1. Improving the grounds of campus.
   A. Installed rain garden next to tennis courts
   B. Planted native plants along mill stream.
   C. Ford building has rain catch and filter system.
   D. Removal of Ivy and replacement with plants to support wildlife off of 12th Street

2. Use of organic fertilizers and discontinued use of insecticides and herbicides containing residual chemicals that would harm wildlife.
This before picture shows the extent of the ivy cover on this bank.
Nothing in this landscape is attractive or benefits any of our local bird population or our native pollinators. The Ivy was mechanically removed and then soil amendments were added to prep the soil for planting native species some non natives that provide food or nectar to our Wildlife
Ivy removed and Stonework in place
Addition of Organics to soil
Winter of 2010

The soil was terraced to prevent erosion and soil amendments were added to the slope to help hold the moisture.
After the removal of the Ivy, we planted as many native plants suitable for that site as possible. The main goal was to use plants that support our native or nesting birds like the Anna hummingbird.

The first season's goal was to fill in and add color using Minners' lettuce – *Atriplex hortensis* atropurpurea, Wallflower – *Cherianthus allionii*, and Basket of gold – *Aurinia saxatilis* and Corn poppy – *Papaver rhoeas* for immediate color until the native plants filled in the site.
Two annuals – 1. The Purple Orach or mountain Spinach (*Atriplex hortensis*) and the 2. Flanders poppies – (*Papaver rhoeas*) give color the first Spring after the Ivy removal. Later the shrubs and woody plants will fill.
(Atriplex hortensis atropurpurea) or Mountain spinach gave the hillside a bright backdrop. Almost a stain glass window effect when the evening sun passes through the leaves.
From English Ivy to habitat for our native wildlife
To provide a supportive habitat for the native wildlife that you have you need to first determine what the native birds, bees, and butterflies live or have lived in your area, and then do the research to find out what (native) plants you have or had at one time to support the wildlife.

For example:

**Cedar wax wings** eat a lot of fruit in the winter months and are transitory so to attract this bird you have to plant fruit bearing trees and shrubs.

**Anna’s hummingbird** requires a stable adequate supply of nectar within close range of its nesting sites. They also require enough small flying insects to supply enough protein to rear these youngsters and support the adults in the neighborhood.

**For native bees** you have to survey the bees and notice their nectar source.

**Butterfly populations** Require nectar for the adults and the specific larvae foods required for the caterpillars….Ex (Milkweed)
Purchase several good reference books to help you in deciding what local wildlife to attract to your garden. I have found two great books by Timber Press are:

**Trees & Shrubs of the Pacific Northwest**
Mark Turner & Ellen Kuhlmann

**Wildflowers of the Pacific Northwest**
Mark Turner & Phyllis Gustafson
Ellen Kuhlmann is a well-regarded professional botanist with extensive experience with Northwest flora. She was enchanted by the forests and tall grass prairie remnants of northern Illinois while growing up, then moved to the Pacific Northwest to earn a Master of Science degree at Western Washington University, specializing in plant ecology. Ellen's main research interests are fire ecology, rare plants, and plant community ecology. Ellen worked for the U.S. Forest Service for over a decade, on ranger districts within the Okanogan-Wenatchee National Forest and at the Wenatchee Forestry Sciences Laboratory. Then she became the Seeds of Success Project Manager for the collection team based at Rare Plant Care and Conservation, a nonprofit affiliated with the University of Washington, a position she held for 6 years.

Ellen has authored both scientific and general interest articles on plants and related subjects. In addition to her professional work, Ellen is an active member of the Washington Native Plant Society. She often leads field trips and native plant educational activities. She recently co-authored the book Trees and Shrubs of the Pacific Northwest with photographer Mark Turner, released in June of 2014.
Mark Turner — Garden photographer & author, “Trees & Shrubs of the Pacific Northwest”

Mark Turner is the owner of Turner Photographics and has been a professional photographer since 1993, specializing in gardens and native plants for books, magazines, and commercial clients. He also creates lifestyle portraits for northwest families. He is the photographer and co-author of *Wildflowers of the Pacific Northwest* (Timber Press, 2006).

These books are invaluable to the serious student that is working on a career in forestry, or Botany in the Pacific Northwest. Great reference books.

