

Biological Assessment of

Champion International

Escambia County

NPDES #FL0002526

Sampled July 1995

January 1996

Biology Section
Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan No. 870346G

Department of Environmental Protection
Results of Fifth Year Inspections

Discharger: Champion International
County: Escambia
NPDES Number: FL0002526
State Permit Expiration Date: 1 December 1994

Toxics Sampling Inspection (XSI)

Date Sampled: 5 July 1995

Results: Organic compounds detected in the effluent included an alkane (12 µg/L), an alcohol (15 µg/L), phenanthrenecarboxylic acid (7.8 µg/L), and unidentifiable organic compounds (36 µg/L). The concentrations of these organics are not high enough to be acutely or chronically toxic to aquatic organisms. Aluminum (355 µg/L), iron (70 µg/L), and zinc (12 µg/L) were found in the effluent at levels which complied with Class III standards.

Compliance Biomonitoring Inspection (CBI)

Results: Not sampled.

Impact Bioassessment Inspection (IBI)

Date Sampled: 13 July 1995

Results: Qualitative measures of benthic macroinvertebrate community health indicated severe adverse effects associated with the discharge. Eleven Mile Creek had extremely low scores for taxa richness, the Florida Index, the EPT Index, and the % filter feeders, compared with the two reference sites. The Stream Condition Index (SCI), which summarizes the health of stream biota, ranked both reference sites as "unimpaired", but placed Eleven Mile Creek in the "severe degradation" category. These results clearly indicate that the discharge was causing an imbalance of aquatic fauna, which is prohibited by Rule 62-302.530(48)(b) FAC. Pollution tolerant "bloodworms" were overwhelmingly abundant in Eleven Mile Creek, a violation of Rule 62-302.530(47) FAC, dominance of nuisance species. The adverse effects seen in the biological communities in Eleven Mile Creek are in response to several factors, including depressed dissolved oxygen, chronically toxic concentrations of unionized ammonia, nutrient enrichment and subsequent eutrophication effects, and extremely elevated conductivity.

Water Quality Inspection (WQI)

Date Sampled: 13 July 1995

Results: Dissolved oxygen in the effluent and in Eleven Mile Creek violated Class III Water Quality Standards (Rule 62-302.530(31) FAC). The specific conductance of Eleven Mile Creek (2,450 µmhos/cm) was extremely elevated, well in excess of the Class III standard. Effluent specific conductance was 2,500 µmhos/cm, which is equal to the facility's permit limit. Elevated effluent concentrations of ammonia (5.4 mg/L), TKN (8.5 mg/L) and total phosphorus (0.85 mg/L) caused significant enrichment in the receiving waters. Eleven Mile Creek levels of total phosphorus, ammonia, and TKN were higher than those found in 90% to 95% of other Florida streams. The unionized ammonia concentration in Eleven Mile Creek (0.11 mg/L) also violated Rule 62-302.530(3) FAC, and was high enough be chronically toxic to the biota of the stream.

Introduction

Champion International, a 1,400 ton/day bleached Kraft pulp and paper mill, is located in Escambia County, Florida (see maps in Appendix). Wastewater treatment at this 28.0 MGD facility includes primary settling, solids dewatering, secondary treatment in four ponds (with a combined storage capacity of 249.7 MG), and nutrient addition. The effluent is discharged into the Class III Eleven Mile Creek, which flows into the Perdido Bay. Average flow from the facility has been 22.1 MGD.

There are a total of 34 effluent parameters the facility is required to monitor (see Facility Summary in Appendix). Effluent limits for these parameters are outlined in Chapter 62-302 FAC. Additionally, the facility must monitor at five stations in Eleven Mile Creek, and meet Class III water quality standards, for the following parameters: dissolved oxygen, BOD, pH, temperature, color, and turbidity.

Permit violations include exceeding the unionized ammonia on every month from September, 1994, to September 1995. The facility is currently operating under a Temporary Operating Permit and a Consent Order (87-1398). In December, 1989, the facility was granted a variance for relief from Class III standards for iron, zinc, transparency, and specific conductance.

Benthic macroinvertebrate communities in Eleven Mile Creek have been sampled 17 times since 1978 (see Appendix). The average Shannon-Weaver diversity in Eleven Mile Creek during this period was 1.4. Compared with 14 reference streams in the Panhandle, where "background" diversity averaged 3.8, Eleven Mile Creek was consistently in violation of the Biological Integrity Criterion (Rule 62-302.530(11) FAC (see Appendix). From May, 1994, to the present, bioassays indicate Champion's effluent samples have been acutely toxic in four of the last eight samplings.

Eleven Mile Creek has had major water quality problems since the early 1970s (Hand *et al.* 1994). Recently, due to dioxin contamination, health advisories have been issued which recommend against consumption of fish caught in Eleven Mile Creek (Hand *et al.* 1994).

Major characteristics of community structure of control and test sites.

	Coffee Creek	I-10 Rest	11 Mile Creek
Macroinvertebrate Dipnet X20			
Stream Condition Index (SCI)	23	29	9
Number of Taxa	41	52	11
EPT Index	6	13	1
Florida Index	22	39	1
% Contribution Dominant Taxon	14.0	12.4	48.2
% Diptera	43.9	28.3	94.1
% Ephemeroptera	1.9	9.0	0
% Plecoptera	15.0	11.5	0
% Trichoptera	3.8	15.9	0.4
% Oligochaeta	7.5	5.3	2.8
% Coleoptera	17.8	17.7	0.6
% Mollusca	1.9	0.9	0
% Crustacea	0.9	2.7	0
% Other	7.3	8.7	2.1
% Predator/Carnivores	23.8	19.0	56.1
% Above-Surface Deposit Feeders	26.6	27.0	56.1
% Below Surface Deposit Feeders	7.5	4.4	2.8
% Shredders	20.1	17.7	24.1
% Suspension Feeders	8.9	16.8	0.4
% Scrapers	9.8	12.0	0.2

Methods

The focus of this investigation was to determine the discharge's current effects on Eleven Mile Creek. A comparison of biological community health was made between two reference sites (located at Coffee Creek and I-10 Rest Run), and a test site (in Eleven Mile Creek, approximately 1.5 miles downstream of the discharge) (see maps in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical and nutrient data were also collected on the study sites and the effluent. The effluent was analyzed for organic constituents (base neutral and acid extractables, and pes-

ticide extractables). Additionally, nutrient analyses were performed on the effluent reference and test sites. Methods used for all chemical analyses are on file at the Tallahassee DEP Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at the reference and test sites. Invertebrates were collected via 20 dipnet sweeps of natural substrates (*e.g.*, snags, leaf packs).

Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate 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.

