Planting for Pollinators

Soil School – April, 2016
Kammy Kern-Korot

WEST MULTNOMAH
Soil & Water Conservation District

Presentation Overview

- What is a pollinator?
- Why protect pollinators and natives?
- Bee types and lifecycle needs
- Principles of pollinator planting
- Types of pollinator plant habitat
- Other landscape features important for pollinators
- Examples of good pollinator plants
- Other things you can do to protect pollinators
- Resources

What is a pollinator?

An animal that:

- Visits flowers and picks up pollen
- Distributes the **pollen** to another part of the flower, or a flower in a different location
- Causes fertilization which produces fruit and/or seeds

Examples of Pollinators

- **Bees**
- Butterflies
- Birds (hummer)

- Moths
- Beetles
- Flies
- Bats

Photo: Jack Dykinga

Bees are the most important Pollinator in North America

Why do we need pollinators?

- 90% of flowering plants' reproduction
- 1/3 of food crops (1 in 3 bites)
- ~$20 billion of agricultural production in North America
- Wildlife food; 25% diet of birds, mammals…
- Honey bee colony collapse; need native bees

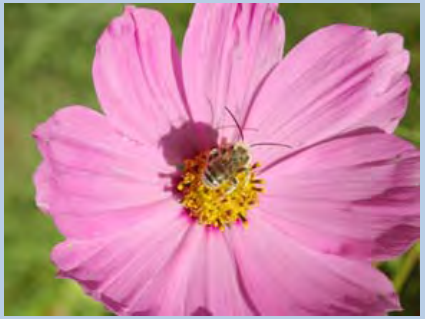


Photo by Mace Vaughan

Free Ecosystem Services from native bees

- Nationwide there are ~4,000 species of bees (45 bumble bee species
- 600- 800 species native to Oregon
- 150 + species in the Willamette Valley
- 18 Bumble bees in the Willamette Valley

Native bees are the bees-knees!

- Hundreds of species pollinate food crops
- Very few are known to sting
- Help honey bees move more quickly, efficiently
- More efficient pollinator of certain species
  - Apple, cherry, blueberry, cranberry, tomato
- Forage earlier & later in the day; in colder & wetter weather
- Insurance against honey bee decline (50% since ‘50)
- Support more native plants & habitats

Native bees / pollinators need our help

- While the decline of European honey bees garners media attention, native bee are on the decline also (e.g. Western Bumble, Franklin's);
- Butterflies are at risk to (e.g. Taylor's Checkerspot)
- Bumbles need corridors; susceptible to inbreeding

Why native plants?

- Native plants are 4 x more likely to attract native bees than non-native plants
- Support native bees which support native plant communities on the landscape
- Specialists need their host (e.g. monarch)

G – Pollinators That May Be Found in Urban Portland Gardens *

BUMBLEBEES	Bombus vosnesenskii (yellow faced)	
	Bombus melanopygus (blacktailed)	
	Bombus mixtus (fuzzy horned)	
CHAP LEGGED BEES	Bombus californica (California)	

*Adapted from Appendix A of the Maritime Northwest Citizen Science Monitoring Guide, Xerces Society, 2014 (unpublished) / corroborated by Mace Vaughn, personal communication (February 2015)

MEDIUM DARK BEES	Andrena spp. + Melandrena spp. (mining bees)	
METALLIC HAIRY BELLY BEES	Osmia spp. + Hoplitis spp. (mason bees)	
SWEAT BEES	Agapostemon spp. (green sweat bee)	
	Halictus spp. (stripped sweat bee)	

Photo Credit:
Left Column (top to bottom): Mace Vaughan, The Xerces Society; Kammy Kern-Korot, WMSWCD; Mace Vaughan; Mace Vaughan
Right Column (top to bottom): Mace Vaughan; Mace Vaughan; Matthew Shepard, The Xerces Society; Mace Vaughan

Bee Niches

- Generalists (like **bumbles**) depend on succession of flowers from early spring (queen emerges) until late summer (when colony dies)
- Specialists pollinate 1-2 plant families but collect nectar from more (e.g. **long-horned bees /chap-leg** and sunflower)
- **Cuckoo** bees are nest parasites; bioindicator of healthy host bee population
- Short-tongued (shallow flowers like aster, carrot family) vs. Long-tongued (favor deep flowers like penstemon)
- Small dark sweat bees like exposed, compacted soil, e.g. driveway cracks; extremely common

Bee Lifecycle

- **Early emergers** like *mining bees* do huge amount of spring pollination
- *Mason bees* active spring or early summer (March – June)
- Green sweat bee active in summer
- Leaf-cutter active early-mid summer
- **Full season life cycle** like bumbles
- New queen bumbles make new nest and lays eggs in spring; incubate until summer
- Ground nesting mostly starts in fall

Native Bee Nesting

- About 70% nest in the ground
  - Solitary female excavates a tunnel, lays eggs, larva overwinter (include green sweat, long-horned, digger, and mining bees)
- Most other species nest in wood
  - Often use dead trees or downed wood
  - Holes made by beetles
  - Hollow stems (mason bees)

- Social bumble bees

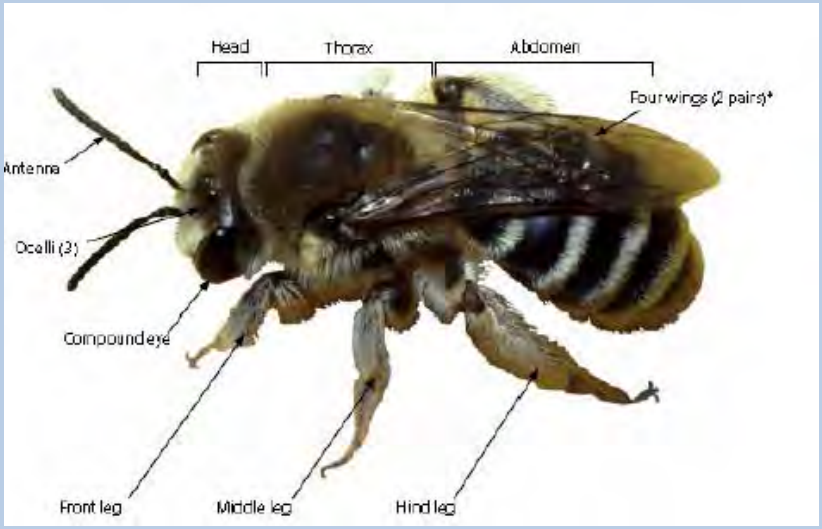
-Might use abandoned rodent hole; under bunch grasses, brush piles, stumps

  - Colony might have a couple hundred worker bees

Native Bee Food & Habits

- Use pollen for protein for young
- Nectar as carbohydrate for adults (for flight & warmth)
- Exhibit floral constancy & fidelity
- Are place based; distance travelled depends on size

- Bees vs. flies – the latter have 1 pair of wings, huge eyes, very short antennae



Principles of pollinator planting

- Provide the full range of bloom times from spring to late summer; 3+ species at any time
- Pay special attention to early & late season
- Plant a diversity of plants: both species, flower size, type and color (blue, purple, violet, white yellow)
- Nectar, pollen and larval food
- Clusters of same species
- Gaps for bare ground

Designing your habitat

Different layers will attract different species and provide other benefits

- Trees - insects, birds, nesting habitat
- Shrubs – insects, birds, cover for wildlife
- Forbs/Wildflowers - diverse insects, larva
- Bunchgrasses - beneficial insect forage, larval growth in butterflies, nesting

Types of Pollinator Plant Habitat

- Hedgerows - along woods, farm field, road, fenceline, under powerlines
- Gardens and residential yards
- Parking strips and rain gardens
- Native habitats – woods, meadows, wetland and pond edges…
- Unproductive farm or forest land: slopes, corners, poorly drained soils; out of reach of irrigation
- Streamsides
- Even turf and weeds provide habitat