Since Xerces published the groundbreaking *Pollinator Conservation Handbook* in 2003, conservation practices have evolved, and the handbook has begun to show its age. At 380 pages, *Attracting Native Pollinators* provides dramatically expanded breadth and detail, reflecting the latest understanding about creating and managing pollinator habitat. Illustrated with hundreds of color photographs and dozens of specially created illustrations, *Attracting Native Pollinators* is divided into the following four detailed sections.
To provide a supportive habitat for the native wildlife that you have you need to first determine what the native birds, bees, and butterflies of the area you live in are, and then do the research to find out what (native) plants in your area support the wildlife.

For example the **Cedar wax wings** eat a lot of fruit in its diet and so to attract this bird you have to plant fruit bearing trees and shrubs.

**Anna’s hummingbird** requires a **stable adequate supply of nectar** within close range of its nesting sites to rear two youngsters to fledgling age. They also require enough small flying insects to supply enough protein to rear these youngsters and support the adults in the neighborhood. To support **butterfly populations** you need to provide nectar and the specific larvae foods required for the caterpillars....
Remember the habitat for butterfly's is more difficult… You must provide the food plant for the caterpillars and nectar plants for the adults often at different times of the season. You also need a sharp eye to differentiate the differences in species. For example the Anise swallowtail would prefer fennel, parsley, dill, coriander, etc…. The anise swallowtail is a variety like Oregon ash and alder…. The anise swallowtail prefers different plants.
Monarch butterfly requires *Asclepias* sp.– or milkweed to lay its eggs on.

Morning cloak butterflies lay their eggs on willow oak or elms.

Anise swallowtail requires parsley family to rear its caterpillars.

Western swallowtails lay their eggs on willows cottonwoods or quaking aspen.
Anise swallowtail caterpillars feed on fennel, dill, and parsley. Adults on Brodiaea species.

Brodiaea congesta – Harvest Lily

A bulb that attracts our Anise swallowtail butterflies.
Meadow foam – *Limnanthus douglasii*

Winter annual sprouts in fall. Flowers early spring and attracts mason bees and benificial insects like surphid flys.
Another native plant to attract beneficial insects.

Mason bees and hover flies get an early start in spring with this self-seeding winter annual.

Limnanthus douglasii - Meadowfoam
Habitat for the monarch butterfly included the native showy milkweed.
Grows more vigorously in moist soil, but it's also drought tolerant. If you don't want additional seedlings next spring, simply cut off the seed pods before they pop open or bind them shut with twist ties or rubber bands if you want to collect showy milkweed seeds. Asclepias speciosa is covered with monarch caterpillars during the summer. The Orioles use the dead stems for nests the next spring. (The matter looks like fiberglass.) This species is closely related to the Common milkweed, with which it sometimes hybridizes at the eastern limits of its distribution.

Asclepias speciosa - Showy Milkweed
The monarch butterfly in Oregon requires *Asclepias speciosa* and *Asclepias fascicularis* to survive. This is the only migrating butterfly in Oregon and habitat is critical for its survival.

Included in the planting is Oregon's native showy milkweed (*Asclepias speciosa*) which supports the Monarch butterfly.
Like its perennial cousin butterflyweed, bloodflower is one of the best plants to attract butterflies. Monarch larvae love to feast on the leaves, and other butterflies that sip its nectar. A drought-tolerant plant, it's also called Indian root and swallowwort. It's perfect for planting in sunny naturalistic or wildlife gardens. In midsummer, it covers itself with gorgeous flowers in oranges, reds, and yellows on tall stems. Plant it in spring after all danger of frost has passed. Be careful of the milky sap, which can irritate skin. While it's grown as an annual in most areas, it is a perennial in the tropics.

Asclepias curassavica – Bloodflower
Tropical Milkweed
Oregon Sunshine

_Eriophyllum lanatum_

Mature Height: 6 - 24"

Sun: Prefers full sun

Soils: Dry, well drained

Notes: Perennial herb with hairy leaves and stems; solid bright yellow “daisy-like” flowers on long stalks; blooms from late spring to late summer; tolerant of drought and rocky soil
Oregon sunshine flowers freely cover the plant in a long bloom time, generally May into July. These bright and cheery flowers attract numerous species of beneficial insects and butterflies.

