EcoSummary

Niceville Landfill South Branch tributary to Turkey Creek

July 9, 2003

TMDL STUDIES

VERY POOR

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.

Introduction



This site failed all three biometrics of a 2001 BioRecon conducted to assess the impacts of Okaloosa County's Niceville landfill to the biota and wildlife habitat in a tributary to Turkey Creek. For this reason, Niceville Landfill South Branch was included in the FDEP Basin Rotation Group 3 (Choctawhatchee Basin) Planning List of Impaired Waters. The FDEP planning list is an inventory of surface waters or suspected and additional sampling is required to verify the suspected impairment(s). Stream Condition Index (SCI) assessments are required to verify biological impariment 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 the Florida Statutes, to determine reductions in the pollutant to obtain the water body's designated use. This 2003 SCI was performed in partnership with the United States Fish and Wildlife Service (USFWS) to verify biological impairment documented by the 2001 BioRecon at this same site (see report on March 22, 2001) (see: ftp://ftp.dep.state.fl.us/pub/water

/eco/Niceville%20Landfill.pdf)

For quality assurance and comparative purposes a BioRecon was also conducted along with this 2003 SCI assessment.

Watershed Characteristics

Niceville Landfill South Branch at the bioassessment site is a first order stream, originating at the landfill, about 0.6 miles west of Highway 85, Okaloosa County (latitude North 30 degrees 32 minutes 45.1 seconds longitude West 86 degrees 30 minutes 31.7 seconds). This stream was a former steephead with sandy, well-drained slope soils prior to the construction of the landfill. The sample site (STORET 32020124) is located in subecoregion 75A watershed drains and flows into Choctawhatchee Bay via Turkey Creek and Boggy Bayou. Niceville Landfill South Branch is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic community.

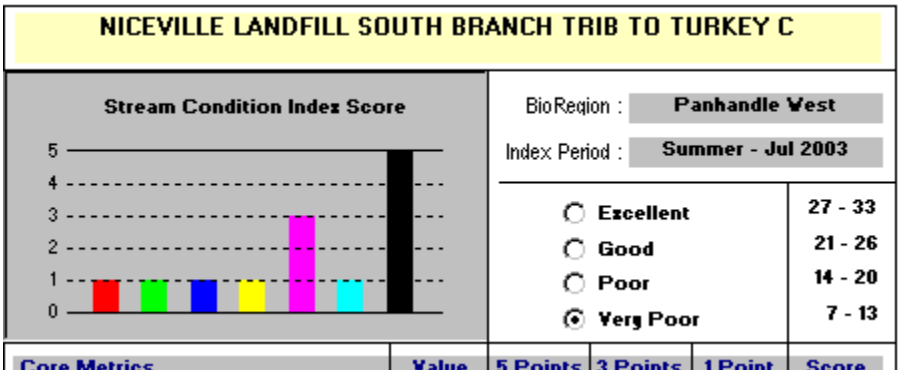
Results and Discussion

The SCI scoring system indicated a very poor condition with a score of 13 out of 33 index points. Like the SCI, both BioRecons indicated a severely impaired biological community. All 3 of the BioRecon biological indicators failed thresholds established for a healthy aquatic wildlife community:

BioRecon Results

Biometrics	2001 Value	2003 Value	Thresholds
Taxa Richness	9	2	>= 24
Florida Index	2	0	>= 22
EPT	0	0	>= 17

The macroinvertebrate community was severely degraded. Only worms, fingernail clams and 1 midge were found in the 2003 BioRecon and SCI monitoring. The only SCI metric that rated 5 points (see chart above) was % suspension feeder/filterer for the pollution tolerant fingernail clam that was 83% of the sample. However, it is common to find suspension feeder/filterers dominating the community structure below sources generating organic pollution such as paper mills and dams.



The habitat assessment of the site rated 49% in 1998 and 54% in 2003. A score of 65% is an interim biometric

Core Metrics	Value	5 Points	3 Points	1 Point	Score
# TOTAL TAXA	5	>= 31	30 - 16	< 16	1
EPT INDEX	0	>= 7	6 - 4	< 4	1
# CHIRONOMID TAXA	1	>= 9	8 - 5	< 5	1
% DOMINANT TAXON	82.65	<= 22	23 - 61	> 61	1
% DIPTERA	1.02	-	<= 50	> 50	3
FLORIDA INDEX	0	>= 16	15 - 8	< 8	1
% SUSPENSION FEEDERS / FILTERERS	82.65	>= 12	11 - 6	< 6	5
Macroinvertebrate Dip Net (20 sweeps of most productive substrates)		SCI TOTAL SCORE :			13

threshold. The only change was water velocity, which improved significantly from marginal to optimal due to the increased rainfall from 2001 to 2003. This area had experienced a record drought from 1998 through the 2001 bioassessment. During June 2003 record rainfall was measured (15.83 inches at Jackson Guard in Niceville) compared to normal 5.94 inches), at least temporarily breaking the area's 5-year drought. For July 2003 rainfall at Jackson Guard was 14.82 inches (normal 8.6 inches), half of it falling during the first week associated with Tropical Storm Bill. Despite the increased flow in 2003, the stream community was still severely limited by pollutants from the landfill. A profuse bloom of iron/sulfur bacteria continued to smother the stream and riparian wetland. The iron/sulfur bacteria smothered 100% of the aquatic habitats, which eliminated the stream's wildlife diversity and productivity. This bloom produced a sheen that covered most of the water surface in stagnant to slow velocity areas. These bacteria and the associated precipitated iron/sulfur and other compounds smother the gills and bodies of the fish and wildlife. Anaerobic sediments filled the stream channel to a depth of 2 feet or more in the upper reach. The stream was very turbid after disturbance, and the floc-like sediments re-suspended rapidly. During rainfall events the turbidity, sediment, iron/sulfur, and other chemical compound leachate pollution load will be transported down stream to Turkey Creek, Boggy Bayou and into Choctawhatchee Bay. The landfill pollutant load could affect the federally listed endangered Okaloosa Darter, which inhabits the Turkey Creek System. Iron is a contributor for algal blooms in marine waters.

