PRELIMINARY BIOTIC SURVEY OF CANE CREEK CALHOUN COUNTY, AL

BY

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Introduction

Only 3% of all water is freshwater. This natural resource is constantly being subjected to use and abuse by man. Streams such as Cane Creek have been utilized as dumpsites for wastewater effluents. Additionally, Cane Creek receives fertilizer-enriched rainwater which washes in from a golf course on Ft. McClellan. Activities such as these can affect the water quality of streams and the types of organisms which inhabit them. When water quality is poor, the organisms which inhabit the stream can be adversely affected (e.g. drop in population size, reproductive capability, and toxicity). Such waters are also hazardous to man. The waters become breeding grounds for disease-carrying organisms which are tolerant to pollution and thus don't have to compete with less tolerant organisms for territory and food.

Wetlands have also been exploited extensively. These 'transitional habitats between deepwater aquatic systems and terrestrial systems near bodies of water along natural soil-moisture gradients between permanently flooded deepwater areas and dry land' (Tiner, 1991) have for some time been credited with the ability to cleanse polluted water (Mitsch, 1986). Therefore, there is a need to determine where wetlands exist along streams.


ALABAMA
Little River
ETOWAH
Gadsden
CHEROKEE
CALHOUN
Jacksonville
Choccolocco
Cane Creek
Ragland
ST CLAIR
Anniston
Ohatchee
CLEBURNE
Choccolocco Creek
Coosa River
TALLADEGA

The improvement of water quality, coupled with functional wetlands will certainly aid in maintaining adequate environments for the many organisms which depend on freshwater for survival.

A biotic survey of Cane Creek (Calhoun County, AL) was conducted in Fall (1992) and Winter (1993) to determine the effects of seasonal change on the general water quality of the stream with respect to the parameters tested. Soil tests were conducted to delineate any wetland regions near the six sites in question. Additionally, the stream was electro -shocked at sites 2 and 3 to determine the types of fish which inhabit the stream. Also, the mollusc populations at each site were observed to determine if the endangered species *Tulatoma magnifica* was among the species present.

Knowing that wastewater effluents are dumped into the stream and that fertilizer washes into the creek from Ft. McClellan, the water quality of Cane Creek was questioned. The presence of wetlands along the stream was also assumed, since they are generally found near permanent bodies of water.

Cane Creek is a meandering second order stream which cuts a path almost entirely across Calhoun County (Fig. 1). It begins at an elevation of 487m and drains the western slope of Choccolocco Mt. Its mouth converges with the Coosa River in the Bailey Springs region below Neely Henry Dam (elevation <152m). Its width at the

headwaters (elevation - 305m) is approximately 2m. The creek broadens along its length and exceeds 15m in some locations (Topographic maps, 30th Engineering Battalion, U.S. Army; 1204th Engineering Corps, 1986).

Methods

The Fall and Winter biotic surveys of Cane Creek were performed utilizing EPA standard methodology for rapid biological assessment and Hach's water quality test kit. The surveys consisted of two tests: 1) water chemistry and 2) benthic macroinvertebrate studies of pollution indicator species.

Six sites along Cane Creek were studied and identified as: Site 1 - Headwaters (elevation:305m - Bain Gap between ranges 21 and 22), Site 2 - Hwy. 21 Bridge (elevation:209m - adjacent to Burdett's Pawn Shop), Site 3 - Effluent dumpsite (several meters below Site 2), Site 4 - Woodland Park (elevation:206m - behind Blue Hole), Site 5 - Pelham Range (elevation:158m - Area 24B), and Site 6 - Mouth (elevation:<152m). The sites will be referred to as Site 1 - 6 for the remainder of this report.

Specific parameters measured were: ammonia, carbon dioxide, chloride, dissolved oxygen, hardness, nitrites, pH, temperature, and turbidity.

The benthic surveys involved collection of macroinvertebrates from the riffle areas of the 6 sites along Cane Creek from headwaters to mouth. The organisms were classified into three taxa groups according to their tolerance to pollution. Taxa groups represented were: 1) Group 1: pollution intolerant, 2)

Group 2: pollution resistant, and 3) Group 3: pollution tolerant. When classified, the sites were given a rating based on the types of organisms present at the sites.

Wetland surveys were conducted at sites 2/3 and 6 to determine vegetation, hydrology, and soil type(s), which is standard procedure utilized in the evaluating wetland existence.

Plants collected were identified at the herberium of Jacksonville State University. They were classified as obligate (OBL), facultative (FAC), facultative wetland (FACW), or facultative upland (FACU) (Reed, 1988) in order to determine if hydrophyte vegetation criteria was met for the sites in question (Tiner, 1991).

Hydrology was evaluated by examining water movement patterns along the stream (e.g. driftlines, debris, erosion of stream banks).

Soil types were determined utilizing Munsell's Soil Color Charts (chart 10YR) and a soil probe. A chroma of 1 or 2 was anticipated for the sites tested.

Results

The following tables represent the findings based on the Fall (1992) and Winter (1993) studies of Cane Creek:

Figure 1 is a map of Northeast Alabama showing the location of Cane Creek with respect to the Coosa River and surrounding counties.

Figures 2 and 3 are graphs illustrating the changes in the water chemistry of Cane Creek from Fall (1992) - Winter (1993).

Figures 4 and 5 represent the types of organisms per taxa group per site represented by the Fall (1992) - Winter (1993) surveys.

Tables 1 and 2 are compilations of the results of the water chemistry analyses.

Tables 3 through 14 are lists of specific organisms collected at each of the 6 sites. Cumulative index values are recorded for each site (Fall-1992 and Winter-1993).

Table 15 is a list of the flora collected at each site along with cover type, dominance, and regional index values for each species.

Appendix 1 is a report on the wetland delineation of Site 2/3.

Appendix 2 is an IchthyofaunalSurvey of Sites 2 and 3.

Appendix 3 is a report on the wetland delineation of Site 6.

