

Ripple Effects

Lesson 02: Find 7 Ways Aquatic Invaders Are Spread

Grade Level

6th

Subject

Science

Class Time

1 CLASS PERIOD

Next Generation Science Standards

www.nextgenscience.org/

MS-LS2-2

MS-LS2-4

MS-LS2-5

MS-ESS3-3

Great Lakes Literacy Principles

www.cgll.org/purpose-principles/

Principles 5, 6, 8



TRANSPORTZERO.ORG

Activity at a Glance

Aquatic invasive species (AIS) can be introduced into new bodies of water through various human pathways. Being aware of these pathways is one step that people can take in preventing future infestations.

Objectives

Students will be able to:

- Name and recognize seven ways that AIS can be introduced into new bodies of water by people.
- Describe how to avoid the spread of AIS.

Materials

- Find 7 Ways Aquatic Invasives are Spread student activity
- Computers or tablets with internet access for student use

Vocabulary

- Angler
- Bait well
- Boat trailer
- Great Lakes
- Hunting decoy
- Hydroplane
- Invasive species
- Pontoon
- Predator
- Propeller
- Recreationist
- Watercraft
- Scuba gear

Background

Aquatic invasive species are organisms that have been introduced, either intentionally or unintentionally, into an ecosystem that is not their own. For example, if an angler releases bait after fishing, or if someone dumps aquarium plants in a local waterway, they could be unintentionally introducing AIS into the environment. These non-native organisms create additional competition for food and shelter, burdening species that were already present in the ecosystem. Because AIS lack natural predators their populations increase rapidly, and they begin to take over an area. It is almost impossible to eliminate them once they dominate a habitat. It costs tens of millions of dollars each year to control AIS. Students need to become aware of how native species in an ecosystem depend on each other to survive and the steps we can take to make a difference in keeping our waterways clean and healthy.

Helpful Hints

- Prior to completing this activity, students should have a general understanding about issues associated with aquatic invasive species.

Procedure

1. Students can work on this activity independently, or in small groups of 2–3.
2. Provide each student with a copy of Find 7 Ways Aquatic Invaders are Spread activity to complete.
3. Provide a brief introduction to AIS. In their groups, have students work cooperatively to find seven ways that AIS are spread. Students should visit <https://www.transportzero.org/> and <http://stopaquatic hitchhikers.org/> to gather tips and clues on ways to control their spread.
4. Facilitate a brief class discussion about the 7 ways AIS are spread and ways to prevent it.

Wrap-Up

- Evaluation is based on the written responses to questions assigned in the Find 7 Ways Aquatic Invaders are Spread activity. The answers should indicate that students have gained understanding in finding the information requested.

Extension

1. One of the most important lessons students can learn in a unit about AIS is how to stop the spread of invaders. Working in groups, students could generate hypothetical solutions to a local environmental imbalance or destructive invasion.
2. A community stewardship project could include writing to congressional representatives about improving laws to prevent further AIS spread, creating a video to share on YouTube, or partnering with a community organization to raise awareness about AIS issues.
3. Students could research and report on current problems involving AIS and discuss successful control measures used to reduce spread.

4. Visit <https://iiseagrant.org/education/students-ask-scientists/> to learn about the Illinois-Indiana Sea Grant Students Ask Scientists program, where you can invite a scientist to be a guest speaker to talk with your students about AIS research and management.
5. Students could research and report on the importance of the Great Lakes regarding industry, recreation and tourism, agriculture, commercial and sports fisheries, forestry, and mining.

