EcoSummary

Lake Gibson near Umatilla

July 6, 1998

LAKE BIOASSESSMENTS

GOOD

Lake Condition Index (LCI): A developmental biological assessment tool used by FDEP biologist to indicate ecosystem health and identify impairment in Florida lakes

For samples collected before June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures and met FDEP quality assurance/quality control standards.
For samples collected on or after June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures (SOPs) and met DEP quality assurance/quality control standards.

Purpose



An outbreak of Mediterranean fruitflies a.k.a. medflies (*Ceratitis capitata*) in the Umatilla area of Lake County in 1998 prompted aerial and ground application of malathion to combat the exotic pests. FDEP Central District's Surface Water Monitoring team responded to this extensive pesticide spraying by monitoring five area lakes before, during, and after the spraying took place. The overall results of the study were reported earlier (FDEP 1998). The objectives of this investigation were to evaluate the ecological health of Lake Gibson after the spraying program ended, and to provide data useable in FDEP's continuing lakes biological assessment criteria (biocriteria) development.

Reference:

FDEP. 1998. Biological assessment of five lakes in the Umatilla, Florida area in response to application of malathion for the control of the Mediterranean fruitfly (*Ceratitis capitata*). Surface Water Monitoring Program, Florida Department of Environmental Protection, Central District, 11 pp. Report available online at:

http://www.dep.state.fl.us/water/Slerp/bio/biorepts/otherepts/umatmedf.pdf

Watershed Characteristics

Lake Gibson is one of some 25 or more named and many other unnamed lakes that cluster in close proximity to one another around the town of Umatilla. This area is situated to the northeast of Lake Yale in the "elbow" of Lake County. Lake Gibson is located east of SR 19, about a quarter mile northeast of Lake Pearl.

The area has for many years been citrus country, with both the growing and the processing of citrus important industries. Lake Gibson is largely surrounded by either currently maintained or abandoned citrus groves and low-density residential development.

Results

Biologists from FDEP Central District's Surface Water Monitoring section carried out biological and water chemistry sampling at Lake Gibson on July 6, 1998. In addition, *in situ* physicochemical measurements were made using a multimeter.

The results of the benthic biological sampling, which consisted of 12 petite ponars grabs at evenly spaced locations throughout the lake, indicated that the lake is in fairly good ecological health. A total of 16 different macroinvertebrate taxa, representing seven different taxonomic groups, were collected. The most abundant of these was a larval midge of the *Polypedilum halterale* group, followed by the non-native snail *Melanoides tuberculata*. Overall species diversity was moderate, with a score of 2.73 on the Shannon-Weaver diversity index. Lake Gibson's macroinvertebrate community health was rated as good, based on the benthic portion of FDEP's Lake Condition Index (LCI), which is currently under development.

Water chemistry and physicochemical measurements were very good. All nutrient levels were quite low. Turbidity and color were very low, and the Secchi depth (a measure of water clarity) was 4.4 meters. The dissolved oxygen concentration was very good, at 7.8 mg/L.

Significance

These results suggest that there was no substantial effect on the health of the macroinvertebrate community of Lake Gibson from the malathion spraying that preceded this sampling. Although the results of the larger study did suggest that subtle differences in the community makeup might have taken place during the spraying program (see the report referenced above), the overall heath of the lake does not appear to have been altered.

Suggestions

Further residential development in the watershed should be discouraged. The remaining lakeside native vegetation should be conserved. Careful spraying protocols and judicious, timely monitoring of malathion levels in air, water, and sediments should be carried out during any future medfly outbreaks.

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