EcoSummary

Morris Lake, Topsail Hill State Preserve,
Walton County
March 9, 1994

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

Purpose

As part of the development of lake biocriteria in the sate, an intensive biological, physical and chemical assessment of this lake was conducted. Morris Lake is a relatively rare environment; thus, provides needed baseline data for land managers and researchers interested in these systems. This lake is considered a candidate reference lake.

Background

This is a coastal dune lake that lies within 1500 yd of the Gulf of Mexico. Morris Lake is a component of a unique and threatened ecosystem in the northern Gulf of Mexico. These coastal dune lake strand communities are characterized by xeric upland vegetation redominant on the mature sand dunes. Slash pine is the dominant tree species in the wetter habitat. Dunes that rise to approximately 30 ft help protect the landward ecosystem from salt spray and heavy wind, except in severe tropical storms. This lake is usually landlocked; however, in times of extreme flooding, it may open a channel and drain to the Gulf. Typical of these coastal lakes it is relatively shallow, about 12 ft at the deepest point.

Results

Grab samples for nutrient and chemical analyses were obtained from the center of the lake at about 0.3 m below the surface. Total nitrogen was 0.397 mg/L and total phosphorus was 43 ug/L. Total phosphorus, while not at a level of concern, was elevated compared to most surface waters in the region. Chlorophyll a, a measure of the algal production, was low (5 ug/L). Related to trophic state (level of biological production), the Secchi measurement was 3.4 m deep. The water color was dark

brown and soft ($CaCO_3$ <1.0 mg/L). Dissolved oxygen was good throughout the water column (7.9 mg/L on the bottom). Conductivity was 80 umho/cm and pH was 4.1 standard units. The sampled biological community was diverse; an intolerant midge, Pagastiella sp., was the most common taxon in the sample, contributing >15 % of the composition. The benthos (organisms living on the lake bottom) were sampled using a petite ponar. The method followed the test procedures under consideration for establishing protocol for lake biological assessment.

Significance

Morris Lake is part of a fragile, rare ecosystem. Coastal lakes are found primarily in the south with the greatest concentration in Florida. There is a dearth of baseline information on these types of systems. Future area growth will eventually stress the integrity of these lakes and associated watersheds. These data may provide land managers with information needed to detect early signs of environmental stress and allow timely intervention to abate the source of pollution.

Suggestions

Fortunately, this lake is now a part of the Florida Park System, managed as a preserve. The management philosophy of state preserves is to maintain the natural components of the ecosystem. Baseline data collected on more coastal dune lakes are needed to learn the function and biological characteristics of these systems. The philosophy of minimal construction of impervious surfaces and associated development must be adhered to so anthropogenic impacts may be minimized. Periodic monitoring is encouraged.

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