



EcoSummary

Morris Lake, Topsail Hill State Preserve,
Walton County
August 31, 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 state, 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 predominant on the mature sand dunes. Slash pine is the dominant tree species in the wet 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 near center of the lake at about 0.3 m deep. Total nitrogen was 0.461 mg/L and total phosphorus was 5 ug/L. Both these values were low and indicated little nutrient enrichment in the water column. Chlorophyll a was <5 ug/L; a related measurement, the Secchi depth, was 1.9 m deep. This was a reduction in Secchi depth from winter and may be attributed to darker color (brown). Algal growth potential was high, 6.722 mg dry wt/L. This

assay uses a specific alga and responds to bioavailable nutrients in the water column. Dissolved oxygen was 7.3 mg/L, but dropped to 0.1 mg/L at the bottom. Conductivity was 103 umho/cm and pH was 4.9 standard units. The benthos (organisms that live 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. There were 22 taxa determined from the sampled biological community (primarily insects). The tolerant fly, *Chaoborus* spp., accounted for >40 % of the community composition. This community structure was in contrast to the intolerant composition of the winter index period. This phenomenon had been observed in other lakes. These lakes had one obvious characteristic in common, shallow depth, typically 12 ft or less.

Significance

Morris Lake is part of a fragile, rare ecosystem. There is a dearth of baseline information on these coastal environments. Future area growth will likely stress these lakes and associated watersheds. These data may serve land managers, and others, information needed to detect early signs of environmental stress; thus, allow timely intervention to relieve the source of pollution.

Suggestions

Fortunately, this lake is now 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 better understand the biological characteristics of these systems. The philosophy of minimal construction of impervious surfaces and associated development must be adhered to so antropogenic impacts may be minimized. Periodic monitoring is encouraged.

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