

North Fork Baggett Creek below Baker Landfill, Okaloosa County

March 20, 2001

BioRecon: A rapid, cost-effective screening mechanism for identification of biological impairment

Purpose

A bioassessment was performed at this site to assess the impacts of Okaloosa County's Baker landfill to the biota and wildlife habitat in the headwaters of Baggett Creek. This bioassessment was in technical support of a compliance action by the FDEP Northwest District's Waste Management Cleanup Section.

Background

Baggett Creek at the bioassessment site is a first (30 meters) and second (70 meter sample area) order stream, originating at the landfill, along County Road 4B, just south of Baker west of State Road 4, Okaloosa County (Lat. 30° 45' 53.6" Long. 86° 40' 38.4"). Steephead slope streams were observed in less disturbed headwater areas. Baggett Creek flows into Pensacola Bay via the Yellow River and drains the Southern Pine and Hills of subcoregion 65f.



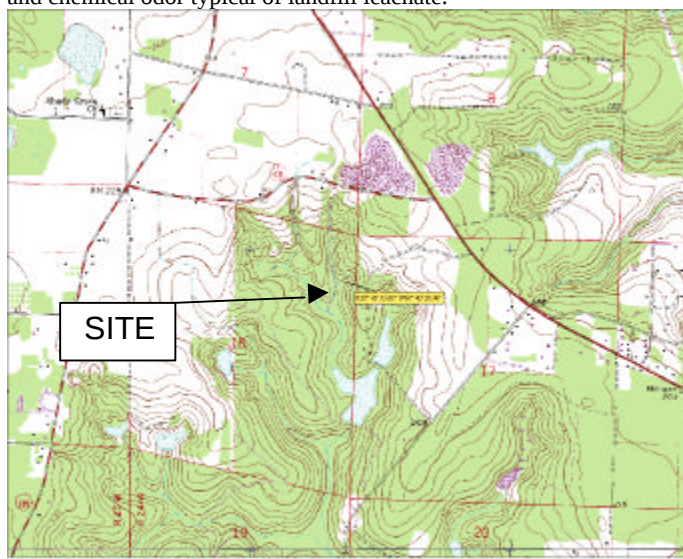
Results

The BioRecon indicated an impaired biological community. Two of 3 biological indicators failed thresholds established for a healthy aquatic wildlife community:

Biometrics	Value	Thresholds
Taxa Richness	25	≥24
Florida Index	9	≥22
EPT	5	≥17

The stream community was severely limited by pollutants from the landfill. A profuse bloom of iron/sulfur bacteria covered the stream and riparian wetland, producing a sheen that covered much of the water surface. Iron/sulfur bacteria smothered 92% of the aquatic habitats, which reduced the stream's wildlife diversity and productivity. These bacteria and the associated precipitated iron smothered the gills and bodies of the fish and wildlife. The stream was very turbid after disturbance, and the floc-like sediments re-suspended rapidly. During rainfall events, the turbidity, iron and sediment pollution load will be transported down Baggett Creek to the Yellow River and into Pensacola Bay. Iron is a contributor for algal blooms in marine waters. The Bay has experienced a fish killing red tide bloom

in the past. Excessive iron loading may be a factor. The dissolved oxygen saturation was reduced to 66% from organic loading caused by the groundwater discharged from the landfill. As the stream temperature rises from 14° C during March, to a warmer 20° C during the summer period, the dissolved oxygen (6.85 mg/l) would be expected to fall below the State Standard of 5mg/l. The specific conductance was 108 umho/cm compared to the normal of 20 or less found in area streams. The water and sediments had a strong sulfur and chemical odor typical of landfill leachate.



Significance

This Baggett 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 iron/sulfur bacteria and chemical leachate effects from the landfill contributed to this stream not meeting State designated use. Organic sediment and nutrient loading from the landfill's groundwater discharge are likely to reduce the dissolved oxygen below the Florida Administrative Code standards 62-302.530(31), ("shall not be less than 5mg/l") during warmer periods. Organic deposition has reduced stream flow and smothered wildlife habitat, which impairs the stream's fish and wildlife nursery function. Leachate from the Baker landfill negatively affects Baggett Creek, Yellow River, and Pensacola Bay's fish and wildlife. Reduced flows, habitat smothering and organic loading could affect the federally endangered gulf sturgeon, which inhabits the Yellow River System.

Suggestions

Isolating the landfill leachate onsite would prevent contaminants from migrating to State Waters from natural springs at the site. Restoration of the stream's natural hydrology (i.e. flow, depth) and preserving riparian wetland forests buffer zones would benefit the watershed's fish and wildlife. **For more information, contact Donald Ray, FDEP Northwest District, 160 Governmental Center, Pensacola, FL 32501 (850) 595-8300 x1126 or SC 695-8300**