



Native and Invasive Plants Lesson Outline

Grades: 4-6

Time: 45-60 minutes

NGSS Connections:

LS1.A: Structure and Function- Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

ESS3.C: Human Impacts on Earth Systems- Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

LS2.A: Interdependent Relationships in Ecosystems-Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)

Essential Question: *How do native plants increase the health of streams and habitats in our watershed?*

Lesson Materials:

- Plant clues and photos
- Student worksheet
- Plant characteristic and vocabulary visuals for overhead projector

Learning Objectives:

1. Students will be able to identify the key features of invasive plants: they reproduce quickly; lack natural predators; grow in disturbed areas.
2. Students will understand the benefits of native plants including their habitat value for wildlife.
3. Students will understand how native plants contribute to water quality (cool, clean, clear).

Vocabulary: Native, introduced, invasive, habitat

Introduction (~15-20 min):

- Engage prior knowledge: If they received the introduction to watersheds class, remind students of the animals that call their watershed home. For this class, students will be discovering another important piece of their watershed...plants!
- Discuss how plants are crucial for habitat (animals depend on them for food and shelter). Plants also help to keep our rivers healthy (*cool, clear* and *clean* by providing shade and filtering pollutants).
- However, not all plants have the same value for healthy rivers, watersheds, and animal habitat.
- This lesson will help students learn why native plants create the best habitat for wildlife and are important for healthy rivers.
- Introduce the essential question. Students can brainstorm answers now or wait until after the activity to answer.

Ideas for discussing and defining native, introduced, and invasive plants:

- Introduce the concept of native, introduced, and invasive plants by making a 3 column list on the board using student generated content. Scientists agree that a **native** species is any living thing that has been here since before the first Europeans arrived. Have students list any native plants they might know. **Introduced** plants are those that were brought over either intentionally or accidentally. This includes most of our food crops. Have students list a few introduced plants. You may choose to discuss the reasons people have brought plants from other places (they're tasty, make good building material, remind them of home etc.). **Invasive** plants are a special group of introduced plants that take over by out-competing native plants.
- For each category, ask students if those plants are good or bad, do we like/need them, why? What point of view (animal or human) are they thinking about? Have students give them either a thumbs-up or thumbs-down. This will likely generate some good discussion. After discussing, show the thumbs-up/down visual associated with each. Students may choose to disagree (for example, maybe introduced should be a thumbs down or thumbs sideways).
- Discuss how invasive plants are so good at being invasive...secrets to success. Use the visuals to highlight the following information briefly:



Tough (hard to kill; hard to remove; can grow anywhere even in polluted and disturbed places such as the side of a highway)



Power in numbers (they multiply fast via unique/varied methods like cloning or making lots of seeds and generally have more than one method of reproduction)



No predators (can spread and spread with no natural controls because local wildlife don't prefer to eat them)

Blackberry is a great example of an invasive plant. It was introduced because its fruit is delicious. However, once planted it can take over and is hard to remove. Blackberry has thick, hardy roots that are hard to dig out and the thorny canes are really hard to chop down. Blackberry can spread by wildlife eating its fruit, via roots underground or by overland vines/canes. Blackberry can also clone itself (grow new roots when branch has contact with soil). While some animals will eat the berries, blackberry only provides fruit for a couple months and if it has taken over an area, there will be limited food sources available to wildlife during the rest of the year. If a streamside forest gets replaced by blackberry, it will no longer have shade to keep it cool and the deep roots of the forest trees will be replaced by shallower roots that don't filter as well.

Activity (25 min.):

- Students can work in teams of 2 for the activity.
- Students are going to be plant detectives and will decide if a plant should be pulled from or planted in their watershed by reading clues, answering questions and giving a watershed score for each plant.
- Pass out an activity worksheet to each student and walk them through an example (typically Himalayan Blackberry or Ivy). Alternatively, student pairs can share one activity sheet and fill it out together.
- Pass out a plant packet to each group.
- Create 2 column headings on the board: Plant it, Pull it
- As students finish a plant packet, they write the plant name on the board under Plant it or Pull it. It's ok to have the same plant multiple times or in differing columns.
- When students finish with one plant, they repack their packet, return it and a new plant is selected.
- Students will have time to finish between 2 and 3 plants.