Appendix 4 is a Mollusc Survey of Cane Creek which was conducted for Ft. McClellan in the fall of 1992.

Discussion

Cane Creek is a moderately fast-flowing stream whose water chemistry varies with the seasons (Tables 1 and 2; Figures 2 and 3),but whose water quality remains relatively constant as indicated by the macroinvertebrate populations which inhabit the creek. Although the kinds of organisms present in the stream are the same as in the fall survey, their dispersal at the sites varies some (Figures 4 and 5).

The streambed at its upper reaches is predominantly solid bedrock with some rocks and pea gravel between the crevices of the bedrock. The water in this region is sparkling clear,cold, and flowing through well-defined banks below the forest floor. Allochthonous material is scarce. Macroinvertebrates inhabiting the stream at Site 1 are primarily representatives of taxa group 1 (Tables 3 and 4).

WINTER WATER QUALITY OF CANE CREEK, CALHOUN COUNTY, AL

	Site 6	Site 5	Site 4	Site 3	Site 2	Site 1
Ammonia (mg/l)	0.0	0.0	0.0	0.0	0.0	0.0
Carbon dioxide (mg/l)	10.0	10.0	10.0	10.0	5.0	10.0
Chloride (mg/l)	22.5	22.5	22.5	30.0	22.5	22.5
Dissolved oxygen (mg/l)	10.2	10.0	10.0	10.0	11.0	11.0
Nitrites (mg/l)	0.1	0.0	0.1	0.7	0.0	0.0
pH	7.8	8.2	7.8	7.5	8.0	6.5
Temperature (C)	11.0	11.1	11.8	15.5	15.5	12.2
Turbidity (NTU)	0.0	0.6	0.0	0.0	0.0	0.0

FALL WATER QUALITY OF CANE CREEK, CALHOUN COUNTY, AL

	Site 6	Site 5	Site 4	Site 3	Site 2	Site 1
Ammonia (mg/l)	0.0	0.0	0.0	0.1	0.0	0.0
Carbon dioxide (mg/l)	15.0	20.0	15.0	15.0	15.0	5.0
Chloride (mg/l)	15.0	15.0	15.0	22.5	15.0	15.0
Dissolved oxygen (mg/l)	10.0	10.0	6.0	7.0	10.0	9.0
Nitrites (mg/l)	0.0	0.0	0.8	1.2	0.0	0.0
pH	7.6	7.6	7.4	7.7	7.6	6.3
Temperature (C)	21.1	17.8	20.0	20.0	18.8	13.3
Turbidity (NTU)	1.0	0.0	0.0	0.0	0.0	0.0

FIGURE 2

FALL WATER QUALITY OF CANE CREEK, CALHOUN COUNTY, AL

	Site 6	Site 5	Site 4	Site 3	Site 2	Site 1
Ammonia (mg/l)	0.0	0.0	0.0	0.1	0.0	0.0
Carbon dioxide (mg/l)	15.0	20.0	15.0	15.0	15.0	5.0
Chloride (mg/l)	15.0	15.0	15.0	22.5	15.0	15.0
Dissolved oxygen (mg/l)	10.0	10.0	6.0	7.0	10.0	9.0
Nitrites (mg/l)	0.0	0.0	0.8	1.2	0.0	0.0
pH	7.6	7.6	7.4	7.7	7.6	6.3
Temperature (C)	21.1	17.8	20.0	20.0	18.8	13.3
Turbidity (NTU)	1.0	0.0	0.0	0.0	0.0	0.0

