Making a Bird-iful Habitat

Oregon State Standards

Science
4.1
4.2
5.1
5.2
6.1
6.2
7.1
7.2
8.1
8.2
H.1
H.2

Common Core Standards

SL.4.1
SL.5.1
SL.6.1
SL.7.1
SL.8.1
SL.9.1
SL.10.1
SL.11.1
SL.12.1

Vocabulary

- Native species
- Non-native
- Invasive plant
- Competition
- Community
- Seed dispersal
- Vegetative propagation

Summary: Students learn about invasive plants and their effects on bird habitat. Their understanding is applied through a service learning project in which they restore a natural area for healthy bird habitat.

Time: 1 hour
(Note: This activity can be structured for longer periods of time, such as a full day event or an ongoing class or school project)

Grade Level: 4th -12th

Goals

- To provide practice for students in local stewardship and environmentally sustainable behavior
- To provide tangible examples of ecological relationships
- To encourage students to think about human and personal connections to the local environment
- To foster positive attitudes toward wildlife and natural environments through hands-on experience

Learner Objectives

Students will… .

- Students will remove invasive species along the trail
- Students will discuss the ways seeds are transported and review adaptations.
- Students will discuss steps that encourage songbird habitat
- Students will learn to identify two invasive species in their local area

Note: This lesson is intended to be adapted to individual class projects and according the selected area for habitat restoration

Materials

- gloves
- trowels
- pruners
- flags to delineate focus area
- potting soil
- watering can
- laminated photos of non-native species. In southern Oregon, some examples include Himalayan blackberry, Spotted Knapweed, Yellow Star Thistle and Medusahead.
- *If planting native plants*: native seeds/ plants, shovels, watering hose

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Background Information

Native Plants and Ecological Relationships

A **native species** is indigenous or has become naturalized to a certain region over a long period of time. Native plants have evolved with other living organisms in an area and native animals and plants can come to depend on each other. For example, animals can feed on plants and in so doing they can pollinate the plant or disperse the plant's seeds. An ecological **community** refers to all the populations and all their interactions in a certain geographical area**.** In most cases, native plants have adapted to living in a certain ecological community over thousands, or even millions, of years. Older land plants including mosses and liverworts are estimated to have evolved over 400 million years ago, while younger flowering plants evolved over 100 million years ago. During the time that these plants have existed on earth, they have developed and adapted specific relationships with other plants and animals in their community.

Competition is one driver of change in the development of ecological relationships within a community. Ecological **competition** is an interaction between species in which the presence of one species limits the fitness of the other. Competition results when a limited supply of a resource (such as water, food, space) is used by two or more species. Various aspects of a plant species' biology, such as ability to obtain nutrients or reproduce, can affect the fitness of other species.

A look at reproduction in plants and its effects on species fitness

Seed dispersal: the process by which seeds move and are spread to new areas. There are many different seed dispersal "methods" that are used by plants, including:

- floating seeds: seeds such as coconuts can float across bodies of water until they land in a suitable place to grow
- wind carried: seeds may be light or have fluffy parts that allow wind to carry them great distances
- animal disperse: seeds may be prickly and have the ability to be carried on the fur of a mammal, or they may be eaten by an animal such as a bird and be excreted in a new location
- bursting: seeds may be contained in a pod, as in peas, and when opened the seeds burst forth

Vegetative reproduction: a process that some plants can undergo, in a which a plant reproduces asexually. For instance, instead of reproducing through seeds or spores, the plant is able to grow new shoots from existing stems or leaves.

Himalayan blackberry is a prime example of a plant that can vegetatively reproduce and therefore has a strong competitive advantage over native plants. This plant is able to reproduce from deeply growing roots and vines. New shoots can propagate from even root fragments and stem cuttings, making it very difficult to eradicate.