Resources

Websites:

Transport Zero: <https://www.transportzero.org/>

Great Lakes Information Network: <https://www.glc.org/work/ais>

U.S. Geological Survey, Nonindigenous Aquatic Species: <https://nas.er.usgs.gov/about/default.aspx>

Great Lakes Aquatic Nonindigenous Species Information System: <https://www.glerl.noaa.gov/glansis/>

Illinois-Indiana Sea Grant Websites:

Aquatic Invasive Species: <https://iiseagrant.org/work/aquatic-invasive-species/>

Sea Grant takes AIM at AIS: <http://www.iiseagrant.org/newsroom/sea-grant-takes-aim-at-ais>

What's in your water garden? Learn more about AIS: <http://www.iiseagrant.org/newsroom/whats-in-your-water-garden-learn-more-about-ais>

Biologists can be heroes too: <http://www.iiseagrant.org/newsroom/biologists-can-be-heroes-too>

Credits

Originally created for ESCAPE Compendium, Great Lakes Sea Grant Network

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This lesson has been reviewed for content and accessibility by the Center for Great Lakes Literacy.

**What's wrong with this picture?
Find 7 Ways Aquatic Invaders Are Spread**



**What's wrong with this picture?
Find 7 Ways Aquatic Invaders Are Spread**





Student Activity: Picture Puzzle

Name _____ Date _____ Class Period _____

Directions: Answer the questions below based on the Find 7 Ways Aquatic Invasives are Spread picture. Explore <https://www.transportzero.org/> or <https://stopaquatic hitchhikers.org/> for additional information.

1. What vehicle can transport zebra mussels on its pontoons? How can this be prevented?

2. Which watercraft can act as an effective carrier of aquatic invaders? How can the owner of this watercraft prevent the unintentional spread of aquatic invaders?

3. What enjoyable indoor hobby creates problems in local ponds and rivers? How can this be prevented?

4. What does this recreationist wear that can move species to other water bodies? How do you think this could be prevented?

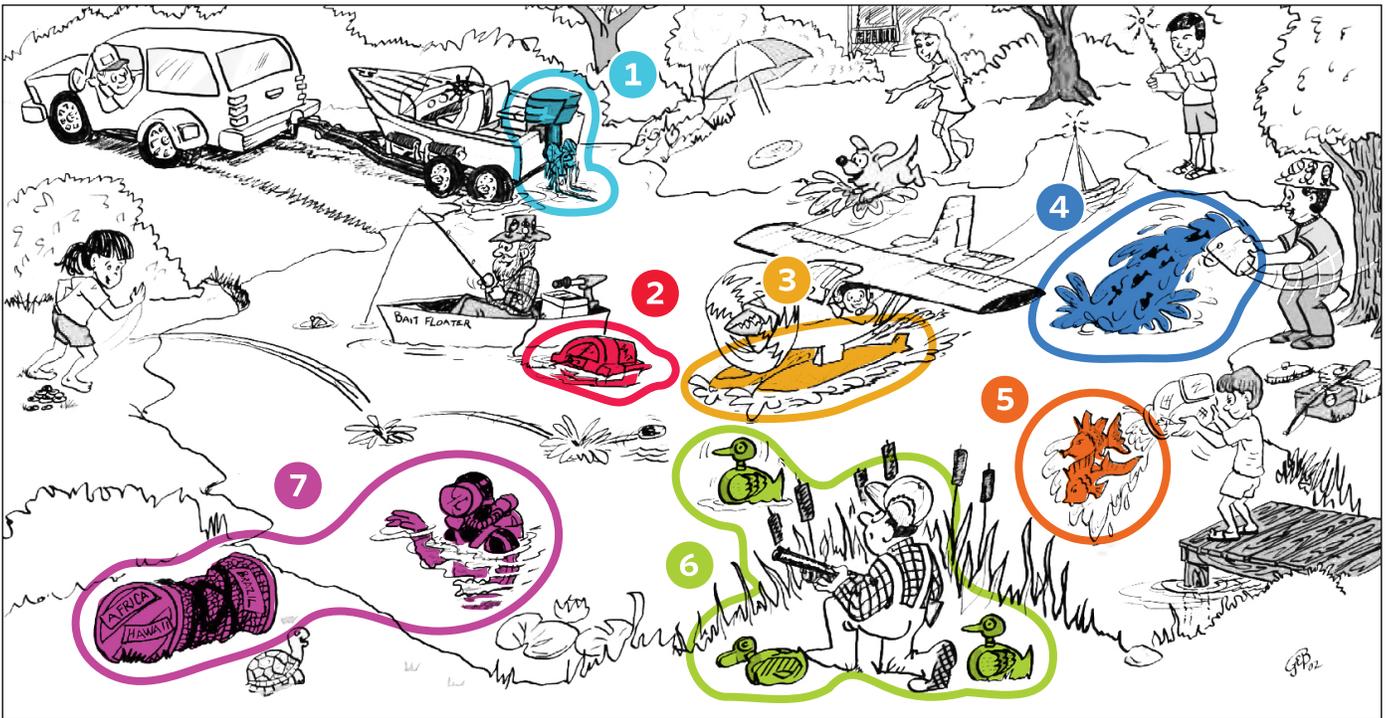
5. How do hunting decoys spread AIS? How do you think this could be prevented?

