

# TEACHER OVERVIEW

Invasive Plants

6th — 8th Grade

## Nature Vision Student Packet

The materials contained within have been created by Nature Vision, an environmental education nonprofit organization that brings programming to schools and local greenspaces for over 70,000 PreK-12th grade students each year in King and Snohomish Counties. This work from home curriculum materials packet is designed to foster an understanding of invasive plants. Packets can be completed either independently, or with the help of an adult caregiver. Each day of the week offers materials building on previous days learning, offering a variety of activities including art, writing, and field exploration.

These materials are provided to you by King County Noxious Weed Control Program. The program works throughout King County to prevent and reduce the economic, environmental, and social impacts of noxious weeds in King County, Washington. Their focus is to provide education and technical assistance to landowners and public agencies to help everyone find the best control options for noxious weeds on each site and to reduce the overall impact of noxious weeds throughout the county. Learn more by visiting: <https://kingcounty.gov/weeds>.

This unit supports NGSS Performance Expectations across various disciplines, as well as supporting K-12 Integrated Environmental and Sustainability Standards. These are listed at the bottom of this page. Teachers will be supplied with PDF formats of materials to be emailed to families, or teachers may print and send to students to complete at home.

In this packet, students will learn about invasive plants, what makes a plant a noxious weed, and the harm these species can do to the environment if they are allowed to spread. Students will study invasive plants that they might find in King County specifically, before exploring the environmental impacts these plants have on our local communities. With this in mind, students learn about different methods of controlling noxious weeds, then create a plan for how they can do their part to address the issue of noxious weeds in their community.

If you have any further questions or concerns regarding this packet, please email our Office Coordinator at [info@naturevision.org](mailto:info@naturevision.org).

### Grades 6-8

**Supports NGSS Performance Expectations:** MS-LS2-1, MS-LS2-4, MS-ESS3-3, LS2.A, LS2.C, ESS3.C.

Grades 6-8
Day 1 - Invasive Plants and Noxious Weeds
Day 2 - In Your Community
Day 3 - Independent Exploration
Day 4 - Prevention and Best Management Practices
Day 5 - Plan a Solution

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# PARENT/CAREGIVER OVERVIEW

Invasive Plants

6th — 8th Grade

Welcome to Nature Vision's student packet for home use. Nature Vision is an environmental education nonprofit organization that brings programming to schools and local greenspaces for over 70,000 PreK-12th grade students each year in King and Snohomish Counties. We are excited to be offering this version of our programming directly to students at home!

This packet is designed to be completed over the course of one week, with each day focusing on a different aspect of environmental science and stewardship. The majority of these materials can be completed independently, but we thought it would be important to provide background information for any adults who may be helping to complete or answer questions. We've included the basic learning objectives for each day along with some vocabulary.

These materials are provided to you by King County Noxious Weed Control Program. The program works throughout King County to prevent and reduce the economic, environmental, and social impacts of noxious weeds in King County, Washington. Their focus is to provide education and technical assistance to landowners and public agencies to help everyone find the best control options for noxious weeds on each site and to reduce the overall impact of noxious weeds throughout the county. Learn more by visiting: <https://kingcounty.gov/weeds>.

Challenge yourself to post all the things you are doing with your friends and family to help control the spread of noxious weeds! Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAInvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!

*Please contact [info@naturevision.org](mailto:info@naturevision.org) with any questions or concerns  
Stay connected with Nature Vision! Follow us for updates @naturevisionorg*



**NOTE: Students may require support in reading directions and/or completing some tasks. While many activities in this packet are creatively oriented and open ended, you may consult the answer key located at the back of the packet for additional assistance or guidance.**

Unless otherwise noted, images courtesy of King County Noxious Weed Control Program

# PARENT/CAREGIVER OVERVIEW: DAY 1

## Invasive Plants and Noxious Weeds

**Background Information:** Native plants have been living in an area for a very long time and have specifically adapted to live there. In contrast, introduced species are plants or animals which have been brought to an area by humans. Introduced plants may travel from place to place as seeds stuck to people's clothing, or hidden in goods shipped across long distances. Some are transported knowingly to be grown in gardens. When an introduced plant has negative impacts on local flora and fauna, it is an invasive plant. Invasive plants grow and spread more rapidly compared to native plants, and negatively impact our ecosystems in the Pacific Northwest.

Noxious weeds are invasive plants that have such a strong negative effect on the environment, agriculture, or people that they are actively controlled by the government, and by determined volunteers across King County.

**Learning Objectives:** Students will be able to describe the difference between native and invasive plants. They will also be able to describe what makes a plant a noxious weed. Students will be able to name a few ways invasive plants travel from place to place and what traits might allow a noxious weed to spread quickly. Lastly, students will be able to explain the impact invasive noxious weeds can have on ecosystems.

### **Main Activity: Traits of Noxious Weeds**

- **Overview:** Students examine the adaptations which make noxious weeds capable at taking over ecosystems
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Noxious Weeds Abroad**

- **Overview:** Students read about how a plant native to Western America became a noxious weed in Europe
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Noxious Weed Charades**

- **Overview:** Students share their knowledge of native plants, invasive plants and noxious weeds with someone else, with a twist!
- **Parent/Caregiver Tasks:** Listen to your student share their thoughts and ideas with you

### **Optional Activity: Noxious Weed Stewardship Challenge**

- **Overview:** Students complete a daily stewardship challenge related to noxious weeds
- **Parent/Caregiver Tasks:** If possible, help students share their work on social media



# PARENT/CAREGIVER OVERVIEW: DAY 2

## In Your Community

**Background Information:** There are many noxious weeds which have found their way into King County. From the toxic tansy ragwort and giant hogweed to fast-spreading Himalayan blackberry and Scotch broom, you don't have to look far to find a noxious weed near you! Fortunately, organizations like the King County Noxious Weed Control Program are tracking these weeds and organizing efforts to control their spread.

**Learning Objectives:** Students will be able to locate noxious weeds in their community.

### **Main Activity: Neighborhood Bullies**

- **Overview:** Students look at a list of different noxious weeds to determine if they have seen them in their community
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Plant Imposters**

- **Overview:** Students examine pairs of plants to spot which are noxious weeds and which are not
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Noxious Weed Sample**

- **Overview:** Students collect a sample of a noxious weed and preserve it to show others
- **Parent/Caregiver Tasks:** Accompany the student outside if it is safe to do so, help them determine if plants are safe to touch and safely interact with them, and (if possible) help students share their work on social media with the hashtag #kingcountyweeds

### **Optional Activity: Noxious Weed Stewardship Challenge**

- **Overview:** Students complete a daily stewardship challenge related to noxious weeds
- **Parent/Caregiver Tasks:** If possible, help students share their work on social media



# PARENT/CAREGIVER OVERVIEW: DAY 3

## Independent Exploration

**Background Information:** Invasive plants that are severely impacting ecosystems in Washington State are added to a list of noxious weeds that the Washington State Noxious Weed Control Board (WSNWCBC) draws up yearly. The WSNWCBC classifies weeds as one of three classes: Class A (i.e. this weed is found in a limited range and needs to be eradicated before it can spread more), Class B (i.e. this weed is found in a somewhat limited range, and should be eradicated or contained), and Class C (i.e. this weed is very prevalent). The state mandates action against all Class A weeds and selected Class B weeds that are still limited in parts of the state. Counties decide whether to require control of any other Class B or C noxious weeds, and which weeds should be recommended for action or volunteer efforts.

**Learning Objectives:** Students will be able to conduct research to help explain why a particular plant is considered a noxious weed and summarize their findings to other people through visual media.

### **Main Activity: Getting to Know a Noxious Weed**

- **Overview:** Students research a particular noxious weed of their choice using the provided resources
- **Parent/Caregiver Tasks:** Determine whether students have the option to do research online about a noxious weed that may be found in your neighborhood

### **Optional Activity: Local Action**

- **Overview:** Students investigate local measures being taken to control noxious weeds
- **Parent/Caregiver Tasks:** Provide supervision of students using the internet

### **Optional Activity: Noxious Weed Stewardship Challenge**

- **Overview:** Students complete a daily stewardship challenge related to noxious weeds
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media



# PARENT/CAREGIVER OVERVIEW: DAY 4

## Prevention and Best Management Practices

**Background Information:** There are many measures taken to reduce the threat of noxious weeds. Prevention is one of the most effective measures. Some examples of prevention are brushing off hiking boots before we leave the hiking area, never dumping home aquariums into bodies of water, and choosing to plant native plants in our home gardens. When a noxious weed does take over an area, there are many steps we can take to either eradicate (i.e. remove completely) or control it (i.e. prevent the noxious weed from spreading). The most effective measures to use against a particular plant are called the Best Management Practices.

**Learning Objectives:** Students will be able to identify best practices for controlling and preventing spread of noxious weeds.

### **Main Activity: Let's Pull Together!**

- **Overview:** Students read a blog post from the King County Noxious Weed Control Program about controlling a few types of noxious weeds
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Prevention is the Best Medicine**

- **Overview:** Students look at images and determine how to better do these activities without spreading noxious weeds
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Responsible Planting**

- **Overview:** Students will design a garden or restoration project focusing on native plants
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Noxious Weed Stewardship Challenge**

- **Overview:** Students complete a daily stewardship challenge related to noxious weeds
- **Parent/Caregiver Tasks:** If possible, help the student share their work on social media



# PARENT/CAREGIVER OVERVIEW: DAY 5

## Plan a Solution

**Background Information:** Noxious weeds are a human-caused problem, and we have to be part of the solution. One of the most important things we can do to help control noxious weeds is to be vigilant and report noxious weeds around us. We can also take other precautions like brushing hiking boots to prevent seed spread and organizing community events to control or eradicate noxious weeds.

**Learning Objectives:** Students will generate an actionable plan to help control the spread of noxious weeds in their community.

### **Main Activity: Realistic Best Management Practices**

- **Overview:** Students look at the established Best Management Practices for a noxious weed and determine if they are appropriate for their community
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Noxious Weeds Pledge**

- **Overview:** Students take the Noxious Weeds Pledge, understanding that they are an important part of preventing the spread of noxious weeds in their communities
- **Parent/Caregiver Tasks:** None

### **Optional Activity: Letter Writing**

- **Overview:** Students write a letter teaching an adult about the importance of controlling noxious weeds
- **Parent/Caregiver Tasks:** If possible, help students share their work on social media

### **Optional Activity: More Information**

- **Overview:** Students read about resources to learn more and consider how they can apply what they have learned
- **Parent/Caregiver Tasks:** Provide supervision

### **Optional Activity: Noxious Weed Stewardship Challenge**

- **Overview:** Students complete a daily stewardship challenge related to noxious weeds
- **Parent/Caregiver Tasks:** Accompany the student outside if it is okay to go out. If needed, help the student share their work on social media



# PARENT/CAREGIVER OVERVIEW: VOCABULARY

## DAY 1

**Adaptation:** A trait a living thing has that helps it survive

**Allelopathy:** When a plant uses chemicals in the soil to slow or prevent the growth of other nearby plants

**Biodiversity:** How many types of animals, plants, and other living things are found in an ecosystem, where more living things in an ecosystem indicates that the ecosystem is healthy and strong

**Ecosystem:** An interconnected system of plants, animals, and inorganic parts (e.g. water, soil nutrients, and sunlight)

**Evolve:** A change in the traits and characteristics of a species over generations

**Introduced Plant:** Any type of plant that was brought to an area by humans

**Invasive Plant:** A plant that spreads quickly and takes up resources that ecosystems need

**Native Plant:** A plant which has evolved in an area for a very long time and become part of an ecosystem

**Noxious Weed:** An invasive plant which has such strong negative effects on an ecosystem that it is monitored by public offices

**Nutrient:** A chemical necessary for something to live, such as nitrates, phosphates, and potassium

**Opportunistic:** Able to quickly spread into unused areas

**Weed:** A plant growing in a place where it is not wanted

## DAY 2

**Infestation:** When a species has taken over enough of the resources in an area to negatively affect the ecosystem

**King County Noxious Weed Control Program/Board:** A part of the King County government that tracks noxious weeds and provides people the information and expertise to remove them

## DAY 3

**Control:** To prevent a plant from spreading to a wider geographic area

**Eradicate:** To remove any traces of a plant, including roots, seeds, and leaves

**Washington State Noxious Weed Control Board:** The Washington State government organization that determines what plants are noxious weeds, tracks noxious weeds, and gives people resources to remove them

## DAY 4

**Best Management Practices:** The most effective strategies for getting rid of noxious weeds

**Erosion:** The wearing down of rocks and soil by wind and weather that damages hillsides and fills bodies of water with dirt

**Herbicide:** A chemical that was created to kill plants

**Prevention:** Stopping a noxious weed from spreading further in an ecosystem, or into a new one

## DAY 5

**Extinct:** All of the members of this species have died out in the wild

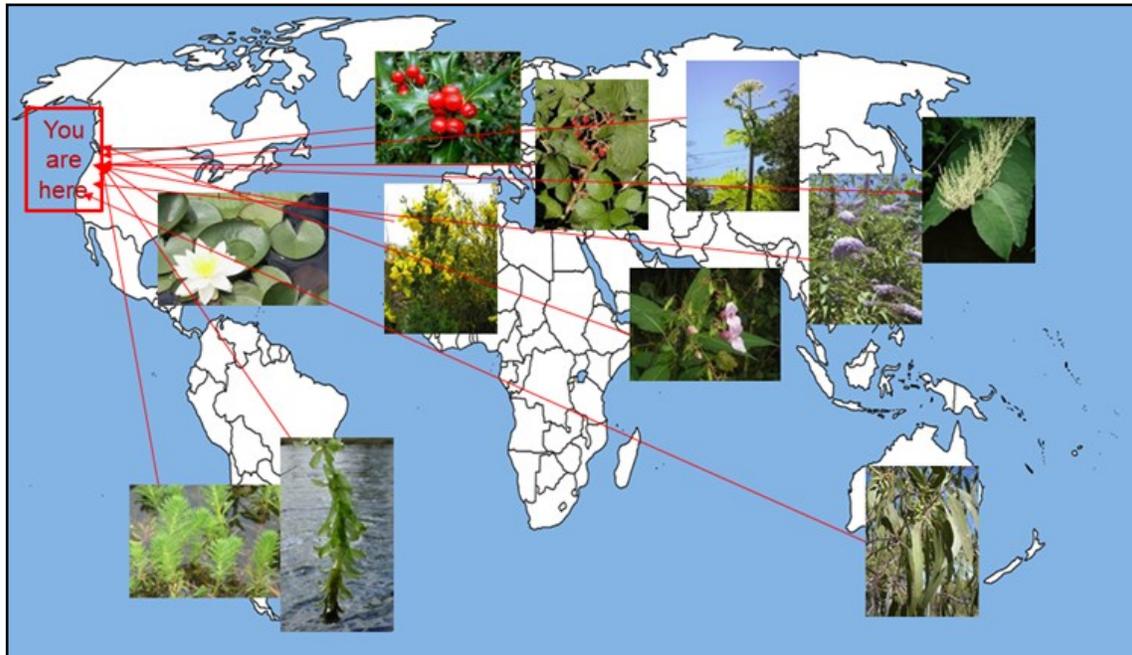
**Stewardship:** The duty we have to take care of the natural world around us



# DAY 1

## Invasive Plants and Noxious Weeds

A **native plant** is a species which has been living in an area for a very long time, and as such occupies a particular place in the local **ecosystem**. In contrast, an **introduced plant** is a plant that was brought here from a different ecosystem, usually from a distant part of the world with a similar climate to ours here in the Pacific Northwest. Humans have many motivations for bringing plants from elsewhere in the world. Some are plants used for agriculture or as popular ornamental garden plants. Sometimes, these plants were even brought to the Pacific Northwest unintentionally. On rare occasions, a plant that is introduced to the Pacific Northwest becomes invasive, meaning that it spreads quickly via seeds, roots or vines and takes over ecosystems. Invasive plants are ones that become bullies when they spread into ecosystems. They have fast-growing roots and leaves that absorb a lot of water, soil **nutrients**, and sunlight. Once they've taken up resources that our ecosystems need, these invasive plants produce thousands of seeds to take over even more of the ecosystem.



