TECHNICAL NOTE

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Spokane, Washington - Boise, Idaho

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Plants for Pollinators in the Inland Northwest

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Brownbelted bumble bee (*Bombus griseocollis*) visiting a blanketflower (*Gaillardia aristata*). Pamela Pavek

The purpose of this Technical Note is to provide guidance for the design and implementation of conservation plantings to enhance habitat for pollinators including: bees, wasps, butterflies, moths and hummingbirds. Plant species included in this document are adapted to the Inland Northwest, which encompasses eastern Washington, northeastern Oregon and northern Idaho. For species adapted to southern Idaho, southeastern Oregon, northern Nevada and northern Utah, refer to the Idaho Plant Materials Technical Note 2A. For lists of species adapted to western Washington and western Oregon, refer to the Oregon Plant Materials Technical Note 13.

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Honey bee (*Apis mellifera*) visiting a Munro's globemallow (*Sphaeralcea munroana*) flower. Pamela Pavek

INTRODUCTION

Pollinators include bees, moths, flies, beetles, wasps, desert bats, hummingbirds, and butterflies. Collectively, pollinators are critical to the function of terrestrial ecosystems because they enhance plant reproduction.

Honey bee (*Apis mellifera*) on a sunflower (*Helianthus annuus*). Pamela Pavek

Many of the world's crop species benefit from insect pollination, which is mostly provided by bees. In North America, bees pollinate many billions of dollars worth of crops annually. Up to one quarter of our diet comes from crops whose production benefits from pollinating bees.

Pollinators are threatened world-wide by habitat loss, habitat fragmentation, pesticides, disease and parasites. The loss of pollinators has serious economic implications for humans and for maintaining ecosystem diversity and stability.

The Natural Resources Conservation Service can assist landowners with habitat enhancement for pollinators by encouraging the establishment of an array of attractive plants that flower throughout the growing season. Plants provide a source of nectar, pollen and cover for adult and immature pollinators and also provide habitat for a large array of other wildlife species.

Well-chosen forbs, legumes, shrubs and trees planted along farm and ranch borders and within fields attract wildlife, including pollinators and other beneficial insects. The correct mix of plant species that bloom throughout the growing season will provide a continuous source of nectar and pollen needed by insects. An ideal plant mix would be one that consists of nine species: three that bloom early in the season, three in mid-season and three in late season. However in areas with less than 16 inches of mean annual precipitation, nine adapted and commercially produced species may not always be available.

Hedgerow planting with early and late blooming plants. Pamela Pavek

Annual plants can be useful tools in pollinator plantings because they produce tremendous amounts of flowers. However, annual crops only last one growing season and can be very competitive with perennial species that are slower establishing. Annual plants may also be "weedy". Consequently, annuals should only be considered for small odd areas and should not be mixed with perennials. A few annual plants that readily attract pollinators include buckwheat, canola, safflower, berseem clover, camelina, lentils ,dry peas and sunflowers. Annuals can also be used as interim crops prior to planting perennials, to suppress weed growth and reduce the weed seed bank.

HABITAT CONSIDERATIONS

Habitat needs for pollinators are similar to other animal species: food, shelter, nesting sites and water. Shelter and nesting sites may be a limiting factor in your project area and should be considered during planning.

Nectar and pollen from flowering plants provide food for pollinators. Water needs can be met with birdbaths, fountains, ponds, puddles and moisture from plants. Moist salt licks help provide mineral requirements for butterflies and sweat bees. Shelter and nesting habitat needs differ by pollinator species and include bare or partially vegetated, well-drained soil; soil banks and cliffs, dead standing or fallen trees with beetle emergence holes, live trees, clumps of grass, live brush, tall grass, piles of leaves and sticks, wood piles, tree bark and rock crevices.

Most native bees are solitary, nesting underground, or less commonly, above ground using beetle holes in dead-wood or dead pithy stems (e.g. elderberry, sumac or rose). Bumble bees are social with colonies of dozens to hundreds of workers. They typically nest in tree hollows or below-ground in old rodent burrows.

Cocoons of a cavity-nesting *Hoplitis* bee in a pithy dead sumac twig. Jim Cane

In pollinator plantings use of pesticides should be avoided, especially insecticides. (Some applications, like carbaryl bran baits for grasshoppers, are safe for bees.) If pesticides must be used, leave some areas untreated as refuge habitat for predatory and parasitic insects and pollinators that can re-colonize treated areas.

TABLE 1: HABITAT REQUIREMENTS FOR NATIVE POLLINATORS

Sollitary bees	Nectar and pollen	Nest in bare and partially vegetated soils where water won't pond; or in beetle holes in deadwood, within pithy stems or twigs or construct nests of mud or leaf pulp
Bumble bees	Nectar and pollen	Nest cavitites underground, often in old rodent burrows, or in hollow trees or beneath clumps of grass
Butterflies and moths	Nectar; nutrients, minerals and salts from rotting fruit, tree sap, clay deposists and mud puddles	Leaves and stems of larval host plants; also small woodpiles used by species that winter as adults
Hummingbirds	Nectar, insects, caterpillars, tree sap and willow catkins	Trees, shrubs and vines

ECOLOGICAL BENEFITS OF POLLINATOR PLANTINGS

Pollinator-friendly plantings have the potential to provide multiple ecological benefits. They can:

Reduce pesticide use. Sequentially flowering plants provide forage and cover for predatory and parasitic insects that help control pest species; established plant communities resist weed invasion.

Stabilize soil and provide ground cover. Root systems and above ground vegetation hold soil in place, improve soil moisture infiltration, reduce the risk of erosion and serve as buffers which protect against surface water pollution. Legumes contribute nitrogen to the soil.

Serve as windbreaks and shelterbelts. Shrubs and trees protect farmsteads, feeding areas, crops and livestock from wind and dust damage. They also provide food, nesting and cover habitat for a great variety of wildlife, pollinators and other beneficial insects.

ESTABLISHING POLLINATOR PLANTINGS: GENERAL CONSIDERATIONS

- **Select an area that is at least 0.5 acres in size.** This will ensure adequate floral resources are available for pollinators.

- **Start right.** Most grasses and forbs, including legumes, can be started by direct seeding or in some cases by transplanting nursery seedlings. Flowering shrubs and trees are often best established by transplanting nursery seedlings.

- **Determine soil drainage and other soil limitation factors**. Most species will not do well in heavy, poorly drained or saline to sodic soils; select species that can perform well in the soils of the site.

- **Match plants with similar site preferences**. Choose plants that have similar soil and water requirements and that are adapted to the local climate.

- **Water wisely.** Shrub plantings in the drier portions of the Inland Northwest will require irrigation. For the best establishment biweekly watering the first 2 to 3 years is recommended. Once the plants are well established, watering less frequently, but for a longer duration to drive the moisture deeper into the soil will ensure the plants develop their roots more fully ensuring long-term survival.

- **Control weeds.** Most plants do not compete well with weeds during establishment. Start with a weed free area or create one using appropriate herbicides or tillage equipment. Keep the area relatively weed free for the first 2 to 3 years of establishment. Mowing weeds during plant establishment will help suppress weed competition and encourage desired plants.

- **Protect planting from wildlife, livestock and rodents.** Fencing to protect the planting may be required in areas with abundant deer, antelope or elk, or with livestock such as sheep, cattle or horses. This will ensure flowers are available to provide nectar, pollen and

succulent foliage for pollinators. Also, using tubes to protecting shrubs from rodent damage is recommended.

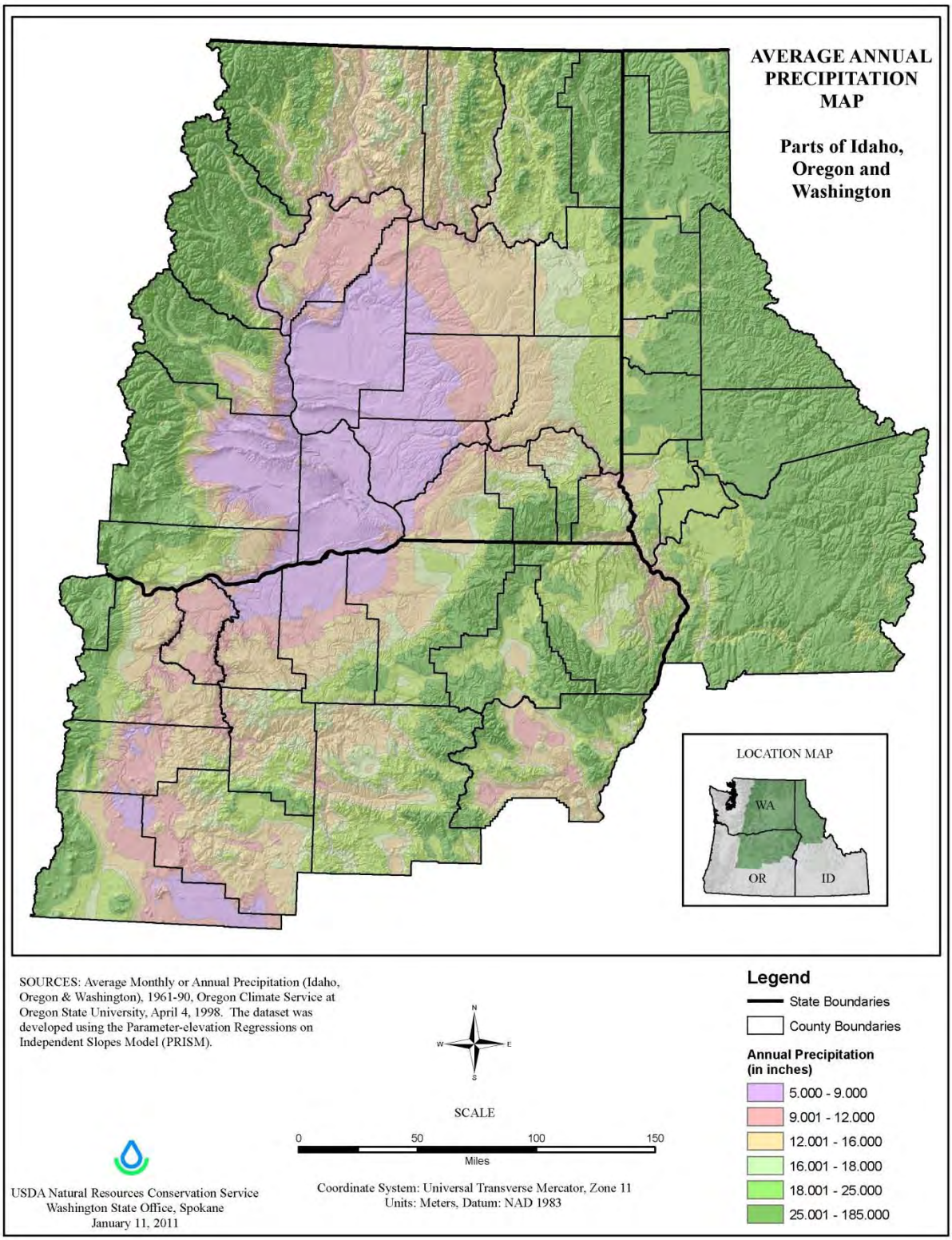
- **Choose the right plant species.** Plantings should include a mixture of species that provide continual blooms throughout the growing season. Depending on precipitation zone, at least one to three species are recommended for each bloom time: spring, summer and fall. One or two grass species may also be included in the mix if ground cover is needed for erosion control or suppression of weeds. To select plant species for your precipitation zone, use the Approved Pollinator Plant Lists (Tables 2 - 6).

- **Maintain plantings.** Treatments such as haying or mowing may be required outside of the flowering period to remove plant litter or weeds. Spot-spray herbicide treatments may also be needed to control invasive weeds.

- **Be aware of risks associated with certain species planted around orchards.** Chokecherry and serviceberry can harbor pests and disease that may be transferred to orchard crops. Also snowberry may be a host for the snowberry maggot which is nearly impossible to distinguish from the apple maggot. If the apple maggot is found in an orchard or warehouse, production throughout the entire area can be shut down. When planting pollinator habitat around orchards, work with your producer and local extension agent to select species that pose minimal risk to orchard crops.

