EcoSummary

Major Lake in Washington County
August 29, 1995

Lake Condition Index: A developmental biological assessment tool used by FDEP biologists to indicate ecosystem health and identify impairment in Florida Lakes.

Purpose

Major Lake was selected as a candidate reference lake to test and develop biocriteria in the state. To determine the biological, chemical and physical condition of this lake, an intensive assessment was conducted. This lake had high water quality and supported many pollution sensitive taxa.

Background

Major Lake covers 100 surface acres. This region is of karst topography with numerous sink hole lakes. Major Lake is landlocked, but receives some source water from springs. The physiography of this region is characterized by hilly land that appears to be dissected due to relict sand dunes. The eroded stream valleys are 20-30 ft lower than the surrounding land. This lake was surrounded by land of 100 ft elevation; the banks slope sharply 20 ft to the surface water. The predominant surrounding land use in the area is silviculture with a growing trend toward development of residential communities around these lakes.

Results

Various physical and chemical parameters were measured and assayed for water quality determination. Nutrient analyses data indicated low quantities of total nitrogen (<0.154 mg/L); likewise, total phosphorus and orthophosphate were <4 mg/L, each. Chlorophyll a and algal growth potential were both low, 0.44 mg/L and 0.029 mg dry wt/L, respectively. The algal growth potential assay provides a good analysis of the presence of required nutrients for algal growth. Water transparency was good, the Secchi measurement was 4.2 m. Conductivity was 28 mmho/cm and pH was 4.28 standard units. Alkalinity was <1.0 mg/L CaCO3. The soft, acid water was typical for ambient conditions in the

region. Dissolved oxygen was good throughout the water column, above 5.00 mg/L on the bottom. Macrobenthos were sampled using a petite ponar. Twelve ponar grabs, evenly spaced around the sublittoral zone (2 m to 4 m deep), were composited for enumeration and analyses. This community had a Shannon-Wiener diversity of 2.94 and evenness of 0.67. Over 50 % of this community was represented by pollution sensitive taxa. The pollution intolerant midge, Pagastiella sp., accounted for 50 % of the community structure; the high oxygen demanding mayfly, Hexagenia limbata, was also present.

Significance

Major Lake provides biological and chemical data that may be used for comparison to similar lakes to ascertain their degree of health. Many lakes in this area (including Major Lake) are undergoing development pressures never before seen in the rural, inland counties of the panhandle. These data are of great value as so many environments have been severely impacted prior to assessment of those systems.

Suggestions

Residential development around the shore is underway at Major Lake. Many of the houses are set back and have a good buffer and unaltered adjacent shoreline. The uplands support oaks and pines as the primary vegetation cover. The littoral zone has healthy growths of torpedo grass and other native plants. Resisting the urge to remove these ?weeds? from the littoral zone is of paramount importance in maintaining good water quality. Proper placement and maintenance of septic tanks is also of vital importance. The developer has expressed the desire to maintain the integrity of these lakes recognizing the value of a healthy environment, both for recreation and the appreciation of nature present in an area such as this. Periodic monitoring is encouraged.

For more information, please contact:
Randall Payne
DEP Northwest District 160 Government Center Pensacola, FL 32501
(850) 595-8300
email: randall.payne@dep.state.fl.us

Published by the Florida Department of Environmental Protection, Tallahassee, FL.
For more information on the DEP Bioassessments program, please visit our website at http://www2.dep.state.fl.us/water/Slerp/bio/