#197



Biological Assessment of

Floridin Company/Little River Basin, including Attapulgus, Willacoochee, and Quincy Creeks

Gadsden County

NPDES #FL0002577, FL0038466, FL0038482,
FL0038474, FL0038458 and FL0039101

Sampled November 1996

FILE COPY
DO NOT REMOVE

June 1997

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Floridin Company
County: Gadsden
NPDES Number: FL002577, FL0038466, FL0038482, FL0038474, FL0038458, and FL0039101
State Permit Expiration Date: 01 August 1997

Toxics Sampling Inspection (XSI)

Date Sampled: 12 November 1996

Results: No pesticides or organic pollutants were detected in the effluent. Metals found in the effluent complied with water quality standards.

Compliance Biomonitoring Inspection (CBI)

Date Sampled: 12 November 1996

Results: The Floridin Quincy facility effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi.*

Impact Bioassessment Inspection (IBI)

Date Sampled: 12 November 1996

Results: Qualitative measures of benthic macroinvertebrate community health suggested all six sites within the Little River basin were relatively healthy. Based on the Stream Condition Index (SCI), all stations (except Station 6) received an "excellent" rating. Station 6 was in the "good" category. Hester-Dendy results demonstrated that the discharge was not negatively affecting the receiving water biota. In general, phytoplankton communities throughout the basin were typical of flowing streams, characterized by low to moderate density, taxa richness, and diversity. Chlorophyll *a* was undetected at all stations. The Quincy effluent and the two retention ponds did not appear to be contributing undesirable amounts of algal biomass. Flow and light penetration characteristics appeared to neutralize the effects of nutrient enrichment found in the flowing portions of the system. It is possible, however, that areas downstream with longer water retention times, such as Lake Talquin, may be affected by the nutrient loading from this basin.

Water Quality Inspection (WQI)

Date Sampled: 12 November 1996

Results: Fecal and total coliforms complied with Class III water quality standards at all sites. Nitrate-nitrite concentrations at station 5 (8.5 mg/L) and at station 3 (0.76 mg/L) were higher than the values found in 95% to 90%, respectively, of other Florida streams. Ammonia was also elevated at station 5 (1.2 mg/L). No nutrient enrichment could be associated with the Quincy discharge or the mining operations. Algal growth potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" throughout the Little River basin, ranging from 6.7 mg dry wt/L at Station 3 to 61.0 mg dry wt/L at Station 5. No undesirable amounts of TSS or turbidity were associated with the Quincy discharge or the mining operations. Relatively high turbidity measurements at most stations (higher than the values found in 80% of other Florida streams) suggested widespread erosion in the basin.

Introduction

Biological, physical, chemical, and habitat information was collected from six stations located in the Little River Basin, including Attapulgus Creek, the Willacoochee River, Quincy Creek, and Little River. These six receiving water sites were selected to assess the effects of human activities in the watershed (*e.g.*, discharges from Floridin Mining as well as runoff from predominantly agricultural land uses) (see maps and station descriptions in Appendix).

The portions of the Little River watershed sampled during this study were in Gadsden County, Florida, between Quincy and Havana. Note that the headwaters of Attapulgus Creek and Willacoochee Creek are in Decatur County, Georgia. The Little River watershed lies within the Tifton Upland/Tallahassee Hills subregion of the Southern Coastal Plain. Topography within the area is characterized by erosional remnant hills with relief up to 120 feet (Hendry and Sproul 1966). Soils consist of a weakly cemented, heterogeneous mixture of yellow-orange clays, silts, and sands, which are somewhat poorly to poorly drained (Hendry and Sproul 1966). A white clay with commercial value, known as attapulgite (Fuller's earth), is abundant in portions of the basin.

The surface area of the drainage basin upstream from our sampling locations is approximately 245 square miles (Table 1). The majority of the land in the basin is forested, ranging from 55.3% at Station 1 to 63.5% at station 5. Agricultural uses are also very common, ranging from 34.4% at station 5 to 40.5% at station 4. Urban/residential uses are lowest at stations 4, 5, and 6 (with 1.3% each) and highest near Quincy (7.4% at station 1). Industrial/mining activities are lowest at station 3 (0%) and highest at station 4 (2.0%).

Figure 1. Land use charateristics in the watersheds upstream of Little River Basin study sites.

Basin Characteristics	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Watershed area (sq. mi.)	17.0	20.5	12.3	62.4	90.5	224.6
% Agriculture	36.7	34.7	35.2	40.5	34.4	36.1
% Urban/Residential	7.4	6.6	2.8	1.3	1.3	1.3
% Forest/Natural	55.3	57.9	62.0	55.9	63.5	60.8
% Industrial/Mining	0.2	0.3	0	2.0	0.6	1.4
% Other	0.4	0.5	0	0.3	0.2	0.4

The Floridin Company strip mines and processes attapulgite (Fuller's earth). Stormwater from the five mining complexes is retained in a series of unlined impoundments, and the water is allowed to settle before the supernatant is discharged. The discharge from the ponds is intermittent, with the release of wastewater occurring when the discharge can meet permit limits. Although none of the ponds were discharging during this study, pond C3 (which discharges into the Willacoochee River), and pond F2 (which discharges into Attapulgus Creek) were sampled. It was thought that these samples would represent the quality of the respective effluents when discharge actually does occur. Additionally, effluent from the Floridin Quincy plant (which discharges to Quincy Creek) was sampled.

Permit limits for all discharges are as follows: flow (2.16 MGD as a weekly maximum), total suspended solids (20 mg/L as a weekly maximum), turbidity (29 NTU's above background as a weekly maximum), and pH (6.5 SU to 8.5 SU, or within 1 SU of background). The flow from the Quincy plant during the survey was 0.023 MGD (see Facility Summary in Appendix).

During 1996, ponds C3, F3, F8, F5, have exceeded permit limits for pH and/or TSS (see Facility Summary in Appendix). The facility is not currently under any enforcement actions.

Methods

The focus of this investigation was to determine potential effects from stormwater and the Floridin Mining Company discharge on the receiving waters (see station map in Appendix). Station 1 was located in Quincy Creek upstream of the Floridin chemical plant discharge, near Highway 267. Station 2, also in Quincy Creek, was located downstream of this discharge. Quincy Creek flows into the Little River. Station 3 (near Highway 65) and station 4 (near Highway 161) were both in the Willacoochee River, located upstream and downstream, respectively, of mining area "F". The Willacoochee River flows south-easterly, forming Little River where it joins with Attapulgus

Table 2. Major characteristics of biological community structure at study sites.

	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Macroinvertebrate Qualitative						
Number of Taxa	29	37	28	43	29	23
Florida Index	14	19	20	23	17	10
SCI	31	29	31	33	29	25
EPT Index.	4	4	3	8	3	5
% Contribution of Dominant Taxon	13.0	15.1	14.9	14.7	18.0	18.0
% Oligochaeta	15.9	5.5	3.2	10.8	1.1	3.4
% Diptera	55.1	59.6	30.9	47.1	70.8	46.1
% Ephemeroptera	10.1	22.6	24.5	17.8	11.2	14.6
% Trichoptera	5.8	0	7.5	1.9	5.6	18.0
% Odonata	1.5	0	4.3	1.3	0	0
% Pelecypoda	0	2.1	7.5	14.7	0	2.3
% Gastropoda	0	0.7	7.5	2.6	2.3	1.1
% Coleoptera	4.4	6.8	13.8	1.9	6.7	13.5
% Other	7.3	2.1	1.1	1.3	1.1	1.1
% Predators	11.6	6.8	13.8	14.0	13.5	1.1
% Above Surface Deposit Feeders	33.3	41.8	27.7	29.6	28.7	20.2
% Below Surface Deposit Feeders	15.9	4.8	3.2	6.4	0	3.4
% Suspension Feeders	15.9	10.6	21.3	26.4	35.4	57.3
% Scrapers	6.5	15.1	24.5	10.2	10.7	14.0
% Shredders	16.7	19.5	7.5	8.6	10.1	2.8
% Other	0	0.7	0	4.5	1.1	0
Macroinvertebrate Hester-Dendy						
Number of Taxa	14	38				
Florida Index	8	21				
Shannon-Weaver Diversity	2.6	3.9				
EPT Index	4	4				
% Oligochaeta	0	7.7				
% Diptera	24.3	44.3				
% Ephemeroptera	64.9	32.1				
% Trichoptera	5.4	8.1				
% Coleoptera	4.1	4.5				
% Other	0	3.3				
% Predators	5.4	9.6				
% Above Surface Deposit Feeders	45.3	35.4				
% Below Surface Deposit Feeders	0	7.7				
% Suspension Feeders	5.4	13.4				
% Scrapers	34.5	18.3				
% Shredders	9.5	13.9				

	Effluent	Pond C3	Pond F2						
Phytoplankton Algae									
Number of Taxa	20	25	3	5	10	10	7	7	7
Shannon-Weaver Diversity	3.7	3.4	1.5	2.3	1.3	1.9	2.3	2.1	1.9
Algal Density (#/mL)	1649	1572	53	51	1995	956	236.3	357.1	565.0
Chlorophyll a (µg/L)	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U
% Blue-green	31.9	46.4	60.0	60.0	2.6	6.5	26.1	82.4	45.5
% Green	36.3	34.6	0	0	94.7	85.0	56.5	14.7	1.8
% Diatoms	15.3	12.4	40	0	1.1	6.5	8.7	2.9	50.9
% Cryptophyceae	12.7	3.3	0	40.0	1.1	2.2	8.7	0	0
% Other	3.8	3.2	0	0	0	0	0	0	1.8
Algal Growth Potential (mg dry wt/l)	28.0	28.9	6.7	13.1	61.0	45.8	0.3		

Creek. Station 5 was located in Attapulgus Creek (near Highway 159) upstream of Willacoochee Creek and upstream of mining areas "F" and "C". Station 6 (near Highway 12) was situated in Little River, downstream of these inputs, but upstream of Quincy Creek. Two retention ponds (C3 and F2) and the Quincy plant effluent were also sampled during this study. The stations upstream of the various mining areas serve two purposes: they are reference sites to compare with the sites downstream from the mining inputs, and they provide an assessment of how agricultural runoff is affecting the streams prior to mining inputs.

Habitat quality was determined for each station during an *in situ* assessment. Seven attributes known to have potential effects on the stream biota were evaluated and scored, with 20 possible points for each factor. Based on the sum of these individual scores, overall habitat quality is assigned to one of four categories: Optimal (105-140 points); Suboptimal (70-104 points); Marginal (35-69 points); and Poor (0-34 points) (see habitat assessment field sheets). Acute screening toxicity bioassays, using *Ceriodaphnia dubia* and *Cyprinella leedsi* as test organisms, were performed on an effluent sample (Weber 1991). The effluent was analyzed for metals and for organic constituents (base neutral and acid extractables, and pesticide extractables). Additionally, nutrient analyses were performed on the

