EcoSummary

Long Branch @ Eglin Rd. 726 S.E. of Choctaw Field

June 8, 2004

FLORIDA AMBIENT

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

A bioassessment was performed on the Long Branch watershed to provide background data requested by the Northwest District's Water Facilities program. Navarre wastewater treatment Rapid Infiltration Basins (RIBS) have been proposed to be located on Eglin Air Base land in the Long Branch watershed.



Watershed Characteristics

Long Branch at the bioassessment site (STORET # 33030160) is a first order stream originating southeast of Choctaw Field on Eglin Air Force Base. The creek is located about 6 miles northwest of Navarre in Santa Rosa County (Latitude 30 degrees 28' 52.3" Longitude 86 degrees 56' 06.1"). This stream flows to East Bay in the Pensacola Bay system. This site drains the Gulf Coast Flatwoods subecoregion (75a). Catfish Branch, located on ER 726 about 2 miles to the northwest of this site, is a similar stream for comparison (see the Catfish Branch ecosummary) http://water.dep.state.fl.us/eswizard/esdata/pdfs/257.pdf.

Results

The BioRecon indicated an impaired biological community. All six biological indicators failed thresholds established for healthy aquatic ecosystems. The BioRecon method now uses 6 biometrics that became effective with the FDEP Quality Assurance Rule finalized June 8, 2004.

Biometrics	Metric Score
# TOTAL TAXA	0.06
# EPHEMEROPTERA TAXA	0
# TRICHOPTERA TAXA	0.14
# LONG-LIVED TAXA	0.1
# CLINGER TAXA	0.13
# SENSITIVE TAXA	0.16
TOTAL METRIC SCORE :	0.59
/ Correction Factor :	0.6
= BIORECON SCORE :	1

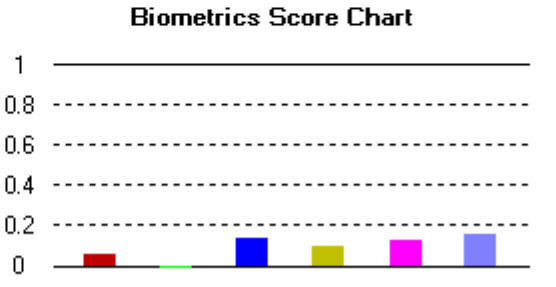
UPPER LONG BRANCH @ EGLIN RD. 726 S.E. OF CHOCTAW FIELD

BioRegion : Panhandle West

Sample Date : Jun 08, 2004

Pass 6 - 10

Fail 0 - 5



Mayflies, stoneflies, and caddisflies, (EPT), the main aquatic insect component of the headwater streams on Eglin Air Force, were conspicuously missing. Only one caddisfly specimen was found. A comparison with Catfish Branch using the pre-2004 biometrics also indicated significant impairment for Long Branch's biota:

Biometrics	Long Branch	Catfish Branch	Thresholds
Taxa Richness	18	34	>= 24
Florida Index	6	25	>= 22
EPT	1	17	>= 17

Silvicultural activities and a logging road (ER 726) affected stream health. The forest surrounding Long Branch had been logged and burned. This allowed fine organic sediment runoff from the logged slope and burned forest to fill the stream channel, limiting fish and wildlife habitat. This sediment load, accumulated due to back flooding caused by a downstream ER 726 road culvert that disrupted the stream's natural hydrology, allowed silt to smother wildlife habitat. Timber activities limited the riparian buffer zone width, resulting in a poor to marginal habitat rating. Pines had been planted within 5 to 6 meters of the stream's sandy-sloped banks. Shrubs dominated the riparian zone after it had been cut and burned. The stream habitat assessment score was rated suboptimal at 65%. The 8 individual habitat parameter scores ranged from optimal (artificial channelization, bank stability), suboptimal (substrate diversity, substrate availability, water velocity, riparian zone vegetation quality), marginal (habitat smothering,), and poor (riparian buffer zone width).

Water quality was excellent, characteristic of the sand and gravel aquifer discharging from the Northwest Florida sand hills. Nutrients (Kjeldahl nitrogen below detection limit of 0.15 mg/l, nitrate-nitrite less than 0.01 mg/l, ammonia less than 0.02 mg/l, and total phosphate below detection limit 0.009) were extremely low, again typical of the area groundwater. Water temperature was 21 degrees centigrade, five-day biochemical oxygen demand below detection limit 0.5 mg/l, conductivity 18 umho/cm, pH 4.73 standard units, chlorophyll a below detection limit 0.5 mg/l, and total and fecal coliform (1091 and 56/100ml) met State Water Quality Standards. Turbidity 9 NTU, color 40 Platinum-Cobalt units, and suspended solids 50 mg/l, were elevated and dissolved oxygen 5.6 mg/l, and percent dissolved oxygen saturation 63% were depressed compared to normal sand hill water quality conditions, indicative of the fine silt accumulation from the logging and burning impacts.

Significance

Long Branch flows into East Bay, one of the least developed bays in the western panhandle. Its water quality was excellent; however, the habitat was affected by silt smothering, which limited the diversity and productivity of the stream's fish and wildlife. The suboptimal habitat was due to the absence of a forest canopy and siltation. Prior logging and burning of the riparian zone and the surrounding slope forest created conditions that impacted wildlife habitat. The resulting shrub over-story lacks large woody debris, which contributes to the most important fish and wildlife habitat in panhandle streams. Long Branch had only 10% of the woody debris that was historically present in southeastern coastal streams. Because of habitat disruption, this Long Branch site did not meet Class III State Water Quality Standards 62-302 for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The watershed's excellent water quality is susceptible to rapid degradation because of its geology. The sandy soil feature of the watershed allows rapid infiltration of water into the sand and gravel aquifer without binding dissolved substances to its chemically inert quartz sand soil. Nutrients from the proposed wastewater Rapid Infiltration Basins could accumulate in Long Branch and East Bay, rapidly accelerating cultural eutrophication in the waters of the fast growing Navarre area. Examples of the area's sandy soil's limited abilities for nutrient uptake: Niceville's wastewater sprayfield located on an Eglin Air Force Base sand hill, increased nitrate-nitrite concentrations from area's background of less than 0.01 mg/l to over 7 mg/l in Turkey Creek draining to Rocky Bayou. Eglin's wastewater spray field discharge elevated the total nitrogen (0.78 mg/l) and total phosphate (0.031 mg/l) load to Garniers Creek draining to Garniers Bayou in Fort Walton Beach.

Suggestions

The sandy quartz soil in the Long Branch watershed does not effectively remove chemical constituents such as nitrogen, and the area's vegetation cannot uptake high nutrient concentrations, as they are adapted to almost sterile conditions. Therefore, if Rapid Infiltration Basins (RIBS) wastewater discharge permits are issued for the Long Branch watershed, the water treatment plant should be designed to an advanced wastewater treatment technology that prevents and increase in nutrient loading, and/or the RIBs should be located much further inland, away from streams and drainage contours. For instance, one RIB is proposed to be located in the headwaters of Poplar Creek, which flows into Miller Bayou. Another RIB location is sited adjacent to Long Branch. 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. Using best management practices for dirt roads, especially minimizing affects on stream morphology, is important to protect stream ecosystems. Examples of observed watershed problems to rectify were a road culvert damming the stream, road sediment filling wetlands/stream channel, logging stream slopes and riparian zones, and fire management impacts to watershed riparian zones. Long Branch's diversity and productivity would improve with a mature riparian forest over story to provide natural habitat conditions in the stream.

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