

**CLASSROOM ACTIVITY**

# Invasive Species

It's war in many ecosystems around the world as invasive and native species battle for primacy. Facing the increased exchange of ship ballast water among worldwide ports, biologists are grappling with a rate and scale of alien takeovers unprecedented in history. In this Bio Bulletin, see the mussels and crayfish that are stressing the vast freshwater network of the Great Lakes region, and learn what researchers are doing to give native populations a leg up.

## CLASS DISCUSSION

### Establish Prior Knowledge

Before watching the video discuss invasive species with students. Ask them to describe the ways invasive species colonize new habitats and how they might affect the ecology and economy of those areas. Tell them that over 120 invasive species are threatening the ecology of the Great Lakes. In this video, scientists are collecting data on these species in hopes of finding an effective way of controlling them.

### Exploration

Have students view the Feature and read the synopsis. Ask students to take notes while they are watching the video about the species scientists are studying and their hypotheses about how they might be eliminated.

Divide the class into three teams. Assign one of the invasive species to each team to read and report on. Have each team answer the following questions:.

- How did the species get to the Great Lakes Region?
- How does the species disrupt the ecosystem and economy?
- What is being done to stop or eliminate the species?

### Quagg and Zebra Mussels

[http://www.great-lakes.net/teach/pollution/ans/ans\\_2.html](http://www.great-lakes.net/teach/pollution/ans/ans_2.html)

[http://www.wgmt.com/news/great\\_1345016\\_article.html/lakes\\_says.html](http://www.wgmt.com/news/great_1345016_article.html/lakes_says.html)

### Rusty Crayfish

<http://www.biopoint.com/rustywebpage/rustywebpage.html>

<http://www.sciencedaily.com/releases/2006/08/060828074913.htm>

### Asian Carp

<http://www.epa.gov/glnpo/invasive/asiancarp/>

<http://www.glc.org/announce/06/07wrda.html>

## Wrap-Up

When groups are ready, have them report their findings to the rest of the class. Use the following question to wrap-up the activity:

- What might be the next step for scientists if their methods for eliminating invasive species are not effective?

### The Scientific Method

Research scientists use the Scientific Method (see page two) to investigate the natural world. You can use *Invasive Species* to illustrate how scientists formulate and test hypotheses about how to address the problem of invasive species in the Great Lakes.

# Scientific Process

The Scientific Method is a dynamic and open-ended process that scientists use when they investigate a question they have. It is not a series of prescribed steps that scientists follow to prove a hypothesis. Rather, it's a general plan that helps guide their investigation. And while all scientists use the Scientific Method, they might not use all the steps, or they may complete the steps in a different order. For example, a scientist might make observations and collect data about a subject that interests him or her for years before formulating a hypothesis.

## DEFINING A QUESTION TO INVESTIGATE

As scientists conduct their research, they make observations and collect data. The observations and data often lead them to ask why something is the way it is. Scientists pursue answers to these questions in order to continue with their research. Once scientists have a good question to investigate, they begin to think of ways to answer it.

## FORMING A HYPOTHESIS

A hypothesis is a possible answer to a question. It is based on: observations scientists make, existing theories, and information they gather from other sources. Once they have a hypothesis, scientists can begin to think about how to test it.

## TESTING A HYPOTHESIS

Evidence is needed to support or disprove the hypothesis. There are several strategies for collecting evidence. Scientists can gather their data by observing the natural world, performing an experiment in a laboratory, or by running a model. Scientists decide what strategy to use, often combining strategies. Then they plan a procedure and gather their data. They make sure the procedure can be repeated, so that other scientists can evaluate their findings.

## ANALYZING THE DATA

Scientists organize their data in tables, graphs, diagrams, and even photographs. If possible, they check the data by comparing it to data from other sources. They are looking for patterns that show connections between important variables in the hypothesis they are testing.

## DRAWING CONCLUSIONS

Scientists must decide whether the data clearly support or do not support the hypothesis. If the results are not clear, they must rethink their procedure. If the results are clear, scientists write up their findings and results to share with others. The conclusions they draw usually present new questions for them to pursue.