Conclusion

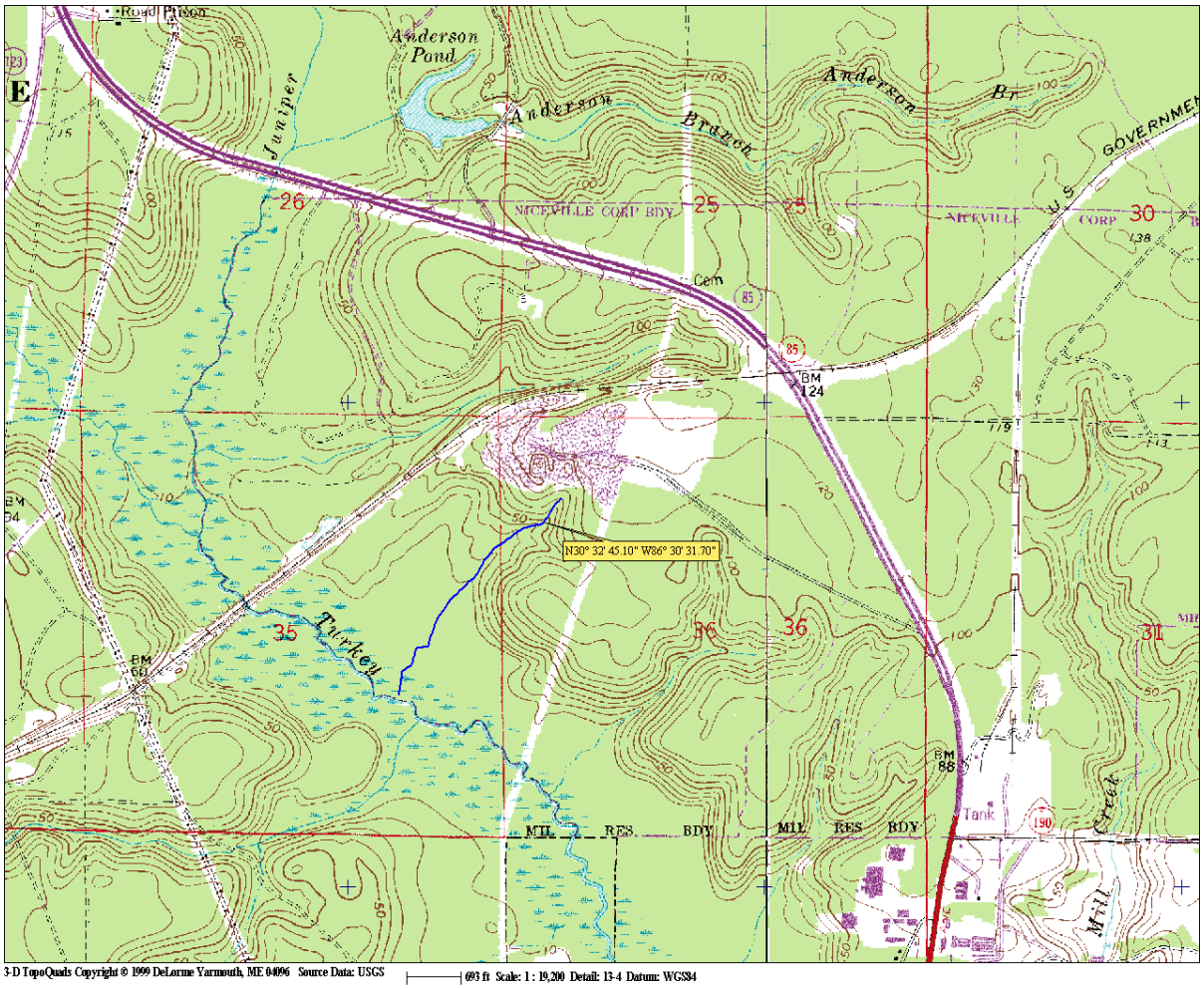
The 2003 SCI and BioRecon affirmed this site did not meet Class III State Water Quality Standards 62-302 for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The iron/sulfur bacteria, sediment, and chemical leachate effects from the un-lined landfill were most likely the major contributors to this stream not meeting State designated use. The steephead's quartz sand soils are not conducive to pollutant removal before landfill leachates contact the water table. On the contrary, the acidic rain and groundwater speed the break down of waste material, which is discharged to surface waters from the

former springhead. It is recommended that Niceville Landfill South Branch be included on the verified list based on the observed biological effects. For more information, contact Donald Ray, FDEP Northwest District, 160 Governmental Center, Pensacola, FL 32501 (850) 595-8300 x1126 or SC 695-8300 and Theresa Thom, USFWS Eglin AFB Jackson Guard, 107 Hwy 85 North, Niceville, Fl 32578 (850) 882-4164 x371

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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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3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS
693 ft Scale: 1 : 19,200 Detail: 13-4 Datum: WGS84