TMDL STUDIES

EcoSummary

Rest Area Run Creek below I-10 & Perdido landfill

February 24, 2005

GOOD

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 Rest Area Run Creek (WBID 542) SCI bioassessment was performed to verify biological impairment documented by two 1996 BioRecons on Beaver Pond Creek, one of its tributaries. The Beaver Pond Creek site that drains the western portion of the Perdido Landfill failed all three biometrics for both those 1996 BioRecons conducted to assess the health of its biota and wildlife habitat. For this reason, the Rest Area Run Creek WBID 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 and additional sampling is required 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.

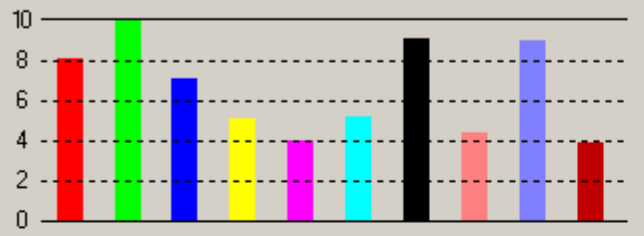
Watershed Characteristics

Rest Area Run Creek (STORET 33010065) at the bioassessment site (latitude North 30 degrees 34 minutes 7 seconds longitude West 87 degrees 24 minutes 18.3 seconds) is a third order stream that drains the Southern Pine Plains and Hills of subecoregion 65f. Its headwaters begin just above I-10 west of Beulah Road at the Perdido Landfill and south of I-10 west of Beulah Road, north of Frank Reeder Road. The Rest Area Run Creek sample site was located below the confluence with Beaver Pond Creek about two miles north of Beulah, Escambia County. The watershed's land use, in addition to the Escambia County's solid waste disposal area, is residential, silviculture, forest, strip mines, roads, and crop/pasture. Property owners have impounded most of the headwater tributaries. The watershed flows into Perdido Bay via the Perdido River, which is listed as an Outstanding Florida Waters under Florida Water Quality Standards. The Perdido River forms Florida's western boundary with Alabama. Rest Area Run Creek is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic wildlife community.

Results

The SCI score indicated a biological community with a good condition metric score. The SCI final score of 74 of a possible 100 index points and rated good for four out of ten biological indicator thresholds established for a healthy aquatic wildlife community:

I-10 REST STOP CREEK (UNNAMED)



BioRegion : Panhandle West

Sample Date : Feb 24, 2005

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

Core Metrics	Value	0 - 10 Points	Metric Score
# TOTAL TAXA	43	16 - 49	8.18
# EPHEMEROPTERA TAXA	6	0 - 6	10
# TRICHOPTERA TAXA	5	0 - 7	7.14
# CLINGER TAXA	8	0 - 15.5	5.16
# LONG-LIVED TAXA	2	0 - 5	4
# SENSITIVE TAXA	10	0 - 19	5.26
% DOMINANT TAXON	12.87	43 - 10	9.13
% SUSPENSION FEEDERS / FILTERERS	20.3	1 - 45	4.39
% TANYTARSINI	18.81	0 - 26	9.05
% VERY TOLERANT	7.92	36 - 0	3.92
	TOTAL METRIC SCORE :		66.23
	/ Correction Factor :		0.9

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

= SCI FINAL SCORE : 74

The individual core metrics for Long-Lived Taxa, Percent Suspension feeders, and Percent Very Tolerant rated poor. Clinger Taxa and Number Sensitive taxa scored in the low range of fair. Stoneflies were conspicuously missing from the well-balanced aquatic insect community that is characteristic of panhandle streams. Stoneflies, Florida's most sensitive aquatic macroinvertebrate order and an important fish food, need cool, highly oxygenated flowing water for their survival. Six stonefly taxa that comprised 10 to 24 percent of the population were collected during four BioRecon/SCI samples in Rest Area Run Creek prior to 1996. Before 1996, Rest Area Run Creek was used as a background for Beaver Pond Creek, located just below the active western area of the Perdido Landfill. During 1996 the landfill opened solid waste disposal cells in the east area that drained to Rest Area Run Creek headwaters above I-10. Biological and water quality compliance monitoring found the runoff from those cells impacted Rest Area Run Creek's water quality as the western landfill operation impacted Beaver Pond Creek. Some of those impairment indicating water quality parameters (dissolved oxygen, fecal coliform, total coliform, pH, turbidity, and un-ionized ammonia) are listed on the 2005 Impaired Water Rule (IWR) Planning List Report for Rest Area Run Creek (WBID 542). Additional