Types of Pollinator Habitat cont'd

- Cover crops in farm field and veggie beds
- Urban trees
- Especially valuable close to insect pollinated crops
  - Bees travel 50 feet to ½ mile +
- And near or within orchards

Farm Hedgerow

Last 2 photos courtesy of Sauvie Island Center, Anna Goldrich

Perennial cover for Orchards and Vineyards

Residential Yard

Parking strips

Oregon white oak understory

Streamside area

Hedgerow waiting to happen along Christmas tree stand

Transform a weedy edge of a native habitat

A neglected area that could be made productive for pollinators

A hard to mow lawn or grassy area

Designing a hedgerow

Species Selection

- Consult lists re: what's beneficial; when in doubt, go native
- What are pollinators currently using?
- 3 blooming species at all times, diverse colors and shapes
- Adapted to site sun, moisture conditions (consult NRCS charts)
- Aesthetically pleasing
- Size of plant when mature

Spacing & Number of plants

- Shrubs can be dense
- More dense for erosion, weed suppression
- More spacing for larger plants
- Think about maintenance when choosing spacing

Tree Spacing	
Distance (ft)	**Trees per acre (TPA)**
3 x 3	4840
4 x 4	2723
5 x 5	1742
6 x 6	1210
7 x 7	889
8 x 8	681
9 x 9	538
10 x 10	436
11 x 11	360
12 x 12	303

How many plants & what kind?

- For a 150 ft. hedgerow
- Maybe 4 rows of shrubs 4-5’ apart; ~0.7 acre
- Total 133 shrubs + various “plugs”

- Container vs. bareroot vs. seed
- Annual, perennial or grass

Herbaceous species / meadowscape

- Use <50% bunchgrasses per planted area to allow ample space for the wildflowers needed to cover three seasons of bloom times for pollinators. You may want to plant bunchgrasses more densely to decrease maintenance, help combat weeds, decrease erosion after site preparation and provide pleasing aesthetic features year round.
- If the main goal is to provide ample pollinator forage and you can maintain some larger open spaces in your design during the dormant season, then the ideal mix is < 25% bunchgrasses (Xerces Society 2013).
- A meadow planting palette dominated by **perennial** grasses and wildflower species (up to 75%) will increase the chance of establishment and resilience of your meadow compared to starting with a lot of annuals.

What to plant:
Some favorite plants for bees

- Trees/shrubs: Scouler's willow, vine and bigleaf maple, western crabapple, native cherry, cascara, Indian plum, serviceberry, oceanspray, mock orange, ninebark, Nootka rose, elderberry, snowberry, huckleberry, Oregon grape, currant, salal, etc.
- Bee friendly native perennials: camas, lupine, penstemon, yarrow, stonecrop, goldenrod, nodding onion, Oregon sunshine, etc.
- Fruit tree and berry yields all benefit: blueberry, strawberry, apple, pear, plum, kiwi, peach, cherry, quince, etc.

Tree/shrub Species - common name *(scientific name)*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
California hazelnut *(Corylus cornuta var. californica)*	yellow							
willow species *(Salix sitchensis, scouleriana, and/or lucida)*			yellow					
osoberry/indian-plum *(Oemleria cerasiformis)*			greenish-white					
tall Oregon-grape *(Mahonia Aquifolium) aka Berberis*			yellow					
salmonberry *(Rubus spectabilis)*			purple					
kinnikinnick *(Arctostaphylos uva-ursi)*			purple					
red elderberry *(Sambucus racemosa)*			white					
vine maple *(Acer circinatum)*			red					
bigleaf maple *(Acer macrophyllum)*			greenish-white					
dwarf Oregon-grape *(Mahonia nervosa) aka Berberis*			yellow					
Oregon crabapple *(Malus fusca)*			white					
western chokecherry *(Prunus virginiana var. demissa)*			white					
Pacific madrone *(Arbutus menziesii)*				white				
Pacifc dogwood *(Cornus nuttallii)*				white				
Oregon white oak *(Quercus garryana)*				yellow				
California black oak *(Quercus kelloggii)*				yellow				
red huckleberry *(Vaccinium parvifolium)*				pale pink				
swamp rose (or nootka or dwarf)				red				
red flowering currant *(Ribes sanguineum)*				red				
Pacific ninebark *(Physocarpus capitatus)*				white				
blue elderberry *(Sambucus caerulea)*				white				
Saskatoon serviceberry *(Amelanchier alnifolia)*				white				
black hawthorn *(Crataegus douglasii)*					white			
salal *(Gaultheria shallon)*					white to pink			
mockorange *(Philadelphus lewisii)*					white			
thimbleberry *(Rubus parviflorus)*					white			
Douglas spiraea *(Spiraea douglasii)*					pink			
rose species *(Rosa gymnocarpa, pisocarpa, and/or nutkana)*					pink to purple			
snowberry *(Symphoricarpos alba)*						pink		
oceanspray *(Holodiscus discolor)*						white		

Flower Species - common name *(scientific name)*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
western buttercup *(Ranunculus occidentalis)*			yellow					
shooting star *(Dodecatheon hendersonii)*			pink					
western trillium *(Trillium ovatum)*			white to purple					
meadow checkerbloom *(Sidalcea campestris)*				light pink				
woodland strawberry *(Fragaria vesca ssp. Brachteata)*				white to pink				
Oregon iris *(Iris tenax)*				purple				
camas *(Camassia leichtlinii* or *quamash)*				blue				
western columbine *(Aquilegia formosa)*				red				
fringecup *(Tellima grandiflora)*				greenish-white to reddish				
varileaf phacelia *(Phacelia heterophylla)*					white			
lance selfheal *(Prunella vulgaris)*						purple		
slender cinquefoil *(Potentilla gracilis)*						yellow		
harvest brodiaea *(Brodiaea elegans)*						purple		
salebrosa goldenrod *(Solidago canadensis var. salebrosa)*						yellow		

Bunchgrass Species - common name *(scientific name)*	Height at maturity (ft)
blue wildrye *(Elymus glaucus)*	3
California brome *(Bromus carinatus)*	3
tufted hairgrass *(Deschampsia caespitosa)*	3
Roemer's fescue *(Festuca roemeri)*	2
California fescue *(Festuca californica)*	3

California hazelnut

Erect willow

Indian Plum

Tall Oregon grape

Salmonberry

vine maple

dwarf Oregon-grape

Pacific dogwood

Oregon white oak

swamp rose

red-flowering currant

Ninebark

Elderberry

mockorange

Douglas spirea

oceanspray

Snowberry

shooting star

western trillium

Sidelcea campestris (Oregon checkerbloom)

Photo: Kammy Kern-Korot

woodland strawberry

Oregon iris

common camas

western columbine

fringecup

Native heal-all (Prunella vulgare)