Grows in many habitats, most often in dry lands with sandy or rocky soils, sometimes along coastal bluffs from near coastline to mid elevations. Var. *achillaeoides* has leaves divided like yarrow, while var. *integrifolium*, the typical Oregon sunshine, has fewer ray flowers, leaves entire or with lobes only at tip end.
Wallflower (Erysimum capitatum or Cherianthus allionii) blooms early in the spring when night temperatures are still freezing and few other flowers are blooming. Attracts beneficial insects and butterflies.

Western swallowtail caterpillar feeds on Alder, willow.
Important native plant
Erysimum or Cheiranthus – Wallflower
Very early and fragrant.
Pollinators - Hummingbirds
The Rufous is the best flyer of the two main species we have in the valley.
Male Anna hummingbird
 Scarlet Monkeyflower or *Mimulus cardinalis*

Native to wet areas throughout the West, this robust perennial can easily grow to 2 ft. tall and wide. Tubular scarlet flowers are a hummingbird favorite and are very showy. Plant in sun to part shade with ample water. Perfect beside a pond, stream or water feature. Trim as needed to keep tidy. The flowers provide nectar for hummingbirds.

Habitat: Riparian. This wildflower mainly grows along streams and in other moist or wet places in the mountains, but it can sometimes be found at lower elevations.

*M. cardinalis'* pollination is the task of the hummingbird. This hummingbird magnet is quite noticeable while in bloom with its bright scarlet color.
The female Anna hummingbird in the process of pollinating *Mimulus cardinalis*.
Zauschneria in the fall makes a great perennial nectar source for Annas.

Major food source for nesting hummingbirds.

2,000 flowers a day to feed these youngsters to fledgling.

Flowering currant in the Spring.
**Ribes sanguineum** (Flowering Currant) Important for nesting females because of the abundant amount of nectar produced per plant
The Anna hummingbird does not migrate south like the Rufous hummingbird so if we can extend the flowering season by adding Late Winter flowering species of plants to our Willamette University landscape we can ensure the Anna has a natural nectar source…. The earliest sources we found are *Ribes speciosum, and some Arctostaphylos species*
One of the first flowering shrubs to supply nectar for the Anna's hummingbird is the Fuchsia flowering gooseberry (*Ribes speciosum*) This **blooms in January** before the Flowering currant – *Ribes sanguineum*. 
Arctostaphylos patula
Green Manzanita

Native in the shaded area of the range map.

Flowering Time: Late Spring

Life Cycle: Perennial

Height: 3--7 feet

Habitat: West-Side Forest, Subalpine

Found In: Siskiyous, Crater Lake NP

Leaves 1–2 1/2 in. long, shiny green, leathery, erect, widely oval, with rounded tips. Flowers pink, urn-shaped, with mostly scale-like bracts at base of each dense cluster. Blooms earlier in the lowlands.

Arctostaphylos patula
Greenleaf manzanita

Important native nectar source for both migrating hummingbirds. The Anna doesn’t migrate (Calypte anna) but manzinita supplies nectar early in the season.
Hummingbirds on an *Arctostaphylos* species in late January ..
Supply nectar plants for all seasons you have the hummingbirds.

A. Early (Critical for nesting) – *Ribes speciosa* (Feb, March, April), *Ribes sanguineum* (March, April), *Symphorcarpos albus* (Snowberry) *Mahonia aquifolium* (Oregon Grape) (all natives), *Ribes areum* (April May) Nesting Season

B. Mid Season – *Crocosmia “Lucifer” Canna, Lonicera cilosa* (Non natives)

C. Late Season – *Fuchsia mangellanica, Kniphofia or Hot Poker plant* (Non natives)
Hot poker is hardy in Zone 7 and although a native of South Africa, it is very popular with many of our native birds and butterflies.

The "Popsicle" series of hybrids are smaller than the species and easier to divide and take up less space in the garden. Not only does kniphofia come in yellow but it also comes in small and large sizes.

Although the hot pokers don’t have a long blooming period, there are so many cultivars and you can extend the nectar season by planting different cultivars.
Kniphofia or Hot Poker attracting native Cedar Waxwings
Bullock’s Oriole – During the breeding season they can be found in the eastern foothills of the Cascade range.

Excellent non-native plant to attract some of our less common native birds.
This little female hummingbird isn’t about to let any unwelcome intruder steal her nectar source.
Back to natives

Less disease problems - Less maintenance
Other natives like Oregon grape and huckleberry provide food for other birds. Ideal understory evergreen shrub.