White-lined sphinx moth (*Hyles lineata*) extracting nectar from a purple sage (*Salvia dorrii*) flower. Pamela Pavek

FIGURE 1: MAP OF AREA COVERED BY THIS TECHNICAL NOTE AND PRECIPITATION ZONES WITHIN THE AREA



SELECTING PLANT SPECIES FOR POLLINATOR HABITAT

Two methods are presented in this Technical Note for selecting plant species for pollinator habitat: 1) use of Base Mixes and 2) use of the Approved Pollinator Plant Lists to create a unique mix. A base mix can be used as is, or it can be modified with species substitutions (with other species on the Approved Lists) or by altering the proportions within the mix. To make modifications to the base mix or create seeding mixes using the Approved Pollinator Plant Lists, use the NRCS Conservation Practice 327 Job Sheet.

It is strongly recommended several species in a pollinator habitat area be planted by transplanting seedlings, due to a higher rate of success. Transplanted seedlings can be planted along a border of a seeded area, and the planting may be considered a separate practice (386 Field Border or 422 Hedgrow Planting for example). Species that should be transplanted are listed below the High Cost Base Mixes and in the Shrub sections of the Approved Plant Lists.

Grasses are included in the Base Mixes and on the Approved Plant Lists because they provide ground cover. Grasses help to reduce weed competition and the potential for soil erosion. However in areas with heavy cheatgrass, medusahead or ventenata infestations they may be omitted in a planting to allow for the option of using selective grass herbicides.

Care was taken to list species in this Technical Note that are commercially available. A few species in the Base Mixes or on the Lists may sometimes be hard to find, particularly late blooming species. In order to meet the requirements for number of species for each bloom time, it may be necessary to make species substitutions or double or triple the seeding rates of species that are available.

Additional species may be available or become available that were not considered for this technical note. Consult your State Plant Materials Specialist prior to including any species in a planting that is not on the Approved Plant Lists.

Photos and more detailed descriptions of the plants on the lists can be found on pages 37 - 62. Additional information for many of these species can be found in NRCS Plant Guides and Fact Sheets, available by download from the NRCS PLANTS Database.

All of the forbs and shrubs on these lists attract generalist pollinators that utilize pollen and nectar from a variety of plant species. For more specifics about plant-pollinator relationships, see pages 63 and 64 of this document.

BASE MIXES

6 - 9" PRECIPITATION

LOW COST BASE MIX - NATIVE AND INTRODUCED SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Summer	Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	16%	0.16
2	*Helianthus annuus*	sunflower		X		1/4-1/2	30	16%	4.8
3	*Melilotus officinalis*	sweetclover	X	X		1/8-1/2	5	16%	0.8
4	Sphaeralcea munroana	Munro's globemallow	X	X		1/4-1/2	3	16%	0.48
5	*Ericameria nauseosa*	rubber rabbitbrush			X	0-1/8	3	16%	0.48
6	*Elymus wawawaiensis*	Snake River wheatgrass				1/4-3/4	8	20%	1.6

HIGH COST BASE MIX - ALL NATIVE SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Summer	Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		*0-1/8*	1	25%	0.25
2	*Astragalus filipes*	basalt milkvetch		X		1/4-1/2	10	25%	2.5
3	*Machaeranthera canescens*	hoary tansyaster		X	X	0-1/8	1	25%	0.25
4	*Elymus wawawaiensis*	Snake River wheatgrass				1/4-3/4	8	25%	2

PLUS SEEDLINGS

	Scientific Name	Common Name	Bloom Time: Spring	Summer	Fall	Planting Depth (in)	Spacing (ft)	% Mix	Plants per Acre
5	*Ericameria nauseosa*	rubber rabbitbrush			X	seedling	4	50%	1,360
6	*Purshia tridentata*	anteope bitterbrush	X			seedling	6	50%	605

BASE MIXES

9 - 12" PRECIPITATION

LOW COST BASE MIX - NATIVE AND INTRODUCED SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Summer	Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	16%	0.16
2	*Gaillardia aristata*	blanketflower	X	X		1/4-1/2	7	16%	1.12
3	*Linum perenne*	blue flax	X			0-1/8	5	16%	0.8
4	*Medicago sativa*	alfalfa	X			1/8-1/2	6	16%	0.96
5	*Ericameria nauseosa*	rubber rabbitbrush			X	0-1/8	3	16%	0.48
6	*Elymus wawawaiensis*	Snake River wheatgrass				1/4-3/4	8	20%	1.6

HIGH COST BASE MIX - ALL NATIVE SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Summer	Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	25%	0.25
2	*Balsamorhiza sagittata*	arrowleaf balsamroot	X			0-1/4	24	25%	6
3	*Gaillardia aristata*	blanketflower	X	X		1/4-1/2	7	25%	1.75
4	*Elymus wawawaiensis*	Snake River wheatgrass				1/4-3/4	8	25%	2

PLUS SEEDLINGS

	Scientific Name	Common Name	Bloom Time: Spring	Summer	Fall	Planting Depth (in)	Spacing (ft)	% Mix	Plants per Acre
5	*Ericamerica nauseosa*	rubber rabbitbrush			X	seedling	4	50%	1,360
6	*Purshia tridentata*	anteope bitterbrush	X			seedling	6	50%	605

BASE MIXES

12 - 16" PRECIPITATION

LOW COST BASE MIX - NATIVE AND INTRODUCED SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Bloom Time: Summer	Bloom Time: Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	10%	0.1
2	*Gaillardia aristata*	blanket flower	X	X		1/4-1/2	7	10%	0.7
3	*Helianthus annuus*	sunflower		X		1/4-1/2	30	10%	3
4	*Linum perenne*	blue flax	X			0-1/8	5	10%	0.5
5	*Medicago sativa*	alfalfa	X			1/8-1/2	6	10%	0.6
6	*Onobrychis viciifolia*	sainfoin	X			1/4-3/4	44	10%	4.4
7	*Sanguisorba minor*	small burnet	X			1/4-1/2	26	10%	2.6
8	*Solidago missouriensis*	Missouri goldenrod		X	X	0-1/8	1	10%	0.1
9	*Chrysothamnus viscidiflorus*	yellow rabbitbrush			X	0-1/8	3	10%	0.3
10	*Pseudoroegneria spicata*	bluebunch wheatgrass				1/4-3/4	8	10%	0.8

HIGH COST BASE MIX - ALL NATIVE SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Bloom Time: Summer	Bloom Time: Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	12%	0.12
2	*Balsamorhiza sagittata*	arrowleaf balsamroot	X			0-1/4	24	12%	2.88
3	*Cleome lutea*	yellow bee plant	X			1/4-1/2	14	12%	1.68
4	*Gaillardia aristata*	blanket flower	X	X		1/4-1/2	7	12%	0.84
5	*Linum lewisii*	Lewis flax	X			0-1/8	5	12%	0.6
6	*Solidago missouriensis*	Missouri goldenrod		X	X	0-1/8	1	12%	0.12
7	*Sphaeralcea munroana*	Munro's globemallow	X	X		1/4-1/2	3	12%	0.36
10	*Pseudoroegneria spicata*	bluebunch wheatgrass				1/4-3/4	8	15%	1.2

	Scientific Name	Common Name	Bloom Time: Spring	Bloom Time: Summer	Bloom Time: Fall	Planting Depth (in)	Spacing (ft)	% Mix	Plants per Acre
8	*Eriogonum heracleoides*	Wyeth's buckwheat		X		seedling	4	50%	1360
9	*Chrysothamnus viscidiflorus*	yellow rabbitbrush			X	seedling	4	50%	1360

BASE MIXES

16 - 18" PRECIPITATION

LOW COST BASE MIX - NATIVE AND INTRODUCED SPECIES

			Bloom Time						
	Scientific Name	Common Name	Spring	Summer	Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	10%	0.1
2	*Gaillardia aristata*	blanket flower	X	X		1/4-1/2	7	10%	0.7
3	*Linum perenne*	blue flax	X			0-1/8	5	10%	0.5
4	*Medicago sativa*	alfalfa	X	X		1/8-1/2	6	10%	0.6
5	*Onobrychis viciifolia*	sainfoin	X	X		1/4-3/4	44	10%	4.4
6	*Sanguisorba minor*	small burnet	X			1/4-1/2	26	10%	2.6
7	*Solidago missouriensis*	Missouri goldenrod		X	X	1/4-1/2	1	10%	0.1
8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush			X	0-1/8	3	10%	0.3
9	*Ericameria nauseosa*	rubber rabbitbrush			X	0-1/8	3	10%	0.3
10	*Pseudoroegneria spicata*	bluebunch wheatgrass				1/4-3/4	8	10%	0.8

HIGH COST BASE MIX - ALL NATIVE SPECIES

			Bloom Time						
	Scientific Name	Common Name	Spring	Summer	Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	14%	0.14
2	*Balsamorhiza sagittata*	arrowleaf balsamroot	X			0-1/4	24	14%	3.36
3	*Gaillardia aristata*	blanket flower	X	X		1/4-1/2	7	14%	0.98
4	*Cleome lutea*	yellow bee plant	X			1/4-1/2	14	14%	1.96
5	*Linum lewisii*	Lewis flax	X			0-1/8	5	14%	0.7
6	*Solidago missouriensis*	Missouri goldenrod		X	X	1/4 - 1/2	1	14%	0.14
7	*Pseudoroegneria spicata*	bluebunch wheatgrass				1/4-3/4	8	15%	1.2

PLUS SEEDINGS

			Bloom Time						
	Scientific Name	Common Name	Spring	Summer	Fall	Planting Depth (in)	Spacing (ft)	% Mix	Plants per Acre
8	*Eriogonum heracleoides*	Wyeth's buckwheat		X		seedling	4	33%	906
9	*Chrysothamnus viscidiflorus*	yellow rabbitbrush			X	seedling	4	33%	906
10	*Ericameria nauseosa*	rubber rabbitbrush			X	seedling	4	33%	906

BASE MIXES

18 - 25" PRECIPITATION

LOW COST BASE MIX - NATIVE AND INTRODUCED SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Bloom Time: Summer	Bloom Time: Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	10%	0.1
2	*Chamerion angustifolium*	fireweed		X	X	0-1/8	0.05	10%	0.005
3	*Gaillardia aristata*	blanket flower	X	X		1/4-1/2	7	10%	0.7
4	*Linum perenne*	blue flax	X			0-1/8	5	10%	0.5
5	*Medicago sativa*	alfalfa	X	X		1/8-1/2	6	10%	0.6
6	*Onobrychis viciifolia*	sainfoin	X	X		1/4-3/4	44	10%	4.4
7	*Sanguisorba minor*	small burnet	X			1/4-1/2	26	10%	2.6
8	*Solidago canadensis*	Canada goldenrod		X	X	0-1/4	0.05	10%	0.005
9	*Solidago missouriensis*	Missouri goldenrod		X	X	1/4-1/2	1	10%	0.1
10	*Pseudoroegneria spicata*	bluebunch wheatgrass				1/4-3/4	8	10%	0.8

HIGH COST BASE MIX - ALL NATIVE SPECIES

	Scientific Name	Common Name	Bloom Time: Spring	Bloom Time: Summer	Bloom Time: Fall	Planting Depth (in)	Full PLS Rate (lb/ac)	% Mix	PLS lb/ac
1	*Achillea millefolium*	yarrow	X	X		0-1/8	1	14%	0.14
2	*Chamerion angustifolium*	fireweed		X	X	0-1/8	0.05	14%	0.007
3	*Eriophyllum lanatum*	Oregon sunshine	X	X		1/4-1/2	3	14%	0.42
4	*Gaillardia aristata*	blanket flower	X	X		1/4-1/2	7	14%	0.98
5	*Linum lewisii*	Lewis flax	X			0-1/8	5	14%	0.7
6	*Solidago canadensis*	Canada goldenrod		X	X	0-1/4	0.05	14%	0.007
7	*Solidago missouriensis*	Missouri goldenrod		X	X	1/4-1/2	1	14%	0.14
8	*Pseudoroegneria spicata*	bluebunch wheatgrass				1/4-3/4	8	15%	1.2

PLUS SEEDINGS

	Scientific Name	Common Name	Bloom Time: Spring	Bloom Time: Summer	Bloom Time: Fall	Planting Depth (in)	Spacing (ft)	% Mix	Plants per Acre
9	*Holodiscus discolor*	oceanspray		X		seedling	6	50%	605
10	*Rosa woodsii*	Woods rose	X	X		seedling	6	50%	605

APPROVED POLLINATOR PLANT LISTS

Tables 2 – 6 (pages 15 – 30) below are lists of plants that have known value for pollinators and are adapted to the Inland Northwest. The lists are separated into 6 – 9", 9 – 12", 12 – 16", 16 – 18" and 18 – 25" mean annual precipitation zones. Full seeding rates are provided for each species. The seeding rates are derived from target seeding densities of 30 seeds/ft^2 for species with less than 500,000 seeds per pound, and 50 seeds/ft^2 for species with more than 500,000 seeds per pound. The full seeding rates will need to be adjusted according to the proportion of the mix when planted with other species.