Wrap-up (10-15 min.):

- Have students return all plant packets to the bin but keep their worksheet on their desk.
- Begin discussion with a question: "Did you find any plants that surprised you by how helpful they were to wildlife or stream health?" or "What was your highest scoring plant? How was it helpful to wildlife?" As students answer, discuss habitat benefits and stream health benefits. Emphasize cool, clean and clear by asking, "Which plants keep the water **clear** by holding soil back and reducing erosion?" Or "Which plants keep the water **cool** by shading streams and rivers?"
- Go through the Plant it/Pull it lists and check which plants are correct and incorrect (optional).
- Review essential question and have students reflect and answer.
- Discuss field trip goals and how students will be helping to make their watershed healthier.

Online Resource: <http://www.weedinvasion.org/>

Worksheet Answer KEYNative Plants

Ash (Oregon)
Black cottonwood
Camas
Indian plum
Nootka rose
Pacific willow
Red alder
Red elderberry
Salal
Snowberry
Western Red Cedar

Invasive Plants

Clematis
English Ivy
Foxglove
Himalayan blackberry
Morning glory
Reed canary grass
Scotch broom

Plant It - or - Pull It?



YOUR Name(s): _____

After reading your plant's clues, answer the questions and score each category below.

plant name: _____

#1 **Question:** What animals use this plant and how do they use it?

Is this plant important to native wildlife?

1	2	3	4	5
not really		somewhat		important

#2 **Question:** What are the ways that this plant spreads?

How fast does this plant spread?

1	2	3	4	5
quickly		average		slowly

#3 **Question:** Where does this plant grow?

Is this plant found ONLY in the Pacific Northwest?

1	5
NO	YES

Total Points: add each category

#1

+

#2

+

#3

=

Circle Your Score:
10 or more = **Native – PLANT IT!**
9 or less = **Non-Native Invasive – PULL IT!**

Does this plant help rivers and streams? How?

Invasive Plant Characteristics

Tough



Power in Numbers



No Predators



NATIVE plants are:



1. Habitat (food + shelter) for wildlife
2. Part of all local food webs

INTRODUCED Plants are:



1. Habitat for people
2. Pretty or tasty

INVASIVE plants:



1. Take over native plants
2. Reduce wildlife habitat

Native and Invasive Plant Activity

Directions:

Print plant clues and photos single-sided onto cardstock and cut into individual photos and clues. Make a separate envelope including the photos and clues for each plant. It is convenient to have each plant printed on a different color for

Example



Indian Plum

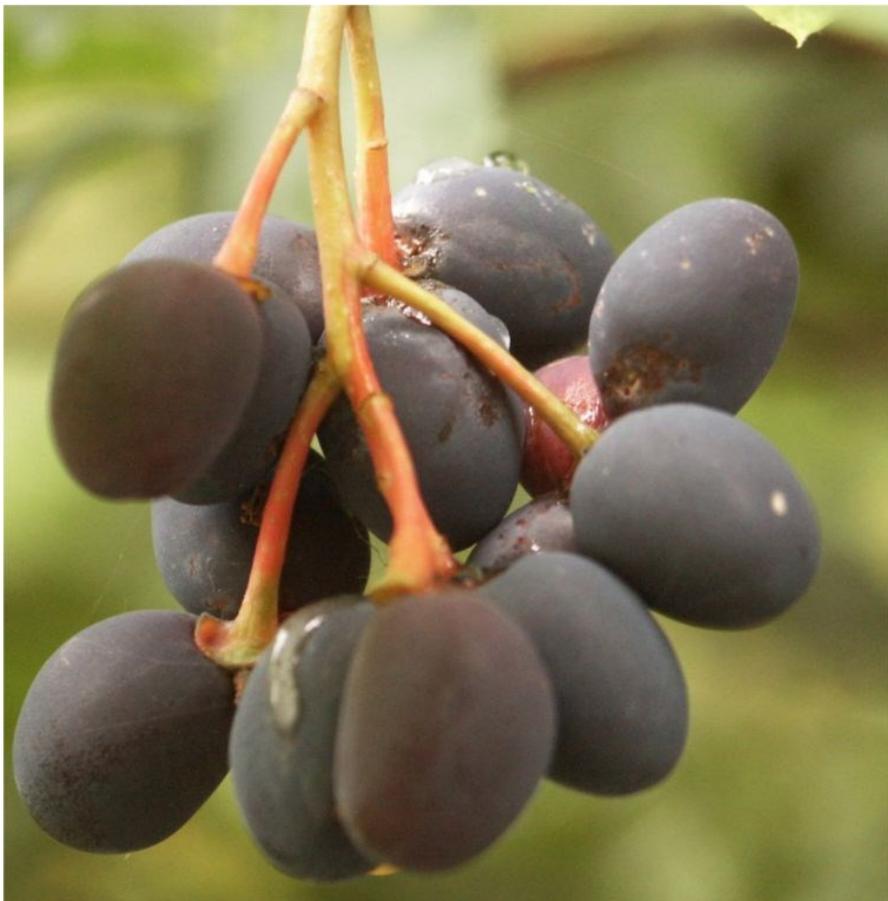
Where Indian Plum grows: Indian Plum is found along streams and forests in the Pacific Northwest.