parameters (chlorophyll *a*, chlorophyll *a* corrected, color, suspended solids, water temperature, conductivity, and biochemical oxygen demand) were documented to be elevated over natural conditions during the 2005 IWR monitoring in Rest Area Run Creek. Rest Area Run Creek water quality parameter values at the SCI monitoring site downstream of the confluence with Beaver Pond Creek were elevated over typical Perdido River basin background values. Results for this sampling event were: ammonia 0.65 mg/l, Kjeldahl nitrogen 0.73 mg/l, dissolved oxygen 6.77 mg/l at only 67.6% saturation, water temperature 16.12 degrees centigrade, turbidity 11 NTU, Biochemical oxygen demand 1 mg/l, total coliform 740/100ml, and fecal coliform bacteria 230/100ml. The Habitat Assessment rated suboptimal at 64%, lowered by poor ratings of Available Substrate (5%) because of Habitat Smothering (95%) by fine silt. Clay sediments from landfill runoff filled riparian wetlands along Beaver Pond and Rest Area Run Creeks. The Available Substrate during the July 1995 bioassessment at this site was an excellent 99%. Substrate Diversity rated marginal with only 2 available productive habitats, as the rest were silt smothered. Water velocity rated suboptimal. All the secondary habitat components rated optimal: Artificial Channelization, Bank Stability, Riparian Buffer Zone Width, and Riparian Zone Vegetation Quality. Sediments had a chemical and hydrogen sulfide odor with some sheen from iron/sulfur bacteria. The water surface also had sheen from the iron/sulfur bacteria, a metallic odor, and was slightly turbid (seechi 0.6 meters). Rust colored groundwater seepage into Rest Area Run Creek was observed along the landfill boundary north of I-10. On the same day as this Rest Area Run Creek SCI sample, Beaver Pond Creek had the same IWR impairment indicating water quality parameters as Rest Area Run Creek, although at higher concentrations of pollutants. Beaver Pond Creek was very muddy (secchi 0.1 meters), measured dissolved oxygen below State Standards (4.3mg/l), had elevated conductivity (259 umho) and was experiencing an algae bloom.

Significance

Biological impairment at this site was not verified by this SCI, although elimination of the sensitive stonefly community affected Rest Area Run Creek's propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Two major tributaries south of Interstate-10 provided dilution of impaired waters from Beaver Pond Creek and upstream Rest Area Run Creek, enabling this Rest Area Run Creek site to pass the SCI score. Beaver Pond Creek and the upstream Rest Area Run Creek reach still had IWR impairment for water quality master parameters and observations of severe sediment smothering indicated both would likely fail biological assessments. Presence of a landfill on the banks of the Perdido River, an Outstanding Florida Water with its associated hydrological, topographical, and geological features made it difficult to control nonpoint source runoff and prevent groundwater from contaminating local springs. Springs within the landfill are the headwaters for Beaver Pond Creek and Rest Area Run Creek that discharge to interstate waters. Contaminated groundwater (leachate) and stormwater runoff from the Perdido Landfill to Rest Area Run Creek had been documented by compliance monitoring since the early 1990's.

Suggestions

Prevent contaminated water from reaching Beaver Pond Creek and Rest Area Run

Creek. Contaminated groundwater (leachate) and stormwater runoff should be isolated onsite at the landfill to protect Beaver Pond Creek and Rest Area Run Creek water quality. Restoring the headwater stream's natural hydrology (i.e. sinuosity, flow, depth), along with restoring and preserving the riparian wetland forest buffer zones, would benefit the watershed's fish and wildlife. The riparian forests prevent erosion, filter pollutants, furnish cooling shade, and provide habitat for a diverse and productive fish and wildlife population. Impoundments artificially warm water temperatures and alter community structure by reducing fish and wildlife diversity.

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