For instructions on how to make plant selections from these spreadsheets, use the Plant Selections and Establishment Protocols for Pollinator Habitat Plantings that corresponds to your precipitation range on pages 31 – 36.

Sweat bee on Douglas' dustymaiden (*Chaenactis douglasii*). Derek Tilley

TABLE 2: POLLINATOR PLANT LIST 6 – 9 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	*Achillea millefolium*	yarrow				N	0 - 1/8	2,500,000	1	N/A		X	X
	Astragalus filipes	basalt milkvetch				N	1/4 - 1/2	120,000	10	N/A		X	X
	Balsamorhiza careyana	Carey's balsamroot				N	1/4 - 1/2	55,000	24	N/A		X	X
	Chaenactis douglasii	Douglas' dustymaiden				N	0 - 1/8	350,000	4	N/A		X	X
	Erigeron filifolius	threadleaf fleabane				N	0 - 1/2	300,000	4	N/A		X	X
	Erigeron linearis	linearleaf daisy				N	0 - 1/2	250,000	5	N/A		X	X
	Erigeron pumilus	shaggy daisy				N	1/4 - 1/2	1,800,000	1	N/A		X	X
	Helianthus annuus	sunflower				N	1/4 - 1/2	45,000	30	N/A	X	X	X
	Machaeranthera canescens	hoary tansyaster				N	0 - 1/8	1,300,000	1	N/A		X	X
*	*Melilotus officinalis*	sweetclover				I	1/8 - 1/2	260,000	5	N/A	X	X	X
*	*Mentzelia laevicaulis*	blazing star				N	1/8 -1/4	300,000	4	N/A			X
	Penstemon pruinosus	Chelan penstemon				N	0 - 1/8	3,000,000	1	N/A		X	X
	Sphaeralcea munroana	Munro's globemallow				N	1/4 - 1/2	500,000	3	N/A		X	X
	GRASSES												
	Elymus wawawaiensis	Snake River wheatgrass				N	1/4 - 3/4	139,000	8	N/A		X	X
	Poa secunda	Sandberg bluegrass				N	1/8 - 1/4	1,000,000	2	N/A	X	X	X

TABLE 2 CONTINUED: POLLINATOR PLANT LIST 6 – 9 INCH PRECIPITATION

	SHRUBS ^		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
	Caragana arborescens	Siberian peashrub				I	seedlings	N/A	N/A	10	X	X	X
*	*Ericameria nauseosa*	rubber rabbitbrush				N	0 - 1/8 or seedlings	693,000	3	4		X	X
	Eriogonum niveum	snow buckwheat				N	0 - 1/4 or seedlings	500,000	3	4		X	X
	Eriogonum sphaerocephalum	round-headed buckwheat				N	0 - 1/4 or seedlings	300,000	4	4		X	X
	Eriogonum umbellatum	sulphur buckwheat				N	0 - 1/4 or seedlings	209,000	6	4		X	X
	Purshia tridentata	antelope bitterbrush				N	seedlings	N/A	N/A	6		X	X
	Salvia dorrii	purple sage				N	seedlings	N/A	N/A	2		X	X
*	Species that germinate and establish well. Several of these species should be included in every mix.												
^	Plant in clumps of 10 or in rows.												

TABLE 3: POLLINATOR PLANT LIST 9 - 12 INCH PRECIPITATION

	FORBS		Bloom Color and Time									Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	*Achillea millefolium*	yarrow				N	0 - 1/8	2,500,000	1	N/A		X	X
	Astragalus filipes	basalt milkvetch				N	1/4 - 1/2	120,000	10	N/A		X	X
	Balsamorhiza careyana	Carey's balsamroot				N	1/4 - 1/2	55,000	24	N/A		X	X
	Balsamorhiza sagittata	arrowleaf balsamroot				N	0 - 1/4	55,000	24	N/A		X	X
	Chaenactis douglasii	Douglas' dustymaiden				N	0 - 1/8	350,000	4	N/A		X	X
	Cleome lutea	yellow bee plant				N	1/4 - 1/2	101,000	14	N/A	X	X	
	Crepis atribarba	slender hawksbeard				N	0 - 1/4	800,000	3	N/A		X	X
	Erigeron filifolius	threadleaf fleabane				N	0 - 1/2	300,000	4	N/A		X	X
	Erigeron linearis	linearleaf daisy				N	0 - 1/2	250,000	5	N/A		X	X
	Erigeron pumilus	shaggy daisy				N	1/4 - 1/2	1,800,000	1	N/A		X	X
*	*Eriophyllum lanatum*	Oregon sunshine				N	1 /4 - 1/2	810,000	3	N/A	X	X	X
*	*Gaillardia aristata*	blanket flower				N	1 /4 - 1/2	200,000	7	N/A		X	X
	Hedysarum boreale	Utah sweetvetch				I	1/4 - 1/2	46,000	28	N/A	X	X	X
	Helianthus annuus	sunflower				N	1/4 - 1/2	45,000	30	N/A	X	X	X
*	*Linum lewisii*	Lewis flax				N	0 - 1/8	260,000	5	N/A		X	X
*	*Linum perenne*	blue flax				I	0 - 1/8	278,000	5	N/A		X	X
	Lomatium triternatum	nineleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A		X	X
	Machaeranthera canescens	hoary tansyaster				N	0 - 1/8	1,300,000	1	N/A		X	X
*	*Medicago sativa*	alfalfa				I	1/8 - 1/2	200,000	6	N/A	X	X	

TABLE 3 CONTINUED: POLLINATOR PLANT LIST 9 - 12 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	*Medicago sativa ssp. falcata*	yellow blossom alfalfa				I	1/8 - 1/2	211,000	6	N/A	X	X	
*	*Mentzelia laevicaulis*	blazing star				N	1/8 -1/4	300,000	4	N/A			X
	Oenothera pallida	evening primrose				N	1/4 - 1/2	700,000	3	N/A		X	X
	Penstemon deustus	hot-rock penstemon				N	0 - 1/8	2,900,000	1	N/A		X	X
	Penstemon pruinosus	Chelan penstemon				N	0 - 1/8	3,000,000	1	N/A		X	X
	Penstemon speciosus	showy penstemon				N	0 - 1/8	400,000	3	N/A		X	X
	Phacelia hastata	whiteleaf phacelia				N	1/8 - 1/4	153,000	8	N/A		X	X
	Phacelia heterophylla	varileaf phacelia				N	1/8 - 1/4	1,100,000	2	N/A		X	X
	Sphaeralcea munroana	Munro's globemallow				N	1/4 - 1/2	500,000	3	N/A		X	X
	GRASSES												
	Elymus wawawaiensis	Snake River wheatgrass				N	1/4 - 3/4	139,000	8	N/A		X	X
	Poa secunda	Sandberg bluegrass				N	1/8 - 1/4	1,000,000	2	N/A	X	X	X

TABLE 3 CONTINUED: POLLINATOR PLANT LIST 9 - 12 INCH PRECIPITATION

	SHRUBS ^		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
	Caragana arborescens	Siberian peashrub				I	seedlings	N/A	N/A	10	X	X	X
*	*Ericameria nauseosa*	rubber rabbitbrush				N	0 - 1/8 or seedlings	693,000	3	4		X	X
	Eriogonum heracleoides	Wyeth's buckwheat				N	0 - 1/4 or seedlings	136,000	10	4		X	X
	Eriogonum niveum	snow buckwheat				N	0 - 1/4 or seedlings	500,000	3	4		X	X
	Eriogonum sphaerocephalum	round-headed buckwheat				N	0 - 1/4 or seedlings	300,000	4	4		X	X
	Eriogonum umbellatum	sulphur buckwheat				N	0 - 1/4 or seedlings	209,000	6	4		X	X
	Purshia tridentata	antelope bitterbrush				N	seedlings	N/A	N/A	6		X	X
	Rhus glabra	smooth sumac				N	seedlings	N/A	N/A	4		X	X
	Salvia dorrii	purple sage				N	seedlings	N/A	N/A	2		X	X
*	Species that germinate and establish well. Several of these species should be included in every mix.												
^	Plant in clumps of 10 or in rows.												

TABLE 4: POLLINATOR PLANT LIST 12 - 16 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	*Achillea millefolium*	yarrow				N	0 - 1/8	2,500,000	1	N/A		X	X
	Astragalus filipes	basalt milkvetch				N	1/4 - 1/2	120,000	10	N/A		X	X
	Balsamorhiza careyana	Carey's balsamroot				N	1/4 - 1/2	55,000	24	N/A		X	X
	Balsamorhiza sagittata	arrowleaf balsamroot				N	0 - 1/4	55,000	24	N/A		X	X
	Chaenactis douglasii	Douglas' dustymaiden				N	0 - 1/8	350,000	4	N/A		X	X
	Cleome lutea	yellow bee plant				N	1/4 - 1/2	101,000	14	N/A	X	X	
	Crepis atribarba	slender hawksbeard				N	0 - 1/4	800,000	3	N/A		X	X
	Dalea ornata	western prairie clover				N	1/4 - 1/2	140,000	10	N/A	X	X	X
	Erigeron filifolius	threadleaf fleabane				N	0 - 1/2	300,000	4	N/A		X	X
	Erigeron linearis	linearleaf daisy				N	0 - 1/2	250,000	5	N/A		X	X
	Erigeron pumilus	shaggy daisy				N	1/4 - 1/2	1,800,000	1	N/A		X	X
*	*Eriophyllum lanatum*	Oregon sunshine				N	1 /4 - 1/2	810,000	3	N/A	X	X	X
*	*Gaillardia aristata*	blanket flower				N	1 /4 - 1/2	200,000	7	N/A		X	X
	Hedysarum boreale	Utah sweetvetch				I	1/4 - 1/2	46,000	28	N/A	X	X	X
	Helianthella uniflora	little sunflower				N	1/4 - 1/2	41,000	32	N/A	X	X	X
	Helianthus annuus	sunflower				N	1/4 - 1/2	45,000	30	N/A	X	X	X
*	*Linum lewisii*	Lewis flax				N	0 - 1/8	260,000	5	N/A		X	X
*	*Linum perenne*	blue flax				I	0 - 1/8	278,000	5	N/A		X	X
	Lomatium dissectum	fernleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A	X	X	X

TABLE 4 CONTINUED: POLLINATOR PLANT LIST 12 - 16 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
	Lomatium triternatum	nineleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A		X	X
	Machaeranthera canescens	hoary tansyaster				N	0 - 1/8	1,300,000	1	N/A		X	X
*	*Medicago sativa*	alfalfa				I	1/8 - 1/2	210,000	6	N/A	X	X	
*	*Medicago sativa ssp. falcata*	yellow blossom alfalfa				I	1/8 - 1/2	211,000	6	N/A	X	X	
	Oenothera pallida	evening primrose				N	1/4 - 1/2	700,000	3	N/A		X	X
*	*Onobrychis viciifolia*	sainfoin				I	1/4 - 3/4	28,000	44	N/A		X	X
	Penstemon attenuatus	taper-leaved penstemon				N	0 - 1/8	3,000,000	1	N/A	X	X	
	Penstemon deustus	hot-rock penstemon				N	0 - 1/8	2,900,000	1	N/A		X	X
	Penstemon pruinosus	Chelan penstemon				N	0 - 1/8	3,000,000	1	N/A		X	X
	Penstemon specious	showy penstemon				N	0 - 1/8	400,000	3	N/A		X	X
	Phacelia hastata	whiteleaf phacelia				N	1/8 - 1/4	150,000	8	N/A		X	X
	Phacelia heterophylla	varileaf phacelia				N	1/8 - 1/4	1,100,000	2	N/A		X	X
*	*Sanguisorba minor*	small burnet				I	1/4 - 1/2	42,000	26	N/A	X	X	X
	Solidago missouriensis	Missouri goldenrod				N	1/4 - 1/2	2,000,000	1	N/A		X	X
	Sphaeralcea munroana	Munro's globemallow				N	1/4 - 1/2	500,000	3	N/A		X	X
	Symphyotrichum spathulatum	western mountain aster				N	0 - 1/2	1,290,000	2	N/A	X	X	
	GRASSES												
	Pseudoroegneria spicata	bluebunch wheatgrass				N	1/4 - 3/4	139,000	9	N/A		X	X