How wildlife use Indian Plum: The plum shaped fruit is a favorite of birds. Deer eat the leaves and birds use the branches to build their nests.

How Indian Plum spreads: Indian Plum spreads by seeds. The seeds fall to the ground or are eaten and spread around by birds. Indian Plum spreads at an average speed.

Interesting fact about Indian Plum: It is one of the first shrubs to flower in the spring. The female flowers smell nice while the male flowers smell like cat urine.

How Indian Plum helps streams and rivers: Indian Plum keeps water clear by holding back the soil (preventing erosion) with its roots.





Black Cottonwood

Where Black Cottonwood grows: Black Cottonwoods are found along streams, lakes, and rivers. Cottonwood grows in the Pacific Northwest.

How wildlife use Black Cottonwood: Cottonwood provides food and shelter to many wildlife species including raccoon, deer and beavers. Large birds like osprey, heron and eagles use cottonwood trees for nesting sites. Small animals use holes in the trunks for homes.

How Black Cottonwood spreads: Cottonwood seeds are covered by a cottony fluff and get spread by the wind. Cottonwood spreads somewhat quickly.

Interesting facts about Black Cottonwood: An old growth Cottonwood can absorb 400 to 600 gallons of water per day.

How Black Cottonwood helps streams and rivers: Cottonwood keeps water cold by providing shade with long branches and leaves.





Nootka Rose

Where Nootka Rose grows: Nootka Rose grows in forests and wetlands throughout the Pacific Northwest.

How wildlife use Nootka Rose: Birds and mammals eat the fruit while browsers (like deer) eat the leaves and twigs. Songbirds use the branches to build their nests.

How Nootka Rose spreads: This plant spreads slowly by seeds and quickly through underground shoots. The seeds may be carried by water to new locations.

Interesting Fact about Nootka Rose: The rosehips are a good source of vitamin C, even better than oranges!

How Nootka Rose helps streams and rivers: Nootka Rose keeps water clean by filtering out pollution.



Red Alder

Where Red Alder grows: Red Alder grows in moist forests, along creeks and rivers throughout the Pacific Northwest.

How wildlife use Red Alder: Deer and elk browse on the twigs and buds of this tree. Beavers eat the inner bark and birds eat the seeds.

How Red Alder spreads: Red Alder cones produce seeds that are spread by wind and birds. Red Alder spreads quickly.

Interesting facts about Red Alder: Red Alder is often the first tree to grow in an area that has been disturbed by a landslide, logging or fire.

How Red Alder helps streams and rivers: Red Alder keeps water clear by holding back the soil (preventing erosion) with its deep roots.



Red Elderberry

Where Red Elderberry grows: Elderberry grows in sunny areas with moist soil. It can be found near streams in the Pacific Northwest.

