FLORIDA AMBIENT

EcoSummary

Big Cypress Branch Telogia Power control site below road crossing north of Forest Rd #103

November 14, 2007

FAIL

BioRecon: A rapid, cost-effective screening mechanism for identification of biological impairment

For samples collected before June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures and met FDEP quality assurance/quality control standards. **For samples collected on or after June 8, 2004**
All field and laboratory methods followed FDEP Standard Operating Procedures (SOPs) and met DEP quality assurance/quality control standards.



Purpose

This bioassessment was performed at Big Cypress Branch as a control site for the Telogia Power LLC discharge to Page Bridge Creek. The carbonaceous-fueled power plant was in the headwaters of Page Bridge Creek preventing the establishment of an upstream control site. The Big Cypress Branch control site is an adjacent tributary located approximately 1,067 meters to the southeast (127 degrees) of Page Bridge Creek. Liberty County officials had described Page Bridge Creek as being dead and ask if it was the result of the old Reichhold Chemical Company or the result of Telogia Power's operation. Water quality and biological stream health data was needed for the permit renewal evaluatory process.

Watershed Characteristics

Big Cypress Branch at the bioassessment site (STORET 22020075) was located less than 2 miles south of the Telogia community in Liberty County (Latitude N30 degrees 19 minutes 49.6 seconds; Longitude W84 degrees 48 minutes 6.1). This stream drains the Brush Island Swamp , along with industrial (the southern border of Telogia Power), highway, railroad, and silviculture land-use areas. The Brush Island

Swamp had been modified by the industrial site and highway and railroad tracks. The hydrology of Big Cypress Branch's watershed also had been anthropogenically modified. The streambed was down-cut 0.8 meters more than the adjacent Page Bridge Creek. The reach's riparian zone had been logged in the past, evidenced by cut stumps directly on the stream bank. Big Cypress Branch flows to Stokes Branch, Telogia Creek, and Ochlockonee River before emptying into Ochlockonee Bay. The watershed drains the Southern Pine Plains and Hills of subecoregion 65f. Big Cypress Branch is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic community.

Results and Discussion

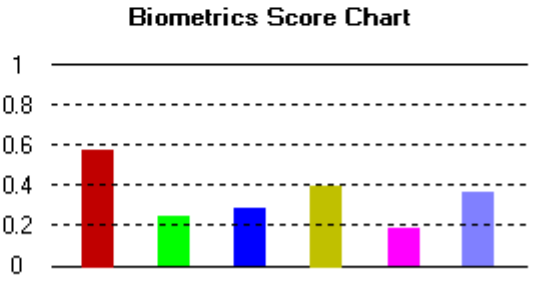
The bioassessment indicated an impaired biological community, scoring only 3 out of 10 for the BioRecon Score. The site failed 5 of 6 biological indicator thresholds established for a healthy aquatic wildlife community:

Biometrics	Metric Score
# TOTAL TAXA	0.58
# EPHEMEROPTERA TAXA	0.25
# TRICHOPTERA TAXA	0.29
# LONG-LIVED TAXA	0.4
# CLINGER TAXA	0.19
# SENSITIVE TAXA	0.37
TOTAL METRIC SCORE :	2.08
/ Correction Factor :	0.6
= BIORECON SCORE :	3

○ Pass 6 - 10
◉ Fail 0 - 5

BIG CYPRESS BR ROAD CROSSING NORTH OF FOREST RD #103 CNTRL SITE TIMBER ENERGY

BioRegion : Panhandle West
Sample Date : Nov 14, 2007



The Total Taxa (34) at the Big Cypress Branch control site was twice the amount found at the Page Bridge Creek test site (17). The Florida Index (10) at Big Cypress Branch was double amount was found at the Page Bridge site. The EPT (5) at the control site was 40% greater than the test site (3). The control site EPT included sensitive taxa common in healthy panhandle streams such as the mayflies *Eurylophella*, *Paraleptophlebia*, *Stenocron*, and caddis flies *Heteroplectron* and *Nectopsyche* along with cases for *Oecetis* and *Phylocentropus* . Riffle beetles and sponges were also abundant at the control site, but absent at the Page Bridge Creek test site. In contrast bloodworms (Chironomus), tolerant of poor water quality conditions were abundant at the test site. Stoneflies, the best indicators of a healthy northwest Florida stream, were missing because of the mostly stagnant conditions at the control site.

A road culvert was placed at an elevation that dammed Big Cypress Branch above the road crossing. This reduced stream velocity to less than 0.05 meters per second in entire channel except for an area of 2 square meters. Drought conditions (2006 rain ~ 22 inches below normal 2007 to date rain ~12 inch deficit) enhanced the culvert's ability to restrict stream velocity. The hydraulic energy generated by the culvert during spates had deeply scoured the stream bed below the road. Old bridge timbers were observed approximately 75 to 100 meters below the road deposited on the stream bank 1.2 meters above the water level. This indicated severe local flooding in the past.

The Big Cypress Branch Habitat Assessment rated optimal (85%), bolstered by optimal conditions for Habitat Smothering, Substrate Availability, Artificial Channelization, Riparian Zone Vegetation Quality, and Riparian Buffer Zone Width. Substrate Diversity, Bank Stability, and Water Velocity rated suboptimal.