TABLE 4 CONTINUED: POLLINATOR PLANT LIST 12 - 16 INCH PRECIPITATION

	Poa secunda	big bluegrass				N	1/8 - 1/4	925,000	2	N/A		X	X
	Poa secunda	Sandberg bluegrass				N	1/8 - 1/4	1,000,000	2	N/A	X	X	X
	SHRUBS ^		**Bloom Color and Time**								**Soils**		
	Scientific Name	**Common Name**	**spring**	**summer**	**fall**	**Origin N = native, I = introduced**	**Seeding Depth (in)**	**Seeds/lb**	**Minimum Seeding Rate (PLS lbs/ac)**	**Plant Spacing (ft)**	**fine**	**med**	**coarse**
#	*Amelanchier alnifolia*	serviceberry				N	seedlings	N/A	N/A	10	X	X	X
	Caragana arborescens	Siberian peashrub				I	seedlings	N/A	N/A	10	X	X	X
*	*Chrysothamnus viscidiflorus*	yellow rabbitbrush				N	0 - 1/8 or seedlings	732,000	3	4		X	X
*	*Ericameria nauseosa*	rubber rabbitbrush				N	0 - 1/8 or seedlings	693,000	3	4		X	X
	Eriogonum heracleoides	Wyeth's buckwheat				N	0 - 1/4 or seedlings	136,000	10	4		X	X
	Eriogonum umbellatum	sulphur buckwheat				N	0 - 1/4 or seedlings	209,000	6	4		X	X
#	*Prunus virginiana*	chokecherry				N	seedlings	N/A	N/A	12	X	X	X
	Purshia tridentata	antelope bitterbrush				N	seedlings	N/A	N/A	6		X	X
	Rhus glabra	smooth sumac				N	seedlings	N/A	N/A	4		X	X
	Rosa woodsii	Woods rose				N	seedlings	N/A	N/A	6		X	X
	Salvia dorrii	purple sage				N	seedlings	N/A	N/A	2		X	X
*	Species that germinate and establish well. Several of these species should be included in every mix.												
^	Plant 90 shrub seedlings per acre of each species. Plant in clumps of 10 or in rows.												
#	Should not be planted near orchards.												

TABLE 5: POLLINATOR PLANT LIST 16 - 18 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	*Achillea millefolium*	yarrow				N	0 - 1/8	2,500,000	1	N/A		X	X
	Astragalus canadensis	Canada milkvetch				N	1/4 - 1/2	270,000	5	N/A		X	
	Astragalus cicer	cicer milkvetch				I	1/4 - 1/2	123,000	10	N/A	X	X	
	Balsamorhiza sagittata	arrowleaf balsamroot				N	0 - 1/4	55,000	24	N/A		X	X
	Cleome lutea	yellow bee plant				N	1/4 - 1/2	101,000	14	N/A	X	X	
	Dalea ornata	western prairie clover				N	1/4 - 1/2	140,000	10	N/A	X	X	X
	Erigeron filifolius	threadleaf fleabane				N	1/4 - 1/2	300,000	4	N/A		X	X
	Erigeron pumilus	shaggy daisy				N	1/4 - 1/2	1,800,000	1	N/A		X	X
	Eriophyllum lanatum	Oregon sunshine				N	1 /4 - 1/2	810,000	3	N/A	X	X	X
*	*Gaillardia aristata*	blanket flower				N	1 /4 - 1/2	200,000	7	N/A		X	X
*	*Geranium viscosissimum*	sticky purple geranium				N	1 /8 - 1/4	55,000	24	N/A		X	
	Hedysarum boreale	Utah sweetvetch				N	1/4 - 1/2	46,000	28	N/A	X	X	X
	Helianthella uniflora	little sunflower				N	1/4 - 1/2	41,000	32	N/A	X	X	X
*	*Linum lewisii*	Lewis flax				N	0 - 1/8	260,000	5	N/A		X	X
*	*Linum perenne*	blue flax				I	0 - 1/8	278,000	5	N/A		X	X
	Lomatium dissectum	fernleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A	X	X	X
	Lomatium triternatum	nineleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A		X	X
	Machaeranthera canescens	hoary tansyaster				N	0 - 1/8	1,300,000	1	N/A		X	X
*	*Medicago sativa*	alfalfa				I	1/8 - 1/2	210,000	6	N/A	X	X	

TABLE 5 CONTINUED: POLLINATOR PLANT LIST 16 - 18 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	*Medicago sativa ssp. falcata*	yellow blossom alfalfa				I	1/8 - 1/2	211,000	6	N/A	X	X	
*	*Onobrychis viciifolia*	sainfoin				I	1/4 - 3/4	30,000	44	N/A		X	X
	Penstemon attenuatus	taper-leaved penstemon				N	0 - 1/8	3,000,000	1	N/A	X	X	
	Penstemon deustus	hot-rock penstemon				N	0 - 1/8	2,900,000	1	N/A		X	X
	Penstemon speciosus	showy penstemon				N	0 - 1/8	400,000	3	N/A		X	X
	Penstemon venustus	elegant penstemon				N	0 - 1/8	1,000,000	2	N/A		X	X
*	*Sanguisorba minor*	small burnet				I	1/4 - 1/2	48,000	26	N/A	X	X	X
	Solidago missouriensis	Missouri goldenrod				N	1/4 - 1/2	2,000,000	1	N/A		X	X
	Symphyotrichum spathulatum	western mountain aster				N	0 - 1/2	1,290,000	2	N/A	X	X	
	GRASSES												
	Pseudoroegneria spicata	bluebunch wheatgrass				N	1/4 - 3/4	130,000	9	N/A		X	X
	Festuca idahoensis	Idaho fescue				N	1/8 - 1/4	450,000	3	N/A	X	X	X

TABLE 5 CONTINUED: POLLINATOR PLANT LIST 16 - 18 INCH PRECIPITATION

	SHRUBS ^		Bloom Color and Time									Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
#	*Amelanchier alnifolia*	serviceberry				N	seedlings	N/A	N/A	10	X	X	X
	Caragana arborescens	Siberian peashrub				I	seedlings	N/A	N/A	10	X	X	X
*	*Chrysothamnus viscidiflorus*	yellow rabbitbrush				N	0 - 1/8 or seedlings	732,000	3	4		X	X
	Crataegus douglasii	black hawthorn				N	seedlings	N/A	N/A	8	X	X	X
*	*Ericameria nauseosa*	rubber rabbitbrush				N	0 - 1/8 or seedlings	693,000	3	4		X	X
	Eriogonum heracleoides	Wyeth's buckwheat				N	0 - 1/4 or seedlings	136,000	10	4		X	X
	Eriogonum umbellatum	sulphur buckwheat				N	0 - 1/4 or seedlings	209,000	6	4		X	X
	Mahonia aquifolium, M. repens	Oregon grape				N	seedlings	N/A	N/A	4		X	X
#	*Prunus virginiana*	chokecherry				N	seedlings	N/A	N/A	12	X	X	X
	Rhus glabra	smooth sumac				N	seedlings	N/A	N/A	4		X	X
	Ribes aureum	golden currant				N	seedlings	N/A	N/A	6		X	
	Ribes cereum	wax currant				N	seedlings	N/A	N/A	6		X	X
	Rosa nutkana	Nootka rose				N	seedlings	N/A	N/A	6		X	X
	Rosa woodsii	Woods rose				N	seedlings	N/A	N/A	6		X	X
	Sambucus nigra ssp cerulea	blue elderberry				N	seedlings	N/A	N/A	10		X	X

TABLE 5 CONTINUED: POLLINATOR PLANT LIST 16 - 18 INCH PRECIPITATION

*	Species that germinate and establish well. Several of these species should be included in every mix.
^	Plant in clumps of 10 or in rows.
#	Should not be planted near orchards.

TABLE 6: POLLINATOR PLANT LIST 18 - 25 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
*	Achillea millefolium	yarrow				N	0 - 1/8	2,500,000	1	N/A		X	X
	Astragalus canadensis	Canada milkvetch				N	1/4 - 1/2	270,000	5	N/A		X	
	Astragalus cicer	cicer milkvetch				I	1/4 - 1/2	123,000	10	N/A	X	X	
	Chamerion angustifolium	fireweed				N	0 - 1/8	6,500,000	0.5	N/A	X	X	X
	Erigeron filifolius	threadleaf fleabane				N	0 - 1/2	300,000	4	N/A		X	X
	Erigeron pumilus	shaggy daisy				N	0 - 1/2	1,800,000	1	N/A		X	X
	Erigeron speciosus	showy daisy				N	0 - 1/2	1,892,000	1	N/A		X	X
*	Eriophyllum lanatum	Oregon sunshine				N	1 /4 - 1/2	810,000	3	N/A	X	X	X
*	Gaillardia aristata	blanketflower				N	1 /4 - 1/2	200,000	7	N/A		X	X
*	Geranium viscosissimum	sticky purple geranium				N	1 /8 - 1/4	55,000	24	N/A		X	
	Geum triflorum	prairie smoke				N	1/8 - 1/4	450,000	3	N/A	X	X	
	Helianthella uniflora	little sunflower				N	1/4 -1/2	41,000	32	N/A	X	X	X
*	Linum lewisii	Lewis flax				N	0 - 1/8	260,000	5	N/A		X	X
*	Linum perenne	blue flax				I	0 - 1/8	278,000	5	N/A		X	X
	Lomatium dissectum	fernleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A	X	X	X
	Lomatium triternatum	nineleaf biscuitroot				N	1/8 - 1/4	45,000	30	N/A		X	X
*	Medicago sativa	alfalfa				I	1/8 - 1/2	200,000	6	N/A	X	X	
*	Medicago sativa ssp. falcata	yellow blossom alfalfa				I	1/8 - 1/2	211,000	6	N/A	X	X	
*	Onobrychis vicifolia	sainfoin				I	1/4 - 3/4	30,000	44	N/A		X	X

TABLE 6 CONTINUED: POLLINATOR PLANT LIST 18 - 25 INCH PRECIPITATION

	FORBS		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
	Penstemon attenuatus	taper-leaved penstemon				N	0 - 1/8	3,000,000	0.5	N/A	X	X	
	Penstemon confertus	yellow pentstemon				N	0 - 1/8	4,600,000	1	N/A	X	X	X
	Penstemon deustus	hot-rock penstemon				N	0 - 1/8	2,900,000	0.5	N/A		X	X
	Potentilla arguta	tall cinquefoil				N	1/8 - 1/4	4,400,000	0.5	N/A		X	
	Potentilla gracilis	slender cinquefoil				N	1/8 - 1/4	1,700,000	1	N/A		X	X
*	Sanguisorba minor	small burnet				I	1/4 - 1/2	48,000	26	N/A	X	X	X
	Solidago canadensis	Canada goldenrod				N	1/4 - 1/2	4,600,000	0.5	N/A		X	X
	Solidago missouriensis	Missouri goldenrod				N	1/4 - 1/2	2,000,000	1	N/A		X	X
	Symphyotrichum spathulatum	western mountain aster				N	0 - 1/2	1,290,000	2	N/A	X	X	
	Trifolium spp	clover species				I	1/8 - 1/2	300,000	4	N/A	X	X	X
	GRASSES												
	Festuca idahoensis	Idaho fescue				N	1/8 - 1/4	450,000	3	N/A	X	X	X
	Pseudoroegneria spicata	bluebunch wheatgrass				N	1/4 - 3/4	130,000	9	N/A		X	X

