TMDL STUDIES

EcoSummary

"Claypit" Branch tributary to Lightwood Knot Creek

July 17, 2003

IMPAIRED

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.

Purpose



A BioRecon was performed at this site to monitor the effects of Eglin Air Force Base's B-26 clay mine stabilization project on the biota and wildlife habitat in a tributary to Lightwood Knot Creek. This bioassessment was a partnership with the United States Fish and Wildlife staff stationed at Eglin Air Force Base's Jackson Guard. A pre-restoration BioRecon was done on August 6, 1998.

Background

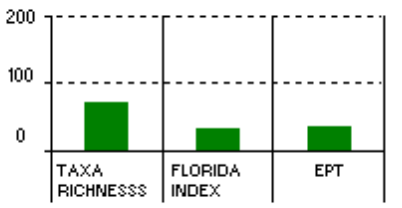
"Claypit" Branch at the bioassessment site was a first order steephead stream located north of Fort Walton Beach (Latitude 30 degrees 31 minutes 37.6 seconds, Longitude 86 degrees 36 minutes 35.3 seconds). This steephead stream flows to Lightwood Knot Creek and Garniers Bayou in the Choctawhatchee Bay system. This site drains the southern pine plains and hills of subecoregion 65F.

Results

The BioRecon still indicated impairment to the biological community. All 3 biological

indicators failed to meet thresholds established for healthy aquatic ecosystems:

Biometrics	Value	Threshold
TAXA RICHNESS	17	>= 24
FLORIDA INDEX	7	>= 22
EPT	6	>= 17



Values and Percent Threshold Attained for Panhandle West BioRecon Metrics

However, this was an improvement over these 1998 biometrics:

Biometrics	Value	Upstream Background
Taxa Richness	8	42
Florida Index	2	25
EPT	1	20

The upstream background site, a Lightwood Knot Creek steephead above "Clay Pit" Branch had a typical diverse and productive fish and wildlife community. Note the aquatic community diversity and productivity at "Clay Pit" Branch had improved since 1998. Grasses now covered the site's former bare soil (compare this photograph with the one in the 1998 ecosummary). Aquatic vegetation provided the only available stream habitat and that was limited to two percent of the area. Iron/sulfur bacteria, silt, and clay smothered 98% of substrate (torpedo grass, *panicum repens,* an invasive was dominant). Iron/sulfur bacteria sheen was noted on water surface. The stream became milky and opaque after disturbing substrates. The water temperature of 24 degrees centigrade was warmed 2 to 4 degrees by sunlight due to the lack of a tree canopy. The background water temperature of the area first order streams fed by groundwater naturally range 20 to 22 degrees centigrade. The adjacent Garnier Creek, a larger third order stream was 20.9 and 21.4 degrees during summer monitoring in 1998 and 2003 respectively. Lightwood Knot Creek, just above the "Claypit" Branch was 22 degrees on August 6, 1998.

Significance

"Claypit" Branch has begun to show improvement, although it 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. The sediment runoff from the historical mining that smothered wildlife habitat and eliminated the native riparian wetland vegetation had been stabilized with grasses (although much of the grass was the invasive torpedo grass). The vegetated area will reduce runoff that contributes to downstream turbidity and the filling of bayou and bay bottoms. The former mining pit still has many years before a functional forested wetland riparian zone develops along the stream channel. The strip-mined land and steephead stream were part of a distinct type of slope forest found only in North Florida. No attempt to restore such a rare and unique habitat is known. These steephead habitats would naturally contain many species of endemic biota as well as rare northern plants. The loblolly

bay (Gordonia), Ashe magnolia, and native camellia (Stewartia) are examples of plants whose habitats have been eliminated at this site.