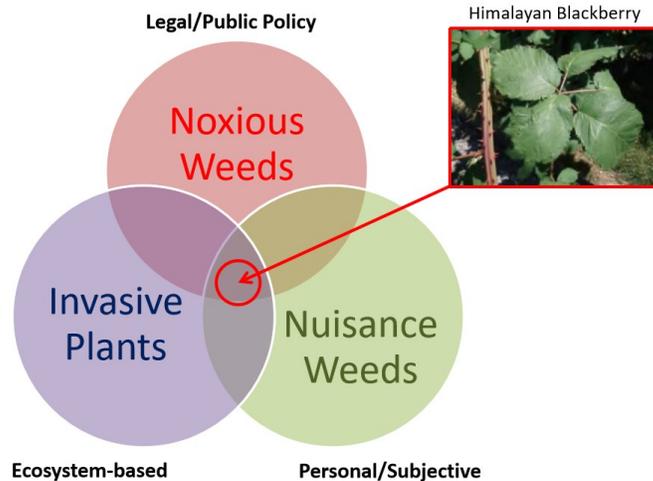
Invasive plants are also **opportunistic**, growing quickly into new openings. In one common scenario, an ancient Douglas fir tree is blown over in a windstorm, creating an opening in the forest canopy where understory plants can now grow. If invasive plants are present in the ecosystem, they will move quickly into this new opening, preventing Douglas fir seedlings or native understory plants like sword fern, salal or Oregon grape from creating new habitat and food sources for the animals that live in the forest. When this happens, we refer to these plants as **weeds** because they are growing in a place where they aren't wanted.



More worrying still are **noxious weeds**, which are opportunistic, invasive plants that cause such serious problems in our ecosystems that they are controlled by our local government. We call these plants weeds no matter where they are growing because they are plants that we don't want growing anywhere in King County.

Because they are invasive and opportunistic, these noxious weeds spread quickly and reduce the **biodiversity** of forests, prairies, rivers, lakes, and streams throughout the Pacific Northwest. Some noxious weeds are even hazardous to humans trying to remove them.

*Himalayan blackberry falls into all three categories, and is also an introduced species.*



### **Vocabulary**

**Adaptation:** A trait a living thing has that helps it survive

**Allelopathy:** When a plant uses chemicals in the soil to slow or prevent the growth of other nearby plants

**Biodiversity:** How many types of animals, plants, and other living things are found in an ecosystem, where more living things in an ecosystem indicates that the ecosystem is healthy and strong

**Ecosystem:** An interconnected system of plants, animals, and inorganic parts (e.g. water, soil nutrients, and sunlight)

**Evolve:** A change in the traits and characteristics of a species over generations

**Introduced Plant:** Any type of plant that was brought to an area by humans

**Invasive Plant:** A plant that spreads quickly and takes up resources that ecosystems need

**Native Plant:** A plant which has evolved in an area for a very long time and become part of an ecosystem

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**Nutrient:** A chemical necessary for something to live, such as nitrates, phosphates, and potassium

**Opportunistic:** Able to quickly spread into unused areas

**Weed:** A plant growing in a place where it is not wanted



# Main Activity

## Traits of Noxious Weeds

Noxious weeds wreak havoc on the ecosystems they are introduced to. This is because they have **adaptations** that help them take up soil nutrients, sunlight and water from the native plants that form the backbone of ecosystems. But in their natural habitats, these adaptations were how noxious weeds **evolved** to survive in their ecosystem.

Let's find the adaptations that make invasive plants and noxious weeds such a problem.

**Materials:** Writing utensil, coloring materials

The pictures below show some of the common adaptations that noxious weeds have evolved. Label each picture with the adaptation it is showing you. When you're done, pick five of these traits to build a noxious weed of your own. Describe how these traits help your plant take over an ecosystem, and then draw it in the space on the last page of this activity.



Himalayan blackberry stem



Bittersweet nightshade (photo credit Katholieke University Leuven)



Giant knotweed (imagine being a smaller plant underneath this knotweed. Does the knotweed affect your ability to grow?)



English ivy



Hairy willow-herb (imagine trying to pull this weed out of the soil. Is it easy?)



Milk thistle seeds



Brazilian elodea on a diver.



Bull thistle



Fragrant waterlily



Policeman's helmet



Spurge laurel

Now that you've identified these adaptations, pick five and describe how they help your noxious weed take over below:

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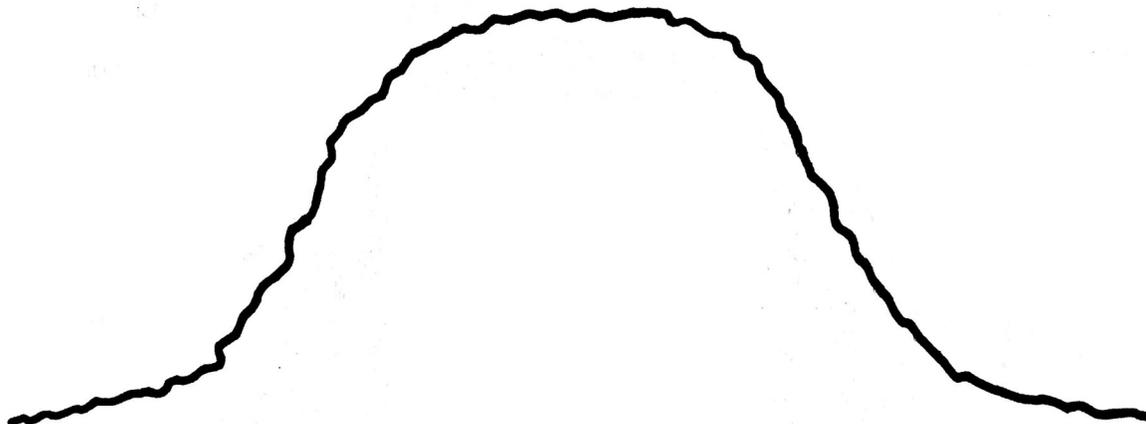
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Draw your noxious weed:



## Optional Activity

### Noxious Weeds Abroad

Plants native to the Pacific Northwest can also become invasive plants if they are introduced to ecosystems in other parts of the world, as in the example below. Read through the excerpt from the article. Highlight the information that you think is the most important, and then answer the questions below.

**Materials:** Writing utensil

**From: “Lupine Invasions” by Marie Davie, in Science Connected**

Source: <https://magazine.scienceconnected.org/2016/10/lupine-invasions/>

*Lupinus polyphyllus*, the big-leaved lupine, is native to the western United States and Canada, from British Columbia and Alberta south to California and east to Montana, Idaho, and Nevada—but in Norway and the rest of Europe it is an introduced invader. In many European countries, lupines have escaped from household gardens where they were originally planted for their vivid blossoms. Once on the loose, they rapidly colonize disturbed habitats such as roadsides, where they are particularly well adapted to spread and thrive.

*What makes this plant so well adapted to spread? Nutrient-poor soils in marginal habitats are less of a barrier to lupine than to most native plants because of lupine’s two specialized mechanisms for acquiring essential nutrients including nitrogen, phosphorous, and potassium.*

*However, once established, the effects of this invader are mixed. Despite enriching soils and making habitats more suitable for other species, lupine does not share well with others. The overall number of plant species in areas invaded by lupine actually decreases as the quick-growing, tall lupines shade later-emerging, shorter native plants and outcompete them.*

*And it’s not just other plants that can be negatively impacted by lupine invasions. In Finland, lupines have a bottom-up effect on the ecosystem, decreasing the number and diversity of moths and butterflies occurring in invaded areas, as they are a poor food source for these insects.*



**Article Questions:**

How did lupine arrive in ecosystems in Norway?

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Why is lupine causing problems?

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Based on the text, what is a “bottom-up” effect? Define it in your own words.

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## Optional Activity

### Noxious Weed Charades

Many people understand that weeds can be a nuisance in their gardens, but not that they are equally dangerous to our ecosystems if they are invasive. Spreading the word is vital! How do we get people to care when they're "just plants"?

**Materials:** (Optional for video chat) computer/phone/tablet, internet connection

**With adult permission**, get in touch with a sibling, parent, or friend, either in person, over the phone or with video chat. Teach them the difference between native plants, introduced species, invasive plants and noxious weeds *without* using words. This is a great time to get creative! Show them the picture you drew or act out how invasive plants and noxious weeds take over.

Too easy? See if you can describe a noxious weed using only song lyrics!



## Optional Activity

### Noxious Weed Stewardship Challenge for Day 1

There are many different plants in King County. Most of what we grow in our gardens are native or introduced plants, while very few are noxious weeds. Let's take a look at just a few of the plants below. They are from the two extremes, either native plants or noxious weeds.

**Materials:** Writing utensil, computer/phone/tablet, internet connection

Take a look at the following plants. Read through their descriptions and decide whether these are native plants or noxious weeds. Highlight evidence from the description. Now look at the plants you suspect are noxious weeds. How do you think they may have travelled to King County? What actions can we take to prevent these plants from spreading more?

**With an adult**, post a photo of this plant on social media and challenge your neighbors to identify it. Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAINvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!



**Salal:** This plant has leathery leaves and fruits which were eaten fresh or dried by Native Americans.



**Garlic Mustard:** This European food plant is allelopathic, meaning it releases chemicals to kill nearby plants.



**English Ivy:** This climbing vine has waxy leaves. It can completely cover other plants and kill them by blocking sunlight. The weight of the vines can also make it easier for wind to knock branches down.



**Sword Fern:** This large fern prefers growing in shady areas beneath towering Douglas Fir and Western Red Cedar Trees.





**Bleeding Heart:** This delicate wildflower prefers moist forests and stream banks. It relies on ants to spread its seeds.



**Purple Loosestrife:** Each of these purple-flowered plants can produce up to 2 million tiny seeds each year. The stems grow so densely in wetlands that animal species cannot swim through.



**Snowberry:** This plant's tiny white berries are an important food source for quail, grouse, deer, and elk, but they are poisonous to people.



**Osoberry:** Also called "Indian plum", these fruits form early in spring, making them important sources of nutrients for bears, raccoons, and other mammals.



**Tansy Ragwort:** This plant lives in pastures and meadows, and can poison horses and cows. Its seeds can live in soil for 15 years, re-growing every spring even if it has been pulled.



**Herb Robert:** Also called "stinky Bob", this smelly plant spreads quickly through woodland areas.



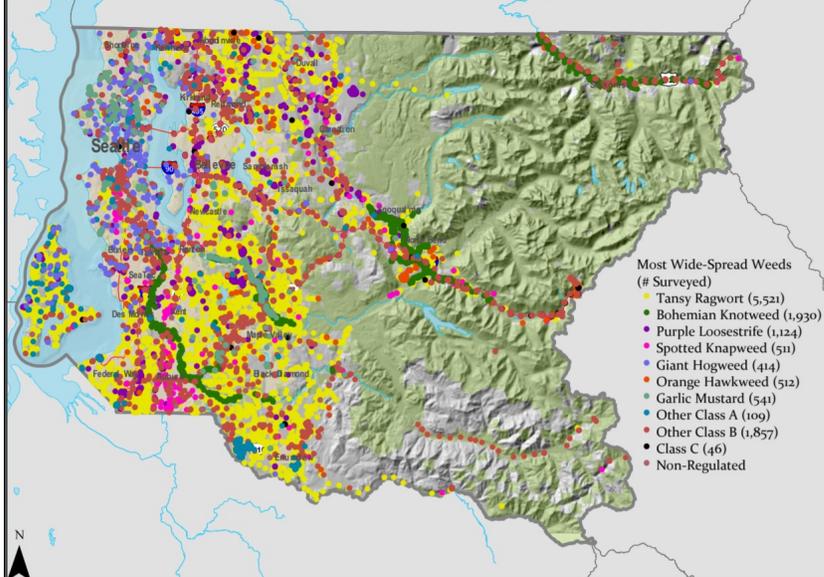
# DAY 2

## In Your Community

Noxious weeds are a spreading problem in King County. Every year, Himalayan blackberry takes over acres of our local parks, creating a hostile environment for birds and butterflies. English ivy sickens and knocks over trees, endangering people and preventing those trees from absorbing carbon dioxide and producing oxygen. Tansy ragwort takes over fields, poisoning horses, cows, and sheep who mistake it for safe grazing grass. Giant hogweed towers over other plants and covers unwary gardeners with terrible burns and scars.

