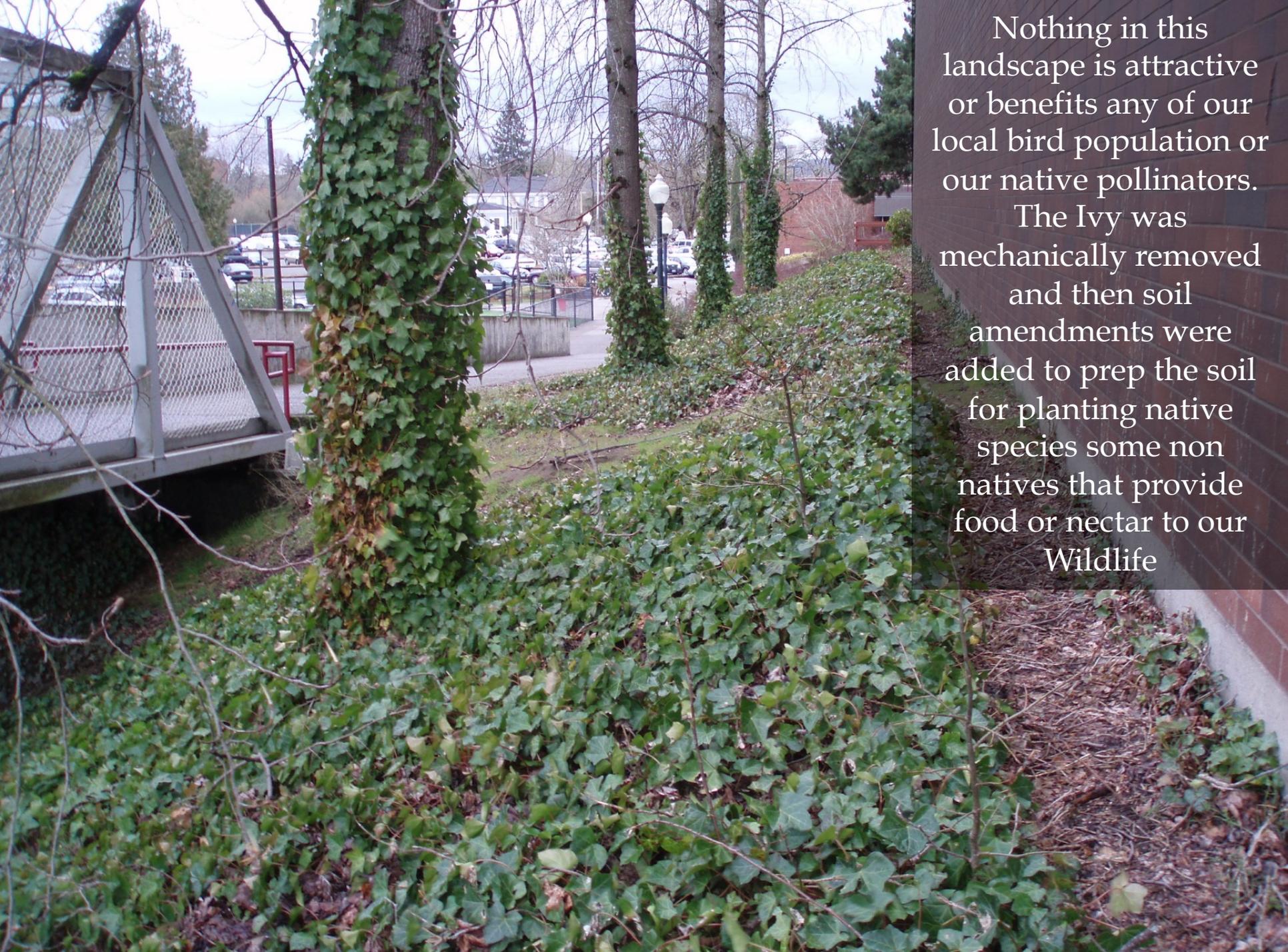




This before picture shows the extent of the ivy cover on this bank





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





Wallflower - *Cherianthus allionii*



Basket of gold - *Aurinia saxatilis*



Corn Poppy - *Papaver Rhoedas*



Purple Orach - *Atriplex hortensis*

Spring of 2011

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)