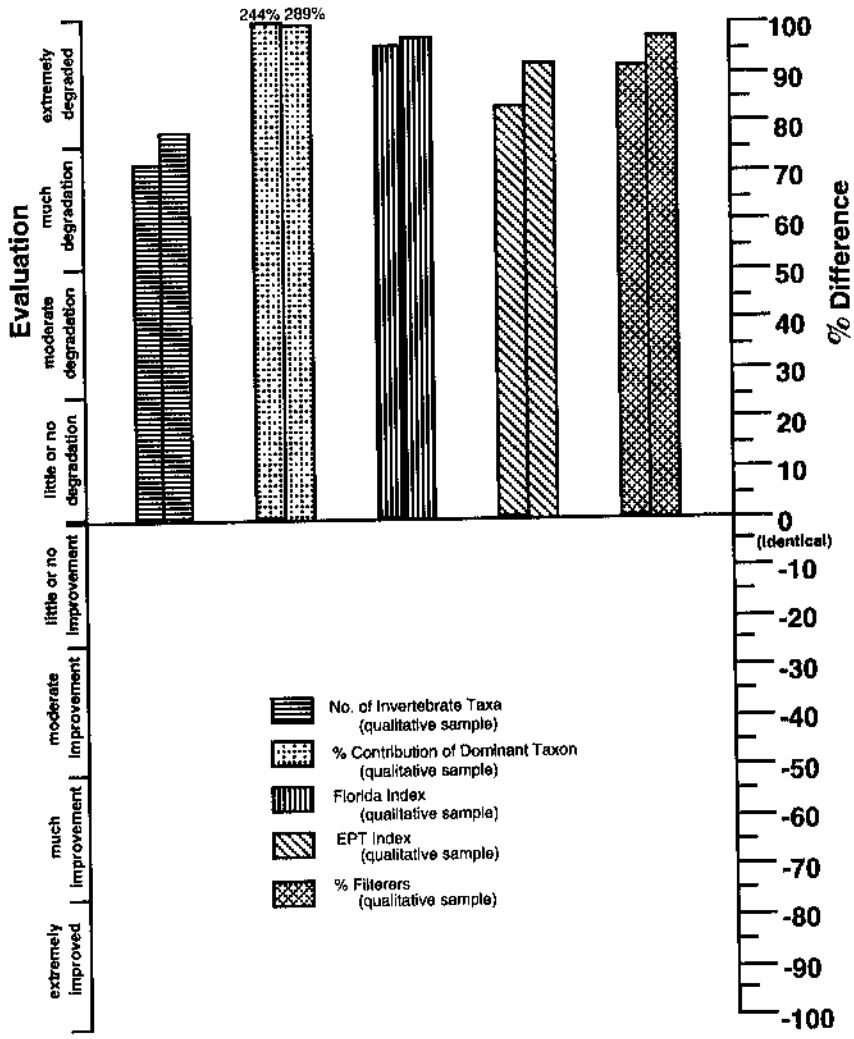
Shannon-Weaver diversity: This index is specified in the Florida Administrative Code as a measure of biological integrity. Low diversity scores are undesirable. They represent conditions where only a few organisms are abundant, to the exclusion of other taxa. Excessive numerical dominance of a single 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 is the sum of the number of EPT taxa present. Higher EPT values are associated with healthier systems.

Community structure: Substantial shifts in 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).

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



Effect of discharge on the benthic macroinvertebrate community.

1994) and shredders (EA Engineering 1994).

The Stream Condition Index for Florida (SCI) is a composite macroinvertebrate metric (EA Engineering 1994). The SCI assigns points to a variety of parameters, depending on how closely each parameter approaches an expected reference condition (see SCI calculation table in Appendix).

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 following personnel were involved in this investigation: Donald Ray, Glenn Butts, Laurence Donelan, Tracy Keefer, and Rick Abad (DEP Northwest District) and Lyn Burton, Russel Frydenborg, Joy Jackson, Kathleen Lurding, Elizabeth Miller, Urania Quintana, Bart Richard, Lisa Tamburello, 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.

Results and Discussion

Two reference sites (Coffee Creek and I-10 Rest Run) were compared to Eleven Mile Creek (the test site located approximately 1.5 miles downstream of Champion's point of discharge). Habitat quality was determined to be 104 points at Coffee Creek, 132 points at I-10 Rest Run, and 101 points at Eleven Mile Creek. All three sites had good to excellent instream substrates and water velocity, but Coffee Creek and Eleven Mile Creek lost points in the categories of artificial channelization, sediment deposition, and riparian zone vegetation quality.

Dissolved oxygen in the effluent (3.4 mg/L) violated ambient standards (Rule 62-302.530(31) FAC. Effluent specific conductance was 2500 µmhos/cm, which is equal to the facility's permit limit. There were some differences in physical/chemical measures between the reference and test sites that may be attributed to the discharge. While dissolved oxygen levels at Coffee Creek (7.5 mg/L) and I-10 Rest Run (6.5 mg/L) were adequate to support aquatic life, dissolved oxygen at Eleven Mile Creek (1.6 mg/L) violated Class III Water Quality Standards (Rule 62-302.530(31) FAC). The specific conductance of Eleven Mile Creek (2,450 µmhos/cm) was extremely elevated, well in excess of the 1,275 µmhos/cm Class III standard. This was not a violation of the facility's permit; however, since a variance allowing 2,500 µmhos/cm conductivity is currently in effect. Reference site conductivity ranged from 52 µmhos/cm to 58 µmhos/cm. As is typical for a non-Floridan aquifer fed Panhandle stream, the water was slightly acidic at the reference sites (pH was 5.6 SU to 5.7 SU). The pH of 7.7 SU at Eleven Mile Creek also suggested influence from the discharge. Water temperature ranged from 23.5 °C to 24.3 °C at the reference streams, and was warmer (29.1 °C) in Eleven Mile Creek. Stream velocity was somewhat faster in Eleven Mile Creek (0.3 m/sec) than at the reference streams (0.1 m/sec to 0.15 m/sec).

Organic pollutants detected in the effluent included an alkane (12 µg/L), an alcohol (15 µg/L), phenanthrenecarboxylic acid (7.8 µg/L), and unidentifiable organic compounds (36 µg/L). The concentrations of these organics are not high enough to be acutely or chronically toxic to aquatic organisms. Aluminum (355 µg/L), iron (70 µg/L), and zinc (12 µg/L) were found in the effluent at levels which complied with Class III standards.

Elevated effluent concentrations of ammonia (5.4 mg/L), TKN (8.5 mg/L) and total phosphorus (0.85 mg/L) caused significant enrichment of Eleven Mile Creek waters with these compounds (see Chemistry Summary Table in Appendix). Eleven Mile Creek levels of total phosphorus (0.84 mg/L), ammonia (2.5 mg/L), and TKN (6.0 mg/L) were higher than 90% to greater than 95% of other Florida streams (see Table of Typical water Quality Values in Appendix). The unionized ammonia concentration in Eleven Mile Creek (0.11 mg/L) also violated Rule 62-302.530(3) FAC, and was high enough to cause chronic toxicity to the biota of the stream.

