



EcoSummary

Pate Lake, Washington County
September 19, 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. Pate Lake supports a biologically diverse community and is of good water quality. This lake is a candidate reference lake in this lake region.



Background

This lake covers 1,045 surface acres and is characterized by having both inflow and outflow hydrology. The lake lies in an area of relatively flat topography with the surface water near 70 ft in elevation; the uplands reach about 100 ft. The area is rural with fewer than 10 houses near shore; these are on the west end of the lake, near SR 279. The lake is primarily surrounded by an extensive second-growth cypress swamp community. The soils in the area are muck, high in clay and organics with a sand mixture, a typical characteristic of swamp conditions.

Results

Results of physicochemical and biological assessments indicated Pate Lake has good water quality. The sampled biological community (primarily insects) was relatively diverse (22 taxa). The greatest percent of this community was composed of tolerant taxa, with a smaller fraction of intolerant ones. However, the community composition changed from the winter results that showed a community primarily of intolerant taxa. This phenomenon occurred in Gap Lake; it had similar physical and chemical characteristics between the two index periods. 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. Pate Lake had brown water and

was poor in salts. Conductivity was 23 umho/cm and pH was 4.3 standard units. Dissolved oxygen was good throughout the water column ranging from 7.4 mg/L (surface) to 5.4 mg/L (bottom). Water quality assay results found the system was moderate in dissolved nutrients. Total nitrogen was 0.497 mg/L and total phosphorus was 18 ug/L. Chlorophyll a was elevated at 33.79 ug/L, but algal growth potential was low (1.1 mg dry wt/L). The Secchi depth was 1.1 m, slightly reduced from the winter index period. These results indicated mesotrophy (moderate level of production due to nutrient availability), an enriched condition that supports a myriad of life and a complex food web.

Significance

This lake provides a baseline of data for similar lakes in this lake region. The relatively intact, extensive cypress swamp and low developmental pressure provides an environmental resource that may be in a healthy state for some time. The cypress system is critical in filtering and abating excess nutrients and other pollutants.

Suggestions

Stewardship in this watershed is paramount for retention of the recreational value of this lake. It is noted as a good fishing lake, producing nice catches of largemouth bass and crappie. Given the high water table, muck soils and lack of municipal waste disposal system, future building of houses should be discouraged near the lake shore. Periodic monitoring is encouraged.

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