TREES & SHRUBS

of the PACIFIC NORTHWEST

Mark Turner & Ellen Kuhlmann



TIMBER PRESS FIELD GUIDE



WILDFLOWERS

of the PACIFIC NORTHWEST

Mark Turner & Phyllis Gustafson



TIMBER PRESS FIELD GUIDE



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.**

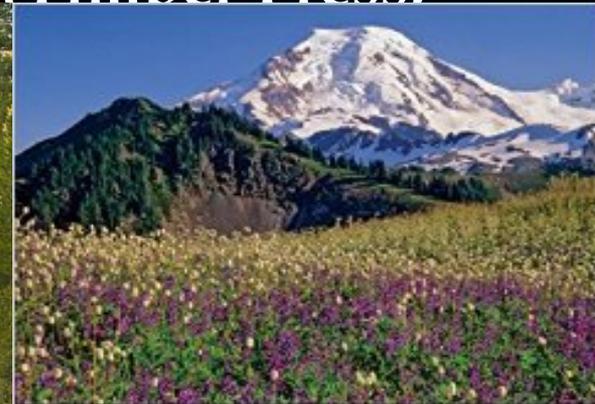
20



TREES & SHRUBS
of the PACIFIC NORTHWEST
Mark Turner & Ellen Kuhlmann



TIMBER PRESS FIELD GUIDE



WILDFLOWERS
of the PACIFIC NORTHWEST
Mark Turner & Phyllis Gustafson



TIMBER PRESS FIELD GUIDE

**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.**

Attracting NATIVE POLLINATORS

Protecting North America's Bees and Butterflies



Excellent resource

Xerces most recent book, *Attracting Native Pollinators: Protecting North America's Bees and Butterflies*, is available to purchase from our website. The book is published in 2011 by Storey Publishing, North Adams, Massachusetts. *Attracting Native Pollinators* is coauthored by four Xerces Society staff members Eric Mader, Matthew Shepherd, Mace Vaughan, and Scott Black in collaboration with Gretchen LeBuhn, a San Francisco State University botanist and director of the Great Sunflower Project.

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....



erfly's is more
ne food plant for
ts for the adults
eason.
fferentiate the
ample the Anise

variety like Oregon as
alder....
The anise swallowtail
parsley, dill, coriander



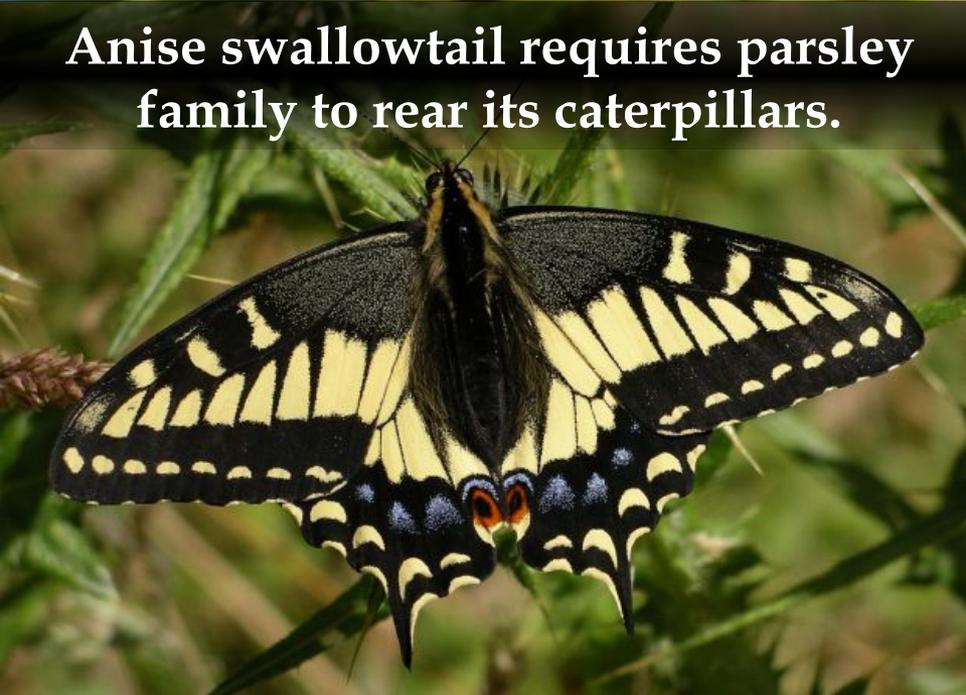
Monarch butterfly requires *Asclepias* sp.- or milkweed to lay its eggs on.