6. Where should anglers (fishermen) dispose of bait that is no longer needed? Why is it important to dispose of live bait properly?

7. If you catch more fish than you want, what's wrong with throwing them into a different lake or river?

Student Activity: Picture Puzzle

What's wrong with this picture? Find 7 Ways Aquatic Invaders Are Spread



1. Boat, 2. Fishing Bait, 3. Seaplane, 4. Releasing Fish, 5. Releasing Pets,
6. Hunting Decoys, 7. Scuba Gear



Find 7 Ways Aquatic Invasives are Spread Picture Puzzle

Directions: Answer the questions below based off the Find 7 Ways Aquatic Invasives are Spread picture. Explore <https://www.transportzero.org/> or <https://stopaquatic hitchhikers.org/> for additional information.

Accept all reasonable responses.

1. What vehicle can transport zebra mussels on its pontoons? How can this be prevented?

Seaplane is the correct answer. However, if students answered "boat" thinking of a pontoon boat, this response would also be correct. Pilots should be aware of the status of AIS in waterbodies they travel in, to avoid the possible infestations and the pontoons should be cleaned and dried before moving to a new water body.

2. Which watercraft can act as an effective carrier of aquatic invaders? How can the owner of this watercraft prevent the unintentional spread of aquatic invaders?

The correct answer is boat. Boat trailer and seaplane are also appropriate answers. Invasive species can cling to the boat motor/propeller, and the trailer. Some steps to prevent the spread of AIS are: 1) clean vegetation from boat, trailer, and equipment, 2) flush the motor, bait wells, and live wells, and 3) let the boat air-dry for 5 days.

3. What enjoyable indoor hobby creates problems in local ponds and rivers? How can this be prevented?

Aquarium plants and animals typically are not from lakes and ponds within the United States. If they are dumped into a waterbody, these fish could possibly breed and reproduce. If released, aquarium plants and animals can outcompete native species, causing them to suffer and die. Never dump aquarium pets or plants into a water body. Seek out rehoming pets or humane disposal.

4. What does this recreationist wear that can move species to other water bodies? How do you think this could be prevented?

Scuba gear. All scuba equipment should be properly cleaned and dried after each use. Even clothing and scuba tanks can be a mode of transportation for aquatic invaders.

5. How do hunting decoys spread AIS? How do you think this could be prevented?

Invasive plants and animals, like Hydrilla and zebra mussels, can attach to hunting decoys and be carried to another lake, river, or pond. As with all equipment used in water, decoys should be properly rinsed off and dried after each use.

6. Where should anglers (fishermen) dispose of bait that is no longer needed? Why is it important to dispose of live bait properly?

"In the trash" is the best answer. Like aquarium fish, bait fish should never be released into a body of water. The proper way to dispose of unwanted minnows, worms and fish parts is in the trash. Some types of bait fish can reproduce rapidly and cause havoc for native fish.

7. If you catch more fish than you want, what's wrong with throwing them into a different lake or river?

All fish that will not be eaten should only be released back into the waterbody from which they were taken. Non-natives introduced into a new ecosystem can disrupt the food web.