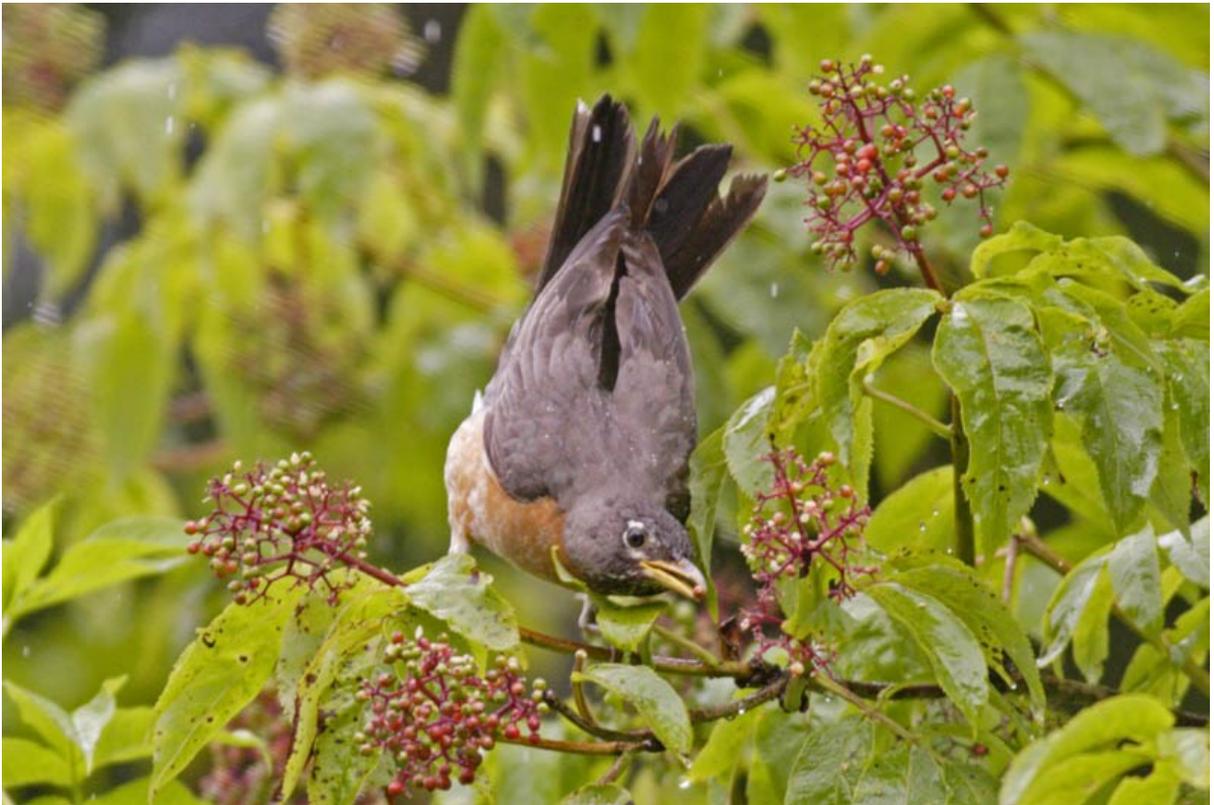
How wildlife use Red Elderberry: Many birds and mammals, like squirrels enjoy eating elderberry fruit. Deer browse the leaves and new shoots.

How Red Elderberry spreads: Elderberry relies on animals to spread its seeds. This plant spreads somewhat slowly.

Interesting facts about Red Elderberry: Even though birds can eat the fruit, the berries are poisonous to humans when eaten raw. Cooked berries make tasty jam and jelly.

How Red Elderberry helps streams and rivers: Elderberry leaves fall into rivers and provide food for water insects.





Snowberry

Where Snowberry grows: This shrub prefers to live on the edge of forests where sunlight is available. Snowberry grows in the Pacific Northwest.

How wildlife use Snowberry: Many birds including the Song Sparrow and Wilson's Warbler eat the fruit, which are available through the winter months. Deer and raccoon eat the twigs and leaves.

How Snowberry spreads: Snowberry spreads slowly by seed and quickly through underground shoots. Each berry contains only two seeds.

Interesting facts about Snowberry: Coastal Native American's referred to Snowberry as "corpse berry." They are considered poisonous to humans.

How Snowberry helps streams and rivers: Snowberry keeps water clean by filtering out pollution.



Himalayan Blackberry

How animals use Himalayan Blackberry: A Blackberry bramble has very little habitat value for animals. Birds and mammals like raccoons and coyotes feast on the berries when they ripe in July and August.

Where Himalayan Blackberry grows: Blackberry grows especially well in sunny areas and can take over any state or country with a mild climate including Australia!

How Himalayan Blackberry Spreads: Blackberry grows from very large root balls that spread quickly underground. It produces tasty berries with many seeds that animals eat and distribute. Blackberry can also clone itself when a branch touches the soil.

Interesting fact: Himalayan Blackberry loves to grow in places that humans have changed.



