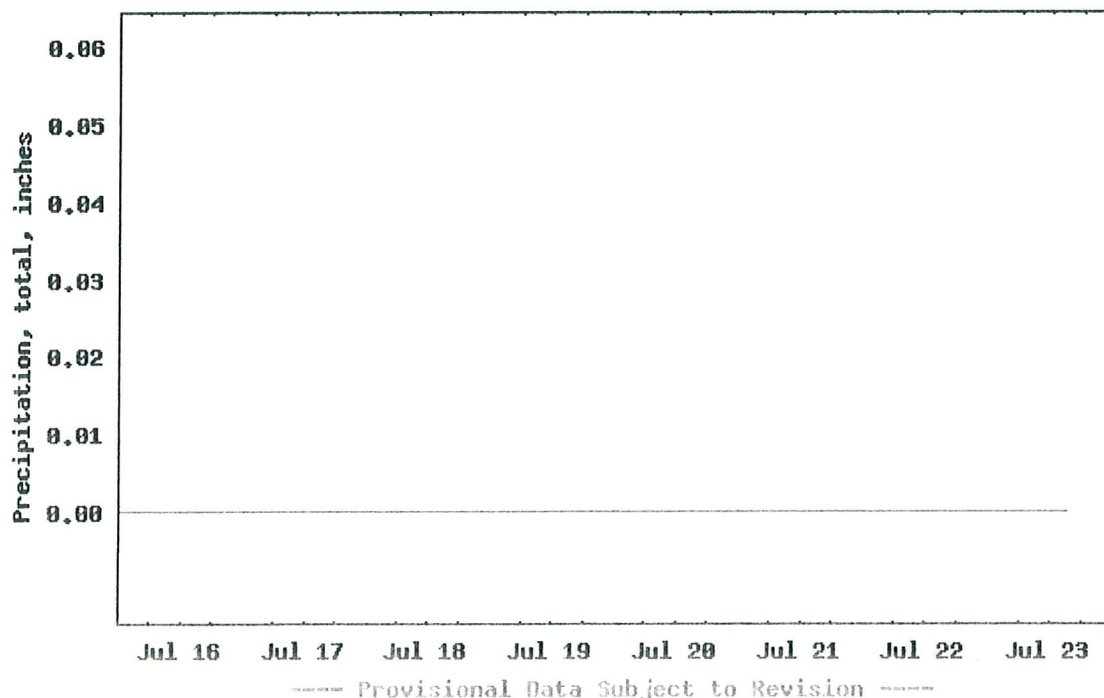
Create presentation-quality graph

Parameter 00065; DD 04

Precipitation, total, inches

Most recent instantaneous value: 0.00 07-23-2008 15:00

USGS 02413000 LITTLE TALLAPOOSA RIVER (US 27) AT CARROLLTON, GA.



Parameter 00045; DD 05

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URL: <http://waterdata.usgs.gov/nwis/uv?>

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2.46 2.04 ca03



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USGS 02413300 LITTLE TALLAPOOSA RIVER NEAR NEWELL AL

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Available data for this site

Time-series: Real-time data

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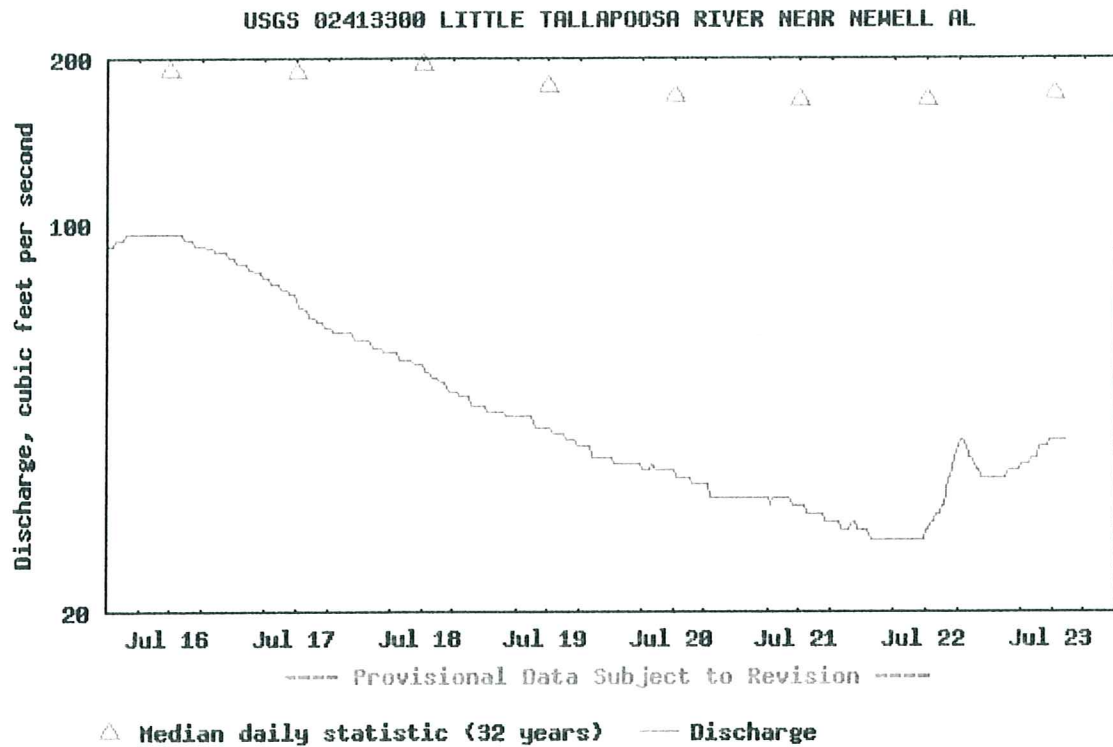