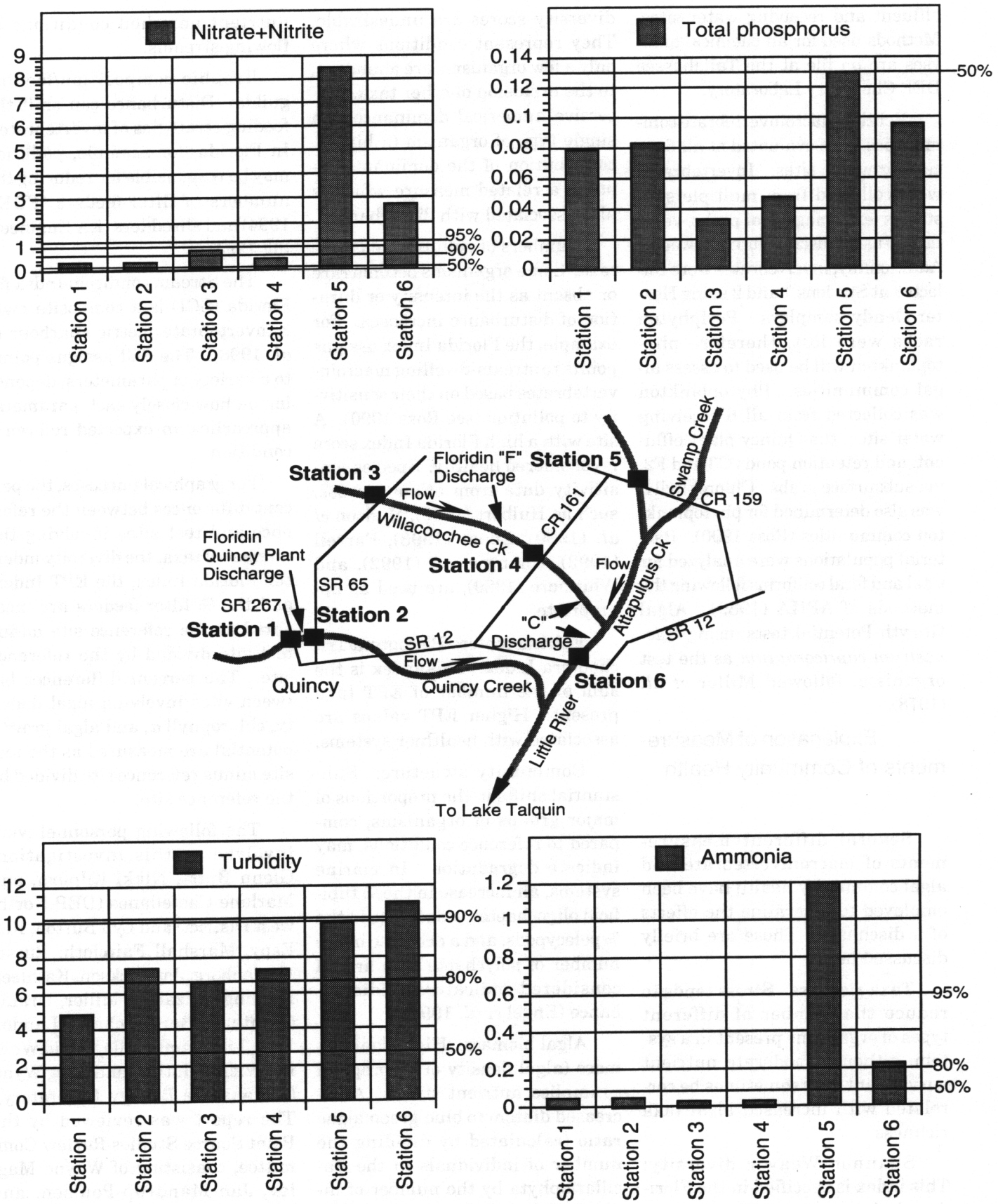


Figure 1. Selected nutrient measurements and turbidity at study sites.

effluent and receiving water sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at all 6 receiving water sites. Invertebrates were collected from multiple substrates (*e.g.*, snags, leaf packs, vegetation) using discrete dip net sweeps. Additionally, invertebrates were collected at Stations 1 and 2 using Hester-Dendy samplers. Periphyton racks were lost, therefore phytoplankton will be used to assess algal communities. Phytoplankton was collected from all 6 receiving water sites, the Quincy plant effluent, and retention ponds C3 and F2, via subsurface grabs. Chlorophyll *a* was also determined for phytoplankton communities (Ross 1990). Bacterial populations were analyzed for total and fecal coliforms following the methods of APHA (1989). Algal Growth Potential tests, using *Selenastrum capricornutum* as the test organism, followed Miller *et al.* (1978).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate and algal community health have been employed to determine the effects of a discharge. These are briefly discussed here.

Taxa richness: Stress tends to reduce the number of different types of organisms present in a system, although moderate nutrient enrichment may sometimes be correlated with increased algal taxa richness.

Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single type of organism (a high % contribution of the dominant taxon) is a related measure which is also associated with disturbance.

Numbers of pollution sensitive taxa: Some organisms become rare or absent as the intensity or duration of disturbance increases. For example, the Florida Index assigns points to stream-dwelling macroinvertebrates based on their sensitivity to pollution (see Ross 1990). A site with a high Florida Index score is considered healthy. Species sensitivity data from other sources, such as Hulbert (1990), Hudson *et al.* (1990), Lenat (1993), Farrell (1992), Chang *et al.* (1992), and Whitmore (1989), are used as appropriate.

Ephemeroptera/Plecoptera/Trichoptera Index: This index is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.

Community structure: Substantial shifts in the proportions of major groups of organisms, compared to reference conditions, may indicate degradation. In marine systems, an increase in the % tubificid oligochaetes, a decrease in the % pelecypods, and a decrease in the number of polychaete taxa are all considered indicators of disturbance (Engel *et al.* 1994).

Algal biomass: High algal biomass (algal density or chlorophyll *a*) implies nutrient stress. A decreased diatom to blue-green algae ratio (calculated by dividing the number of individuals in the Bacillariophyta by the number of individuals in the Bacillariophyta + Cyanophyta) is often indicative of nutrient enriched conditions in flowing streams.

Trophic composition/feeding guilds: Disturbance can shift the feeding strategies of invertebrates. In Florida, for example, pollution may be responsible for reducing the numbers of filter-feeders (FDEP 1994) and shredders (EA Engineering 1994).

The Stream condition Index for Florida (SCI) is a composite macroinvertebrate metric (Barbour *et al.* 1996). The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition.

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa, the diversity index, the Florida Index, the EPT Index, and the % filter-feeders are measured as the reference site minus test site divided by the reference site. The percent differences between sites involving algal density, chlorophyll *a*, and algal growth potential are measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: Glenn Butts, Nikki Kilburn, and Marlane Castellanos (DEP Northwest District) and Lyn Burton, Ken Espy, Marshall Faircloth, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Bart Richard, Landon Ross, Lisa Tamburello, David Whiting, Vicki Whiting, and Greg Wynn (Tallahassee Biology Laboratory). The report was reviewed by the Point Source Studies Review Committee, consisting of Wayne Magley, Jan Mandrup-Poulsen, and Michael Tanski, as well as District representatives.

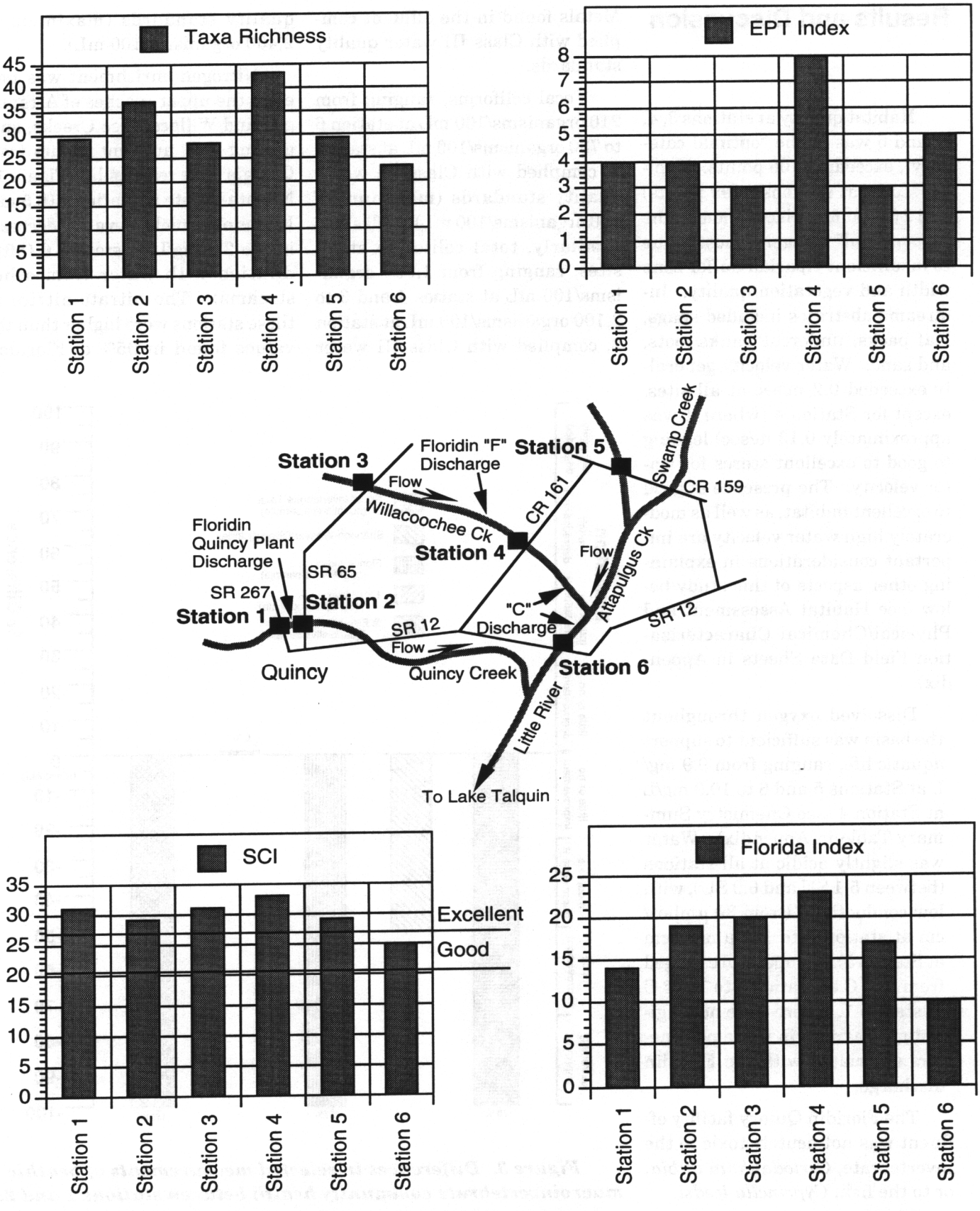


Figure 2. Selected measurements of benthic macroinvertebrate community health.

Results and Discussion

Habitat quality at stations 3, 4, 5, and 6 was in the "optimal category", exceeding 106 points. Habitat scores at stations 1 (99 points) and 2 (81 points) placed them in the "suboptimal" category, mostly due to insufficient riparian buffer zone width and vegetation quality. In-stream substrates included snags, leaf packs, undercut banks/roots, and sand. Water velocity generally exceeded 0.2 m/sec at all sites, except for Station 4 (where it was approximately 0.13 m/sec) leading to good to excellent scores for water velocity. The presence of good to excellent habitat, as well as moderately high water velocity are important considerations in explaining other aspects of this study below (see Habitat Assessment and Physical/Chemical Characterization Field Data Sheets in Appendix).

Dissolved oxygen throughout the basin was sufficient to support aquatic life, ranging from 9.9 mg/L at Stations 5 and 6 to 10.9 mg/L at Station 4 (see Chemistry Summary Table in Appendix). Water was slightly acidic at all stations (between 5.1 SU and 6.9 SU), with low conductivity (from 30 µmhos/cm at station 3 to 110 µmhos/cm at Station 5). Temperature ranged from 9.8° C at station 3 to 13.6° C at station 1. There were no longitudinal changes in these parameters associated with the Floridin discharge.

The Floridin Quincy facility effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi*.

No pesticides or organic pollutants were detected in the effluent. Metals found in the effluent complied with Class III water quality standards.

Fecal coliforms, ranging from 210 organisms/100 mL at station 6 to 730 organisms/100 mL at station 3, complied with Class III water quality standards (maximum of 800 organisms/100 mL) at all sites. Similarly, total coliforms at all sites, ranging from 1,000 organisms/100 mL at statios 4 and 6 to 2,100 organisms/100 mL at station 2, complied with Class III water quality standards (maximum of 2,400 organisms/100 mL).

