# 2020 Cooperative Summer Field Training Program

<table>
<thead>
<tr>
<th>USGS Project Scientist</th>
<th>Nicholas S. Johnson</th>
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<tbody>
<tr>
<td>Project start date</td>
<td>4/15/2020</td>
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<tr>
<td>Duration</td>
<td>4 months</td>
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<tr>
<td>Location</td>
<td>Millersburg, Michigan</td>
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<td>Type of Intern</td>
<td>ESA</td>
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<tr>
<td>Title of Project</td>
<td>DEPLOY AND EVALUATE SEA LAMPREY CONTROLS TO SUPPLEMENT LAMPRICIDES AND BARRIERS</td>
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## Background
Control of invasive sea lamprey is a cornerstone of Great Lakes ecosystem management, but existing sea lamprey control tactics are becoming increasingly difficult to maintain and execute. Therefore, we have actively researched new control tactics and many have been developed including: pheromone-based trapping, pheromone-based repellents, low voltage electrical barriers, and sterile male release. While these tools have produced incremental improvements, they have not been broadly used in sea lamprey control because of a general inability to compare the cost effectiveness of new tools versus old tools. Therefore, in 2020, we are initiating a 12 year study on 12 streams to (1) develop, implement, and evaluate an integrated array of sea lamprey control tools focused on reducing reproduction that supplement on-going lampricide and barrier programs and (2) define stream characteristics where supplemental controls provide the greatest benefit.

## Objectives
Determine how effects of supplementing lampricide treatments with control tools that reduce reproduction vary among streams and why. Our objective will be accomplished by implementing an adaptive assessment plan on 12 experimental streams for 12 years to answer two guiding questions: (1) What is the relationship between reductions in reproduction via supplemental controls and recruitment of age-1 sea lamprey and (2) what ecological factors influence survival and growth from age 1 to the juvenile life stage?

## Intern Tasks
- Deploy and maintain sea lamprey traps in Great Lakes streams
- Insert tags and track sea lamprey in Great Lakes streams
- Locate spawning sea lamprey and assess embryo viability
- Deploy and evaluate low voltage barriers to guide and block sea lamprey
- Assess larval sea lamprey habitat
- Capture larvae sea lamprey using back-pack eletrofishing
- Management and summary of experimental data
- Produce initial drafts describing methods and results of experiments.

## Expected Results and Benefits to the Intern
The intern will get practical experience working in Great Lakes Tributaries with USGS staff and will also be able to work side-by-side with biologists of U.S. Fish and Wildlife Service and Department of Fisheries and Oceans, Canada. Practical experience includes
trapping techniques, biotelemetry, habitat assessment, and laboratory rearing and evaluation of sea lamprey embryos. Furthermore, the intern will be given an opportunity to contribute to reports and manuscripts by drafting methods and results of activities they lead.

Skills and Interests of Candidates

- Enjoy being outside and working in and around streams that are in remote locations.
- Willing to help with dissect or conduct surgeries on sea lamprey and other fishes.
- Data analysis in R would be preferred
- Interest in completing entire scientific process: conceive research question, develop method, conduct experiment, summarize method and result.
- Ability to adapt to quickly changing field conditions and experimental needs.

Project Type

Field Work; Lab Work; Office Work;

Project Discipline

Ecology; Surface Water;