Oregon grape (Mahonia aquifolium)

Evergreen Huckleberry (Vaccinium ovatum)
Mahonia aquifolium – Oregon grape is a native shrub best grown as an understory plat amongst deciduous trees and shrubs if it doesn’t receive any supplemental water in the summer months. Grows in oak woodlands, forests to sagebrush slopes, below 7000 ft. State flower of Oregon. Habitat: Coastal, West-Side Forest, East-Side Forest, Disturbed Sites.
Lonicera ciliosa – Orange Honeysuckle
Late Spring bloomer
Aquilegia formosa – Western Columbine

Lonicera cilosa – Native Honneysuckle

Monarda didma – Bee Balm

Two Non-natives that are hummingbird favorites

Neither of these plants are native

When ever possible I suggest you use native plants to attract our native wildlife but with hummingbirds I have made a few exceptions to give them a longer season of nectar supplies.
Trailing to climbing vine with hollow stems. Stems, leaves hairless or with straight hairs on edges. Leaves deciduous, opposite, green above, whitish below, egg-shaped to oval, 1–4 in. long, upper pair fused around stem. Flowers held in short, dense, whorled spike beyond fused leaves at ends of stems. Flowers orange, trumpet-shaped, with 5 lobes, stamens and stigma protruding. Many small orange-red berries. Grows in forests, thickets, from sea level to 5500 ft.

Blooms in late spring; flowers in terminal clusters. Not fragrant. Pollinated by hummingbirds (Rufous primarily). Fruit orange-red, translucent, to 1 cm, many seeded.

Sun to partial shade. Looks great when an old plant climbs up an Oregon White Oak tree.

Lonicera ciliosa – Orange honeysuckle
A few non-natives for excellent nectar sources
Monarda didyma – Non-native, Great nectar source
A perfect match: – **Lobelia cardinalis** and Hummingbirds  

non-native

Lobelia cardinals. Cardinal flower grows in moist areas such as seeps, wooded swamps, freshwater marshes.
Lobelia cardinalis grown in the fountains at Dancing Oak nursery
Lobelia cardinalis Eastern USA native adapted to grow in wet saturated soils. See the fountains of Dancing Oak Nursery in mid-summer...
From the bog to summer drought conditions
Epilobium canum ssp. Latifolium - Hummingbird Trumpet

Flowering Time: Late Summer-Autumn

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Flowers bright red-orange, in clusters at stem tips, held horizontally. Four sepals and 4 petals form a 1–1 1/2 in. long funnel-shaped tube with petals 2-lobed at the end. Remember Annas hummingbird doesn't migrate.
Sub-species and cultivars of Epilobium canum are available that flower at different times and are different heights. My job is to find a niche for as many of them as we can fit into our land space to support the hummingbirds in on campus.

Great alpine drought tolerant perennial that requires little care and adapts well to the cultivated garden.
Winterberry for Cedar Waxwings when insects are scarce – Winter months

Zauschneria in the fall makes a great perennial nectar source for Annas

2,000 flowers a day from February until 21 days later at fledgling

Flowering currant in the Spring
Ipomopsis is derived from a Greek work meaning "striking appearance." The striking trumpet-shaped, odorless flowers are arranged in compact 1-sided clusters. The corolla is red, highlighted with yellow or white spotting in the throat. The stamens are attached to the corolla tube and are described in botanical descriptions as epipetalous, or on the petal. The principal pollinators of Scarlet Gilia are hummingbirds. As they probe for nectar in the slender-tubed flowers, these birds pick up and carry pollen on their heads and bills from one plant to another. Grows in dry soils, in openings of woodlands, meadows, in all elevations. Subsp. aggregata has orange-red flowers speckled white, tube gradually flaring to the lobes. Subsp. formosissima has white or yellow pollen, stem leaves sharply lobed.
Ipomopsis aggregata - Scarlet Gilia

**Life Cycle:** Biennial, Perennial

**Found In:** Siskiyous, Crater Lake NP, Wallowas, Steens, N Cascades NP

**Habitat:** West-Side Forest, East-Side Forest, Subalpine, Alpine, Shrub-Steppe

Flower tubes 3/4–1 1/2 in., topped with pointed lobes, stamens extending outward. Grows in dry soils, in openings of woodlands, meadows, in all elevations.