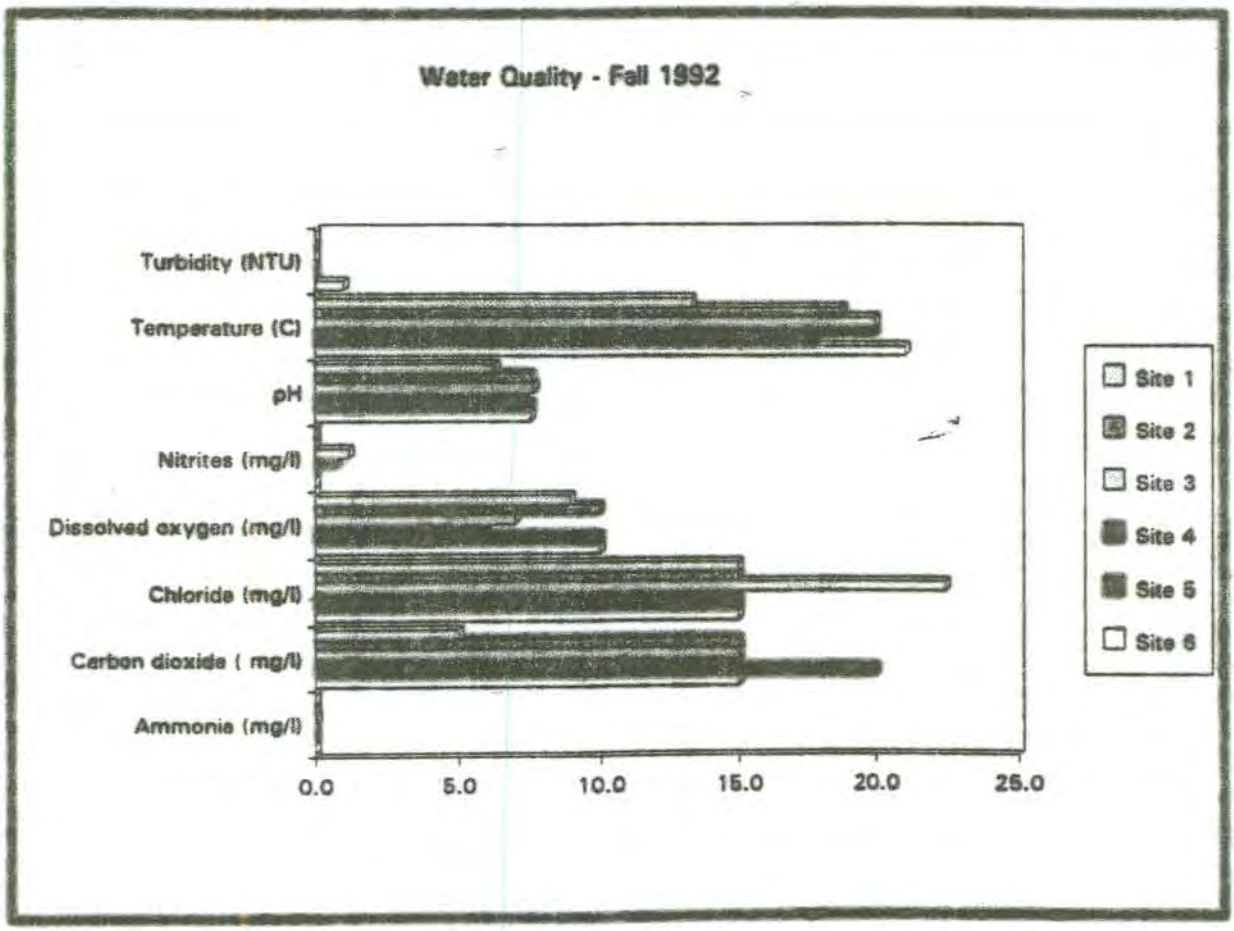

FIGURE 3

WINTER WATER QUALITY OF CANE CREEK, CALHOUN COUNTY, AL

	Site 6	Site 5	Site 4	Site 3	Site 2	Site 1
Ammonia (mg/l)	0.0	0.0	0.0	0.0	0.0	0.0
Carbon dioxide (mg/l)	10.0	10.0	10.0	10.0	5.0	10.0
Chloride (mg/l)	22.5	22.5	22.5	30.0	22.5	22.5
Dissolved oxygen (mg/l)	10.2	10.0	10.0	10.0	11.0	11.0
Nitrites (mg/l)	0.1	0.0	0.1	0.7	0.0	0.0
pH	7.6	8.2	7.9	7.5	8.0	6.5
Temperature (C)	11.0	11.1	11.6	15.5	15.5	12.2
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0	0.0

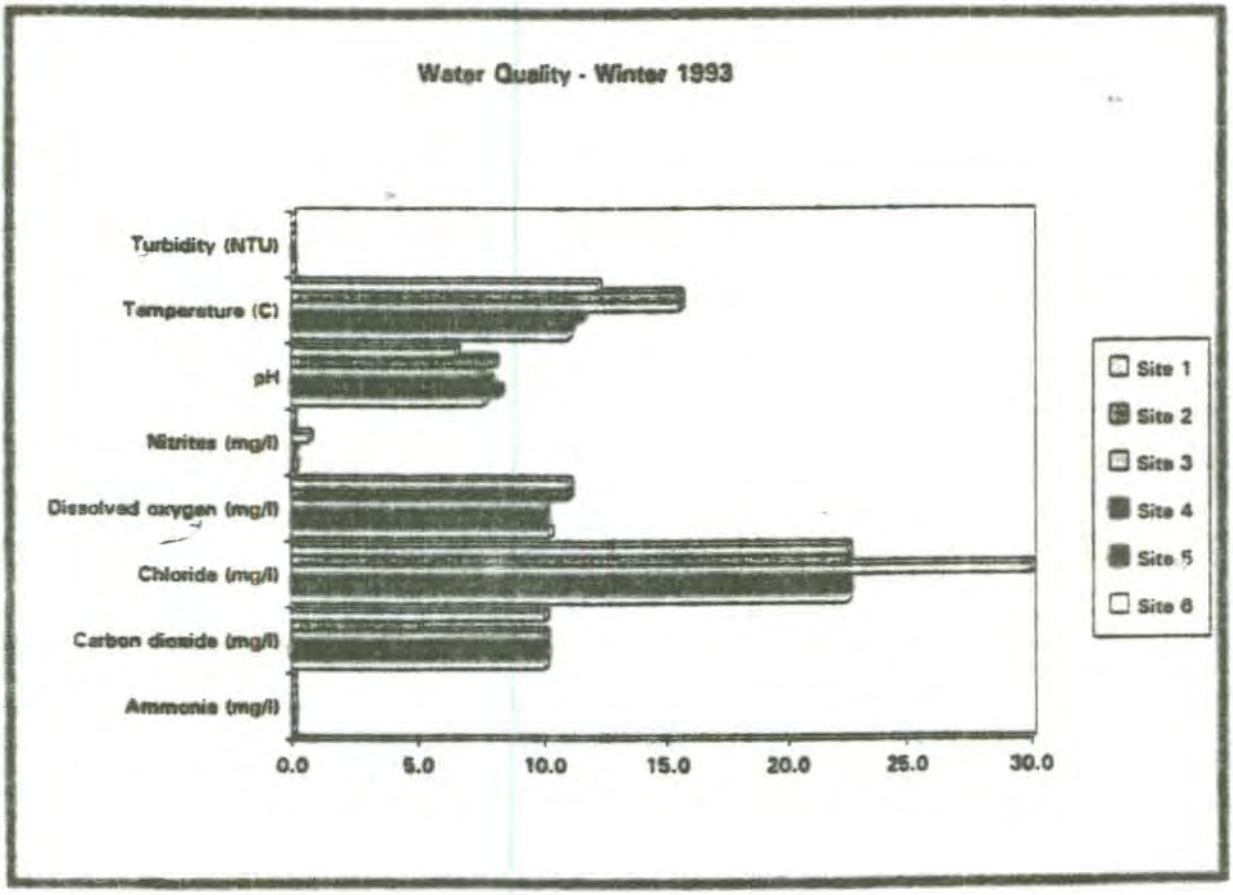

FIGURE 4

FALL BENTHIC SURVEY OF CANE CREEK, CALHOUN COUNTY, AL

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
Group 1	2	3	2	1	2	0
Group 2	1	2	1	3	1	1
Group 3	0	2	5	2	0	2