However, there are members of your community that are working to prevent the spread of noxious weeds, to remove them where practical, and to stop new species from invading King County. The **King County Noxious Weed Control Program** is a group of King County staff that organizes events to remove noxious weeds from our parks, tracks the spread of noxious weeds throughout our neighborhoods, and teaches people how to safely remove these hazards from their gardens and lawns. These efforts are made possible because people in your community help out by reporting noxious weeds, volunteering their time to remove them, and spreading knowledge to their neighbors.

King County Noxious Weed Control Program: All Surveys 2017



Check out the map here: <https://kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/maps.aspx>

### **Vocabulary**

**Infestation:** When a species has taken over enough of the resources in an area to negatively affect the ecosystem

**King County Noxious Weed Control Program/Board:** A part of the King County government that tracks noxious weeds and provides people the information and expertise to remove them

# Main Activity

## Neighborhood Bullies

Noxious weeds are found throughout King County and in your neighborhood. If you are able, go to the King County Noxious Weed Control Program Website **with an adult** and use the interactive map to find your neighborhood. Use the “Noxious Weeds” layer to see plants that have been found near you. Or, if you do not have access to the website, check out the “Neighborhood Bullies” handout on the next few pages. Have you seen any of these plants before? In your school yard or a nearby park? Maybe even in your own backyard? After taking a look, answer the questions below!

King County Noxious Weed Control Program maps: <https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/maps.aspx>

**Materials:** Writing utensil

Are there any large-scale **infestations** in your community? Of what species?

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What problems could these noxious weeds cause?

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What adaptations are helping these weeds take over?

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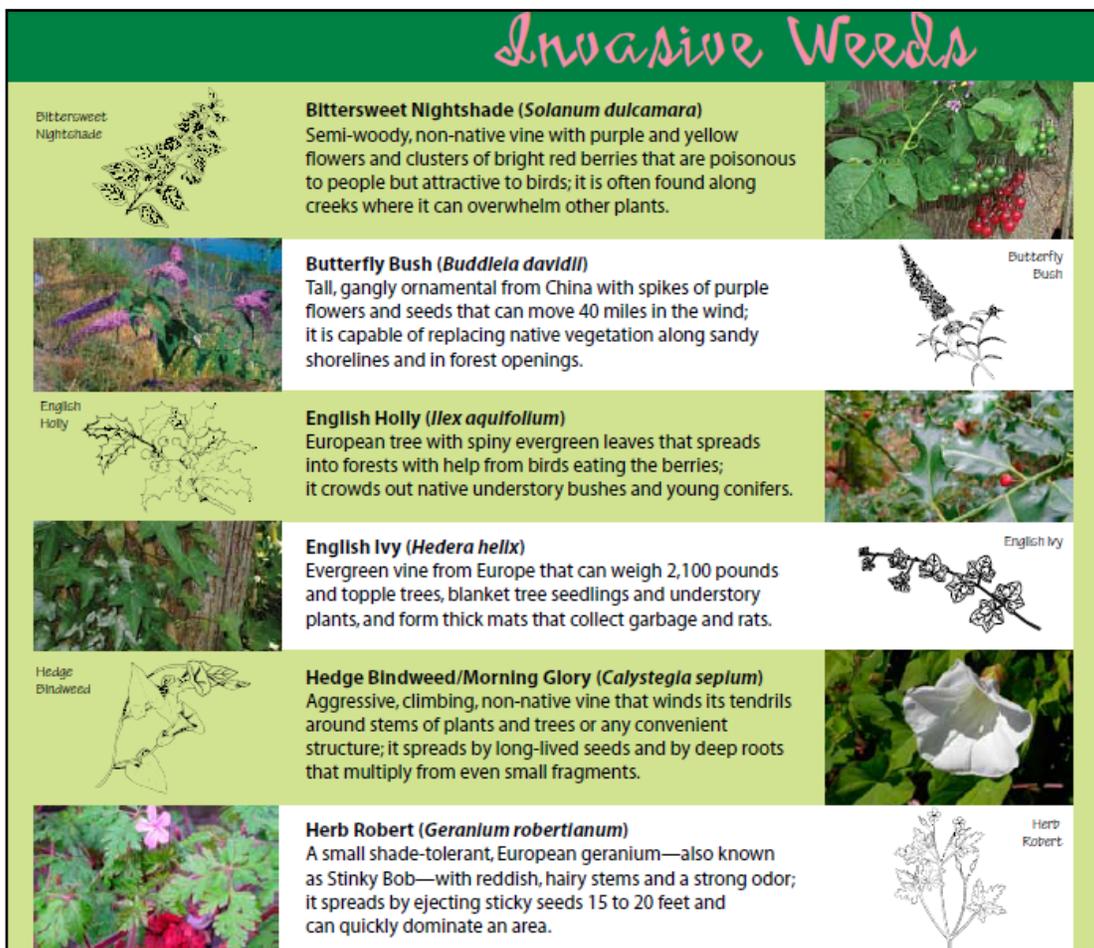
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**“Neighborhood Bullies” Pamphlet:**

Source: <https://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Neighborhood-Bullies.pdf>



The pamphlet features a green header with the title "Invasive Weeds" in a pink, cursive font. Below the header, there are seven rows, each representing a different invasive species. Each row includes a photograph of the plant, a botanical line drawing, a name in bold, and a descriptive paragraph. The species listed are: Bittersweet Nightshade, Butterfly Bush, English Holly, English Ivy, Hedge Bindweed/Morning Glory, and Herb Robert.

Species	Description
<b>Bittersweet Nightshade (<i>Solanum dulcamara</i>)</b>	Semi-woody, non-native vine with purple and yellow flowers and clusters of bright red berries that are poisonous to people but attractive to birds; it is often found along creeks where it can overwhelm other plants.
<b>Butterfly Bush (<i>Buddleia davidii</i>)</b>	Tall, gangly ornamental from China with spikes of purple flowers and seeds that can move 40 miles in the wind; it is capable of replacing native vegetation along sandy shorelines and in forest openings.
<b>English Holly (<i>Ilex aquifolium</i>)</b>	European tree with spiny evergreen leaves that spreads into forests with help from birds eating the berries; it crowds out native understory bushes and young conifers.
<b>English Ivy (<i>Hedera helix</i>)</b>	Evergreen vine from Europe that can weigh 2,100 pounds and topple trees, blanket tree seedlings and understory plants, and form thick mats that collect garbage and rats.
<b>Hedge Bindweed/Morning Glory (<i>Calystegia sepium</i>)</b>	Aggressive, climbing, non-native vine that winds its tendrils around stems of plants and trees or any convenient structure; it spreads by long-lived seeds and by deep roots that multiply from even small fragments.
<b>Herb Robert (<i>Geranium robertianum</i>)</b>	A small shade-tolerant, European geranium—also known as Stinky Bob—with reddish, hairy stems and a strong odor; it spreads by ejecting sticky seeds 15 to 20 feet and can quickly dominate an area.

Himalayan Blackberry



**Himalayan Blackberry (*Rubus armeniacus*)**

Prolific, fast-growing brambles from Central Europe that can overwhelm most other plants, crowding out even small trees and covering nearly every available hillside and vacant area with its imposing thorny thickets.



**Knotweed (*Polygonum cuspidatum*, *Polygonum sachalinensis*, and *Polygonum bohemicum*)**

Massive, clump-forming, bamboo-like perennials from Asia that spread aggressively from stem and root fragments and crowd out native vegetation, degrade habitat, and increase erosion.



Japanese Knotweed

Old Man's Beard



**Old Man's Beard (*Clematis vitalba*)**

An aggressive deciduous, non-native vine, with woody stems up to 100 feet long that blankets entire groves of trees, and becomes festooned with masses of fluffy white seeds that spread in the wind.



**Poison-hemlock (*Conium maculatum*)**

Tall, non-native plant with stout, purple-spotted stems, parsley-like leaves and tons of small, umbrella-shaped flower clusters; often shows up in gardens, parks and roadsides and is deadly if eaten.



Poison-hemlock

Scotch Broom



**Scotch Broom (*Cytisus scoparius*)**

Yellow-flowered bush in the pea family from Scotland with very long-lived seeds that has spread widely into open areas and cleared forests throughout the region; it poses a fire hazard and invades grassy areas.



**Yellow Archangel (*Lamlastrum galeobdolon*)**

Fast-growing, tough European perennial ground cover with distinctive silvery-gray markings; it is very competitive in shady forests, spreads readily from yard waste piles, and crowds out understory plants.



Yellow Archangel

**The following HIGH PRIORITY noxious weeds are regulated in Washington and control is required on all properties in King County.**

Garlic Mustard



**Garlic Mustard (*Alliaria petiolata*)**

Shade tolerant, garlicky herb from Europe with small, white flowers that quickly takes over in woodlands, harms beneficial soil fungi, replaces native plants, and is extremely tenacious and difficult to eradicate.



**Giant Hogweed (*Heracleum mantegazzianum*)**

Imposing 15-foot tall plant from Russia with jagged leaves, huge flower clusters, and thick, purple-blotched stems that can create burns and blisters when handled; it has spread into parks, ravines, alleys and backyards.



Giant Hogweed

Policeman's Helmet



**Policeman's Helmet (*Impatiens glandulifera*)**

Up to ten feet tall, hollow-stemmed Asian annual with pinkish flowers that spreads quickly by shooting seeds 15 to 20 feet, grows in dense stands and quickly dominates gardens, parks, and wetlands.



# Optional Activity

## Plant Imposters

Some invasive plants look very similar to native plants that are important to our ecosystems. Others are nearly identical to edible introduced plants and have been accidentally eaten by people or animals. See if you can spot the dangers below!

**Materials:** Writing utensil

Compare the photos below. In each set, there is at least one noxious weed, and a plant that looks similar enough that people often pull it by mistake. Can you spot the difference? Use the info attached to help determine which is which. When you think you know which is a noxious weed, circle or draw arrows pointing to the parts of each plant that acted as clues for you to tell the difference.



English holly, a King County noxious weed of concern, is a large, dense, slow-growing evergreen tree or shrub found throughout King County, from natural areas to native forests. Plants reach 15-50 feet tall and 15 feet wide. 1-3-inch-long, thick, glossy, dark green, wavy, and usually spiny leaves grow alternately on stems. Small, whitish, sweetly scented flowers in winter lead to red, yellow, or orange berries. English holly berries are poisonous to humans and pets. In comparison, the native Oregon grape produces blue, edible berries. Its leaves are paired instead of alternating, with less pronounced points.



Both noxious weed herb Robert and native bleeding heart are low-growing plants found in shaded forest understory. Herb Robert's 5-petaled flowers are in all shades of pink and sometimes white, as opposed to the pink namesake flowers of native bleeding heart. Overall, herb Robert is covered with short glandular hairs, giving the plant a sticky feel and a distinct odor (sometimes this plant is known as "stinky Bob"), where bleeding heart is smoother. Shallow, weak roots make herb Robert easy to pull although large infestations can be highly labor-intensive to remove.



Trailing blackberry is a native species of blackberry in Washington that is smaller, generally grows along the ground, has narrow prickly stems instead of stout, star-shaped or ridged canes, and has only three narrower leaves instead of five rounded leaves like the invasive Himalayan blackberry. All species of blackberry have edible fruits, but the fruits on the native trailing blackberry are smaller (but tastier!).



The noxious weed giant hogweed is similar in appearance to our native cow parsnip, only it is much larger, the purplish blotches are more raised and bumpy, and the hairs on the under surface of the leaf are shorter (about .25 mm long). Cow parsnip seeds also tend to be wider at the base whereas giant hogweed seeds are more often elliptical, the same width at the base and seed tip.



(photo credit Ben Legler)

Flowering poison-hemlock may be confused with wild carrot (*Daucus carota*, or Queen Anne's Lace). In contrast with poison-hemlock, wild carrot has one densely packed umbrella-shaped flower cluster on a narrow, hairy stem, usually with one purple flower in the center of the flower cluster, and is usually 3 feet tall or less. Wild carrot also flowers later in the summer. While both species are invasive plants, wild carrot is not poisonous and causes less of an impact in King County. Poison-hemlock is poisonous to ingest and is controlled as much as possible especially in public places where people could be harmed by it.

## Optional Activity

### Noxious Plant Sample

Identifying noxious weeds can be a challenge, especially since many resemble other plants. Sometimes the best way to identify a plant is with a sample. By preserving a sample from a noxious weed, you can easily help others recognize the plant too.

**Materials:** A book (hardcover is ideal), paper towels, gloves (if possible)

**With an adult's permission**, head outside and see if you can find a noxious weed near where you live. If you are able, pull it up by the roots (gloves are recommended). Break off enough of the plant so you have some stem, leaves, and flowers if there are any. Throw the rest of the plant away (not in your compost pile where it could spread again). Take your sample, sandwich it between two paper towels, then lay the leaves and paper towels flat between the pages of a book. Place something heavy on top of the book to weigh the cover down. Allow this to sit overnight (and potentially longer, if you are patient). Attach a small piece of paper to your sample that includes its name, where you found it, and the date. Now you have a long lasting sample from a noxious weed you can show to others to teach them how to spot weeds on their own.

One way to share your plant would be using social media. If you do, don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAInvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!



*An English ivy sample ready to be pressed and labeled*

## Optional Activity

### Noxious Weed Stewardship Challenge for Day 2

Now that you know about invasive plants and noxious weeds, can you find them in your neighborhood? Are they growing in your own backyard? Can you spot any from your window or doorway at home? Think about your school campus. Were any growing there or around any of the entrances to your school?

**Materials:** Writing utensil, (optional) computer/phone/tablet and internet access

Check out King County's Neighborhood Bullies pamphlet online at <https://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Neighborhood-Bullies.pdf> or by looking back to the "Neighborhood Bullies" Main Activity for today to learn about the most common invasive plants in King County. In addition, check out these common noxious weeds listed on the next page. See if you can fill out the bingo card of noxious weeds on the page following the common noxious weeds by marking the ones you've been before!