Nitrogen enrichment was noted in the upper reaches of Attapulgus and Willacoochee Creeks, suggesting that nutrient inputs from Georgia were responsible (Figure 1). Nitrate-nitrite at station 5 (8.5 mg/L) was extremely elevated, decreasing to 2.7 mg/L at station 6 (after dilution with water from other streams). The nitrate-nitrite at these stations were higher than the values found in 95% of Florida's

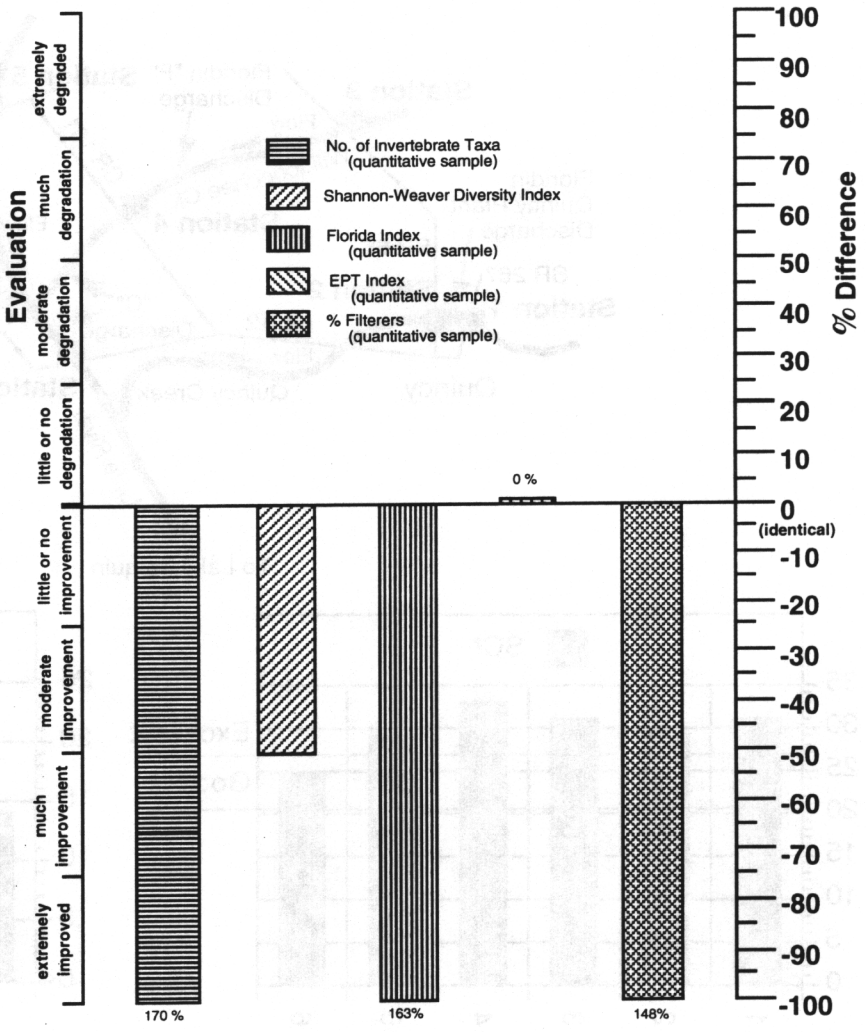


Figure 3. Differences in selected measurements of benthic macroinvertebrate community health between stations 1 and 2, upstream and downstream from the Floridin Quincy Plant discharge.

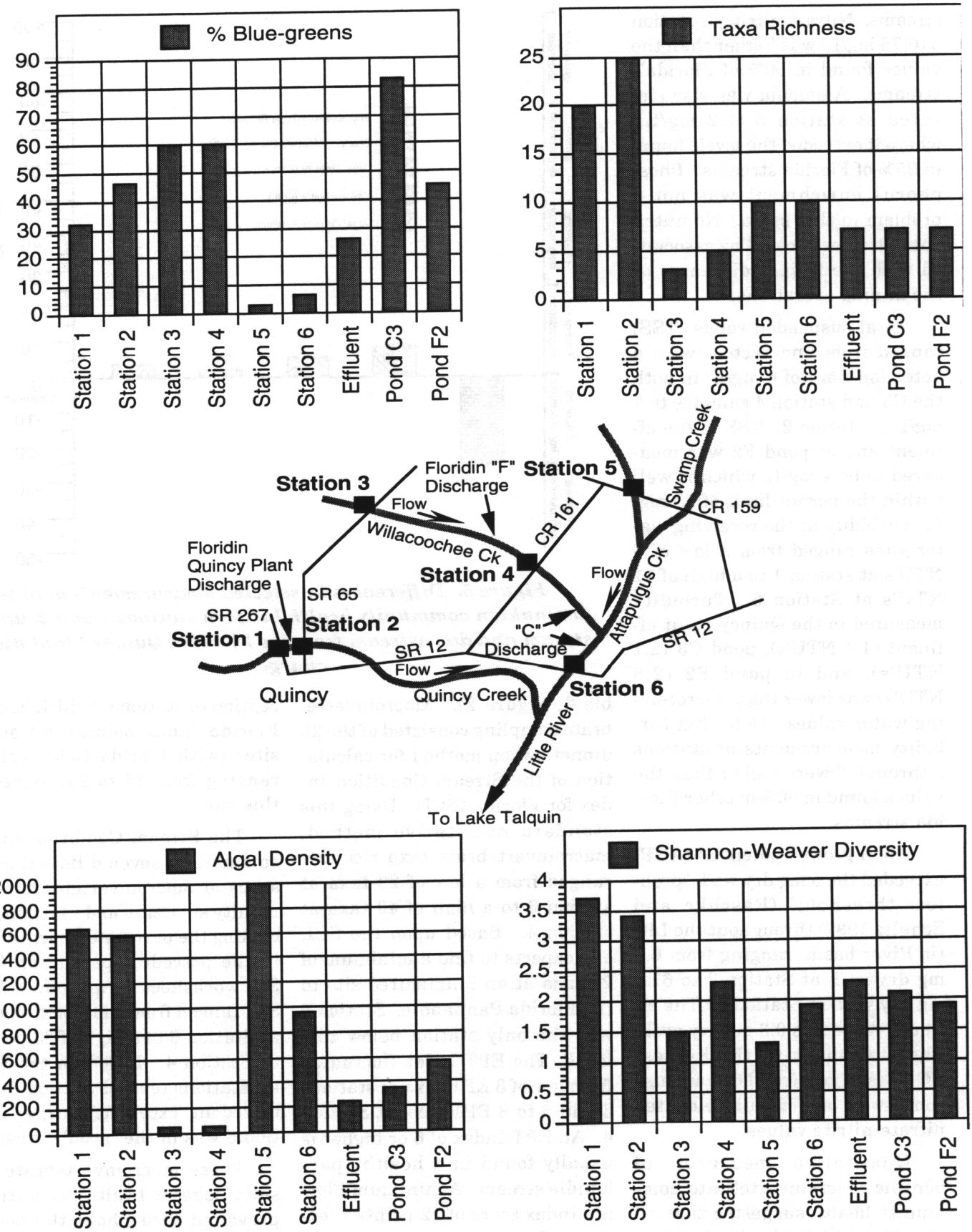


Figure 4. Selected measurements of phytoplankton community health at study sites.

streams. Nitrate-nitrite at station 3 (0.76 mg/L) was higher than the values found in 90% of Florida's streams. Ammonia was also elevated at station 5 (1.2 mg/L), where it exceeded the levels found in 95% of Florida streams. Phosphorus enrichment was not a problem in this basin. No nutrient enrichment could be associated with the Quincy discharge or the mining operations.

Total suspended solids (TSS) ranged from undetected (with a detection limit of 4 mg/L) in both the C3 and station 4 samples to 7 mg/L at station 2. TSS in the effluent and at pond F2 was measured to be 4 mg/L, which is well within the permit limit of 20 mg/L. Turbidity at the receiving water sites ranged from a low of 5 NTU's at station 1 to a high of 11 NTU's at Station 6. Turbidity measured in the Quincy plant effluent (1.4 NTU's), pond C3 (2.1 NTU's), and in pond F2 (2.5 NTU's) was lower than the receiving water values. Note that turbidity measurements at stations 2 through 6 were higher than the values found in 80% of other Florida streams.

Algal growth potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" (Raschke and Schultz 1987) throughout the Little River basin, ranging from 6.7 mg dry wt/L at Station 3 to 61.0 mg dry wt/L at Station 5. The effluent value was 0.3 mg dry wt/L. The stations with the highest AGP's (stations 5 and 6) were also those with abnormally elevated nitrate-nitrite values.

Qualitative measures of benthic macroinvertebrate community health suggested that all six sites within the Little River basin were relatively healthy (Table 2, Figure 2). Macroinvertebrate sampling consisted of the 20 dipnet sweep method for calculation of the Stream Condition Index for Florida (SCI). Using this standard qualitative method, macroinvertebrate taxa richness ranged from a low of 23 taxa at station 6 to a high of 43 taxa at station 4. Based upon the SCI, one expects to find a minimum of 27 taxa at an unimpaired site in the Florida Panhandle. Station 6 was the only station below this level. The EPT Index fluctuated from low of 3 EPT taxa at stations 3 and 5 to 8 EPT taxa at Station 4. An EPT Index of 6 or higher is usually found in a healthy panhandle stream. A minimum Florida Index score of 12 points is expected for an unimpaired panhandle stream. Again, with the exception of station 6 (which had 10 Florida Index points), all other sites (with Florida Index values ranging from 14 to 23) exceeded this value.

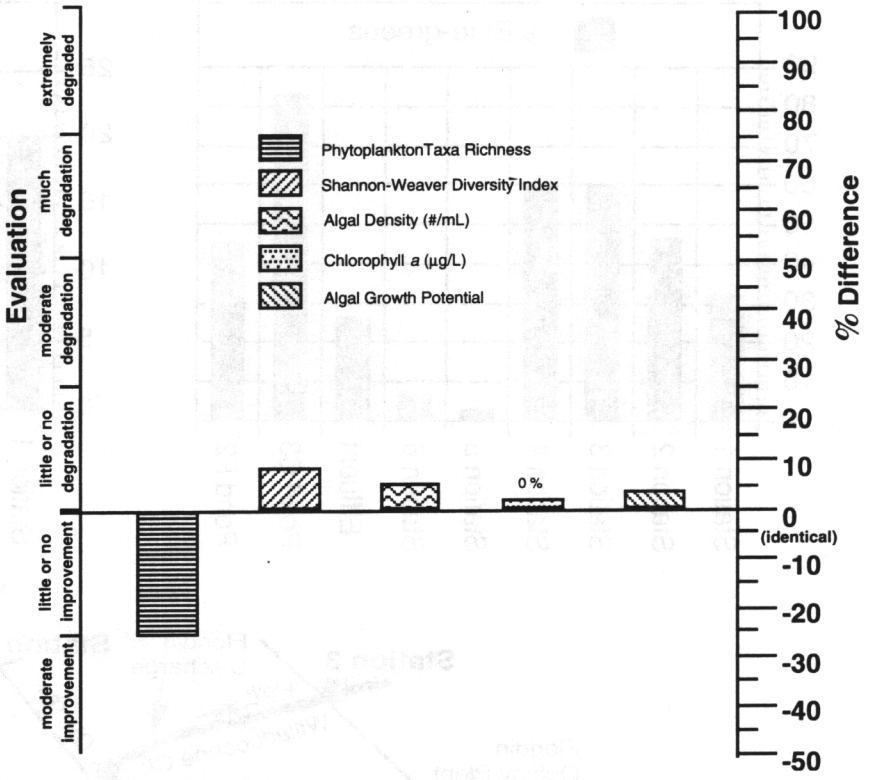


Figure 5. Differences in selected measurements of phytoplankton community health between stations 1 and 2, upstream and downstream from the Floridin Quincy Plant discharge.

The Stream Condition Index summarizes seven different measures of macroinvertebrate community structure and function, including the parameters mentioned in the preceding paragraph (see SCI worksheet in Appendix). The SCI ranged from a low of 25 points at Station 6 to a high of 33 points at Station 4. Based on the SCI, all stations (except Station 6) received an "excellent" rating. Station 6 was in the "good" category.

These macroinvertebrate results suggest healthy conditions prevailed throughout the basin, despite the nutrient enrichment and suboptimal habitat observed

at some sites. Apparently, the instream substrate quality, flow, and light penetration characteristics of the system were sufficient that the observed nutrient enrichment and riparian zone disturbances did not translate into negative influences on the invertebrate community.