TABLE 6 CONTINUED: POLLINATOR PLANT LIST 18 - 25 INCH PRECIPITATION

	SHRUBS ^		Bloom Color and Time									Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
#	Amelanchier alnifolia	serviceberry				N	seedlings	N/A	N/A	10	X	X	X
	Caragana arborescens	Siberian peashrub				I	seedlings	N/A	N/A	10	X	X	X
	Ceanothus sanguineus	red-stem ceanothus				N	seedlings	N/A	N/A	8	X	X	X
	Crataegus douglasii	black hawthorn				N	seedlings	N/A	N/A	8	X	X	X
	Dasiphora fruticosa	shrubby cinquefoil				N	seedlings	N/A	N/A	6		X	
	Eriogonum heracleoides	Wyeth's buckwheat				N	0 - 1/4 or seedlings	136,000	10	4		X	X
	Eriogonum umbellatum	sulphur buckwheat				N	0 - 1/4 or seedlings	209,000	6	4		X	X
	Holodiscus discolor	oceanspray				N	seedlings	N/A	N/A	6	X	X	X
	Mahonia repens	Oregon grape				N	seedlings	N/A	N/A	4		X	X
	Philadelphus lewisii	Lewis' mock orange				N	seedlings	N/A	N/A	8		X	X
	Physocarpus malvaceus	ninebark				N	seedlings	N/A	N/A	6	X	X	X
#	Prunus virginiana	chokecherry				N	seedlings	N/A	N/A	12	X	X	X
	Rhus glabra	smooth sumac				N	seedlings	N/A	N/A	4		X	X
	Ribes aureum	golden currant				N	seedlings	N/A	N/A	6		X	
	Ribes cereum	wax currant				N	seedlings	N/A	N/A	6		X	X
	Rosa nutkana	Nootka rose				N	seedlings	N/A	N/A	6		X	X
	Rosa woodsii	Woods rose				N	seedlings	N/A	N/A	6		X	X

TABLE 6 CONTINUED: POLLINATOR PLANT LIST 18 - 25 INCH PRECIPITATION

	SHRUBS ^		Bloom Color and Time								Soils		
	Scientific Name	Common Name	spring	summer	fall	Origin N = native, I = introduced	Seeding Depth (in)	Seeds/lb	Minimum Seeding Rate (PLS lbs/ac)	Plant Spacing (ft)	fine	med	coarse
	Sambucus nigra ssp cerulea	blue elderberry				N	seedlings	N/A	N/A	10		X	X
#	Symphoricarpos albus	snowberry				N	seedlings	N/A	N/A	4	X	X	X
*	Species that germinate and establish well. Several of these species should be included in every mix.												
^	Plant in clumps of 10 or in rows.												
#	Should not be planted near orchards.												

PLANT SELECTIONS AND ESTABLISHMENT PROTOCOLS FOR POLLINATOR HABITAT PLANTINGS

6 – 9" and 9 – 12" PRECIPITATION ZONES

PLANT SELECTIONS

- Select plants from the Approved Plant List that corresponds to your precipitation range.
- **A mixture of 5 species including one that blooms in spring, one in summer and one in fall is recommended.**
- Species with an asterisk (*) are known to establish easily and are commercially available in large quantities. It is strongly recommended several of these species be included in all mixes. The remainder of species for each mix will be dependent on seed availability and the price the landowner is willing to pay.
- Species not included on these lists may be substituted only if approved by the State Plant Materials Specialist.

RECOMMENDED ESTABLISHMENT PROTOCOLS

SITE PREP

- Eliminate existing vegetation prior to seeding with tillage, herbicide, or a combination of techniques.
- Fallow the area to be seeded for one growing season. Delay seeding until after a flush of fall germinating weeds. These weed seedlings need to be controlled prior to any seeding.

SEEDING

- Seed forbs and grasses at the same time in a late fall dormant planting (November or December).
- One of two seeding methods is recommended:
    - 1) Pull the tubes on the split packer drill and allow the seed to be broadcast on the surface.
    - 2) Run an empty split packer drill through the field and then broadcast seed the field.
- Rice hulls, cracked grain or granular clay may be used to assist seed flow.
- Omit grasses from the planting mix in areas heavily infested with cheatgrass to allow for the option of using selective grass herbicides. This should only be done if the ground is not highly erodible.

SHRUB ESTABLISHMENT

- Plant shrub seedlings in March or April directly into sod with vegetation that has been killed during the previous growing season with 1-2 applications of glyphosate. Plant shrubs in areas that will not be mowed, or in rows to allow for mowing between the rows.
- Suppress weed growth around the shrubs with use of weed barrier fabric or glyphosate.
- Install protective tubes or other barriers to prevent damage from rodents, rabbits and deer.

MANAGEMENT

- Manage weeds during the first year by mowing to prevent weed seeds from disseminating.
- Manage weeds during the years following by spot spraying, using pre-emergent herbicides or herbicides applied during phases of perennial dormancy.
- Do not use fertilizers during the first year of establishment.

Establishment techniques different than those listed above may be used, but only with extreme caution. The above-mentioned protocols have proven to have the highest rates of success.

THERE ARE MULTIPLE CHALLENGES ASSOCIATED WITH ESTABLISHING FORB PLOTS. Many forb seedings fail due to low germination, weed competition, and neglect. Establishing, monitoring and maintaining forb plantings is expensive and labor-intensive. The area may have to be re-seeded if an adequate stand is not achieved the first time.

An alternative establishment method is transplanting forb seedlings. Transplanting seedlings may initially be more expensive than seeding but may be less expensive in the long run, especially if a seeding fails and has to be reseeded. The advantages of forb seedlings are: there are no seed dormancy or germination concerns, they already have a developed root system, and they can better compete with weeds. To establish forb seedlings, use the same protocols listed above for shrub establishment.

PLANT SELECTIONS AND ESTABLISHMENT PROTOCOLS FOR POLLINATOR HABITAT PLANTINGS

12 - 16" PRECIPITATION ZONES

PLANT SELECTIONS

- Select plants from the Approved Plant List that corresponds to your precipitation range.
- **A mixture of 9 species including 3 that bloom in spring, 3 in summer and 3 in fall is recommended.**
- Species on the list with an asterisk (*) are known to establish easily and are commercially available in large quantities. It is strongly recommended several of these species be included in all mixes. The remainder of species for each mix will be dependent on seed availability and the price the landowner is willing to pay.
- Species not included on these lists may be substituted only if approved by the State Plant Materials Specialist.

RECOMMENDED ESTABLISHMENT PROTOCOLS

SITE PREP

- Eliminate existing vegetation prior to seeding with tillage, herbicide, or a combination of techniques.
- Fallow the area to be seeded for one growing season. Delay seeding until after a flush of fall germinating weeds. These weed seedlings need to be controlled prior to any seeding.

SEEDING

- Seed forbs and grasses at the same time in a late fall dormant planting (November or December).
- One of two seeding methods is recommended:
    - 1) Drill seed into a firm weed-free seedbed. The best drill seedings have been accomplished by setting the drill to place the seed no deeper than ¼ inch. Drag chains or press wheels help to cover the seed with a thin soil layer.
    - 2) Broadcast seed into a weed-free seedbed. The best broadcast seedings have been accomplished by pulling the tubes on the drill and running the packer wheels with enough down pressure to create good furrows.
- Rice hulls, cracked grain or granular clay may be used to assist seed flow.

- Omit grasses from the planting mix in areas heavily infested with cheatgrass to allow for the option of using selective grass herbicides. This should only be done if the ground is not highly erodible.

SHRUB ESTABLISHMENT

- Plant shrub seedlings in April directly into sod with vegetation that has been killed during the previous growing season with 1-2 applications of glyphosate. Plant shrubs in areas that will not be mowed, or in rows to allow for mowing between the rows.
- Suppress weed growth around the shrubs with use of weed barrier fabric or glyphosate.
- Install protective tubes or other barriers to prevent damage from rodents, rabbits and deer.

MANAGEMENT

- Manage weeds during the first year by mowing to prevent weed seeds from disseminating.
- Manage weeds during the years following by spot spraying, using pre-emergent herbicides or herbicides applied during phases of perennial dormancy.
- Do not use fertilizers during the first year of establishment.

Establishment techniques different than those listed above may be used, but only with extreme caution. The above-mentioned protocols have proven to have the highest rates of success.

THERE ARE MULTIPLE CHALLENGES ASSOCIATED WITH ESTABLISHING FORB PLOTS. Many forb seedings fail due to low germination, weed competition, and neglect. Establishing, monitoring and maintaining forb plantings is expensive and labor-intensive. The area may have to be re-seeded if an adequate stand is not achieved the first time.

An alternative establishment method is transplanting forb seedlings. Transplanting seedlings may initially be more expensive than seeding but may be less expensive in the long run, especially if a seeding fails and has to be reseeded. The advantages of forb seedlings are: there are no seed dormancy or germination concerns, they already have a developed root system, and they can better compete with weeds. To establish forb seedlings, use the same protocols listed above for shrub establishment.

PLANT SELECTIONS AND ESTABLISHMENT PROTOCOLS FOR POLLINATOR HABITAT PLANTINGS

16 - 18" and 18 – 25" PRECIPITATION ZONES

PLANT SELECTIONS

- Select plants from the Approved Plant List that corresponds to your precipitation range.
- **A mixture of 9 species including 3 that bloom in spring, 3 in summer and 3 in fall is recommended.**
- Species on the list with an asterisk (*) are known to establish easily and are commercially available in large quantities. It is strongly recommended several of these species be included in all mixes. The remainder of species for each mix will be dependent on seed availability and the price the landowner is willing to pay.
- Species not included on these lists may be substituted only if approved by the State Plant Materials Specialist.

RECOMMENDED ESTABLISHMENT PROTOCOLS

SITE PREP

- Eliminate existing vegetation prior to seeding with tillage, herbicide, or a combination of techniques.
- Fallow weedy fields for one growing season.
- Create a firm, weed-free seed bed. Rule of thumb: a person's footprint will not be deeper than ½ inch.

SEEDING

- Ideally, if grasses are included in a mix they should be seeded in the spring (May) and forbs should be seeded in the fall (late October). This allows for another season of broad-leaf weed control with application of selective herbicides. If two seedings cannot be performed, grasses and forbs should be seeded together in the fall. Forbs should not be seeded in the spring because most need a cold-moist period to break seed dormancy.
- The drill should be set to place the seed no deeper than ¼ inch. Do NOT harrow after seeding. To acquire very thin soil coverage, either use press wheels, drag chains, or a roller packer. Double the seeding rate in draws and other areas where concentrated water flow may occur.
- Rice hulls, cracked grain or granular clay may be used to assist seed flow.

- Omit grasses from the planting mix in areas heavily infested with cheatgrass, ventenata, jointed goatgrass or wild oats to allow for the option of using selective grass herbicides. This should only be done if the ground is not highly erodible.

SHRUB ESTABLISHMENT

- Plant shrub seedlings in May directly into sod with vegetation that has been killed during the previous growing season with 1-2 applications of glyphosate. Plant shrubs in areas that will not be mowed, or in rows to allow for mowing between the rows.
- Suppress weed growth around the shrubs with use of weed barrier fabric or glyphosate.
- Install protective tubes or other barriers to prevent damage from rodents, rabbits and deer.

MANAGEMENT:

- Manage weeds during the first year by mowing to prevent weed seeds from disseminating.
- Manage weeds during the years following by spo**t** spraying, using pre-emergent herbicides or herbicides applied during phases of perennial dormancy.
- Do not use fertilizers during the first year of establishment.

Establishment techniques different than those listed above may be used, but only with extreme caution. The above-mentioned protocols have proven to have the highest rates of success.

THERE ARE MULTIPLE CHALLENGES ASSOCIATED WITH ESTABLISHING FORB PLOTS. Many forb seedings fail due to low germination, weed competition, and neglect. Establishing, monitoring and maintaining forb plantings is expensive and labor-intensive. The area may have to be re-seeded if an adequate stand is not achieved the first time.

An alternative establishment method is transplanting forb seedlings. Transplanting seedlings may initially be more expensive than seeding but may be less expensive in the long run, especially if a seeding fails and has to be reseeded. The advantages of forb seedlings are: there are no seed dormancy or germination concerns, they already have a developed root system, and they can better compete with weeds. To establish forb seedlings, use the same protocols listed above for shrub establishment.

PLANT PHOTOS AND DESCRIPTIONS

Additional information for many of these species can be found in NRCS Plant Guides and Fact Sheets, available for download from the PLANTS Database: www.plants.usda.gov. Seeding rates are PLS lb/ac. Rates should be adjusted appropriately when used as part of a seed mixture.

