EcoSummary

Brushy Creek below Nokomis Road
March 7, 2005

POOR

TMDL STUDIES

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



This 2005 SCI bioassessment was performed to verify biological impairment documented by a 1999 Brushy Creek Watershed Agricultural Best Management Practice BioRecon. This site failed two of three biometrics of the 1999 BioRecon conducted to assess the health of the biota and wildlife habitat in Brushy Creek. For this reason, Brushy Creek (WBID 4) was included on the FDEP Basin Rotation Group 5 (Perdido Basin) Planning List of Impaired Waters. The FDEP planning list is an inventory of surface waters or segments of which impairment of one or more parameters is suspected. Additional sampling is required for these waters to verify the suspected impairment(s). Stream Condition Index (SCI) assessments are required to verify biological impairment of a stream or water body segment (Rule 62-330.330). When impairment is verified, a TMDL will be developed, as provided in Subsection 403.067(2) in Florida Statutes, to determine reductions in the pollutant to obtain the water body's designated use.

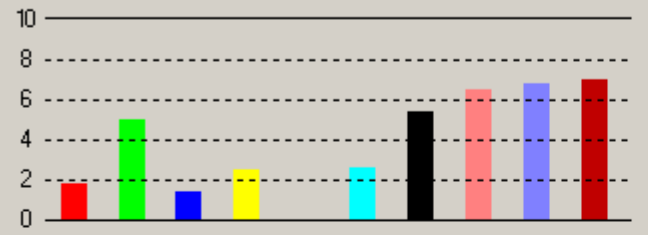
Watershed Characteristics

Brushy Creek (STORET 33010063) at the bioassessment site (latitude North 30 degrees 58 minutes 37.5 seconds longitude West 87 degrees 31 minutes 42 seconds) is a third order stream that drains the Southern Pine Plains and Hills of subecoregion 65f. The watershed is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic wildlife community and flows into Perdido Bay via the Perdido River. Its headwaters begin in Escambia County, Alabama, north of Atmore. Brushy Creek's land use above this SCI site is mainly agricultural, but also includes the urban component of Atmore.

Results

The SCI score indicated an impaired biological community with a poor condition metric score. The SCI final score of 44 of a possible 100 index points failed to meet biological indicator thresholds established for a healthy aquatic wildlife community:

BRUSHY CREEK AT NOKOMIS RD ALSO BFA STATION



BioRegion : Panhandle West

Sample Date : Mar 07, 2005

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

Core Metrics	Value	0 - 10 Points	Metric Score
# TOTAL TAXA	22	16 - 49	1.82
# EPHEMEROPTERA TAXA	3	0 - 6	5
# TRICHOPTERA TAXA	1	0 - 7	1.43
# CLINGER TAXA	4	0 - 15.5	2.58
# LONG-LIVED TAXA	0	0 - 5	0
# SENSITIVE TAXA	5	0 - 19	2.63
% DOMINANT TAXON	25	43 - 10	5.45
% SUSPENSION FEEDERS / FILTERERS	29.81	1 - 45	6.55
% TANYTARSINI	8.65	0 - 26	6.87
% VERY TOLERANT	1.92	36 - 0	7.02
	TOTAL METRIC SCORE :		39.35
	/ Correction Factor :		0.9

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

= SCI FINAL SCORE : 44

Brushy Creek's macroinvertebrate community was dominated by pollution

tolerant/facultative taxa and short-lived midges. Healthy, well-balanced aquatic wildlife communities in the Perdido River basin include mayfly, stonefly, and caddisfly taxa. Stoneflies were conspicuously absent at this Brushy Creek site. Stoneflies, Florida 's most sensitive aquatic macroinvertebrate order and an important fish food, need cool, highly oxygenated flowing water for their survival. Brushy Creek's Core Metrics: # Total Taxa, # Trichoptera taxa (caddisflies), # Clinger Taxa, # Sensitive Taxa, and # Long-Lived Taxa had low metric scores indicating impairment.

The Habitat Assessment rated marginal (43%) from poor scores of Available Substrate (2%), Habitat Smothering (90%), Bank Stability (2 meters wider than 1999), Riparian Buffer Zone Width (3-6 meters), and Riparian Zone Vegetation Quality (Chinese privet dominant). Substrate diversity and Water Velocity rated suboptimal while Artificial Channelization at this reach rated optimal.

The dissolved oxygen (DO) concentration was 8.4 mg/l with a DO saturation of 82%.Water temperature was 14.57 degrees centigrade with a pH of 6.16 standard units. Conductivity was 92 umho/cm, higher than is normally associated with the Perdido River basin (less than 50 umho/cm). Nitrate-nitrite (1.8 mg/l) and total phosphates (0.11 mg/l), nutrients deriving from farm runoff and/or wastewater discharge, were significantly elevated. Background concentrations for the Perdido River drainage are less than 0.2 mg/l nitrate-nitrite and less than 0.02 total phosphates.

Water had a musty odor and was slightly turbid (secchi 1.2 meters). Water color was olive-brown from the reflections off the silt deposits smothering the stream bed. Sediments were anaerobic with a hydrogen sulfide odor. The stream was braided above Nokomis Road and dredged below the bridge because of excessive sediment loading to Brushy Creek. Numerous deer/dog carcasses and household garbage were dumped by the bridge.

Significance

Biological impairment is verified by this SCI. TMDL development to reduce pollutant loading will proceed according to the Impaired Waters Rule, Chapter 62-303, Florida Administrative Code. Brushy Creek in this reach 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. Water quality was a source of impairment as indicated by the elevated concentration of nitrates-nitrites and total phosphates. Potential nutrient sources include Atmore's wastewater/stormwater runoff and agriculture (livestock and row crop) runoff. Sediment runoff from land clearing (construction, agriculture, and silviculture) was also affecting Brushy Creek's fish and wildlife.

Suggestions

Monitor interstate water quality conditions on Brushy Creek by sampling at this site,

the closest road crossing to the state line. Brushy Creek should be monitored because of wastewater dischargers in Alabama and data is lacking for public health and growth management decisions. Restore Brushy Creek's stream sinuosity and width/depth ratio to natural conditions near the bridge. This would increase fish and wildlife habitat availability along with water velocity, which would improve summer DO. Prevent garbage dumping into Brushy Creek and its riparian zone at this site.

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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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