Macroinvertebrate communities upstream and downstream from the Quincy facility effluent were also sampled using Hester-Dendys. These results demonstrated that the discharge was not negatively affecting the receiving water biota (Figure 3). For example, Shannon-Weaver diversity improved from 2.6 at station 1 to 3.9 at station 2. The EPT Index was identical at both sites (4 taxa). Improvements in taxa richness, the Florida Index, and the % filter feeders were also observed between stations 1 and 2.

In general, phytoplankton was sparsely to moderately abundant throughout the basin, ranging from 51 organisms/mL to 1,995 organisms/mL (Figure 4). Algal taxa richness varied widely, with only 3 taxa found at station 3, but with 25 taxa recovered from station 2. Shannon-Weaver diversity ranged from 1.3 at station 5 to 3.7 at station 1. Chlorophyll *a* was undetected at all stations (with a detection limit of 0.88 µg/L). The Quincy effluent and the two retention ponds had low algal densities, suggesting that they were not contributing undesirable amounts of algal biomass to the system (Figures 4 and 5). Again, flow and light penetration characteristics appeared to neutralize the effects of nutrient enrichment found in the system. It is possible, however, that areas downstream with longer water retention times, such as Lake Talquin, may be affected by the nutrient loading from this basin.

Conclusions

The Floridin Quincy facility effluent was not acutely toxic to the invertebrate, *Ceriodaphnia dubia*, or to the fish, *Cyprinella leedsi.*

No pesticides or organic pollutants were detected in the effluent. Metals found in the effluent complied with Class III water quality standards.

Fecal and total coliforms complied with Class III water quality standards at all sites.

Nitrogen enrichment was noted in the upper reaches of Attapulgus and Willacoochee Creeks, suggesting that nutrient inputs from Georgia, perhaps due to agricultural operations, were responsible. Nitrate-nitrite concentrations at station 5 (8.5 mg/L) and at station 3 (0.76 mg/L) were higher than the values found in 95% to 90%, respectively, of other Florida streams. Ammonia was also elevated at station 5 (1.2 mg/L), where it exceeded the levels found in 95% of Florida streams. No nutrient enrichment could be associated with the Quincy discharge or the mining operations.

No undesirable amounts of TSS or turbidity were associated with the Quincy discharge or the mining operations. Relatively high turbidity measurements at most stations (higher that the values found in 80% of other Florida streams) are of concern.

Algal growth potential (AGP) exceeded the 5 mg dry wt/L "problem threshold" throughout the Little River basin, ranging from 6.7 mg dry wt/L at Station 3 to 61.0 mg dry wt/L at Station 5. The effluent value was 0.26 mg dry wt/L.

Qualitative measures of benthic macroinvertebrate community health suggested that all six sites within the Little River basin were relatively healthy. Based on the Stream Condition Index (SCI), all stations (except Station 6) received an "excellent" rating. Station 6 was in the "good" category. Hester-Dendy results demonstrated that the discharge was not negatively affecting the receiving water biota. Apparently, the instream substrate quality, flow, and light penetration characteristics of the system were sufficient that the observed nutrient enrichment and riparian zone disturbances did not translate into negative influences on the invertebrate community.

In general, phytoplankton communities throughout the basin were typical of flowing streams, characterized by low to moderate density, taxa richness, and diversity. Chlorophyll *a* was undetected at all stations. The Quincy effluent and the two retention ponds did not appear to be contributing undesirable amounts of algal biomass to the system. Again, flow and light penetration characteristics appeared to neutralize the effects of nutrient enrichment found in the system. It is possible, however, that areas downstream with longer water retention times, such as Lake Talquin, may be affected by the nutrient loading from this basin.

Literature Cited

American Public Health Assoc., American Water Works Assoc., and Water Pollution Control Federation. 1989. Standard Methods for the Examination of Water and Wastewater, 17th ed. New York, N.Y. 1268 p.

Barbour, M. T., J. Gerritsen, and J. S. White. 1996. Development of the Stream Condition Index for Florida. Prepared for the Fla. Dept. Environ. Protection. 105 p.

Chang, S., F. W. Steimle, R. N. Reid, S. A. Fromm, V. S. Zdanowicz, and R. A. Pikanowski. 1992. Association of benthic macrofauna with habitat types and quality in the New York Bight. Mar. Ecol. Prog. Ser. 89: 237-251.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Fla. Dept. Environ. Protection. Unpaginated.

Engle, V. D., J. K. Summers, and G. R. Gaston. 1994. A benthic index of environmental condition of Gulf of Mexico estuaries. Estuaries 17(2): 372-384.

Farrell, D. H. 1992. A community based metric for marine benthos. Fla. Dept. Environ. Reg. SW Dist. Office. unpublished rept. 15 p.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Fla. Dept. Environ. Prot. Biology Section, Tallahassee, Fla. 73 p.

Hendry, C. W. and C. R. Sproul. 1966. Geology and groundwater resources of Leon County, Florida. Fla. Geological Survey. Bull No. 47. 178 pp.

Hudson, P. L., D. R. Lenat, B. A. Caldwell, and D. Smith. 1990. Chironomidae of the Southeastern United States: A checklist of species and notes on biology, distribution, and habitat. U. S. Fish Wildl. Serv., Fish. Wildl. Res. 7. 46 p.

Hulbert, J. L. 1990. A proposed lake condition index for Florida. North Amer. Benth. Soc. 38th Ann. Mtg., Blacksburg, VA, 11 p.

Lenat, D. R. 1993. A biotic index for the southeastern United States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. J. N. Am. Benthol. Soc. 12(3): 270-290.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. U. S. Environ. Prot. Agency, EPA-600/9-78-018. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

Weber, C. I. 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 4th edition. EPA/600/4-90/027. U. S. EPA, Cincinnati, Ohio. 216 pp.

Whitmore, T. J. 1989. Florida diatom assemblages as indicators of trophic state and pH. Limnol. Oceanogr. 34(5): 882-895.

Chemistry Summary Table for Floridin /Little River basin Study.

	Effluent	Pond C3	Pond F2	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Organic Constituents (ug/L)									
None Detected									
Metals (ug/L)									
Aluminum	240 A								
Arsenic	15 U								
Cadmium	0.05 U								
Copper	0.6 I								
Chromium	5 U								
Iron	52								
Lead	10 U								
Mercury	0.10 U								
Nickel	4 U								
Selenium	30 U								
Silver	0.04 U								
Zinc	4 U								
Nutrients (mg/L)									
Ortho-phosphate	0.004 U			0.019	0.023	0.010 I	0.013	0.056 A	0.034
Total phosphorus	0.026 I			0.079	0.083	0.033 I	0.047	0.033 I	0.095
Unionized Ammonia	0.0000			0.0000	0.0000	0.0000	0.0000	0.0004	0.0000
Ammonia	0.020 U			0.050	0.047	0.029	0.032	1.2	0.22
Nitrate+Nitrite	0.020 U			0.36	0.34 A	0.76	0.48	8.5	2.7
TKN	0.28 A			0.36	0.36	0.30	0.29	2.1	0.79
General Phys-Chem Parameters									
Habitat Assessment				99	81	128	107	117	107
D. O. (mg/L)	8.5	4.8	4.7	10.4	10.7	10.4	10.9	9.9	9.9
pH (SU)	8.5	7.7	8.2	6.9	6.6	6.0	6.6	6.1	5.1
Specific Conductance (µmhos/cm)	301	168	91	38	39	30	32	110	62
Temperature (°C)	16.3	17.1	17.1	13.6	11.6	9.8	10.1	10.3	10.5
Total Suspended Solids (mg/L)	4	4 U	4	6	7 A	4	4 U	4	4
Biological Oxygen Demand (mg/L)	1.0 A								
Turbidity (NTU's)	1.4	2.1	2.5	4.8	7.4	6.6	7.3	9.9 A	11
Hardness (mg CaCO3)	189.2								
Algal Growth Potential (mg dry wt/L)	0.3			28.0	28.9	6.7	13.1	61.0	45.8
Toxicity									
Bioassay Fish-Dechlorinated	95% Survival								
Bioassay Invertebrate-Dechlorinated	No Mortality								
Microbiological Communities (org/100 mL)									
Fecal Coliform	6			480	720 Q	730 Q	565 A	260	210
Total Coliform	10			1500	2100 Q	1600 Q	1000 A	1200	1000
Escherichia coli	4			380	700 Q	700	445 A	220	350

A - Value reported is the mean of two or more determinations

I - Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit

O - Sampled, but analysis lost or not performed

Q - Sample held beyond normal holding time

U - Material analyzed for but not detected; value reported is the minimum detection limit

Typical Values for Selected Parameters in Florida Waters

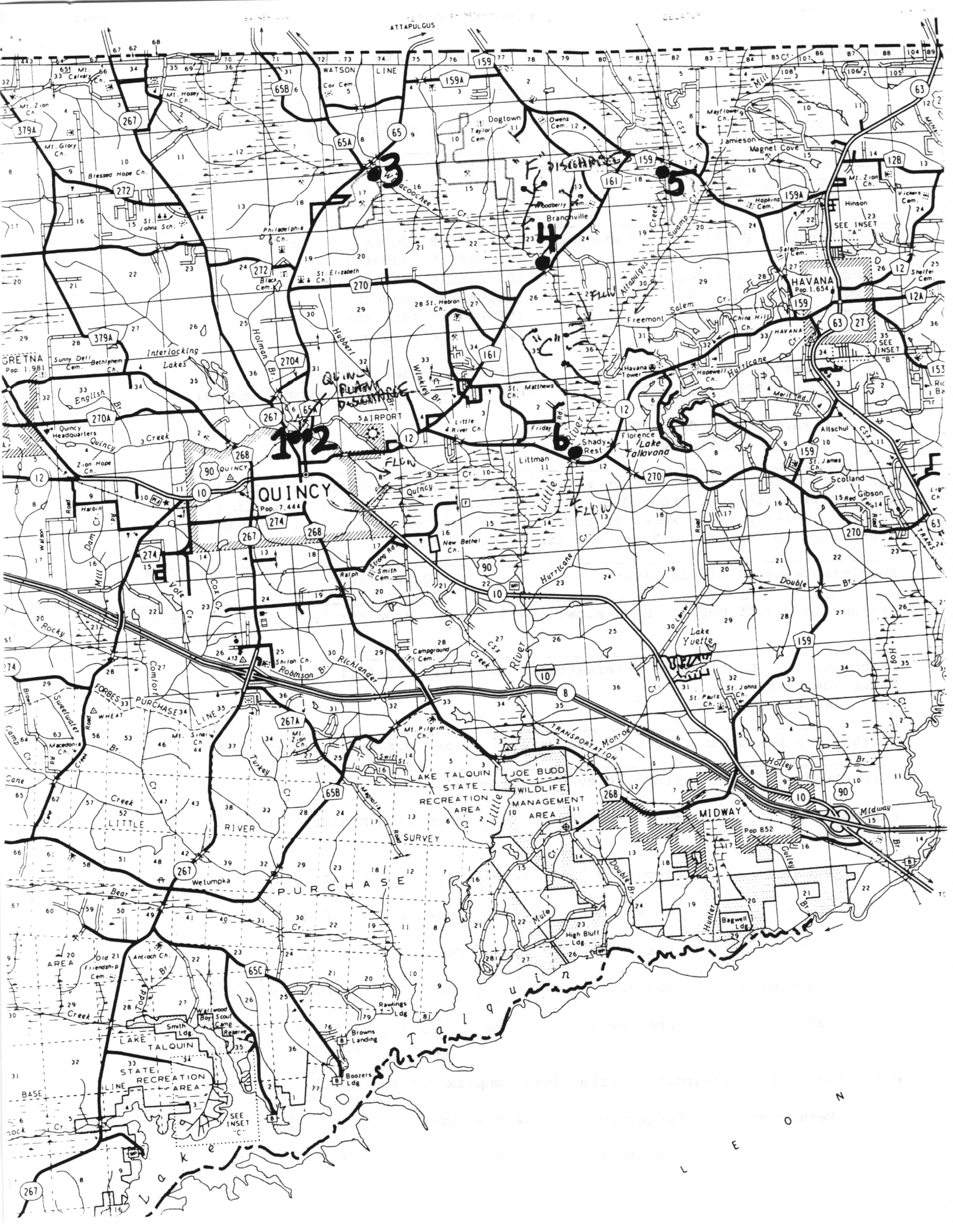
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