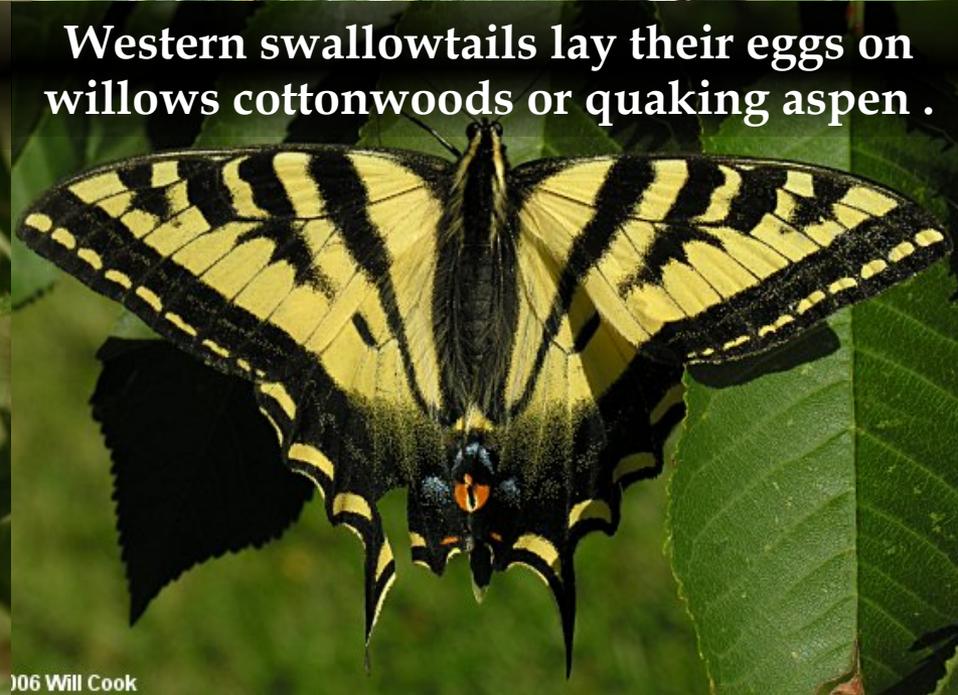
Morning cloak butterflies lay their eggs on willow oak or elms.



Anise swallowtail requires parsley family to rear its caterpillars.