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Background Information continued

Non-native Species

Although ecological changes due to competition are natural and species relationships are always evolving, humans can interfere with this process. In the past few hundred years humans have introduced numerous species into new communities. **Non-native** plants evolved in another part of the world and have been transported to a new community or ecosystem. Many times a species in a new ecosystem will not survive, but if conditions are favorable for the non-native species (e.g., lack of competitors or predators) then the non-native species may flourish and out-compete native species. If a non-native species has an advantage in obtaining resources and significantly displaces native species it can be referred to as an **invasive species**.

Tips for a bird friendly habitat: Although human impacts on natural ecosystems often have negative effects, humans also have the opportunity to restore and promote healthy habitats for wildlife. *(modified from PRBO "Biedify your yard" available http://www.prbo.org/cms/docs/edu/Backyard_hab.pdf)*

- Provide Nesting and Cover Sites
  - Native vegetation provides the best protection for breeding birds. Planting a variety of native shrubs and trees in multi-species clumps provides the most nest sites with the best cover.
- Create Structural Diversity
  - A structurally diverse habitat is one that has plants growing at different heights and different assemblages. This provides birds with many places to build nests and find food. It also provides adult and young birds with excellent concealment from predators.
- Plantings that Mimic Natural Configurations

  A) Planting native species in a mosaic design - where species are overlapped and grown in clumps - mimics natural plant communities and, therefore, provides good nesting habitat for birds. This offers more choices for birds to build nests, find food, while offering sufficient cover for birds traveling to and from nests.

  B) Leave Dead Trees or Dead Limbs

  This provides habitat for cavity (tree hole) nesting species such as woodpeckers, bluebirds, nuthatches, chickadees, American Kestrel, and Oak Titmouse. Overall, natural cavities provide better nest sites than bird boxes.

  C) Leave Brush Piles and Grass Clippings

  Brush and grass piles provide shelter, nesting material, foraging grounds, and even nesting sites for birds.
- Reduce Introduced Predators or unnaturally high populations of native predators

  The most common neighborhood predator is the non-native, domestic cat. Researchers estimate that over 2.4 billion birds are killed annually by domestic and feral cats in the United States. Native predators, such as raccoons, skunks, rats, and jays, can also negatively impact birds.

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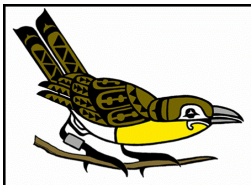

Making a Bird-iful Habitat

Background Information continued

Human activities are responsible for sustaining higher than natural numbers of these predators which negatively affect nesting songbirds. You can help with these simple actions:

- Eliminate outdoor sources of food such as pet food dishes, compost piles, uncovered garbage cans
- Cover compost piles or use covered worm bins
- Use bird feeders that exclude jays and squirrels. Many of these types of feeders can be found at wildlife stores.
- Keep cats indoors. Especially during the breeding season when vulnerable young birds are just out of the nest. Bells on collars are not enough.
- Mow Smart: Many songbirds nest close to the ground in grasses and 'weedy' areas. Critical nesting habitat and even nests are often destroyed unknowingly through mowing and other routine yard maintenance. Set aside "no-mow" areas of your land, this will provide nest sites and shelter for several bird species, especially goldfinches, buntings, quail, and towhees.
- Do not mow native tree saplings and shrubs. Even poison oak, a native shrub, has high value for birds and other wildlife.
- Declare Your Land a Bird Sanctuary
- Designate areas of your land "bird-friendly" with these actions:
- Minimize human disturbance during the breeding season (mid-March through August). Some common disturbances may include, vegetation clearing, construction, spraying, and pet activity.
- Create networks of suitable habitat. Connecting habitat patches is valuable to birds and other wildlife. Work with neighbors and local conservancies to create a network of "bird sanctuaries" in your community.
- Learn the Birds on Your Land
  - Buy a field guide and binoculars!
  - Take a workshop or join a bird walk in your area.

Get to know your local habitats

It is important to observe and research an area to understand how the habitat is used by various species. Drastic changes to a habitat can sometimes have adverse effects on particular species, even if it is a beneficial change such as eradication of a non-native plant species. For instance, in many areas of Oregon, Himalayan Blackberry is an invasive species that will completely cover riparian areas and prevent growth of other native plants along streams. Though the growth of Himalayan Blackberry has significantly altered natural habitats, some bird species have become accustomed to feeding on its berries, or using its dense brush for cover. When removing a non-native species in such cases, it is important to replace it with native plants that can provide similar habitat resources.