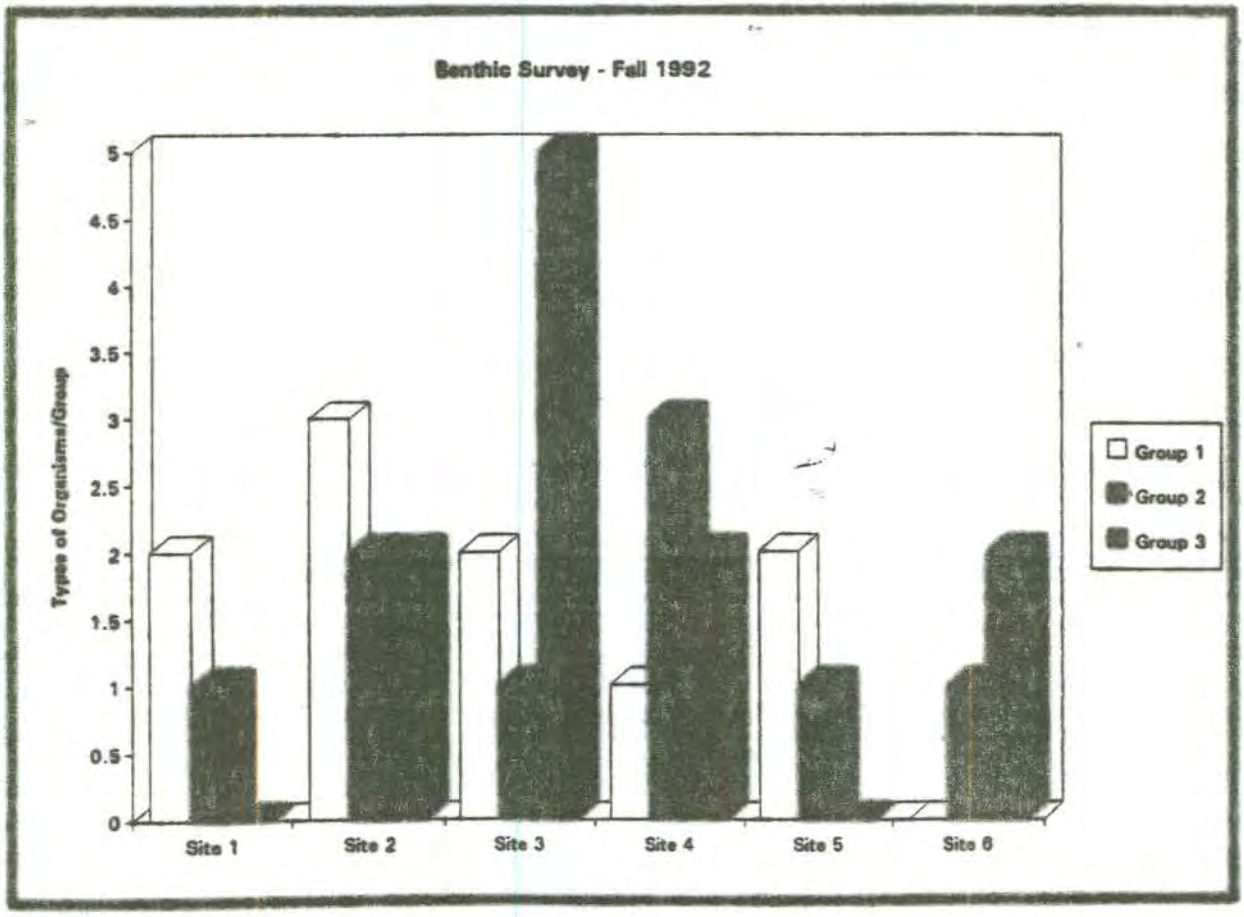

FIGURE 5

WINTER BENTHIC SURVEY OF CANE CREEK, CALHOUN COUNTY, AL

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
Group 1	4.0	2.0	3.0	3.0	4.0	0.0
Group 2	0.0	2.0	1.0	2.0	2.0	1.0
Group 3	1.0	0.0	4.0	3.0	1.0	1.0