A PDF version of the Noxious Weed Bingo sheet is available here: [https://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Noxious%20Weeds%20BINGO 3.35.20.pdf](https://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Noxious%20Weeds%20BINGO%203.35.20.pdf)

If you find a noxious weed, report it to the King County Noxious Weed Control Program on their website: <https://survey123.arcgis.com/share/c3b80813f7eb4471b0713d9c1275f774>.

Also, challenge yourself to post all the things you are doing with your friends and family to help control the spread of noxious weeds! Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAINvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!





English ivy is a vine that covers the ground and wraps around trees. It kills native shrubs and creates habitat for pest animals like mosquitos and rats. But this plant is the most dangerous when it wraps itself around a tree. The extra weight of the vines makes the unlucky tree more likely to fall in heavy wind, rain or snow storms. This plant was brought to the Pacific Northwest from England, where it is a popular garden plant because it stays green year-round. It can re-grow if the roots are left in the ground.



Think of the invasive vines of Himalayan blackberry as the “arch enemies” of native plants. They grow in arches over other, low growing plants, blocking out sunlight, and creating patches of dead soil. Their thorns injure animals seeking food or shelter. Although they are called “Himalayan”, these plants were brought here from Europe as a food source. Since then, they’ve spread all over the Pacific Northwest.

# NOXIOUS WEEDS

# B I N G O



Bull thistle



Old man's beard



Himalayan blackberry



Spurge laurel



Scotch broom



Garlic mustard



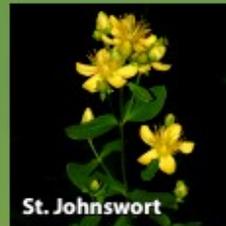
Ox-eye daisy



Bindweed



Tansy ragwort



St. Johnswort



English ivy



Herb Robert



Be a Weed Warrior - Stomp out Noxious Weeds  
www.kingcounty.gov/weeds



Knötweed



Creeping buttercup



Poison hemlock



English hawthorn



English holly



Yellow archangel



Yellow flag iris



Canada thistle



Butterfly bush



English laurel



Bittersweet nightshade



Giant hogweed

 **King County**  
Department of Natural Resources and Parks  
Water and Land Resources Division  
**Noxious Weed Control Program**  
www.kingcounty.gov/weeds

Report sightings of noxious weeds with the **King County Connect** app on your smartphone.



## DAY 3

### Independent Exploration

Now that we've had a chance to think about how noxious weeds spread and what makes them harmful to our local ecosystems, it's time to explore and learn about a few of the many different noxious weeds we might find around King County. We will start to think about how and why we fight these weeds.

Every year, the **Washington State Noxious Weed Control Board** (WSNWCB) creates a list of invasive plants found in Washington we should be concerned about. These plants are officially considered noxious weeds, and the WSNWCB sorts them into three categories to help county officials know how to deal with these noxious weeds. The three categories are Class A, Class B, and Class C noxious weeds. Some weeds do not have a class, but are still controlled by King County.

- Class A noxious weeds are not wide spread across Washington, which means through determined group effort, we can **eradicate** them entirely before they spread. Every county in Washington is required to help remove these weeds if spotted.
- Class B noxious weeds are found in parts (but not all) of Washington. It will be difficult to eradicate all of these plants, but we can keep them from spreading. The state requires some Class B noxious weeds to be eradicated, while some are up to the county to **control**. Check with your local county noxious weed authorities to find out how they are controlling each individual Class B weed.
- Class C noxious weeds are very widespread, so eradicating them is almost impossible (not to mention expensive). However, Class C noxious weeds can still be damaging to ecosystems, so individual counties may choose to control Class C weeds if they can.
- King County Weeds of Concern are plants not listed as noxious weeds by the state but are nonetheless problematic in King County. It is still recommended we all participate in preventing the spread of these weeds.

These classes of noxious weeds inform how we control noxious weeds. We are all required to help eradicate Class A noxious weeds. Even if Class B and Class C weeds are not controlled in your county, it is still helpful for ecosystems to prevent their spread.



The classes of noxious weed are summarized below. If you want to learn more, a list of all noxious weeds in Washington State sorted by class is available here:

<https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/laws/list.aspx>

### Class A noxious weeds

- Class A weeds are the most limited in distribution and therefore the highest priority for control

### Class B and C noxious weeds

- Class B and C weeds vary in priority based on local distribution and impacts

### Non-designated noxious weeds

- Noxious weeds that are widespread and control of them is recommended but not required

#### **Vocabulary**

**Control:** To prevent a plant from spreading to a wider geographic area

**Eradicate:** To remove any traces of a plant, including roots, seeds, and leaves

**Washington State Noxious Weed Control Board:** The Washington State government organization that determines what plants are noxious weeds, tracks noxious weeds, and gives people resources to remove them



What adaptations does your noxious weed have that help it grow aggressively in Washington?

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What impact does your noxious weed have on Washington ecosystems?

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Does your noxious weed have a significant economic impact in Washington State? Why or why not? What is one piece of evidence that supports your claim?

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# Noxious Weed Fact Card

## Himalayan Blackberry (*Rubus armeniacus*)

### Description

Thicket forming evergreen shrubs 8 to 15 feet tall with arching, thorny canes. Has white to pink flowers with five petals, large black berries and leaflets usually in groups of five on main branches. Himalayan blackberry has round to oblong leaflets, and reproduces by seed and also by rooting at cane tips. Highly invasive and painful to control. May look similar to the native plant trailing blackberry *Rubus ursinus*, which is smaller, has three leaflets and grows along the ground.

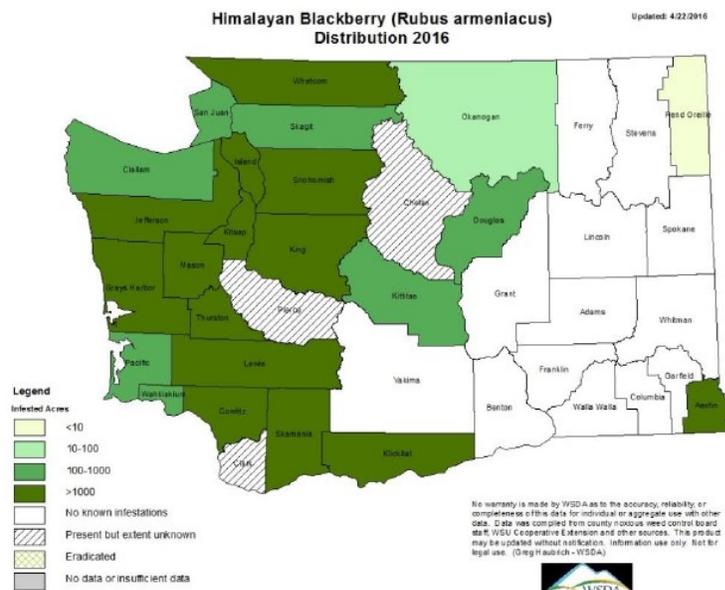


### Impacts

**Cattle and livestock:** Outcompetes native pasture plants and impacts quality of grazing lands.

**Timber:** Prevents growth of shade intolerant trees such as Douglas fir and Ponderosa pine.

**Croplands:** Can infest croplands and requires control.



### Other Considerations

**Recreation:** Himalayan blackberry produces dense thickets that restrict access to or limit the use of public lands and increase park management costs.

**Cost of control:** Birds and animals consume fruit and carry seed over a wide area. Any control program needs to be long term.

**Host for berry pest:** Himalayan blackberry is a host species to the spotted-wing fruit fly, *Drosophila suzukii*, a serious insect pest of berry and tree fruit crops in the Pacific Northwest.



**Direct Economic Impact of Species**

If Himalayan blackberry spread an additional 12% in the 19 counties with significant infestations in Washington, that would translate to approximately: 17,000 invaded acres of croplands, 284,000 acres of rangeland and wildland, 2.1 million acres of timberlands, and 1,605 miles of rivers and streams. Timber is the natural resource affected the most by Himalayan blackberry, with a direct economic impact of almost \$14 million worth of timberland. Impacts to timber account for 68% of the total estimated direct impacts from Himalayan blackberry.

Two of the counties most affected by Himalayan blackberry are Lewis County and Grays Harbor County, which have estimated direct impacts of \$2.4 million and \$2.1 million, respectively.

<b>Direct Impacts to Crops</b>		<b>\$-1,369,500</b>
	Blueberry	<b>\$-323,000</b>
	Strawberry	<b>\$-54,000</b>
	Other Berries	<b>\$-2,500</b>
	Hay	<b>\$-990,000</b>
<b>Direct Impacts to Livestock</b>		<b>\$-4,025,000</b>
<b>Direct Impacts to Timber</b>		<b>\$-13,903,000</b>
<b>Recreation in Wildlands</b>		<b>\$-1,135,000</b>
	Direct Impacts to Hunting	<b>\$-247,000</b>
	Direct Impacts to Fishing	<b>\$-888,000</b>
<b>Total</b>		<b>\$-20,432,500</b>

**Total Economic Activity at Risk**

Looking at the broader Washington economy, Himalayan blackberry infestation could have a cumulative output impact of \$48.7 million. This loss of output translates into a loss of 230 jobs in Washington and \$12.7 million in lost labor income.

**Control**

Himalayan blackberry is considered a Class C noxious weed in Washington state. Dig up plants removing the root ball completely. For larger stands, first cut the canes with loppers or a brush cutter, then dig up the remaining root ball. Regular, repeated cutting can suppress and weaken blackberry. Pile up canes on a dry surface to keep stems from re-rooting. Can dispose of plant material in city or county provided yard waste bins if available. Herbicides are an effective control method if applied to actively growing plants at the time of year recommended on the product label. Follow all label directions. Plant desirable species to discourage weeds from reestablishing.

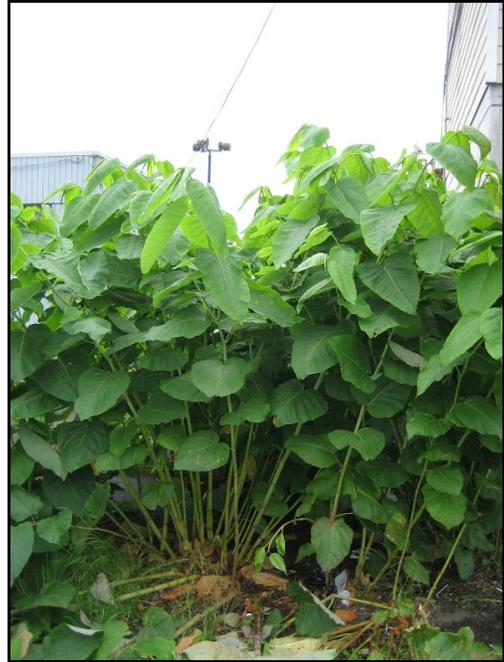
# Noxious Weed Fact Card

## Giant Knotweed (*Polygonum sachalinense*)

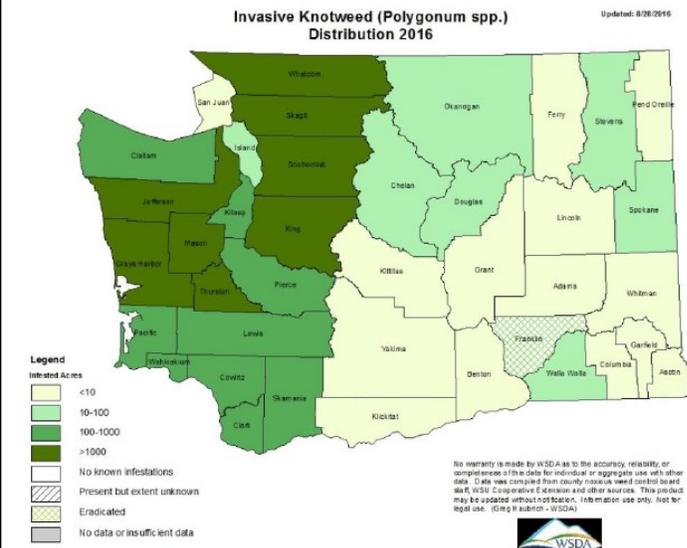
### Description

Stems are stout, cane-like, and reddish-brown. The plants die back at the end of the growing season but their old reddish-brown canes often persist. The stem nodes are swollen and surrounded by thin papery sheaths. Leaves are either heart-shaped or spade-shaped or somewhere in between. The flowers are small, creamy white to greenish white, and grow in showy plume-like, branched clusters from leaf axils near the ends of the stems. The fruit is 3-sided, black and shiny.

In the Pacific Northwest, there are four similar species of invasive knotweed that are difficult to tell apart and share similar habitat, impacts and control methods. They are all large, robust perennials that spread by long creeping rhizomes to form dense thickets. These tall, bamboo-like plants were introduced from Asia as ornamentals beginning in the early 1800's in England and in the United States by 1890.



Due to their widespread use, the lack of natural predators, and their ability to spread by root and stem fragments, invasive knotweed species have spread and become widely established throughout North America and Europe. Knotweed clones can completely clog small waterways and displace streamside vegetation, increasing bank erosion and lowering the quality of riparian habitat for fish and wildlife. Rapid spring growth and deep, extensive roots enable knotweed to outcompete most other plants, even small trees and shrubs. Knotweeds can tolerate partial shade and are most competitive in moist, rich soil. Invasive knotweed species are commonly found along roadsides and on stream banks but also may be present in yards, vacant lots, edges of fields, parks and many other places.



### Impacts

**Environment:** Invasive knotweeds can significantly alter riparian habitats, food webs, and native plant communities.

**Rivers and Streams:** Invasive knotweeds can rapidly dominate river embankments and cause severe soil erosion, impacting water quality and salmon habitat.

### Other Considerations

**Wildfire:** Dry knotweed biomass can be a fire hazard.

**Infrastructure:** Knotweed rhizomes can damage septic systems and infrastructure such as roads and pipes.



### Direct Economic Impact of Species

Invasive knotweed has significant populations in 19 of Washington’s 39 counties. However, it is mostly confined to riparian habitats, so economic impact estimates only reflect a 1% impact on rangeland, wildlands, streams and rivers. This is roughly equivalent to 24,000 acres of rangeland and wildland and a further 227 miles of stream banks and river banks. Impacts across counties are fairly similar, with the average direct impact per county estimated at \$48,000.