Subsp. *aggregata* has orange-red flowers speckled white, tube gradually flaring to the lobes.

Stem erect, sticky with glands or hairy. Plant dies after flowering.

Basal leaves much divided; stem leaves reducing in size up the stem. Inflorescence tops stem, loose flower clusters with short stalks. Flowers brilliant orange-red spotted or mottled with yellow, can be pink, yellow, or white.
Biennial wildflower with trumpet-shaped, brilliant scarlet flowers in late summer; erect stems and leaves are somewhat sticky; first year is a small rosette, blooms second year; attracts hummingbirds; gorgeous plant!

The Primary pollinators are hummingbirds (attracted more to the red form) and long-tongued moths, who seem to be attracted more by the unpleasant odor of the plant. This unpleasant odor gives it the "Skunk Flower" common name sometimes applied.

Highly drought-tolerant and mostly intolerant to cold, the skyrocket's is hardy to Sunset's Climate Zones 1 through 3, 6 through 14 and 18 through 21.

Choose a well-drained, elevated planting location with loamy soils, such as a hillside or raised bed. Be sure the location has loamy soils and receives a full day of direct sunlight, as the skyrocket plant is intolerant to shady locations.

*Ipomopsis aggregata* – Scarlet gilia

more by the unpleasant odor of
*Ipomopsis aggregata* – Scarlet Gilia

Pacific Northwest Native
One of the non-native trees we planted to attract hummingbirds is the Chilean tree of fire *Embothrium coccineum*.
Interdependence of unrelated species – The orb weaving spiders, the Hummingbirds, and the Bushtits.
Hummingbird Building Nest
This gives you an idea of how small the nests are and how small the chicks are when they first hatch. The nest is flexible because the spider web stretches as the chicks grow. This tight fit acts like a mummy bag to keep them warm and the lichen waterproofs and camouflages the nest from would be predators.
These Chicks are about to fledge…
Tiny Rufus chicks barely able to fit in the nest...
The bush tit starting to build a nest using a wad of cobweb to begin the nest.
Putting the finishing touches on a well hidden nest in a cedar tree.
American Goldfinch feeds on seeds like the Rudbeckia triloba and catnip in upper right corner.
**Rudbeckia triloba** is a biennial that self seeds in the garden and is taller than *R. goldstrum* but doesn’t require division.
Although the seeds are very small they seem to be very popular with the goldfinches in the fall.....
Parent teaching youngster how to forage for food....
SUPPORT NATIVE BEES

NATIVE PLANTS FOR MOIST SOILS

CULVER'S ROOT
Veronicastrum virginicum

SWAMP MILKWEED
Asclepias incarnata

GREAT ST. JOHN'S WORT
Hypericum pyramidatum

COMMON IRONWEED
Vernonia fasciculata

NEW ENGLAND ASTER
Symphyotrichum novae-angliae

COMMON BONESET
Eupatorium perfoliatum

WHITE TURTLEHEAD
Chelone glabra

PRAIRIE BLAZINGSTAR
Liatris pycnostachya

CANADA ANEMONE
Anemone canadensis

BLUE VERVAIN
Verbena hastata

SPOTTED JOE PYE WEED
Eutrochium maculatum

MOUNTAIN MINT
Pycnanthemum spp.

PollinatorsNativePlants.com
facebook: PollinatorNativePlants
© Heather Holm

PLANT NATIVE PLANTS
We are continually surveying our bee population and learning about the habitats that our native bees require for survival. We have sweat bees, Mason bees, Carpenter bees, Leaf cutter bees, Cuckoo bees, and digger bees. We welcome all who are knowledgeable about habitat requirements of these species.
Advantages of planting seed over buying nursery grown plants is that you can avoid using plants treated with the insecticide Imidacloprid. We purchased our seed from Applewood Seed Co. to avoid introducing Imidacloprid from nursery grown stock.
All of these "pesticides" are deadly to bees.

It isn’t a question of not seeing the forest for the trees…. It is that the pesticide can not distinguish the Aphids from the bees.
IMIDACLOPRID -
THE DEADLY NICOTINE
GROW WILDFLOWERS FROM SEED TO AVOID PESTICIDES

Used to control fleas on your pets but deadly to our bees. Used since 1994 – Used to disrupt nerves ability to send normal signals. More toxic to insects than to mammals. Extensively used in the horticulture industry to control insect pests.