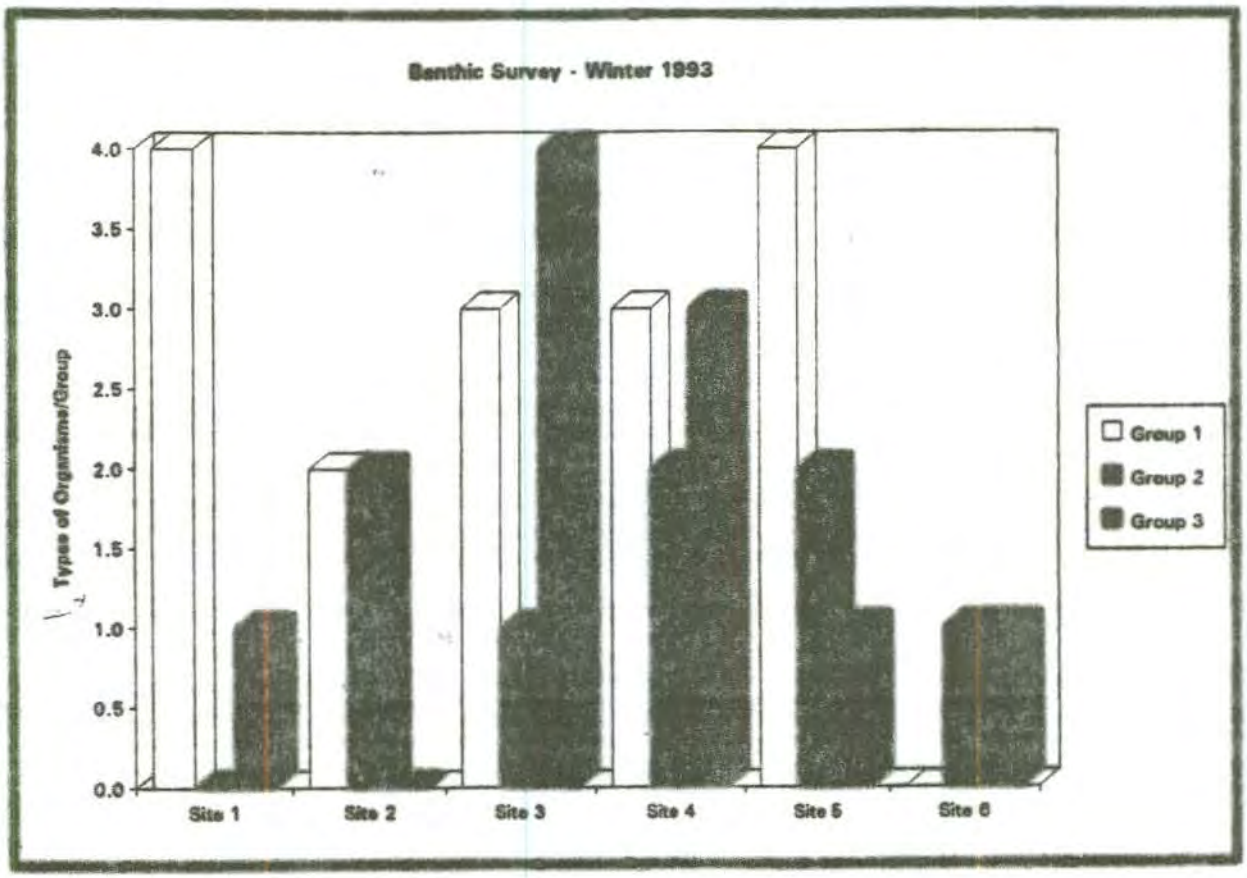

Table 3
BENTHIC SURVEY SITE 1 FALL 1992

Taxa	Group	Index Value
Water Penny (Coleoptera)	1	3
Mayfly (Ephemeroptera)	1	3
Sowbugs(Crustacea)	2	2
Group 1: 2x3 = 6 Group 2: 1x2 = 2 Group 3: 0x1 = 0 Cumulative index = 8 (poor)		

Table 4
BENTHIC SURVEY SITE 1 WINTER 1993

Taxa	Group	Index Value
Water Penny (Coleoptera)	1	3
Mayfly (Ephemeroptera)	1	3
Caddisfly (Trichoptera)	1	3
Stonefly (Plecoptera)	1	3
Blackfly (Diptera)	3	1
Group 1: 4x3 = 12 Group 2: 0x2 = 0 Group 3: 1x1 = 1 Cumulative index = 13 (Fair)		

The soft water at Site 1 remained unchanged during the winter, but the temperature dropped. Carbon dioxide, chloride dissolvedoxygen, and pH levels increased.

The winter benthic survey yielded a higher cumulative tolerance index than the fall survey and additional types of organisms such as stoneflies, blackflies and caddisflies were also collected. Higher populations of all organisms were observed

than was observed in the fall survey. However, the water quality at this site remained only fair.

Site 2 is also moderately fast-flowing. The streambed at this site consists of boulders, rocks, and some sand along the banks. Sand bags and pipes which were observed in the fall were no longer present on the streambed. Apparently, the scouring during the rainy season of winter washed them downstream.

The winter water chemistry yielded a drop in carbon dioxide, hardness, and temperature and an increase in chlorides, dissolved oxygen, and pH. There was still no indication of ammonia or nitrites at this site.

The benthic survey yielded less diversity of organisms and a cumulative index value of 10(poor), lower than the fall survey value of 15(fair). Again, scouring of the streambed or possible migration of organisms to calmer waters could explain these findings. No organisms of taxa group 3 were observed at the time of the winter survey (Tables 5 and 6).

Table 5
BENTHIC SURVEY SITE 2 FALL 1992

Taxa	Group	Index Value
Water Penny (Coleoptera)	1	3
Gilled Snail (Mollusca)	1	3
Mayfly (Ephemeroptera)	1	3
Clam (Mollusca)	2	2
Damselfly (Odonata)	2	2
Aquatic Worms (Oligochaeta)	3	1
Chiromomous (Diptera)	3	1
Group 1: 3x3 = 9	Group 2: 2x2 = 4	Group 3: 2x1 = 2
Cumulative index = 15 (Fair)		

Table 6
BENTHIC SURVEY SITE 2 WINTER 1993

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Gilled Snail (Mollusca)	1	3
Damselfly (Odonata)	2	2
Clam (Mollusca)	2	2
Group 1: 2x3 = 6	Group 2: 2x2 = 4	Group 3: 0x1 = 0
Cumulative index = 10 (Poor)		

Site 3, the effluents dumpsite, remained a problem site during the winter months. Ammonia, chlorides, and nitrites were still present in the stream. Ammonia and nitrites decreased but chloride levels increased. In fact, the chloride count was highest at Site 3, doubled since the fall. There was a rise in dissolved oxygen and a decrease in carbon dioxide, hardness, pH, and temperature.

The benthic population was only slightly changed since the fall survey. The pouch snails which were present in the fall were no longer at Site 3, but the midge and clam populations were still high. The worm populations were also in abundance (Tables 7 and 8).

Table 7
BENTHIC SURVEY SITE 3 FALL 1992

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Stonefly (Plecoptera)	1	3
Clam (Mollusca)	2	2
Chironomous (Diptera)	3	1
Pouch Snail (Mollusca)	3	1
Aquatic Worms (Oligochaeta)	3	1
Tubifex Worms (Oligochaeta)	3	1
Snail Eggs (Mollusca)	3	1
Group 1: 2x3 = 6	Group 2: 1x2 = 2	Group 3: 5x1 = 5
Cumulative index = 13 (Fair)		

Table 8
BENTHIC SURVEY SITE 3 WINTER 1993

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Gilled Snail (Mollusca)	1	3
Caddisfly (Trichoptera)	1	3
Clam (Mollusca)	2	2
Chironomous (Diptera)	3	1
Aquatic Worms (Oligochaeta)	3	1
Other Diptera (2species)	3	1
Group 1: 3x3 = 9	Group 2: 1x2 = 2	Group 3: 3x1 = 3
Cumulative index = 14 (Fair)		

A wetland survey was performed at Site 2/3 (Appendix 1). Vegetation, hydrology, and soil tests confirmed the presence of a small wetland characteristic of a marsh found in southern bottomland forests (Brown, 1969).

