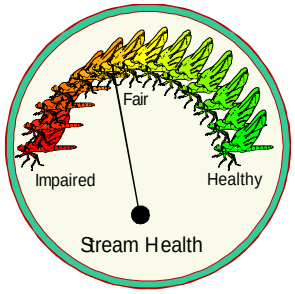
EcoSummary

BioRecon Report

Spring Creek @ Power Lines, Bonita Springs
12 August 1998



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

Introduction

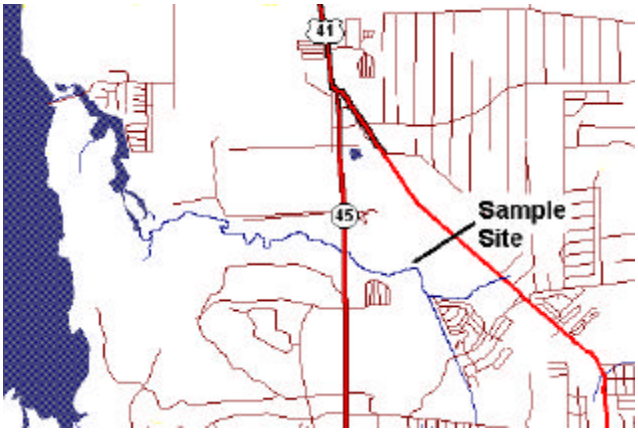
Spring Creek, located in Lee County, drains the area north of Bonita Springs into Estero Bay. The drainage basin consists of pine flatwoods with moderate residential development inland, with mangrove forest and denser residential development nearer the coast. The predominant land-use in the area is single family residential, encompassing approximately 50% of the drainage basin. Pine flatwoods, improved pasture, golf course, and a few commercial sites make up the other 50 %. Spring Creek has been placed on the 303(d) list due to 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 South District Biology 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), were calculated and compared to existing thresholds to determine the



community's health. The sample site was just upstream of the obviously estuarine portion of the creek. Spring Creek(with 28 taxa, 4 Florida Index points, and 4 EPTs) met two of the thresholds, but did not meet the Florida Index threshold (10). This indicates that the site may be impaired. Factors contributing to the marginal Biorecon scores included low water velocity (less than 0.1 m/sec), low dissolved oxygen (2.7 mg/L), suboptimal habitat, and possibly salt water influence.

One measured physical/chemical parameter or water quality variable did not meet the acceptable criteria for Class III waterbodies. Dissolved oxygen was only 2.7 mg/L, below the Class III standard of 5.0 mg/L, but only slightly lower than typical for streams in the region during the summer. Nutrient concentrations (nitrogen and phosphorus) were all below the median values for all Florida Streams.

Conclusions

Spring Creek failed one of three of the Biorecon metrics mainly due to low water velocity, low dissolved oxygen, suboptimal habitat, and possibly salt water influence. This is not a definite indicator of impairment. In light of this , and the reasonably good water chemistry values, it is recommended that Spring Creek be removed from the 303(d) list.

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Biological Data

Parameter	Value	Units
Total number of taxa	28	number
Florida Index	4	points
EPT taxa	4	number
Habitat score	117	points (160 maximum)

Physical and Chemical Data

Parameter	Value	Units
Sample depth	0.5	meters
Temperature	29.6	^{0}C
pH	7.4	standard units
Dissolved oxygen	2.7	mg/l
Conductivity	624	µmho/cm
Secchi depth	1.5	meters
Turbidity	nr	NTU
Color	nr	pt-co units
Ammonia	0.034 A Q	mg/l
Total Kjeldahl nitrogen	0.71 J	mg/l
Nitrate-nitrite	0.11	mg/l
Total phosphorus	0.044	mg/l

nr - Not recorded.

A - Value reported is the mean of two or more determinations.

I - Value reported is less than the minimum quantation limit, and greater than or equal to the minimum detection limit.

J - Estimated value.

Q - Sample held beyond normal holding time.

U - Material was analyzed for but not detected; the value reported is the minimum detection limit.

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