EcoSummary

Kelley Branch below Dam North of Bristol

January 11, 2006

FAIL

FLORIDA AMBIENT

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 28.6 seconds North, Longitude 84 degrees 58 minutes 54.1 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 31010242) is in the Tifton Uplands/ Tallahassee Hills

ecoregion/subregion (65h).

Results

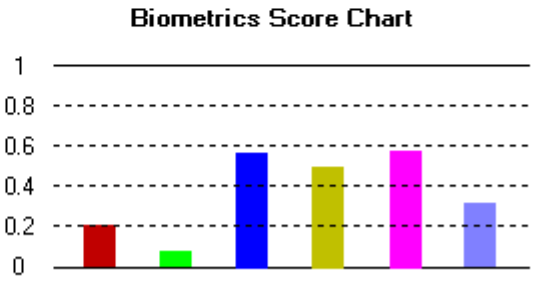
The BioRecon indicated an impaired biological community. All 6 biological indicators (biometrics) failed thresholds established for a healthy stream ecosystem:

Biometrics	Metric Score
# TOTAL TAXA	0.21
# EPHEMEROPTERA TAXA	0.08
# TRICHOPTERA TAXA	0.57
# LONG-LIVED TAXA	0.5
# CLINGER TAXA	0.58
# SENSITIVE TAXA	0.32
TOTAL METRIC SCORE :	2.26
/ Correction Factor :	0.6
= BIORECON SCORE :	4

Pass 6 - 10
Fail 0 - 5

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

BioRegion : Panhandle West
Sample Date : Jan 11, 2006



The EPT taxa (Ephemeroptera - mayfly, Plecoptera - stonefly, Trichoptera - caddisfly), normally the most diverse indicators of stream health in the Apalachicola steephead streams were depressed to 7 taxa, less than half the expected community. Stoneflies, the best indictor of healthy streams, were very rare with only two individuals collected at this site. Only one species of mayfly, a diatom scraper was found. The caddisfly taxa were all net-spinners with exception of one sponge feeder. These net-spinners capture microscopic plankton and are normally the dominant taxa below dam outfalls. The altered community structure of the macroinvertebrate population was caused by affects of the dam on Kelly Branch's hydrology and water quality. The site's habitat assessment rated optimal (88%) because of the intact diverse riparian forest and did not cause an alteration of the fish and wildlife community. Water Velocity, Habitat Smothering, Artificial Channelization, Riparian Buffer Zone Width, and Riparian Zone Vegetation Quality rated optimal.
Substrate Diversity, Substrate Availability, and Bank Stability rated suboptimal.

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 below 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. Hydraulic modifications and water quality changes from the dam are the major impact to stream health. The TNC/USFWS stream restoration project should restore the natural hydrological conditions and water quality allowing the area's unique riparian forest buffer zone to reestablish Kelly Branch's native population of macroinvertebrates. Large woody debris, the most important fish and wildlife habitat in panhandle streams was limited since the upstream 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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