An ichthyofaunal survey of Sites 2 and 3 was performed utilizing electro-shocking to determine the kinds of fish as well as numbers of species found in the stream. Several species of fish were identified and placed into the museum at Jacksonville State University(Appendix 2). The survey was conducted at these sites because of the proximity of the sites to the wastewater effluents dumpsite. I wanted to see if the effluents had any effect on the species found at that site as opposed to those found at site 2. Fewer species were observed at Site 3 than at Site 2.

Site 4 was forested and the stream was more laminar. While allochthanous material was abundant in the fall, the streambed was now scoured. Algal growth was present on the rocks in the stream. Sand filled the crevices between the rocks. The banks of the creek were well-defined. This site is home for several species of molluscs. Liverworts are also present and weren't observed at the other sites along the creek.

The winter water chemistry yielded a presence of ammonia at a slightly higher level than the fall reading. Carbon dioxide,

nitrites, hardness, and temperature decreased while chlorides, dissolved oxygen, and pH increased.

The benthic survey yielded a higher cumulative tolerance index-16(fair), than in the fall (Tables 9 and 10). This figure was probably due to migration of gilled snails and caddisflies to the area. These species weren't observed at this site in the fall.

Table 9
BENTHIC SURVEY SITE 4 FALL 1992

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Dragonfly (Odonata)	2	2
Crayfish (Crustacea)	2	2
Clam (Mollusca)	2	2
Pouch Snail (Mollusca)	3	1
Aquatic Worms (Oligochaeta)	3	1
Group 1: 1x3 = 3 Group 2: 3x2 = 6 Group 3: 2x1 = 2 Cumulative index = 11 (Fair)		

Table 10
BENTHIC SURVEY SITE 4 WINTER 1993

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Caddisfly (Trichoptera)	1	3
Gilled Snail (Mollusca)	1	3
Clam (Mollusca)	2	2
Dragonfly (Odonata)	2	2
Pouch Snail (Mollusca)	3	1
Other Snails (Mollusca)	3	1
Aquatic Worms (Oligochaeta)	3	1
Group 1: 3x3 = 9 Group 2: 2x2 = 4 Group 3: 3x1 = 3 Cumulative index = 16 (Fair)		

Site 4 is still influenced by the activity at Site 3. Although the nitrite level dropped, ammonia and chlorides were elevated and pouch snails were now found at this site. They did not inhabit this area in the fall. They are believed to have migrated from Site 3 because there were no pouch snails found at Site 3 in Febuary.

The stream widens at Site 5. The streambed consists of rocks, cobble, and sand. This is an observable difference from the fall description of the site. At that time there was a slimy clay consistancy of substrate on the streambed covering the rocks. Apparently the streambed had been scoured here,also.

Water chemistry tests yielded decreases in carbon dioxide, hardness and temperature. Levels of chloride and pH increased, while the dissolved oxygen levels remained unchanged. Again, as in October, ammonia and nitrites were absent at Site 5.

The winter benthic survey was impressive. The cumulative index was 17(good) as opposed to 8(poor) in the fall. Apparently the chlorides in the stream have no particular adverse effects on the organisms present (Tables 11 and 12). Also, the change in substrate may have made inhabitation possible for those species

which weren't observed in October.

Table 11
BENTHIC SURVEY SITE 5 FALL 1992

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Gilled Snail (Mollusca)	1	3
Clam (Mollusca)	2	2
Group 1: 2x3 = 6	Group 2: 1x2 = 2	Group 3: 0x1 = 0
Cumulative index = 8	(Poor)	

Table 12
BENTHIC SURVEY SITE 5 WINTER 1993

Taxa	Group	Index Value
Mayfly (Ephemeroptera)	1	3
Caddisfly (Trichoptera)	1	3
Gilled Snail (Mollusca)	1	3
Dobsonfly (Megoloptera)	1	3
Dragonfly (Odonata)	2	2
Clam (Mollusca)	2	2
Blackfly (Diptera)	3	1
Group 1: 4x3 = 12	Group 2: 2x2 = 4	Group 3: 1x1 = 1
Cumulative index = 17	(Good)	

Site 6, the mouth of Cane Creek, is deeper and more laminar than the other sites tested. It is much wider and slightly turbid. The streambed is silty and packed.

The winter water chemistry yielded a trace of ammonia and nitrites which weren't detected in the fall survey. There was

also an increase in chloride and hardness. pH remained constant while carbon dioxide and temperature decreased.

The benthic study resulted in a slightly lower cumulative index than in October,1992 (Tables 13 and 14). There is an absence of suitable substrate to support benthic macroinvertebrates at this site. The substrate is highly silted and packed. Vegetation is minimal and there are no rocks of significant size at this site. The cumulative index value at this site was 4(poor) in October and 3(poor) in February. The organisms collected were representative of taxa groups 2 and 3, which are pollution tolerant species.

Table 13
BENTHIC SURVEY SITE 6 FALL 1992

Taxa	Group	Index Value
Dragonfly (Odonata)	2	2
Midge (Diptera)	3	1
Aquatic Worms (Oligocheata)	3	1
Group 1: 0x3 = 0	Group 2: 1x2 = 2	Group 3: 2x1 = 2
Cumulative index = 4 (Poor)		

Table 14
BENTHIC SURVEY SITE 6 WINTER 1993

Taxa	Group	Index Value
Clam (Mollusca)	2	2
Midge (Diptera)	3	1
Group 1: 0x3 = 0	Group 2: 1x2 = 2	Group 3: 1x1 = 1
Cumulative index = 3 (Poor)		

A wetland delineation was conducted at this site. Additional flora was observed in Febuary during the study of the site. The vegetation, hydrology and soils tests confirmed the existance of a wetland (Appendix 3).