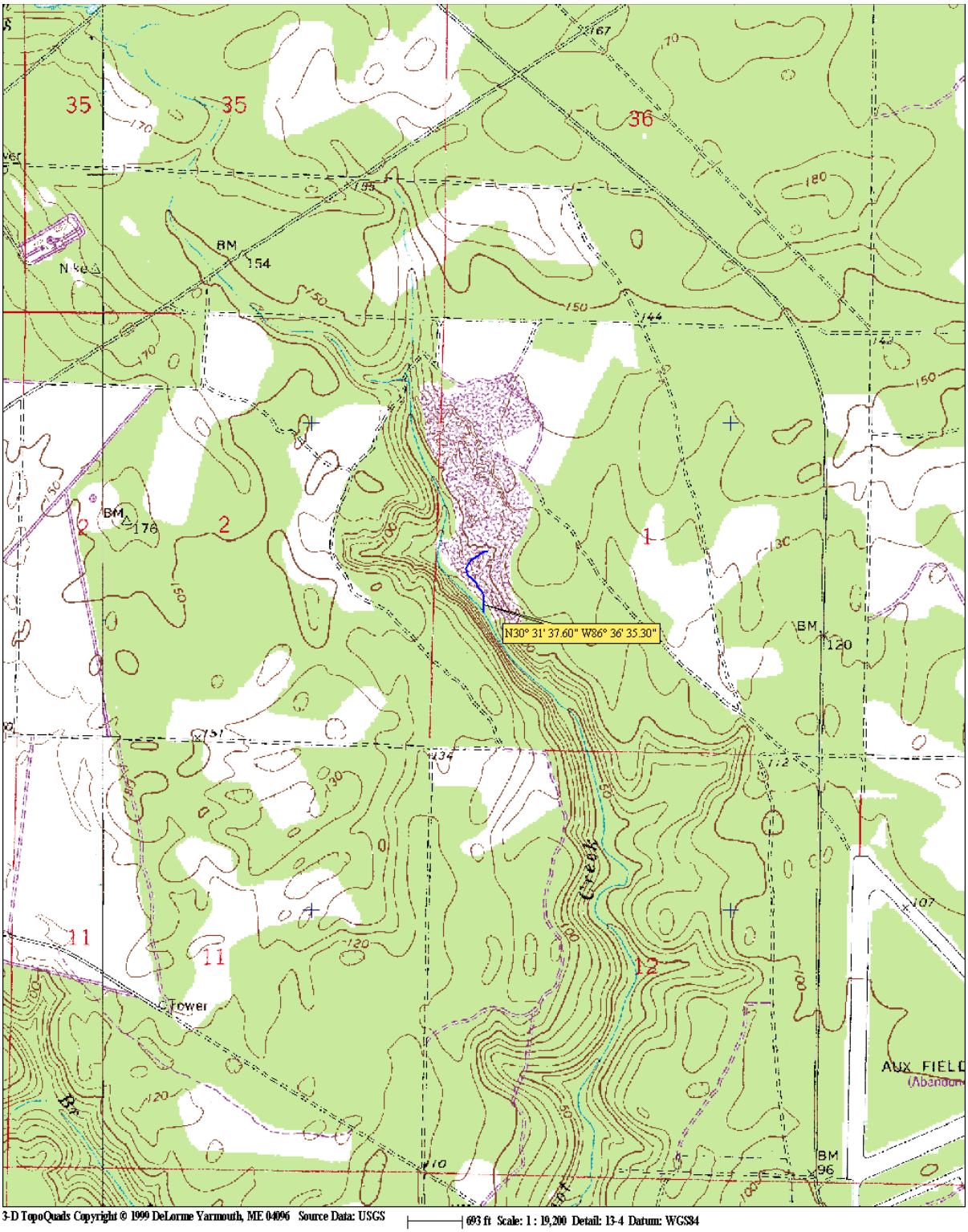
Suggestions

Continue the stream restoration activities by the Eglin AFB staff at Jackson Guard. In order to mitigate for the missing riparian forest, placement of large pine logs in the stream to provide habitat and stabilize the natural channel is recomenended. Maintain a buffer zone along the watershed's hillsides to prevent erosion and gully formation. Continue forest management practices to restore and protect native riparian and transitional zone forests to enhance fish and wildlife diversity and productivity. It is recommended that Eglin's successful ecological restoration program be expanded to include steephead and stream riparian and transitional zone forests.

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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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693 ft Scale: 1 : 19,200 Detail: 13-4 Datum: WGS84