Photo Credit: Lynda Boyer, Heritage Seedlings

Native grass for caterpillars

Tufted hairgrass

Roemer’s fescue

D – Wildflower Bloom Time Chart

	Genus Species	Common Name	Color	Pollinator		Bloom Time							
				Host	Food	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
FORBS (WILDFLOWERS)	Aquilegia formosa	Red columbine	Orange										
	Collomia grandiflora	Large flowered collomia	Orange										
	Lilium columbianum	Columbia lily	Orange										
	Cardamine nuttallii	Spring beauty	Pink										
	Dodecatheon hendersonii	Broadleaf shooting star	Pink		Bumble Bees								
	Lithophragma parviflorum	Small flowered fringecup	Pink		X								
	Dicentra formosa	Bleeding heart	Pink	X									
	Plectritis congesta	Rosy plectritis	Pink		X								
	Dodecatheon pulchellum	Shooting star	Pink										
	Microsteris gracilis	Slender phlox	Pink		X								
	Allium acuminatum	Tapertip onion	Pink		X								
	Asclepias speciosa	Showy milkweed	Pink	X	X								
	Clarkia amoena	Farewell to spring	Pink		X								
	Sidalcea campestris	Meadow checkermallow	Pink		X								
	Synthyris reniformis	Snow queen	Purple										
	Cynoglossum grande	Pacific hounds' tongue	Blue		X								
	Viola adunca	Hookedspur violet	Purple	X									
	Iris tenax	Oregon iris	Purple										
	Collinsia grandiflora	Blue-eyed Mary	Blue		X								
	Camassia leichtlinii	Large camas	Blue		X								
	Camassia quamash	Small camas	Blue		X								
	Dichelostema congestum	Ookow	Purple										
	Hydrophyllum tenuipes	Pacific waterleaf	Purple		X								
	Sisyrinchium idahoense	Blue-eyed grass	Purple										
	Prunella vulgaris	Self-heal	Purple		X								
	Brodiaea coronaria	Crown brodiaea	Purple		X								
	Micranthes occidentalis	Western mountain saxifrage	White										
	Micranthes integrifolia	Wholeleaf saxifrage	White										
	Fragaria vesca	Woods strawberry	White		X								
	Micranthes oregana	Oregon saxifrage	White										

	Genus Species	Common Name	Color	Pollinator		Bloom Time							
				Host	Food	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
FORBS (WILDFLOWERS)	Heuchera micrantha	Alumroot	White										
	Plagiobothrys figuratus	Fragrant popcornflower	White		X								
	Triteleia hyacinthina	Hyacinth brodiaea	White										
	Fragaria virginia	Prairie strawberry	White		X								
	Plagiobothrys scouleri	Scouler's popcornflower	White										
	Achillea millefolium	Yarrow	White	X	X								
	Allium amplectens	Slim leaf onion	White		X								
	Anaphalis margaritacea	Pearly everlasting	White	X	X								
	Ranunculus orthorhyncus	Straightbeak buttercup	Yellow										
	Lomatium (various)	Biscuitroot	Yellow	X	X								
	Mimulus guttatus	Seep monkeyflower	Yellow		X								
	Ranunculus occidentalis	Western buttercup	Yellow										
	Viola praemorsa	Canary violet	Yellow										
	Sedum spathulifollium	Stonecrop	Yellow		X								
	Potentilla gracilis	Graceful cinquefoil	Yellow		X								
	Geum macrophyllum	Avens	Yellow		X								
	Madia gracilis	Slender tarweed	Yellow		X								
	Eriophyllum lanatum	Oregon sunshine	Yellow		X								
	Solidago elongata	West coast goldenrod	Yellow		X								
	Solidago lepida	Western Canada goldenrod	Yellow		X								
GRAMINOIDS (GRASS-LIKE PLANTS)	Agrostis exarata	Spike bentgrass	Green										
	Carex densa	Dense sedge	Green										
	Carex leptopoda	Dewey's sedge	Green										
	Carex scoparia		Green										
	Carex tumulicola	Foothill sedge	Green										
	Festuca roemeri	Roemer's fescue	Green										
	Koeleria macrantha	Junegrass	Green										
	Luzula comosa	Wood rush	Green										

From Portland Urban Meadowscaping

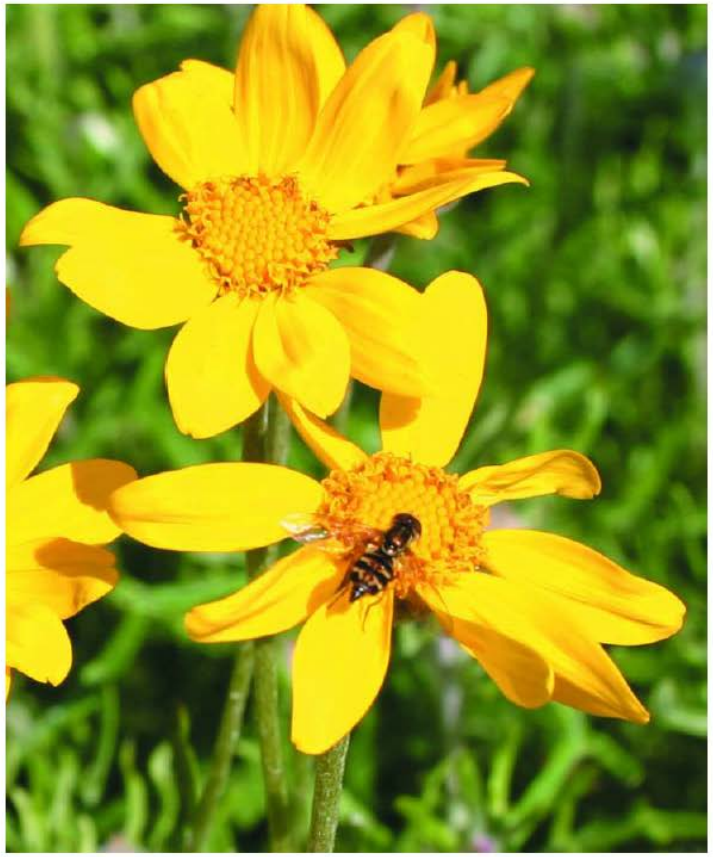
Wildflower Bloom Time Chart Continued

	Genus Species	Common Name	Color	Pollinator		Bloom Time							
				Host	Food	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
SHRUBS	Ribes sanguineum	Red-flowering currant	Pink		X								
	Rosa gymnocarpa	Baldhip rose	Pink	X	X								
	Symphoricarpos albus	Snowberry	Pink	X	X								
	Rubus spectabilis	Salmonberry	Pink	X	X								
	Rubus parviflorus	Thimbleberry	White		X								
	Gaultheria shallon	Salal	White	X	X								
	Philadelphus lewisii	Mock orange	White		X								
	Holodiscus discolor	Oceanspray	White		X								
	Berberis aquifolium	Tall Oregon grape	Yellow	X	X								
	Salix spp.	Willow	Green	X	X								

*Chart adapted from source material provided by Metro and The Xerces Society.

Other desirable species

Favorite “Bullies”



Photos: heritageseedlings.com

Native bumble bee on lupine

Other Lovely “Bullies”

Achillea millefolium

Solidago canadensis var salebrosa

Outstanding Annuals

Gilia capitata (Photo: Mary Bushman)

Plectritis congesta (Photo: Erica Stokes)

Other bee-friendly Native plants

Honey bee on native thistle

Other beneficial plants

- Lots of herbs: basil, borage, lavender, rosemary, marjoram
- Garden plants: lithodora, sunflower, hyssop
- Flowering fruit trees, raspberries / berries
- Cover crops, e.g. red clover
- Phacelia is an attractive cover crop; buckwheats (*Eriogonum*) are effective (some natives, too)
- Veggies gone to flower

Cover Crops or Insectary Plants

Table 2. Seasonal cover crop or insectary plants (arranged by bloom timing and flower color)

Common Name	Scientific Name	Bloom timing	Flower color	Cover (C) or Insectary (I) plants	Beneficial Insect Visitors
*+Baby blue eyes (native)	Nemophila meziesii	Early	White	I	Bees, parasitic wasps, pirate bugs
*+Mustards	Brassica species	Early	Yellow	I	Bees
Calendulas, pot marigold	Calendula officinalis	Early-mid	Orange, yellow	I	Bees, various predators and parasitoids
*+Alfalfa	Medicago sativa	Early-mid	Purple	C	Bees, assassin bugs, lady beetles, pirate bugs, parasitic wasps,
*+Bell beans	Vicia faba	Early-mid	White	C	Bees
*+Clover, Crimson	Trifolium incarnatum	Early-mid	Red	C	Bees
+Vetch	Vicia species	Early to late	Whites to purples	C	Bees
*+Tidytips	Layia platyglossa	Early to late	Yellow and white	I	Bees, parasitic wasps, pirate bugs
+Borage	Borago officinalis	Mid	Blue	I	Bees
*+Mexican sunflower	Tithonia rotundiflora	Mid	Orange	I	Bees
*+Buckwheat, California (native)	Eriogonum fasciculatum	Mid	Pink	I/C	Bees, hover flies, pirate bugs
*+Clover, Red	Trifolium pratense	Mid	Pink	C	bees
Basil	Ocimum basilicum	Mid	White	I	Bees
*Coriander (cilantro)	Coriandrum satirum	Mid	White	I	Bees, hover flies, parasitics wasps, pirate bugs
Zinnias (no double petals)	Zinnia species	Mid-late	Multi-colors	I	Various predators

