

Hydrilla and Brazilian Elodea

Use the case study, lesson plan, activities, assessment questions, and Aquatic Invader Investigator page to enhance student understanding of hydrilla and Brazilian elodea and connect these organisms to the community. Assign assessment questions as a homework assignment, or use the questions for classroom discussions or final evaluation.

CASE STUDY

Hydrilla Threat: 27 Acres of Plant Found in Cayuga

<http://www.ithacajournal.com/story/news/local/2017/04/12/cayuga-lake-hydrilla-infestation/100370106/>

Hydrilla Treatment Scheduled for Lake Hatchineha

<http://myfwc.com/news/news-releases/2017/february/27/hatchineha-treatment/>

About hydrilla and Brazilian elodea

Hydrilla (*Hydrilla verticillata*) and Brazilian elodea (*Egeria densa*) are invasive aquatic plants that occupy freshwater habitats. While hydrilla is native to Asia, Africa, and eastern Australia, and Brazilian elodea is native to South America, both plants are invasive to North America. Both of these plants were initially sold for use in aquariums and aquatic gardening, but they became established in water bodies through their intentional release. Both plants can quickly infest underwater habitats, with twisting, submersed vegetation that can produce a dense, impenetrable canopy at the water's surface. This interferes with native plant growth and impedes recreational activities such as boating or swimming. Hydrilla and Brazilian elodea outcompete native species by growing rapidly in lakes, ponds, marshes, and streams.

LESSON PLAN

1. **How to Manage Killer Plants.** Guide your students through a scientific experiment looking at different ways to kill Brazilian elodea.
2. **EDRR Tag Game:** Through playing a fun and action-filled tag game, we will explore how exposure

time, the number of invasive species, and the role of early detection can impact or protect the population of native species.

3. **Hazardous Paths to the Columbia Gorge:** Hazard Analysis and Critical Control Point (HACCP) planning is an important tool for managing harmful invasive species. HACCP planning engages students' critical thinking and logic skills to determine when and where to control the invasive species on its pathway of spread. Students will use HACCP planning to identify pathways for invasive species spread. This exercise is based on the actual HACCP plan for electrofishing activities used by the Lower Great Lakes Fisheries Resource Office.

LEARNING ACTIVITIES

1. **Classroom Takeover:** This activity can be made specific to aquatic environments and help students grasp the idea of how invasive plants can affect their new environment. Discuss the effects that hydrilla and Brazilian elodea have on other plants, animals, and even humans. <http://www.tbep.org/isteachers-guide/PDF/classroomtakeover.pdf>
2. **Design the Perfect Plant:** Through building knowledge of plant structures and functions, this activity challenges students to create and draw the "perfect" plant for their ecosystem. This can be altered for a variety of age groups, depending on the amount of research and background presented to the students. [http://www.weedcenter.org/education/docs/Science_Scope_Article\[1\].pdf](http://www.weedcenter.org/education/docs/Science_Scope_Article[1].pdf) (<http://www.weedcenter.org/education/k-12.html>)

Be careful not to spread invasives: Any time you visit a natural area, either in the water or on dry land, you could be spreading invasive species. Before you leave for the field trip, it is important to inspect your boots, nets, or any other gear to make sure they do not have seeds or other plant material attached. You should also check and clean your boots and gear before you leave the field site.

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ADDITIONAL RESOURCES

Non-native, Invasive Freshwater Plants

<http://www.ecy.wa.gov/programs/wq/plants/weeds/>

USGS Fact Sheets:

Hydrilla: <https://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=6>

Brazilian Elodea: <https://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=1107>

Center for Invasive Species Management (Montana)

Invasive Species Outreach and Education K-12
<http://www.weedcenter.org/education/k-12.html>

ASSESSMENT QUESTIONS AND ANSWERS

1. What is hydrilla's native home? What is Brazilian elodea's native home? *Hydrilla is native to Asia, Africa, and eastern Australia. Brazilian elodea is native to South America.*
2. What is the most likely way hydrilla and Brazilian elodea were introduced to the United States? *The aquarium trade and shipment is most likely how they were introduced.*
3. How long can hydrilla stems grow? How long can Brazilian elodea stems grow? *Hydrilla can grow up to more than 9 meters, and Brazilian elodea can grow to more than 5 meters.*
4. What nutrients essential to plant growth are taken up by hydrilla and Brazilian elodea? *Nitrogen, phosphorus, and potassium.*
5. What are some problems caused by hydrilla and Brazilian elodea? *They reproduce quickly, creating thick, dense mats. This allows them to shade and outcompete other species. They can cause reductions in dissolved oxygen concentrations. These characteristics create alterations to the structure, function, and chemical concentrations of the native habitats.*
6. Why is hydrilla used in vitamin supplements? *Because it is high in calcium, iron, and vitamin B-12.*
7. Give a few examples of how elodea and hydrilla are spread once they are introduced. *Boating, fishing, shipping bait, irrigating, ingestion by birds, and aquaculture.*
8. Describe the difference between monoecious and dioecious. *Monoecious denotes a plant that can develop both male and female flowers on the same plant. Dioecious denotes a plant that can develop either male or female flowers on different plants.*
9. What is one cool fact on hydrilla? What is one cool fact on Brazilian elodea? Do you think it is important for people to know these facts? Why? *Variable answers*
10. What can people do to help prevent the spread of hydrilla and Brazilian elodea? *Clean, Drain, and Dry! Always inspect and remove any invasive species from your boat, live well, bait bucket, waders, and any equipment that enters the water.*

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WHAT DO YOU KNOW?

- 1 What is hydrilla's native home? What is Brazilian elodea's native home?
- 2 What is the most likely way hydrilla and Brazilian elodea were introduced to the United States?
- 3 How long can hydrilla stems grow? How long can Brazilian elodea stems grow?
- 4 What nutrients essential to plant growth are taken up by hydrilla and Brazilian elodea?
- 5 What are some problems caused by hydrilla and Brazilian elodea?
- 6 Why is hydrilla used in vitamin supplements?
- 7 Give a few examples of how elodea and hydrilla are spread once they are introduced.
- 8 Describe the difference between monoecious and dioecious.
- 9 What is one cool fact on hydrilla? What is one cool fact on Brazilian elodea? Do you think it is important for people to know these facts? Why?
- 10 What can people do to help prevent the spread of hydrilla and Brazilian elodea?