Despite the current modest impacts per county, any increase in the rate of spread has a sizable effect on the direct impacts of invasive knotweeds because of how widespread it is. For example, if the rate of spread were estimated to be 5% of productive lands, total direct impacts from invasive knotweed jump to more than \$9.3 million.

Direct Impacts to Livestock		\$-1,565,000
Recreation in Wildlands		\$-306,000
	Direct Impacts to Hunting	\$-41,000
	Direct Impacts to Fishing	\$-265,000
<b>Total</b>		<b>\$-1,871,000</b>

### Total Economic Activity at Risk

Looking at the wider economic impacts of invasive knotweeds reveals that at a 1% rate of infestation, total economic output at risk across Washington is nearly \$4.5 million. This represents 25 jobs at risk with an associated \$1.2 million in lost labor income.

### Control

All invasive knotweed species are Class B noxious weeds, including Japanese and giant knotweed, and the most common one, Bohemian knotweed, a hybrid of the other two. Knotweed is very difficult to control once it is established. A combination of treatments and revegetation may be needed to control populations depending on the site. In loose soil, small individual plants can be dug up if done carefully and completely. Plants can re-sprout from rhizomes so be sure to remove the entire root system and inspect for new growth. Cutting and covering with black plastic or geotextile fabric is somewhat effective, but covering must be left in place and monitored for at least five years or until shoots stop emerging when cover is removed. Application of systemic, slow-acting herbicide is the most effective control method. Contact the KCNWCB for specific suggestions for each situation. Do not compost roots or green stems – they can sprout from nodes.

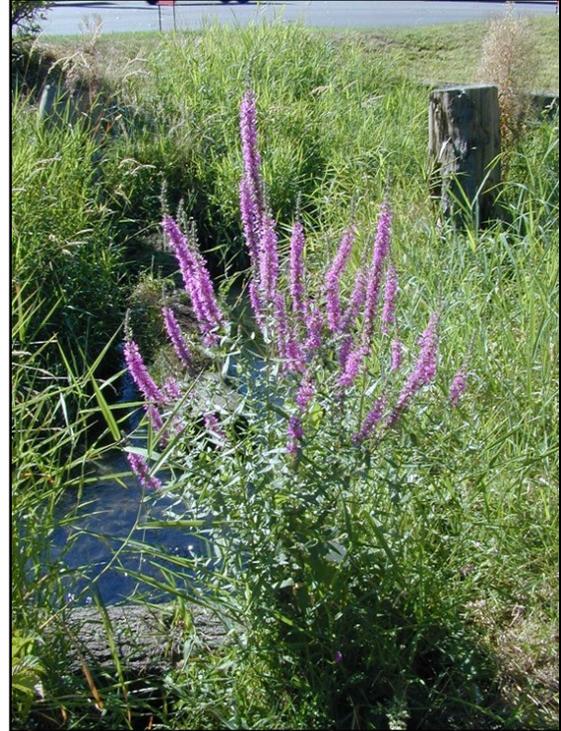
# Noxious Weed Fact Card

## Purple Loosestrife (*Lythrum salicaria*)

### Description

Square stems and showy purple-magenta flower spikes. Flowers are small and numerous with 5-7 petals, growing in densely packed spikes. Leaves are opposite, lance-shaped to oblong and have smooth edges. Reproduces by seed and can form up to 2.7 million pepper-size seeds per plant.

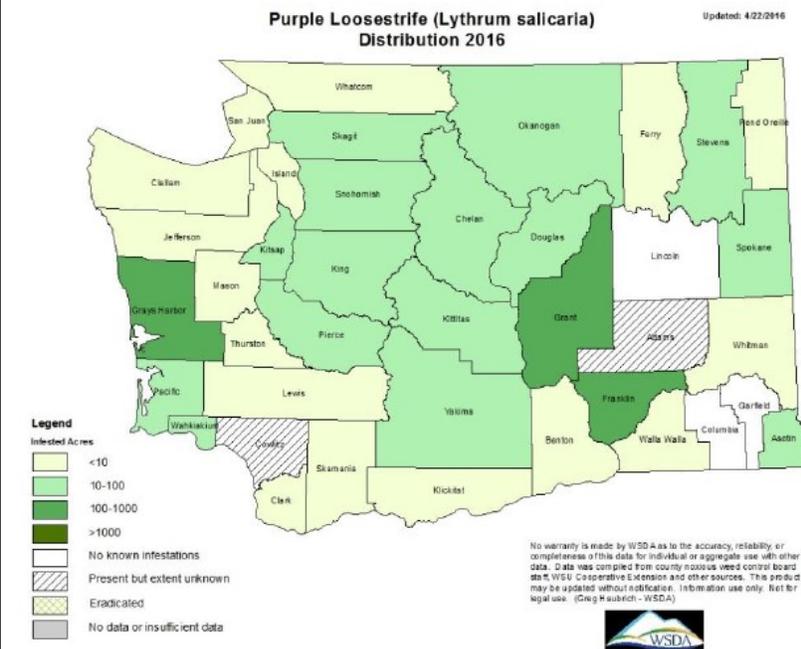
They choke out wildlife habitat, displace native species and clog drainage ditches and irrigation canals. One purple loosestrife plant can produce over 2 million seeds. It is illegal to buy, sell, or transport this plant and property owners are legally required to control these plants on their property. Root and stem fragments and seeds should be kept out of soil and water to avoid further spread



### Impacts

**Recreational Fishing:** Purple loosestrife displaces native plant species in riparian habitats. Once it forms dense stands, it restricts access to rivers.

**Shellfish/Wetlands:** Native plant species are displaced; wetland animals cannot use it for nesting or food; can lead to soil erosion and damage to floodplain habitat needed for shellfish production.



### Other Considerations

**Wetlands:** Purple loosestrife is very invasive in wetland areas, where it displaces native wetland plants, significantly reducing food and nesting habitat for waterfowl and other animals. It can also alter the aquatic food web.

**Irrigation Systems:** Can restrict water flow in irrigation ditches.



King County

Department of

Natural Resources and Parks

Water and Land Resources Division

Noxious Weed Control Program

### Direct Economic Impact of Species

Purple loosestrife impacts are centered primarily around recreational activities such as impacts to hunting waterfowl, fishing and recreational boating. The weed is found in significant amounts in 20 counties across Washington and risks affecting more than 1,600 miles of rivers and streams along with 38,000 acres of boat-able lakes and rivers.

Purple loosestrife is estimated to potentially impact an additional 12% of riparian habitats if it is not controlled, with Grant and Chelan Counties expected to have the largest share of impacts with \$932,000 and \$726,000 respectively. The average direct loss per county due to purple loosestrife is an estimated \$308,000. These economic impacts do not reflect the degradation of valuable wetland habitat and function.

Recreation in Wildlands		<b>\$-6,156,000</b>
	Direct Impacts to Hunting	<b>-\$511,000</b>
	Direct Impacts to Fishing	<b>-\$1,872,000</b>
	Direct Impacts to Boating	<b>-\$3,773,000</b>
<b>Total</b>		<b>\$-6,156,000</b>

### Total Economic Activity at Risk

Purple loosestrife effects on recreation industry suggest that more than \$20.8 million in economic output is at risk across the Washington economy. Furthermore, 150 jobs in Washington would be at risk along with \$6.6 million in lost labor income.

### Control

Purple loosestrife is considered a Class B noxious weed in Washington state. Small infestations can be dug up, bagged, and disposed of, taking care not to disperse seeds. A key principle to loosestrife control is preventing seed production. When removing loosestrife plants, all plant parts and root ball must be discarded in trash or transported to a landfill in plastic bags or in an enclosed or securely tarped vehicle. Due to the highly invasive nature of loosestrife, composting is not a disposal option. Remove as much of the root system as possible because broken roots may sprout new plants. Brush off boots and clothes before leaving the infested area. Herbicides are also an effective control method but only use aquatic herbicides and obtain required permits for using herbicide near water. Please report all populations of these species to the county weed program so we can prevent them from spreading further.



# Noxious Weed Fact Card

## Scotch Broom (*Cytisus scoparius*)

### Description

Scotch broom is a perennial evergreen shrub with numerous dark green angled branches with small, simple, or three-part deciduous leaves. The Class B noxious weed grows up to 8 to 10 feet tall and is in bloom from April to June with numerous bright yellow, pea-shaped flowers. As its seeds mature inside black, ripened pods, they are ejected and thrown several feet away from the parent plant to start new plants. Scotch broom roots have nitrogen-fixing bacteria in nodules that help it thrive in nutrient-poor soils.



### Impacts

**Cattle and livestock:** Scotch broom creates dense stands that displace desirable, forage species. It is toxic to livestock.

**Timber:** Dense stands prevent forest regeneration after clearing.

**Field crops:** Outcompetes crops for nutrients and water.

**Elk:** Scotch broom is toxic to elk and reportedly may have once poisoned elk on the Olympic Peninsula. Encroaching Scotch broom reduces forage for elk, potentially reducing hunting opportunities.



### Other Considerations

**Costs of control:** Scotch broom shrubs can produce an average of almost 10,000 seeds per year, which can remain viable in the soil for more than 30 years. This means that any control measures must be extremely long term.

**Recreation:** Scotch broom can grow in a variety of areas including natural areas, parkland and even dunes. These all increase the cost of parkland management significantly.

**Fire hazard:** Stands of Scotch broom provide dry biomass that is flammable and can elevate fires to tree canopies.

**Environment:** Scotch broom can alter soil chemistry and composition, making native plant restoration difficult.

**Ecosystems:** Scotch broom threatens rare or vulnerable ecosystems such as prairies and Garry oak trees.

### Direct Economic Impact of Species

Scotch broom is more abundant in western Washington and extremely difficult to eliminate due to its size, dense stands, and because seeds can remain viable for at least 30 years. More than half the counties in Washington are considered to have a significant presence of Scotch broom. Because it is already so pervasive, the risk of increased spread is considered to be extremely high and Scotch broom could invade 35% of productive lands in afflicted counties if landowners stopped controlling it.

More than 1.8 million acres of rangeland and wildland are estimated to be at risk for Scotch broom infestation. A further 6.5 million of timberland is also considered to be at risk of Scotch broom infestation. Kittitas, Lewis and Grays Harbor Counties are the three counties estimated to experience the largest share of impacts from Scotch broom. Kittitas County is estimated to experience roughly \$6.5 million in direct losses from Scotch broom. Lewis County and Grays Harbor County are estimated to have \$6.2 million and \$5.9 million in direct losses from Scotch broom, respectively. Scotch broom impacts average around \$2.9 million per infested county.

Direct Impacts to Livestock	\$-15,859,000
Direct Impacts to Timber	\$-42,907,000
Direct Impacts to Hunting	\$-971,000
<b>Total</b>	<b>\$-59,737,000</b>

### Total Economic Activity at Risk

Given Scotch broom's pervasiveness and high average direct impact per county, the wider impacts throughout the Washington economy are similarly significant. An estimated \$142.8 million in business activity is expected to be at risk across the Washington economy. This lost business activity is associated with a loss of 660 jobs and more than \$36 million in lost wages.

### Control

Scotch broom is considered a Class B noxious weed in Washington state. Plants shorter than three feet can be hand pulled when soil is moist. Larger plants can be wrenched out with specially designed weed tools which are available to borrow from the King County Noxious Weed Control Program. Cutting large plants near ground level where the stem is brown or yellow during the dry season (i.e. August- September) will kill most plants. Those that survive can be pulled or sprayed when they regrow. Take care to avoid spreading mature seed pods to non-infested areas. Selective herbicides are also an effective control method. Establish a healthy grass cover to reduce weed seed germination and continue to monitor the site.

# Noxious Weed Fact Card

## Giant Hogweed (*Heracleum mantegazzianum*)

### Description

A member of the parsley family, its most impressive characteristic is its massive size. Giant hogweed reaches a height of 10 to 15 feet when in flower and has hollow stems, 2 to 4 inches in diameter, with dark reddish-purple raised spots and stiff bristle-like hairs. Coarse white hairs are also at the base of the leaf stalk. The sharply incised compound leaves grow up to 5 feet in width. White, umbrella shaped flower clusters up to 2 feet wide.



If skin comes into contact with sap, wash immediately with soap and water. Burned skin is very sensitive to sunlight, so keep any exposed areas covered when outside. After the burns subside, darkened areas or scars can persist for several years. The affected areas remain sensitive to sunlight so it is important to keep the burned areas away from direct sunlight as much as possible.

### Impacts

Public health hazard. Sap can cause blistering of the skin and scarring. Do not get plant sap on skin. This Class A noxious weed is controlled throughout King County. It does not cause significant economic impact because outbreaks are reported and eradicated.



### Control

Giant hogweed is considered a Class A noxious weed in Washington state. Always avoid skin contact. Clear, watery sap in leaves and stems can cause burns, blisters and scarring. Mature plants can be killed by digging up at least the first 4 to 6 inches of the central root. Young plants often break off when being pulled from compacted soils, leaving the root to continue to grow. Be sure to bag flowers and seed heads and put in the trash. Wear proper clothing, shoes, and eye protection when attempting any control measures. Systemic herbicide applied to young or pre-flowering plants is another effective control method. Please report all populations of this plant to the County Weed Program so we can prevent it from spreading further.



# Noxious Weed Fact Card

## Garlic Mustard (*Alliaria petiolata*)

### Description

Garlic mustard, a Class A noxious weed, is a biennial or winter annual herb that generally grows 2-3 (up to 6) feet tall. Lower leaves are kidney-shaped with scalloped edges. Leaves feel hairless, and the root has an "S" or "L" shape just below the stem base. In spring, roots and new leaves smell like garlic, and small, four-petal white flowers appear clustered at stem ends, followed by long, skinny seedpods. This weed spreads by seed and can self-pollinate, helping it rapidly displace native plants along trails, in forests, and on riverbanks, among other areas.