Percentile Distribution

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
STREAMS (1617 stations)											
Phytoplankton Chlorophyll *a*	0.22	0.52	0.94	1.60	3.02	4.63	6.72	9.87	14.68	27.35	48.70
Periphyton Chlorophyll *a*	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85
H-D Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90
Qualitative Taxa Richness	9.00	12.00	17.00	20.00	22.00	24.50	26.00	28.00	31.00	37.00	53.00
H-D Taxa Richness	6.00	6.50	9.00	11.50	13.00	15.00	17.00	21.50	26.00	29.00	32.00
TKN	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80
Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60
NO2-NO3	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51
Ortho Phosphorus	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37
Turbidity	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30
LAKES (477 stations)											
Phytoplankton Chlorophyll *a*	0.80	1.71	2.88	4.28	10.06	13.40	20.00	30.10	47.20	65.44	113.90
Dredge Diversity	0.71	0.97	1.43	1.74	1.98	2.12	2.21	2.59	2.85	3.15	3.17
Dredge Taxa Richness	3.00	5.00	6.50	7.00	9.00	10.00	11.00	13.00	15.00	17.00	21.00
TKN	0.36	0.49	0.67	0.83	1.08	1.26	1.40	1.51	1.68	2.11	3.46
NH3+NH4	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.12	0.15	0.21	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.10	0.14	0.23
Total Phosphorus	0.01	0.02	0.02	0.03	0.05	0.07	0.09	0.11	0.14	0.23	0.42
Ortho-Phosphorus	0.00	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.21	0.32
Turbidity	1.00	1.25	1.55	2.05	2.75	4.50	6.45	9.60	14.10	26.00	40.00
ESTUARIES (690 stations)											
Phytoplankton Chlorophyll *a*	2.14	3.28	4.49	5.13	6.00	6.93	7.94	9.60	12.40	17.60	22.20
Dredge Diversity	1.34	1.53	1.91	2.28	2.56	2.90	3.15	3.59	4.01	4.53	4.98
Dredge Taxa Richness	4.00	6.00	9.00	11.00	15.00	18.50	25.00	35.00	41.00	62.00	90.00
TKN	0.26	0.34	0.42	0.50	0.59	0.69	0.76	0.82	0.95	1.30	1.49
NH3+NH4	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.13	0.22	0.28
NO2-NO3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.17	0.23
Total Phosphorus	0.01	0.02	0.06	0.07	0.10	0.11	0.14	0.17	0.23	0.43	0.59
Ortho-Phosphorus	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.09	0.12	0.21	0.44
Turbidity	3.50	4.00	4.50	5.05	5.40	5.60	6.30	6.80	8.00	11.40	11.75

Units:

Phytoplankton Chlorophyll *a* (ug/L), Periphyton Chlorophyll *a* (mg/m^2), Nutrients (mg/L), Turbidity (NTU), Taxa richness and diversity values are for macroinvertebrates


QUINCY
Pop. 7,444
HAVANA
Pop. 1,654
MIDWAY
Pop 852
GRETNA
Pop. 1,981
ATTAPULGUS
WATSON LINE
Lake Talquin
Lake Talquin State Recreation Area
Joe Budd Wildlife Management Area
Little River
Forbes Purchase Line
Florida
Georgia
Lake Yvette
Lake Talkavona
Lake Talquin State Recreation Area
Airport
Quincy Municipal Airport
Quincy Headquarters
Havana Tower
Campground Cem.
Shiloh Ch.
Robinson Br.
Richlander
Interlocking Lakes
Sunny Dell Cem.
Bethlehem Ch.
English Br.
Holman Br.
Hubbert
Winkley Br.
Quincy Creek
Zion Hope Ch.
Harbin Road
Dam Cr.
Mill
Watson
Rocky
Comfort
Sweetwater
Macedonia Ch.
Camp Cr.
Cane
Creek
Turkey
Mt. Sinai Ch.
Mt. Pilgrim Ch.
Mt. Zion Ch.
Smith St.
Magnolia Road
Survey
Welumpka
Bear
Old Friendship Cem.
Antioch Ch.
Todd
Wallwood Boy Scout Camp
Reserve
Smith Ldg.
Rawlings Ldg.
Browns Landing
Boozers Ldg
Base Line
See Inset "A"
See Inset "B"
See Inset "C"
Mt. Calvary Ch.
Mt. Hosey Ch.
Mt. Glory Ch.
Blessed Hope Ch.
St. Johns Sch.
Philadelphia Ch.
Black Cem.
St. Elizabeth Ch.
St. Hebron Ch.
Woodberry Cem.
Branchville
Dogtown
Taylor Cem.
Owens Cem.
Cor Cem.
Mayflower Ch.
Jamieson
Magnet Cove
Mt. Zion Ch.
Hopkins Cem.
Hinson
Vickers Cem.
Salem Cem.
Shelfer Cem.
Freemont
Salem Cr.
China Hill Ch.
Havana Cr.
Hopewell Ch.
Hurricane
Merit Rd.
St. Matthews Ch.
Little R. River Ch.
Friday Rd.
Shady Rest
Florence
Littman
Altschul
St. James Ch.
Scotland
Red Gibson Road
New Bethel Ch.
Strong Rd.
Ralph Smith Cem.
Vols Cr.
Cox Cr.
Hurricane Cr.
Double Br.
Lake Yvette
St. Johns Ch.
St. Pauls Ch.
Transportation
Holley Br.
Culley
Hunter Cr.
Bagwell Ldg.
High Bluff Ldg.
Mud
Double Br.
Little River
Swamp Creek
Jackson Cr.
Mill Cr.
Csx
Flow
Quincy Cr.
Little River
Lake Talquin
Lake Talquin State Recreation Area
Joe Budd Wildlife Management Area
Florida
Georgia

Facility Summary

Facility Name: Floridin Company Date Summary Prepared: 11/07/96

Location: County: Gadsen County District:10/Northwest
1101 North Madison Street
Quincy, Florida 32351

NPDES Permit #	FL0002577	State GMS #	1020P58608 (Quincy)	Facility Type: Ind.
Comp. A	FL0038466		1020P58610 (Gadsen)	Dom. Fed. Agric.
Comp. B	FL0038482		1020P58610 (Gadsen)	
Comp. C	FL0038474		1020P58610 (Gadsen)	
Comp. D	FL0038458		1020P58610 (Gadsen)	
Comp. F	FL0039101		1020P58610 (Gadsen)	

expiration date 03/31/98 (Quincy NPDES permit)

expiration date 08/01/97 (For all state permits listed above)

expiration date 09/30/97 (Comp. A-F NPDES permit)

Function of facility: To manage several unlined impoundments for detaining industrial wastewater created by open-pit mining operation at Floridin's five mining complexes. The water is treated to allow sedimentation before being discharged to the Little River and its tributaries.

Receiving waters: Little River Classification: I II (III)

Design Flow: 2.16 MGD Mean Flow: .0855 MGD Flow during survey: .023 MGD (JUL 96)

Discharge is: Continuous Intermittent Seasonal Rainfall dependent
Other (describe)
best time to sample is:

If facility has a mixing zone, give details (size, parameters, etc.) N/A

List effluent limits (attach relevant paperwork):

Following is for all effluent discharge impoundments in Mining Complexes A, B, C, D & F:

Parameter	Frequency	Sample Type	Limit (units)
Flow	Once/month	Instantaneous	2.16 MGD
T.S.S.	Once/week	24 Hr Comp	20 mg/l
Turbidity	Once/week	24 Hr Comp	29 NTU above bkgd.
pH	Once/week	Grab	6.5 - 8.5 or within one unit of bkgd.

Following is for Background Little River Complex "A" and Solids Complex "B":

Parameter	Frequency	Sample Type
T.S.S.	Once/week	Grab

Turbidity	Once/week	Grab
pH	Once/week	Grab
River Elev.	Once/month	Grab

List permit violations (from MOR data or other source) and plant upsets within past year:

Jul 96 - TSS was 46 mg/l for 1020x12489 (F8)
TSS was 50 mg/l for 1020x12487 (F5)
pH was 9.1 SU for 1020x13206 (C3)

Feb 96 - pH was 8.9 mg/l for 1020x12489 (F8)

Jan 96 - pH was 8.8 mg/l for 1020x13200 (F3)
pH was 5.7 mg/l for 1020x12487 (F5)

Sep 95 - TSS was 30.4 mg/l for 1020x13200 (F3)

Describe previous impact bioassessments, WQBEL's and previous or current enforcement actions:

The facility is not under any type of enforcement action.

Discuss comparability of MOR results to past FDER results and whether there are trends (improving, declining) in the data set:

No definite trends can be identified within the data set.

Additional information:

Staff contributing to this review (signature)

Nikki Kilburn, ESI/Co-op — Biologist

Inspector

Engineer

Other

Other

FLRQUINCEF ✓

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/12/96	12:55	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	GADSDEN	QUINCY CREEK 0267 (REF)	1

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category): Power Transformer

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40		5	5	40		10	

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☒ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☒

Width of riparian vegetation (m) on least buffered side: <1m

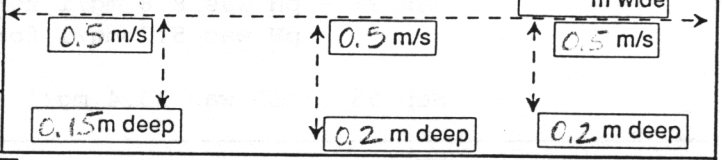
List & map dominant vegetation on back

Artificially Channelized ☒ no ☐ ☐ ☐ (recent, severe / some recovery / mostly recovered)

Artificially Impounded ☐ yes (more sinuous)

High Water Mark: 1m (m above present water level) + 0.2 (present depth in m) = 1.2 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



Canopy Cover % : Open : ☐ Lightly Shaded (11-45%): ☒ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ _____

Sediment Oils: Absent: ☒ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none (slight) moderate severe Silt smothering: none (slight) moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	12	6		Sand	80	2	
Leaf Packs or Mats	5	6		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	3	6					

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		13.6	6.92	10.4	38			Bottom
Mid-depth								
Bottom								

System Type : Stream: ☒ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐ _____

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐ _____

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☒ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☒ Other: ☐ _____

Weather Conditions/Notes:

Cold, windy

- HD condos not burned but block was

*See note on back

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☐	☐	☒	☐
Aquatic Macrophytes	☒	☐	☐	☐
Iron/sulfur Bacteria	☐	☐	☒	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
LMiller, JJackson, RKent, JFrench	LMiller	11-12-96

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/12/96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	GADSDEN	QUINCY CREEK @269 (REF)	1

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability [13]	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 (13) 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity [20]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec (20) 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Artificial Channelization [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Habitat Smothering [18]	Less than 20% of habitats affected by sand or silt accumulation 20 19 (18) 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [18]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 (18) 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [5]	Width of native vegetation (least buffered side) greater than 18 m 20 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities (5) 4 3 2 1
Riparian Zone Vegetation Quality [5]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or (exotics) present. Vegetation removed to stubble height of 2 inches or less. (5) 4 3 2 1

[ ] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

[99] **TOTAL SCORE**

Comments
Colocasia present near bridge
Up from bridge riparian zone looked normal

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-12-96	L Miller, J Jackson	L Miller

FLR QUINTS7

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/12/96	8:36	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	GADSDEN	QUINCY CREEK @ 65 (TEST)	2