Qualitative measures of benthic macroinvertebrate community health indicated severe adverse effects associated with the discharge. The Figure on p. 2 indicates the degree of difference between the invertebrate populations of the reference and test sites. Larger differences (that is, higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the reference.

Taxa richness at Coffee Creek (with 41 taxa) and I-10 Rest Run (with 52 taxa), both greatly exceeded that of Eleven Mile Creek (which had only 11 taxa). The number of taxa found in Eleven Mile Creek was lower than the taxa richness values in 90% of other Florida streams (see Typical Values in Appendix). The Florida Index (22 to 39) and EPT Index (6 to 13) values at the reference sites were fairly typical of undamaged Panhandle streams. Eleven Mile Creek scored only one (1) point on each of these indices, which is additional evidence of extremely disturbed conditions. An unusual lack of filter feeders (0.4 % of the total population) at Eleven Mile Creek showed that the trophic relationships (food web patterns) were highly disrupted there. The Stream Condition Index (SCI), which summarizes the health of stream biota, ranked both reference sites as "unimpaired", but placed Eleven Mile Creek in the "severe degradation" category. These results, in conjunction with the nutrient measurements, clearly indicate that the discharge was causing an imbalance of aquatic fauna, prohibited by Rule 62-302.530(48)(b) FAC.

Eleven Mile Creek was overwhelmingly dominated (91.7% of the total population) by three pollution tolerant chironomids, including *Chironomus* sp., *Goeldichironomus carus,* and *Goeldichironomus holoprasinus*. The abundance of these "bloodworms", shown by Beck and Beck (1969) to be nuisance species, indicates that the facility was causing a dominance of nuisance species in Eleven Mile Creek, a violation of Rule 62-302.530(47) FAC. The adverse effects seen in the biological communities in Eleven Mile Creek are in response to several factors, including depressed dissolved oxygen, chronically toxic concentrations of unionized ammonia, nutrient enrichment and subsequent eutrophication effects, and extremely elevated specific conductance. All of these factors can be traced directly to the Champion International discharge.

Conclusions

Dissolved oxygen in the effluent (3.4 mg/L) and in Eleven Mile Creek (1.6 mg/L) violated Class III Water Quality Standards (Rule 62-302.530(31) FAC). Effluent specific conductance was 2500 µmhos/cm, which is equal to the facility's permit limit. The specific conductance of Eleven Mile Creek (2,450 µmhos/cm) was extremely elevated, well in excess of the 1,275 µmhos/cm Class III standard.

Organic compounds detected in the effluent included alkane (12 µg/L), alcohol (15 µg/L), phenanthrenecarboxylic acid (7.8 µg/L), and unidentifiable organic compounds (36 µg/L). The concentrations these organics are not high enough to be acutely or chronically toxic to aquatic organisms. Aluminum (355 µg/L), iron (70 µg/L), and zinc (12 µg/L) were found in the effluent at levels which complied with Class III standards.

Elevated effluent concentrations of ammonia (5.4 mg/L), TKN (8.5 mg/L) and total phosphorus (0.85 mg/L) caused significant enrichment of Eleven Mile Creek waters with these compounds (see Chemistry Summary Table in Appendix). Eleven Mile Creek levels of total phosphorus (0.84 mg/L), ammonia (2.5 mg/L), and TKN (6.0 mg/L) were higher than 90% to greater than 95% of other Florida streams. The unionized ammonia concentration in Eleven Mile Creek (0.11 mg/L) also violated Rule 62-302.530(3) FAC, and was high enough to cause chronic toxicity to the biota of the stream.

Qualitative measures of benthic macroinvertebrate community health indicated severe adverse effects associated with the discharge. Eleven Mile Creek had extremely low scores for taxa richness, the Florida Index, the EPT Index, and the % filter feeders, compared with the two reference sites, or any undamaged Panhandle stream. The Stream Condition Index (SCI), which summarizes the health of stream biota, ranked both reference sites as "unimpaired", but placed Eleven Mile Creek in the "severe degradation" category. These results, in conjunction with the nutrient measurements, clearly indicate that the discharge was causing an imbalance of aquatic fauna, prohibited by Rule 62-302.530(48)(b) FAC.

Pollution tolerant "bloodworms" were overwhelmingly abundant in Eleven Mile Creek, a violation of Rule 62-302.530(47), dominance of nuisance species. The adverse effects seen in the biological communities in Eleven Mile Creek are in response to several factors, including depressed dissolved oxygen, chronically toxic concentrations of unionized ammonia, nutrient enrichment and subsequent eutrophication effects, and extremely elevated conductivity. All these factors can be traced directly to the Champion International discharge.

Literature Cited

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Chemistry summary table for

Champion International	Effluent	Coffee Creek	I-10 Rest Run	Eleven Mile Creek (test)
Organic Constituents (ug/L)				
Alkane	12 J			
Alcohol	15 J			
1-Phenanthrenecarboxylic acid, 1, 2	7.8 J			
Unidentifiable Organic Compounds	36 J			
Metals (ug/L)				
Aluminum	355 A			
Arsenic	10 U			
Copper	3 U			
Chromium	10 U			
Iron	70 A			
Lead	10 U			
Nickel	4 U			
Zinc	12 I			
Nutrients (mg/L)				
Total phosphorus	0.85 Q*	0.011	0.012	0.84
Ammonia	5.4 Q*	0.29	0.032	2.5
Unionized Ammonia		0.0001	0.000008	0.00
Nitrate+Nitrite	0.08 Q*	0.21	0.5	0.11
TKN	8.5 Q*	0.52	0.33	6.0
General Phys-Chem Parameters				
Habitat Assessment		104	132	101
D. O. (mg/L)	3.4	7.5	6.5	1.6
pH (SU)	7.8	5.7	5.6	7.7
Specific Conductance (µmhos/cm)	2500	52	58	2450
Temperature (°C)	31.0	24.3	23.5	29.1
Chloride (mg/L)	290 A	5.8	6.6	220
Sulfate (mg/L)	370 A	1.8	0.2 U	340

A - Value reported is the mean of two or more determinations
J - Estimated value
Q - Sample held beyond normal holding time
T - Value reported is less than the criterion of detection
U - Material analyzed for but not detected; value reported is the minimum detection limit
* - Sample not preserved; pH > 2

