

Beware! Invaders!

Trip at a Glance

This activity offers a song to supplement and reinforce lessons about exotic species.

Based on the approach that students learn in different ways, this song may help many students retain information, especially those students who are right-brain oriented.

Destination

Students will be able to

- ✿ Name all five Great Lakes.
- ✿ Name six to eight exotic species.
- ✿ Explain why exotic species are harmful.
- ✿ Describe how to stop the spread of exotic species.

Adventure Levels

Grades 2–5

Areas of Interest

Science, Music, and Geography

Locale

Classroom

Length of Stay

20–30 minutes

Invader Background Check

An exotic plant or animal is one that does not occur naturally in a specific location or ecosystem. Exotics arrive through intentional or accidental actions by humans, and those that survive always affect local ecosystems.

A few exotics have had very substantial impacts. One such invader to the Great Lakes is the sea lamprey. Natural barriers, like Niagara Falls, previously prevented them from reaching the Great Lakes. However, once shipping canals were opened, sea lampreys easily found their way to the Great Lakes, where they reduced many species including trout and whitefish.



Zebra mussels clog water intake pipes along the Great Lakes. The spiny water flea eats the plankton that small, native fish need in order to survive. Plants such as the purple loosestrife and Eurasian watermilfoil grow so rapidly and spread so widely that many native species are crowded out of wetland regions and other waterways.

People can help to avoid the spread of exotic species by taking careful precautions. Boaters should be careful to rinse the bottoms of boats, bilge pumps, and livewells with clean tap water at 104°F before leaving lake or river areas. Water from these areas should be drained on land, and bait buckets should be emptied on land. Aquatic plants that get stuck on boat trailers and boats should be removed. It is helpful to let boats and boating equipment dry in the sun for at least five days.

Foreign Language

Alewife
Common carp
Crustacean
Eurasian watermilfoil
Indigenous species

Invader
Nonindigenous species
Purple loosestrife
Round goby
Ruffe

Sea lamprey
Spiny water flea
Zebra mussel
Zooplankton

Amenities Provided

Beware! Invaders! (answer key for song sheet) 2.1–2.2
Beware! Invaders! (song sheet) 2.3–2.4
Beware! Invaders! on *ESCAPE Song and Game* CD-ROM (with vocals first, followed by an instrumental version)

Things to Pack

CD player
U.S. map
Overhead projector (optional)
Clear transparencies for copying song (optional)



Passport for Success

This song should follow an initial lesson on exotic species. It is meant to reinforce material already presented. With children in primary grades, the *ESCAPE* activity "Mussel Builders" (5) would provide a good introduction. For older students the activity "Awareness of Aquatic Exotic Species" (1) contains a large amount of information. Some aspects of that activity could also be used with younger students. In addition, there are many activities with games that can introduce students in upper elementary grades to exotic species. These include "Rival for Survival" (15), "Beat the Barriers: A Sea Lamprey Game" (26), and "What Are the Characteristics of the Great Lakes Exotic Species?" (18). Once the song is introduced to the class, it is likely that students will want to sing this daily while involved in an exotic species unit.

Itinerary

1. Give an initial lesson on exotic species, or use this activity after or during another *ESCAPE* activity. See "Passport for Success."
2. Point out the location of the Great Lakes on a large wall map (optional), and explain that the class will be learning a song about exotic species that have invaded the Great Lakes.
3. Distribute song sheets, and have students listen to tape the CD (with vocals) while following the song sheet. Put the lyrics on transparencies and use the overhead projector if you think it will help students keep their place on the song sheets (optional).
4. Replay the CD several times and have students sing along.
5. Have students draw lines from pictures to boldfaced words on the song sheet. Use the overhead projector while they are doing this or after they have had time to do this on their own (optional).
6. Have students sing the song as often as desired or as there is interest. Students may have this song memorized in just a few class sessions.