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
				10		90	

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☐ Heavy ☒

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☒

Width of riparian vegetation (m) on least buffered side: < 3m

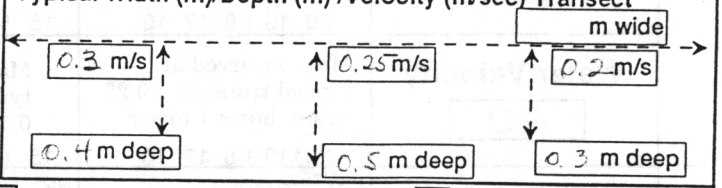
List & map dominant vegetation on back

Artificially Channelized ☒ no ☐ ☐ ☐ (recent, severe / some recovery / mostly recovered)

Artificially Impounded ☐ yes more sinuous

High Water Mark: 1.0 (m above present water level) + 0.5 (present depth in m) = 1.5 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



Canopy Cover % : Open : ☒ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☒ Metallic

Sediment Oils: Absent: ☒ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none / slight / moderate / severe (moderate) Silt smothering: none / slight / moderate (moderate) / severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	10		Sand	90		
Leaf Packs or Mats	2	5		Mud/Muck/Silt	2		
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	1	5					

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		11.6	6.64	10.7	39			
Mid-depth								
Bottom								

System Type : Stream: ☒ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐ _____

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐ _____

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☒ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☒ Other: ☐ _____

Weather Conditions/Notes:
Cold, sunny
- Periphyton rack gone
- HD half buried

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☒	☐	☐	☐
Fish	☐	☐	☒	☐
Aquatic Macrophytes	☒	☐	☐	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
LMiller, J Jackson, R Kent, J French	L Miller	11-12-96

FLRAVINTST

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/12/96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	GADSDEN	QUINCY CREEK @ 65 (TEST)	2

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability [7]	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 1 8 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 (7) 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity [18]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 (18) 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Artificial Channelization [18]	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 (18) 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Habitat Smothering [13]	Less than 20% of habitats affected by sand or silt accumulation 20 19 1 8 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 (13) 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [9]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 1 8 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 (9) 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [3]	Width of native vegetation (least buffered side) greater than 18 m 20 19 1 8 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 (3) 2 1
Riparian Zone Vegetation Quality [8]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 20 19 1 8 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 (8) 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

? [5] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

[81] **TOTAL SCORE**

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-12-96	LMiller, JJackson	LM, JJ

FLRWILLNET

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11/12/96	8:45 AM	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	GADSDEN	WILLACOOCHEE @ 65 (REF)	3

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
53	20	5	20	2			

Local Watershed Erosion (check box): None ☐ Slight ☑ Moderate ☐ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☑ Moderate potential ☐ Obvious sources ☐

Width of riparian vegetation (m) on least buffered side: >18

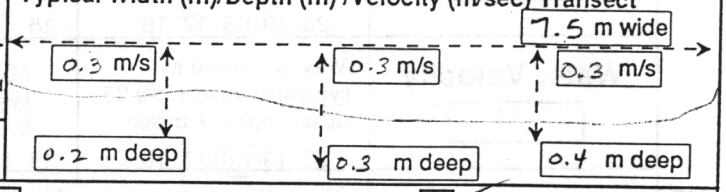
List & map dominant vegetation on back

Artificially Channelized ☒ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

High Water Mark: 0.5 (m above present water level) + 0.4 (present depth in m) = 0.9 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



Canopy Cover % : Open : ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☑ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none slight (moderate) severe Silt smothering: none (slight) moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	8	10		Sand	86	2	
Leaf Packs or Mats	3	5		Mud/Muck/Silt			
Aquatic Vegetation	1	1		Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	2	2					

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	9.8	6.0	10.4	30			VOB
Mid-depth								
Bottom								

System Type : Stream: ☑ (1st - 2nd order (3rd - 4th order) 5th - 6th order 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☑ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:

Cool and sunny

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☑	☐	☐
Fish	☐	☑	☐	☐
Aquatic Macrophytes	☐	☑	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
Ken, Bart, Jen		

FLRWILLREF

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11/12/96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	GADSDEN	WILLACOOCHEE @ 65 (REF)	3

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability 10	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 1 8 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. (10) 9 8 7 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity 20	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec (20) 19 1 8 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Artificial Channelization 20	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 1 8 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Habitat Smothering 13	Less than 20% of habitats affected by sand or silt accumulation 20 19 1 8 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 (13) 12 11	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability 20	Stable. No evidence of erosion or bank failure. Little potential for future problems. (20) 19 1 8 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width 20	Width of native vegetation (least buffered side) greater than 18 m (20) 19 1 8 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality 20	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. (20) 19 1 8 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

5 Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

128 **TOTAL SCORE**

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-12-96	Ken, Bart, Jen	

FLKWILL
2202005

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11:50	11-12-96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	Willacoochee Crk @ 161	4

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
30		5	5	10		50	

(Other (Specify): mowing recreation)

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☒ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☒

Width of riparian vegetation (m) on least buffered side: >18m

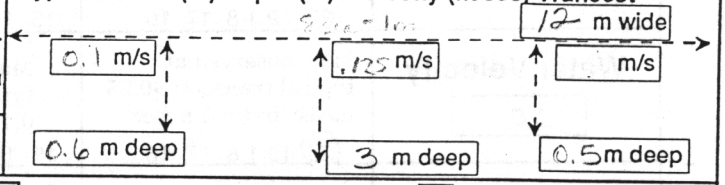
List & map dominant vegetation on back

Artificially Channelized ☒ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes ☐ more sinuous

High Water Mark: 0.5 (m above present water level) + 3 (present depth in m) = 3.5 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



Canopy Cover % : Open ☒ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☒ (slightly) Other: ☐

Sediment Oils: Absent: ☒ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: (none) slight moderate severe Silt smothering: none slight (moderate) severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	10	7		Sand			
Leaf Packs or Mats	3	7		Mud/Muck/Silt	95		
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	2	6					

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top		10.1	6.57	10.9	32			
Mid-depth								
Bottom								

System Type : Stream: ☒ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☐ Turbid: ☒ Opaque: ☐

Color (check box): Tannic: ☒ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:

Cold, windy

- Upstream of bridge too deep to sample - no access. Sampled (starting) about 15m dn from bridge.

Severe muck!

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☒	☐	☐	☐
Fish	☐	☒	☐ (Can't see)	☐
Aquatic Macrophytes	☒	☐	☐	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
L Miller, J Jackson, R Ward, J French	L Miller	11-12-96

1-RWIL-[illegible]
2202012

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11-12-96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	Willacoochee @ 161	4

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability 8	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 (8) 7 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity 10	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec (10) 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Artificial Channelization 20	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Habitat Smothering 11	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 (11)	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability 13	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 (13) 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width 20	Width of native vegetation (least buffered side) greater than 18 m (20) 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality 20	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. (20) 19 18 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

5 Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

107 **TOTAL SCORE**

Comments
Water dark + turbid - unable to see all habitat

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-12-96	LMiller, JJackson	L Miller

FLRATTLEF
2202000?

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11-12-96	10:30	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	Attapulgus Crk @ 159	5

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
20	30	20	25	5			

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☑ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☑ Obvious sources ☐

Width of riparian vegetation (m) on least buffered side: > 18

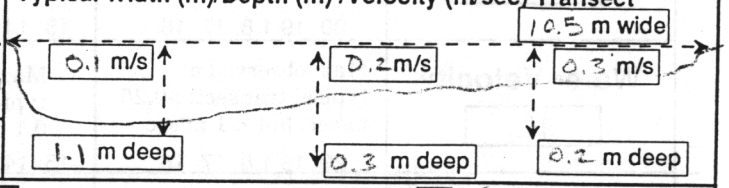
List & map dominant vegetation on back

Artificially Channelized ☑ no ☐ recent, ☐ severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

High Water Mark: 0.5 (m above present water level) + 1.1 (present depth in m) = 1.6 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



Canopy Cover % : Open : ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☑ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none slight (moderate) severe Silt smothering: none (slight) moderate severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	10		Sand	90	2	
Leaf Packs or Mats	2	3		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots	3	5					

Draw aerial view sketch of habitats found in 100 m section

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	10.3	6.1	9.9	110			
Mid-depth								
Bottom								

System Type : Stream: ☑ (1st - 2nd order (3rd - 4th order) 5th - 6th order 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☑ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:

Cool + Sunny

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☑	☐	☐
Fish	☐	☐	☑	☐
Aquatic Macrophytes	☑	☐	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
Ken, Bart, Jen	Jennifer Eichler	11-12-96

FLRATTREF
2202001

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11-12-96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	Attapulgus Crk @ 159	5

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability [8]	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 18 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 **8** 7 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity [18]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 **18** 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Artificial Channelization [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern **20** 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Habitat Smothering [11]	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 **11**	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [15]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 18 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. **15** 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 10 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [20]	Width of native vegetation (least buffered side) greater than 18 m **20** 19 18 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality [20]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. **20** 19 18 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[5] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

[117] **TOTAL SCORE**

Comments

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-12-96	Ken, Barb, Jen	Jennifer Eichelberger

FLKTKTST
22020016

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (5-10-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		11-12-96	12:00	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	Little River @ 12	6

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
30	20	5	40	5			

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☑ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☑ Obvious sources ☐

Width of riparian vegetation (m) on least buffered side: > 18

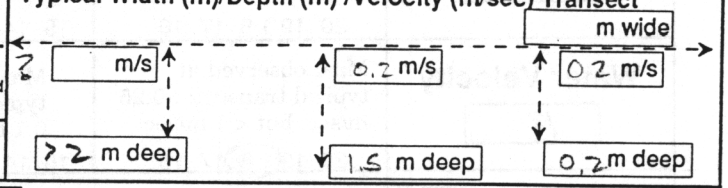
List & map dominant vegetation on back

Artificially Channelized ☑ no ☐ ☐ ☐ (recent, severe / some recovery / mostly recovered more sinuous)

Artificially Impounded ☐ yes

High Water Mark: 1.0 (m above present water level) + > 2 (present depth in m) = > 3 (m above bed)

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect



Canopy Cover % : Open : ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☑ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand smothering: none / slight / (moderate) / severe Silt smothering: none / slight / (moderate) / severe Other:

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	7	12		Sand	85	2	
Leaf Packs or Mats	2	4		Mud/Muck/Silt			
Aquatic Vegetation				Other: Clay	5		
Rock or Shell Rubble				Other:			
Undercut banks/Roots	1	2		*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (µmho/cm) or Salinity (ppt):			Secchi (m):
Top	0.1	10.5	5.1	9.9	62			
Mid-depth								
Bottom								

System Type : Stream: ☑ (1st - 2nd order / 3rd - 4th order / 5th - 6th order / 7th order or greater) Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☑ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:

Cool + clear

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☑	☐	☐
Fish	☐	☐	☑	☐
Aquatic Macrophytes	☑	☐	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
Ken, Bart, Jen	[signature]	11-12-96

FLKTRTST
22020016

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (4-22-96)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
		11-12-96	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	Little River @ 12	6

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Substrate Types & Availability [8]	Greater than 30% snags, logs, tree roots, aquatic vegetation, leaf packs (partially decayed), undercut banks, rock, or other stable habitat. 20 19 1 8 17 16	16% to 30% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 15% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 (8) 7 6	Less than 5% snags, logs, tree roots, aquatic vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Water Velocity [15]	Max. observed at typical transect: >0.25 m/sec. but < 1 m/sec 20 19 1 8 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec (15) 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect <0.05 m/sec, or spate occurring; > 1 m/sec 5 4 3 2 1
Artificial Channelization [20]	No artificial channelization or dredging. Stream with normal, sinuous pattern (20) 19 1 8 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Habitat Smothering [11]	Less than 20% of habitats affected by sand or silt accumulation 20 19 1 8 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 (11)	Smothering of 50%-80% of habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools absent 5 4 3 2 1
Bank Stability [10]	Stable. No evidence of erosion or bank failure. Little potential for future problems. 20 19 1 8 17 16	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 15 14 13 12 11	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. (10) 9 8 7 6	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 5 4 3 2 1
Riparian Buffer Zone Width [20]	Width of native vegetation (least buffered side) greater than 18 m (20) 19 1 8 17 16	Width of native vegetation (least buffered side) 12 m to 18 m 15 14 13 12 11	Width of native vegetation 6 to 12 m, human activities still close to system 10 9 8 7 6	Less than 6 m of native buffer zone due to intensive human activities 5 4 3 2 1
Riparian Zone Vegetation Quality [20]	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. (20) 19 1 8 17 16	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 10 9 8 7 6	Less than 25% of streambank surfaces are vegetated and/or poor plant community (*e.g.* grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 5 4 3 2 1

[5] Add **5 points** if cross-sectional area of flow is estimated to be > one square meter during periods of normal flow.