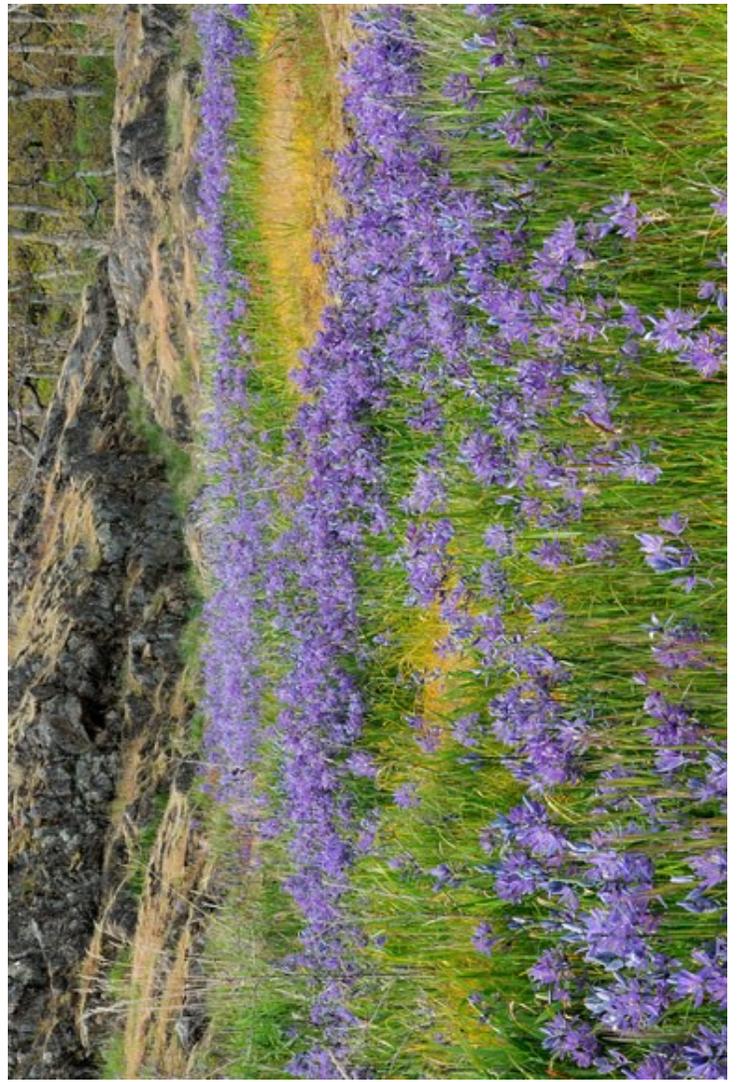
Camas

How wildlife use Camas: Elk and deer eat Camas in the early spring.

Where Camas grows: Camas typically grows in fields, sometimes so thick the blue flowers make the meadow look like a lake. This plant grows in the Pacific Northwest.

How Camas spreads: Seeds grow slowly and take two years to create a flower. Camas also spreads slowly by underground roots.

Interesting fact about Camas: Native Americans roasted Camas bulbs in large pits. Baked Camas tastes similar to baked pear.



Reed Canary Grass

How wildlife use Reed Canary Grass: Cows will eat Reed Canary Grass if it is short. The grass grows so thick that birds cannot build their nests on the ground.

Where Reed Canary Grass grows: Reed Canary Grass grows well in wetlands, in fields and along streams. Reed Canary Grass is found in many parts of the United States not only the Pacific Northwest.

How Reed Canary Grass spreads: The grass can spread quickly by seed or by cloning itself. Canary Grass grows in thick mats up to 8 feet tall.

Interesting information about Reed Canary Grass: People try many methods to kill the grass including dynamite.



