



# Nature at School Pre-lesson Sea Lamprey

## Learning outcomes:

Join DNR educator Alan Wernette from the shores of Lake Michigan at Ludington State Park to learn about Michigan's first, and most impactful, invasive fish species, the sea lamprey. They are "vampire-like" fish, attaching to and drinking the body fluids of other fish species! Native to our oceans, how did they get to the Great Lakes? Can we control them? Learn how they affect the ecosystem, fishery and economy. These and more of your questions will be answered as we "stake a point" into the sea lamprey story. This 30-minute presentation will meet the following learning outcomes:

- Define "invasive species" and describe the impacts on a natural community like the Great Lakes.
- Identify at least three aquatic invasive species in the Great Lakes, including the sea lamprey.
- Describe at least three paths through which invasive species can enter the Great Lakes.
- Discover actions students can take to protect the Great Lakes from invasive species.

## Background information:

Invasive species are plants or animals that are not native to an ecosystem and cause harm to natural communities. Sea lamprey are a type of primitive fish native to the north Atlantic Ocean, and are just one of more than 150-plus non-native species that have made their way to the Great Lakes through ballast water, removal of physical barriers, dumping of bait or pets, or other means.

Sea lamprey entered the Great Lakes from the ocean through man-made shipping canals and locks that were created to bypass natural barriers like Niagara Falls for shipping. By 1938 they were found in the entire Great Lakes system. Adult sea lamprey feed on large deep-water fish, and no aquatic predators are found in the Great Lakes to control them. By the 1960's they had killed off 98% of native lake trout, and those that survived showed signs that they, too, had been attacked.

## Resources:

- [Great Lakes Fishery Commission](#)
- [Sea Lamprey Summary](#)
- [Ontario Sea Lamprey Fact Sheets](#)
- [Fisheries and Ocean Canada](#)

## Suggested pre-activity:

- [Break the Barriers simulation](#), Michigan Sea Grant
- [Great Lakes Science STEM lessons](#)
- [Sea lamprey education resources](#)
- [Aquatic Roots](#), Aquatic WILD

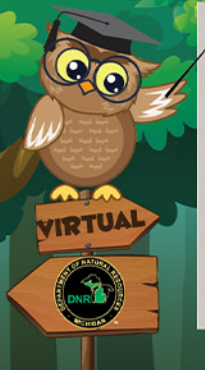
## Directions for your DNR Nature at School virtual program:

1. You will receive a reminder email from SignUp Genius three days prior to your scheduled *DNR Nature at School* program. Please read and follow the directions, so we all can have a successful program.
2. At least one day prior to your lesson, send your instructor the link to your Zoom/Google Meet/Skype/Teams for your lesson time. Starting 10 minutes early with just your instructor is encouraged.

### Day of:

3. Make sure students have their sound muted and their cameras on to participate (with thumbs up, number on fingers).
4. If you use the chat feature, we encourage the students to ask their questions there, and the teacher can ask them at the end of the program.
5. See further directions in your SignUp Genius confirmation.

# Nature at School NGSS Correlation Sea Lamprey



Live from Ludington State Park: The eel-like sea lamprey has changed the dynamics of the Great Lakes ecosystem by parasitizing our large native Great Lakes fish.

## Guiding question/phenomenon:

What factors make invasive species impact native species populations negatively?

Science and Engineering Practice	Disciplinary Core Idea	Cross-Cutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p>Analyze data using tools, technologies, and/or models in order to make valid and reliable scientific claims or determine an optimal design solution.</p> <ul style="list-style-type: none"> <li>Students will understand the trend over time between native and invasive Great Lakes species.</li> </ul>	<p><b>LSI.A: Structure and Function</b></p> <p>Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.</p> <ul style="list-style-type: none"> <li>Students will learn lamprey anatomy, physiology and how and why they have certain adaptations.</li> </ul>	<p><b>Systems and System Models</b></p> <p>A system can be described in terms of its components and their interactions.</p> <ul style="list-style-type: none"> <li>Students learn and reflect on the role of fish in Michigan’s waters, and with humans, and how invasive species interrupt a system.</li> </ul>
<p><b>Constructing Explanations and Designing Solutions</b></p> <p>Constructing explanations and designing solutions in grades 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.</p> <ul style="list-style-type: none"> <li>Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.</li> <li>Students will understand how biologists solved lamprey population issues over time and may construct their own theories on how to solve invasive species threats.</li> </ul>	<p><b>ETSI.B: Developing Possible Solutions</b></p> <ul style="list-style-type: none"> <li>Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions.</li> <li>At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.</li> </ul>	<p><b>Cause and Effect</b></p> <p>Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.</p> <ul style="list-style-type: none"> <li>Students will learn the relationship between native and invasive species, and human impacts to that system for solutions and causation.</li> </ul>

**Recommended grade band(s):** Early elementary through middle school  
All Nature At School virtual programs have been created to introduce students at any grade level to life and/or earth science core ideas, when used with pre- and post-activity suggestions.

# Nature at School Post-lesson Sea Lamprey

## Activity wrap-up:

An invasive species is an animal or plant which is not native to an area, may spread rapidly, and causes economic, ecological, or human health impacts. They threaten the biodiversity of a natural community.

Using the sea lamprey as an example, students will have gained a better understanding of the effects of invasive species on an ecosystem like the Great Lakes. Their life cycle and the measures that have been taken to reduce or control the spread of sea lamprey illustrate the economic harm and ecological impacts of this species on the lakes. Education and awareness of solutions to this problem may help prevent the introduction and spread of additional invasive species in our waterways.

## Resources:

- [Michigan Invasive Species](#)
- [Midwest Invasive Species Information Network](#)

## Connect to home:

- Aquarium pets and plants are a responsibility for their owners. Learn about the potentially harmful results of releasing them into the wild. [This resource will get you started.](#)



## Post-activities:

- Learn about other types of invasive species in your community and what can be done to control the spread.
- Find out how ballast water regulations are helping to prevent new aquatic invasive species from entering the Great Lakes.
- Learn how man-made barriers are being studied as a solution to prevent species like invasive carp from entering the Great Lakes near Chicago.

## Connect with DNR content:

For a daily dose of nature, like [MiNatureDNR](#) on Facebook.

Visit the [DNR Nature at Home page](#) for educational video series, resources, lessons, virtual tours and more.