FLORIDA AMBIENT

EcoSummary

PASS

Kelley Branch TNC Stream Channel Restoration Site above the Removed "Paradise Lake" Dam

February 14, 2008

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 newly restored stream channel above the removed dam and culvert on The Nature Conservancy (TNC) Apalachicola Bluffs and Ravines Preserve property in Liberty County. Kelley Branch is a steephead stream that was impounded by a dam during the 1950's. Bioassessments previously were conducted above and below the dam on January 11, 2006 to document existing conditions before dam and culvert were removed. On January 17, 2007 bioassessment was conducted after the lake draw-down phase. 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. A FWC grant was used by 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.

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

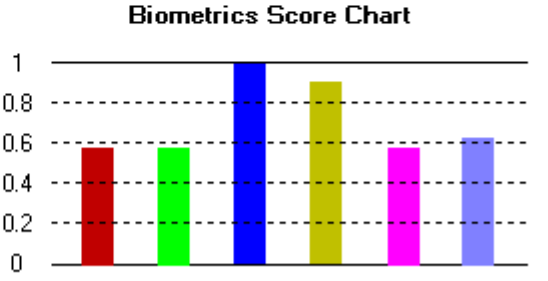
The BioRecon indicated a healthy biological community. All 6 metric scores for this assessment passed thresholds (0.6) established for healthy streams. The BioRecon score improved from a score of 6 in 2007 to 7 in this 2008 monitoring.

Biometrics	Metric Score
# TOTAL TAXA	0.58
# EPHEMEROPTERA TAXA	0.58
# TRICHOPTERA TAXA	1
# LONG-LIVED TAXA	0.9
# CLINGER TAXA	0.58
# SENSITIVE TAXA	0.63
TOTAL METRIC SCORE :	4.27
/ Correction Factor :	0.6
= BIORECON SCORE :	7

(•) 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 : Feb 14, 2008



This 2008 Kelly Branch macroinvertebrate population community structure was dominated by EPT taxa (Ephemeroptera - mayfly, Plecoptera - stonefly, Trichoptera - caddis fly). These indicators of healthy stream communities in the Apalachicola steephead watersheds increased from 12 to 21 of the 35 total taxa collected during both years in the newly restored stream channel. Stoneflies, the best indicator of stream health, increased from 2 to 3 taxa with an abundance of *Perlesta.* Last year, stoneflies were rare with only 3 individuals consisting of 2 taxa that were found after impoundment draw-down restored stream flow. Stoneflies were previously absent in the impoundment. The number of mayfly taxa increased from 3 found in the impoundment to 5 after draw-down and 7 after channel restoration. Caddisfly taxa increased from 2 in the impoundment to 5 after draw-down and 11

after channel restoration. In addition to the increased numbers of EPT in 2008 the sensitive taxa increased from a Florida Index score of 4 in the impoundment, to 22 after draw-down and 26 after channel restoration. The dragonfly *Cordulegaster sayi*, listed as threatened in the Rare and Endangered Biota of Florida was found after channel restoration. The removal of the dam enabled its return to its native spring seepage habitat in hardwood forests.

The habitat assessment stayed in the marginal range at 43%, essentially no change from last year¿s 42%. The habitat should improve rapidly as the hardwood forest regenerates along the stream's riparian zone. The low score was mainly due to the exposed soil from the former lake bottom and heavy construction equipment affecting Riparian Zone Buffer Zone Width, Habitat Smothering, and Substrate Availability with Poor ratings. Substrate Diversity, Bank Stability, and Riparian Zone Vegetation Quality rated marginal. Water Velocity and Artificial Channelization rated Optimal.

The dissolved oxygen (DO) concentration was 9.84 mg/l along with % DO saturation of 95.4%. Water temperature was 13.4 degrees centigrade and was slightly cooler than the previous 2 years' samples (14 degrees C). The pH was 6.51 standard units and had increased 1 standard unit (5.46). All these parameters were typical of area streams.

Conclusions

The restored Kelley Branch site above the removed 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. The BioRecon score had improved this year to 7 out of 10 compared to 5.56 in 2007 after draw-down and 2 of 10 before restoration. Fine organic sediments from the former impoundment and construction activities still smothered aquatic wildlife habitats; however the 3% available habitat was productive and fairly diverse. The TNC/USFWS/FWC stream restoration project is still in the process of restoring the area's unique riparian forest buffer zone (endangered Torreya Tree and Florida Yew as understory components of a Beech/Magnolia forest) and reestablishing the natural hydrological conditions. This will continue to improve Kelley Branch's health as the planted trees grow to shade the steam and provide leaves and woody debris as food and habitat. Large woody debris, the most important fish and wildlife habitat in panhandle streams comprised only 1% of the wetted channel because the impounded area's forest was cut prior to dam construction. Adding large woody debris in a hydrologically stable method to nearly 40% coverage in the stream channel would enhance its fishery potential (large pine logs work best for long term bank stabilization and habitat creation while decaying hardwoods are preferred as food material for aquatic invertebrates). See Conclusions in 2007 Kelley Branch below dam report for more restoration information.

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