

SSI Conservancy Stewards in Training Program

Station Sheets

INVASIVE SPECIES

Theme: invasive species management

Objectives:

- ✧ Identify common introduced, invasive plant species.
- ✧ Learn different ways to remove Scotch broom.
- ✧ Learn about the threats which Scotch broom and other invasive plants have on native plants, and in turn how this effects native animal species.

Duration: Each station is 40 min for activities, 5 min to move on

ACTIVITY	TIME	EQUIPMENT
<p>Introduction: We are pulling broom at this station. Why would we want to pull broom? What is a native plant species? (here before settlers) E.g. camas, oceanspray</p> <p>What is an introduced plant species? (brought by settlers) E.g. foxglove, dandelion, ivy, broom, holly, gorse, Himalayan blackberry, English hawthorn, Scotch broom</p> <p>What is an invasive plant species? (introduced species that takes over, threatening biodiversity) E.g. Scotch broom, English holly</p> <p>Yet not all introduced species are invasive. Why would this be? Do we treat different introduced species differently?</p> <p>When would an introduced species not be considered invasive?</p> <p>Tell them about possible problems or threats to native species from introduced plant species (e.g. introduced plants may out compete, i.e. grow faster, shade out others, change soil).</p> <p>What effect would a change of plants have on the rest of the community? (i.e. birds, animals, and insects, like butterflies?) (Loss of food source for butterflies and others, loss of open meadow habitat for songbirds, loss of open hunting areas in the case of birds of prey, etc.). An invasive species, such as Scotch broom, has a negative effect on the open Garry oak meadows. (Although it is a good source of cover for species like California quail).</p>	<p>10 min</p>	<p>3 broom pullers</p> <p>3 pruning saws</p> <p>8 pairs of gloves</p> <p>8 pairs of safety glasses</p> <p>2 clippers</p> <p>8 long sleeved shirts</p> <p>Native grass seed & baggies (if possible)</p> <p>Optional: laminated photographs of invasive species</p>

ACTIVITY	TIME	EQUIPMENT
<p>Activity:</p> <p>1) Explain the best time for broom removal (always!) and which methods to use at which times. The best method is cutting them off at the base. The best time is in the spring (May or June) when the plant has green seed pods. Why do you think this is? (this is before the seeds have been broadcast and after the plant has put all its energy into seed production)</p> <p>Pullers can be used to pull broom out by the roots. This kills the plant but may also promote germination of broom seeds dormant in the soil. When possible it is a good idea to replant with native species.</p> <p>Tell the students that for the purpose of this restoration work they will be allowed off the trail, however, they should be careful not to step on fragile mosses or wildflowers. They should always stay within sight of the leaders and work with a buddy.</p> <p>2) Work with students to remove broom and plant native seeds, if available.</p> <p>3) Collect tools from students.</p>	<p>30 min</p>	
<p>Reflection:</p> <p>Our method of broom removal is through physical removal as opposed to chemical spraying. What do you think are the advantages and disadvantages of either method? (discuss)</p> <p>Since most of the lands on SSI are private, protection of Garry oak ecosystems on private lands is critical. On your own land broom removal is a very effective way of helping Garry oak meadows and wildlife that rely on them</p> <p>Record the # of broom plants pulled by the group in journal.</p>	<p>5 min</p>	

Notes on broom removal

Ensure students are wearing safety glasses, work shirts and gloves.

- ✧ Select plant to pull (stem of 1cm to 6cm diameter)
- ✧ Tip handle forward to open clamp
- ✧ Place clamp on stem (don't pinch fingers)
- ✧ Gently pull handle back to clamp on stem low to the ground
- ✧ Look behind you to make sure you don't fall backwards down hill or onto a rock
- ✧ Pull handle down until roots are loose
- ✧ Remove puller, shake plant, throw it aside
- ✧ Tamp dirt down and replace any disturbed vegetation

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RESTORATION

Theme: Restoration as a function of stewardship

Objectives:

- ✧ describe a number of characteristics which affect plant growth.
- ✧ observe and record biotic & abiotic characteristics of a study plot.
- ✧ recognize agents of change.