### Impacts

Garlic mustard has infested and degraded immeasurable amounts of woodland habitat in City of Seattle Parks properties and nearby private properties, but garlic mustard has also moved into Bellevue, properties along the Cedar River, North Bend, Tukwila, Shoreline and other parts of the county. Early detection, containment and eradication of new sites is of the highest priority.

Because this is a controlled Class A noxious weed, it has not spread enough into King County for economic impacts to be measured. However, garlic mustard is almost impossible to remove once it has established itself in a new site. See controls below.



### Control

Make sure to get expert identification before controlling. This plant closely resembles many native plants. For mature plants, carefully pull by hand, loosening soil and removing entire root. The plant will sprout from the root crown if it breaks off. For young plants, hand pulling is NOT recommended. Rosettes tend to snap off at the root, allowing the plant to re-sprout. Dig up rosettes with a trowel or use an herbicide. Bag up and discard all plant matter in garbage. A key principle to garlic mustard control is preventing seed production. Spraying young plants with herbicide is an effective control method. Please report all populations of this plant to the county weed program so we can prevent it from spreading further.



# Optional Activity

## Local Action

Chances are, if there are noxious weeds in your community, there are already people out there helping control them. Let's find out if that's the case where you live

**Materials:** Computer/phone/tablet, internet connection, writing utensil

**With an adult's permission**, type the name of your plant from today's main activity into a search engine, along with the name of your neighborhood or community. Then, answer the following questions!

*What did you find?*

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*Are there other people/organizations helping to fight the spread of this noxious weed near you?*

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*Are they planning events you and your family can safely attend? If so, what are they?*

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# Optional Activity

## Noxious Weed Stewardship Challenge for Day 3

One of the most important ways we can prevent the spread of noxious weeds is by teaching people how to spot them so they can report them.

**Materials:** Writing utensil, paper, any coloring supplies or art supplies you would like

Create a poster to hang in a window to help teach your neighbors about the noxious weed you researched. Put a picture or a drawing of the weed on your poster. Be sure to include a few facts about the weed such as some identifying features, what adaptations help it grow in Washington, and how it harms local ecosystems. Tell people what they should do if they find this plant. When you are done, hang this poster in a window facing out so your neighbors can see it if they walk by, and learn some new things about a noxious weed.

Challenge yourself to post all the things you are doing with your friends and family to help control the spread of noxious weeds! Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAInvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!

*Example poster* →

### Root Out Noxious Weeds!



Help me pick  
**Tansy Ragwort**  
when you see it in our  
neighborhood!

#### What is Tansy Ragwort?

Its daisy-like flowers are bright yellow with 13 petals. It has "ruffled" leaves.

#### Where does Tansy Ragwort grow?

It can be found in sunny spots like fields and the edges of roads

#### Why should we get rid of Tansy Ragwort?

This plant is poisonous to many animals! Removing it makes more space for helpful plants.

#### How do we get rid of Tansy Ragwort?

Dig up the plant by the roots and throw it in the trash.

More info can be found at the King County Noxious Weed Control Board website: <https://kingcounty.gov/weeds>

# DAY 4

## Prevention and Best Management Practices

We've investigated what makes a plant a noxious weed, and why we control noxious weeds across King County. Now it's time to explore our means and methods of control.

The first consideration is what our goal is. With Class A and some Class B noxious weeds, the goal is to eradicate them throughout the state. This means removing every single plant, as well as the seeds, roots, and stems that could regrow. With the remaining Class B and C noxious weeds, the goal is to control their spread. This means stopping new infestations, especially into public parks and protected natural areas, because these noxious weeds may already be too common to realistically eradicate.

One important way to control noxious weeds is **prevention**. If we know how different noxious weeds spread, we can prevent that from happening with simple practices like banning the sale of these plants at stores, having people check their clothes, shoes, pets and boats for the "hitchhiking" seeds of these plants, and giving people native plant alternatives to grow in their gardens. If noxious weeds can't spread into our communities, then we won't have to control them later.

When noxious weeds are already in our communities, King County Noxious Weed Control Program has **Best Management Practices**, which are the most effective strategies to eradicate these plants. These practices are based on scientific studies and observations of each plant, and also consider the infestation size. For instance, removing one poison-hemlock plant in a yard will require different strategies than removing thousands of plants that have grown on the side of the highway. This means we need to use the right method for controlling each different noxious weed in each separate situation. Small infestations, plants with weak root systems, and plants that have grown around native plants that we don't want to damage can be pulled up by hand and thrown away. Noxious weeds with deep roots need to be dug out with shovels or special tools. Some large infestations can be eaten by goats, covered in tarps and mulch, or mowed down (if doing so does not release toxins or spread seeds). With plants like Bohemian knotweed, the best management practice is to inject knotweed stems with an **herbicide** (plant-killing poison) directly, so that no herbicide can damage other plants or the environment. After pulling them, some Class A and Class B noxious weeds should be disposed of in the trash instead of the compost if their seeds are likely to regrow.

### **Vocabulary**

**Best Management Practices:** The most effective strategies for getting rid of noxious weeds

**Erosion:** The wearing down of rocks and soil by wind and weather that damages hillsides and fills bodies of water with dirt

**Herbicide:** A chemical that was created to kill plants

**Prevention:** Stopping a noxious weed from spreading further in an ecosystem, or into a new one

# Main Activity

“Let’s Pull Together!”

There are many challenges when it comes to fighting noxious weeds. Let’s think a little about three common noxious weeds here in Washington State, and some of the ways we can fight them.

**Materials:** Writing utensil, paper

The following is an excerpt from an April 10, 2020 post on the Noxious Weeds blog for King County, Washington. It contains a discussion of three different noxious weeds: English ivy, Himalayan blackberry, and poison-hemlock. Read the article, and answer three questions on the pages that follow for each plant.

“Let’s Pull Together” (10 Apr 2020) Source: <https://kingcountyweeds.com/2020/04/10/lets-pull-together/>

Another way to help is to control the weeds in your backyard or community space. Weeds don’t respect property lines so the weeds on your property could be spreading to your neighbors or into a nearby natural area. But don’t despair! Weed control is possible even if you can’t do it all at once. Not only will you have a sense of satisfaction from helping protect the environment, but spending time gardening (including pulling weeds) has been proven to lower stress and improve physical as well as mental health.

**Here are some common weeds that you just might have outside right now.**

English Ivy was planted in lots of gardens in Washington. The evergreen vine grows and spreads very quickly and can even grow in the shade. These qualities that people liked are the same reasons it is such a problematic weed. Ivy doesn’t stay where it’s planted. Birds eat the black berries, which are poisonous to people, and spread seedlings. In a natural area, ivy will quickly smother all the plants in the understory. Then it starts growing up trees.

The vines can grow up to 90 feet long; they make trees sick, prone to rot and more likely to blow over in a windstorm. Plus rats (and other rodents that carry disease) love making their homes in the dense vegetation.

Some folks have planted ivy on slopes hoping it will provide **erosion** control. But, ivy roots only go a few inches deep and don’t do a good job holding onto the soil. So ivy can actually make slopes more likely to fail. But those puny roots also mean that you can pull ivy out with your bare hands! (Always wear gloves).



*English ivy smothers trees and can lead to early death (photo by Karen Peterson)*

Early spring is a great time to pull ivy since the soil is still nice and loose from winter rains. If ivy has climbed up your tree, you don't need to pull it all down right away. Make your tree a life ring! Go around the trunk and cut all of the ivy stems and then pull the lower ivy away from the tree, making about a 6 foot cleared ring around the base. The ivy needs to have roots in the ground to survive, so the upper ivy will die and dry out, making it much easier to pull down.



*Ouch!*

It grows into dense, thorny thickets up to 15 feet tall. This makes it very difficult for animals (including humans) to move through. When blackberry takes over the understory of forests the thickets shade out native tree seedlings and prevent them from growing. Blackberry is common along streambanks, which can cause erosion and damage salmon habitat.

Blackberry spreads by its canes that can root every place they touch the ground and also spreads by seed (humans aren't the only animals eating those tasty berries in the summer). Digging out seedlings when you first notice them is the easiest way to control this plant. Once it is well-established digging plants out is effective, but very labor-intensive.

Some people have good luck by repeatedly mowing blackberries with machinery... or goats! Over time this will weaken the plants and at least leave you with fewer to dig out. Although blackberry damages our

environment and reduces habitat for many animals, some birds use the thickets as a place to build their nests. If you see birds visiting your blackberry thickets, you might want to avoid controlling the blackberry during nesting season from April 1 – August 15, or just control the smaller patches around the edges. Replacing the blackberry with native plants will attract native birds and will help discourage the weeds from coming back.

Himalayan blackberry is one of the most recognizable weeds in the Pacific Northwest. It was originally planted for its delicious berries, but the plants almost immediately jumped garden fences and headed into natural areas. Once this plant gets established it can be a real pain!



*Blackberry can take over streambanks ("Urban Kokanee Streams" by USFWS – Pacific Region is under license by CC 2.0)*



*Goats make cute mowers! (The Buffet by floodllama is licensed by CC2.0)*



*Young poison-hemlock plants look like wild carrots*

Another way we can all protect the health of our communities and environment is by looking out for and getting rid of poison-hemlock. It's in the carrot family and looks kind of like a wild carrot, especially when young. But, every part of poison-hemlock is toxic and can even be deadly if eaten by people or animals.

Mowing, weed-whacking or burning this plant is highly discouraged because the toxins can be released into the air and breathed in, making you very sick. Some people are sensitive to the sap and extensive contact can lead to the toxins being absorbed through the skin.

I know that all sounds pretty scary, but by taking a few simple precautions anyone can help control this plant. Always wear gloves, long sleeves, and long pants or leggings. In soft soil you can often grab the stem at the base and pull up the long taproot (just like pulling out a carrot). Or you can dig the plants out making sure you get as much of that taproot as possible. When you're done put the plants in a plastic bag and put in the trash, not the yard waste and definitely not your home compost. Poison-hemlock stems can stay toxic for up to 3 years, even when dried. If you see poison-hemlock growing on public land like a park or next to a road let us know about it!



*Poison-hemlock stems are hollow with red or purple blotches or spots and are not hairy*

Right now little efforts by all of us can make a big difference. If we all pull together we can make our neighborhoods safe and healthy places for everyone to enjoy.



*Poison-hemlock gets tall, but it's still easy to dig up (photo by Jeanette Jurgensen)*



Why should we control English ivy?

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What precautions should we take to be careful while removing English ivy?

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What steps do we take to remove English ivy?

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What precautions should we take to be careful while removing poison-hemlock?

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What steps do we take to remove poison-hemlock?

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# Optional Activity

## Prevention is the Best Medicine

One important way to control noxious weeds is to prevent them from spreading in the first place. Let's examine a few images of activities and think how we can enjoy recreational activities without spreading noxious weeds accidentally.

**Materials:** Writing utensil

Look at the following images. For each image, what is a behavior you see which might spread noxious weeds? What is something that can be done to reduce the spread of noxious weeds doing this activity? Use the space next to the picture to write down your ideas and thoughts!



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*(photo credit USDA Forestry)*

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*(photo credit Utah State University)*

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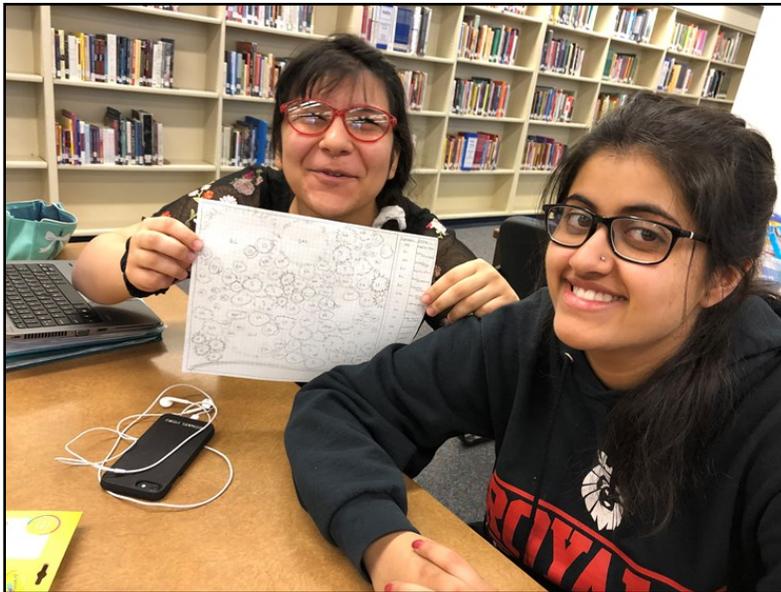
## Optional Activity

### Responsible Planting

Many non-native plants were imported to King County to be grown in gardens for their beautiful flowers and delicious fruit. As we've learned, though, introducing plants from far away may be a recipe for ecological disaster. One responsible alternative is to plant native plants instead.

**Materials:** Writing utensil, paper, crayons/markers/colored pencils

Create a map of a garden you could plant at your home, school, or somewhere else in your community, and label which native plants you would plant in your garden. Alternatively, think of a location near you with lots of invasive plants (i.e. like a park or trail). What kinds of native plants would grow well in place of the invasive ones? Take a look at the example on the next page for inspiration, as well as the chart listing various native plants on the page that follows.