Typical Values for Selected Parameters in Florida Waters

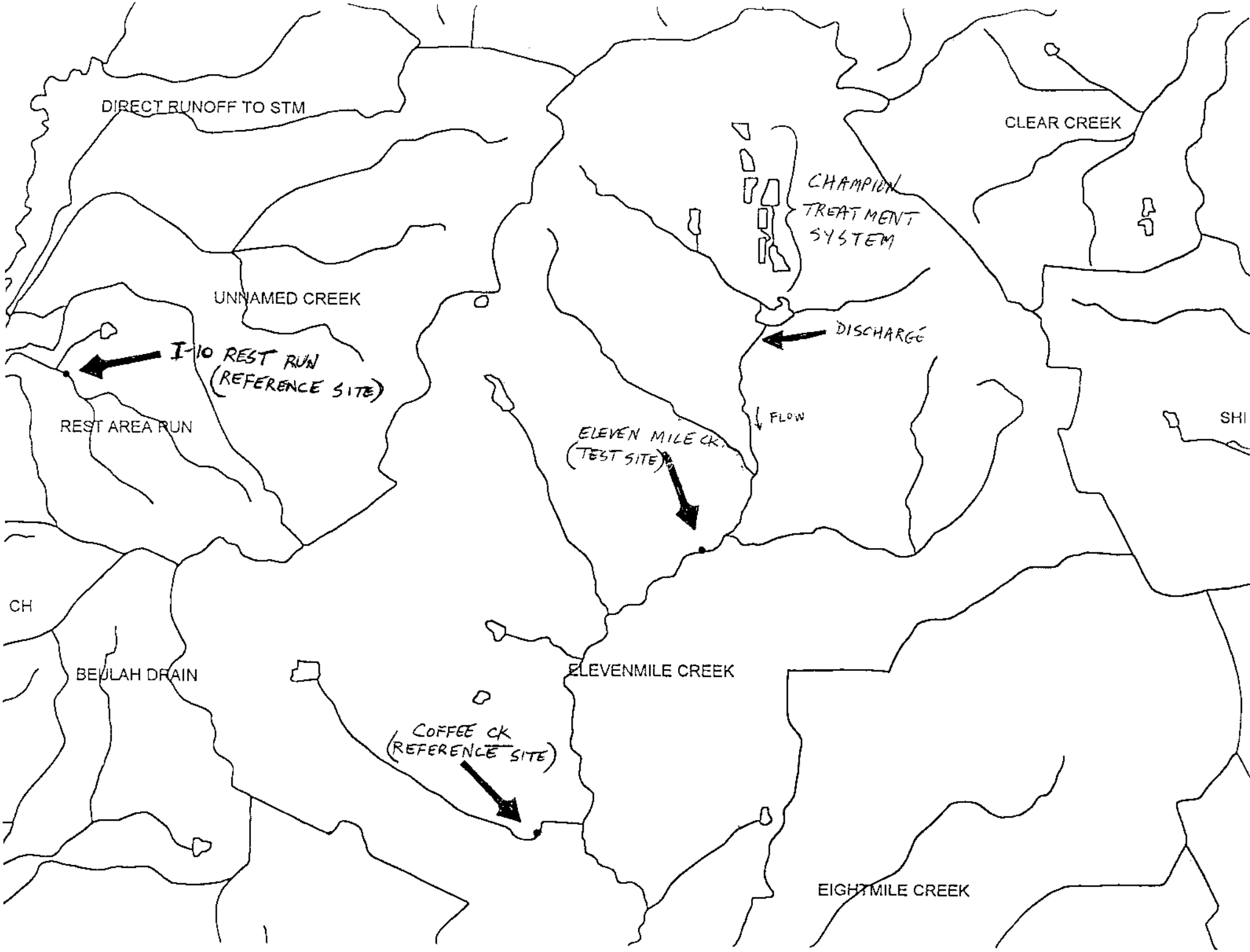
Adapted from Joe Hand, FDER, personal communication, 1991
(data was collected between 1980 and 1989)

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


CHAMPION
BIOASSESSMENT
STATION
LOCATIONS.
I-10 REST
RUN (REF)
DISCHARGE
11 MILE CK (TEST)
COFFEE CK (REF)
TO GATESWOOD
TO MOBILE
PERDIDO RIVER RANCH AIRPORT (PVT.)
CANTONMENT
CANTONMENT DELIMITED AREA Est. Pop. 4,656
GONZALEZ
PENSACOLA DELIMITED AREA Pop. 68,236
TALLAHASSEE
BASELINE
NAS ELLYSON FIELD
PENSACOLA REGIONAL AIRPORT
PENSACOLA
Pop. 57,619
NAAS SAUFLEY FIELD (ABD.)
OLF BRONSON (NAVY)
NAVAL RESERVATION
WARRINGTON
FORREST SHERMAN FIELD
PENSACOLA NAVAL AIR STATION
PENSACOLA LIGHT HOUSE ECC & Fort Barrancas
GULF BEACH DELIMITED AREA
OLF SITE 8-A
OLF SITE 8
OLF SITE 4-A
Big Rock
Waldorf Lake
Snake Bayou
Big Eagle
Crescent Lake
Bayou Grande
Bayou Marcus
Bayou Chico
Bayou Texar
Bayou Jones
Bayou Tarkiln
Bayou Garcon Swamp
Pensacola Bay
Pensacola Bay Bridge
Escambia Bay
Tarkiln Bay
Sherman Inlet
Muslin Beach
San Carlos Beach
Yoongs Hammock
Perdido Hgts
Haven Park
Halcyon Shores
Millview
Beach Haven
Pleasant Grove
Sherman Grove
Ramsey Beach
Wicker Lakes
Tee L.
Black L.
Fan L.
Spanish Mill Creek
Big Eagle Creek
Bayou Texar
Bayou Chico
Bayou Grande
Bayou Marcus
Bayou Jones
Bayou Tarkiln
Bayou Garcon Swamp
Pensacola Bay
Pensacola Bay Bridge
Escambia Bay
Tarkiln Bay
Sherman Inlet
Muslin Beach
San Carlos Beach
Yoongs Hammock
Perdido Hgts
Haven Park
Halcyon Shores
Millview
Beach Haven
Pleasant Grove
Sherman Grove
Ramsey Beach
Wicker Lakes
Tee L.
Black L.
Fan L.
Spanish Mill Creek
Big Eagle Creek


DIRECT RUNOFF TO STM
CLEAR CREEK
CHAMPION TREATMENT SYSTEM
UNNAMED CREEK
I-10 REST RUN (REFERENCE SITE)
DISCHARGE
REST AREA RUN
FLOW
ELEVEN MILE CK (TEST SITE)
SHI
CH
BEULAH DRAIN
ELEVENMILE CREEK
COFFEE CK (REFERENCE SITE)
EIGHTMILE CREEK

Facility Summary

Facility Name: Champion International Date Summary Prepared: 11/20/95

Location map: State Road 184 at U.S. Hwy 29.
375 Muscogee Road
P.O. Box 87
Cantonment, FL 32533-0087

County: Escambia District: Northwest/10

NPDES Permit # FL0002526
expiration date: 8/31/95

State GMS # 1017P00571
expiration date: 12/01/94
(new permit application has been submitted)

Facility Type:
Industrial

Function of facility: To process the wastewater generated by the 1400 ton-per-day bleach Kraft pulp and paper mill.