![Imidacloprid Chemical Structure]

Oral LD50 = 450 mg/kg
Dermal LD50 = >5000 mg/kg
The binding affinity of imidacloprid at the nicotinic receptors in mammals is much less than that of insect nicotinic receptors. This is why the flea medicine doesn’t kill your cat or dog, but kills the fleas… Imidacloprid is part of the neonicotinoids class of insecticides and acts upon the nervous system, causing blockage of postsynaptic acetylcholine receptors. We found that imidacloprid was highly toxic when ingested via plant nectar and pollen to adult lacewings (non-target beneficial insects). There is a potential for this insecticide to leach to ground water. Many non-target beneficial arthropods such as honeybees, parasitic wasps, and predaceous ground beetles are sensitive to imidacloprid. These organisms may be adversely affected by sublethal doses of the insecticide.
Imidacloprid

Vesicles of acetylcholine

Nicotinic receptors blocked open

Constant neuromuscular stimulation
PLANTS TO ATTRACT NATIVE WILDLIFE BY SEED

1. Silene armeria – Catchfly
2. Clarkia amoena – Dwarf Godetia
3. Adonis aestivalis – Pheasants Eye
4. Ipomopsis aggregata – Scarlet Gilia
5. Alyssum saxatile – Basket of Gold
6. Asclepias curassavica – Bloodflower
7. Asclepias speciosa – Showy Milkweed
8. Monarda citriodora – Lemon Mint
9. Penstemon eatonii – Eaton’s Penstemon
Growing seeds without the use of insecticides
Learning the proper time to plant for our micro-climate
Using our grounds as an outdoor teaching lab.
Care:
Provide full sun to part shade and dry to medium, well-drained soil that is preferably sandy or gravelly. Plants do not do well in hot and humid summers. Most often grown as an annual, as it readily propagates from seed.

Sweet William catchfly seed requires a period of cold for the seed to break dormancy and germinate. Seeds purchased through a seed company are often pretreated and ready to plant.

The catchfly seeds need to be kept in cold, moist conditions before they are sown indoors in flats for later planting in the garden. While one Silene variety was recently grown after its seed was buried in the Siberian permafrost for 30,000 years, sweet William catchfly seeds won't need quite that long to sprout.

Silene armeria - Catchfly
Culture

Cool weather annual. It is easily grown in average, moderately fertile, well-drained soils in full sun. Plants appreciate some light afternoon shade in hot summer climates. Plants also appreciate good air circulation. Start seed indoors in pots 6-8 weeks before last frost date or sow directly in the garden as soon as the ground can be worked. Plants often perform poorly in hot and humid summer weather, and will produce best bloom prior to the onset of peak summer heat. Plants may reseed in the garden in optimum growing conditions.

Clarkia amoena – Dwarf Godetia

Leaf cutter bee.
Summer Pheasant's Eye (Adonis Aestivalis) - Start Pheasant's Eye seeds and grow this annual to naturalize a landscape and add some bold color for interest and appeal. The Pheasant's Eye plant, also called Summer Pheasant's Eye, has finely cut leaves from 1 - 2 inches long. It is a mid-summer bloomer with small cup-shaped, dark centered red flowers that are 1/2 - 1 inch wide. It grows easily from Pheasant's Eye flower seeds, and it prefers fertile well-drained soil in full sun. Adonis aestivalis – Pheasant’s Eye is useful for use in wild gardens, on slopes and mixed borders. It can grow in a light woodland area.
Alyssum 'Basket of Gold' is a spring-blooming perennial with gray-green leaves and bright yellow flowers. *Alyssum saxatile* typically lives for several years before the plants get old and woody. It self-sows, but it's not invasive. It makes a good groundcover for a small area. Basket-of-gold is one of those plants that loves to grow in the least likely of place -- cracks between paving stones, the edge of gravel paths and patios, rocky outcroppings, between the stacked stones of a retaining wall, and more. It loves a baked spot with excellent drainage but will struggle in hot, humid areas and tends not to do well in the South. But where it does well, it's a showstopper. It will reseed prolifically in little cracks, filling an area each spring with dazzling neon yellows. After it finishes blooming, the grayish-green foliage makes an attractive mat in the perennial garden.
Monarda citriodora has several common names including Lemon Beebalm, lemon horsemint, plains horsemint, lemon bee balm, lemon bergamot, and Purple Horse Mint. Native Lemon Horsemint grows in full sun to partial shade and prefers a sandy soil. Lemon mint is a long flowering annual wildflower with fragrant, curved, tubular flowers in purple to pink; attractive to bees and hummingbirds. It has the scent of lemon, blooms from May to July and is excellent as a bedding plant or in the butterfly garden or hummingbird garden. The leaves can be brewed for tea and, when crushed, can make a insect repellent.
Perennial. Firecracker blooms with brilliance as early as April, and is the only red penstemon to be found as far north as Utah. It lives up to its name, with fiery red tubular flowers amassed on tall spikes. Very heat and drought tolerant, perfect for a sunny, rocky slope or wildflower garden. Deer resistant.