The dissolved oxygen (DO) concentration of 4.16 mg/l at 0.1 meters depth below the road culvert was in violation of Rule 62-302.530(30), F.A.C. ("shall not be less than 5 mg/l"). This Big Cypress Branch control site's depressed DO and low 40% DO saturation was exacerbated by stagnant conditions from a silviculture road culvert damming the stream. Water temperature was 56 degrees Fahrenheit (13.52 degrees Centigrade) at Big Cypress Branch, this is 7 degrees F cooler than the Page Bridge Creek's 63 degrees F. Both sites were shaded with a canopy cover of 80% of more.

Biochemical Oxygen Demand was less than 0.5 mg/l in Big Cypress Branch. The pH was 6.86 standard units. Turbidity was 1 NTU. Conductivity was 124 umho/cm at Big Cypress Branch. In addition, Big Cypress Branch was less than 5 ug/l Chlorophyll a, typical of panhandle streams.

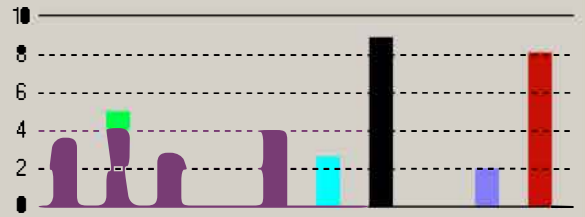
Sediment oils/odors and water oils/odors were absent. The water was clear and tannic. Iron/sulfur bacteria and aquatic macrophytes were absent. Periphyton was rare. Fish including darters and pirate perch were common as were salamanders.

The stream bed, despite little flow (0.05 meters a second) was clean sand (47%) overlain with well-conditioned leaf mat. In contrast, the site below Telogia Power, despite adequate stream velocity (0.1 to 0.25 meters a second), was anaerobic leaf mat smothered by mud/muck/silt (81%) with a hydrogen sulfide and sulfur odor.

Bioassessments in Big Cypress Branch using the SCI method with different scoring criteria conducted in 2002 and 2006 had poor scores similar to this 2007 BioRecon. The taxa present in all 3 bioassessments were similar.

BIG CYPRESS BRANCH-TIMBER ENERGY FYI CNTRL SITE

Stream Condition Index Metric Scores



BioRegion : Panhandle West

Sample Date : Jan 17, 2006

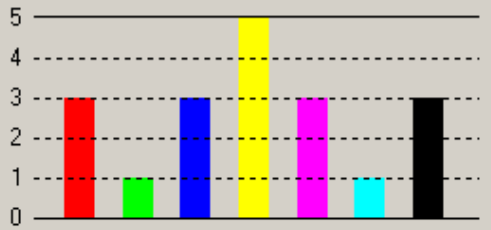
Good	73 - 100
Fair	46 - 72
Poor	19 - 45
Very Poor	0 - 18

Core Metrics	Value	0 - 10 Points	Metric Score
# TOTAL TAXA	28	16 - 49	3.64
# EPHEMEROPTERA TAXA	3	0 - 6	5
# TRICHOPTERA TAXA	2	0 - 7	2.86
# CLINGER TAXA	0	0 - 15.5	0
# LONG-LIVED TAXA	2	0 - 5	4
# SENSITIVE TAXA	5	0 - 19	2.63
% DOMINANT TAXON	13.59	43 - 10	8.91
% SUSPENSION FEEDERS / FILTERERS	0.49	1 - 45	0
% TANYTARSINI	0.97	0 - 26	2.05
% VERY TOLERANT	0.97	36 - 0	8.12
		TOTAL METRIC SCORE :	37.21
		/ Correction Factor :	0.9
		= SCI FINAL SCORE :	41

Macroinvertebrate Dip Net (20 sweeps, emphasizing most productive substrates)

BIG CYPRESS BRANCH-TIMBER ENERGY FYI CNTRL SITE

Stream Condition Index Metric Scores



BioRegion : Panhandle West

Index Period : Summer - Aug 2002

Excellent	27 - 33
Good	21 - 26
Poor	14 - 20
Very Poor	7 - 13

Core Metrics	Value	5 Points	3 Points	1 Point	Score
# TOTAL TAXA	28	>= 31	30 - 16	< 16	3
EPT INDEX	3	>= 7	6 - 4	< 4	1
# CHIRONOMID TAXA	7	>= 9	8 - 5	< 5	3
% DOMINANT TAXON	16.84	<= 22	23 - 61	> 61	5
% DIPTERA	21.05	-	<= 50	> 50	3
FLORIDA INDEX	6	>= 16	15 - 8	< 8	1
% SUSPENSION FEEDERS / FILTERERS	6.32	>= 12	11 - 6	< 6	3

Macroinvertebrate Dip Net
(20 sweeps of most productive substrates)

SCI TOTAL SCORE 19

Conclusions

The Big Cypress Branch did not meet Class III State Water Quality Standards of Chapter 62-302, F.A.C. for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The main factor responsible for the biological impairment was a dissolved oxygen (DO) concentration in violation of Rule 62-302.530(30), F.A.C. Restoration of the natural stream hydrology and continued maintenance of a riparian buffer zone of 18-meters should restore this Big Cypress Branch to a healthy biological community.

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For more information on the DEP Bioassessment programs, please visit
our web site at http://www.dep.state.fl.us/water/bioassess

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