EcoSummary

Long Branch @ Eglin Rd. 815 S.S.E. of Choctaw Field

June 8, 2004

TMDL STUDIES

FAIR

Stream Condition Index (SCI): The standardized biological assessment tool used by FDEP biologist to indicate ecosystem health and identify impairment as compared to reference (natural) conditions of streams within the various ecoregions of Florida

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



A Stream Condition Index (SCI) bioassessment was performed on Long Branch to verify a failed BioRecon at Alabama Hollow in the TMDL listed Water Body Identification (WBID) # 663 watershed into East Bay. However, Alabama Hollow, adjacent to Long Branch was dry from apparent historic silviculture operations adjacent to and above Choctaw Field. In addition, background data for Long Branch was requested by the District's Water Facility program. Navarre's wastewater treatment Rapid Infiltration Basins (RIBS) have been proposed to be located on Eglin Air Force Base in the Long Branch watershed within Water Body Identification #663. A BioRecon was also conducted on 06/08/05 in Long Branch at Eglin Road 726, closer to the proposed RIBS sites upstream.

Basin Characteristics

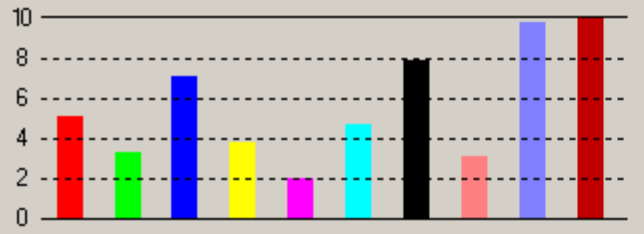
Long Branch at the bioassessment site (STORET 330300161) is a second order stream originating southeast of Choctaw Field on Eglin Air Force Base. The creek is located about 3.5 miles northwest of Navarre in Santa Rosa County (Latitude 30 degrees 28 minutes 22.2 seconds Longitude 86 degrees 56 minutes 54.6 seconds). This streams flows to East Bay in the Pensacola Bay system. Long Branch is located in the Gulf Coast Flatwoods subecoregion (75a), but also drains the Southern Pine Plains and Hills (65f). Its headwaters are a geologically formed steephead created by groundwater seepage through porous sand onto a sloping surface. Steephead streams are a distinct type of slope forest stream found mainly around Eglin Air Force Base in the Florida panhandle. Much of the watershed in the headwaters was pine silviculture in nearly sterile sandy soils. The watershed below the site was mostly wetland historically ditched for log transport and drained for pine silviculture. The watershed's topography was also altered by a Civil War era salt works and lime kiln that were located near the mouth of Long Branch to East Bay.

Results

The SCI indicated a biological community that rated a fair condition. Six out of ten Core Metrics failed to meet thresholds established for healthy stream ecosystems:

LOWER LONG BRANCH @ EGLIN RD. 815 S.S.E. OF CHOCTAW FIELD

Stream Condition Index Metric Scores



BioRegion : Panhandle West

Sample Date : Jun 08, 2004

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

Core Metrics	Value	0 - 10 Points	Metric Score
# TOTAL TAXA	33	16 - 49	5.15
# EPHEMEROPTERA TAXA	2	0 - 6	3.33
# TRICHOPTERA TAXA	5	0 - 7	7.14
# CLINGER TAXA	6	0 - 15.5	3.87
# LONG-LIVED TAXA	1	0 - 5	2
# SENSITIVE TAXA	9	0 - 19	4.74
% DOMINANT TAXON	16.83	43 - 10	7.93
% SUSPENSION FEEDERS / FILTERERS	14.85	1 - 45	3.15
% TANYTARSINI	24.75	0 - 26	9.84
% VERY TOLERANT	0	36 - 0	10
	TOTAL METRIC SCORE :		57.15
	/ Correction Factor :		0.9
	= SCI FINAL SCORE :		64