FORBS

Western yarrow. Clarence A. Rechenthin, PLANTS Database

Achillea millefolium, western yarrow
Origin: native
Mature Height: 0.5 - 1.5 ft
Growth Rate: rapid
Growth Habit: upright to prostrate
Wildlife Value: good forage
Attracts: butterflies, some bees
Flowers: white to yellow
Bloom: June – August
Precip Range: 6 – 25 in
Seeding Rate: 1 lb/ac

Canada milkvetch. William S. Justice, PLANTS Database

Astragalus canadensis, Canada milkvetch
Origin: native
Mature Height: 1 – 2.5 ft
Growth Rate: moderate
Growth Habit: prostrate to upright
Wildlife Value: good forage and seeds food source
Attracts: bees, butterflies and is host for some white and sulphur butterfly larvae
Flowers: June - July
Bloom: cream
Precip Range: 16+ in
Seeding Rate: 5 lb/ac

Cicer milkvetch. University of Wyoming

Astragalus cicer, cicer milkvetch
Origin: introduced
Mature Height: 1 - 3 ft
Growth Rate: moderate to rapid
Growth Habit: upright (lodges at maturity)
Wildlife Value: excellent forage and seeds food source
Attracts: bees, butterflies
Flowers: cream
Bloom: June-July
Precip Range: 16 + in
Seeding Rate: 10 lb/ac

Basalt milkvetch. Clint Shock, Oregon State University

Astragalus filipes, basalt milkvetch
Origin: native
Mature height: 1-3 ft
Growth Rate: moderate to rapid
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies
Flowers: white to cream
Bloom: May-July
Precip Range: 6 - 16 in
Seeding Rate: 10 lb/ac

Carey's balsamroot. www.perr.com

Balsamorhiza careyana, Carey's balsamroot
Origin: native
Mature Height: 1-2 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: fair forage
Attracts: bees
Flowers: yellow
Bloom: April - May
Precip Range: 6 - 16 in
Seeding Rate: 24 lb/ac

Arrowleaf balsamroot. Al Schneider, PLANTS Database

Balsamorhiza sagittata, arrowleaf balsamroot
Origin: native
Mature Height: 1-2 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: fair forage
Attracts: bees
Flowers: yellow
Bloom: April - May
Precip Range: 16 – 25 in
Seeding Rate: 24 lb/ac

Douglas' dustymaiden. Derek Tilley

Chaenactis douglasii, Douglas' dustymaiden
Origin: native
Mature Height: 1-3 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: insects eaten by young birds
Attracts: bees
Flowers: white to pinkish
Bloom: June–July
Precip Range: 6 - 16 in
Seeding Rate: 4 lb/ac

Fireweed. Ben Legler, University of Washington Burke Herbarium

Chamerion angustifolium, **fireweed**
Origin: native
Mature Height: 2 – 4 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees
Flowers: June - September
Bloom: pink
Precip Range: 18+ in
Seeding Rate: 0.5 lb/ac

Yellow beeplant. Idaho Dept. of Transportation

Cleome lutea, yellow beeplant
Origin: native
Mature Height: 2-3 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: cover
Attracts: bees
Flowers: yellow
Bloom: May-June
Precip Range: 9 – 18 in
Seeding Rate: 14 lb/ac

Slender hawksbeard. Thayne Tuason

Crepis atribarba, slender hawksbeard
Origin: native
Mature Height: 0.5 – 2.5 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: fair forage
Attracts: bees, butterflies
Flowers: yellow
Bloom: May - June
Precip Range: 6 – 16 in
Seeding Rate: 3 lb/ac

Western prairie clover. Kishor Bhattarai, Utah State University

Dalea ornata, western prairie clover
Origin: native
Mature Height: 1-2.5 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: excellent forage
Attracts: bees
Flowers: pink, purple
Bloom: June-August
Precip Range: 12 - 18 in
Seeding Rate: 10 lb/ac

Threadleaf fleabane. www. botany.hawaii.edu

Erigeron filifolius, threadleaf fleabane
Origin: native
Mature Height:4 – 20 in
Growth Rate: slow
Growth Habit: upright
Wildlife Value: poor forage
Attracts: bees
Flowers: blue, pink, white
Bloom: June - August
Precip Range: 6 – 25 in
Seeding Rate: 4 lb/ac

Linearleaf daisy. www.wildgingerfarm.com

Erigeron linearis, linearleaf daisy
Origin: native
Mature Height: 2 – 12 in
Growth Rate: slow
Growth Habit: upright
Wildlife Value: poor forage
Attracts: bees, butterflies; larval host for Sagebrush Checkerspot butterfly
Flowers: yellow
Bloom: April - May
Precip Range: 6 – 16 in
Seeding Rate: 5 lb/ac

Shaggy daisy. Utah Valley University Herbarium

Erigeron pumilus, shaggy daisy
Origin: native
Mature Height: 2 – 20 in
Growth Rate: slow
Growth Habit: upright
Wildlife Value: poor forage
Attracts: bees, butterflies
Flowers: white, blue, pink
Bloom: May - July
Precip Range: 6 – 25 in
Seeding Rate: 1 lb/ac

Showy daisy. Rod Gilbert, University of Washington Burke Herbarium

Erigeron speciosus, showy daisy
Origin: native
Mature Height: 6 – 32 in
Growth Rate: slow
Growth Habit: upright
Wildlife Value: poor forage
Attracts: bees, butterflies
Flowers: purple, white
Bloom: June - August
Precip Range: 18 – 25 + in
Seeding Rate: 1 lb/ac


Oregon sunshine. Pamela Pavek

Eriophyllum lanatum, Oregon sunshine
Origin: native
Mature Height: 4 – 24 in
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: food and cover
Attracts: bees
Flowers: yellow
Bloom: May - July
Precip Range: 9 – 25 in
Seeding Rate: 3 lb/ac


Blanketflower. Pamela Pavek

Gaillardia aristata, blanketflower
Origin: native
Mature Height: 1-1.5 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: excellent food and cover
Attracts: bees, butterflies
Flowers: orange, yellow
Bloom: July-September
Precip Range: 9 – 25 in
Seeding Rate: 7 lb/ac


Sticky purple geranium. Pamela Pavek

Geranium viscosissimum, sticky purple geranium
Origin: native
Mature Height: 2-3 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: good forage
Attracts: bees, butterflies
Flowers: pink, purple
Bloom: May-June
Precip Range: 16 – 25 in
Seeding Rate: 24 lb/ac

Northern or Utah sweetvetch. Al Schneider, PLANTS Database

Hedysarum boreale, northern or Utah sweetvetch
Origin: introduced (native to UT)
Mature Height: 1-2 ft
Growth Rate: rapid
Growth Habit: spreading to upright
Wildlife Value: good forage
Attracts: bees, butterflies
Flowers: pink, purple
Bloom: May-June
Precip Range: 9 - 18 in
Seeding Rate: 28 lb/ac

Little sunflower. Ben Legler, University of Washington Burke Herbarium

Helianthella uniflora, little sunflower
Origin: native
Mature Height: 0.75 – 3.5 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: food and cover
Attracts: bees, wasps, butterflies
Flowers: yellow
Bloom: June - August
Precip Range: 12 – 25 in
Seeding Rate: 32 lb/ac

Annual sunflower. A. Schneider. PLANTS Database

Helianthus annuus, annual sunflower
Origin: native
Mature Height: 2-5 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: good winter food
Attracts: butterflies, bees
Flowers: yellow
Bloom: July-September
Precip Range: 6 - 16 in
Seeding Rate: 30 lb/ac


Prairie smoke. Pamela Pavek

Geum triflorum, prairie smoke
Origin: native
Mature height: 1 ft
Growth Rate: moderate to rapid
Growth Habit: upright
Wildlife value:
Attracts: bees
Flowers: yellow (enclosed by pink sepals)
Bloom: May-June
Precip Range: 18 – 25+ in
Seeding Rate: 3 lb/ac


Lewis flax. Derek Tilley

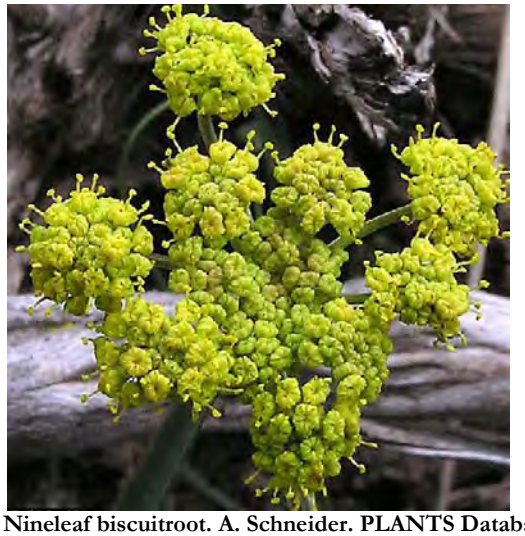
Linum lewisii, Lewis flax
Origin: native
Mature height: 1-2 ft
Growth Rate: moderate to rapid
Growth Habit: upright
Wildlife value: excellent food
Attracts: bees
Flowers: light blue
Bloom: May-July
Precip Range: 9 – 25 in
Seeding Rate: 5 lb/ac


Blue flax. Derek Tilley

Linum perenne, blue flax
Origin: introduced
Mature height: 1-2 ft
Growth Rate: moderate to rapid
Growth Habit: upright
Wildlife value: excellent food
Attracts: bees
Flowers: light blue
Bloom: May-July
Broadcast Seeding Rate: 4 lb/ac
In-row Spacing: 1-2 ft
Precip Range: 9 – 25 in
Seeding Rate: 5 lb/ac


Fernleaf biscuitroot. Dave Skinner

Lomatium dissectum, fernleaf biscuitroot
Origin: native
Mature Height: 0.5-3 ft
Growth Rate: slow
Growth Habit: erect
Wildlife Value: good forage
Attracts: bees, flies, beetles, butterflies; host for larvae of Anise and Indra swallowtail butterflies
Flowers: yellow green
Bloom: May-July
Precip Range: 12 – 25 in
Seeding Rate: 30 lb/ac


Nineleaf biscuitroot. A. Schneider. PLANTS Database

Lomatium triternatum, nineleaf biscuitroot
Origin: native
Mature Height: 2-3 ft
Growth Rate: slow
Growth Habit: erect
Wildlife Value: good forage
Attracts: bees, flies, beetles, butterflies; host for larvae of Anise and Indra swallowtail butterflies
Flowers: yellow green
Bloom: May-June
Precip Range: 9 – 25 in
Seeding Rate: 30 lb/ac


Hoary tansyaster. Pamela Pavek

Machaeranthera canescens, hoary tansyaster
Origin: native
Mature Height: 2-3 ft
Growth Rate: rapid
Growth Habit: erect
Wildlife Value: fair to good forage
Attracts: bees, butterflies, moths
Flowers: blue to purple
Bloom: August-October
Precip Range: 6 - 18 in
Seeding Rate: 1 lb/ac

Alfalfa. Midwest Cover Crops Council

Medicago sativa, alfalfa
Origin: introduced
Mature Height: 2-3 ft
Growth Rate: fast
Growth Habit: upright
Wildlife Value: excellent forage
Attracts: bees, butterflies; host of some blue and hairstreak butterflies
Flowers: purple
Bloom: May – July (delay by cutting)
Precip Range: 9 – 25 in
Seeding Rate: 6 lb/ac

Yellow blossom alfalfa. www.agroatlas.ru

Medicago sativa **ssp.** *falcata*, yellow blossom alfalfa
Origin: introduced
Mature Height: 2-3 ft
Growth Rate: fast
Growth Habit: upright
Wildlife Value: excellent forage
Attracts: bees, butterflies
Flowers: yellow
Bloom: May – July (delay by cutting)
Precip Range: 9 – 25 in
Seeding Rate: 6 lb/ac

Yellow sweetclover. J.S. Peterson, PLANTS Database

Melilotus officinalis, white and yellow sweetclover
Origin: introduced
Mature Height: 1-3 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: fair forage
Attracts: many bees, butterflies; larval host of some sulphur butterflies
Flowers: white or yellow
Bloom: June-July
Precip Range: 6 - 9 in (will become weedy at higer precip)
Seeding Rate: 5 lb/ac