Table:15

VEGETATION SURVEY OF SIX SITES ALONG CANE CREEK

SITE	SCIENTIFIC NAME	STRATUM	R2 INDEX
1	*Quercus alba*	(5)C	FACU
	Quercus shumardi	(5)C	FACW
	Acer leucoderme	(5)C	FACU
	Liquidambar styraciflua	(4)C	FAC
	Xanthorhiza simplicissima	(4)S	FACW
	Alnus serrulata	(3)S	FACW
	Cephalanthus occidentalis	(1)S	OBL
	Hamamelis virginiana	(R)S	FACU
	Aster spp.	(5)H	Unknown
	Dicanthelium dicotomum	(4)H	FAC
	Eupatoriadelphus spp.	(4)H	Unknown
2/3	*Platanus occidentalis*	(5)C	FACU
	Liquidambar styraciflua	(5)C	FAC
	Cornus amomom	(5)C	FACW
	Salix nigra	(2)C	OBL
	Alnus serrulata	(4)S	FACW
	Justicia americana	(5)H	OBL
	Typha latifolia	(4)H	OBL
	Polygonum hydropeperoides	(4)H	OBL
	Boehmeria cylindrica	(4)H	FACW
	Juncus effusus	(2)H	FACW
	Salix caroliniana	(1)H	OBL
4	*Liquidambar styraciflua*	(5)C	FAC
	Cornus amomum	(5)C	FACW
	Fraxinus pensylvanica	(4)C	FACW
	Salix nigra	(3)C	OBL
	Acer negundo	(3)C	FACW
	Liriodendron tulipifera	(2)C	FAC
	Liqustrum sinense	(5)S	FAC
	Scirpus cyperinus	(4)H	OBL

SITE	SCIENTIFIC NAME	STRATUM	R2 INDEX
5	*Acer leucoderme*	(5)C	FACU
	Quercus alba	(5)C	FACU
	Liquidambar styraciflua	(5)C	FAC
	Cornus amomum	(4)C	FACW
	Eagus grandifolia	(3)C	FACU
	Liriodendron tulipifera	(1)C	FAC
	Platanus occidentalis	(1)C	FACW
	Ulmus alata	(1)C	FACU
	Oxydendrum arboream	(1)C	NI
	Liguistrum sinense	(4)S	FAC
	Itea virginica	(3)S	FACW
	Sassafras albidum	(1)S	FACU
	Pilea pumila	(4)H	FACW
	Lechea torreyi	(3)H	FACU
	Elephantopus carolinianus	(3)H	FAC
	Acalypha virginica	(2)H	FACU
6	*Liquidambar styraciflua*	(5)C	FAC
	Liriodendron tulipifera	(5)C	FAC
	Cephalanthus occidentalis	(4)S	OBL
	Pluchea camphorata	(5)H	FACW
	Juncas effusus	(4)H	FACW
	Solidago altissima	(4)H	FACU
	Vernonia gigantea	(3)H	FAC

a. A number 1-5 entered under stratum denotes coverage of species at site. Values are 5 - 50 to 100%, 4 - 25 to 50%, 3 - 12.5 to 25%, 2 - 5 to 12%, 1 - 1 to 5%, and R - rare.

b. A letter C, S, or H denotes canopy, shrub, or herb, respectively.

c. OBL = obligate, FAC = facultative, FACW = facultative wetland, and FACU = facultative upland.

Conclusions:

The following conclusions are presented for review:

1) Seasonal changes do affect the water quality of Cane Creek. The level of pollutants is lower in winter but is still a concern at Sites 3 and 4.

2) Chlorides are higher in winter than in fall at all sites tested.

3) The benthic organisms in the stream are primarily pollution tolerant species, with the greatest concentrations at Sites 3 and

4) Wetland regions exist at Site 2/3 and Site 6. Though not included in the study, there are several other wetland regions along this creek.

5) The average water quality for the stream is 10.9 (Poor). This figure is based on a Fall-1992/Winter-1993 study of the creek. The quality of the stream degrades from headwaters to mouth.

6) An ichthyofaunal survey conducted at Site 2 and 3 yielded more species of fish at Site 2 than at Site 3.

7) There were no signs of the *Tulatoma magnifica* in Cane Creek at the sites surveyed.

Further research should be conducted to determine the reliability of this study. Questions which warrant further consideration are:

1) What phenomenon could account for the presence of chlorides in the creek at all 6 sites?

2) What effect do the wetland regions along Cane Creek have on the water quality of the creek?

3) How extensive was the search for the endangered mollusc *Tulatoma maginfica*, initially?

4) How do the species of fish identified at the upper reaches of the creek compare with those at the mouth in types and numbers?

5) Is the water quality of Cane Creek suitable for recreational purposes such as swimming and fishing? Particular concern is expressed with respect to Sites 3,4, and 6.

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JACKSONVILLE STATE UNIVERSITY ICHTHYOLOGICAL COLLECTIONS

Project: An Ichthyological survey of Cane Creek, Calhoun County, AL

Drainage System: Coosa River Drainage Field No. TD93-13

Locality: Cane Creek at the bridge on AL HWY 21 across from Ft. McClellan Middle Gate

Township:____ Range:____ Section:____

County: Calhoun Date: 3/__/93 Time: 16:00-17:00

Water: turbid Current: slow - moderate

Diss. Oxyg. level:____ Water temp.:____

Vegetation: Justicia (died back)

Bottom: bedrock, boulders, cobble, silt

Dist. offshore: to 15 ft. Stream width: to 30 ft.

Depth of capture: to 2½ ft. Depth of water: to 3 ft.

