

Exotic Plant Invasion Lesson Plan

Students debate the "worst" invasive plant, consider impacts of climate change on invasives.

Lesson Summary: Students will learn how Florida's lakes are being invaded by exotic plants, and use real data from the Water Atlas to examine and graph the number of species, percentage of exotics and number of pest plants in their local lakes.

Grade Level: Upper elementary, Grades 3-5

Time Allotted: 1-5 hours

Performance Objectives

References are to the Next Generation Sunshine State Standards (2007).

Science

- SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
- SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.
- SC.5.L.15.1 Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.
- SC.5.L.17.1 Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

Math

- Big Idea 2 Develop an understanding of and fluency with addition and subtraction of fractions and decimals.
- MA.5.A.6.4 Compare, order, and graph integers, including integers shown on a number line.

Key Vocabulary

Exotic

A species introduced to Florida, purposefully or accidentally, from a natural range outside of Florida.

Hydrilla

An aquatic, invasive plant from Asia, *Hydrilla verticillata*, that is arguably Florida's worst. State and local governments spend millions each year on chemicals and chopping machines in an effort to control it. It chokes waterways and prevents swimming and boating.

Exotic Plant Invasion Lesson Plan

Students debate the "worst" invasive plant, consider impacts of climate change on invasives.

Invasive exotic

An exotic that not only has naturalized, but is expanding on its own in Florida native plant communities.

Native

A species whose natural range included Florida at the time of European contact (1500 AD).

Naturalized exotic

An exotic that sustains itself outside cultivation (it is still exotic; it has not "become" native).

Materials

- Computer with internet access
- Spreadsheet and presentation software (optional)
- Material for preparing presentations

References

The following documents are available in the Orange County Water Atlas Digital Library:

[Comparison of Plants in Six Orange County Lakes](#)

Compiled from data supplied by the Orange County Environmental Protection Division.

[What You Can Do](#)

Source: Hillsborough County Adopt-A-Pond Program

Other References:

Florida Exotic Pest Plant Council

<http://fleppc.org/>

Florida Plant Atlas

<http://florida.plantatlas.usf.edu/>

Hydrilla Page

<http://plants.ifas.ufl.edu/node/183>

Orange County Water Atlas

<http://www.orange.wateratlas.usf.edu/>

Plant Management in Florida Waters – Non-native Invasive Plants

<http://plants.ifas.ufl.edu/guide/invplant.html>

Florida Invasive Plant Education Initiative and Curriculum

<http://plants.ifas.ufl.edu/education/>

For instructions on how to create graphs using Microsoft Excel, visit these links:

[Demo: Create charts in Excel 2007](#). Accessed July 2011. Microsoft, Inc.

[Video: Create a chart \(or graph\)](#). Accessed July 2011. Microsoft, Inc. (*Applies to Microsoft Office Excel 2003*).

Exotic Plant Invasion Lesson Plan

Students debate the "worst" invasive plant, consider impacts of climate change on invasives.

Procedure

Engage/Elicit

1. Ask students what they know about the lakes near your school. Have they fished, floated, swam or walked by them?
2. Now tell them that many of Florida's lakes are being invaded! Ask them what they think might be invading the lakes. Make a list of their guesses.

Explore & Explain

1. Discuss with students the concepts of *native*, *exotic*, *naturalized* and *invasive* species. The resource ***Plant Management in Florida Waters*** website contains excellent descriptions to help you understand; you may also want to browse the ***Florida Exotic Pest Plant Council*** site and the ***Florida Plant Atlas***. Hydrilla makes a good example, as it "rises up" from the bottom of lakes to "grab" swimmers and stop boats by tangling itself in their propellers. Florida spends over ten million dollars a year trying to control it with chemicals and choppers. The ***Hydrilla Page*** in resources has great background and details.
2. Have students examine the document **Comparison of Plants in Six Orange County Lakes** (see references). Have them answer the following questions:
 - a. For each lake, find:
 - the number of different kinds (species) of plants it has
 - the percentage of species that are invasive
 - the percentage of species that are native
 - b. Which lake has the most different kinds (species) of plants? Which has the fewest?
 - c. Which lake has the most different kinds of invasive plants? Which has the fewest?
 - d. Which of the invasive plants seem to be the most common?
 - e. Which lake do you think is the healthiest, in terms of its plant life? Why do you think so? (There is no right answer to this question, but students should be able to convincingly argue their positions.)
 - f. Have students choose one invasive plant species to investigate as a group. They should decide among themselves what questions they want to answer about it, such as: Where did it come from? How long has it been here? How did it get "loose"? How does it spread? Is it useful to people or to wildlife? Is it a problem everywhere in the country (or state), or just in this area? How big a problem is it? What are we doing/can we do to get rid of it? Once they have decided on their questions, they should work together, with the guidance of the teacher, to answer them in a short report. They may wish to illustrate the report by making a drawing of the plant, the way it is spread, a public service poster about it, etc. Each group can then report their findings to the class.

Exotic Plant Invasion Lesson Plan

Students debate the "worst" invasive plant, consider impacts of climate change on invasives.

Extend

- Discuss some of the relevant points on the **What You Can Do** document (See resources), which lists ways students and their families can help prevent the spread of pest species.
- Bring in some hydrilla, water hyacinth, Brazilian pepper or another invasive plant to show the class. Be sure to treat it like an invasive – do not let it loose in your school's watershed! (*Note: You are required to have a permit to collect and remove vegetation, even for educational purposes. For information, visit the [Florida Wildlife and Conservation Commission's website.](#)*)
- If it is practical, visit one of the lakes with your class, or encourage them to visit with their parents. Or visit another lake near your school and try to identify the invasive plants in or around it.
- Consider one of the most important limiting factors in plant invasions – temperature. Using the range maps on the Florida Plant Atlas, as well as plant lists on the **Florida Exotic Pest Plant Council** website, have students consider what might happen in a variety of climate change possibilities. Students might tally how many invasive plants now problematic in South Florida might extend their ranges into Orange County if temperatures rise. Often it is the "hard" freezes that limit ranges – are they getting better or worse right now?

Exchange/Evaluate

- Have students present their invasive plant reports to the rest of the class. Ask everyone to decide which plant they think is the "worst" invader.
- The student reports, and/or their presentations, may be used to assess their knowledge and effort.

Curriculum developed for Orange County Environmental Protection Division by USF's Florida Center for Community Design & Research. This material is based upon work supported by the Department of Energy under Award Number DE-EE0000791.

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.