EcoSummary

BioRecon Report

Juniper Creek, Gadsden County
7/21/98

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

Introduction

Juniper Creek, a tributary of Telogia Creek, is located in Gadsden County. Land use in the drainage basin consists predominantly of agriculture, silviculture and pasture. Less than 20% of the area remains natural or forested.

Juniper Creek was placed on the 303(d) list for violations of turbidity and coliforms, as well as having elevated 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

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. Juniper Creek failed to meet all three of the thresholds, indicating suspected impairment. It is thought that the stream had been dry (during extended drought conditions) prior to sampling, contributing to suppressed macroinvertebrate communities. Although there had been rain prior to sampling, water velocity was very low (0.02 m/sec) with most habitats exposed. The organisms collected were all first or second instars, suggesting only recent inundation or some other recent disturbance.

Total coliform bacteria (3,000 colonies/100 mL), exceeded the Class III water quality standard of 2,400 colonies/100 mL. Fecal coliform counts of 108 colonies/100 mL complied with the Class III standard (800 colonies/100 mL). Dissolved oxygen was 5.4 mg/L, meeting the Class III standard of 5.0 mg/L. Nitrite-nitrate concentrations (0.19 mg/L) in Juniper Creek were elevated to levels higher than those found in 70% of other Florida streams. The specific conductance at Juniper Creek (27 umhos/cm) suggested that non-point source surface runoff, rather than Floridan Aquifer spring inputs, was responsible for the nitrate-nitrite loading. Both total Kjeldahl nitrogen and total phosphorus concentrations (0.47 and 0.088 mg/L, respectively) ranked in the lower 40th percentile of streams in Florida. Juniper Creek had no turbidity problems at the time of sampling (2.3 NTU).

It was also observed that water from this stream was being pumped to an adjacent holding pond for agricultural irrigation purposes. It was not known if this activity was authorized by a consumptive use permit.

Conclusions

Juniper Creek failed all three of the Biorecon metrics. Recent drought conditions and pumping from the stream for irrigation purposes may have contributed to the system going dry prior to sampling. Total coliform samples from Juniper Creek violated Class III water quality criteria, and nitrate-nitrite concentrations were elevated, potentially due to non-point source runoff. It is recommended that Juniper 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 Juniper Creek

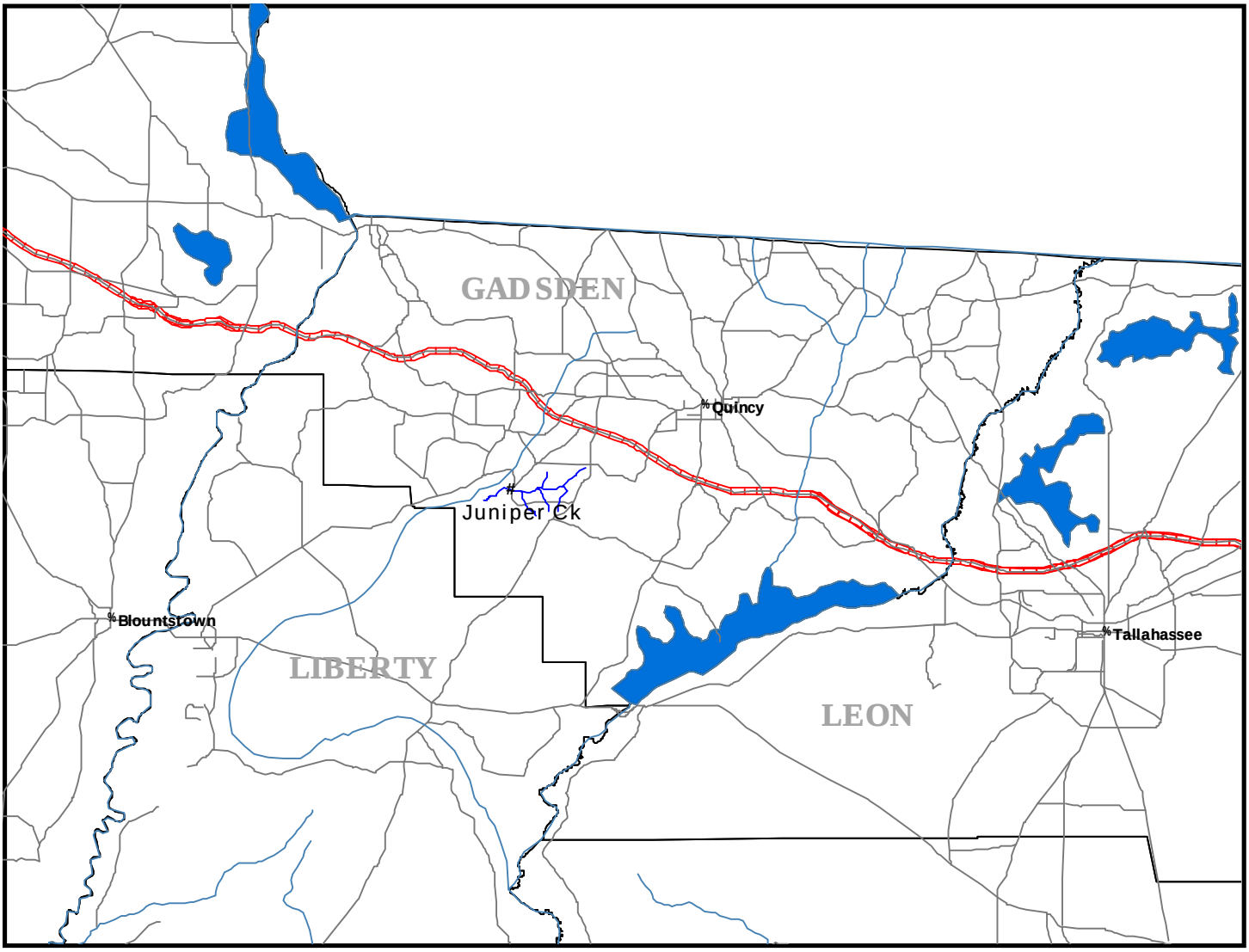


Table 1: Data for selected parameters

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)
7/21/98	16	2	2	27	5.4	5.7	23.9	0.19	0.47	0.088	108	3000

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