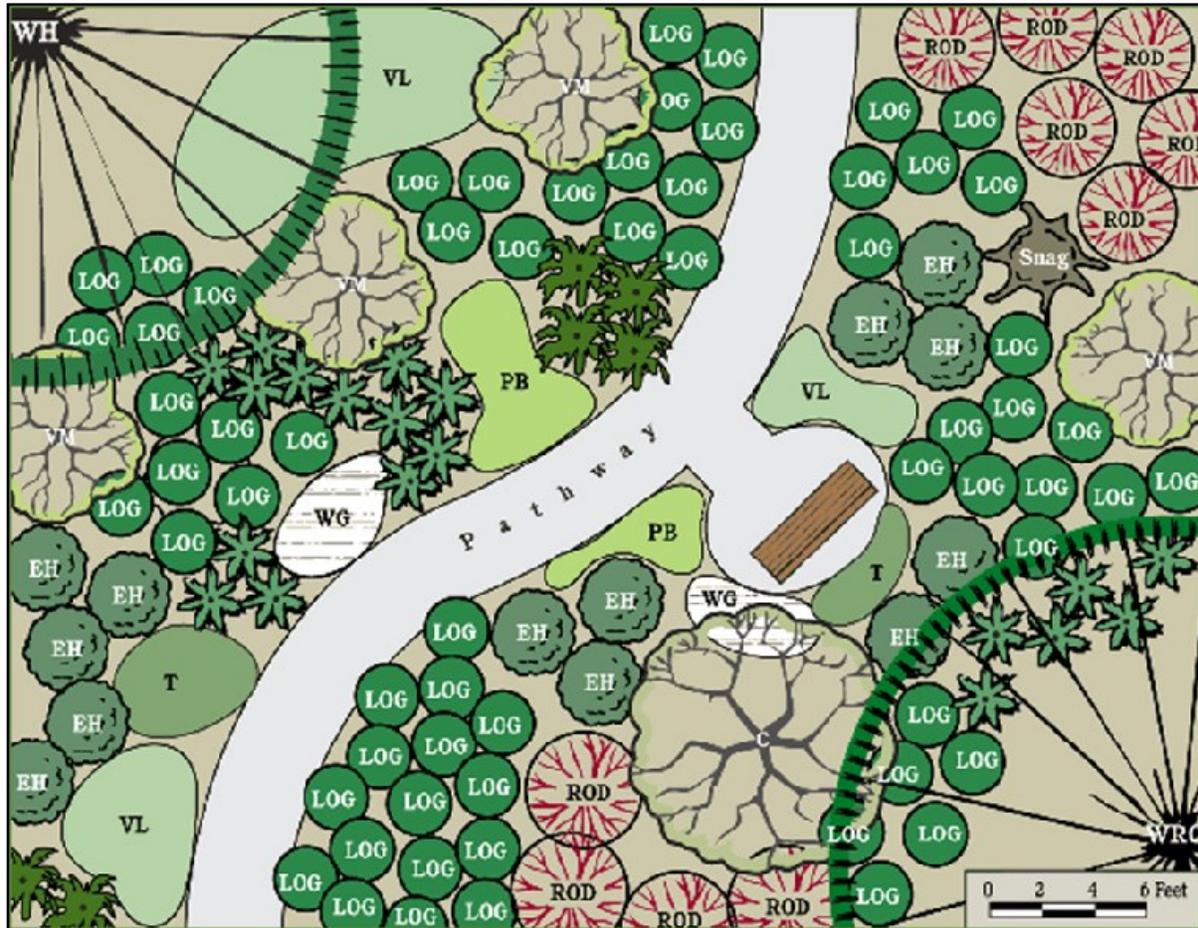


*Check out the native garden these students have designed!*

#### **HINTS:**

- Group small plants together with others of the same kind.
- If you want to be able to see all of your plants, make sure to put the small ones in front and the big ones in back.
- When choosing plants to put near a big tree, try to find ones that don't need much sun. Some trees can act like a giant umbrella, creating a lot of shade.

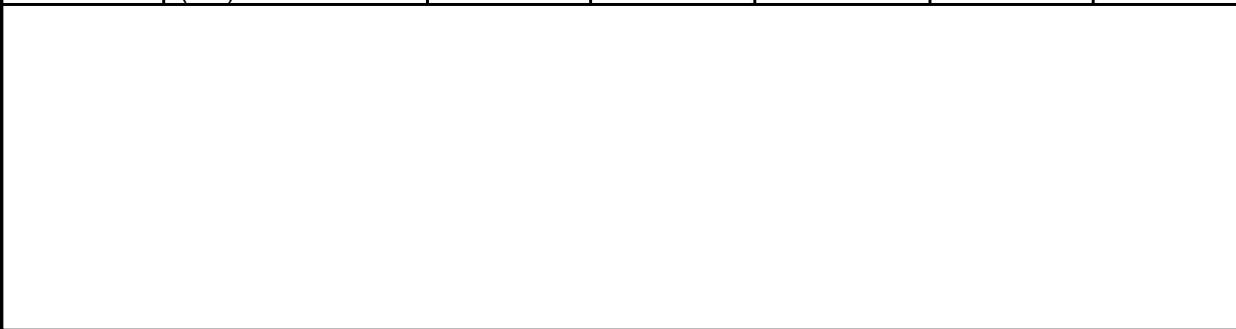
When you're finished it might look something like this, but with fewer plants:



There is a lot going on there! Every item in this image is like one piece of a natural puzzle, with each item representing a single plant. For example, the small circle with 'LOG' refers to a native plant called 'Low Oregon Grape,' while the larger items labeled 'WRC' refer to a tree known as 'Western Red Cedar.' Put together in one single location, these plants form the foundation for a healthy and wonderful ecosystem!

The table on the next two pages lists many types of native plants, as well as the conditions under which they grow the best. Take these into consideration as you plan your native garden.

	<b>Plant Name</b>	<b>Sun Needs</b> 1=Little 2=Some 3=LOTS	<b>Water Needs</b> 1=Little 2=Some 3=LOTS	<b>Size</b> S=Small M=Medium L=Large	<b>Flowers?</b>	<b>Fruit?</b>
<b>Trees</b>	Vine Maple (VM)	☀	6	M	No	No
	Bigleaf Maple (BM)	☀☀	6	L	No	No
	Madrona (MAD)	☀☀	6	L	No	No
	Paper Birch (PB)	☀☀	66	L	No	No
	Pacific Crabapple (PC)	☀☀☀	666	M	Yes	Yes
	Douglas Fir (DF)	☀☀☀	66	L	No	No
	Shore Pine (SP)	☀☀	66	M	No	No
	Quaking Aspen (QA)	☀☀☀	66	M	No	No
	Western Red Cedar (WRC)	☀	66	L	No	No
<b>Shrubs/ Bushes</b>	Beaked Hazelnut (BH)	☀☀	66	M	No	No
	Oceanspray (OS)	☀☀	66	M	Yes	No
	Tall Oregon Grape (TOG)	☀☀	66	M	Yes	Yes
	Low Oregon Grape (LOG)	☀	66	M	Yes	Yes
	Bald Hip Rose (BHR)	☀☀	66	M	Yes	No
	Black Cap Raspberry (BCR)	☀☀☀	66	M	Yes	Yes
	Rhododendron (RHO)	☀	66	M	Yes	No
	Thimbleberry (THM)	☀☀	66	M	Yes	Yes
	Salmonberry (SB)	☀☀	666	M	Yes	Yes
	Red Huckleberry (RH)	☀	66	M	Yes	Yes



	Plant Name	Sun Needs 1=Little 2=Some 3=LOTS	Water Needs 1=Little 2=Some 3=LOTS	Size S=Small M=Medium L=Large	Flowers?	Fruit?
Small plants/ Ground-cover	Columbine (COL)	☀☀☀	000	S	Yes	No
	Douglas Aster (DA)	☀☀☀	00	S	Yes	No
	Salal (SAL)	☀	00	S	Yes	Yes
	Camas (CAM)	☀☀☀	00	S	Yes	No
	Bleeding Heart (BLH)	☀	00	S	Yes	No
	Swamp Lantern (SL)	☀	000	S	No	No
	Cattail (CAT)	☀☀☀	00	M	No	No
	Trailing Blackberry (TB)	☀☀	00	S	Yes	Yes
	Dagger-leaved rush (DLR)	☀☀☀	000	S	No	No
	Sword Fern (SF)	☀	00	M	No	No
	Goldenrod (GOL)	☀☀☀	00	S	Yes	No
	Wild strawberry (WS)	☀	00	S	Yes	Yes
	Silverweed (SIL)	☀☀☀	000	S	Yes	No
	Foam flower (FF)	☀	000	S	Yes	No
	Stream Violet (SV)	☀	000	S	Yes	No
	Yellow Monkey Flower (YMF)	☀☀	000	S	Yes	No

## Optional Activity

### Noxious Weed Stewardship Challenge for Day 4

We've learned about the challenges associated with removing noxious weeds like Himalayan blackberry, English ivy, and poison-hemlock. Now we should think about the weeds we see in our own neighborhood!

**Materials:** Writing utensil

Think of some of the noxious weeds you noticed in your community on Day 2. **With an adult**, check the King County Noxious Weed Control Program website for more information on these weeds by following this link: <https://kingcounty.gov/services/environment/animals-and-plants/noxious-weeds.aspx>

Using this website, answer the questions below and write down your thoughts on this, because they will come in handy tomorrow!

Challenge yourself to post all the things you are doing with your friends and family to help control the spread of noxious weeds! Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAIInvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!

What physical adaptations do the noxious weeds in your community have that could make them difficult to eradicate?

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# DAY 5

## Plan a Solution

This past week, we've thought quite a bit about noxious weeds. We've thought about what it means for a plant to be a noxious weed, and how noxious weeds can travel to places they shouldn't be. We've thought about what makes noxious weeds so harmful for ecosystems, and things we can do to reduce the spread of noxious weeds. Now it's time to ask the question, "What can I do about noxious weeds?"

Noxious weeds are a problem primarily caused by humans, and they are a problem humans need to help solve. If we do nothing about noxious weeds, they will continue to grow and harm native species. The biodiversity of the natural places we love will go down, and the plants and animals we care about could even go **extinct!**

The good news is, there are many ways to get involved removing noxious weeds. From King County programs removing garlic mustard, to you and your neighbors pulling English ivy, all the way to just you and your friends reporting sightings of noxious weeds to King County, every little bit helps control noxious weeds.



*Local high school students work together to restore native prairie ecosystems!*

### **Vocabulary**

**Extinct:** All of the members of this species have died out in the wild

**Stewardship:** The duty we have to take care of the natural world around us



**Control methods for Himalayan blackberry:**

*“For best results, control methods should be adaptive and employed throughout several growing seasons. Minimize impacts to wildlife, native plants, and pollinators by timing activities carefully and replacing blackberry with beneficial plants. Cover bare soil with mulch, erosion control fabric, or other material, especially near water.*

*Manual: Effective on small infestations (less than 200 square feet). Uproot small plants by loosening soil around roots and pulling by hand, or remove with stout digging tools like mattocks. For larger, more mature stands, cut canes with loppers or pruners and dig up the remaining root-ball. Small cane fragments can be left in place as mulch; larger cane sections can be piled up to compost on site or burned if allowed in your area. Root balls may regrow and should be discarded with yard waste.*

*Mechanical: Mowing, including the use of riding mowers and tractor-mounted mowers, can be very effective in controlling blackberries. However, do not use mowers or tractors on sites that are wet or susceptible to compaction or erosion. Instead use loppers, or a hand-held brush cutter or hedge trimmer. Cut 5 times per year for best results. If cutting only once per year, most effective when the plant begins to flower. Make sure to return the following year; without follow-up, the plant may regrow at a greater density than before. In agricultural areas cultivation can also be effective.*

*Biological: Biological control is the deliberate introduction of insects, mammals or other organisms which adversely affect the target weed species. Biological control is generally most effective when used in conjunction with other control techniques. Biological control methods that may assist in blackberry control include the use of goats and chickens as follows:*

*Goats and pigs may be effective on clearing or controlling blackberry regrowth from a year to four years old. On mature stands, goats tend to only strip leaves off of the canes. Animals may prefer alternative forage available, so reduce opportunities for selective browsing. Grazing must be continuous or else regrowth will occur. Care needs to be taken to fence off or protect any native or other valuable*

*vegetation. The King Conservation District can provide further information of the use and management of goats for weed control. Chickens can potentially decrease the seed bank in blackberry cleared areas by grazing on the seeds.*

*(Please note, safe chemical control is an option that is not included here. Manual, mechanical and biological methods are preferred).*

-  **Manual**
-  **Mechanical**
-  **Chemical**
-  **Biological**

		SIZE OF INFESTED AREA			
		ISOLATED PLANTS	SMALL less than 1 acre (0.1 - 0.5 hectares)	MEDIUM up to 4 acres (0.5 - 2 hectares)	LARGE more than 4 acres (more than 2 hectares)
DENSITY OF INFESTED AREA	LOW DENSITY 1 to 50 plants (1 - 25% of the area)				
	MEDIUM DENSITY 50 to 1,000 (25 - 75% of the area)				
	HIGH DENSITY more than 1,000 (75 - 100% of the area)				

*The solution depends on the scale of the problem.*

## Optional Activity

### Noxious Weeds Pledge

Even if there aren't any invasive plants you can remove right now, you can still have a huge impact. Preventing the spread of noxious weeds is as important as stopping them once they're here.

**Materials:** Writing utensil

Carefully read through the "Root Out Noxious Weeds" pledge below. Check off the commitments you are going to make to prevent the spread of noxious weeds. Then, show this card to your household, or even your community via social media to get more people spreading the word instead of spreading weeds. Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAINvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!

I promise to root out noxious weeds by:

- Always checking my clothing, boots, and bicycle for "hitchhiking" seeds.
- Never dumping aquarium pets or plants in a stream or lake.
- Helping my household pick native plants to grow in our yard or garden.
- Teaching others about noxious weeds!

**SIGN YOUR NAME HERE:**

**ROOT OUT  
NOXIOUS WEEDS  
PLEDGE CARD**

# Optional Activity

## Letter Writing

Sometimes efforts to remove noxious weeds work best when they are planned at a higher level. Writing a letter can inspire larger groups to get involved in stopping noxious weeds.

**Materials:** Writing utensil, paper

Write a letter to a community member explaining why removing noxious weeds is important. Focus on a noxious weed you have learned about this week. Discuss the threats posed by this noxious weed, and the recommended strategies for removing it. Your letter can be to a neighbor, your school's principal, the King County Noxious Weeds Control Board, or even your state legislator.