Duration: Each station is 40 min for activities, 5 min to move on

ACTIVITY	TIME	EQUIPMENT
<p>Introduction:</p> <p>Stop in grove of small trees on path. Ask students if they know how to tell the age of a tree. (All know about cutting down the tree and counting the rings – point out that kills the tree, some tell about a core sample that doesn't kill the tree, a few remember from Channel Ridge about counting limbs). Have students count limbs on one of the trees. (They are all about 30 years old)</p> <p>Walk down to twin stumps. Ask students what they notice about this place. (They notice the stumps, the view, and the "cages"). Ask them what they think about the two stumps. (One is scabbed and one is not.) How old were these trees when they were cut down? (They count the rings and get to roughly 150-250 rings). What kind of tree was it? (Douglas fir – by looking at the bark) Why log only firs and not the oaks? Were both these trees logged at the same time? (Probably not – explain the scabbing – one continued to grow to scab over its 'wound' by using the crossed roots of its sister under the ground. The first things that attack a tree when it has a wound is insects and the bacteria they bring – refer back to why some people don't like to use the cores to age trees because it leaves a wound.</p> <p>Move to cages. What do you notice in this cage? (Tall grass, a lot of grassy material)</p> <p>Tell them the history of this place. It was donated land but the Conservancy didn't know what to do with it or what was here. They hired a biologist to study it. She put up these two types of cages (an open cage and a closed cage.) What is different about this closed cage and that open cage on the ground? (short grass, different color flowers).</p>	<p>15 min</p>	<p>4 quadrat frames</p> <p>Measuring tape/meter stick (2 of either)</p> <p>10 compasses</p> <p>5 Clinometers</p> <p>Survey Sheets (2/group)</p>

ACTIVITY	TIME	EQUIPMENT
<p>(NOTE: only yellow and white flowers all over the field area but the pink and blue flowers in the closed cage are very small – it’s a great visual). What would be the factors that would allow tall grasses and blue flowers in a cage but not in the open cage? (Grazing) From what? (deer, feral goats & sheep, eastern cottontail rabbits possibly)</p> <p>Move to open cage and sit around it on the ground. Explain to the students that they will be doing their own study plots. They will be considering two things – 1. the impact of grazing, and 2. the influence of abiotic (environmental) factors. Ask what sorts of things, beyond grazing activity, might affect the growth of plants in the plot. (Abiotic factors to consider include: amount of sunlight (influenced by slope of plot, exposure or aspect of plot, place on slope, etc.; biotic factors (other than grazing) could be growth of other plants, shading, natural toxins, human influence, etc.).</p> <p>Hand out clipboards with laminated sheets. What is the aspect or exposure of the slope? Do a compass reading. Point when you find north. So, which way is south? Why would a biologist care about that? (South facing slope gets sun all day, different plants grow here, Garry oaks love it – have kids point to a Garry oak.) Looking at diagram of slope what is the position of the plot on the slope?. (Upper slope- have kids look behind them – are they at the top? No. Can they see the bottom of the trees below us? No) Why does a biologist care where on the slope they are? (Water runs down the hill under the ground and to the ocean. Drier at the top of a slope. Different vegetation). Measure steepness of slope. Explain how the quadrat is useful because it is broken into squares. That helps us determine exactly where something is and to calculate how much vegetation there is. Show them how a biologist filled out a quadrat study and labeled it. Why would a biologist do this kind of study? (Shows detail in one place over time.)</p> <p>Activity: Students do their own quadrat study – one on the higher slope, one down lower on the slope.</p>		
<p>Reflection: Meet back and discuss findings. What was the difference between the plants in the two plots? What would be some of the reasons – biotic (grazing, competition from other plants; abiotic (moisture, shade, etc)? Which agents of change do you think most influence your 2 plots?</p>		