Blazing star. Pamela Pavek

***Mentzelia laevicaulis*, blazing star**
Origin: native
Mature Height: 1 – 3.5 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: poor to fair forage
Attracts: bees
Flowers: yellow
Bloom: June - August
Precip Range: 6 – 12 in
Seeding Rate: 4 lb/ac

Evening primrose. Al Schneider, PLANTS Database

***Oenothera pallida*, evening primrose**
Origin: native
Mature Height: 4 – 20 in
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: poor to fair forage
Attracts: bees, moths, butterflies
Flowers: white, pink
Bloom: May - June
Precip Range: 9 – 16 in
Seeding Rate: 3 lb/ac

Sainfoin. www.apiculture-populaire.com

***Onobrychis viciifolia*, sainfoin**
Origin: introduced
Mature Height: 2-5 ft
Growth rate: rapid
Growth Habit: upright
Wildlife Value: excellent forage
Attracts: larger bees
Flowers: pink
Bloom: May-July (delay by cutting)
Precip Range: 12 – 25 in
Seeding Rate: 44 lb/ac

Taper-leaved penstemon. www.wildgingerfarm.com

Penstemon attenuatus, taper-leaved penstemon
Origin: native
Mature Height: 4 in – 3 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies; larval host of some Checkerspot butterflies
Flowers: blue, purple, pink
Bloom: May - July
Precip Range: 12 – 25 in
Seeding Rate: 1 lb/ac

Yellow penstemon. www.wildgingerfarm.com

Penstemon confertus, yellow penstemon
Origin: native
Mature Height: 0.75 – 2 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies; larval host of some Checkerspot butterflies
Flowers: pale yellow
Bloom: June - July
Precip Range: 18 – 25 in
Seeding Rate: 0.5 lb/ac

Hot-rock penstemon. Utah Valley University Herbarium

Penstemon deustus, hot-rock penstemon
Origin: native
Mature Height: 0.75 – 2 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies
Flowers: white
Bloom: June - July
Precip Range: 9 – 25 in
Seeding Rate: 1 lb/ac

Chelan penstemon. Pamela Pavek

Penstemon pruinosis, Chelan penstemon
Origin: native
Mature Height: 4 – 16 in
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies; larval host of some Checkerspot butterflies
Flowers: blue, purple
Bloom: June - July
Precip Range: 6 – 16 in
Seeding Rate: 1 lb/ac

Showy penstemon. www.perr.com

Penstemon speciosus, showy penstemon
Origin: native
Mature Height: 0.75 – 3 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies; larval host of some Checkerspot butterflies
Flowers: blue
Bloom: June - July
Precip Range: 9 – 18 in
Seeding Rate: 3 lb/ac

Elegant penstemon. Derek Tilley

Penstemon venustus, elegant penstemon
Origin: native
Mature Height: 1 – 2.5 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies; larval host of some Checkerspot butterflies
Flowers: blue - purple
Bloom: June - July
Precip Range: 16 – 18 in
Seeding Rate: 2 lb/ac

Whiteleaf phacelia. Ben Legler, University of Washington Burke Herbarium

Phacelia hastata, whiteleaf phacelia
Origin: native
Mature Height: 1-2 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: good forage
Attracts: bees
Flowers: white, lavender
Bloom: May - June
Precip Range: 9 – 16 in
Seeding Rate: 8 lb/ac

Varileaf phacelia. www.swcoloradowildflowers.com

Phacelia heterophylla, varileaf phacelia
Origin: native
Mature Height:0.75 – 4 ft
Growth Rate:rapid
Growth Habit: upright
Wildlife Value: good forage
Attracts: bees
Flowers: white
Bloom: May - June
Precip Range: 9 – 16 in
Seeding Rate: 2 lb/ac

Tall cinquefoil. Pamela Pavek

Potentilla arguta, tall cinquefoil
Origin: native
Mature Height: 1.5 – 3 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: fair to good forage
Attracts: bees, butterflies
Flowers: pale yellow to white
Bloom: June - July
Precip Range: 18 – 25 in
Seeding Rate: 0.5 lb/ac

Slender cinquefoil. University of Washington Burke Herbarium

Potentilla gracilis, slender cinquefoil
Origin: native
Mature Height: 1 – 2 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: poor to fair forage
Attracts: bees, butterflies
Flowers: yellow
Bloom: June - July
Precip Range: 18 – 25 in
Seeding Rate: 1 lb/ac

Small burnet. J. Duft, PLANTS Database

Sanguisorba minor, small burnet
Origin: introduced
Mature Height: 1-2.5 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: excellent forage
Attracts: bees
Flowers: green-red
Bloom: June-August
Precip Range: 12 – 25 in
Seeding Rate: 26 lb/ac

Canada goldenrod. www.discoverlife.org

Solidago canadensis, Canada goldenrod
Origin: native
Mature Height: 3 – 5 ft
Growth Rate: rapid
Growth Habit: upright, rhizomatous
Wildlife Value: fair forage and seeds eaten by songbirds
Attracts: bees, butterflies
Flowers: yellow
Bloom: August - October
Precip Range: 18 – 25 + in
Seeding Rate: 0.5 lb/ac

Missouri goldenrod. US Fish and Wildlife Service

Solidago missouriensis, Missouri goldenrod
Origin: native
Mature Height: 0.75 – 3 ft
Growth Rate: rapid
Growth Habit: upright, rhizomatous
Wildlife Value: fair forage and seeds eaten by songbirds
Attracts: bees, butterflies
Flowers: yellow
Bloom: August - October
Precip Range: 12 – 25 + in
Seeding Rate: 1 lb/ac

Munro's globemallow. Pamela Pavek

***Sphaeralcea* munroana**., Munro's globemallow
Origin: native
Mature Height: 1.5-3 ft
Growth Rate: rapid
Growth Habit: upright, rhizomatous
Wildlife Value: excellent forage
Attracts: bees, flies, butterflies
Flowers: orange
Bloom: May - June
Precip Range: 6 – 16 in
Seeding Rate: 3 lb/ac

Western mountain aster. Dave Skinner

Symphiotrichum spathulatum., western mountain aster
Origin: native
Mature Height: 0.5-3 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: excellent food and cover
Attracts: butterflies, bees, beetles; larval host of some Crescent butterflies (*Phyciodes* spp.)
Flowers: purple
Bloom: July - October
Precip Range: 12 – 25 in
Seeding Rate: 2 lb/ac

White clover. William S. Justice, PLANTS Database

***Trifolium* spp.,** clover species
Origin: introduced
Mature Height: 0.5-1 ft
Growth Rate: rapid
Growth Habit: spreading
Wildlife Value: excellent forage
Attracts: bees, butterflies; larval host for some white and sulphur butterflies
Flowers: white, red, pink
Bloom: May-July (delay by cutting)
Precip Range: 18 – 25+ in
Seeding Rate: 4 lb/ac

SHRUB PHOTOS AND DESCRIPTIONS

Serviceberry. J. McMillian. PLANTS Database

Amelanchier alnifolia, serviceberry
Origin: native
Mature Height: 6-15 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: good cover and food
Attracts: butterflies, bees
Flowers: white
Bloom: May-June
Precip Range: 12 – 25 in
In-row Spacing: 10 ft

Siberian peashrub. R.A. Howard, PLANTS Database

Caragana arborscens, Siberian peashrub
Origin: introduced
Mature Height: 6-20 ft
Growth Rate: rapid
Growth Habit: erect oval shrub
Wildlife Value: nesting
Attracts: large bees (especially bumblebees)
Flowes: yellow
Bloom: April-June
Precip Range: 6 – 25 in
In-row Spacing: 10 ft

Red-stem ceanothus. University of Idaho Herbarium

Ceanothus sanguineus, red-stem ceanothus
Origin: native
Mature Height: 2 – 6 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: elk browse, berries for birds
Attracts: bees, butterflies; larval host for the pale swallowtail and some hairstreak and blue butterflies
Flowers: white
Bloom: May - June
Precip Range: 18 – 25 in
In-row Spacing: 8 ft

Yellow rabbitbrush. www.swcoloradowildflowers.com

Chrysothamnus viscidiflorus, yellow rabbitbrush
Origin: native
Mature Height: 2 – 3 ft
Growth Rate: rapid
Growth Habit: upright
Wildlife Value: food, forage, cover
Attracts: bees, butterflies; larval host of Sagebrush Checkerspot butterfly
Flowers: yellow
Bloom: August - October
Precip Range: 6 – 18 in
Seeding Rate: 3 lb/ac
In-row Spacing: 4 ft

Black hawthorn. Ben Legler, University of Washington Burke Herbarium

Crataegus douglasii, black hawthorn
Origin: native
Mature Height: 12-15 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: food and cover
Attracts: moths, bees, butterflies
Flowers: white
Blooms: May-June
Precip Range: 16 – 25 + in
In-row Spacing: 8 ft

Shrubby cinquefoil. Ben Legler, University of Washington Burke Herbarium

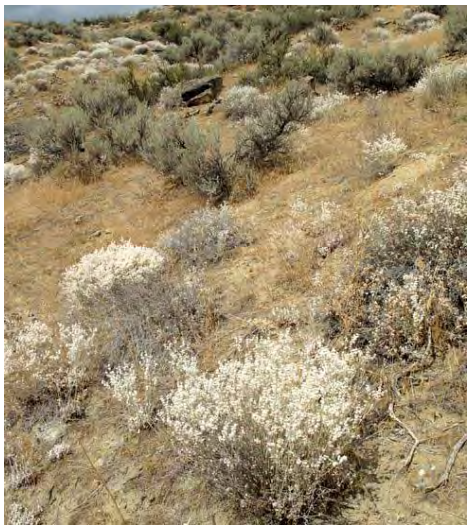
Dasiphora fruticosa, shrubby cinquefoil
Origin: native
Mature Height: 2-4 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: food and cover
Attracts: moths, bees, butterflies, beetles, flies
Flowers: yellow
Blooms: May-June
Precip Range: 18 – 25 + in
In-row Spacing: 6 ft

Rubber rabbitbrush. S. and A. Wilson, Lady Bird Johnson Wildflower Center

Ericameria nuaseosa, rubber rabbitbrush
Origin: native
Mature Height: 2-6 ft
Growth Rate: moderate
Growth Habit: open spreading
Wildlife Value: food, winter forage, cover
Attracts: butterflies, small bees
Flowers: yellow
Bloom: August-October
Precip Range: 6 – 18 in
Seeding Rate: 3 lb/ac
In-row Spacing: 4 ft

Whorled buckwheat. Derek Tilley

Eriogonum heracleoides, Wyeth's buckwheat
Origin: native
Mature Height: 1-3 ft
Growth Rate: moderate
Growth Habit: spreading, open sub-shrub
Wildlife Value: cover, fall forage
Attracts: moths, butterflies, bees, beetles; larval host of some blue and copper butterflies
Flowers: white, cream
Bloom: July-September
Precip Range: 9 – 18 in
Seeding Rate: 10 lb/ac
In-row Spacing: 4 ft


Snow buckwheat. Marc Dilley. www.justgetout.org

Eriogonum niveum, snow buckwheat
Origin: native
Mature Height: 1 – 2 ft
Growth Rate: moderate
Growth Habit: spreading, rounded shrub
Wildlife Value: forage for mule deer and bighorn sheep
Attracts: bees, butterflies, moths, wasps; larval host of some blue butterflies
Flowers: white, pink
Bloom: August - September
Precip Range: 6 – 12 in
Seeding Rate: 3 lb/ac
In-row Spacing: 4 ft


Round-headed buckwheat. Sheri Hagwood, PLANTS Database

Eriogonum sphaerocephalum, round-headed buckwheat
Origin: native
Mature Height: 1 – 1.5 ft
Growth Rate: slow
Growth Habit: upright
Wildlife Value: forage, cover
Attracts: bees, moths, butterflies; larval host of some blue butterflies
Flowers: yellow
Bloom: June - August
Precip Range: 6 – 12 in
Seeding Rate: 4 lb/ac
In-row Spacing: 4 ft


Sulphurflower buckwheat. Derek Tilley

Eriogonum umbellatum, sulphurflower buckwheat
Origin: native
Mature Height: 0.5-2 ft
Growth Rate: moderate
Growth Habit: spreading, open sub-shrub
Wildlife Value: cover, fall forage
Attracts: moths, butterflies, bees; larval host of some blue butterflies
Flowers: yellow
Bloom: July-September
Precip Range: 6 – 25 in
Seeding Rate: 6 lb/ac
In-row Spacing: 4 ft


