EcoSummary

Dry Creek, East of Hwy 29, Molino

February 17, 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 1996 Dry Mile Creek Watershed Total Maximum Daily Load (TMDL) SCI and BioRecon.
This site rated poor on that 1996 SCI and failed all three metric of the BioRecon conducted at the same time to assess the health of the biota and wildlife habitat in Dry Creek. For this reason, Dry Creek 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.

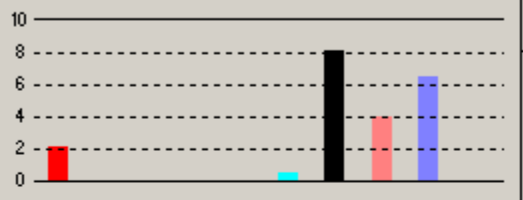
Watershed Characteristics

Dry Creek (STORET 33010086) at the bioassessment site (latitude North 30 degrees 42 minutes 53.4 seconds longitude West 87 degrees 20 minutes 56.1 seconds) is a third order stream that drains the Southern Pine Plains and Hills of subecoregion 65f. Its headwaters begin northwest of U.S. Highway 29 above Molino, Escambia County. Dry Creek above the assessment site had intensive agriculture with filled riparian wetlands and dredged ditches that replaced the original stream channels. The watershed flows into Perdido Bay and is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic wildlife community.

Results

The SCI score indicated an impaired biological community with a poor condition metric score. The SCI final score of 24 of a possible 100 index points failed to meet biological indicator thresholds established for a healthy aquatic wildlife community:

DRY CK, 20 M. E OF HWY 29, S OF CR 182



BioRegion : Panhandle West

Sample Date : Feb 17, 2005

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

Core Metrics	Value	0 - 10 Points	Metric Score
# TOTAL TAXA	23	16 - 49	2.12
# EPHEMEROPTERA TAXA	0	0 - 6	0
# TRICHOPTERA TAXA	0	0 - 7	0
# CLINGER TAXA	0	0 - 15.5	0
# LONG-LIVED TAXA	0	0 - 5	0
# SENSITIVE TAXA	1	0 - 19	0.53
% DOMINANT TAXON	16.04	43 - 10	8.17
% SUSPENSION FEEDERS / FILTERERS	18.87	1 - 45	4.06
% TANYTARSINI	7.55	0 - 26	6.5
% VERY TOLERANT	46.23	36 - 0	0
		TOTAL METRIC SCORE :	21.38
		/ Correction Factor :	0.9
		= SCI FINAL SCORE :	24

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

Dry Creek's macroinvertebrate community was still severely degraded as it was in 1996. Midges and worms, very tolerant organisms, had replaced the sensitive stonefly, mayfly, and caddisfly community found naturally in panhandle streams. Agricultural nonpoint source runoff and habitat destruction were the main source of

anthropogenic impairment. Much trash/litter and highway debris (i.e. tire retreads) was observed in the creek. The habitat was severely degraded, rating poor with score of 23%. Substrate Availability, Water Velocity, Habitat Smothering, Artificial Channelization, left Bank Stability, Riparian Buffer Zone Width, and Riparian Zone Vegetation Quality all rated poor. Substrate diversity rated Suboptimal and right Bank Stability marginal. The dominant riparian vegetation was Chinese Privet. Other introduced foreign plants present included mimosa, Japanese climbing fern, and Japanese honeysuckle. Dry Creek's water quality was also affected by the watershed land use. The dissolved oxygen was severely depressed (2.7 mg/l with 26% saturation) even during the winter with a water temperature of 14.2 degrees centigrade. Ten Mile Creek and Churchhouse Branch, also in the Perdido basin had DO concentrations well above State Standards. Biochemical Oxygen Demand (1.1 mg/l), suspended solids (Residue, nonfilt. - 12 mg/l), color (100 Pt-Co), turbidity (23 NTU), and alkalinity (31 mg/l), were above background conditions. Calcium (10.8 mg/l), fluoride (0.22 mg/l), magnesium (1.4 mg/l), potassium 2.1mg/l), and sulfate (4.7 mg/l), commonly found trace elements/compound in fertilizers, were elevated compared to background concentrations. The nutrients, ammonia (0.029 mg/l), Kjeldahl nitrogen (0.37 mg/l), total phosphates (0.051 mg//l) were also higher than conditions in adjacent watershed with more limited agriculture land use. Fecal coliform bacteria (180/100ml) and total coliform bacteria (620 /100ml) were higher than other Perdido basin watersheds with different land use (see chart below). Ten Mile Creek's watershed had become urbanized in past 2 decades and Churchhouse Branch historically drained silviculture and had a sanitary landfill located on its headwaters.

PARAMETER	UNITS	Dry Creek	Ten Mile Creek	Churchhouse Branch
Date		2/17/2005	3/2/2005	3/9/2005
Water Temperature	degrees C	14.22	13.86	12.98
Turbidity	NTU	23	3	2
Color	Pt-Co	100	50	28
Dissolved Oxygen	mg/l	2.74	13.76	8.24
% DO Saturation	%	26.1	100	77.9
BOD 5 day	mg/l	1.1	0.6	0.6
pH	units	6.27	5.75	5.56
Residue, nonfilt.	mg/l	12	8	less than 5
Alkalinity	mg/l CACO3/L	31	4.7	less than 0.65
Calcium	mg/l	10.8	2.6	0.84
Fluoride	mg/l	0.22	0.05	less than 0.05
Magnesium	mg/l	1.4	0.69	0.51
Potassium	mg/l	2.1	1.1	0.71
Sulfate	mg SO4/L	4.7	3.5	2.2
Ammonia-N	mg/l	0.029	less than 0.01	less than 0.01
Kjeldahl Nitrogen	mg/l	0.37	0.24	0.18
Total Phosphate	mg/l	0.051	less than 0.02	less than 0.02
Total coliform	#/100 ml	620	52	72
Fecal coliform	#/100 ml	180	36	23

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. Dry 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. The main reason for the biological impairment was destruction of the stream corridor. Agricultural Best Management Practices (BMPs) were not followed, which allowed stormwater runoff to impact the Dry Creek fish and wildlife community. A significant portion of the stream's headwater area has been plowed, filled, and converted to pasture, row crop, ditches, and swales planted with non-native grass. The native riparian zone vegetation along streams such as Dry Creek provide the food and habitat for aquatic macroinvertebrates, which become the food for fish and wildlife of the Perdido basin ecosystem. Elimination of watershed forested-wetland reduces the diversity and productivity of a stream ecosystem.

Suggestions

An agricultural BMP program is needed for the Dry Creek watershed. After successfully applying BMPs, a stream corridor restoration program using a buffer width of at least 18-meters of native forested wetlands could be implemented. Dry Creek corridor's hydrologic and geomorphic conditions, along with the biological and chemical characteristics in this report, should be analyzed to make appropriate restoration decisions. Stream Corridor Restoration: Principles, Processes, and Practices is a recommended technical reference manual. It details stream corridor restoration techniques that can help improve streams considered degraded from erosion, sedimentation and excess nutrients. This manual, published through the Natural Resources Conservation Service, Washington, DC., contains field-tested methods and approaches.

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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