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ACTIVITY	TIME	EQUIPMENT
<p>Discuss Restoration and the significance of understanding past, present and future conditions. Past conditions are surmised through observation, i.e. observations that area had been logged, probably twice. We also know about the past through local knowledge by long time resident. For example, we know that there was a goat farm here from previous stories of settlers.</p> <p>How did we consider present conditions? (the enclosure cages, presence of non-native species, presence of grazing, different plants, trees of different age [most of trees on slope are middle height fir trees]).</p> <p>What can we assume about the future of this place? What will happen when those middle height fir trees are allowed to grow to their full height without people cutting them down for housing or logging (they are in a reserve now)? Fir trees grow more quickly than the Garry oaks, and they reproduce sooner.</p> <p>The biologist's findings will affect decisions the conservancy makes for the restoration of the reserve. What sorts of decisions might be made? (Perhaps a decision might be taken to fence the reserve to keep out herbivores. An active reseeding or replanting of native plants might be undertaken. More aggressive removal of all invasive plants (not just broom) might be undertaken).</p> <p>Often when people want to preserve a place, people think that means 'don't touch it'. But humans have already 'touched' this place. We have logged it, we've brought in invasive species, and we've brought in animals that graze the natural vegetation. To return this place to its natural space, humans need to manage it. We pulled broom today. Conservation can look differently than keeping a place pristine from humans.</p>		

Quadrat Survey Sheet

<p>Date: _____</p> <p>Name: _____</p> <p>Plot #: _____</p>	<p><u>Aspect</u> (circle one):</p> <p>a) south facing c) west facing b) north facing d) east facing</p>
<p><u>Slope position</u> (circle one):</p> <p>a) Apex e) Lower slope b) Face f) Valley floor c) Upper Slope g) Gully/ravine d) Middle slope r) Riparian</p>	<p><u>Wildlife Signs</u> (circle all that apply):</p> <p>a) Scat g) Browsing b) Nest h) Other: _____ c) Den e) Trail f) Bed g) Tracks</p>
<p>Vegetation Cover (estimate)</p> <p>Tree layer cover: _____%</p> <p>Shrub layer cover: _____%</p> <p>Herb layer cover: _____%</p> <p>Moss layer cover: _____%</p>	<p><u>Describe Evidence of Wildlife Browsing:</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><u>Plant Species</u> (list any you know):</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	
<p><u>Does your plot need restoration? How would you restore it?</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	

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WILDLIFE TREES

Theme: Wildlife trees are an important part of the Garry oak woodlands

Objectives:

- ✧ Identify wildlife trees and describe their characteristics.
- ✧ Describe the role of wildlife trees in an ecosystem.
- ✧ Assess a tree to determine its value as a wildlife tree.

Duration: Each station is 40 min for activities, 5 min to move on

Reference: Wildlife Trees of British Columbia, Project WILD, Victoria, BC

ACTIVITY	TIME	EQUIPMENT
<p>Introduction:</p> <p>What do you know about a wildlife tree?</p> <p>Use the wildlife tree poster to facilitate a discussion about the creatures that use a wildlife tree during different stages of decay.</p> <p>Include information about – nesting sites, roosting sites, food, nutrients through decay for many life groups, i.e. fungi, bacteria, insects, plants and animals. For example: bats roost under loose bark or in hollow trees; raccoons, squirrels and many bird species nest in tree cavities; amphibians (salamanders) roost under bark on lying logs; bark beetles, termites, ants; turkey tail fungi; molds.</p> <p>Review the WILDLIFE TREE ASSESSOR’S FORM and demonstrate its use with the near tree.</p>	15 min	<p>Wildlife Tree poster</p> <p>Flagging for trails</p> <p>Map to wildlife trees</p>
<p>Activity:</p> <p>Send students off to assess their own trees with a partner after showing them the map and describing the locations. They are to assess 2 or 3 more trees.</p> <p>SAFETY NOTE: Please tell the students NOT to shake the wildlife trees – we don’t want any branches knocking them out!</p>	25 min	<p>8 Wildlife tree assessor forms</p> <p>8 Dry erase markers/ or grease pencils</p> <p>4 measuring tapes or dbh tapes</p> <p>4 rags</p>
<p>Reflection:</p> <p>Students gather to discuss and record answers to the journal questions.</p> <p>Since most of the lands on SSI are private, your care for wildlife trees on your lands (which are important for over 90 species of plants and animals) is critical.</p>	5 min	

