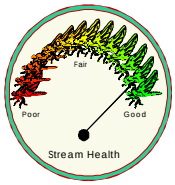


EcoSummary

SCI Report



Black Creek, Leon County
5/11/94-8/12/97

Stream Condition Index (SCI): The standardized biological assessment tool used by FDEP biologists to indicate ecosystem health and identify impairment as compared to reference (natural) conditions of streams within the various ecoregions of the State of Florida

Introduction

Black Creek, a tributary to the Ochlockonee river, is located in the Apalachicola National Forest. The drainage basin consists predominantly of pine flatwoods and swamps. Human activities in the area have been minimal, consisting of some historic silviculture use. Because of the relatively undisturbed nature of the Black Creek drainage, the creek has been used as a reference stream for development of FDEP's Stream Condition Index.

However, Black Creek is also on the 303(d) list. Waterbodies on this list are required by EPA to have a Total Maximum Daily Load (TMDL) study performed on them. The purpose of the TMDL is to determine the amount of pollution reduction needed to restore the system to a condition suitable for its designated use. In this case, the designated use is for recreation and maintenance of a healthy, well balanced aquatic community.

DEP's Environmental Assessment Section was requested to assess the status of selected waterbodies on the TMDL list which were placed on the list with limited data. The data available for these selected waterbodies consisted of less than 10 observations in the STORET database, somewhat dated, pre-1990 information, or qualitative non-point source survey data only.

Results and Discussion

There are limited STORET data available for Black Creek. It was placed on the 303(d) list for fecal coliform violations and a visual survey assessment of the watershed categorizing the creek as "threatened". Benthic macroinvertebrates (using 20 discrete dip net sweeps), physical/chemical parameters, and nutrients were sampled over a four-year period, starting in early 1994, and these data are available in the Department's Statewide Biological Database.

Stream Condition Index (SCI) scores were calculated for all seven of the sampling dates. The macroinvertebrate-based SCI produces a score which is a composite of 7 measures of community health, depending on how closely each parameter approaches an expected reference condition. A given SCI score is assigned a descriptive category, with an "excellent" or "good" score indicating healthy biological communities. Black Creek scored in the "excellent" or "good" category for all events except one, which was sampled during near flood conditions. Because of a known sampling error (difficulty in reaching productive habitats), this particular sampling event is viewed as an outlier. Measured physical/chemical parameters and water quality variables all "fully" met acceptable criteria for Class III waterbodies during this four year period. Dissolved oxygen values ranged from 6.2 to 9.4 mg/L (complying with the Class III standard of 5.0 mg/L) on all five of the seven sampling events that dissolved oxygen was reported. Total Kjeldahl nitrogen, nitrate-nitrite, and total phosphorus concentrations all ranked in the lower 40th percentile for other Florida streams. Coliforms in Black Creek were collected once in the winter of 1995 and then again in the summer of 1997. Fecal coliform counts were very low on both sampling dates (20 colonies/100 mL and 32 colonies/100 mL, respectively), complying with the Class III standard of 800 colonies/100 mL. Similarly, total coliforms on these two sampling dates (200 colonies/100 mL and 400 colonies/100 mL, respectively) complied with the Class III total coliform standard of 2400 colonies/100 mL.

Conclusions

Black Creek has been a reference stream used for the development of FDEP's Stream Condition Index, and has been sampled periodically over the last four years. During those four years, all parameters sampled indicated Black Creek is a healthy aquatic ecosystem. Black Creek consistently scored in the "excellent" or "good" range of the SCI. The demonstrated health of the benthic macroinvertebrate communities provides a more reliable and quantitative measure of aquatic biological health than the previous visual surveys. Fecal coliforms, the other parameter responsible for placing Black Creek on the 303(d) list, were very low in 1995 and 1997, complying with Class III water quality standards. Furthermore, nutrient concentrations in the stream, based on seven samplings, were not problematic. This evidence suggests Black Creek should be removed from the 303(d) list.

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Figure 1: Overview map of Black Creek