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Procedure

1. Discuss background information with the students

2. Tell the students what the goal is for today:
Our goal today is to help prevent the spread of these non-native plant seeds. Today we will be working to remove non-native, invasive plants to make more room for native plants. Address any concerns about cutting plants and not honoring "Leave No Trace" practices. Today you are working on a restoration project. You will work to *restore* this area to a more natural state by removing non-natives.

(If you plan to plant native plants in this area, tell students that by planting native plants it will help prevent non-native plants from regenerating in the area)

3. Safety talk- Make students aware of any hazards at your side (dead snags, uneven ground, roads). All students should pay attention to where they are walking during the activities. We will be using tools throughout the activity to clear invasive plants. Students should be very careful with tools: do not point them toward other students, place shovels or rakes so they will not get stepped upon etc. Also, we want them all returned to the gear area after use, so we do not leave anything behind.

4. Show students an example of how to identify and properly remove the particular species of invasive plant.

For example Meadow Knapweed: Tall stalk with flower (seeds on top) Small rounded leaves at the base, try pulling up one or two to show roots. Stress the importance of removing the seed stalks and the leaves/roots.

For example Himalayan Blackberry: While wearing work gloves and/or using a shovel, remove as much of the root system as possible. When removing the roots, you will eventually come across a burl that may be harder to remove (this may be a good time get adult-assistance). Clean up all fragments of plant parts, because they are able to regrow.

5. If planting native plants: show students an example of how to properly plant (*see tips on following page or ask your local nursery or plant supplier for tips according to the plant species*).

6. Divide students into small groups of 2-3 and assign tasks or areas to work: pulling invasive plants, planting native plants, clearing trail, removing trash etc...

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General procedure for planting a small tree or shrub:

1) Dig a hole that is about 2-3 times as wide as the plant's root ball

2) Gently loosen the root ball and place in the hole and place some soil back in the hole so that the plant stands upright

3) Soak the soil with water and continue to backfill the hole with the soil that was dug for the hole. The soil level should be pressed down and level with the top of the root ball.

4) Cover the ground surrounding the plant with a few inches of mulch.

5) If necessary, protect the base of the tree from weed trimmers by cutting a 2 liter plastic bottle into a cylinder or protect the foliage from deer with wire fencing.

6) Set up a plan to maintain care for the plant especially during the first few years of growth.

Hand out tools, discuss boundaries for the project. Show student the focus area they will be covering. You may also wish to split them into working groups for cooperation and team building.

Teachers restore streamside habitat for birds by removing Himalayan blackberry and suppressing its growth around native vegetation with cardboard and mulch.
Photo © 2013 Klamath Bird Observatory

Recipe for an interpretive trail "from scratch"

1) Choose a pathway to make a trail. Things to consider when selecting a path: environmental sensitivity of the area, safety for the trail users, landmarks to feature.
2) Contact and secure permission from owner of the property where the trail is located whether it is private, or owned by state of local governments.
3) Decide whether you want to use signage, brochures or other communication form to express information about the trail.
4) Research the area for the interpretive trail: history, geography, ecology, etc... Walk the trail and note sights of interest, interesting geologic formations or plants. For deeper information, walk the trail during different times of the year. Seek experts (botanists, geologists, ornithologists, historians, etc.) and anyone that is familiar with the local area to provide specific information.
5) Create your signage, You may also want to place a suggestion box near the trailhead for comments, criticisms and observations from other hikers.

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Conclusion

1. Ask students to reflect on what they learned and their experience:

A) What plant did we remove?
B) How will this help the native bird species?
C) Was this project successful? How can we measure our success?
D) What can you do in your area to help birds?

Link to KBO lessons

- **Birds and Meadow Conservation:** Through this activity, students will learn about the importance of meadow restoration and conservation efforts being made in the Rogue-Siskiyou National Forest through studying the distribution of species along a forest/edge/meadow gradient.