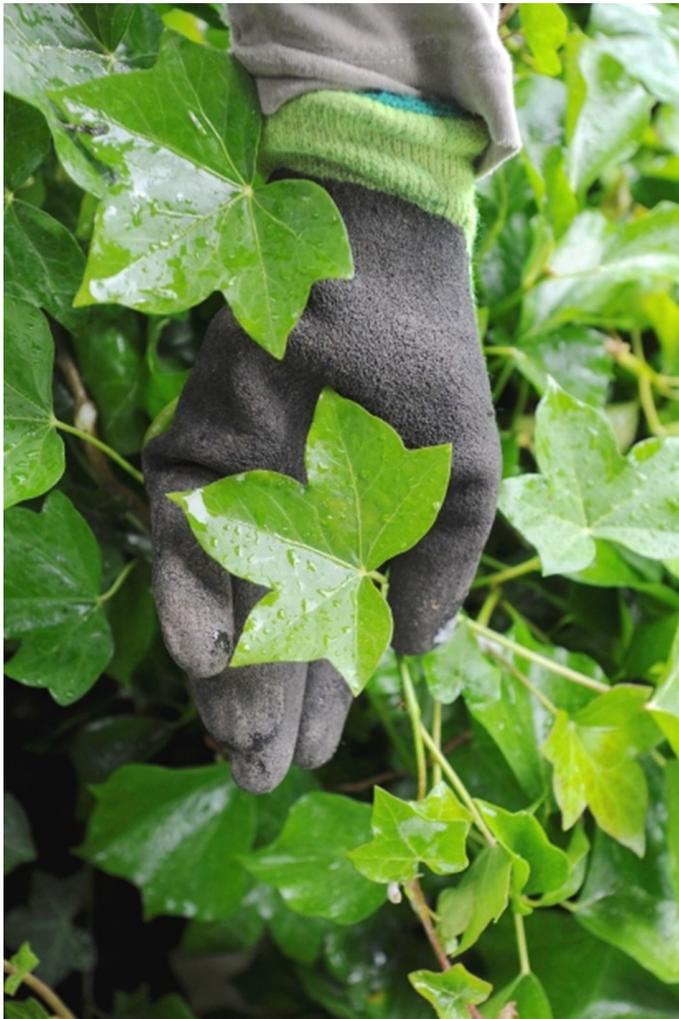
English Ivy

How wildlife use ivy: A few birds will eat ivy berries, but they are mildly poisonous. Animals do not eat ivy leaves due to the thick, waxy covering. Ivy completely covers trees and shrubs and can destroy forest habitat.

Where ivy grows: Ivy is found in forests and neighborhoods in many parts of the United States, Canada and Europe.

How ivy spreads: Ivy berries are eaten and distributed by birds. Ivy can clone itself from a piece of root or leaf left on the ground. This plant spreads very quickly.

Interesting fact about ivy: Ivy releases a glue-like substance that helps it stick. The stem can grow to one foot thick, adding a lot of weight for trees to hold up.





Salal

How wildlife use Salal: Many animals including birds and raccoons eat Salal berries. Deer, elk and rodents browse young leaves. This plant is an important winter food source.

Where Salal grows: Salal grows in forests and in sunny areas in the Pacific Northwest.

How Salal spreads: Seeds in the berries are spread by birds. Salal is able to send out new shoots from its roots which grow into another plant. Salal can grow quickly or slowly depending on the amount of sunlight and water.

Interesting information about Salal: You can make a tiny drinking cup by shaping a Salal leaf into a cone.

How Salal helps streams and rivers:

Salal keeps water **clean** by filtering out pollution.





Foxglove

How wildlife use Foxglove: The plant is poisonous to most animals.

Where Foxglove grows: This hardy plant grows in meadows throughout the United States. Foxglove thrives after human disturbance.

How Foxglove spreads: Each plant produces 1-2 million seeds.

Interesting information about Foxglove: A heart medication derived from foxglove is used by millions of people.





Scotch Broom

How wildlife use Scotch Broom: Birds and ants eat the seeds. The rest of the plant is mildly poisonous to animals.

Where Scotch Broom grows: Scotch Broom is found in sunny, dry areas, typically along the highway. It grows in many areas of the United States and around the world.

How Scotch Broom spreads: It spreads by seeds which are thrown as the pods snap open at maturity. The seeds also stick to tire wheels, clothing, and fur. The seeds can be dormant in the ground for up to 40 years which helps it spread quickly.

Interesting information about Scotch Broom: People get rid of Scotch Broom by introducing beetles that eat the seeds.





Oregon Ash

Where Oregon Ash grows: Oregon Ash grows along streams and in wetlands in the Pacific Northwest.

How wildlife use Oregon Ash: The seeds provide food for songbirds and tree swallows. The tree trunk provides hunting grounds for woodpeckers and homes for birds and raccoons.

How Oregon Ash spreads: The seeds are spread by wind and birds. Oregon Ash spreads slowly.

Interesting facts about Oregon Ash: Ash is used to make tools, furniture and smoke salmon.

How Oregon Ash helps streams and rivers:

Oregon Ash keeps water **cold** by providing shade with leaves and branches.





Pacific Willow

How wildlife use Pacific Willow: Beavers love eating the inner layer of Pacific Willow bark. The Song Sparrow and other small birds use the limbs for nesting, seeds for food and hunt for insects living on the branches. Leaves that fall into water provide food for crawfish and caddisflies (water bugs).

Where Pacific Willow grows: Pacific Willow is often found on river banks, lakeshores and wet meadows. This willow grows in the Pacific Northwest.

How Pacific Willow spreads: Pacific Willow spreads by seed and by broken branches taking root. Pacific Willow spreads at an average speed.

Interesting information about Pacific Willow: The leaves and bark of the willow tree have been used as a remedy for aches and fever for thousands of years.

How Pacific Willow helps streams and rivers: Pacific Willow trees keep water **clear** by holding back the soil (preventing erosion) with its large roots.



Western Red Cedar

How wildlife use Western Red Cedar: The bark is bedding for squirrels and the cones are food for birds in winter. Deer and elk eat the needles. The hollow stumps provide shelter for bears, raccoons and skunks.