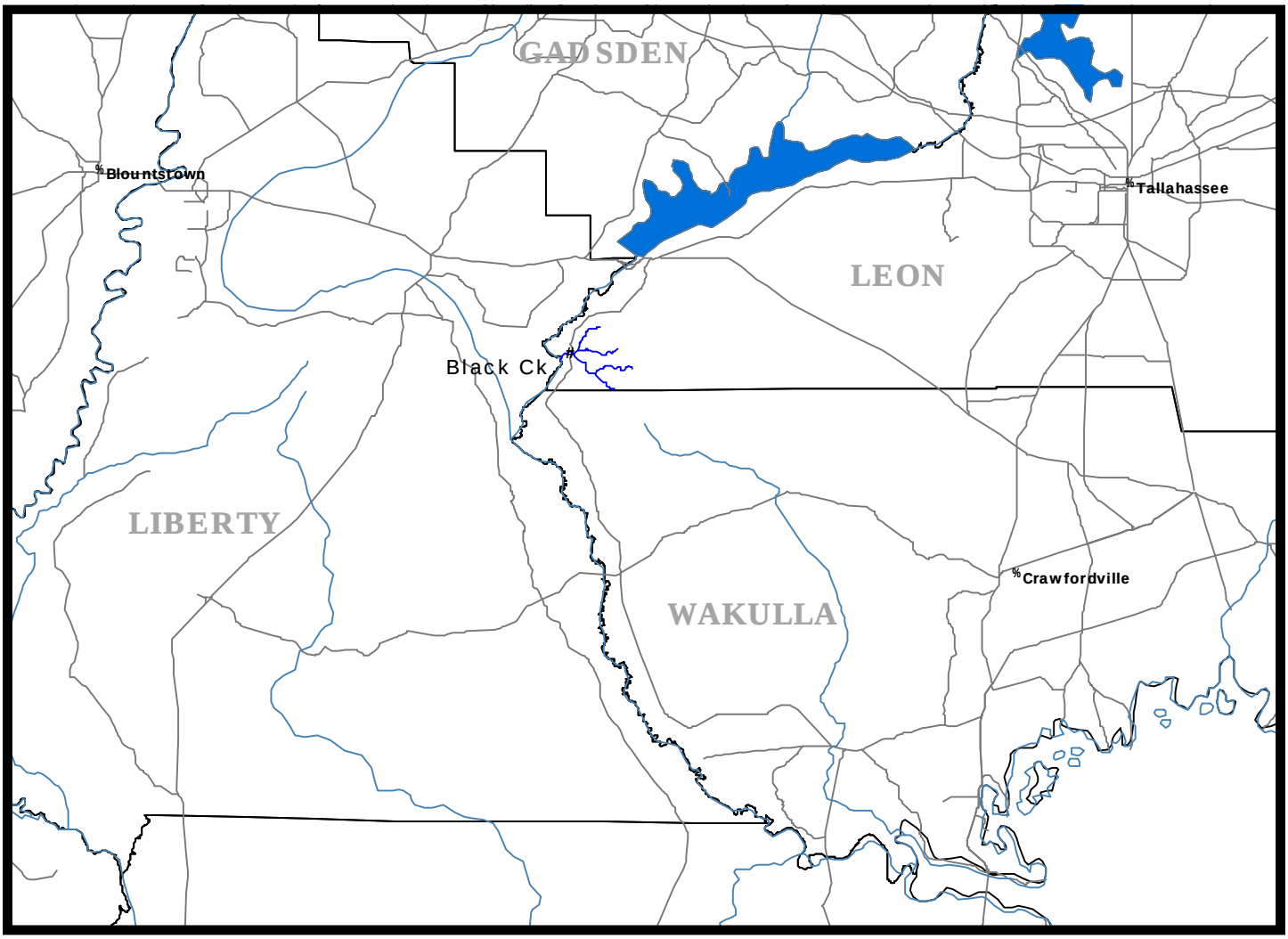


Table 1

Storet: 22020063	BLACK CREEK						
Date	5/11/94	7/31/94	8/1/94	2/15/95	7/19/95	2/13/96	8/12/97
Region	Pan	Pan	Pan	Pan	Pan	Pan	Pan
SCI (Pan)	27	29	23	15	29	29	25
Panhandle Evaluation	excellent	excellent	good	poor	excellent	excellent	good
Cond (umho/cm)			40	25	98	20	41
DO (mg/L)			6.2	9.3	7.4	9.4	6.4
pH (SU)			4.31	5.2	7.3	5.3	4.3
Temp (C)			23	12.7	25.1	11.3	24.6
NH3 (mg/L)				0.015	0.022	0.096	0.016
NO3NO2 (mg/L)				0.01 BDL	0	0.04	0.02
TKN (mg/L)				0.42	0.14	0.51	0.85
TP (mg/L)				0.027	0.037	0.011	0.026
Fecal Col (col/100 mL)				20			32
Total Col (col/100 mL)				200			400
Velocity (m/s)			1		0.8		
Taxa	23	41	42	20	35	38	28
Ephem	4	2	2	2	3	4	1
Plecop	6	1	1	1	2	1	1
Trichop	4	2	2	1	2	3	4
EPT	14	5	5	4	7	8	6
% Cont Dom	8.33	34.98	34.64	26.04	15.74	25.22	21.84
Fla Index	25	17	15	5	20	18	12
% Diptera	8.33	26.4	29.08	11.46	33.33	73.48	47.13
# Chiro	1	4	4	1	3	1	0
# Ortho	0	6	7	2	12	14	6
# Tot Chironomidae	1	10	11	3	15	15	6
% Filterer	12.5	8/1/94	2.29	0.52	4.17	46.96	40.8

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