



EcoSummary

Pate Lake, Washington County

March 11, 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 high water quality. It 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. Pate Lake lies in an area of relatively flat topography with the surface about 70 ft in elevation and 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 mixed with sand, a typical characteristic of swamp conditions.

Results

Results of physicochemical and biological assessment indicated Pate Lake was of good water quality. Dissolved oxygen was good throughout the water column while conductivity (23 umho/cm) and pH (3.6 standard units) were typical for ambient waters in this region. Nutrient assays found total nitrogen at 0.406 mg/L (near the median for this lake region) and total phosphorus of 16 ug/L (below the median). Water color was dark brown and the Secchi depth was 1.6 m. The sampled biological community (primarily insects) was relatively diverse; it was composed of 25 taxa, with the mayfly *Hexagenia* sp., and the midge *Pagastiella* sp., common to the community. These taxa are considered sensitive to stressed environments. 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. These results, and good fish production, indicated a mesotrophic (moderate nutrient enrichment) condition.

Significance

This lake provides a baseline of data for other 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 nutrients and other pollutants during rain events.

Suggestions

Periodic monitoring is encouraged for early detection of water quality degradation. 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.

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