When to sow outside: 2 to 4 weeks before average last frost or late fall, or up to 2 months before average first fall frost.

When to start inside: 6 to 8 weeks before average last frost. Cooler soil temperatures are preferred (around 55° F).

Penstemon eatonii Eaton's Penstemon
The name tells you this is a wildflower from cold climates, and it is naturally a biennial. However, in warmer places, it grows as a perennial, returning year after year. The plants are very easy to grow; simply scatter the seed in spring or fall on loosened soil, and compress into the dirt; do not cover.

For best results, direct sow in the fall for germination in the spring. Since this seed needs light to germinate, sow it on the surface of the soil and compact it lightly. For spring planting, mix the seed with moist sand and store it in the refrigerator for 30 days before direct sowing on the surface of the soil. This seed can also be started indoors, sown on the surface of a flat; keep the soil lightly moist and at a temperature of 65-70 degrees until germination, which should occur within 10-15 days. Transplant the seedlings 9-12" apart after the last spring frost. Though it prefers well-drained soil, this plant can adapt to many soils including clay.

Cheiranthus allionii – Siberian Wallflower
The Cedar Waxwing is one of the few North American birds that specializes in eating fruit. It can survive on fruit alone for several months. Cedar Waxwings feed mainly on fruits year-round. In summer, they feed on fruits such as serviceberry. The birds' name derives from their appetite for cedar berries in winter; they also eat mistletoe, madrone, juniper, mountain ash, honeysuckle, crabapple, hawthorn, and Russian olive fruits.

In summer Cedar Waxwings supplement their fruit diet with protein-rich insects including mayflies, dragonflies, and stoneflies, often caught on the wing.
1. We plant and maintain as many plant species (native and non-native) as we can to support the native wildlife of Willamette. This is an ongoing learning process.....

2. We don't use any insecticides or herbicides that could harm the native wildlife. Whenever possible we augment our environment with species to attract wildlife to the campus.

Birds that visit Willamette University grounds
The End
Plants pollinated by hummingbirds share a number of characteristics. 1. Many have tube-shaped flowers to accommodate a humming bird’s long beak and probing tongue. 2. Pendant flowers don’t have a perch so the pollinator must hover. 3. Most hummingbird-pollinated flowers are red – a color that birds are ultra-sensitive to, and that insects are blind to.
Most fragrant plants are moth pollinated – Moths can “smell” fragrant flowers in parts per million and most fragrant flowers are white....visible at night.
The Martha Springer garden put in three water features

Shallow areas are best for bathing
Jewelweed – *Impatiens capensis*

A favorite of hummingbirds and bumblebees. An annual that often occurs in dense stands, it is especially adapted to hummingbird visitation; but bees and butterflies are also important pollinators. The stem juice is said to relieve itching from poison ivy and has also been used to treat athlete's foot. Scientific data confirm the fungicidal qualities.

**Habitat:** Meadow, Bog/Fen/Wetland, Moist Riverbanks
Native plants are extremely important for hummingbirds. During spring migration in February and March, the Rufous Hummingbirds need native plants for their survival as they make their way northward. In our area, the first plants to bloom are Arctostaphylos, Indian Plum, salmonberry and red-flowering currants. Hummingbirds also find small insects for their needed protein intake.

Native plants, which have co-evolved with native wild birds, are more likely to provide a mix of foods - just the right size, and with just the right kind of nutrition - and just when the birds need them.