Comments

[109] **TOTAL SCORE**

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-12-96	Ken, Bart, Jen	

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Floridin
County: Gadsden
Contact / District:
NPDES Permit #: FL00
LIMS Sample #: 159359 **LIMS Job #:** 96-NOV-13-12
sample log 11-18-96

Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Sample Collection: Date 11/12/96 Time 1030
Test Beginning: Date 11/13/96 Time 1140
Test Ending: Date 11/15/96 Time ~~1255~~ 1355 DW 11/15
Organism Batch #: #86 **Diluent Batch #:** Well
Organism Age: 10 days
Test Organism: Cyprinella leedsi

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.1 @ 22.1	8.2 @ 25.0 °C	102 @ 92.8 994 @ 1001 @ 24.3 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.0 @ 22.0	8.7 @ 22.3 °C	103.0 @ 92.8 1004 @ 1001 @ 25.2 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.8 @ 22.8	8.2 @ 25.3 °C	102.1 @ 92.8 1003 @ 1001 @ 25.1 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctl A	D1	5	5	5	7.9	8.2	8.3	24.0	23.7	25.1	8.0	8.0	7.9	250	250	260
Ctl B	D2	5	5	5	7.9	8.2	8.4	23.9	23.9	24.6	8.0	8.0	7.6	250	250	250
Ctl C	D3	5	5	5	7.9	8.3	8.4	23.8	23.9	25.2	8.0	8.0	7.7	250	255	265
Ctl D	D4	5	5	5	7.9	8.3	8.4	23.8	24.2	24.0	8.0	8.0	7.7	250	255	260
100% A	D5	5	5	5	8.5	8.4	8.4	23.5	25.6	25.1	8.5	8.0	7.9	370	390	400
100% B	D6	5	5	4 10	8.5	8.4	8.4	23.2	24.0	24.8	8.9	8.1	7.8	370	390	400
100% C	D7	5	5	5	8.5	8.4	8.5	23.2	24.0	24.6	9.0	7.9	7.8	370	390	400
100% D	D8	5	5	5	8.6	8.4	8.5	23.3	24.1	23.9	8.9	8.0	7.8	370	390	400
Measured/Loaded by:		DW	ND	MF	MF	DN	JS	MF	DN	JS	MF	DN	JS	MF	DN	JS
Recorded by:		MF	ND	DW	DN	ND	DW	DN	ND	DW	DN	ND	DW	DN	ND	DW

Investigators' Signatures

Marshall Fairchild
Denise Nicholson
Julie Harps
reviewer

form updated 4/01/96

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			not measured		
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	DW
Alkalinity (mg/L as $CaCO_3$):	130	—	125	HACH	DB
Hardness (mg/L as $CaCO_3$):	135	—	195	HACH	DB
Total ammonia (mg/L as N):	<0.017	—	<0.017	ORION	mf

Ammonia Meter #98136 Ammonia Meter Slope: -59.5 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Floridin
County: Gadsden
Contact / District:
NPDES Permit #: FL00
LIMS Sample #: 159354 LIMS Job #: 96-NOV-13-12
sample log 11-18-96
Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 1 of 2
Remarks:

Sample Collection: Date 11/12/96 Time 1030
Test Beginning: Date 11/13/96 Time 1140
Test Ending: Date 11/15/96 Time 1255
Organism Batch #: 50 Diluent Batch #: 47
Organism Age: <24-hr
Test Organism: Ceriodaphnia dubia

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.1 @ 22.1	8.2 @ 25.0 °C	102.2 @ 92.8 994 @ 1001 @ 24.3 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.0 @ 22.0	8.7 @ 22.3 °C	1030 @ 92.8 1004 @ 1001 @ 25.2 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.8 @ 22.8	8.2 @ 25.3 °C	102.1 @ 92.8 1003 @ 1001 @ 25.1 °C

wrote on wrong page 48-hr pH values under 24hrs DW 11/15

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h DW	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 48 h
Ctr	A	5	5	5	8.2	8.0	7.7	22.8		24.8	8.0		7.7	165		165
Ctr	B	5	5	5		8.1	7.8			24.8			7.8			175
Ctr	C	5	5	5		8.0	7.8			24.7			7.8			190
Ctr	D	5	5	5		8.1	7.9			24.5			7.7			200
100%	A	5	5	5	8.5	8.2	8.0	22.9		24.5	8.3		7.9	360		390
100%	B	5	5	5		8.3	8.0			24.4			7.8			420
100%	C	5	5	5		8.4	8.0			24.4			7.8			420
100%	D	5	5	5		8.4	8.0			24.3			7.8			425
Measured/Loaded by:		MF	ND	MF	MF	JS	JS	MF		JS	MF		JS	MF		JS
Recorded by:		MF	ND	MF	DN	DW	DW	DN		DW	DN		DW	DN		DW

Investigators' Signatures

Marshall Faircloth
Dennis Nicholson
Julie Shipe
Jeff Wolf

reviewer

form updated 4/01/96

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			Not Measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR100	DW
Alkalinity (mg/L as $CaCO_3$):	—	70	125	HACH	DB
Hardness (mg/L as $CaCO_3$):	—	90	195	HACH	DB
Total ammonia (mg/L as N):	—	<0.017	<0.017	ORION	MF

Ammonia Meter #98136 Ammonia Meter Slope: -59.5 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

Quincy Creek Reference STATION 1

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	**Panhandle**				**Peninsula**				**Northeast**			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	29	≥27	26-14	<14	5	≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index	4	≥6	5-3	<3	3	≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa	14	≥9	8-5	<5	5	≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon	13	≤25	26-62	>62	5	≤30	31-65	>65		≤37	38-69	>69	
% Diptera	55	-	≤60	>60	3	-	≤52	>52		-	≤67	>67	
Florida Index	14	≥ 13	12-7	<7	5	≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers	15.9	≥ 13	12-7	<7	5	≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		**Panhandle**			31	**Peninsula**				**Northeast**			
Interpretation of Score		**Excellent**			**27-33**	**Excellent**			**27-33**	**Excellent**			**26-31**
		Good			**21-26**	**Good**			**21-26**	**Good**			**20-25**
		Poor			**14-20**	**Poor**			**14-20**	**Poor**			**14-19**
		Severely Degraded			**7-13**	**Severely Degraded**			**7-13**	**Severely Degraded**			**7-13**

Quincy Creek Test STATION 2

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	**Panhandle**				**Peninsula**				**Northeast**			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	37	≥27	26-14	<14	5	≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index	4	≥6	5-3	<3	3	≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa	16	≥9	8-5	<5	5	≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon	15.1	≤25	26-62	>62	5	≤30	31-65	>65		≤37	38-69	>69	
% Diptera	55	-	≤60	>60	3	-	≤52	>52		-	≤67	>67	
Florida Index	19	≥ 13	12-7	<7	5	≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers	10.6	≥ 13	12-7	<7	3	≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		**Panhandle**			29	**Peninsula**				**Northeast**			
Interpretation of Score		**Excellent**			**27-33**	**Excellent**			**27-33**	**Excellent**			**26-31**
		Good			**21-26**	**Good**			**21-26**	**Good**			**20-25**
		Poor			**14-20**	**Poor**			**14-20**	**Poor**			**14-19**
		Severely Degraded			**7-13**	**Severely Degraded**			**7-13**	**Severely Degraded**			**7-13**

Willacoochee Reference STATION 3

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	28	≥27	26-14	<14	5	≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index	3	≥6	5-3	<3	3	≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa	10	≥9	8-5	<5	5	≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon	18	≤25	26-62	>62	5	≤30	31-65	>65		≤37	38-69	>69	
% Diptera	30.8	-	≤60	>60	3	-	≤52	>52		-	≤67	>67	
Florida Index	20	≥ 13	12-7	<7	5	≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers	21.3	≥ 13	12-7	<7	5	≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		Panhandle			31	Peninsula				Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Willacoochee Test STATION 4

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast			
		5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	43	≥27	26-14	<14	5	≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index	8	≥6	5-3	<3	5	≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa	17	≥9	8-5	<5	5	≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon	14.6	≤25	26-62	>62	5	≤30	31-65	>65		≤37	38-69	>69	
% Diptera	47.1	-	≤60	>60	3	-	≤52	>52		-	≤67	>67	
Florida Index	23	≥ 13	12-7	<7	5	≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers	26.4	≥ 13	12-7	<7	5	≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		Panhandle			33	Peninsula				Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Athapulgus - Ref STATION 5

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle			Score	Peninsula			Score	Northeast			Score
		5	3	1		5	3	1		5	3	1	
Total Number of Taxa	29	≥27	26-14	<14	5	≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index	3	≥6	5-3	<3	3	≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa	15	≥9	8-5	<5	5	≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon	18	≤25	26-62	>62	5	≤30	31-65	>65		≤37	38-69	>69	
% Diptera	70.8	-	≤60	>60	1	-	≤52	>52		-	≤67	>67	
Florida Index	17	≥ 13	12-7	<7	5	≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers	35.4	≥ 13	12-7	<7	5	≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		Panhandle			29	Peninsula				Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Little River - Test STATION 6

Winter Index Period: Stream Condition Index for Florida (SCI) (April 1996)													
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	Value	Panhandle			Score	Peninsula			Score	Northeast			Score
		5	3	1		5	3	1		5	3	1	
Total Number of Taxa	23	≥27	26-14	<14	3	≥ 27	26-14	<14		≥18	17-9	<9	
EPT Index	5	≥6	5-3	<3	3	≥ 4	3-2	<2		-	≥3	<3	
# Chironomid Taxa	8	≥9	8-5	<5	3	≥9	8-5	<5		≥4	3-2	<2	
% Contribution of Dominant Taxon	18	≤25	26-62	>62	5	≤30	31-65	>65		≤37	38-69	>69	
% Diptera	46.1	-	≤60	>60	3	-	≤52	>52		-	≤67	>67	
Florida Index	10	≥ 13	12-7	<7	3	≥10	9-5	<5		≥ 6	5-3	<3	
% Suspension feeders/Filterers	57.3	≥ 13	12-7	<7	5	≥15	14-8	<8		≥ 25	25-13	<13	
Total Score		Panhandle			25	Peninsula				Northeast			
Interpretation of Score		Excellent			27-33	Excellent			27-33	Excellent			26-31
		Good			21-26	Good			21-26	Good			20-25
		Poor			14-20	Poor			14-20	Poor			14-19
		Severely Degraded			7-13	Severely Degraded			7-13	Severely Degraded			7-13

Benthic macroinvertebrate taxa list for Floridin, collected via Hester-Dendy artificial substrates in Quincy Creek, on 12 November, 1996. Densities, in number/m^2, represent the mean of three replicates.

