EcoSummary

BioRecon Report

Bevins (Boggy) Creek, Taylor County
8/4/98

BioReconnaissance (BioRecon): A rapid, cost effective screening mechanism for identification of biological impairment.

Introduction

Bevins (Boggy) Creek, a tributary of the Steinhatchee River, is located in Taylor County. The drainage basin consists primarily of natural swamp forest, while potentially adverse human activities (agricultural and residential uses) account for less than 20% of the drainage basin area).

Bevins (Boggy) Creek was placed on the 303(d) list for previous violations of Class III water quality Standards for dissolved oxygen and coliform bacteria. Waterbodies on the 303(d) 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 that were placed on the list with "limited data". "Limited data" waterbodies were those with less than 10 observations in the STORET database, with the most recent observations occurring prior to 1990, or those with qualitative, non-point source survey data only.

Results and Discussion

Benthic macroinvertebrates communities, physical/chemical parameters, and nutrients were sampled in August of 1998. Macroinvertebrate communities were sampled from in-stream habitats using 4 discrete dip-net sweeps, field picked, and lab identified (the Biorecon procedure). Three metrics, consisting of total taxa richness, the Florida Index and total EPT taxa (Ephemeroptera, Plecoptera and Trichoptera), are calculated and compared to existing thresholds to determine the community's health. Bevins (Boggy) Creek failed to meet the thresholds for all three metrics, indicating impairment is suspected at the site. Factors contributing to the poor Biorecon scores included low water velocity (almost 0 m/s), low dissolved oxygen (2.1 mg/L), and habitat smothering from organic matter.

Measured physical/chemical parameters and water quality variables met all of the acceptable criteria for Class III waterbodies, except dissolved oxygen, which was only 2.1 mg/L (below the Class III standard of 5.0 mg/L). Such dissolved oxygen levels may be typical in swamp dominated (high organic leaf litter input), non-flowing, blackwater streams during the late summer. Fecal coliform counts (30 colonies/100 mL) complied with the Class III standard of 800 colonies/100 mL. Similarly, total coliforms for this sampling date (240 colonies/100 mL) complied with the Class III standard of 2400 colonies/100 mL. Nitrite-nitrate (0.076 mg/L), total Kjeldahl nitrogen (0.54 mg/L), total phosphorus (0.041 mg/L) and turbidity (3.8 NTU's) were all acceptable levels (below the 50th percentile) for Florida streams.

Conclusions

Bevins (Boggy) Creek failed to meet all three of the macroinvertebrate Biorecon metrics. Factor contributing to the low Biorecon scores included the absence of flow, low dissolved oxygen, and habitat smothering with fine organic matter. These conditions may be typical of non-flowing blackwater streams during the late summer. Nutrients, turbidity and coliform levels were all within expected values. It may be necessary to establish distinct biological and water quality expectations (*e.g.*, Site Specific Alternative Criteria) for such stagnant, swamp dominated, blackwater systems. Further sampling during higher flow conditions is recommended before the creek can be removed from the 303(d) list.

For more information, contact Tom Frick, FDEP Environmental Assessment Section, 2600 Blair Stone Rd., Tallahassee, FL 32399 (850)413-0247