Description of treatment process: 28.0 MGD WWTF treats the wastewater produced by the mill. Treatment consists of primary treatment (primary settling basin, two solids dewatering basins, and dredging equipment), secondary treatment (four ponds with a design storage capacity of 249.7 MG), nutrient feed system, stormwater diversion system and spill pond (3.475 MG design capacity), with discharge into Eleven Mile Creek.

Receiving waters: Eleven Mile Creek

Classification: I II **III**
Class III: Propagation, recreation, maintenance of a healthy population of fish and wildlife.

Design Flow:28.0 MGD Mean Flow: 22.10 MGD Flow during survey: 21.40 MGD (September MOR)

Discharge is: Continuous
Other (describe)
best time to sample is:

If facility has a mixing zone, give details (size, parameters, etc.)
The facility has no mixing zone.

List effluent limits (attach relevant paperwork):

Effluent at Parshall flume:

Parameter	Frequency
flow	continuous
temperature	daily
fecal coliform	weekly
oil & grease	weekly

BOD5	3/week
TSS	3/week
color	3/week
turbidity	3/week
iron	monthly
phosphates (total)	monthly
specific conductance	monthly
NH3-N total	5/week
N-NO2+NO3	monthly
ammonia (un-ionized)	5/week
N-TKN	monthly
pH	5/week
hardness as CaCO3	quarterly
Cadmium	quarterly
Calcium	quarterly
Chromium	quarterly
Lead	quarterly
Magnesium	quarterly
Mercury	quarterly
Sulfate	quarterly
Zinc	quarterly
Arsenic	annually
Copper	annually
Nickel	annually
Selenium	annually
Silver	annually
Chlorinated Hydrocarbons	quarterly
Phenols	quarterly
Dioxin	quarterly
Titantium	

Eleven Mile Creek (five stations):

Parameter	Frequency
DO	monthly
BOD5	monthly
pH	monthly
Temperature	monthly
Color	monthly
Specific Conductance	monthly
turbidity	monthly
Chlorinated hydrocarbons	
Titantium	

The limitations for the effluent parameters are listed under 62-302 FAC.

In addition to the effluent monitoring requirements, the facilitiy is required to submit quarterly monitoring well reports. The monitoring wells are sampled for the following parameters.

Parameter:
Water level
pH
Conductivity
Sulfates
TOC

Chromium
Manganese
Mercury
Arsenic
Chloride

List permit violations (from MOR data or other source) and plant upsets within past year:
Prior to April 1995 violations occured daily for NH3-N mg/l. Violations that occured from April 1, 1995 to May 31, 1995 are listed on attachment I. The NH3-N mg/l for the month of September 1995 averages 0.479. All days in the month of September exceed the permit limit of 0.02mg/l. This facility has also exceed permit limits for color and total phosphates. The following is a summary of the monthly averages for NH3-N, color, and total P.

MONTH	NH3-N	Color	Total-P
Sep. 95	0.479 mg/l	171 NTU	0.5 mg/l
July 95	0.540	199	not reported
June 95	0.612	243	not reported
May 95	0.582	495	0.7
Apr. 95	0.281	395	0.2
Mar. 95	0.199	471	0.5
Feb. 95	0.134	444	0.9
Jan. 95	0.098	435	1.4
Dec. 94	0.133	431	0.6
Nov. 94	0.113	400	1.3
Oct. 94	0.175	426	1.0
Sep. 94	0.321	452	1.2
permit limitation	0.02 mg/l	20 NTU	0.1 mg/l

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

Impact Bioassessments:

15 Aug 95--19 Aug 95: Toxic to the test organisms
25 Jul 95--29 Jul 95: Toxic to the test organisms
09 Jun 95--13 Jun 95: Toxic to the test organisms
03 Jun 95--07 Jun 95: Not toxic to the test organisms
11 Apr 95--15 Apr 95: Not toxic to Ceriodaphnia dubia
23 May 95--27 May 95: Toxic to Pimephales promelas
17 Oct 94--21 Oct 94: Not toxic to the test organisms
23 May 94--31 May 94: Not toxic to the test organisms

CURRENT ENFORCEMENT ACTIONS:

June 24, 1992: Facility placed under Consent Order 92-0682
December 1, 1989: Facility placed under Consent Order 87-1398
December 8, 1989: Variance granted (VE-19-320): The variance is for the Class III water quality criteria for iron, transparency, and zinc, and the general water quality criterion for specific

conductance. The variance was granted for the life of the operating permit (5 years).

Discuss comparability of MOR results to past FDER results and whether there are trends (improving, declining) in the data set:
The MOR results appear to be accurate. However, no comparison can be made between FDEP and MOR results.

Additional information:

Staff contributing to this review (signature)

Biologist
Inspector
Engineer
Lisa A. Kelley Co-Op Other
Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	33010062	07-13-95	1200	Effeveamile Ck; feeds Jo Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
B65	Coffee Ck. N. of Jonesville Rd. Esc. Co	4

RIPARIAN ZONE/INSTREAM FEATURES

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

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

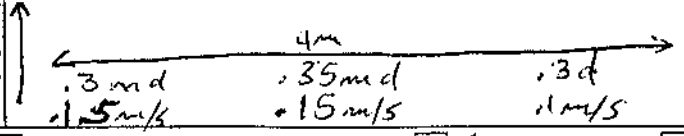
Local Watershed Erosion (check box): None ☐ Slight ☑ Moderate ☐ Heavy ☐

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

Width of riparian vegetation (m) on least buffered side: 40

List & map dominant vegetation on back

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)



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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 2.5

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)	10.5	6		Sand	90	1	
Leaf Packs or Mats	10.5	6		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	10	7		*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	.4	24.3	5.7	7.5	52			1.5 L
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:

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

SAMPLING TEAM:	SIGNATURE:	DATE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (V2)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	33010062	07-13-95	Eleven mile Cr-Perdido Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
B65	Coffee Cr N. of Jonesville Rd.	4

Habitat Parameter	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover **13**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 **13** 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity **12**	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 **12** 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization **15**	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
Deposition **10**	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 **19**	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 **15**	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two 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. 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 greater than one square meter during periods of normal flow.

Comments

104 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (V2)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 33010065	DATE (M/D/Y):	RECEIVING BODY OF WATER: Perdido River
REMARKS:	LOCATION: I-10 Rest Stop CR Esc. Co		FIELD ID/NAME: 2

Habitat Parameter	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover **19**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 (19) 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity **13**	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 18 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 (13) 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 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
Deposition **19**	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 **19**	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 **19**	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 (19) 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. 15 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two 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. 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 greater than one square meter during periods of normal flow.

