EcoSummary

BioRecon Report

Weaver Warrior Creek, Taylor County
8/4/98

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

Introduction

Weaver Warrior Creek, located in Taylor county, drains portions San Pedro Bay into the Gulf of Mexico. The drainage basin consists of swamp forest in the headwaters, transitioning to pine flatwoods and then to salt marshes closer to the Gulf. The predominant land-use in the area is silviculture, encompassing approximately three-quarters of the drainage basin. Agricultural and residential use make up the other twenty-five percent. Weaver Warrior Creek has been placed on the 303(d) list due to coliform bacteria and dissolved oxygen violations, and for excessive nutrient levels. 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 macroinvertebrate 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), were calculated and compared to existing thresholds to determine the community's health. Weaver Warrior Creek failed to meet all three of the thresholds, 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 (0.3 mg/L), and habitat smothering from organic matter.

Some measured physical/chemical parameters and water quality variables did not meet the acceptable criteria for Class III waterbodies. Dissolved oxygen was only 0.3 mg/L, far below the Class III standard of 5.0 mg/L. Fecal coliform counts (350 colonies/100 mL) complied with the Class III standard of 800 colonies/100 mL. Similarly, total coliforms on this sampling date (1650 colonies/100 mL) were within the Class III standard of 2400 colonies/100 mL. It should be noted that little rain had fallen in the basin within the past month, resulting in reduced runoff, and therefore, lower potential coliform contamination. Nitrite-nitrate levels (0.04 mg/L) were acceptable for Florida streams. However, both total Kjeldahl nitrogen (3.4 mg/L) and total phosphorus (0.68 mg/L) concentrations exceeded the values found in over 80% of other Florida streams. A turbidity value of 45 NTU's was measured at Weaver Warrior Creek. Using the average turbidity for Florida streams (2.8 NTUs) as "background", this would represent a violation of the Class III turbidity standard (29 NTU's above background).

Conclusions

Weaver Warrior Creek failed all three of the Biorecon metrics. Factors contributing to the low Biorecon scores included the absence of flow, low dissolved oxygen, and habitat smothering with fine organic matter. Although some of these conditions may be typical of non-flowing blackwater streams during the late summer, other evidence pointed to human disturbance. Turbidity exceeded Class III water quality standards and nutrients (especially Kjeldahl nitrogen and total phosphorus) were elevated compared to other Florida streams. The dissolved oxygen (0.3 mg/L) was exceptionally low, even for a blackwater system. It is recommended that Weaver Warrior Creek remain on 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 Weaver Warrior Creek

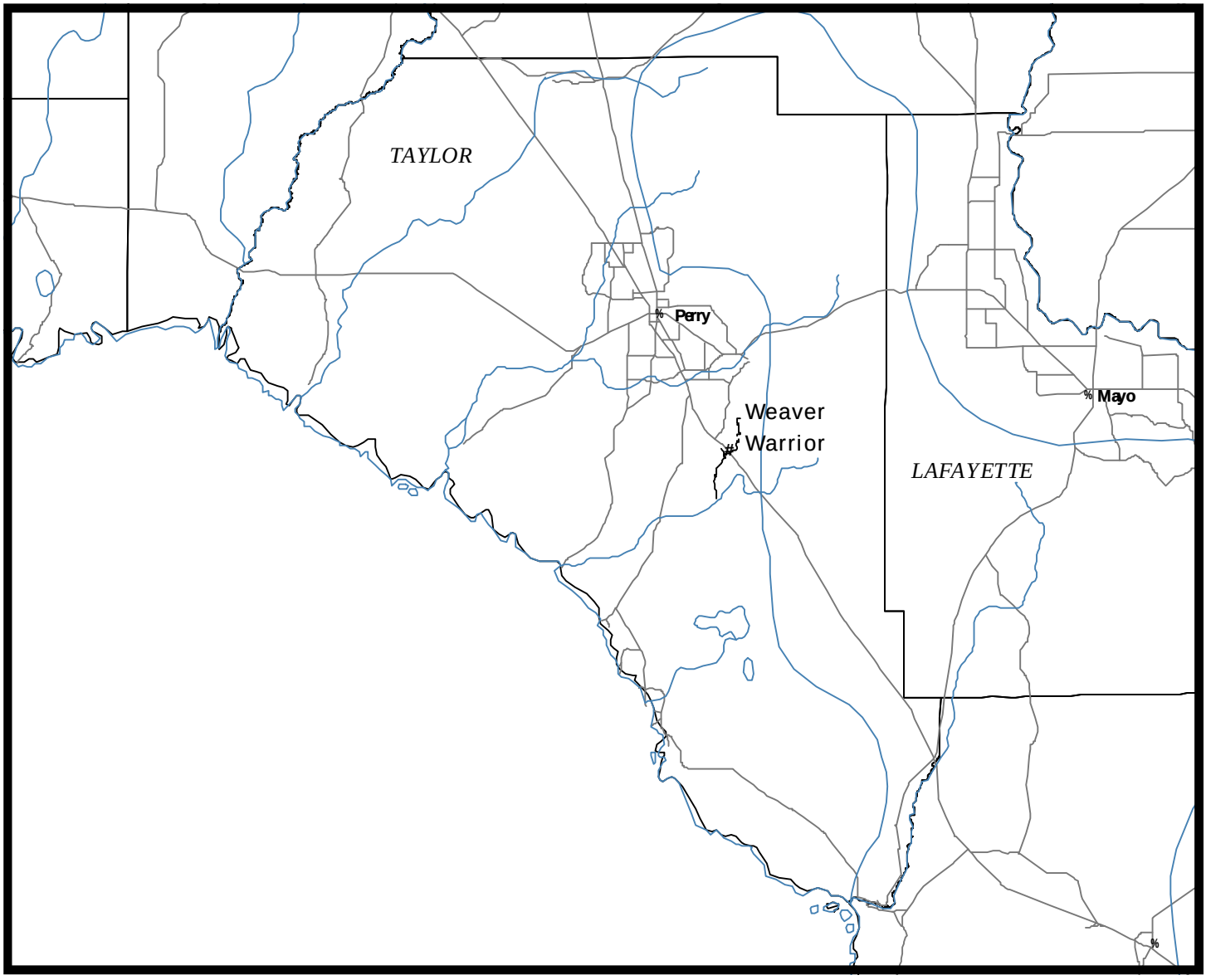


Table 1: Data for selected parameters

Date	# Taxa	Florida index	EPT	Cond-uctivity (uhms/cm^2)	DO (mg/L)	pH (Std Units)	Temp (C)	NOx (mg/L)	TKN (mg/L)	TP (mg/L)	Fecal coliforms (col/100 ml)	Total coliforms (col/100 ml)
8/4/98	21	1	0	260	0.3	6.97	26.6	0.04	3.4	0.68	350	1650

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