Further Resources

• Community Works Institute
http://communityworksinstitute.org/cwpublications/index.html

Environmental Stewardship Topic Page. National Service Learning Clearinghouse website. December 4, 2012 available online: <http://www.servicelearning.org/topic/area-service/environmental-stewardship>

Educator Resources. 2012 SOLVE website. December 4, 2012. available online: <http://www.solv.org/leader-resources/educator-resources>

Kids and Trails. 2012 American Trails Website. December 19, 2012 available online: <http://www.americantrails.org/resources/kids/Getting-Kids-on-Trails.html>

Kreitinger, K. and T. Gardali. 2006. Bringing the Birds Back: A Guide to Habitat Enhancement in Riparian and Oak Woodlands for the North Bay Region. California Partners in Flight Regional Bird Conservation Plan No. 1, January 4, 2013. available online: <http://www.prbo.org/calpif/pdfs/north_bay.pdf>

Literature Cited

All About Birds. Web. 2013 available http://www.allaboutbirds.org/Page.aspx?pid=1189

Loss S. R. and T. Will, P. Marra. "The impact of free-ranging domestic cats on wildlife of the United States" *Nature Communications.* (January 2013) Web 22 February 2013, DOI: 10.1038

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Klamath-Siskiyou plants: Native and Non-Native

Native Grassland Plant List for Sections of Klamath-Siskiyou Bioregion

- Lemmon's stipa
- Small-leaf bentgrass
- California brome
- Woodland bromegrass
- Dense sedge
- Clustered field sedge
- California oatgrass
- Annual hairgrass
- Slender hairgrass
- Needle spikerush
- Blue wildrye
- Squirreltail
- California fescue
- Western fescue
- Meadow barley
- Foxtail barley
- Wiregrass
- Common toad rush
- Colorado rush
- Bog rush
- Mexican rush
- Nevada sedge
- Spreading rush
- Junegrass
- Beardless wildrye
- Common woodrush
- Onion grass
- Bearded melicgrass
- Purple needlegrass
- Sandberg bluegrass
- Pacific fescue

Common Invasive Plant Species of the Klamath-Siskiyou Bioregion

- Medusahead
- Ventenata
- Rush skeletonweed
- Spikeweed
- Hungarian brome
- Leafy spurge
- Canada thistle
- St. John's Wort
- Tansy ragwort
- Evergreen blackberry
- Scotch broom
- False brome

Cut out: Non-native plant species ID cards

Non-native plant

Yellow star-thistle

Photo © 2013 Flickr Creative Commons

Non-native plant

Spotted Knapweed

Photo © 2013 Flickr Creative Commons

Non-native plant

Himalayan blackberry

Photo © 2013 Flickr Creative Commons

Non-native plant

Cheatgrass

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Birdify Your Yard!
Landscaping for Birds

What Birds Need For Successful Nesting and Survival:

- **Native Plants —** Birds rely on native plants for safe nesting and feeding habitat.
- **Habitat Structure —** Good bird habitat has a mixture of native plants growing at different heights to create habitat structure.
- **Healthy Understory —** Most songbirds nest on or near the ground among native forbs and shrubs.
- **Dead Trees —** Snags and dead trees provide woodpeckers and other cavity nesting birds with essential nesting habitat and insects to feed their young.
- **No Disturbance —** Mowing, brush clearing, and habitat restoration during the nesting season (mid-April-July) causes nests to fail.

American Robin on Nest © Diane Pierce

Lazuli Bunting Nest

How You Can Create a Bird Habitat Garden:

- Plant native plants in mixed species clumps
- Create an understory using native grasses, shrubs, and forbs
- Leave dead or dying trees in your yard
- Avoid mowing, disking, spraying, brush clearing and building activities from mid-April-July in the Klamath-Siskiyou region.
- Reduce predators– keep cats indoors and eliminate outdoor sources of food which attract rats, opossums, skunks, foxes, and jays, all are nest predators eating eggs and young!
- Discourage non-native predators such as House Sparrows and European Starlings– take down nest boxes being used by these species (for more on safe nest boxes see our nest box handout)
- Leave brush piles and pruning debris through the winter to encourage quail and winter sparrows; Golden-crowned and Fox Sparrows.
- Use only selective bird feeders, those that exclude jays, cowbirds, starlings, and crows. For more information see our bird feeding handout.