Comments

132 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	33010065	07-12-95	1022	Perdido River

REMARKS:	LOCATION:	FIELD ID/NAME:
BG	I10 Rest Stop CR Esc. Co.	2

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
90	9	1					

Local Watershed Erosion (check box): None [✓] Slight [ ] Moderate [ ] Heavy [ ]

Local Watershed NPS Pollution (check box): No evidence [ ] Some potential sources [ ] Obvious sources [✓]

Width of riparian vegetation (m) on least buffered side: — *List & map dominant vegetation on back*

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)

.10 M/S .25 | 0.1 M/S .31 | 0.1 M/S .24

Artificially Channelized [✓] no [ ] recent, severe [ ] some recovery [ ] mostly recovered, more sinuous

Artificially Impounded [ ] yes

High Water Mark (m above bed): 1.75

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)	24	7		Sand	1		
Leaf Packs or Mats	5	6		Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	20	7		*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	.4	23.47	5.55	6.5	58			.8
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:

1300

Abundance:	Absent	Rare	Common	Abundant
Periphyton	[ ]	[ ]	[ ]	[ ]
Fish	[ ]	[ ]	[ ]	[ ]
Aquatic Macrophytes	[ ]	[ ]	[ ]	[ ]
Iron/sulfur Bacteria	[ ]	[ ]	[ ]	[ ]

SAMPLING TEAM:	SIGNATURE:	DATE:
Bradley L R...		

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET (Version 5)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
	33010011	07-13-95	0820	Pensacola Bay

REMARKS:	LOCATION:	FIELD ID/NAME:
B72	Eleven Mile Cr 297A	6

RIPARIAN ZONE/INSTREAM FEATURES

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

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)
40	40			15	5		

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

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

Width of riparian vegetation (m) on least buffered side: 20

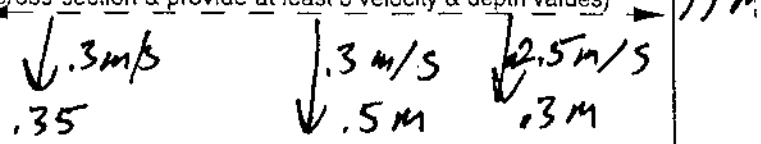
List & map dominant vegetation on back

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

Artificially Impounded ☐ yes

High Water Mark (m above bed): 8

Typical Width (m)/Depth (m) /Velocity (m/sec) Transect (draw cross-section & provide at least 3 velocity & depth values)



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: Sludge

Substrate Types	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	5	4	NAT	Sand	50		NAT
Leaf Packs or Mats	5	4	NAT	Mud/Muck/Silt	20		NAT
Aquatic Vegetation	15	4	NAT	Other:			
Rock or Shell Rubble				Other:			
Undercut Banks/Roots	5	4	NAT	*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	.4	29.1	7.72	1.56	2450			.3
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: ☐ Foam

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

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

Weather Conditions/Notes:

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

SAMPLING TEAM:	SIGNATURE:	DATE:
	Dave Lew	

Photo 5-9

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRESHWATER BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET (V2)

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	RECEIVING BODY OF WATER:
	33010011	07-13-95	Perdido Bay

REMARKS:	LOCATION: Eleven Mile Cr 29 > A	FIELD ID/NAME:
		6

Habitat Parameter	Excellent	Good	Fair	Poor
Bottom Substrate/ Available Cover **12**	Greater than 40% snags, logs, tree roots, emergent vegetation, leaf packs (partially decayed), undercut banks, rubble, or other stable habitat. 20 19 18 17 16	20% to 40% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 (13) 12 11	5% to 20% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	Less than 5% snags, logs, tree roots, emergent vegetation, leaf packs, etc. Lack of habitat is obvious, substrates unstable. 5 4 3 2 1
Water Velocity **18**	Max. observed: >0.25 m/sec. but < 2 m/sec 20 19 (18) 17 16	Max. observed; 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed; 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed; <0.05 m/sec, or spate occurring; > 2 m/sec 5 4 3 2 1
Artificial Channelization **17**	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
Deposition **6**	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 **15**	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 **15**	Over 80% of streambank surfaces consist of native plants, including trees understory shrubs, or non-woody macrophytes. Plants growing naturally. 20 19 18 17 16	50% to 80% of riparian zone is vegetated, but one class of plants is not represented. Some disruption in community evident. (15) 14 13 12 11	25% to 50% of riparian zone is vegetated, but one or two 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. 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 greater than one square meter during periods of normal flow.

Comments

101 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
		Rowland

Eleven Mile Creek Biota - 12/78 thru 7/95

DATE	LOCATION	DIVERSITY	#SPECIES
12-21-78	HWY 90	1.56	7
09-03-80	HWY 90	0.85	12
12-19-83	Below Saufley	1.70	12
12-19-83	HWY 90	1.95	10
12-19-83	SR 297A	0.85	6
10-09-84	HWY 90	1.67	13
10-09-84	SR 297A	0.33	12
11-05-86	Below Saufley	2.62	8
11-05-86	HWY 90	0.46	9
11-05-86	SR 297A	2.15	12
12-03-87	Above Ten mile Creek	2.02	13
07-14-88	Above Ten Mile Creek	1.03	12
03-28-89	Above Ten Mile Creek	1.01	17
08-24-89	SR 297A	0.56	9
11-28-89	SR 297A	0.74	13
03-20-90	SR 297A	1.95	15
07-13-95	**SR 297A**	**1.88**	**11****

MEAN = 1.37

****Compared to:**

Coffee Branch (above Beulah Landfill)

07-13-95	**Above Beaulah**	**5.00**	**46**

Rest Stop Run

07-13-95	**Below I-10 Rest Stop**	**5.27**	**57**

REFERENCE SITE HESTER DENDY'S DIVERSITIES

DATE	LOCATION	DIVERSITY	#SPECIES
92	Alaqua Creek	3.36	23
93	"	3.30	29
94	"	4.05	46
92	Big Horse Creek	4.22	30
93	"	4.19	31
94	"	4.60	41
93	Black Creek at 20	1.53 ± SAMPLERS EXPOSED	8
94	"	4.39	43
92	Dean Creek	4.60	33
93	"	3.53	22
94	"	4.45	38
92	Ecofina Creek at Scott Rd	3.39	25
93	"	3.27	21
94	"	4.18	36
93	Little Crooked Creek	3.43	20
94	"	3.56	24
93	McDavid Creek	3.28	19
94	"	3.78	18
92	Mitchell Creek	3.52	34
93	"	3.77	22
94	"	4.09	28
92	Panther Creek	3.35	27
93	"	4.21	25
94	"	4.61	31
92	Pine Log Creek	4.22	32
93	"	3.73	22
94	"	3.29	37
92	Sandy Creek at 183	4.13	29
93	"	4.00	26
94	"	2.78	22
92	Sandy Creek at 22	3.81	31
93	"	3.48	16
94	"	4.23	35
93	South Fork Bear Creek	3.43	18
94	"	3.87	20
92	Ten Mile Creek	3.84	28
93	"	3.83	24
94	"	4.34	31