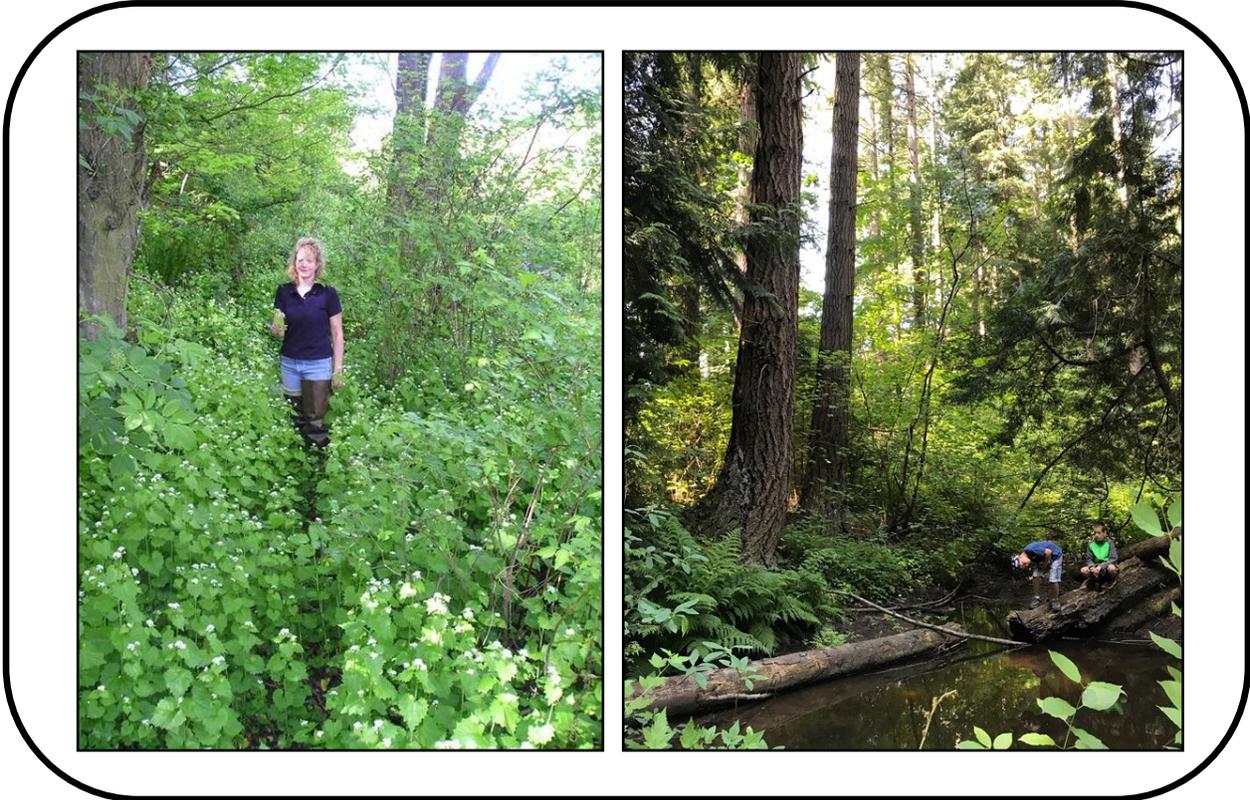
Your letter should explain the following:

- What noxious weeds are
- How they can be harmful to the environment and your community
- How removing them is helpful

If possible, send your letter.

## Optional Activity

### More Information



**Materials:** (Optional) Computer/phone/tablet, internet connection

Most people just see a beautiful natural landscape in both of these photos. But with the skills that you have developed this week, you can view our parks and other green spaces with a more critical eye. Noxious weeds can feel indistinguishable from the rest of the “green blur,” unless we make the effort to identify, report and stop them.

A self-defeating mindset might tell us that stopping noxious weeds doesn't matter: “They're going to take over anyway and, hey, plants are plants, right?” No. Now we know better.

A biodiverse temperate rain forest full of Douglas fir, sword ferns, salmon berry, salal, and Oregon grape support the wildlife that we love, while endless acres of Garlic mustard just makes for sick pollinators and deer that have to migrate elsewhere. Meanwhile, plants like English ivy actively contribute to climate change because bring down trees that we desperately need.

We can stop the spread of noxious weeds if we are well-equipped with knowledge and surrounded by a community committed to making our world better, one plant at a time.

Thank you for your time and your determination this week!

If you are interested in finding out more information about noxious weeds and what people are doing in your area, there are lots of great resources you can check out on the internet with an adult's permission.

Report noxious weeds you see near you here: <https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/infestation-form.aspx>

If you'd like to see what noxious weeds have been reported near you, there's a map on the King County Noxious Weed Control Program webpage here: <https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/maps.aspx>

If you'd like to know what kind of work is being done in your community, check out the KCNWCP Volunteer Information page here: <https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/volunteer-information.aspx>

For a handy guide to some of the most common noxious weeds in King County, check out the KCNWCP Neighborhood Bullies Handout: <https://your.kingcounty.gov/dnrp/library/water-and-land/weeds/Brochures/Neighborhood-Bullies.pdf>

## Optional Activity

### Noxious Weed Stewardship Challenge for Day 5

Now that we know the impact noxious weeds have, let's make a positive change in our own communities.

**Materials:** Gloves, shovels, other gardening equipment if appropriate, computer/phone/tablet, internet connection

**If you can, go outside with your parent or caregiver.** Using the guidelines you researched in the previous activities, gather the tools you need to safely remove your noxious weed from your neighborhood. Get the members of your household involved and make a plan. Which weeds are you removing? What supplies do you need (e.g. gloves, tools, garbage bags, tarps)? If the weeds are on public property (in a park, on a school campus, etc.), who will you need to contact about removing them?

Just make sure to carefully consider any plant you want to remove. Ask yourself three questions:

1. Can I safely pull this plant? (Remember, the plant doesn't have to be poisonous or thorny to be dangerous. Could the ivy you're pulling knock a tree branch down onto you?)
2. Am I confident this is a noxious weed? (Check the KCNWCP website if you're not sure!)
3. Was this plant put here on purpose? (Lots of people still grow plants like English ivy in their yards. Remember, someone will learn a lot more from being told about the dangers of noxious weeds than being mad that their ideal garden was messed up.)

If the answer to any of these questions is NO, leave the plant alone for now. Report the noxious weed(s) on the King County website if you can. Don't worry. There's still a lot you can do to help. Check out the activities below!

Challenge yourself to post all the things you are doing with your friends and family to help control the spread of noxious weeds! Don't forget to use the hashtags #kingcountyweeds and #wainvasives and tag @kingcountyweeds @WAINvasiveSpeciesCouncil @PlayCleanGo @naturevisionorg in your post so we can see your work!

## Answer Key

### Day 1 Activity #1: Traits of Noxious Weeds

Himalayan blackberry: Sharp thorns  
Bittersweet nightshade: Berries are poisonous to people, though birds can still eat them  
Giant knotweed: Large leaves block sunlight for smaller plants  
English ivy: Grows quickly to cover other plants  
Milk thistle: Easily spreads seeds using the wind  
Hairy willow-herb: Long, fast-growing roots make it hard to remove  
Brazilian elodea: Wraps around animals and gets moved to new places  
Bull thistle: Spines around seeds  
Fragrant waterlily: Spreads quickly  
Policeman's helmet: Grows very tall  
Spurge laurel: Spreads quickly

## Answer Key

### Day 1 Activity #2: Noxious Weeds Challenge

Native plants: *Salal*, *Sword Fern*, *Bleeding Heart*, *Osoberry*, *Snowberry*

Noxious Weeds:

*Garlic mustard*: Allelopathic, small seeds can stick to clothes. Garlic mustard was brought to the Americas as a food for its flavor. Brushing clothes off can prevent spread of Garlic mustard.

*English ivy*: Grows quickly to cover other plants and can harbor pests like rats. English ivy was brought to the Americas as a garden plant. Pulling ivy up by the roots and throwing it in the garbage or municipal compost (not into a compost pile, as it can grow back) or storing it up in a tree where the roots can't get to the ground will keep it from spreading.

*Purple loosestrife*: Spreads quickly through lots of seeds and clogs wetlands. Seeds from Purple loosestrife got carried on ships both accidentally and to be planted in gardens. King County uses special methods to try and control purple loosestrife. It can also be pulled out if you are able to remove all the roots.

*Tansy ragwort*: Can poison wildlife, horses, and other animals. Tansy ragwort arrived in the Americas in hay transported for animals. Try to pull up tansy ragwort (wear gloves) after it forms a shoot but before it flowers and makes seeds. If it has flowered, be extra careful to dispose of plants in the trash, not the compost.

*Herb Robert*: Spreads quickly and prevents other plants from growing. Herb Robert was used for gardens then escaped. Herb Robert is fairly easy to pull because the roots are shallow.



## Answer Key

### Day 1 Activity #3: Noxious Weeds Abroad

#### Article Questions

How did lupine arrive in ecosystems in Norway?

*Lupine was introduced to ecosystems in Norway by humans who wanted to grow it in their gardens. The lupine seeds escaped from gardens and yards, spreading into nearby ecosystems.*

Why is lupine causing problems?

*Despite adding nutrients like nitrogen back to the soil, lupine is still an invasive species because it is growing faster and earlier in the season than native plants. The shade lupine produces prevents the native plants from getting the sunlight they need.*

Based on the text, what is a “bottom-up” effect? Define it in your own words.

*A bottom-up effect is when a loss of plant biodiversity in an ecosystem negatively impacts the herbivores that eat those plants, and the carnivores that eat those herbivores. This means the living things at all trophic levels are negatively impacted.*

## Answer Key

### Day 2 Activity #1: Neighborhood Bullies

Are there any large-scale infestations in your community? Of what species?

*Example- There is an infestation of giant hogweed in a park by my house.*

What problems could these noxious weeds cause?

*Example- Giant hogweed is a noxious weed that causes serious problems. Not only does it take over habitat, using its height and its wide leaves to hog the sunlight. This plant is also dangerous to people. Direct contact with any hogweed sap leaves a sunlight sensitive rash on the skin that can last.*

What adaptations are helping these weeds take over?

*Example- Giant hogweed has several adaptations that help it take over. It is fast growing and can reach heights up to 15 feet, blocking out sunlight for lots of other plants. Once it is established, not only does it have massive, deep roots and plenty of seeds to help it spread, its dangerous sap also make it daunting for people to remove.*



# Answer Key

## Day 2 Activity #3: Plant Imposters



Oregon grape (Native)  
Blue berries, paired leaves



English holly (Invasive)  
Red berries, alternating leaves



Bleeding heart (Native)  
Distinctive heart-shaped flowers, no "hairs"



Herb Robert (Noxious)  
Five-petaled flowers, "hairy" stems



Trailing blackberry (Native)  
Sets of 3 small leaves, thinner stems with spikes instead of thorns



Himalayan blackberry (Noxious)  
Sets of 5 broad leaves, thicker stems with thorns





Cow parsnip (Native)  
Shorter, less noticeable purple color on the stems



Giant hogweed (Noxious)  
Much larger, more noticeably purple stems



Wild carrot (class C invasive)  
Only one, densely packed flower



Poison-hemlock (Noxious)  
Wider spread flowers, multiple clumps



## Answer Key

### Day 4 Activity #1: Lets Pull Together

Why should we control English ivy?

*We need to control English ivy because it shades out and kills ground cover plants, and it creates habitat for rats and other pests. Also, if English ivy is allowed to grow onto trees, it increases the likelihood of rot, and of a tree falling over.*

What precautions should we take to be careful while removing English ivy?

*Gloves should be worn while pulling English ivy.*

What steps do we take to remove English ivy?

*Because of its shallow root system, ivy can be pulled manually from the ground. If ivy has spread up trees, create a "life ring" by severing the vines that connect the plant to the ground, and pull the ivy you can reach so that it can't reconnect to the soil.*

Why should we control Himalayan blackberry?

*Blackberry infestations can grow up to 15 feet tall, killing anything growing below and creating a hostile, thorny habitat for animals. On river banks, blackberry causes erosion that can ruin salmon habitat.*

What precautions should we take to be careful while removing Himalayan blackberry?

*Himalayan blackberry can still be habitat for nesting birds, so we should be careful if cutting it down during peak nesting season between April 1<sup>st</sup> and August 15<sup>th</sup>. Also, the sharp thorns of blackberries can hurt, so wearing gloves and using tools is essential.*

What steps do we take to remove Himalayan blackberry?

*Digging out the root crowns of Himalayan blackberry is the best way to keep the plants from coming back. However, with large infestations, strategies like repeatedly mowing, or even having goats eat the plant, will also be effective.*

Why should we control Poison-hemlock?

*Poison-hemlock is important for us to control because it is poisonous to people and animals. Even worse, this plant looks like wild carrot, which could lead it to accidentally being eaten.*

What precautions should we take to be careful while removing poison-hemlock?

*Gloves, long sleeves and long pants are important to protect us from poison-hemlock. This plant should never be mowed or burned, because the toxins it releases can also make people sick. Poison-hemlock cannot be disposed of in yard waste or compost, but only in the trash.*

What steps do we take to remove poison-hemlock?

*Poison-hemlock can be pulled by (gloved!) hand, or using a shovel. As much of the root should be pulled out as possible. All parts of the plant should be put in the trash. If poison-hemlock is spotted in a park or another public place, report it to the King County Noxious Weed Control Program.*



## Answer Key

### Day 4 Activity #3: Prevention is the Best Medicine

**Dog:**

*The seeds stuck to this dog could easily be spread to a new place. Always check your pet's fur for hitchhiking seeds before leaving a natural area.*

**Lawn mower:**

*Mowing down noxious weeds can spread the plant to other parts of your lawn. Even worse, some noxious weeds can release hazardous fumes when mowed. Only mow if it is recommended by the noxious weed's Best Management Practices.*

**Boots:**

*The seeds of noxious weeds can be spread by sticking to our shoes, especially the fabric of our shoelaces. It is good practice to brush off your shoes before leaving a natural area.*

**Boat motor:**

*Aquatic noxious weeds can latch onto boats, especially the motor. Always check your boat when you remove it from the water, or when entering a new body of water.*

**Blowing dandelion fluff:**

*Noxious weeds like bull thistle rely on the wind to spread their seeds. Many noxious weeds are best removed before they flower and go to seed.*

**Pouring out aquarium:**

*The contents of aquariums should never be disposed of in rivers, lakes or streams. Noxious weeds can be spread from popular aquarium plants. Instead, spread aquarium gravel on the ground to dry out on a hot day, or throw all aquarium contents into the trash.*

