



Rival for Survival

Trip at a Glance

This game presents real-life choices involving exotic species found in the Great Lakes, such as zebra mussels and purple loosestrife. Students are to analyze a situation related to ecology and make an environmentally sound decision. After playing the game, students organize what they learned into a concept map.

Destination

Students will be able to

- ✿ Analyze situations and factors affecting ecosystems.
- ✿ Recognize exotic species found in the Great Lakes.
- ✿ Create a concept map that interrelates the topics presented in the game.

Adventure Levels

Grades 6–9

This activity can be adapted for younger students.

Areas of Interest

Science and Citizenship

Locale

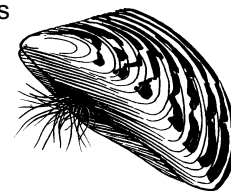
Classroom tables, desks, and/or the floor

Length of Stay

Two class periods

Invader Background Check

Exotic species are organisms that are brought into an ecosystem that is not their own. These organisms attempt to fill the niche of organisms that are already present. There is a limited amount of resources in any environment. Adding new species means that species already present now have more competition for food and shelter. If an exotic species does well, it usually means a preexisting species begins to decrease in numbers through intense competition for ecosystem resources.



Exotic species have been introduced into new environments both intentionally and unintentionally. For example, purple loosestrife was introduced for landscaping purposes. Other species, such as zebra mussels, were transferred unintentionally through the ballast water of ocean freighters.

Foreign Language

Alewife
Eurasian watermilfoil
Exotic species
Fishhook flea

Indigenous species
Niche
Organism
Purple loosestrife

Round goby
Sea lamprey
Zebra mussel

Amenities Provided

Rival for Survival game board found in “Posters and Games”
Game Cards 15.1–15.6
Rival for Survival game Instructions 15.7

Things to Pack

Dice
Movable game pieces
Paper for keeping score
Pen or pencil



Itinerary

Preparing for the activity

1. Copy and assemble the game boards for each learning group. See “Travel Tips” for a way to prepare the game board and other materials.
2. Copy game cards and instructions. Copy one set of cards for each game (matching front and back by letters, such as “Front a” to “Back a”). Copy one game instruction page for each game.

First class period: Introducing and playing the game

3. Divide students into cooperative learning groups of two to five people.
4. Provide an introduction to exotic species. Ask the following questions:
What are exotic species?
How do you think exotic species affect the environment?
(See “Invader Background Check.”)
5. Explain that students will be playing this game to learn about exotic species—how they affect the ecosystem and how our actions affect the control or spread of exotic species.
6. Distribute the games and materials. Read the directions and rules of the game. Explain that students will be allowed to play the game for the majority of the class hour. Establish a time limit for play so that they are aware that all points will be counted at a certain time.
7. Clean up with five minutes left in class.

Second class period: Building concept maps

8. Give each student a sheet of paper and request that a concept map be developed for the term “exotic species.” Ask the following questions to direct students to the relevant topics that should be included:
Can you name some exotic species?
What are the potential problems of taking a species out of its natural habitat?
How did some exotic species get transported to the Great Lakes region?
9. After their individual concept maps have been collected for evaluation, create a “class” concept map for the term “exotic species” using an overhead projector or the chalkboard. Discuss how their concept maps compare to the one the class created.

Directions

1. The objective of the game is to have the most points when all players have reached the “Finish” position, at the Great Lakes.
2. Each player rolls the die, and the player with the highest number goes first.
3. Player 1 rolls the die and moves the playing piece the number of spaces shown on the die. Player 1 chooses a question card and hands it to the player on the left, who reads the question aloud. Player 1 chooses the best answer.
4. Points received are based on the player’s answer and are recorded on the score sheet.
5. When landing on a space that requires the player to move ahead or backward, the player moves the game piece before picking a question card.
6. Some answers will cause a player to lose points. If the player has no points, however, he or she cannot go below zero, even if told to subtract a point.
7. Play continues in a clockwise direction until all players reach the Great Lakes region or the time limit is reached. The player with the **most points** is the winner—not the player who reaches the Great Lakes first. Finishing first may not necessarily be a good thing in this game!

Travel Tips

- ✿ Here is a great way to preserve and store your games. Glue each game board inside a file folder, and glue the game instructions on the back of the folder. For each game, make an envelope to store the cards for that game. Laminate everything: the folders, the game cards, and the envelope. Place the envelope into the file folder. Then it’s ready to store.
- ✿ To help the game move more smoothly, you can
 - Make sure you keep the numbers in the cooperative groups as low as possible.
 - Have each player keep track of his or her own score on a sheet of paper, or assign one scorekeeper per group if you feel there will be arguments about the scores.
 - Assign one student to pick up and return the game so that there is no confusion at the end.
- ✿ This activity relates to several 9th Grade Proficiency Test Learning Outcomes [noted for the state of Ohio but likely relates to other states as well]:
 - Science: Trace the flow of energy and/or interrelationships of organisms in an ecosystem.
 - Science: Describe how a given environmental change affects an ecosystem.
 - Citizenship: Identify opportunities for involvement in civic activities.

Debriefing

Use a rubric similar to the following to evaluate the concept map and assess what the students have learned:

Exotic Species Concept Map Rubric

Demonstrates what an exotic species is	1
Mentions at least three exotic species	3
Includes one method of transport of exotic species	1
Includes one way native species are affected	1

Total: 6

Sample Concept Map Information

Exotic species are nonindigenous organisms that have invaded an ecosystem.

Some exotic species are purple loosestrife, goldfish, zebra mussels, sea lamprey, and starlings.

Some were transported intentionally by people, such as purple loosestrife for landscaping.

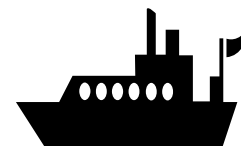
Some were transferred unintentionally, such as zebra mussels, through the ballast water of ocean freighters.

If exotics do well, they can lower the numbers of some native species in an ecosystem through intense competition for the ecosystem resources.

Extending the Visit

- ✿ Take a field trip to places where students can observe actual specimens of exotic species. If possible schedule a talk by park staff or a water-resource manager knowledgeable about the effects of the organisms and any actions that have been taken to control them.
- ✿ Add more questions to the game that are geared specifically to your curriculum.

Places to Go



Web Sites

Great Lakes Information Network (GLIN)

Main Web site: <http://www.great-lakes.net>

Exotic Species Web site: <http://www.great-lakes.net/envt/flora-fauna/invasive/invasive.html>

National Aquatic Nuisance Species Clearinghouse Web site: <http://www.entryway.com/seagrant>

U.S. Geological Survey, Biological Resources Division

Nonindigenous Aquatic Species Web site: <http://nas.er.usgs.gov>

Fact Sheets and Publications

Great Lakes Commission. *ANS (Aquatic Nuisance Species) Update* quarterly newsletter. View at the Great Lakes Commission Web site: <http://www.glc.org/ans/ansupdate/ansupdate.html> or e-mail: shwayder@glc.org

Multimedia

Zebra Mussel Information System CD-Rom, available from the U.S. Army Corps of Engineers:

Waterways Experiment Station

3909 Halls Ferry Rd.

Vicksburg, MS 39180

Phone: 601-634-2972

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Adapted from: http://www.iisgcp.org/education/rival_lesson.pdf