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

Total Taxa, Ephemeroptera (mayfly) Taxa, # of Clinger Taxa, Long-Lived Taxa, Sensitive Taxa, and % Suspension Feeders/Filters were below biometric thresholds. Trichoptera (caddisfly) Taxa, % Dominant Taxon, % Tanytarsus (midge), and % Very Tolerant surpassed biometric thresholds. The forest along Long Branch had been burned, eliminating the tree canopy and affecting stream habitat conditions. Fine particulate organic sediment runoff from the burned forest accumulated in the stream channel, limiting fish and wildlife habitat. The stream habitat assessment score rated marginal at 42.5%. The 8 individual habitat parameter scores ranged from optimal (artificial channelization), suboptimal (water velocity), marginal (bank stability, riparian zone vegetation quality, substrate diversity, substrate availability), and poor (habitat smothering, riparian buffer zone width). Water quality was good, characteristic of the sand and gravel aquifer discharging from the Northwest Florida sand hills. Nutrients were low (Kjeldahl nitrogen 0.26 mg/l, nitrate-nitrite 0.026 mg/l, ammonia 0.027 mg/l, and total phosphate below detection limit 0.02) were low, but were slightly higher than the upstream site at Eglin Road 726, which was typical of the area groundwater. Parameters meeting numeric State Water Quality Standards were five-day biochemical oxygen demand below detection limit 0.5 mg/l, conductivity 17 umho/cm, pH

5.02 standard units, chlorophyll a below detection limit 0.5 mg/l, turbidity 5 NTU, color 40 Platinum-Cobalt units, and suspended solids 8 mg/l, and total and fecal coliform (1700 and 74/100ml). Water temperature was 25.1 degrees centigrade, elevated 4 degrees centigrade compared with Long Branch upstream at Eglin Road 726 from of lack of shading. Dissolved oxygen 5.6 mg/l, and percent dissolved oxygen saturation 64.5% were depressed compared to normal sand hill water quality conditions, indicative of the fine silt accumulation from the logging and burning impacts. Overall, water parameters were slightly elevated compared to the Eglin Road 726 site upstream.

Significance

This Long Branch site's stream biological health only rated fair because of forest removal affecting stream habitat. The marginal habitat rating was due to siltation and the absence of a forest canopy. The logged and burned forest in the stream riparian zone affected water quality. Removal of the tree canopy increased water temperature and the exposed soil increased fine particulate organic particulate matter runoff, both of which decreased dissolved oxygen concentrations. The fine organic matter also smothered 93% of fish and wildlife habitat, including 16.5% of the 19% woody debris habitat present. Long Branch flows into East Bay, one of the least developed bays in the western panhandle. Its nutrient concentrations were low; however, the habitat was affected by silt smothering, which limited the diversity and productivity of the stream's fish and wildlife. Prior logging and burning of the riparian zone and upstream slope forest resulted in an open canopy shrub over-story. Shrubs lack the potential to add large woody debris stream habitat, which reduces the most important fish and wildlife habitat in panhandle streams. The upstream steephead slope forest's characteristic rare and endemic species (i.e. Ashe's magnolia and silky camellia) were missing because of historical logging and fire. The transfer of secondarily treated nutrient enriched wastewater from the rapidly growing Navarre area along Santa Rosa Sound and the Gulf of Mexico to the poorly flushed eastern side of East Bay could cause eutrophication problems.

Suggestions

Maintain at least an eighteen-meter buffer along the stream courses in the Long Branch watershed to protect its riparian zone. Historical silviculture activity has reduced the riparian zones along many Northwest Florida streams. Forest management to restore and protect native riparian and transitional zone forests would enhance fish and wildlife diversity and productivity. Long Branch's diversity and productivity would improve with a mature riparian forest over-story to provide natural habitat conditions in the stream. Examples of observed watershed problems to rectify were logging stream slopes and riparian zones, and fire management impacts to watershed riparian zones, a road culvert damming the stream, and road sediment filling wetlands/stream channel. Using best management practices for dirt roads, especially minimizing affects on stream morphology, is important to protect stream ecosystems. The sandy quartz soil in the Long Branch watershed does not effectively remove chemical constituents such as nitrogen, and the area's native vegetation cannot uptake high nutrient concentrations, as they are adapted to almost sterile conditions. If Rapid Infiltration Basins wastewater discharge permits are issued for the Long Branch watershed, higher-level wastewater treatment could address these watershed concerns. Use of advanced wastewater

treatment technology (AWT) technology would limit nutrient loading and locating the RIBS further inland, away from streams and drainage contours, would help protect East Bay from possible anthropogenic eutrophication.

For more information, please contact
Donald H. Ray
Northwest District Office
160 Government Center, Pensacola, FL 32502
(850) 595-8300 (Suncom 695-8300 x 1126)
E-mail: donald.ray@dep.state.fl.us

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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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