Additional Resources: Klamath Bird Observaotry www.klamathbird.org, Plant Oregon www.plantoregon.com, Oregon Native Plant Society www.npsoregon.org, Rogue Valley Audubon Society www.roguevalleyaudubon.org, North Mountain Park Nature Center http://www.northmountainpark.org/, National Wildlife Federation www.nwf.org

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Native Plants For Birds—
In the Klamath-Siskiyou

When choosing to landscape for birds and other wildlife, look around your neighborhood and try to re-create the habitats in the surrounding open spaces.

The plants listed here are examples of native plants by habitat type of the common habitat types in the Klamath-Siskiyou region.

Additional Resources:
Klamath Bird Observaotry
www.klamathbird.org,
Plant Oregon
www.plantoregon.com,
Oregon Native Plant Society
www.npsoregon.org,
Rogue Valley Audubon Society
www.roguevalleyaudubon.org,
North Mountain Park Nature Center
www.northmountainpark.org/
National Wildlife Federation
www.nwf.org

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Oak Savannah

Grasses

Elymus glaucus	blue wildlrye
Elymus elymoides	squirreltail
Festuca idahoensis	Idaho fescue
Koelaria macrantha	junegrass
Psuedoregnaria spicata	bluebunch wheat-grass

Herbs

Achillea milefolium	yarrow
Amsinckia meniesii	fiddleneck
Camassia quamash	camas
Cynoglossum grande	hounds tongue
Castilleja spp.	paintbrush
Clarkia purpurea	farewell spring
Delphinium menziesii	larkspur
Lomatium utriculatum	desert parsley
Lupinus bicolor	miniature lupine
Plagiobothyrs spp	popcorn flower
Wyethia angustifolia	mule's ears

Trees

Quercus garriana	OR white oak
Quercus kellogii	CA black oak

Riparian

Shrubs

Prunus virginiana	chokecherry
Ribes spp.	wild currant
Rosa californica	CA wild rose
Rubus spp.	thimbelberry, salmonberry
Sambucus spp.	elderberry
Symphocarpus spp.	snowberry

Trees

Cercocarpus betuloides	birch leaf mtn. mohogany
Populus trichocarpa	black cottonwood
Salix spp.	willows

Pine-Oak-Madrone/Mixed Conifer

Herbs

Aquilegia formosa	columbine
Iris chrysophylla	yellow iris
Iris innominata	Siskiyou iris
Lilium columbianum	tiger lily
Phlox adsurgens	woodland phlox
Polystichum munitum	sword fern
Trillium ovatum	trillium

Shrubs

Amalankier utahensis	serviceberry
Berbrus aquifolim	Oregon grape
Ceanothus spp.	wild lilac
Holodiscus discolor	oceanspray
Kalmiopsis Leachiana	kalmiopsis
Lonicera ciliosa	honesuckle
Philadelphus lewisii	mock orange
Ribes sanguineum	flowering currant
Sambucus mexicana	blue elderberry
Symphoriocarpus alba	snowberry

Trees

Acer glabrum	Douglas maple
Arbutus menziesii	madrone
Calocedrus decurrens	incense cedar
Lithocarpus desiflorus	tan oak
Pinus ponderosa	ponderosa pine
Psuedosuga menzesii	Douglas Fir
Quercus kellogii	CA black oak
Umbellularia califonica	CA bay laurel

Chaparral

See Oak Savannah grasses and herbs

Shrubs and Trees

Amelanchier utahensis	servinceberry
Arctostaphylos spp.	manzanita
Ceanothus cuneatus	buckbrush
Cercis occidentalis	redbud
Cercocarpus betuloides	mtn. mohogany
Rhamus californica	CA coffeberry

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