AVERAGE: 3.8

Stream Condition Index for Florida (SCI)

COFFEE CREEK (REF)

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**			
		5	3	1	Score	5	3	1	Score
Number of Taxa	41	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	6	≥ 7	4–6	0–3	3		≥ 4	0–3	
% Contribution of Dominant Taxon	14.0		≤ 20	> 20	3		≤ 37	> 37	
Florida Index	22	≥ 18	9–17	0–8	5	≥ 7	4–6	0–3	
% Diptera	43.9		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	8.9	≥ 12	7–11	0–6	3	≥ 8	4–7	0–3	
% Shredders	20.1		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			23	**Peninsula**			
Interpretation of Score		**No Impairment**			**29-23**	**No Impairment**			**33-27**
		Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
		Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

I-10 REST RUN (REF)

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**			
		5	3	1	Score	5	3	1	Score
Number of Taxa	52	≥ 31	16–30	0–15	5	≥ 27	14–26	0–13	
EPT Index	13	≥ 7	4–6	0–3	5		≥ 4	0–3	
% Contribution of Dominant Taxon	12.4		≤ 20	> 20	3		≤ 37	> 37	
Florida Index	39	≥ 18	9–17	0–8	5	≥ 7	4–6	0–3	
% Diptera	28.3		≤ 38	> 38	3		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	16.9	≥ 12	7–11	0–6	3	≥ 8	4–7	0–3	
% Shredders	17.7		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		**Panhandle**			29	**Peninsula**			
Interpretation of Score		**No Impairment**			**29-23**	**No Impairment**			**33-27**
		Moderate Impairment			**22-15**	**Moderate Impairment**			**26-17**
		Severe Degradation			**14-7**	**Severe Degradation**			**16-9**

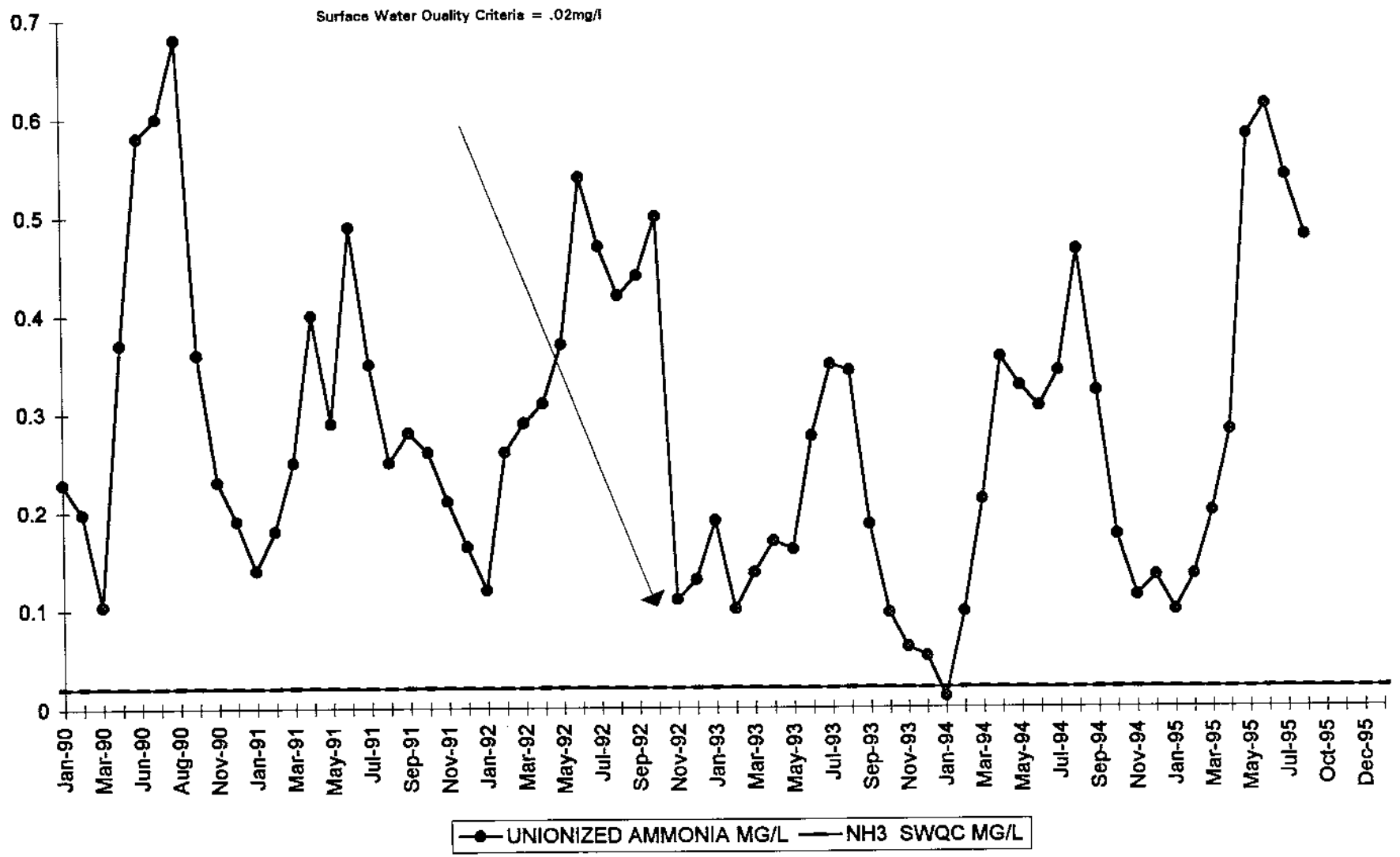
Stream Condition Index for Florida (SCI)

11 MILE CREEK (CHAMPION TEST)

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**			
		5	3	1	Score	5	3	1	Score
Number of Taxa	11	≥ 31	16–30	0–15	1	≥ 27	14–26	0–13	
EPT Index	1	≥ 7	4–6	0–3	1		≥ 4	0–3	
% Contribution of Dominant Taxon	48.2		≤ 20	> 20	1		≤ 37	> 37	
Florida Index	1	≥ 18	9–17	0–8	1	≥ 7	4–6	0–3	
% Diptera	94.1		≤ 38	> 38	1		≤ 32	> 32	
% Suspension feeders/ Collector-Filterers	0.4	≥ 12	7–11	0–6	1	≥ 8	4–7	0–3	
% Shredders	24.1		≥ 10	0–9	3		≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		Panhandle			9	Peninsula			
Interpretation of Score		No Impairment			29-23	No Impairment			33-27
		Moderate Impairment			22-15	Moderate Impairment			26-17
		Severe Degradation			14-7	Severe Degradation			16-9

