

EcoSummary

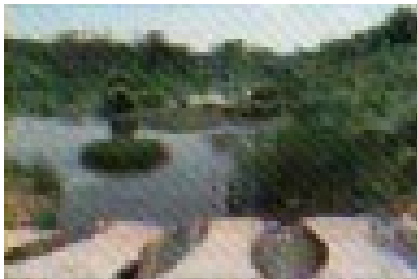
BioRecon Report

S. Mosquito Creek at CR 379B W of Mt. Pleasant, Gadsden Co. August, 6, 1996

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

Purpose

A BioRecon was performed at this site to assess any impacts to South Mosquito Creek from rural non-point source runoff. This stream was on the State's 303(d) Priority TMDL list compiled by the FDEP Division of Water Facilities. Section 303(d) of the Clean Water Act requires States to identify impaired water bodies and to develop a wasteload allocation. These allocations are known as a Total Maximum Daily Load (TMDL) which are designed to reduce pollutants to a level sufficient to protect a watershed's water quality.



Basin Characteristics

South Mosquito Creek drains to the Outstanding Florida Waters of Apalachicola River and Apalachicola Bay. All the above water bodies are located in the Greater Apalachicola Ecosystem

Management Area. The ~ 6 square mile watershed drains primarily agricultural (row crop & pasture) and silvicultural (pine plantation) land. Two rail lines and a major power transmission line transect the sampled drainage area. A surplus & salvage operation in Mt. Pleasant was on the Superfund site list. The operation was delisted because of the heavy metal contamination in the area's soil was determined to be caused by local tomato/tobacco farms. USGS topographic maps indicate elevations of 300 feet in the headwaters to 170 feet at the downstream sample area. The sample site on this third order stream is ~ 5 miles downstream of its headwaters. South Mosquito Creek is located in the Tallahassee Hills subecoregion (65H) of Northern Highlands geomorphic zone of uplands stretching from Duval County to the westward Florida-Alabama state line. The soils are composed largely of resistant clayey sands, silts, and clays which results in high rainfall runoff. The dammed Glen Julia Spring, historically developed as a recreational area, is one the headwater streams of South Mosquito Creek.

Results

The BioRecon monitoring by the Tallahassee central laboratory biology staff indicated impairment of the South Mosquito Creek watershed. All 3 biological indicators failed to meet the interim thresholds established to determine healthy panhandle streams:

BioRecon	Taxa	FI	EPT
Rating value	21	15	7
Threshold	24	22	11

The benthic habitat assessment rated the stream in the upper optimal range. Water temperature was above normal at 27.1 degrees C. Water

velocity was optimal at 0.5 m/s. The afternoon dissolved oxygen concentration (6.6 mg/l) appeared low considering the optimal water velocity and the abundance of algae and aquatic plants in the impoundment upstream. Compare this to Big Gully Creek's DO of 8.5 at 22.8 degrees C with a low water velocity of 0.1 m/s located ~ 30 miles to the south during the same basin survey. Because of profuse growth of vegetation in the impoundment, the early morning DO is expected to be below the standard of 5 mg/l at the its discharge. Oxygen depletion normally occurs in these situations with an excessive aquatic plant biomass. Impoundments typically increase oxygen depletion, nutrient enrichment, and disrupt the aquatic community structure. No cleanwater indicating stoneflies were collected. Species of this order are common in the surrounding healthy streams.

Significance

The site sampled was located below are large, marshy impoundment. This impoundment was indicated as cause of the suspected impairment to South Mosquito Creek. The following water quality problems were listed in both the 1994 and 1996 Water-Quality Assessment For the State of Florida (305b Report). Total coliform (4000/100ml both years), and fecal (450 and 323/100ml) bacteria exceeded screening criteria in the report. Total nitrogen (0.98 and 0.88 mg/l) and phosphorus (0.15 and 0.12 mg/l) concentrations were elevated compared to ambient background conditions in the area. Excessive coliform bacteria can effect human health and restrict recreational use of public waters. The nutrient loading along with sediment runoff can cause the imbalance of the biological community structure.

Suggestions

Restoration of the natural flow conditions of South Mosquito Creek by removal of the County Road 379 B dam would restore the health of the stream's natural riparian zone and aquatic wildlife community. Removal of a dam on Glen Julia Springs, now owned by the Nature Conservancy, could restore a rare Steephead Stream endemic to North Florida. These headwater brook biological communities and the surrounding Slope Forest exhibit one of the highest species diversities in Florida. Close adherence to BMP's for agriculture and silviculture would reduce nutrients, coliform bacteria, and sediment input to the South Mosquito Creek ecosystem. This stream should be sampled downstream to monitor recovery and to distinguish between the effects of the impoundment and the water quality problems listed in the 1994 and 1996 Water-Quality Assessment For the State of Florida (305b Report).



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