	Reference Site	Test Site
Nemeretina		
Prostoma rubrum	–	1
Oligochaeta		
Limnodrilus hoffmeisteri	–	6
Nais behningi	–	1
Nais communis	–	12
Pelecypoda		
Corbicula fluminea	–	2
Pisidiidae	–	2
Acarina		
Lebertia sp.	1	–
Isopoda		
Caecidotea sp.	–	1
Amphipoda		
Hyalella azteca	–	1
Ephemeroptera		
Baetis intercalaris	37	1
Baetis sp.	2	–
Caenis sp.	–	1
Stenacron sp.	1	–
Stenonema smithae	8	77
Odonata		
Libellula incesta	–	1
Coleoptera		
Ancyronyx variegatus	2	6
Macronychus glabratus	1	3
Stenelmis sp.	–	2
Trichoptera		
Cheumatopsyche sp.	4	20
Diptera		
Ablabesmyia mallochi	–	1
Ablabesmyia rhamphe grp.	1	–
Chironomidae	4	26
Conchapelopia sp.	1	1
Corynoneura sp. B epler	–	2
Cricotopus or orthocladius	2	2
Goeldichironomus holoprasinus	–	1
Hemerodromia sp.	–	1
Pentaneura inconspicua	–	3
Polypedilum aviceps	2	1
Polypedilum convictum grp	3	20

Polypedilum fallax	1	9
Polypedilum illinoense grp.	–	2
Polypedilum scalaenum grp.	–	5
Polypedilum sp.	–	2
Rheocricotopus robacki	4	18
Rheotanytarsus distinctissimus grp.	–	1
Rheotanytarsus exiguus grp.	–	1
Rheotanytarsus sp.	–	2
Simulium sp.	–	1
Tanytarsus sp. A Epler	–	2
Tanytarsus sp. C Epler	–	1
Tanytarsus sp. L Epler	–	3
Tanytarsus sp. M Epler	–	2
Thienemanniella sp. A Epler	–	1
Tipula sp.	–	1

Macroinvertebrate taxa list for Floridin Basin Study, collected via 20 dip net sweeps in Quincy Creek, Willacoochee River, Attapulgus Creek, and Little River on 12 November 1996.

	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Acarina						
Limnesia sp.	–	–	–	–	1	–
Amphipoda						
Hyalella azteca	5	1	–	–	–	–
Coleoptera						
Ancyronyx sp.	1	–	–	–	–	–
Ancyronyx variegatus	–	6	1	–	–	–
Dineutus angustus	–	–	–	–	–	1
Dryopidae	–	1	–	–	–	–
Dytiscidae	1	–	–	–	–	–
Ectopria sp.	–	–	–	–	1	
Ectopria thoracica						1
Gyrinus sp.	–	–	4	–	–	–
Helichus fastigiatus	1	–	–	–	–	–
Liodessus sp.	–	–	–	1	–	–
Macronychus glabratus	–	2	3	1	–	1
Macronychus sp.	–	–	–	–	1	–
Microcylloepus sp.	–	–	–	–	1	–
Scirtes sp.	–	–	–	1	–	–
Sperchopsis tessellatus	–	–	–	–	2	–
Stenelmis sp.	–	–	5	–	1	9
Tropisternus sp.	–	1	–	–	–	–
Decapoda						
Cambaridae	–	–	–	–	–	1
Palaemonetes paludosus	–	1	–	–	–	–
Procambarus sp.	–	–	–	1	1	–
Diptera						
Ablabesmyia mallochi	2	3	2	4	–	–
Ablabesmyia rhamphe grp.	3	–	1	–	1	–
Atherix sp.	1	–	–	–	–	–
Cardiocladius sp.	1	–	–	–	–	–
Chaoborus punctipennis	–	1	–	–	–	–
Chironomidae	2	6	2	13	4	–
Chironomus sp.	–	14	–	2	–	–
Cladotanytarsus sp.	–	–	1	–	–	–
Clinotanypus sp.	–	–	1	1	–	–
Conchapelopia sp.	–	–	–	–	1	–
Corynoneura sp.	1	–	–	–	1	–
Cricotopus bicinctus	–	1	–	–	–	–
Goeldichironomus sp.	–	1	–	–	–	–
Hemerodromia sp.	1	–	–	–	2	–
Labrundinia pilosella	–	–	2	–	2	–
Labrundinia sp.	–	–	–	1	1	–
Nanocladius sp.	1	2	–	–	–	–

	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Palpomyia/Bezzia grp.	–	–	–	4	1	–
Parakiefferiella sp. A Epler	–	–	–	4	–	–
Parakiefferiella sp. B Epler	–	1	–	–	–	–
Pentaneura inconspicua	–	1	–	–	–	–
Polypedilum aviceps	–	–	1	–	–	–
Polypedilum convictum grp.	6	6	–	13	3	
Polypedilum fallax	–	2	–	–	–	–
Polypedilum halterale grp.	–	–	–	8	–	–
Polypedilum illinoense	5	22	2	8	1	11
Polypedilum scalaenum	1	–	–	–	–	–
Polypedilum scalaenum grp.	–	3	–	–	–	–
Polypedilum sp.	1	–	–	–	–	–
Procladius sp.	–	–	–	1	–	–
Rheocricotopus robacki	2	7	10	6	4	1
Rheosmittia sp.	–	–	–	–	–	1
Rheotanytarsus distinctissimus grp.	2	5	–	–	6	1
Rheotanytarsus exiguus grp.	2	1	2	2	15	12
Rheotanytarsus sp.	–	1	–	–	2	2
Simulium sp.	3	5	3	6	–	16
Stempellinella sp.	1	–	–	–	–	–
Tanytarsus sp.	1	1	–	3	2	1
Tanytarsus sp. D Epler	–	–	–	–	1	–
Tanytarsus sp. E Epler	–	–	–	–	1	–
Tanytarsus sp. L Epler	–	–	1	1	2	2
Tanytarsus sp. M Epler	–	–	–	1	1	1
Tanytarsus sp. S Epler	–	–	–	1	–	–
Tanytarsus sp. T Epler	–	–	–	3	–	–
Thienemanniella sp. A Epler	–	–	–	–	1	–
Thienemanniella sp. B Epler	–	–	–	1	–	–
Thienemanniella xena	–	–	–	–	1	–
Tipula sp.	–	–	1	–	–	–
Tribelos jucundus	–	4	–	2	–	–
Tribelos sp.	2	–	–	1	–	–
Ephemeroptera						
Acerpenna pygmaeus	6	–	–	–	–	–
Baetidae	–	2	–	–	–	–
Baetis intercalaris	–	7	–	5	–	6
Baetis sp.	–	–	9	–	–	–
Caenis sp.	1	–	–	–	–	1
Hexagenia sp.	–	–	–	2	–	–
Isonychia sp.	–	–	–	3	–	–
Labiobaetis propinquus	–	1	–	–	8	–
Leptophlebia bradleyi	–	3	–	–	–	–
Stenacron sp.	–	–	–	1	–	1
Stenonema exiguum	–	–	–	8	–	–
Stenonema smithae	–	20	14	9	2	5
Gastropoda						
Ancylidae	–	–	5	2	2	–

	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Hebetancylus excentricus	–	1	–	–	–	–
Hydrobiidae	–	–	–	–	–	1
Physella sp.	–	–	2	2	–	–
Hemiptera						
Rhagovelia sp.	–	–	1	–	–	–
Megaloptera						
Corydalus cornutus	–	1	–	–	–	–
Sialis sp.	–	–	–	1	–	–
Odonata						
Boyeria vinosa	1	–	–	–	–	–
Calopteryx sp.	–	–	1	–	–	–
Enallagma sp.	–	–	2	–	–	–
Ischnura sp.	–	1	–	1	–	–
Macromia sp.	–	–	1	–	–	–
Macromia taeniolata	–	–	–	1	–	–
Oligochaeta						
Aulodrilus pigueti	1	–	–	2	–	–
Branchiobdellida sp.	–	1	–	–	–	–
Bratislavia unidentata	–	1	–	–	–	–
Dero trifida	–	–	–	–	–	1
Haber speciosus	–	–	–	7	1	–
Limnodrilus hoffmeisteri	9	4	3	4	–	2
Nais barbata	–	–	–	1	–	–
Nais communis	1	2	–	–	–	–
Psammoryctides convolutus	–	–	–	2	–	–
Slavina appendiculata	–	–	–	1	–	–
Pelecypoda						
Corbicula fluminea	–	2	5	–	–	2
Pisidiidae	–	1	2	23	–	–
Plecoptera						
Perlidae	–	–	–	1	–	–
Trichoptera						
Cheumatopsyche sp.	–	–	7	3	5	16
Hydropsychidae	3	–	–	–	–	–
Triaenodes sp.	1	–	–	–	–	–

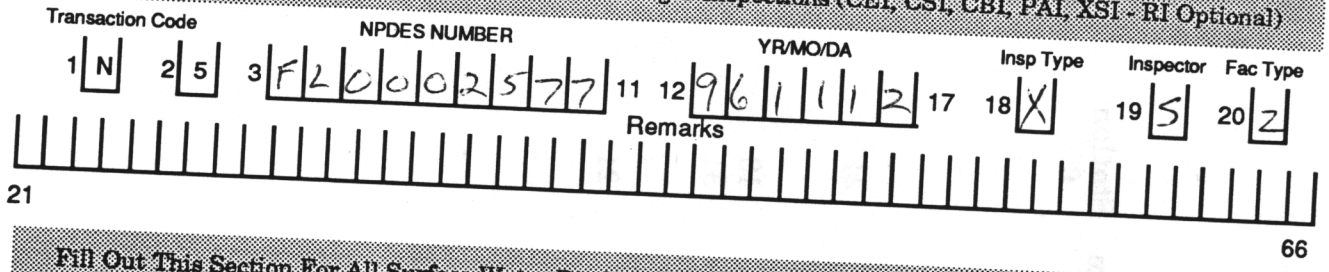
Phytoplankton taxa list and densities (#/mL) for Floridin Co., collected via subsurface grabs in Quincy Creek, Willacoochee River, Attapulgus Creek, and Little River on 12 November, 1996.

	F2 Pond	Effluent Pond	C3 Pond	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
Bacillariophyceae									
Cyclotella sp.	-	10	-	-	10	-	-	-	-
Gomphonema sp.	-	10	-	-	-	-	-	-	-
Melosira sp.	-	-	-	-	-	-	-	11	21
Navicula sp.	-	-	11	11	-	11	-	11	41
Nitzschia sp.	288	-	-	116	113	-	-	-	-
Pennales	-	-	-	-	-	11	-	-	-
Rhizosolenia sp.	-	-	-	126	72	-	-	-	-
Chlorophyceae									
Actinastrum sp.	-	-	-	-	10	-	-	-	10
Chlamydomonas sp.	-	-	-	53	21	-	-	-	-
Chlorophyceae	-	-	-	21	-	-	-	420	226
Chodatella sp.	-	-	-	-	10	-	-	-	-
Coelastrum sp.	-	-	-	-	-	-	-	11	-
Cosmarium sp.	-	-	-	-	10	-	-	-	-
Crucigenia sp.	-	-	-	32	31	-	-	-	-
Eudorina sp.	-	21	-	11	-	-	-	-	-
Gloeocystis sp.	-	-	-	42	21	-	-	-	-
Golenkinia sp.	-	-	32	63	72	-	-	-	-
Mougeotia sp.	10	-	-	42	41	-	-	-	-
Oocystis sp.	-	-	-	-	-	-	-	1176	432
Pediastrum sp.	-	-	-	11	10	-	-	-	-
Scenedesmus sp.	-	113	11	252	175	-	-	221	92
Schroederia sp.	-	-	11	74	123	-	-	63	51
Spermatozoopsis sp.	-	-	-	-	-	-	-	11	-
Tetraedron sp.	-	-	-	-	10	-	-	-	-

Treubaria sp.	-	-	-	-	10	-	-	-	-

	F2 Pond	Effluent Pond	C3 Pond	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
Chrysophyceae									
Dinobryon sp.	-	-	-	-	10	-	-	-	-
Ophiocytium sp.	-	-	-	-	21	-	-	-	-
Cryptophyceae									
Chroomonas sp.	-	-	-	42	21	-	10	-	-
Cryptomonas sp.	-	21	-	168	31	-	10	21	21
Cyanophyceae									
Anabaena sp.	144	-	-	-	-	-	-	-	-
Chroococcus sp.	-	41	63	42	10	-	10	-	10
Dactylococcopsis sp.	10	21	-	294	596	21	10	21	31
Lyngbya sp.	51	-	42	-	-	-	-	-	-
Merismopedia sp.	-	-	-	21	21	-	-	-	-
Oscillatoria sp.	51	-	189	168	103	11	10	32	21
Dinophyceae									
Peridinium sp.	10	-	-	32	21	-	-	-	-
Euglenophyceae									
Euglena sp.	-	-	-	32	-	-	-	-	-

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)



Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)

