EcoSummary

Kelley Branch above Dam North of Bristol

January 11, 2006

FLORIDA AMBIENT

FAIL

BioRecon: A rapid, cost-effective screening mechanism for identification of biological impairment

For samples collected before June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures and met FDEP quality assurance/quality control standards.
For samples collected on or after June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures (SOPs) and met DEP quality assurance/quality control standards.

Introduction



This biological assessment was conducted in support of a partnership with The Nature Conservancy (TNC) and the United States Fish and Wildlife Service (USFWS) for a Kelley Branch Ecosystem Restoration Project. A USFWS grant is being used by the TNC to remove the dam and culvert and reconnect the stream to the Apalachicola River. Information learned from this dam removal will be shared by TNC for future restoration projects. Kelley Branch, a steephead stream was impounded by a dam in the 1950's. A FDEP BioRecon bioassessment was made above the dam on January 11, 2006 to document existing conditions before dam and culvert removal. Another BioRecon will be conducted during the winter of 2007 to re-assess Kelley Branch's macroinvertebrate community after completion of the dam and culvert removal.

Background

The bioassessment site (Latitude 30 degrees 27 minutes 32.2 seconds North, Longitude 84 degrees 58 minutes 51.3 seconds West) is located less than 1 mile north of Bristol and Highway 20 in Liberty County. Kelley Branch is a third order stream at this site. The stream originates from steepheads on the bluffs of the Apalachicola River and drains to Apalachicola Bay. This site (STORET station 31010241) is in the Tifton Uplands/ Tallahassee Hills ecoregion/subregion (65h).

Results

The BioRecon indicated an impaired biological community. All 6 biological indicators (biometrics) failed thresholds established for a healthy stream ecosystem:

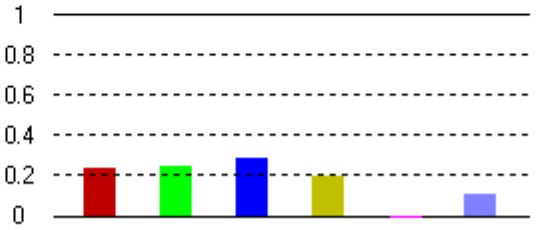
Biometrics	Metric Score
# TOTAL TAXA	0.24
# EPHEMEROPTERA TAXA	0.25
# TRICHOPTERA TAXA	0.29
# LONG-LIVED TAXA	0.2
# CLINGER TAXA	0
# SENSITIVE TAXA	0.11
TOTAL METRIC SCORE :	1.09
/ Correction Factor :	0.6
= BIORECON SCORE :	2

○ Pass 6 - 10
◉ Fail 0 - 5

KELLEY BRANCH ABOVE PARADISE LAKE DAM TNC PRE-DAM REMOVAL PROJECT N. OF BRISTOL

BioRegion : Panhandle West

Sample Date : Jan 11, 2006



Stoneflies (Plecoptera), the best indictor of healthy streams, were conspicuously missing from this site. Also, the diverse numbers of mayfly (Ephemeroptera) and caddisfly (Trichoptera) taxa normally found in the Apalachicola steephead streams was severely depressed. Habitat destruction from impounding the stream caused alteration of the fish and wildlife community. The dam and its effects physically destroyed stream habitat and Kelley Branch's riparian forest, which provided woody debris, leaf pack/mat, and roots for food and habitat, and a cooling canopy. The lack of water velocity due to hydraulic modifications caused by the dam had led to year round silt deposition and stagnation in deeper benthic areas during summer season. The habitat assessment (59%) barely reached a suboptimal score and Water Velocity rated poor. Substrate Diversity, Artificial Channelization, and Left Bank Riparian Buffer Zone Width rated marginal. Habitat Smothering and Left Bank Riparian Zone Vegetation Quality rated Suboptimal. Substrate Availability, Bank Stability, Right Bank Riparian Buffer Zone Width and Vegetation Quality rated optimal.

Significance

The Apalachicola Bluffs and Ravines watersheds provide the public with scenic areas unlike any other in Florida for hiking and other recreational activities. The steep bluffs and deep ravines of the northeastern Apalachicola River valley are some of the most significant

natural features of the southeastern Coastal Plain. The Nature Conservancy has listed this area of the Florida Panhandle as one of six "hot spots of American biodiversity with the upper Apalachicola River having the highest biodiversity of reptile and amphibian species in the United States, while the river basin holds the country's highest diversity of woody plant species." The area's forests are home for many northern, rare and endemic plants and animals such as the nearly extinct Florida Torreya tree. The dam removal and restoration of Kelly Branch and its watershed's rare forest habitat will help preserve this rare biota restricted to the east bank of the upper Apalachicola River. The scientific assessments of the biota and water quality of the stream system before, during, and after dam removal to be shared by The Nature Conservancy will be valuable for future projects in the southeast.

Conclusions

The Kelley Branch site above the dam did not meet Class III State Water Quality Standards 62-302 for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Fine organic sediments smothering aquatic wildlife habitats and hydraulic modifications caused by the dam are the major source impacting stream health. The TNC/USFWS stream restoration project should restore the area's unique riparian forest buffer zone (add habitat, food sources, and reduce sediment loading,) and reestablish the natural hydrological conditions (including stream velocity) to improve Kelley Branch's health. Large woody debris, the most important fish and wildlife habitat in panhandle streams was missing since the impounded area's forest was cut prior to dam construction. Proper addition of large woody debris (old growth pine works best) to create up to 40% coverage in the flowing stream channel would enhance its fishery potential. A post-restoration bioassessment will be made to confirm the expected return of a healthy population of stream macroinvertebrates. Kelley Branch after restoration could be an educational learning tool for area students to observe the unique natural geomorphology and biological function of a steephead stream.

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For more information on the DEP Bioassessment programs, please visit our web site at http://www.dep.state.fl.us/water/bioassess

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