A site map can be viewed by clicking on the report site name.

FLORIDA AMBIENT

EcoSummary

Goodwin Creek Northeast Fork above Highway 20 west of Freeport

February 27, 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.

Introduction



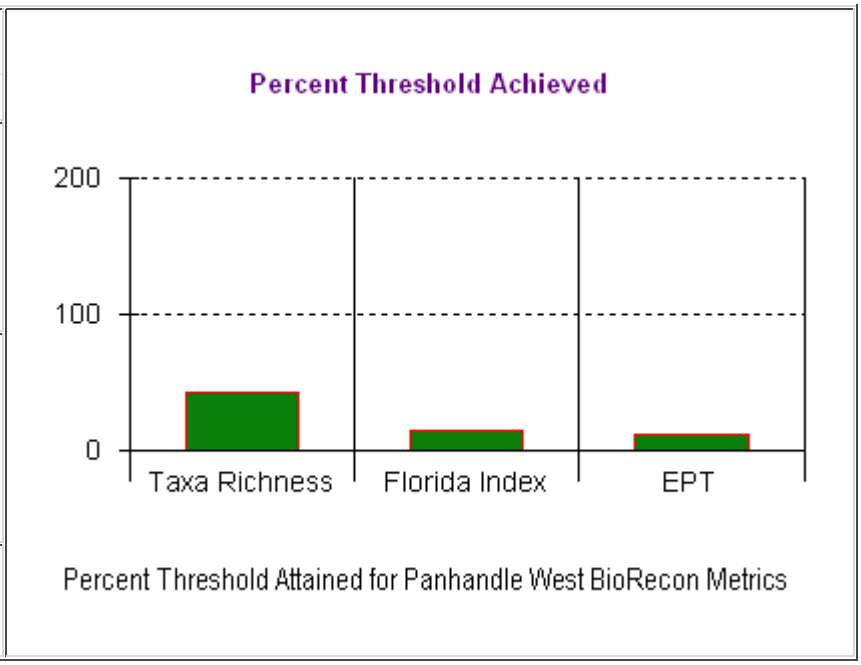
A bioassessment (BioRecon) was performed at this site to assess the impacts of Waste Recyclers of North Florida Inc. Freeport Construction & Demolition Debris Disposal (C & D) facility to the biota and wildlife habitat in Goodwin Creek. This bioassessment was in technical support of a compliance action by the FDEP Northwest District's Waste Management Cleanup Section. Goodwin Creek at the bioassessment site above Highway 20 is located about a mile east of Freeport's city limits in Walton County (Latitude N30 degrees 30 minutes 42.1 seconds; Longitude W86 degrees 10 minutes 32.3 seconds). It is a first order stream at the sample site and the headwaters originate about 3500 feet upstream. Goodwin Creek flows into Choctawhatchee Bay via Alaqua Creek and Bayou and drains the Gulf Coast Flatwoods of subecoregion 75a.

Results and Discussion

The BioRecon indicated a severely impaired biological community. All 3 biological indicators failed thresholds established for a healthy aquatic wildlife

community:

Biometrics	Value	Threshold
Taxa Richness	10	>= 24
Florida Index	3	>= 22
EPT	2	>= 17



Along with the severe impairment of the stream's biological community, the habitat assessment rated poor (31%). Mud/muck/silt covered virtually 100% of stream habitats. Sediment runoff from land clearing activities for the mining pit/C & D landfill filled the Highway 20 culvert, damming Goodwin Creek. Goodwin Creek's water was very turbid after disturbance, with flocculent sediments rapidly re-suspending into the water column. Aluminum and iron were detected in the C & D facility's monitoring wells in proximity to surface waters and prompted the request for this bioassessment of Goodwin Creek. Iron/sulfur bacteria were common in this stream section, leaving sheen on the water and sediments. At the time of the BioRecon, pH measured 6.35 standard units (s.u.) in this stream section. A beaver dam located above the highway provided the only available primary habitat and stream velocity, but sedimentation, not the beaver dam, was responsible for the artificially impounded waters. Because of the sediment-filled culvert, no water was observed flowing under the Highway despite significant rainfall a few hours earlier. Goodwin Creek waters appeared to be migrating through the road fill as groundwater. Some oil sheen was also observed. Heavy equipment and trucks were observed working in both the mining pit adjacent to the C & D landfill and the landfill itself. The photograph above shows where turbidity curtains have been placed in an attempt to stem sediment from the mining pit from entering the creek. Dumped construction debris material is also visible just above the mine pit in the photograph. The USGS topographic quadrangle indicated the mining activity and landfill were located in two of the many spring tributaries along Goodwin Creek. The numerous tributary streams following land contours are typical of Florida panhandle sand hill watersheds. The watershed's topography and hydrology had been seriously disturbed in

the past few years impairing Goodwin Creek's biota. An additional landfill and asphalt plant are adjacent to Goodwin Creek just below Highway 20 with another landfill in the headwaters of tributaries of Four Mile Creek to the East. During rainfall events, sediments and turbidity, as well as aluminum and iron pollution load will be transported from this upper part of the watershed down to Alaqua Bayou and into Choctawhatchee Bay. Sediments bury habitat necessary for productive aquatic systems. Dissolved aluminum has been shown in field and laboratory experiments to have negative biological effects such as reduced fish spawning and toxicity to aquatic organisms. Aluminum mobilization in acidic waters is thought to be an important contributory factor to the decline of fisheries in North America. Aluminum in an acidic groundwater can enter a stream and precipitate if the pH is above 5.5 s.u. causing a physical toxicity to fish and coating the stream substrate. At pH 5.5 to 7 fish and invertebrates may be stressed due to aluminum adsorption onto gill surfaces and subsequent asphyxiation. Aluminum can impair ion regulation and augment the toxicity at pH 4.5 to 5.5. Research has also shown that iron is a contributor to algal bloom conditions, including red tide, in marine waters. The Bay has experienced fish kills (including juvenile gulf sturgeon) caused by red tide blooms during 1999 and 2000.