Collected by: T. Dodson and L. Weinegar

Method of capture: backpack electrofishing

Orig. preserv.: 15% Formalin: 1 jar

List of Species:

	No. coll.	Comments
Campostoma oligolepis	20	(3 retained)
Luxilus chrysocephalus	17	(11 retained)
Notropis xaenocephalus	1	
Hypentelium etowanum	5	1 retained
Ictalurus natalis	4	1 retained
Lepomis cyanellus	8	1 retained
Lepomis megalotis	18	2 retained
Micropterus coosae	7	1 retained
Etheostoma sp.	2	1 - Mark's Aquarium

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): Loretta Weninger & Don Spaulding Date: 06 Feb 93
Project/Site: Site 2/3 Hwy 211 (Bellwood Gate) State: AL County: Calhoun
Applicant/Owner: ______ Plant Community #/Name: ______
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ____ No ✓ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ✓ No ____ (If yes, explain on back) (area is maintained by city of Anniston; sewer effluents are dumped into creek; pipe across creek)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Platanus occidentalis	FACW-	T	11. Juncus effusus	FACW+	H
2. Salix nigra	OBL	T	12. Polygonum sp.	NI	H
3. Alnus serrulata	FACW+	S	13.		
4. Ligustrum sinense	FAC	S	14.		
5. Cornus amomum	FACW+	S	15.		
6. Justicia americana	OBL	H	16.		
7. Typha latifolia	OBL	H	17.		
8. Ludwigia alternifolia	OBL	H	18.		
9. Nasturtium officinale	OBL	H	19.		
10. Carex sp.	NI	H	20.		

Percent of dominant species that are OBL, FACW, and/or FAC ______
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale: hydrophytic vegetation (several types)

SOILS

Series/phase: Philo series / Philo+Stendal fine sandy loam Subgroup:[2] ______
Is the soil on the hydric soils list? Yes ____ No ____ Undetermined ______
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ✓
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: 10YR 4/2 Mottle Colors: ______
Other hydric soil indicators: ______
Is the hydric soil criterion met? Yes ____ No ____
Rationale: low chroma

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: to 3"
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole: NA
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale: debris, driftlines

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ✓ No ____
Rationale for jurisdictional decision:
hydrophytic vegetation, driftlines to 5' above water level, low soil chroma

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): Loretta Weinegar & Dan D. Spaulding Date: 13 Feb 93
Project/Site: Cane Creek - Mount R. Site 6 State: AL County: Calhoun
Applicant/Owner: / Plant Community #/Name:
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Platanus occidentalis	FACW	T	11.		
2. Liquidambar styraciflua	FAC+	T	12.		
3. Salix nigra (marshall)	OBL	T	13.		
4. Acer rubrum L.	FAC	T	14.		
5. Quercus nigra L.	FAC	T	15.		
6. Celtis laevigata (willd)	FACW	T	16.		
7. Crataegus sp.		T	17.		
8. Sable minor (Jacquin)	FACW	S	18.		
9. Aquidiacic gymnocarpon	FACW	S	19.		
10. Viola sagittata (Aiton)	FAC	H	20.		

Percent of dominant species that are OBL, FACW, and/or FAC ____
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:
hydrophytic vegetation

SOILS

Series/phase: Atkins series - Atkins silt loam Subgroup:[2] ____
Is the soil on the hydric soils list? Yes ____ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ✓ No ____ Gleyed? Yes ____ No ✓
Matrix Color: 10 YR 6/1 Mottle Colors: 10 YR 5/8
Other hydric soil indicators: NA
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: low chroma, oxidized root channels

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth: < 1/2"
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole: 0 - 2"
List other field evidence of surface inundation or soil saturation.
slight buttressed trees, drift lines
Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ✓ No ____
Rationale for jurisdictional decision: hydrophytic vegetation, low chroma, oxidized root channels, buttressed roots, drift lines

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

Final Report for Contract/Purchase Order No. DABT02-92-P-1668

USACML and MPCEN and FM
DEH, END
Attn: ATZN-PE-E, Building 3270
Fort McClellan, AL 36205-5000 DABT0292P1668

Freshwater Mollusk Survey of Cane Creek

A preliminary report of mollusk species found in Cane Creek was sent to you with the species of mollusks listed as found in the survey. There was evidence of two species of freshwater mussels found in the Cane Creek watershed. None found were alive. Only dead shells of the species, Villosa vanuxemensis umbrans, the Coosa Creek shell, were collected in the survey. Jim Godwin called me on October 26, 1992, and said he picked up two specimens (dead shells) of Villosa nebulosa, Alabama rainbow shell, which were identified by Paul Hartfield and were found at Willett Spring and Cane Creek. There were no evidences of the ten species identified by the U.S. Fish and Wildlife Service as potentially inhabiting Cane Creek. Cane Creek does not appear to be the type habitat which the ten species would typically inhabit. The substrate is variable from lots of bedrock to some course gravel and sand. The bivalves listed by the Fish and Wildlife Service are typically found in larger streams than Cane Creek with much more sandy substrate. The spring-fed Cane Creek may be a few degrees cooler than typical ideal habitat for the species the Fish and Wildlife Service listed. The snail, Tulotoma magnifica, concentrates on large boulders and in swift flow and may occur in relatively deep water or shallow water. Physical conditions in Cane Creek do not appear to be quite right for this snail. The above statements are based on general observations and not collected physical data. Past experience with freshwater mussel species has indicated also that the fish hosts must be attracted to a stream in large numbers and feed or spawn in the habitat where the mussels will eventually occur.

Possibly the fish host species do not inhabit the Cane Creek drainage and, thus, the mussels are excluded.

The bivalve Carbicula fluminea is in the Cane Creek drainage but not in large numbers. The freshwater clam was found in all reaches of the creek except the last few miles.

The snail population was concentrated in the upper parts of Cane Creek especially along and above the golf course. The substrate is mostly bedrock with crevices of sand and gravel between. Rather large numbers of snails were seen clinging to the rocks along the stream. The algae increased from the golf course downstream for several hundred yards and this increase, possibly, is the result of run-off of fertilizer from the golf course and organic material from the old sewerage treatment facility.