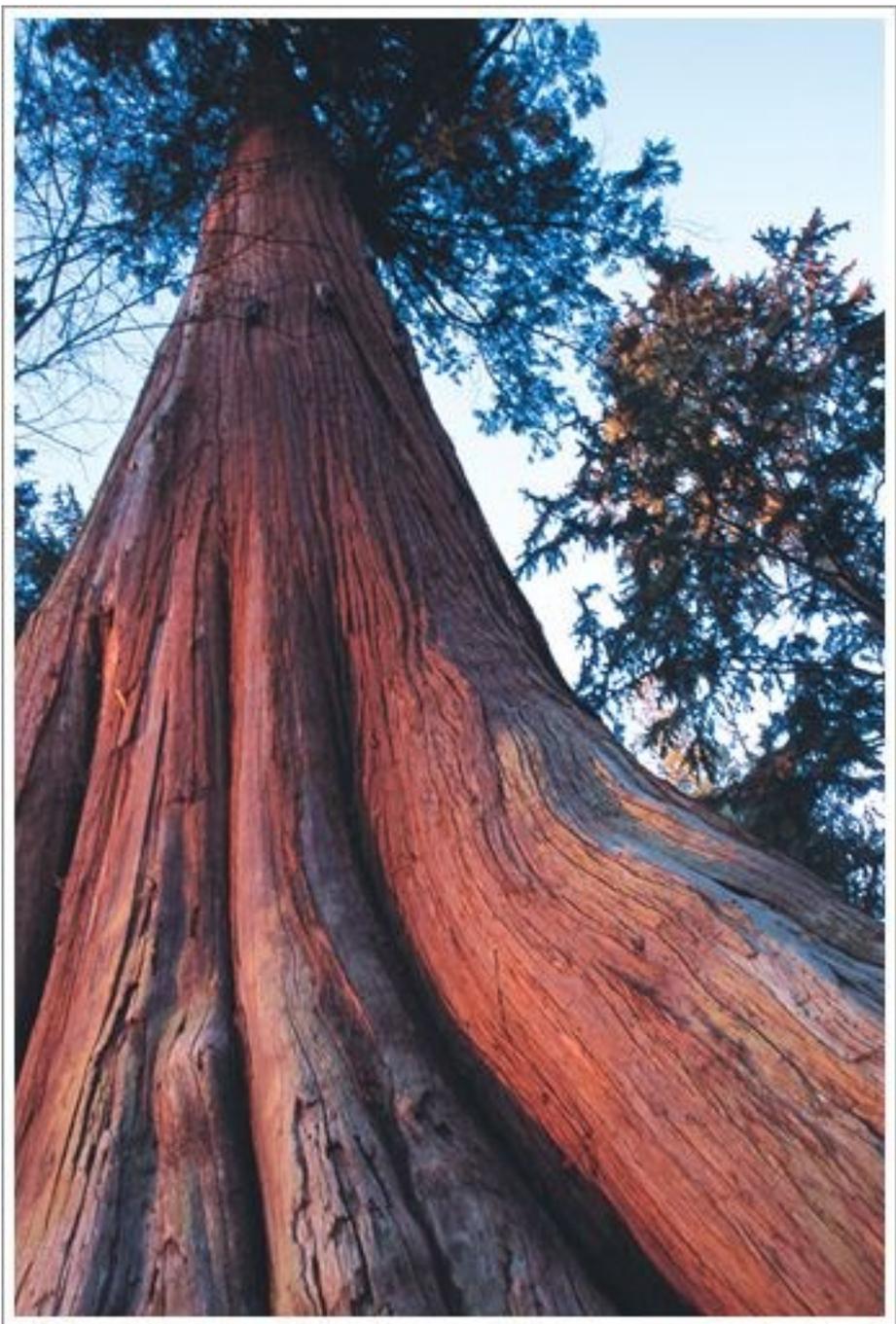
Where Western Red Cedar grows: Western red cedar is often found in shady, cool, moist habitats along streams. Western Red Cedar is found in the Pacific Northwest.

How Western Red Cedar spreads: Western Red Cedar reproduces by seeds and cloning itself from fallen logs or branches. Western Red Cedar spreads slowly.

Interesting fact about Western Red Cedar: The soft fiber of the inner layer of the bark was used for diapers, cradle padding, clothing, and blankets.

How Western Red Cedar helps streams and rivers: Cedar trees keep water **cold** by providing shade with its large branches.





