



EcoSummary

Turkey Pen Pond, Calhoun County
September 12, 1995



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

Purpose

Turkey Pen Pond was selected as a candidate reference lake in Lake Region 65-03 (Greenhead Slope) as part of a statewide effort to develop biological criteria for lake environments. Data collected from the best attainable lakes in each lake region may be used to establish standards for least impacted lakes in a given region and as benchmarks for all similar lakes in that particular region.

Background

Turkey Pen Pond is located in rural northwest Calhoun County, approximately 20 miles south of Marianna. This pond is rectangular and covers 16 acres. There is no inflow or outflow resulting in a long residence time for the water. This pond is a sinkhole formed by the collapse of soluble limestone and is groundwater fed. The surrounding land immediately adjacent to the pond is hilly; silviculture is the primary land use. To the south, Tenmile Creek and its flood plain (a reference stream) is separated by a ridge that rises about 50 ft above lake elevation. The littoral zone and upland vegetation immediately surrounding the pond are intact with native vegetation. The prominent plant in the littoral zone is St. John's-wort. The primary use of this pond is swimming and subsistence fishing. However, since this bioassessment, access to the pond has been restricted by gating the road and posting the property.

Results

Many aspects of water quality and biological indicators were determined through water and biological sample analyses. Nutrient analyses showed this lake to be oligotrophic (infertile). All nutrient parameters (nitrite-nitrate, ammonia, total Kjeldahl-nitrogen, phosphorus and orthophosphate) were less than, or equal to, the minimum detection limit for each. Little chlorophyll a (0.86 ug/L) was present; also, the limited nutrients were reflected in the algal growth potential (AGP) assay that produced 0.023 mg dry wt/L of algae. Dissolved oxygen was good throughout the water column, ranging from 6.60 mg/L near the surface to 6.49 mg/L at the bottom (7.1 m). The water was mixed as indicated by the temperature; it ranged from 29.69 C (0.4 m deep) to 29.39 C on the bottom (7.1 m deep). The water was acidic and soft, the pH was 4.24 SU and alkalinity was below 1.0 mg/L. The

specific conductivity (26 umho/cm) reflected the good water quality of this lake. The benthic macroinvertebrate community was sampled using a petite ponar. The lake was divided into twelfths with the benthos sampled from the sublittoral zone. The Department of Environmental Protection SOP defines this zone as the area between 2 m - 4 m deep. The benthos was diverse, Shannon-Wiener diversity was 3.99 and evenness was 0.85 (evenness is a measure of how well (evenly) the community population is distributed among the different taxa). Another biological indicator of a healthy lake environment is the worm to midge ratio. This metric was 1: 15, indicating a good balance between these taxa. Of note, a new or previously unknown larva of midge was found in this pond. Lake sediments in the sublittoral zone consisted of sand, silt/clay, CPOM (coarse particulate organic matter) and SAV (submerged aquatic vegetation). Hydrogen sulfide odor was absent from all sediments sampled in the lake, indicating aerobic conditions. Total and fecal coliform bacteria results were 1 colony/100mL, each.

Significance

Turkey Pen Pond is biologically diverse and has exceptionally good water quality. This pond is in a rural area of the panhandle. The only foreseeable threat to the integrity of this environment is potential impacts from silvicultural practices that do not implement best management practices (BMPs) into the operation. These data provide baseline reference information that may be useful when the need arises to determine the extent of environmental impairment caused on this lake, or a similar lake in the region.

Suggestions

As activities such as timber harvest take place in the watershed, implementation of BMPs will be a significant step toward maintaining the water quality and biological integrity of this water body. Maintaining the littoral zone and near upland vegetation intact are essential to provide adequate buffer and soil stabilization. Periodic monitoring is encouraged for early detection of environmental degradation.

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