Available Parameters	Output format	Days	
<input type="checkbox"/> All 2 Available Parameters for this site <input checked="" type="checkbox"/> 00060 Discharge <input checked="" type="checkbox"/> 00065 Gage height	Graph Graph w/ stats Graph w/o stats Table Tab-separated	7 (1-60)	GO

Summary of all available data for this site

Discharge, cubic feet per second

Most recent instantaneous value: 41 07-23-2008 14:30



Create presentation-quality graph

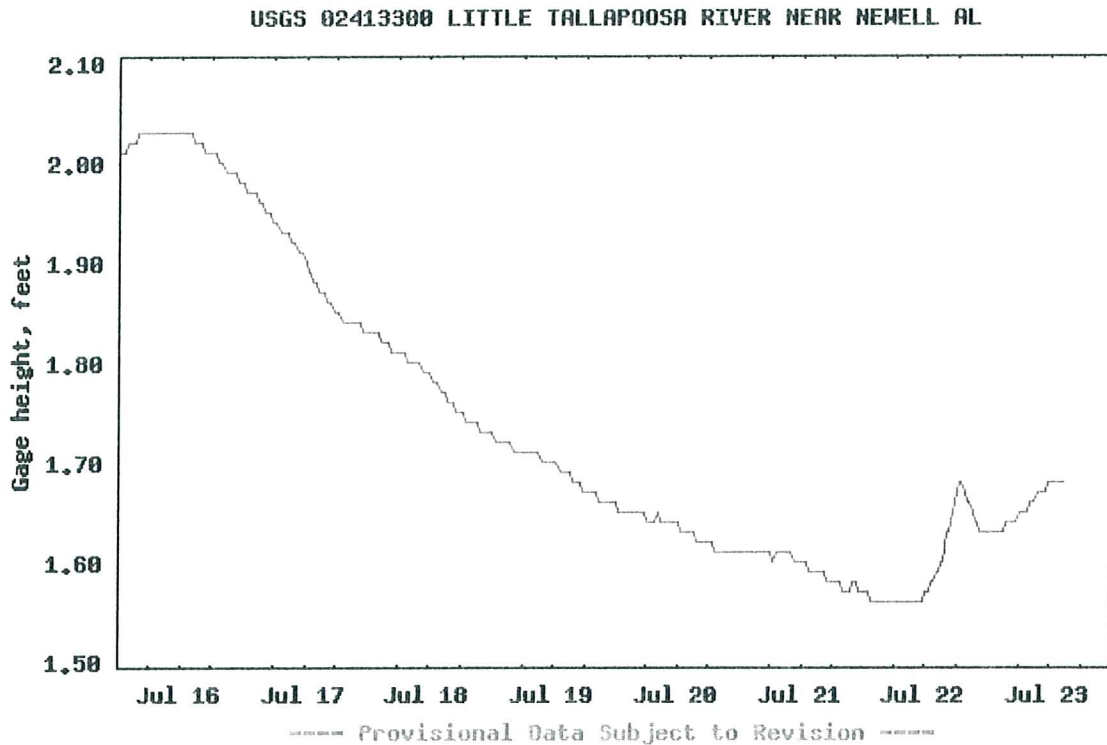
Parameter 00060; DD 01

**Daily discharge statistics, in cfs, for Jul 23 based on 32 years
of record** more

Min (2000)	Most Recent Instantaneous Value	20th percen- tile	Median	Mean	80th percen- tile	Max (1989)
27	41	89	173	396	446	2430

Gage height, feet

Most recent instantaneous value: 1.68 07-23-2008 14:30



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Parameter 00065; DD 02

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2.14 1.94 ca03