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Juvenile River Herring (Alosa species) Otoliths Identify Spawning Runs in Coastal Watersheds with Poor Nursery Habitat

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"River Herring" is a collective term for Alewife, Alosa pseudoharengus,s and Blueback Herring, A. aestivalis. Both species range from Atlantic Canada to North Carolina; Blueback Herring continue to northern Florida USA. Both species have been ecologically, commercially and culturally important. Drastic declines in population led North Carolina to enact a harvest moratorium in 2006-2007, with loss of spawning and nursery habitats proposed as reasons for the decline. "Strategic Habitat Areas" (SHAs) have been established in North Carolina, one goal of which is to protect river herring spawning and nursery habitat; however, these designations were made based on presence/absence information, which may not correctly identify the best nursery areas. Our goal was to identify essential river herring nursery habitats in Albemarle Sound by examining otolith elemental signatures during the first year of life, then applying these signatures to adults returning to purported natal streams for springtime spawning. Using elemental signatures juvenile river herring were classified to river of capture with high accuracy. These signatures were then used to predict the natal habitats of adult river herring returning to spawn. The rate of adults returning to the Chowan River was high compared to the Perquimans and Scuppernong rivers suggesting that the Chowan River functions as high quality river herring habitat compared to the other two rivers. The effective habitat designations from our study match the state SHA designations. Continued protection of important habitats and restoration of degraded habitats may aid in the recovery of river herring stocks.

Key words: otolith, elemental signatures, critical habitat, Alosinae, River Herring

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