Cover Crops or Insectary Plants

*+Phacelia	Phacelia tanaecitifolia	Mid-late	Purples	I/C	Bees, syrphid flies
*+Mint, Korean licorice	Agastache rugosa	Mid-late	Purples	I	Bees
+Pincushion flower	Scabriosa species	Mid-late	Pink to blue	I	Bees
Pigweed	Amaranthus	Mid-late	Red	I	Ground beetles
*+Buckwheat (non-native crop)	Fagopyrum esculentum	Mid-late	White	I/C	Bees
*Alyssum, annual or sweet	Lobularia maritima	Mid-late	White to purples	I	Bees, hoverflies, lacewings, parasitic wasps, pirate bugs
*+Cosmos	Cosmos binpinnatus	Mid-late	White(best), pinks, purple	I	Bees, hoverflies, parasitic wasps, lacewings, lady beetles
*+Buckwheat, sulphur-flowered (native)	Eriogonum umbellatum	Mid-late	Yellow	I/C	Bees, hover flies, pirate bugs
*+Dill	Anethum graveolens	Mid-late	Yellow	I	Bees, lady beetles, lacewings, wasps
*+Sunflower	Helianthus annulus	Mid-late	Yellow	I	Bees, Pirate bugs beneficial mites, various predators and parasitoids
*Marigolds (single petal varieties)	Tagetes patula	Mid-late	Yellow to oranges	I	Various predators and parasitoids
*Corn cockle	Agrostemma githago	Late to early	Pink	I	Bees, lady beetles, parasitics wasps
* - particularly good insectary plants.					
+ - particularly good bee plant					

Other things you can do for pollinators

- Provide bare dirt and wood; don't over-mulch; especially in sunny spots, dedicate a dirt path
- Other nesting structure, e.g. pithy stems
- Use care with insecticides/neonicotinoids; look out for garden store products e.g anti-aphid (amino chloropid) and treated nursery plants
- Avoid organic-approved pyrethrin, spinosad pesticide – danger to bees; neem ok when not applied directly to bees; citrus may inhibit pollination
- Practice IPM; spray at night; avoid blossoms
- Minimize ground disturbance, tillage
- Provide shallow water
- Provide mud for mason bees (clay soil)
- Clean or replace artificial nest structures
- Leave existing habitat undisturbed

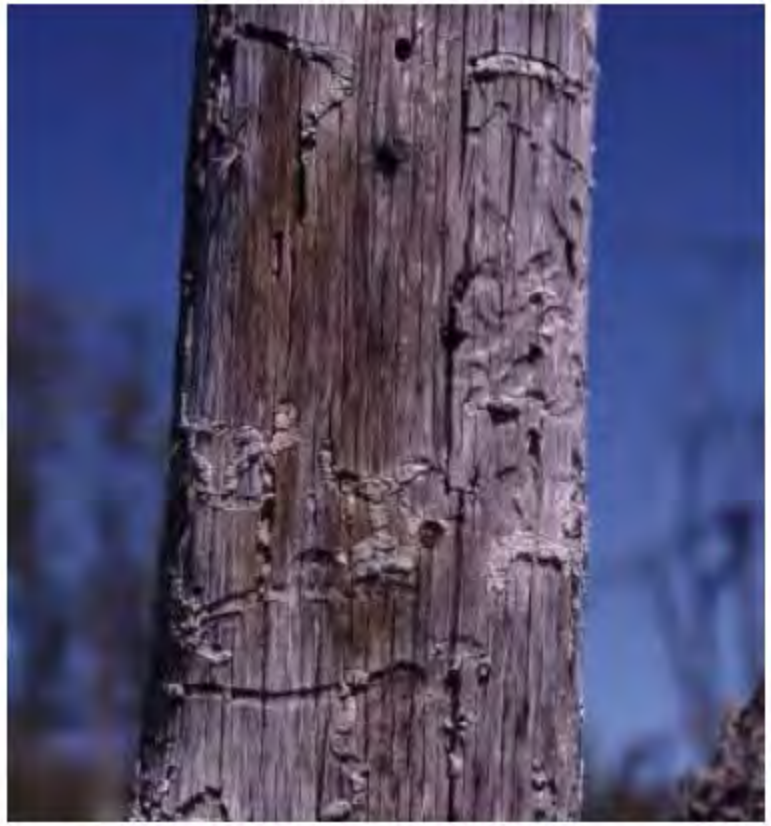
Keep it dirty and “messy”

Overwintering bumble bees will live in a leaf

Native nesting habitat

Nest sites - bare ground and wood

Bees seen entering or leaving holes in the ground are a sure sign of an active nest site. These mining bees were flying on a sunny, April morning. (Photograph by Matthew Shepherd.)



Beetle–tunneled snags, like this one, and patches of bare ground are important nesting sites for solitary bees. (Photograph by Matthew Shepherd.)

Photos: Farming for Bees

Nest sites

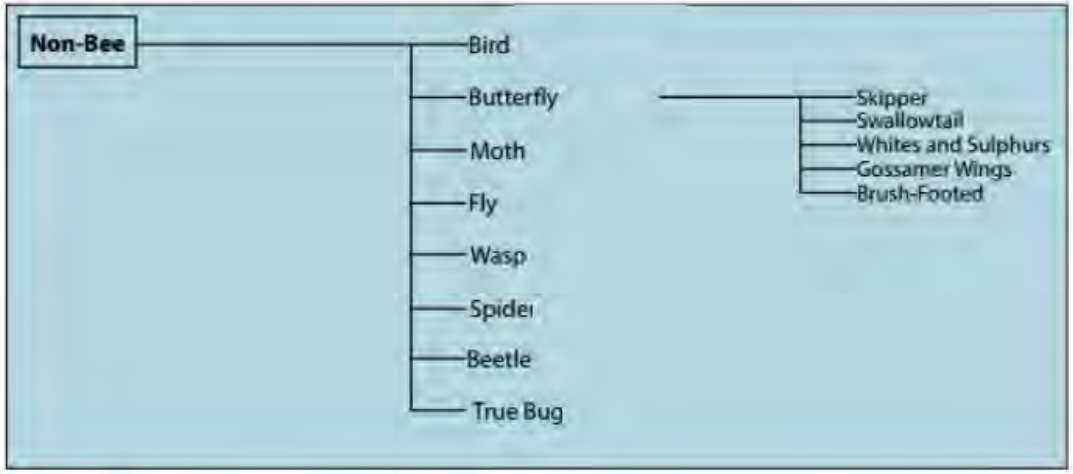
Nest sites for tunnel-nesting bees can be made in many ways. They may be made from a stack of grooved planks (left photo). Nests also may be constructed from a bundle of hollow stems (right photo), such as bamboo (shown here), common reed, or teasel. (Photographs by Matthew Shepherd and Mace Vaughan.)

