EcoSummary

Kelley Branch above TNC "Paradise Lake" Dam

January 17, 2007

FLORIDA AMBIENT PASS

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 from above the dam 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 Kelley Branch below Dam North of Bristol and Kelley Branch above Dam North of Bristol). The bioassessments were conducted in support of a partnership with The Nature Conservancy (TNC), the United States Fish and Wildlife Service (USFWS), and the Florida Fish and Wildlife Conservation Commission (FWC) for a Kelley Branch Watershed Restoration Project. An 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 32.4 seconds North, Longitude 84 degrees 58 minutes 49.2 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

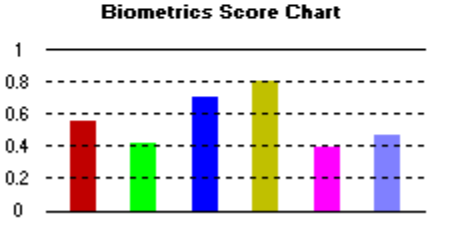
The BioRecon indicated a healthy rated biological community. However, only 2 of 6 metric scores passed thresholds (0.6) established for healthy streams.

Biometrics	Metric Score
# TOTAL TAXA	0.55
# EPHEMEROPTERA TAXA	0.42
# TRICHOPTERA TAXA	0.71
# LONG-LIVED TAXA	0.8
# CLINGER TAXA	0.39
# SENSITIVE TAXA	0.47
TOTAL METRIC SCORE :	3.34
/ Correction Factor :	0.6
= BIORECON SCORE :	6

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 17, 2007



The BioRecon Score improved from last year's pre-draw-down failed score of 2 to a passing score of 6. The 2006 Kelly Branch macroinvertebrate population community structure that was altered by dam affects to hydrology and water quality is starting to recover. The EPT taxa (Ephemeroptera - mayfly, Plecoptera - stonefly, Trichoptera - caddis fly), indicators of healthy stream communities in the Apalachicola steephead watersheds, have increased from 5 to 12 taxa after the draw-down returned the former impoundment back to a flowing stream channel. Stoneflies, the best indicator of stream health, absent last year, returned with 2 taxa; however they were rare with only 3 individuals. Mayflies increased from 3 to 5 taxa. Caddis flies increased from 2 to 5 taxa. The aquatic macroinvertebrate population was now more diverse compared to the former impoundment community dominated by scuds (amphipods) and tolerant odonates. In addition to the increased numbers of EPT this year; the 6 taxa of sensitive lotic dragonflies collected were an improvement compared to the 2 tolerant dragonflies found last year.

The habitat assessment dropped to a marginal 42% from a barely suboptimal 59%. This was mainly because the exposed former lake bottom affected Riparian Zone Vegetation Quality and Riparian Zone Buffer Zone width along the stream

channel with marginal and poor scores. Substrate Diversity, Substrate Availability, Habitat Smothering, and Artificial Channelization were marginal. Water Velocity and Bank Stability scored suboptimal.

The dissolved oxygen (DO) concentration significantly improved from 8 mgl/ to 11 mg/l along with % DO saturation (76% to 107%) because of the restored water velocity. Water temperature was 14 degrees centigrade during both years' samples. The pH was reduced to a more natural 5.46 standard units compared to last year's lake influenced increase of 7.1 standard units. Specific conductance also decreased to less than 20 umho/cm, typical of the area's groundwater, compared to the previous lake affected 90 umho/cm.

Conclusions

The Kelley Branch site above the dam 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. Albeit, near the bottom margin of the BioRecon score (5.56).

Fine organic sediments smothering aquatic wildlife habitats, lack of habitat and hydraulic modifications from stream channelization were still limiting stream health. However, TNC/USFWS/FWC stream restoration project is in the process of restoring the area's unique riparian forest buffer zone and reestablishing the natural hydrological conditions. This should continue 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 (large pine logs work best) to create near 40% coverage in the flowing stream channel would enhance its fishery potential. See Conclusions in 2007 Kelley Branch below dam report for more restoration information.

Post-dam removal and channel restoration bioassessments will be made to confirm the continued recovery of the stream macroinvertebrate population. Kelley Branch after restoration could be an educational learning tool 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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