Figure 1: Overview map of Boggy Creek

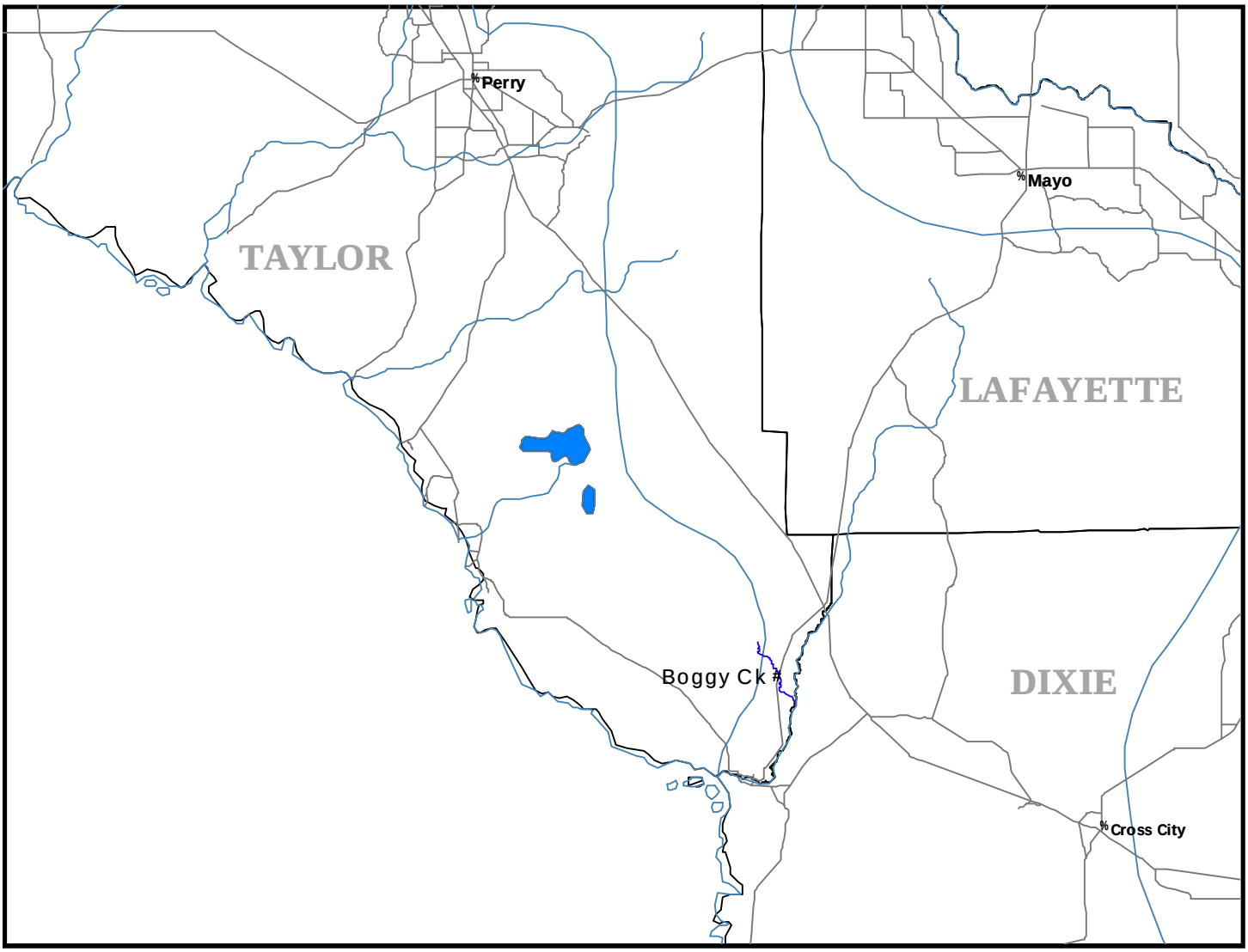


Table 1: Data for selected parameters

Station NickName	Date	# Taxa	Florida index	EPT	pH (Std Units)	Temp (C)	NOx (mg/L)	TKN (mg/L)	TP (mg/L)	Fecal coliforms (col/100 ml)	Total coliforms (col/100 ml)
Boggy Ck at SR 51	8/4/98	23	4	2	7.5	25	0.08	0.54	0.041	30	240

Date	Depth (ft)	Width (ft)	Area (ft^2)	Velocity (ft/s)	Flow (cfs)	DO (mg/L)	Cond. (uhms/cm^2)
8/4/98	0.5	3	0.7	0.003	0.002	2.7	445

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