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PLANT IDENTIFICATION

Theme: Plant biodiversity in Garry oak woodlands

Objectives:

- ✧ Identify a number of common wildflowers, trees and shrubs.
- ✧ Demonstrate use of a dichotomous key for plant identification.

Duration: Each station is 40 min for activities, 5 min to move on

Set-up: Place 10 numbers on appropriate plants, sometimes flagging the plants if they are small.

ACTIVITY	TIME	EQUIPMENT
<p>Introduction:</p> <p>Why is it important to identify plants? It's important to know your neighbours. You know your classmates by name so you can refer to them. When you become familiar with plants, you also need to know their names to refer to them. And if you want to understand if anything within the community of plants changes over time you would need to know their names. Using names will also help you keep good field notes.</p> <p>The Conservancy is recording the names of all the plants in the Reserve. This is called a baseline inventory. Why might this be important? What use would this information be?</p> <p>The baseline plots will reveal how many rare, threatened or endangered plants are in the area. The inventory will help the Conservancy in future to understand how the plant community changes over time. This inventory will also aid the Conservancy to make decisions about what sort of restoration should take place on the land (e.g. broom removal, native plant seeding or planting, prescribed burning, etc.).</p> <p>One way to find the name of a species is to look at field guides although that may take too long. A biologist would use a dichotomous key as a more accurate way to identify unknown species through its characteristics.</p>	<p>10 min</p>	<p>10 plant identification keys</p> <p>10 tree & shrub identification keys</p> <p>10 flagged and numbered tags for each plant</p> <p>Answer key</p> <p>Field guides</p> <p>10 sit-upons</p>

ACTIVITY	TIME	EQUIPMENT
<p>Activity:</p> <p>Explain how the dichotomous key for identification works and demonstrate the recording process.</p> <p>Send the students off in pairs to identify the ten flagged plants. Remind them to be mindful of where they step, careful not to crush the moss or wildflowers.</p>	25 min	
<p>Reflection:</p> <p>Share results. Do you think using a dichotomous key for plant identification is more useful than someone telling you the name? Which way would let you remember better? Which way has you look more closely at the plant? Plant identification is particularly important in Garry oak meadows because over 90 species at risk live in these meadows.</p>	10 min	

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Dichotomous Key

Student name: _____

Name the plant at the stations below and write the steps which you took to name them

Plant # 1) steps: , 1 2 3 , , , , ,
name: _____ Douglas-fir _____.

Plant # 2) steps: , 1 4 5 , , , , ,
name: _____ salal _____.

Plant # 3) steps: , 1 5 8 , , , , ,
name: _____ buttercup _____.

Plant # 4) steps: , 1 4 6 , , , , ,
name: _____ oceanspray _____.

Plant # 5) steps: , 1 4 , , , , ,
name: _____ blue-eyed Mary _____.

Plant # 6) steps: , 1 5 7 , , , , ,
name: _____ arbutus _____.

Plant # 7) steps: , 1 4 6 , , , , ,
name: _____ Scotch broom _____.

Plant # 8) steps: , 1 2 , , , , ,
name: _____ sea blush _____.

Plant # 9) steps: , 1 2 3 , , , , ,
name: _____ baldhip rose _____.

Plant #10) steps: , 1 5 6 , , , , ,
name: _____ Garry oak _____.

Plant #11) steps: , 1 2 3 4 , , , , ,
Name: _____ grand fir _____.