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Survival and metamorphosis of larval sea lamprey in Lake Erie tributaries
Project ID – 2016_JOH_54055
by:

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April 2025

ABSTRACT:

Survival of non-native larval and juvenile sea lamprey (*Petromyzon marinus*) in the Lake Erie Basin was investigated to inform decisions about how limited sea lamprey control resources are allocated among the Laurentian Great Lakes to protect valued fish stocks. Coded-wire tagged (CWT) larvae and outmigrating juveniles were released between 2012 and 2018 in sea lamprey producing tributaries of Lake Erie in places they would likely not be subjected to control program mortality. Adult sea lamprey returning to Lake Erie tributaries during the spawning season were scanned for the presence of CWTs, with the intention of fitting tagging models to the recovery to determine (1) if sea lamprey survival differed between the St. Clair River and other sea lamprey producing tributaries of Lake Erie and (2) if survival in Lake Erie differs from previous estimates of survival in Lakes Huron and Michigan. However, no tagged larvae were recaptured in the adult stage regardless of release location in Lake Erie tributaries, which prevented model fitting. Recovery probability of juveniles released in the St. Clair River at the adult stage was approximately ½ that of other sea lamprey-producing streams to Lake Erie; however, the difference in recovery probability was not statistically significant due to the overall low recovery (Objective 1). Lake-wide estimates of adult sea lamprey abundance were also at record lows when tagged larvae were expected to be recaptured in the adult stage. Given that ~11,000 tagged larvae were released, simulation modeling suggests that larval and juvenile survival in Lake Erie may be considerably less than survival estimated in Lakes Huron and Michigan (<25% versus 40-70%; Objective 2). Understanding the natural factors influencing sea lamprey populations in the Great Lakes may improving decisions about where limited control resources are allocated.