Oceanspray. Washington State University Herbarium

Holodiscus discolor, oceanspray
Origin: native
Mature Height: 3 – 9 ft
Growth Rate: moderate
Growth Habit: upright, arching branches
Wildlife Value: browse and cover
Attracts: bees, butterflies; larval host of the pale swallowtail butterfly and some "blues"
Flowers: cream
Bloom: May - July
Precip Range: 18 – 25 + in
In-row Spacing: 6 ft


Oregon grape. Jeff McMillian, PLANTS Database

Mahonia aquifolium, M. repens, Oregon grape
Origin: native
Mature Height: 1 – 2 ft (*M. repens*); 3 – 5 ft (*M. aquifolium*)
Growth Rate: rapid
Growth Habit: creeping (*M. repens*); upright (*M. aquifolium*)
Wildlife Value: food and cover
Attracts: bees
Flowers: yellow
Bloom: May - June
Precip Range: 16 – 25 + in
In-row Spacing: 4 ft


Lewis' mockorange. www.flikr.com

Philadelphus lewisii, Lewis' mockorange
Origin: native
Mature Height: 4 – 8 ft
Growth Rate: slow
Growth Habit: branching shrub
Wildlife Value: food (berries)
Attracts: bees, butterflies
Flowers: white
Bloom: May - June
Precip Range: 12 – 25 in
In-row Spacing: 10 ft

Ninebark. Steve Sutherland, Montana Field Guide

Physocarpus malvaceus, ninebark
Origin: native
Mature Height: 1.5 – 6 ft
Growth Rate: slow
Growth Habit: spreading erect shrub
Wildlife Value: food, cover
Attracts: bees, butterflies, flies
Flowers: white
Bloom: June
Precip Range: 18 – 25+ in
In-row Spacing: 6 ft

Chokecherry. Nevada Native Plant Society, PLANTS Database

Prunus virginiana, chokecherry
Origin: native
Mature Height: 10 - 20 ft
Growth Rate: moderate
Growth Habit: oval to round; suckering
Wildlife Value: excellent food and cover
Attracts: bees, butterflies; larval host of the two-tailed swallowtail butterfly (largest butterfly in the PNW)
Flowers: white
Bloom: May
Precip Range: 12 – 25 in
In-row Spacing: 12 ft

Antelope bitterbrush. G. Monroe, PLANTS Database

Purshia tridentata, antelope bitterbrush
Origin: native
Mature Height: 2-6 ft
Growth Rate: moderate
Growth Habit: upright shrub
Wildlife Value: cover, fall forage
Attracts: butterflies, bees, flies; larval host of some hairstreak butterflies
Flowers: yellow
Bloom: May-June
Precip Range: 6 – 16 in
In-row Spacing: 6 ft

Smooth sumac. Larry Allain, PLANTS Database

Rhus glabra, smooth sumac
Origin: native
Mature Height: 3 – 9 ft
Growth Rate: moderate
Growth Habit: many-branched shrub
Wildlife Value: food, cover
Attracts: bees,
Flowers: pale green
Bloom: May
Precip Range: 12 – 25 in
In-row Spacing: 4 ft


Golden currant. Ben Legler, University of Washington Burke Herbarium

Ribes aueum, golden currant
Origin: native
Mature Height: 4 - 6 ft
Growth Rate: moderate
Growth Habit: spreading and upright
Wildlife Value: nesting cover, fruit
Attracts: early spring bees, bumblebees; larval host of some anglewing butterflies
Flowers: fragrant golden yellow
Bloom: April-May
Precip Range: 16 – 25 in
In-row Spacing: 6 ft


Wax currant. www.wikimedia.org

Ribes cereum, wax currant
Origin: native
Mature Height: 3 – 4 ft
Growth Rate: moderate
Growth Habit: compact, rounded
Wildlife Value: berries, cover
Attracts: early spring bees, bumblebees, butterflies, flies; larval host of some anglewing butterflies
Flowers: white, greenish-white, pink
Bloom: April - May
Precip Range: 16 – 25 in
In-row Spacing: 6 ft

Nootka rose. www.wikimedia.org

Rosa nutkana, Nootka rose
Origin: native
Mature Height: 3 – 6 ft
Growth Rate: moderate
Growth Habit: erect, drooping braches
Wildlife Value: nesting, cover, excellent food
Attracts: bees, butterflies, beetles
Flowers: pink
Bloom: May - July
Precip Range: 16 – 25 in
In-row Spacing: 6 ft

Wood's rose. Don Knoke, University of Washington Burke Herbarium

Rosa woodsii, Wood's rose
Origin: native
Mature Height: 3-6 ft
Growth Rate: moderate
Growth Habit: upright to semi-drooping
Wildlife Value: nesting, cover, excellent food
Attracts: bees, butterflies
Flowers: pink
Bloom: May-July
Precip Range: 12 – 25 in
In-row Spacing: 6 ft

Purple sage. Pamela Pavek

***Salvia dorrii*,** purple sage
Origin: native
Mature Height: 1 – 3 ft
Growth Rate: moderate
Growth Habit: rounded, compact
Wildlife Value: food, cover
Attracts: bees, moths, butterflies
Flowers: purple
Bloom: May - July
Precip Range: 6 – 16 in
In-row Spacing: 2 ft

Elderberry. Ben Legler, University of Washington Herbarium

Sambucus nigra* ssp. *cerulea, blue elderberry
Origin: native
Mature Height: 6-15 ft
Growth Rate: moderate
Growth Habit: upright
Wildlife Value: nesting, food
Attracts: bees, nesting bees, butterflies, beetles, flies
Flowers: white to cream
Bloom: June-July
Precip Range: 18 – 25+ in
Soil Texture: medium to coarse
In-row Spacing: 10 ft

Snowberry. Ben Legler, University of Washington Herbarium

Symphoricarpos albus., snowberry
Origin: native
Mature Height: 2-4 ft
Growth Rate: moderate
Growth Habit: open and spreading
Wildlife Value: food, berries, browse, cover
Attracts: butterflies, bees, hummingbirds; larval host of the Snowberry Checkerspot butterfly
Flowers: pink
Bloom: June-August
Precip Range: 18 – 25+ in
Soil Texture: fine, medium or coarse
In-row Spacing: 4 ft

BUTTERFLY-PLANT RELATIONSHIPS

Butterflies are a highly visible and attractive ingredient of many inland northwest ecosystems. Approximately 160 species occur in this region but populations of many of them are in decline due to habitat degradation and loss. In addition to their value as pollinators, providing vital components of functioning ecosystems and being aesthetically pleasing, butterflies play an important role as indicators of environmental change. Whether environments or habitats change as a result of human interference or natural processes, butterfly populations are often among the first to respond. Conservation of our butterfly resource is therefore important on many levels and using butterfly-attractive plants is one way that landowners can help slow the trend of diminishing butterfly populations. Many of the plants listed in this technical note attract butterflies to feed on nectar. However, a subset of these also serves as hosts for breeding, multiplying their value for butterfly conservation. These plant species, indicated in the plant description section, provide food for larvae as well as adults and will support breeding populations that may persist from season to season. By selecting appropriate plants, landowners and farmers have the opportunity to contribute to native butterfly conservation as well as aiding other pollinators.

BEE-PLANT RELATIONSHIPS

Table 7 below shows the known relationships between several crops and flowers and the bees that visit them. All types of bees listed on this table are native with the exception of honey bees. Please be aware that many relationships between bees and plants have yet to be discovered and documented. Also keep in mind if crop production enhancement is a primary goal for establishing pollinator habitat, selection of plants that attract the same types of bees and bloom at the same time as the crop may not have a positive result. The best strategy for designing habitat usually involves selecting a variety of plants that bloom in succession throughout the season and attract a variety of bees and other insects.

Bumble bee visiting a western prairie clover (*Dalea ornata*) flower . Pamela Pavek

TABLE 7: BEE-PLANT RELATIONSHIPS

	TYPE OF BEE					
	Social bees			Solitary bees		
				CAVITY-NESTERS		MINING4
CROP	BUMBLE	HONEY	SWEAT1	LEAF-CUTTER2	MASON3	
ALFALFA5		x	x	**X**		A
APPLE	x	**X**			**X**	**X**
APRICOT	x	**X**			**X**	x
RASPBERRY	**X**	**X**	x		**X**	**X**
CHERRY		**X**			**X**	**X**
LEGUMES	**X**	x	**X**	**X**	x	**X**
SQUASH	x	**X**	x			P
CUCUMBERS, MELONS	**X**	**X**	**X**			**X**
FLOWER						
ASTRAGALUS	**X**	x		x	**X**	**X**
BALSAMORHIZA	**X**	**X**	**X**		**X**	**X**
CLEOME		**X**	x	x		**X**
CREPIS	x	**X**	x	x	**X**	**X**
DALEA	**X**	**X**		**X**		**X**
HEDYSARUM	**X**	**X**		**X**	**X**	
HELIANTHUS	x	x	**X**	**X**		**X**
LOMATIUM		x	x			**X**
MELILOTUS	x	**X**	x	**X**		**X**
PENSTEMON6	**X**	x			**X**	
PHACELIA	**X**	**X**	x		**X**	**X**
POTENTILLA		x				x
ROSA	**X**	x			x	
SOLIDAGO	**X**	**X**	**X**	**X**		**X**
SPHAERALCEA		x	x			**X**

"**X**" means likely to visit, "x" means minor use. Three purposes are confounded for some like alfalfa: which bees pollinate it commercially and which will benefit from it planted in seed mixes

1 genera with social species include *Halictus* and *Dialictus,* all ground-nesters

2 alfalfa leaf-cutting bee and others in its genus *Megachile.* All cut leaves, some nest shallowly underground

3 all species of *Osmia.* Most use masticated leaf pulp rather than mud in nests, some nest shallowly underground

4 all the many and diverse non-social bees that nest underground. "A" is for the alkali bee, *Nomia melanderi.* "P" is specifically for the squash bee, *Peponapis pruinosa*

5 alfalfa is commercially pollainated by alfalfa leaf-cutting bees and alkali bees, but attracts a large diversity of summer-flying bees

6 species of *Penstemon* differ greatly in their fauna of visitors and pollinators. Several pollen wasps (*Pseudomasaris*) are key pollinators of some species

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ADDITIONAL SOURCES OF INFORMATION

For more information about establishing plantings see the following Washington Technical Notes in eFOTG:

Plant Materials Tech Note No. 1	Seeding Guide (September 2010)
Plant Materials Tech Note No. 6	Seedbed Preparation and Seed to Soil Contact (March 2005)
Plant Materials Tech Note No. 7	Seed Quality, Seed Technology and Drill Calibration (February 2005)
Plant Materials Tech Note No. 15	Conservation Reserve Program Technology (February 2005)

For more information about pollinators and pollinator habitat:

"Native Pollinators", "Butterflies", "Bats", and "Ruby Throated Hummingbird" Fish and Wildlife Habitat Management Leaflet Numbers 34, 15, 5, and 14 respectively.
http://www.whmi.nrcs.usda.gov/technical/leaflet.htm

Agroforestry Note on nest sites: http://www.unl.edu/can/agroforestrynotes/an34g08.pdf

How to Reduce Bee Poisoning form Pesticides:
http://extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf

Other NRCS documents: http://plants.usda.gov/pollinators/NRCSdocuments.html

The Xerces Society documents: http://www.xerces.org/

The North American Pollinator Protection Campaign:
http://pollinator.org/nappc/index.html

The Pollinator Partnership: http://www.pollinator.org/

For information about beneficial insects:

The ATTRA Farmscaping to Enhance Biological Control Guide: http://www.attra.org/attra-pub/PDF/farmscaping.pdf

For additional information about the plants listed in this document:

The USDA PLANTS Database: http://www.plants.usda.gov/

For additional information about other plants for pollinators:

The Utah State University Fast Sheet: Gardening for Native Bees in Utah and Beyond
https://extension.usu.edu/files/publications/factsheet/plants-pollinators09.pdf

For sources of plant materials:

Plant Materials Tech Note No. 3	Partial List of Vendors of Conservation Plants and Seed for Oregon, Washington and Northern Idaho (March 2009)