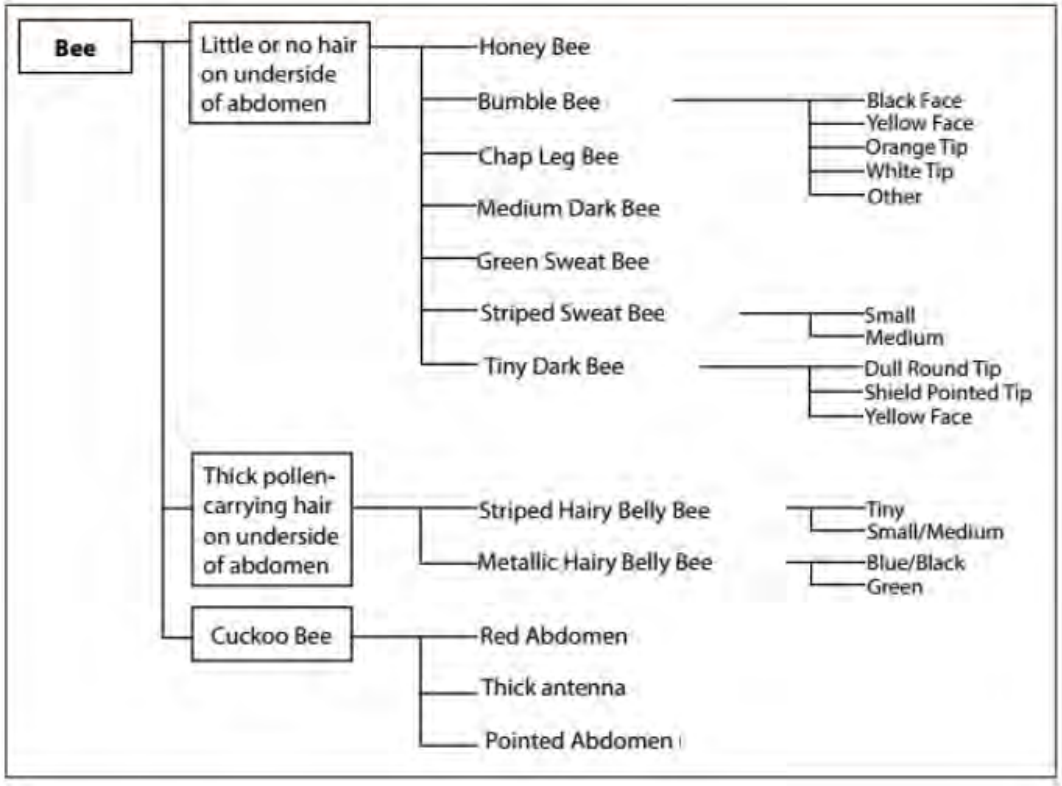
Photos: Farming for Bees

Monitoring

- Evaluate plant health
- Are they too crowded?
- Too many weeds?
- Do you still have bare dirt?
- Do you have species that insects are never using?
- Do you still have continuous blooming?
- What species can you add?
- Do you have bee groups missing?

Key to Identifying Floral Visitors





Resources

POLLINATOR PLANTS

Maritime Northwest

Nootka rose, Douglas aster, and Pacific ninebark

The Maritime Northwest is a diverse geographic region, encompassing the coastline and coastal range of southern Vancouver Island, Washington, Oregon, and northern California; the grasslands of the Puget Trough and Willamette Valley; and ending on the eastern side of the Cascade Mountains. Large elevation and rainfall changes throughout this region have created diverse plant communities, ranging from the temperate rainforests of the Olympic Peninsula, the oak savannah grasslands of the Valleys, and the evergreen forests and subalpine meadows of the Cascade range.

Corresponding to this striking diversity of plant communities is an equally remarkable range of pollinators, including the once prominent Western bumble bee (*Bombus occidentalis*). Imperiled butterflies, including the Oregon silverspot (*Speyeria zerene hippolyta*), Taylor's checkerspot (*Euphydryas editha taylori*), Fender's blue (*Icaricia icarioides fenderi*), and Puget blue (*I. i. blackmorei*) butterflies also inhabit this region. As a group, these and other pollinators maintain healthy, productive plant communities, provide food that sustains wildlife, and play an essential role in crop production.

Providing wildflower-rich habitat is the most significant action you can take to support pollinators. Adult bees, butterflies, and other pollinators require nectar as their primary food source. Female bees also collect pollen as food for their offspring. Native plants, which are adapted to local soils and climates, are usually the best sources of nectar and pollen for native pollinators. Incorporating native wildflowers, shrubs, and trees into any landscape promotes local biological diversity by providing shelter and food for wildlife. Native plants are better adapted to regional climate cycles, do not need fertilizers, and are less likely to become weedy.

This guide features regional native plants that are highly attractive to pollinators and are well-suited for small-scale plantings in gardens, on business and school campuses, in urban greenspaces, and in farm field borders. In addition to supporting native bees and honey bees, many of these plants attract nectar-seeking butterflies, moths, and hummingbirds, and some are host plants for butterfly and moth caterpillars. With few exceptions, these species occur broadly across the region and can be purchased as seed or transplants. Please consult regional Floras, the Biota of North America's North American Plant Atlas (http://bonap.net/napa), or the USDA's PLANTS database (http://plants.usda.gov) for details on species's distributions in your area.

BRING BACK THE POLLINATORS

Our Bring Back the Pollinators campaign is based on four principles: grow pollinator-friendly flowers, protect bee nests and butterfly host plants, avoid pesticides, and spread the word. You can participate by taking the Pollinator Protection Pledge and registering your habitat on our nationwide map of pollinator corridors.

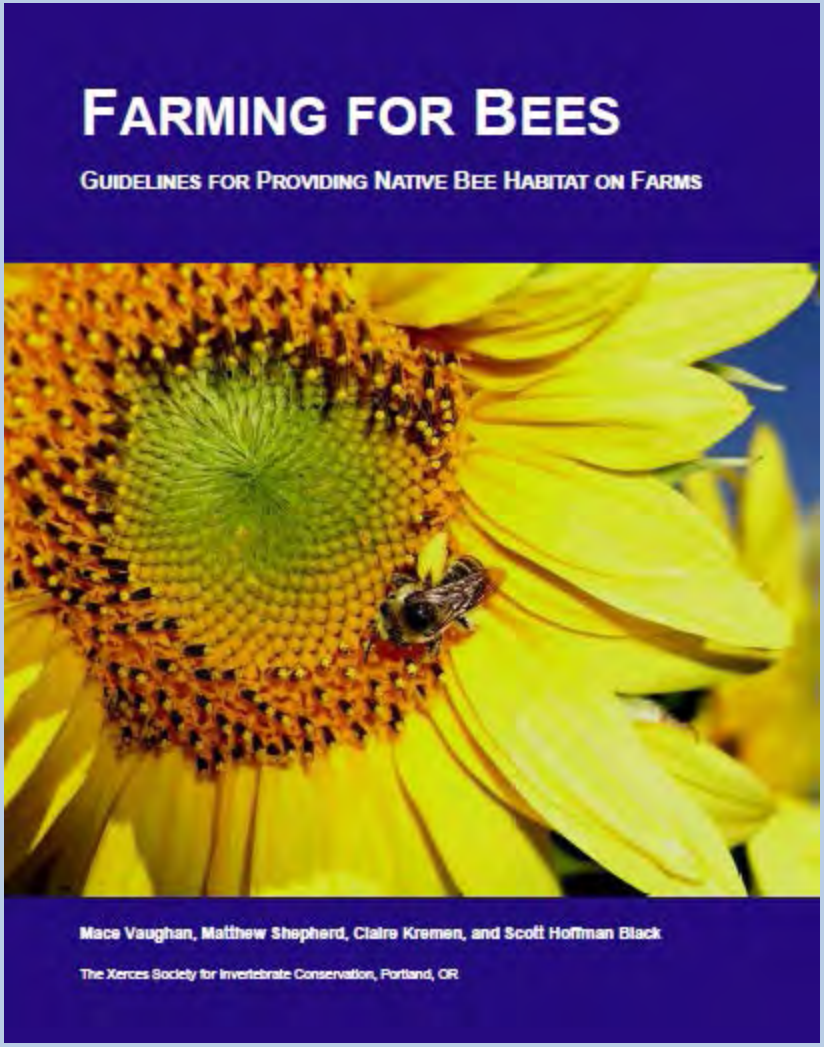
www.bringbackthepollinators.org

THE XERCES SOCIETY

Pollinator Plants: Maritime Northwest
http://www.xerces.org/wp-content/uploads/2014/09/MaritimeNorthwestPlantList_web.pdf

