

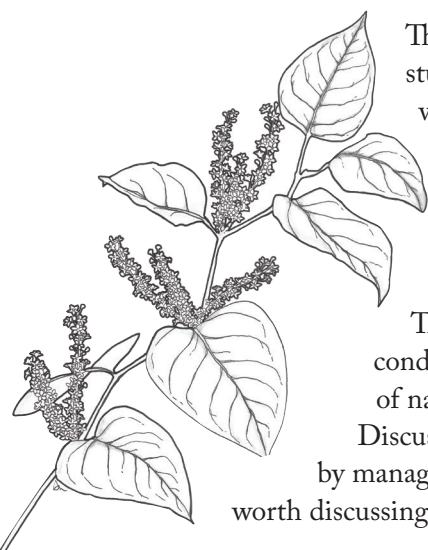
Knotweed

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

LEARNING ACTIVITIES

- **Polygonum Positions**
- **Lesson: How Fast Can It Spread?**
- **Learning Comprehension Questions**

POLYGONUM POSITIONS: TO USE OR NOT TO USE HERBICIDES



This is a writing project that asks students to take a position about whether or not one should use herbicides to control invasive species such as knotweed in riparian areas.

Note to teacher

This project may be adapted to conduct a formal cost/benefit analysis of natural-area management decisions. Discussion may address challenges faced by managers and decision makers. It is also worth discussing bias associated with each informa-

tion source. Are the authors trying to promote the goals of the agency they represent by presenting the information in a certain way?

Instructions

You are the director of a nature reserve that is managed for maintaining healthy streams for salmon. You recently discovered that a large section of a stream is infested with Japanese knotweed. You have to decide whether or not to use herbicides to control the knotweed. Your research paper will consist of your explanation of why you decided for one option and why you decided against the alternative. Be sure to back up your decision with data, evidence, and examples. The following resources might be useful.

- 1 Article on the role of riparian vegetation for stream quality. See <http://www.kingcounty.gov/environment/animals-and-plants/noxious-weeds/weed-identification/invasive-knotweeds.aspx>
- 2 Review the knotweed Species Guide from the Menace to the West Curriculum to understand the negative impacts of knotweed on riparian areas.
- 3 Controlling Knotweed in the Pacific Northwest. See <http://www.invasive.org/gist/moredocs/polssp01.pdf>.
- 4 Comparison chart for risks of selected herbicides used on knotweed. Created by University of California Statewide Integrated Pest Management Program. See <http://www.ipm.ucdavis.edu/TOOLS/PNAI/pnaicompare.php?pn=7484&cx=126&cy=32>.

SPECIES GUIDE ASSESSMENT QUESTIONS AND ANSWERS

- 1 **Where is knotweed from?**
Asia.
- 2 **How did knotweed get here?**
Knotweed was first introduced to North America in the late 19th century, for ornamental purposes.
- 3 **How fast and how tall does it grow?**
Knotweed grows up to 8 cm a day and reaches heights of 3 m or more.
- 4 **What is knotweed's preferred habitat?**
Sunny areas with moist soil.
- 5 **What are the differences and similarities between Japanese and giant knotweed?**
Giant knotweed is taller.
- 6 **What is knotweed's ecological function in its native range?**
Knotweed facilitates ecosystem development and plant succession on lava fields.

7 How is knotweed's interaction with other plants in its native habitat different from its interaction with plants in the habitat it has invaded?

In its native habitat, knotweed dies back in the center of its patches, allowing other plants to grow. In its invasive range, there is no central die back, so knotweed prevents the growth of native plants, primarily by shading.

8 How does it reproduce in its native habitat?

It can reproduce both by seed and by vegetative growth.

9 How does it reproduce and spread in its invaded habitat?

Although it does produce viable seed, it is thought to reproduce and spread primarily vegetatively.

10 Name three ways knotweed can disperse to a new site.

Fragments of the plant can be taken to a new site by movement of dirt with construction activities, purposeful planting, or by being washed downstream in a flood.

11 Why is the Pacific Northwest particularly prone to knotweed invasions?

The Pacific Northwest has a high number of flood-prone waterways and associated riparian areas.

12 What is a riparian area?

The area of land adjacent to a stream or lake that is influenced by and has an influence on the water. That is, where the water and the land interact.

13 Why is riparian vegetation important?

- a** *Helps control nonpoint source pollution by holding and using nutrients and reducing sediment.*
- b** *Recreation and scenic values. However, because riparian areas are relatively small and occur in conjunction with watercourses, they are vulnerable to severe alteration and damage caused by people.*
- c** *Food, cover, and water for a large diversity of aquatic and terrestrial animals and serve as*

migration routes and stopping points between habitats for a variety of wildlife.

- d** *Stabilize stream banks and reduce floodwater velocity, resulting in reduced downstream flood peaks.*

14 How does knotweed affect riparian vegetation?

It out-competes native riparian vegetation, replacing it with a monoculture of knotweed.

15 Knotweed leaf litter has reduced nutrient value as compared to some common native riparian plants. How might this affect the stream food web?

Will compromise food source for macroinvertebrates that graze on algae growing on leaf litter. Because salmon and other fish feed on aquatic macroinvertebrates, this loss of invertebrates may affect fish food resources, too.

16 You are a land manager, and it is your job to eradicate (remove permanently) a small patch of knotweed from a riverside. What are some steps you can take, as part of your control project, to prevent knotweed from spreading?

Make sure to collect and contain all plant fragments.

17 How do you know that your control project has been successful? In other words, how do you know that you have PERMANENTLY removed knotweed from the site?

Continue to monitor the site every year for five years, to make sure you don't see any regrowth.

18 Congratulations! You have successfully eradicated knotweed from a site. Does this mean you are "done"? Is this site now permanently weed-free? What reason(s) would you give to a land manager to explain why this plant should be actively managed?

Dramatic and detrimental effects on ecosystem; ability of knotweed to spread rapidly and pervasively.