7. After a few sessions, students should be able to answer the following questions:
- If I wanted to travel by boat from Lake Superior to Lake Ontario, what lakes would I travel on and in what order?** Lake Superior, Lake Huron (Lake Michigan could be a "side trip"), Lake Erie, and Lake Ontario
 - What nonindigenous species might I come across?** Zebra mussel, sea lamprey, spiny water flea, ruffe, round goby, carp, and alewife. (Purple loosestrife and Eurasian watermilfoil are not in the song but are pictured on the song sheet.)
 - How might they have gotten here?** By boats, currents, and swimming. (Students may be able to identify other ways depending on depth of preceding activity.)
 - What should I do each time before putting my boat in a different lake?** Inspect boat, trailer, and fishing gear. Wash and let dry for five* days in the sun. (Students may be able to name other preventive measures as well.)

Travel Tips

- ✿ The instrumental version of the CD is for confident students who think they can sing the song without help.
- ✿ The music teacher could teach the following concepts that are present in this song: verse/chorus, bridge, melody/accompaniment, minor modality, vocal timbres, and dynamics.

Debriefing

- ✿ The song sheets labeled in step 5 can be collected and graded if it is desired and is useful for evaluation purposes. In the alternative, the educator can simply have students find connections between the words and associated graphic along with the teacher. Students can also make their own corrections as the teacher shows them the correctly labeled sheets.
- ✿ Student answers to the questions in step 7 can be used as another evaluation tool.
- ✿ The information from the song could be put into a teacher-made objective test. Students can often memorize songs more easily and in less time than information presented in standard classroom lessons. If a teacher assesses with a written test, information in the song will most likely be retained.