Great ideas for plants our region:
http://www.pollinator.org/guides.htm
and follow the prompts

Resources



Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms

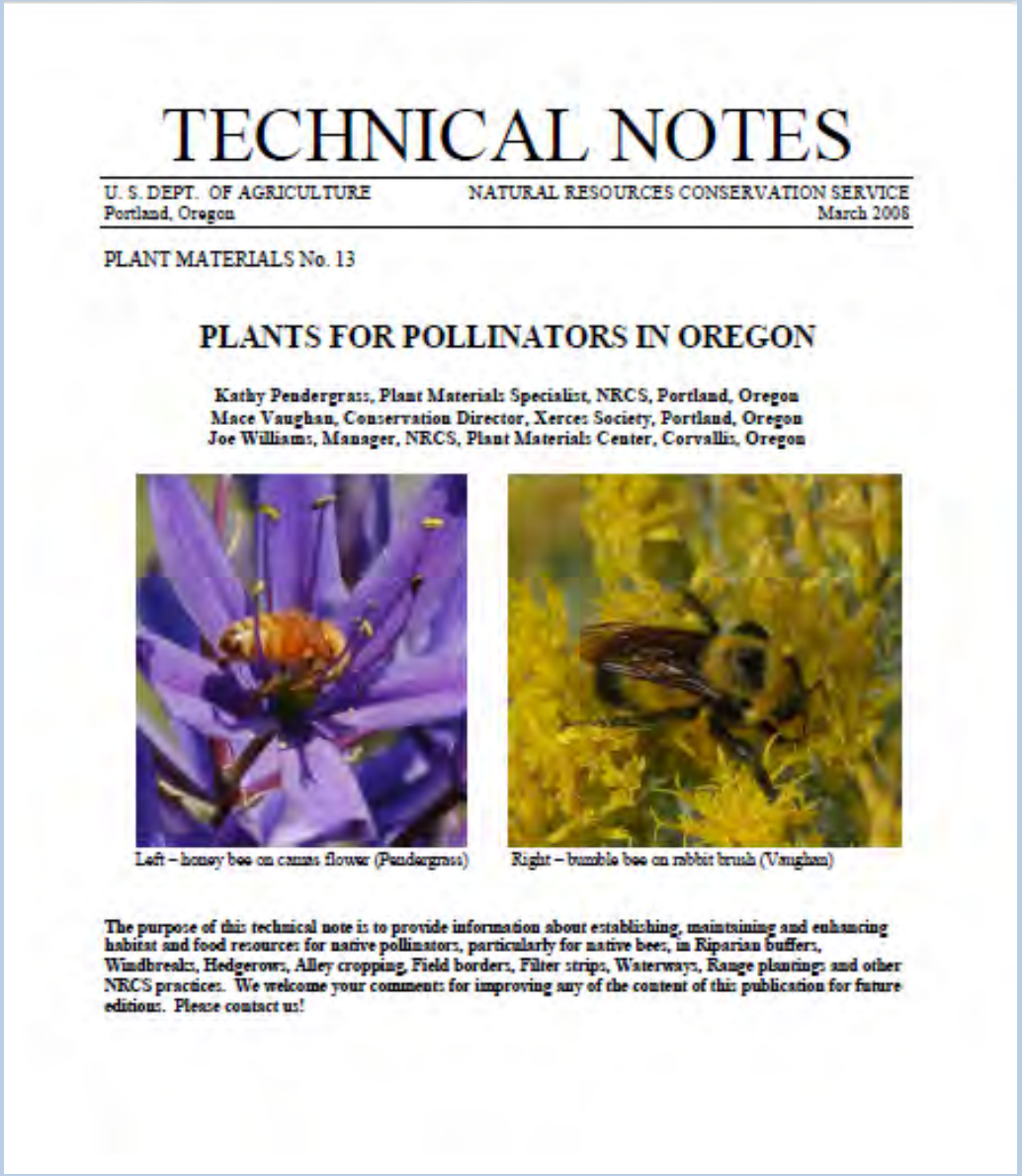
Xerces Publication

Mace Vaughan, Matthew Shepherd, Claire Kremen, and Scott Hoffman Black

www.xerces.org

(The background info in this talk is based heavily on info gathered from this document!!)

Resources



TECHNICAL NOTES

U. S. DEPT. OF AGRICULTURE — NATURAL RESOURCES CONSERVATION SERVICE
Portland, Oregon — March 2008

PLANT MATERIALS No. 13

PLANTS FOR POLLINATORS IN OREGON

Kathy Pendergrass, Plant Materials Specialist, NRCS, Portland, Oregon
Mace Vaughan, Conservation Director, Xerces Society, Portland, Oregon
Joe Williams, Manager, NRCS, Plant Materials Center, Corvallis, Oregon

Left – honey bee on camas flower (Pendergrass)

Right – bumble bee on rabbit brush (Vaughan)

The purpose of this technical note is to provide information about establishing, maintaining and enhancing habitat and food resources for native pollinators, particularly for native bees, in Riparian buffers, Windbreaks, Hedgerows, Alley cropping, Field borders, Filter strips, Waterways, Range plantings and other NRCS practices. We welcome your comments for improving any of the content of this publication for future editions. Please contact us!

Plants for Pollinators in Oregon

Pendergrass, Vaughan, & Williams

Publication from NRCS

Plants for Pollinators in Oregon Table 5a

Table 5a. Oregon perennial forbs (wildflowers) for pollinators (arranged by bloom period and flower color)

Species known to be used by beneficial insects
Species known to be used by bees
Species known to be used by both bees and beneficials

Genus known to be used by beneficial insects
Genus known to be used by bees
Genus known to be used by both bees and beneficials

Where "use local stocks" is indicated, species may exhibit multiple subspecies or varieties; so it is particularly important to use plants originating from the region of your project

Common Name	Scientific Name	MLRA's in which species occurs (watch the wrapping on this column)	Bloom Period	Flower Color	*Height Mature (feet)	Light Needs	*Drought Tolerance	*Precipitation Minimum	*pH Min.	*pH Max.	*Calcium carbonate Tolerance	*Salinity Tolerance	Notes
pale agoseris	^Agoseris glauca var. glauca	6,9,10,21,23,24,25,43	Mid Spring	Yellow	1	Sun	Medium	10	6	8	Medium	None	
western yarrow	Achillea millefolium var. occidentalis^	All	Early Summer	White	3	Sun to part shade	Medium	8	6	8	Medium	Low	good for beneficials, low use by bees
Columbian monkshood	Aconitum columbianum ssp. columbianum	3,5,6, 9,10,24,43,	Mid-late Summer	Blue	5	Sun to part shade	Low	28	5.4	7.2	Medium	None	used by bumblebees
nettleleaf giant hyssop	Agastache urticifolia var. urticifolia	3(South),5,9,10,21,23,24,25,43,	Late Spring	Red	5	Sun to part shade	Low	18	6	8	Medium	Low	

Plants for Pollinators in Oregon Table 5b

Table 5b. Oregon annual forbs (wildflowers) for pollinators (arranged by bloom period and flower color)

