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Analysis of Fish Movements between Great Lakes Coastal Wetlands and Near Shore Habitat via Otolith Microchemistry.

Great Lakes coastal wetlands are unique habitats with physical connections with near shore environments. This facilitates the exchange of energy between habitats in a principle known as habitat coupling. Coupling can be facilitated by movements of consumers; however, wetland use by fish is largely understudied in the Great Lakes. As a result, our goal was to reconstruct fish movements between the habitats. To accomplish this goal, wetland (WL) and near shore (NS) water and fish samples were collected from 13 sites across the basin for water and otolith trace element analysis. After standardizing to moles calcium, water chemistry indicated that Sr and Ba were most important in discerning WL and NS chemistry. Concentrations of Sr and Ba in recently deposited outer-otolith showed positive relationships with the water chemistry fish were caught in. As a result, outer-otolith Sr:Ca and Ba:Ca from WL and NS caught fish was used to build a predictive model of WL/NS chemistry using linear discriminant function analysis (LDFA). After verifying the model, it was applied to transect data to estimate habitat use. The results indicated three life histories for yellow perch including (1) WL residents (2) NS residents and (3) fish utilizing WL once/year. These data suggest complex life histories that may facilitate habitat coupling.