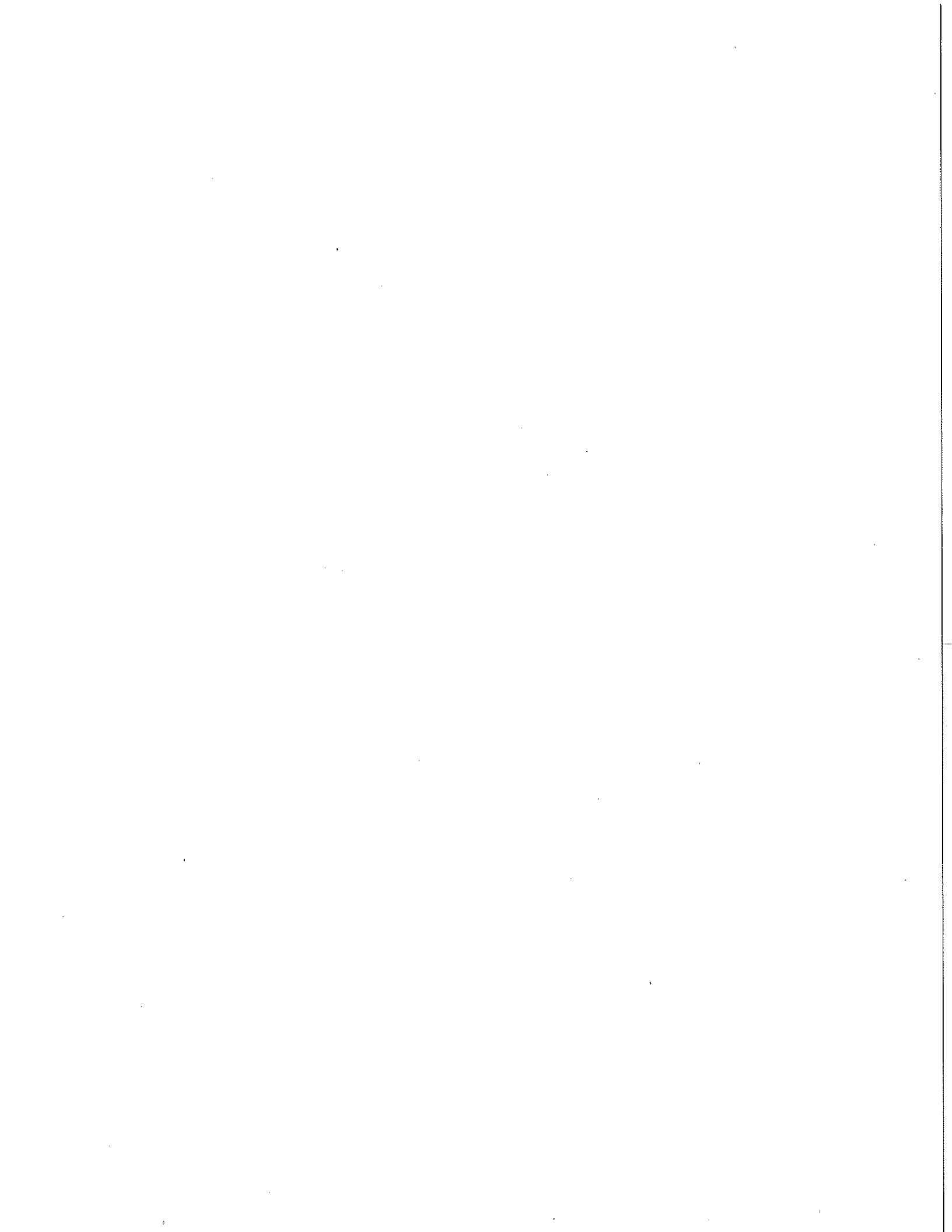
Extending the Visit

One of the most important things students learn in a unit on exotic species is how to stop the spread of nonindigenous species. Students could make posters telling boaters about "invaders" and what to do before taking their boats to another lake. If boating areas are easily accessible, the class could take a field trip to post their signs at local marinas. Students could interview marina personnel and look for evidence of exotic species.

Travel Agent

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*Please note that the song indicates four days for drying in the sun, but it is now recommended that boats dry for at least five days. Teachers may want to substitute five when singing "Beware! Invaders!"





Beware! Invaders!

1. There are 5 Great Lakes—**Lake Superior, Lake Michigan, Lake Huron, Lake Erie, Lake Ontario.**
There's fishing and boating and swimming and fun,
All this and their beauty for everyone.

(CHORUS)

Beware! Invaders!
Will they forever change the Great Lakes?
Beware! Invaders!
Unwelcome guests who came to stay.



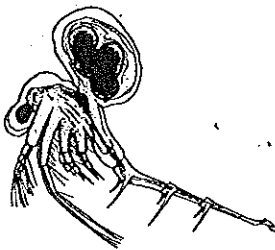
2. **Zebra mussels** came in on a ship.
They spread through the lakes lickety split.
They foul up boat motors and clog water pipes.
They take other's food for their own delight.

(CHORUS)



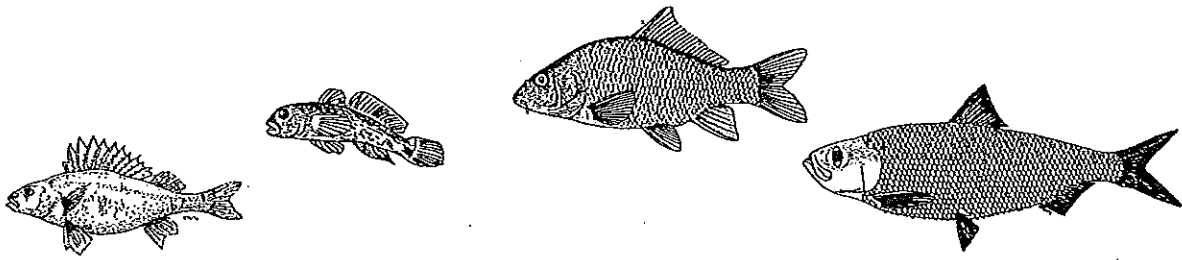
3. **Sea lampreys** are the vampires of the Great Lakes,
A bloodsucking enemy they do make.
From Atlantic through Erie Canal they came,
To kill lots of fish—that is their game.

(CHORUS)



4. A **spiny water flea** is so very tiny.
How could this crustacean be so mighty?
It feeds on zooplankton that small fish need,
And they reproduce as fast as can be.

(CHORUS)



5. **Ruffe, round goby, carp, and alewife,**
They take food and space from indigenous life.
Destructive sea weed is spreading about.
More nonindigenous species than I care to count.

What can we do?
What can we do?
It only takes one little mistake,
For one boater to infest a lake.
Clean and inspect boat, trailer, fishing gear,
Before going to a lake, far or near.
Let it dry for 4 days in the sun.
We can stop the spread. **COME ON EVERYONE!**

(CHORUS)

(CODA)

Beware! Invaders! Beware! Invaders! Beware! Invaders!
Unwelcome guests who came to stay.