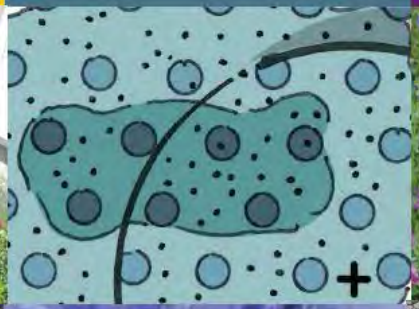
Species known to be used by beneficial insects
Species known to be used by bees
Species known to be used by both bees and beneficials

Genus known to be used by beneficial insects
Genus known to be used by bees
Genus known to be used by both bees and beneficials

Where "use local stocks" is indicated, species may exhibit multiple subspecies or varieties; so it is particularly important to use plants originating from the region of your project

Common Name	Scientific Name	MLRA's in which species occurs (watch the wrapping on this column)	Bloom Period	Flower Color	*Height, Mature (feet)	Light Needs	*Drought Tolerance	*Precipitation Minimum	*pH (Minimum)	*pH (Maximum)	*Calcium carbonate Tolerance	*Salinity Tolerance
shortspur seablush	Plectritis congesta	1,2,3,4,5	Early Spring	pink	2	Sun to part shade	Low	25				
slender clarkia	Clarkia gracilis	2,5,6,21	Early Spring	Purple	2.5	Sun to part shade	High	12	6.4	8.5	Medium	None
small-flowered lupine	Lupinus polycarpus	1,2,3,4,5,7	Early Spring	Purple	1.5	Sun	High	20				
narrowleaf minerslettuce	Montia linearis	2,5,6,10,11,21, 23,24,25,43	Early Spring	White	0.8	Sun to part shade	Low	16				

The Meadowscaping Handbook












WEST MULTNOMAH
Soil & Water Conservation District

Resources

West Multnomah
Soil & Water Conservation District
http://www.wmswcd.org
click on “Resources”

Bees and Flowers: A Partnership for Life

A Partnership for Bees

Flowers sustain bees through their entire life cycle. Adult bees drink sugar-rich nectar to get energy for flight and warmth, and females collect nectar and pollen to provide for their offspring. The flowers that support native pollinators—bees, flies, butterflies, and birds—are disappearing from many modern landscapes.

In recognition of this, West Multnomah Soil & Water Conservation District and the Xerces Society for Invertebrate Conservation are working together to encourage the planting of native species for pollinator conservation in west Multnomah County.

Native plants can be incorporated into urban and rural landscapes to benefit pollinators and support the pollination needs of adjacent crops. West Multnomah SWCD provides free technical assistance on conservation practices to its constituency.

Pollination is critical for plant reproduction. Without it, plants will not produce fruit or seed. More than 70% of plants rely on an animal—in most cases, an insect—to move their pollen.

Bees are the most important group of pollinators. They are the primary pollinators for more than one hundred crops grown on this continent. Together, these crops are valued at over $20 billion per year.

North America has 4,000 species of bees. The non-native European honey bee is the most common managed pollinator. However, many wild native bees also pollinate crops. Native bees are often adapted to specific plants, resulting in more efficient pollination and the production of larger and more abundant fruits and seeds.

Bees are threatened by diseases and changes in the landscape that reduce habitat.

Providing Habitat for Bees

Pollinator-friendly flowers can be easily integrated into any landscape. Hedgerows that include flowering shrubs with overlapping bloom will provide pollen and nectar for bees throughout the growing season. Conservation plantings with a diversity of flowers offer food for bees (and the stable, untilled ground provides nesting opportunities for a range of bees). The vegetation in buffer strips, ditches, or roadsides can also support flowers, and thus bees.

Use native plants wherever possible, and try to have three or more species in bloom at one time. Particularly important are flowers that bloom early or late in the season, helping bee populations grow at critical periods of the year.

Also try to provide nest sites in pollinator habitat. Patches of bare earth allow mining bees and others to excavate nests. Mason and leafcutter bees will occupied drilled wooden blocks or bundles of hollow stems. Bumble bees will nest under grass tussocks or in old rodent holes.

Simple steps will make a significant difference for our vital bees.

For more information about providing bee habitat, visit:
www.xerces.org www.wmswcd.org

Willamette Valley Butterfly Garden

[species choices from N. American Butterfly Association – Eugene Chapter]

Trees and Shrubs

Deciduous Trees

Bigleaf maple (Acer macrophyllum) [l]
Chokecherry (Prunus emarginata) [l] [n]
Oregon white oak (Quercus garryana) [l]
Red alder (Alnus rubra) [l]

Medium to tall shrubs

Mock orange (Philadelphus lewisii) [n]
Nutka rose (Rosa nutkana) [l] [n]
Ocean spray (Holodiscus discolor) [l] [n]
Redstem ceanothus (Ceanothus sanguineum) [l]
Scouler's willow (Salix scouleriana) [l] [n]

Herbaceous Perennials

Medium to Tall Perennials and Annuals

Barestem lomatium (Lomatium nudicaule) [n]
Bigleaf lupine (Lupinus polyphyllus) [l] [n]
Balsamroot (Balsamorhiza deltoidea [n]
Bleeding heart (Dicentra Formosa) [l]
Cow parsnip (Heracleum lanatum) [n]
Douglas' aster (Aster subspicatus) [n]
Fernleaf lomatium (Lomatium dissectum) [l] [n]
Fireweed (Epilobium angustifolium) [n]
Goldenrod (Solidago canadensis) [n]
Gumweed (Grindelia inegrifolia) [n]
Hall's aster (Aster hallii) [n]
Large-flowered collomia (Collomia grandiflora) [n]
Meadow checkermallow (Sidalcea campestris) [l] [n]
Mugwort (Artemesia douglasii)[l] [n]
Mule's ear (Wyethia angustifolia) [n]
Oregon sunshine (Eriophyllum lanatum) [n]
Oregon geranium (Geranium oreganum) [n]
Oregon iris (Iris tenax) [n]
Pearly everlasting (Anaphalis margaritacea) [l] [n]
Popcorn flower (Plagiobothyrus figuratus) [n]
Rose checkermallow (Sidalcea virgata) [h] [n]
Self-heal (Prunella vulgaris var lanceolata] [n]
Slender cinquefoil (Potentilla gracilis) [h]
Showy milkweed (Asclepias specioa) [h] [n]
Showy tarweed (Madia elegans) [n]
Spanish clover (Lotus purshianus) [l]
Streambank lupine (Lupinus rivularis) [l] [n]
Tall camas (Camassia leichtlinii [n]
Tigerlily (Lilium columbianum) [n]
Yarrow (Achillea millefolium)[l] [n]

Low Perennials and annuals

American vetch (Vicia americana) [l] [n]
Broadleaf strawberry (Fragaria virginiana) [l] [n]
California poppy (Eschscholtzia californica) [n]
Cat's ears (Calochortus tolmeia) [n]
Cutleaf microseris (Microseris laciniata) [n]
Early blue violet (Viola adunca)[h]
Monkey flower (Mimulus guttatus) [l]
Rosy plectritis (Plectritis congesta) [n]
Slim-leaf onion (Allium amplectens) [n]
Spring-gold (Lomatium utriculatum) [n]
Stream violet (Viola glabella) [l]
Western buttercup (Ranunculus occdentalis) [n]
Wintercress (Barbarea orthocerus) [l] [n]

Ornamental Grasses and Sedges

Medium to Tall Grasses

Blue wildrye (Elymus glaucus)
California oatgrass (Danthonia californica)
Roemers fescue (Festuca roemeri)
Tufted hairgrass (Deschampsia cespitosa)

Low Grasses

California oatgrass (Danthonia californica)
Dense sedge (Carex densa)
Dewey's sedge (Carex dewyana)
Foothill sedge (Carex tumulicola)
Junegrass (Koeleria macrantha)
Pine bluegrass (Poa secunda)
Spiked bentgrass (Agrostis exarata)

Last 3 slides from Linda Boyer, Heritage Seedlings (Dec. 2005)

A List of 12 Favorites and their benefits

- **Lavenders:** Bumblebees, carpenter bees, digger bees and large and small leafcutting bees collect the nectar of this evergreen shrub.
- **Pacific or coast rhododendron:** Larval host for brown elfin and gray hairstreak butterflies. Hummingbirds, bees and Western tiger swallowtails collect the nectar of this evergreen shrub. Native to the Pacific Northwest.
- **Blueblossom:** Larval host for pale swallowtail, California tortoiseshell and echo blue butterflies. Bumblebees, carpenter bees, honey bees, digger bees and a variety of small native bees collect the nectar of this evergreen shrub.
- **Ocean spray:** Larval host for spring azure, brown elfin and Lorquin's admiral butterflies. Bumblebees and a variety of small native bees collect the nectar of this deciduous shrub.
- **Serviceberry:** Hummingbirds, bees and butterflies collect the nectar of this deciduous shrub. Larval host for Weiddemeyer's admiral butterflies. Native to the Pacific Northwest.
- **Russian sage:** Honey bees, small carpenter bees and leafcutting bees collect the nectar of this perennial garden plant. The nectar also attracts hummingbirds.