Morning Glory

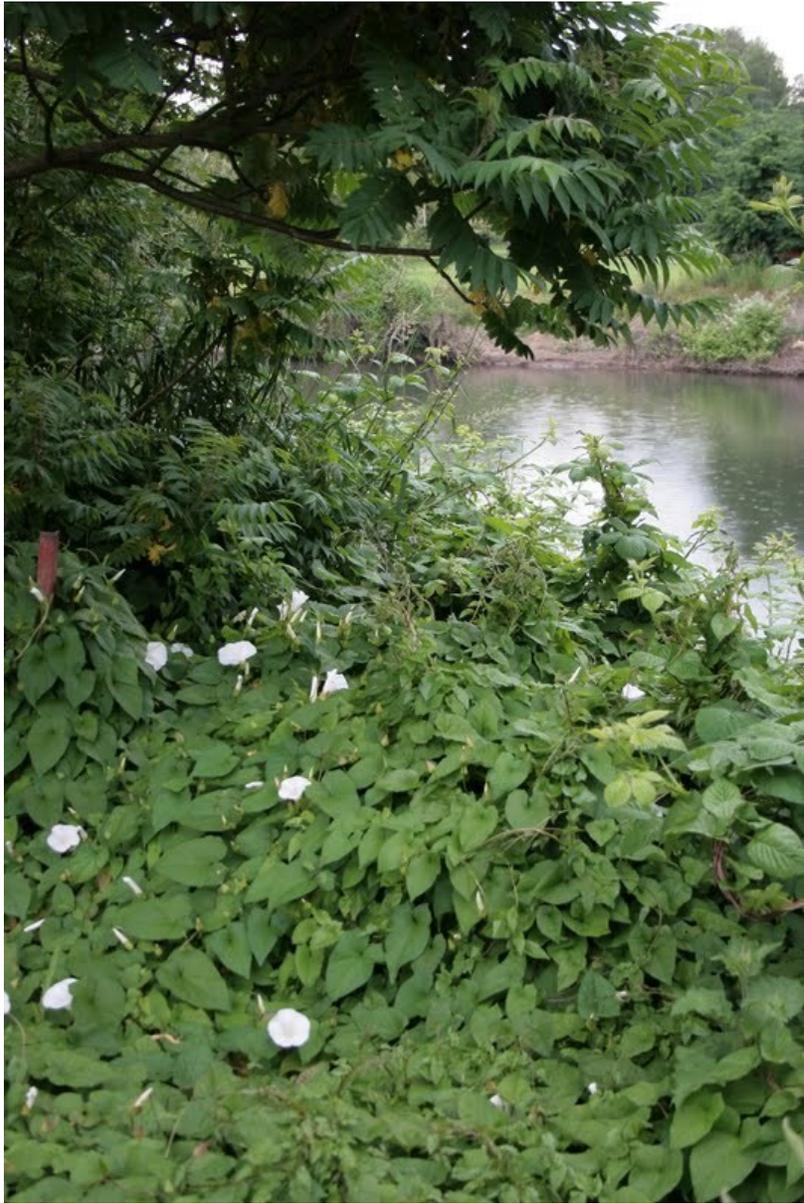
How wildlife use Morning Glory: Bees and Butterflies use Morning Glory pollen. Morning Glory is mildly toxic to grazing animals like cows and deer.

Where Morning Glory grows: It can be found in forests, farmlands and home gardens. It does well in both sunny and shady areas. It grows throughout the U.S. and in Europe and Asia.

How Morning Glory spreads: Morning glory produces hundreds of seeds and the seeds can stay alive in the soil for up to 50 years. Morning Glory can also spread underground by roots.

Interesting information about Morning Glory: Once Morning Glory moves into an area, it is almost impossible to get rid of. It is a serious problem for farm fields and can reduce what farmers are able to grow by 60%.





Clematis

How wildlife use Clematis: Bees and butterflies feed on clematis flower nectar. However, clematis can kill woody plants which destroys food sources for birds, lizards and insect.

Where Clematis grows: Grows along rivers, roadsides, gardens and forest edges. It grows throughout the U.S. and in Europe.

How Clematis spreads: It spreads mainly by seeds that travel by wind, water and in soil or gravel. Each plant can produce more than 100,000 seeds in a year. Pieces of the vines can also take root and form new plants.

Interesting information about Clematis: Clematis can cover bushes and trees over 60 feet tall. Once a tree collapses from the weight of Clematis, the plant continues to grow along the ground in layers that are several feet thick.



