

EVALUATION OF THE LITTORAL FISH ASSEMBLAGE TO ASSESS BIOLOGICAL INTEGRITY IN NEW JERSEY LAKES

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ABSTRACT

In general, current lake water monitoring programs lack direct assessment and reporting on biological conditions. This is partly attributed to a lack of development of biological assessment protocols. Through the use of boat electrofishing, fish samples were collected from the littoral zone of 22 lakes in New Jersey during the summers 2002-2006. Fish data was evaluated for the potential development of an index of biological integrity (IBI). Twenty-five species of fish in the families Anguillidae, Catostomidae, Centrarchidae, Clupeidae, Cyprinidae, Esocidae, Fundulidae, Ictaluridae, Moronidae, and Percidae were collected. The four most commonly occurring fish species were *Lepomis gibbosus* (100%), *Micropterus salmoides* (100%), *Lepomis macrochirus* (95%), and *Pomoxis nigromaculatus* (73%). Fish assemblage data collected from Jefferson Lake in 2002-2003 and 2005-2006 were analyzed to assess interannual variability. Variability was measured using the coefficient of variation of species richness, percent centrarchids, percent top carnivores, percent generalist feeders, percent disease and anomalies, and total abundance. Multiple-year CV values were lower for the species richness, composition, and trophic guild metrics (except percent top carnivores) and highest for the abundance and fish condition metrics. In addition, fish species richness and composition metrics were examined for their general response to a gradient of land use conditions. Our results indicate some attributes of the littoral fish assemblage may be used to assess the ecological health of New Jersey lakes. However, additional information on the responses of the littoral fish assemblage to specific physical habitat and water quality parameters is needed before an IBI can be developed.

KEYWORDS

Biological integrity, fish assemblage, lakes, littoral zone, New Jersey.