- **Red-flowering currant:** Important nectar source for early-season butterflies. Nectar also attracts hummingbirds. Perennial that is a native to the Pacific Northwest.
- **Zinnias:** A wide array of hummingbirds, butterflies and bees collect the nectar. Annual garden plant.
- **Sunflower:** Longhorn bees, sweat bees, leafcutting bees and bumblebees collect the pollen and nectar of this annual.
- **Salal:** Larval host for spring azure butterflies. Bees collect the nectar on this groundcover. Native to the Pacific Northwest.
- **Catmint:** Honey bees, bumblebees, carder bees and mason bees collect nectar and pollen from this perennial.
- **Milkweed:** Monarch butterflies collect nectar and pollen and lay their eggs on this perennial wildflower. Nectar also attracts hummingbirds. Native to the Pacific Northwest.

List from OSU Extension

Willamette Valley Butterfly Garden

[species choices from N. American Butterfly Association – Eugene Chapter]

Trees and Shrubs

Deciduous Trees

Bigleaf maple (Acer macrophyllum) [l]
Chokecherry (Prunus emarginata) [l] [n]
Oregon white oak (Quercus garryana) [l]
Red alder (Alnus rubra) [l]

Medium to tall shrubs

Mock orange (Philadelphus lewisii) [n]
Nutka rose (Rosa nutkana) [l] [n]
Ocean spray (Holodiscus discolor) [l] [n]
Redstem ceanothus (Ceanothus sanguineum) [l]
Scouler's willow (Salix scouleriana) [l] [n]

Herbaceous Perennials

Medium to Tall Perennials and Annuals

Barestem lomatium (Lomatium nudicaule) [n]
Bigleaf lupine (Lupinus polyphyllus) [l] [n]
Balsamroot (Balsamorhiza deltoidea [n]
Bleeding heart (Dicentra Formosa) [l]
Cow parsnip (Heracleum lanatum) [n]
Douglas' aster (Aster subspicatus) [n]
Fernleaf lomatium (Lomatium dissectum) [l] [n]
Fireweed (Epilobium angustifolium) [n]
Goldenrod (Solidago canadensis) [n]
Gumweed (Grindelia inegrifolia) [n]
Hall's aster (Aster hallii) [n]
Large-flowered collomia (Collomia grandiflora) [n]
Meadow checkermallow (Sidalcea campestris) [l] [n]
Mugwort (Artemesia douglasii)[l] [n]
Mule's ear (Wyethia angustifolia) [n]
Oregon sunshine (Eriophyllum lanatum) [n]
Oregon geranium (Geranium oreganum) [n]
Oregon iris (Iris tenax) [n]
Pearly everlasting (Anaphalis margaritacea) [l] [n]
Popcorn flower (Plagiobothyrus figuratus) [n]
Rose checkermallow (Sidalcea virgata) [h] [n]
Self-heal (Prunella vulgaris var lanceolata] [n]
Slender cinquefoil (Potentilla gracilis) [h]
Showy milkweed (Asclepias specioa) [h] [n]
Showy tarweed (Madia elegans) [n]
Spanish clover (Lotus purshianus) [l]
Streambank lupine (Lupinus rivularis) [l] [n]
Tall camas (Camassia leichtlinii [n]
Tigerlily (Lilium columbianum) [n]
Yarrow (Achillea millefolium)[l] [n]

Low Perennials and annuals

American vetch (Vicia americana) [l] [n]
Broadleaf strawberry (Fragaria virginiana) [l] [n]
California poppy (Eschscholtzia californica) [n]
Cat's ears (Calochortus tolmeia) [n]
Cutleaf microseris (Microseris laciniata) [n]
Early blue violet (Viola adunca)[h]
Monkey flower (Mimulus guttatus) [l]
Rosy plectritis (Plectritis congesta) [n]
Slim-leaf onion (Allium amplectens) [n]
Spring-gold (Lomatium utriculatum) [n]
Stream violet (Viola glabella) [l]
Western buttercup (Ranunculus occdentalis) [n]
Wintercress (Barbarea orthocerus) [l] [n]

Ornamental Grasses and Sedges

Medium to Tall Grasses

Blue wildrye (Elymus glaucus)
California oatgrass (Danthonia californica)
Roemers fescue (Festuca roemeri)
Tufted hairgrass (Deschampsia cespitosa)

Low Grasses

California oatgrass (Danthonia californica)
Dense sedge (Carex densa)
Dewey's sedge (Carex dewyana)
Foothill sedge (Carex tumulicola)
Junegrass (Koeleria macrantha)
Pine bluegrass (Poa secunda)
Spiked bentgrass (Agrostis exarata)

Last 3 slides from Linda Boyer, Heritage Seedlings (Dec. 2005)

A List of 12 Favorites and their benefits

- **Lavenders:** Bumblebees, carpenter bees, digger bees and large and small leafcutting bees collect the nectar of this evergreen shrub.
- **Pacific or coast rhododendron:** Larval host for brown elfin and gray hairstreak butterflies. Hummingbirds, bees and Western tiger swallowtails collect the nectar of this evergreen shrub. Native to the Pacific Northwest.
- **Blueblossom:** Larval host for pale swallowtail, California tortoiseshell and echo blue butterflies. Bumblebees, carpenter bees, honey bees, digger bees and a variety of small native bees collect the nectar of this evergreen shrub.
- **Ocean spray:** Larval host for spring azure, brown elfin and Lorquin's admiral butterflies. Bumblebees and a variety of small native bees collect the nectar of this deciduous shrub.
- **Serviceberry:** Hummingbirds, bees and butterflies collect the nectar of this deciduous shrub. Larval host for Weiddemeyer's admiral butterflies. Native to the Pacific Northwest.
- **Russian sage:** Honey bees, small carpenter bees and leafcutting bees collect the nectar of this perennial garden plant. The nectar also attracts hummingbirds.

- **Red-flowering currant:** Important nectar source for early-season butterflies. Nectar also attracts hummingbirds. Perennial that is a native to the Pacific Northwest.
- **Zinnias:** A wide array of hummingbirds, butterflies and bees collect the nectar. Annual garden plant.
- **Sunflower:** Longhorn bees, sweat bees, leafcutting bees and bumblebees collect the pollen and nectar of this annual.
- **Salal:** Larval host for spring azure butterflies. Bees collect the nectar on this groundcover. Native to the Pacific Northwest.
- **Catmint:** Honey bees, bumblebees, carder bees and mason bees collect nectar and pollen from this perennial.
- **Milkweed:** Monarch butterflies collect nectar and pollen and lay their eggs on this perennial wildflower. Nectar also attracts hummingbirds. Native to the Pacific Northwest.

List from OSU Extension