



EcoSummary

BioRecon Report



Turkey Creek Rocky Bayou Okaloosa County July 27, 2000

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

Purpose

A bioassessment was performed at this Turkey Creek site to assess the impacts of the Niceville wastewater treatment plant sprayfield to its biota and wildlife habitat. It was conducted to assist to Eglin Air Force Base's Jackson Guard's project monitoring the federally endangered Okaloosa Darter found only in streams in the Niceville area.

Background

Turkey Creek at the bioassessment site (Lat. 30° 30' 44.1" Long. 86° 25' 30.3") is a second order stream originating in a steephead between two Niceville wastewater treatment plant spray sites about a mile east of Okaloosa-Walton Community College. Turkey Creek flows into Choctawhatchee Bay via Rocky Bayou. This site drains the Gulf Coast Flatwoods subecoregion (75a) with the Southern Pine Plains and Hills (65f) in the headwaters.



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	32	≥24
Florida Index	21	≥22
EPT	16	≥17

Pollution tolerant midges (including "bloodworms") and damselflies were the dominant aquatic wildlife. Biological observations of Turkey Creek during 1987 found a healthy stream wildlife community with abundant stoneflies, a clean water indicator. Previous monitoring in 2000 by the Jackson Guard staff noted unusually high conductivity and decreased numbers of the endangered darter in Turkey Creek. Follow up monitoring by FDEP confirmed the highly elevated specific conductance (132 umho/cm). The natural conductivity of streams inhabited by the Okaloosa Darter is normally around 20 umho/cm. The most obvious potential source of these salts is the spray site located in the stream's headwaters. The total nitrogen concentrations of Turkey Creek (2.1mg/l {nitrite-nitrate = 1.7mg/l}) were highly elevated over the natural conditions of area streams (0.2mg/l) indicating nutrient loading from a wastewater source. Organic and sand sediments smothered 83% of the aquatic habitats reducing stream

wildlife productivity. Sediment problems from organic loading were created by a culvert replacing a bridge at College Boulevard. The culvert and associated filling of the stream's riparian wetland have dammed the stream. Impounding the stream killed the riparian forest by flooding resulting in excessive organic loading from the decaying plant material. This changed the stream character above Rocky Bayou Drive from a cool (22°C), fast flowing crystal clear water body observed in 1988 to a hot (31.3 °C) stagnant and brown colored system. The area's steephead source streams are typically cool (in the lower 20's °C) during the warmer months. This occurs because the groundwater source maintains a near 20° C year round temperature.



Significance

This Turkey 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. Elevated nutrients, habitat modification, dissolved salts and temperature increase contributed to this stream not meeting State designated use. Hydrological modification from the culvert impaired the stream's fish and wildlife nursery function. Habitat destruction from sedimentation and water pollution from the nitrite-nitrate source negatively affects Turkey Creek, Rocky Bayou, and Choctawhatchee Bay's fish and wildlife. Increased water temperature, nutrient, and organic sediment loading could affect the federally endangered Okaloosa Darter, which inhabits Turkey Creek. Continued nutrient loading to Rocky Bayou could lead to cultural eutrophication problems such as fish kills and algal blooms which have occurred in Jose Bayou and Bayou Texar.

Suggestions

Upgrade the Niceville wastewater treatment plant to advanced wastewater treatment in order to obtain nutrient removal. The local sandy soil does not have the capacity for nutrient uptake. 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 including the endangered Okaloosa darter. **For more information, contact Donald Ray, FDEP Northwest District, 160 Governmental Center, Pensacola, FL 32501 (850) 595-8300 x1126 or SC 695-8300**