FLORIDA
AMBIENT

EcoSummary

PASS

Kelley Branch TNC dam removal project below "Paradise Lake" Dam

January 17, 2007

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 monitored the lake draw-down phase of a dam and culvert removal project on The Nature Conservancy (TNC) Apalachicola Bluffs and Ravines Preserve property in Liberty County. Previously, bioassessments were made above and below the dam on January 11, 2006 to document existing conditions before dam and culvert removal (see http://water.dep.state.fl.us/eswizard/ecosummary.asp?id=739 and http://water.dep.state.fl.us/eswizard/ecosummary.asp?id=740). The bioassessments were conducted in support of a partnership with The Nature Conservancy (TNC), and the United States Fish and Wildlife Service (USFWS)) and the Florida Fish and Wildlife Conservation Commission (FWC) for a Kelley Branch Watershed Restoration Project. A FWC 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 is a steephead stream that was impounded by a dam during the 1950's.

Watershed Characteristics

The bioassessment site (Latitude 30 degrees 27 minutes 28.6 seconds North, Longitude 84 degrees 58 minutes 54 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

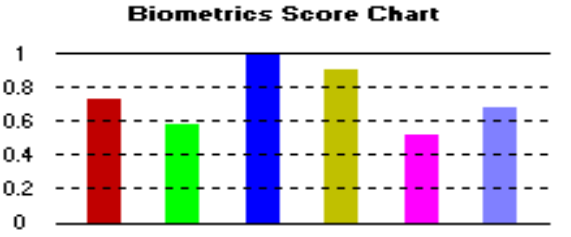
The BioRecon indicated a healthy biological community. Four of six biological indicators (biometrics) now passed thresholds established for a healthy stream ecosystem:

Biometrics	Metric Score
# TOTAL TAXA	0.73
# EPHEMEROPTERA TAXA	0.58
# TRICHOPTERA TAXA	1
# LONG-LIVED TAXA	0.9
# CLINGER TAXA	0.52
# SENSITIVE TAXA	0.68
TOTAL METRIC SCORE :	4.41
/ Correction Factor :	0.6
= BIORECON SCORE :	7

(•) 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 17, 2007



The BioRecon Score improved from last year's pre-draw-down failed score of 4 to a passing score of 7. The 2006 Kelly Branch macroinvertebrate population community structure that was altered by dam affects to hydrology and water quality is returning to more natural conditions. The EPT taxa (Ephemeroptera - mayfly, Plecoptera - stonefly, Trichoptera - caddis fly), indicators of healthy stream communities in the Apalachicola steephead watersheds, have increased from 7 to 18 taxa after the draw-down returned the former impoundment located just up stream of this sample reach, back to a flowing stream channel. Stoneflies, the best indicator of stream health, were now common improving to 3 taxa with over 15 individuals. Last year, stoneflies were rare with only two individuals collected in this 100-meter sample reach. Mayflies increased significantly from 1 to 7 taxa. Caddis flies doubled from 4 to 8 taxa. The caddis fly population was now more diverse and the dominate numbers of net-spinning *Hydropsyche* caddis flies that bloom below impoundments were reduced.

The Habitat Assessment was still optimal at 90% only a slight improvement from last year's 88%. Habitat smothering decreased to 10% from a 20% area affected, which slightly increased Substrate Availability. Water Velocity, Habitat Smothering, Artificial Channelization, Riparian Buffer Width, and Riparian Zone Vegetation Quality all rated optimal. Substrate Diversity, Substrate Availability, and Bank Stability rated at the top of suboptimal. Bank Stability was rated down because of channel down-cutting caused by the dam discharge pipe.

Salamanders, sunfish (dollar and spotted), and numerous schools of shiners (*Pternotropis*) were observed during this monitoring, while only spotted sunfish were observed last year. Iron/sulfur bacteria was rare, however it was common last year below the impoundment. Iron/sulfur bacteria is commonly found below the outfalls of impoundments in the Florida panhandle. The blue-green algal mats observed last year had disappeared. Fine silt decreased from 4% last year to 1% coverage. This year's water temperature was 13.99 versus last year sample's 13.29 degrees centigrade. The pH decreased to a natural 5.47 standard units from a pH of 6.5 that was elevated by the impoundment. Specific conductance was a less than 20 umho/cm, typical of the local groundwater, down from 90 umho/cm. The dissolved oxygen (DO) concentration (11.24 mg/l) and % DO saturation (107%) improved from 9.68 mg/l DO and 91% DO saturation.

Conclusions

The Kelley Branch site below the dam now met 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. The up-stream dam removal and channel restoration is in progress (July 2007). Conditions may be enhanced this year for the dam removal and channel restoration project if the 2006 drought that has persisted through the first half of 2007 continues until work is completed. Continued improvement of the stream health is expected after completion of the dam removal, channel restoration, and re-growth of the former beech-magnolia forest buffer zone. Hopefully Florida *Torreya* , a nearly extinct tree, and the rare Florida Yew both only found in the Apalachicola ravines will be re-planted. A complete recovery to the natural aquatic community is not expected until a mature riparian forest grows to shade the formerly impounded reach. Native riparian and transitional streamside forest provide food and habitat (woody debris, leaves, root wads, terrestrial wildlife) for the stream's fish and wildlife. In addition to the canopy cover's shade cooling the water, which increases the dissolved oxygen concentration, the streamside forest anchors the stream banks, and contributes large snags that create riffles/pools vital to a healthy stream community.

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