Calculation & Interpretation of the Stream Condition Index for Florida (SCI) (Draft 1994)									
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)	**Value**	**Panhandle (65, 75a)**				**Peninsula (75b, c, d)**			
		5	3	1	Score	5	3	1	Score
Number of Taxa		≥ 31	16–30	0–15		≥ 27	14–26	0–13	
EPT Index		≥ 7	4–6	0–3			≥ 4	0–3	
% Contribution of Dominant Taxon			≤ 20	> 20			≤ 37	> 37	
Florida Index		≥ 18	9–17	0–8		≥ 7	4–6	0–3	
% Diptera			≤ 38	> 38			≤ 32	> 32	
% Suspension feeders/ Collector-Filterers		≥ 12	7–11	0–6		≥ 8	4–7	0–3	
% Shredders			≥ 10	0–9			≥ 13	0–12	
% Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 16	0–15	
# Crustacean+Mollusks (Peninsula only)		–	–	–			≥ 4	0–3	
Total Score		Panhandle				Peninsula			
Interpretation of Score		No Impairment			29-23	No Impairment			33-27
		Moderate Impairment			22-15	Moderate Impairment			26-17
		Severe Degradation			14-7	Severe Degradation			16-9

Champion Unionized Ammonia January 90' - Sept.95'



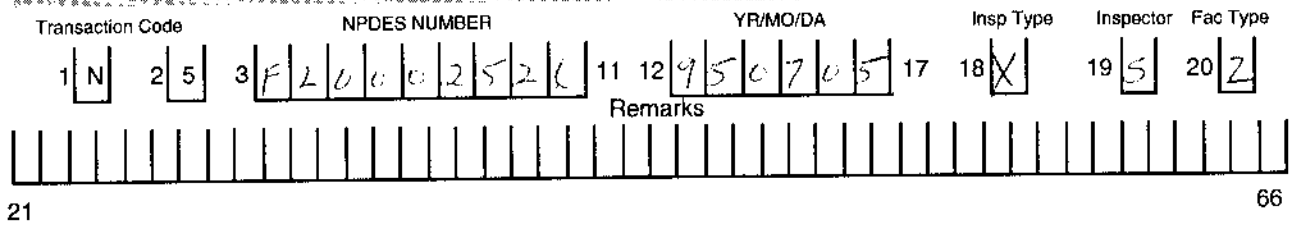
Macroinvertebrate taxa list for Champion International, collected via 20 dipnet sweeps on July 13 and 14, 1995. Coffee Creek and I-10 Rest Run are reference sites, while Eleven Mile Creek is the test site, located downstream of the discharge.

	Coffee Creek	I-10 Rest Run	11 Mile Creek
Oligochaeta			
Aulodrilus limnobius	2	–	–
Eclipidrilus sp.	–	3	–
Haber speciosus	–	1	–
Limnodrilus hoffmeisteri	1	1	19
Nais communis	1	1	–
Nais variabilis	3	–	–
Enchytraeidae	1	–	–
Pelecypoda			
Pisidiidae	2	1	–
Acarina			
Atractides sp.	–	1	–
Trombidiformes	1	–	–
Amphipoda			
Amphipoda	–	1	–
Decapoda			
Hyalella azteca	–	1	–
Cambaridae	–	1	–
Decapoda	1	–	–
Ephemeroptera			
Acerpenna pygmaeus	–	4	–
Stenonema smithae	1	1	–
Leptophlebiidae	1	4	–
Odonata			
Argia sp.	1	1	–
Boyeria vinosa	–	1	–
Calopteryx sp.	–	1	–
Gomphus sp.	–	1	–
Hagenius brevistylus	–	1	–
Hetaerina titia	–	1	–
Ischnura sp.	–	–	13
Neurocordulia sp.	–	1	–
Neurocordulia virginiensis	1	–	–
Corduliidae	2	2	–
Zygoptera	–	1	–
Plecoptera			
Acroneuria sp.	–	2	–
Leuctra sp.	14	8	–
Neoperla sp.	2	2	–
Paragnetina sp.	–	1	–

Hemiptera			
Belostomatidae	–	–	1
Coleoptera			
Ancyronyx variegatus	–	1	1
Dineutus sp.	1	–	2
Dubiraphia sp.	2	–	–
Ectopria sp.	1	–	–
Gyretes iricolor	–	1	–
Microcylloepus pusillus	–	1	–
Oulimnius latiusculus	–	2	–
Prionocyphon sp.	–	–	1
Stenelmis sp.	12	14	–
Elmidae	3	–	–
Gyrinidae	–	1	–
Megaloptera			
Corydalus cornuta	2	–	–
Nigronia sp.	1	–	–
Trichoptera			
Anisocentropus pyraloides	–	5	–
Cheumatopsyche sp.	–	–	3
Chimarra sp.	–	1	–
Diplectrona modesta	1	–	–
Hydropsyche sp.	–	7	–
Macrostemum carolina	–	2	–
Neureclipsis crepuscularis	–	1	–
Oecetis sp.	2	1	–
Hydropsychidae	1	–	–
Trichoptera	–	1	–
Diptera			
Ablabesmyia mallochi	5	–	–
Ablabesmyia rhamphe grp.	2	–	–
Alotanypus sp.	1	–	–
Chironomus sp.	–	–	327
Conchapelopia sp.	2	1	–
Corynoneura sp. B Epler	–	1	–
Cryptochironomus sp.	2	–	–
Goeldichironomus carus	–	–	216
Goeldichironomus holoprasinus	–	–	79
Hemerodromia sp.	1	1	–
Hexatoma sp.	–	1	–
Meropelopia sp.	4	–	–
Microtendipes rydalensis grp.	–	1	–
Pagastiella sp.	1	1	–
Palpomyia/Bezzia grp.	1	1	–
Parametriocnemus sp.	–	6	–
Polypedilum aviceps	–	2	–
Polypedilum halterale grp.	–	1	–
Polypedilum illinoense grp.	4	1	–
Rheocricotopus robacki	6	2	–

Rheotanytarsus sp.	–	1	–
Rheocricotopus tuberculatus	1	–	–
Rheotanytarsus distinctissimus grp.	1	–	–
Rheotanytarsus exiguus grp.	–	3	–
Simulium sp.	1	1	–
Stempellinella sp.	–	1	–
Stenochironomus sp.	2	5	–
Tanytarsus sp.	2	–	–
Tanytarsus sp. D Epler	1	–	–
Tanytarsus sp. L Epler	2	–	–
Tanytarsus sp. M Epler	2	1	–
Tribelos fuscicornis	–	1	–
Tribelos jucundus	3	–	–
Chironomidae	3	–	16

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)