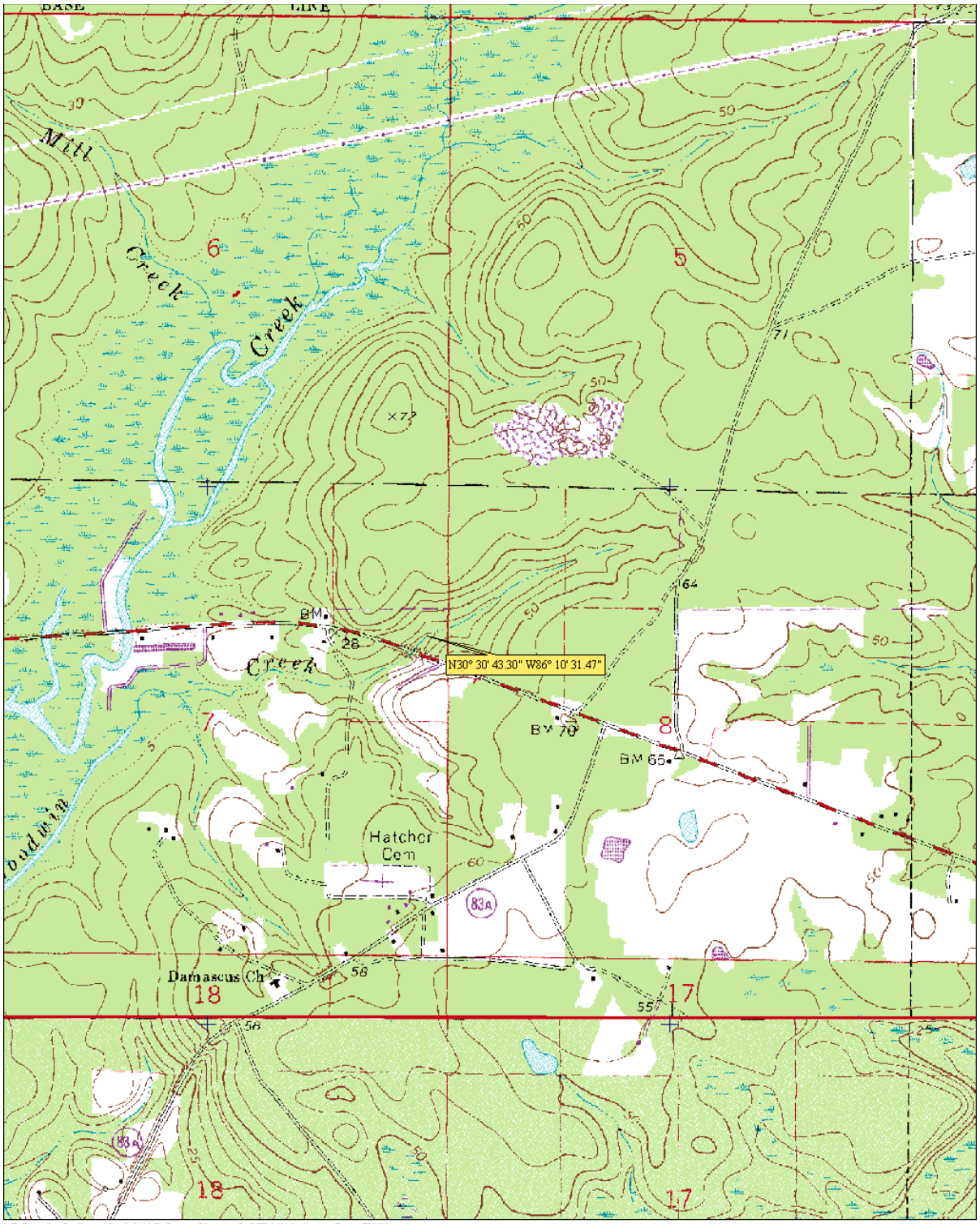
Conclusions

The Goodwin Creek site 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 sediments, turbidity, iron/sulfur bacteria and habitat destruction from the borrow pit/landfill activities contributed to this stream not meeting State designated use. Organic deposition smothered wildlife habitat, which impaired the stream's fish and wildlife nursery function. The activities observed in this area are negatively impacting Goodwin Creek fish and wildlife, and ultimately impact downstream Alaqua Bayou and Choctawhatchee Bay. Habitat smothering, organic loading and limited macro benthos could affect the system's fish and wildlife, including the federally endangered gulf sturgeon, which inhabits the Choctawhatchee Bay System. Practices that could reduce impacts to the stream include: maintaining a greater than 18 meter buffer zone along riparian zones to prevent sediment runoff and isolating the landfill leachate onsite to prevent groundwater contaminates from migrating to State Waters through natural springs on the site. Sediment runoff that exceeds an amount a stream is able to assimilate (i.e. Total Maximum Daily Load or "TMDL") is a major problem in cleared land across Northwest Florida. The Panhandle is unique to Florida in having topography with highly erodible soils on sloping land, intense thunderstorms and tropic storms. With this combination, land after forest removal is very susceptible to excessive erosion. This contributes to sediments filling the area's wetlands and waterways, as has occurred in Goodwin Creek. Restoration of the stream's natural hydrology (i.e. flow, depth, sinuosity) and preserving riparian wetland forests buffer zones would benefit the watershed's fish and wildlife. It is recommended that the USFWS office in Panama City be contacted to provide stream restoration oversight.

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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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