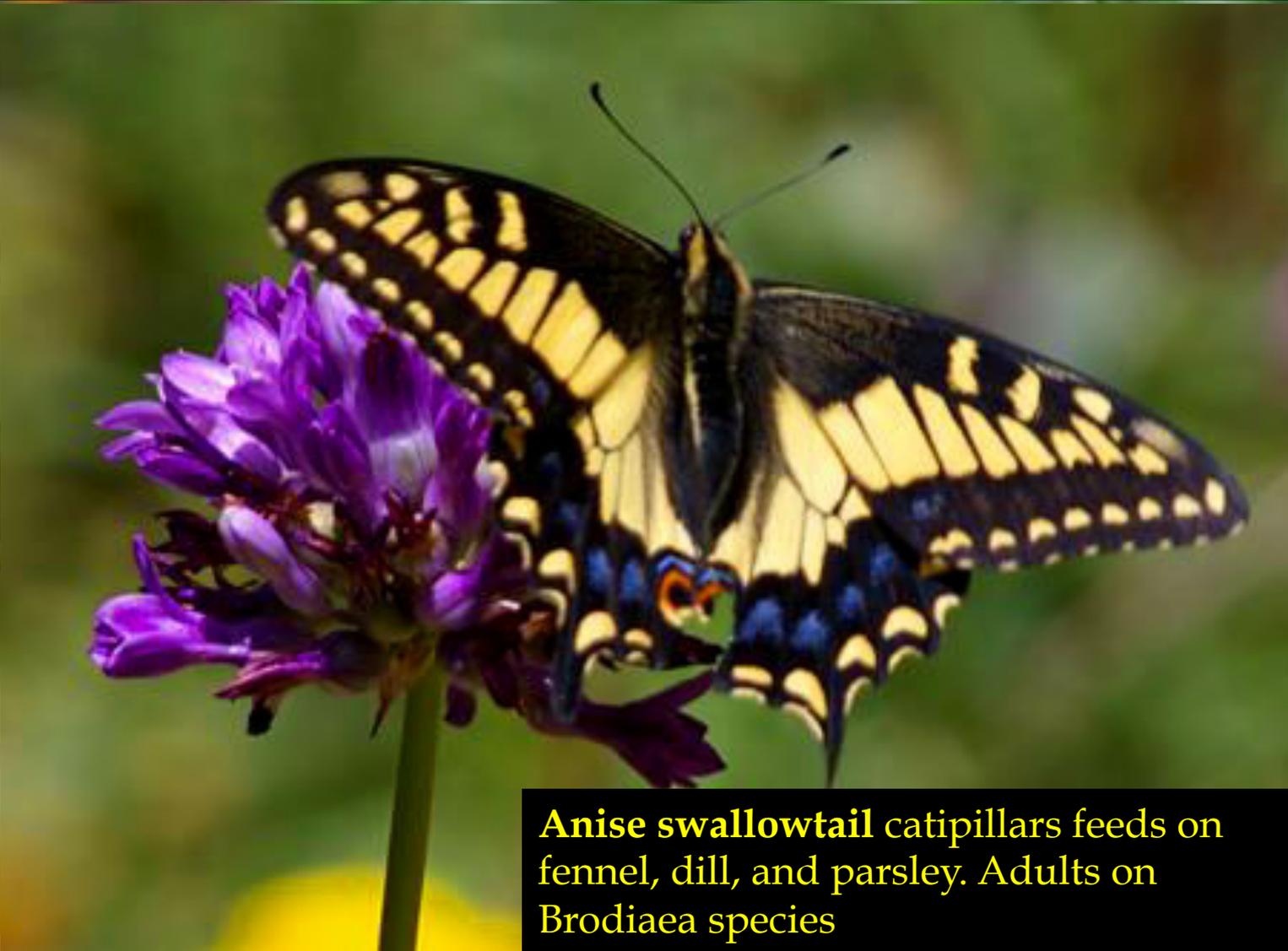


Western swallowtails lay their eggs on willows cottonwoods or quaking aspen .



Brodiaea congesta – Harvest Lily

a a bulb that Attracts our Anise swallowtail butterflies



Anise swallowtail catipillars feeds on fennel, dill, and parsley. Adults on Brodiaea species

Meadow foam – *Limnanthus douglasii*
Winter annual sprouts in fall. Flowers
early spring and attracts mason bees and
benifical insects like surphid flies



Limnanthus douglasii - Meadowfoam

Another native plant to attract beneficial insects.

Mason bees
and hover flies

get an early start in spring with this self seeding winter annual.



Mason Bee

Syrphid fly



Habitat for the monarch butterfly included the native showy milkweed.



Monarch butterfly on Mexican Sunflower
(*Tithonia rotundifolia*)





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.

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 a drought tolerant native wildflower



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



Wallflower

Important native plant
Erysimum or Cheiranthus – Wallflower
Very early and fragrant.



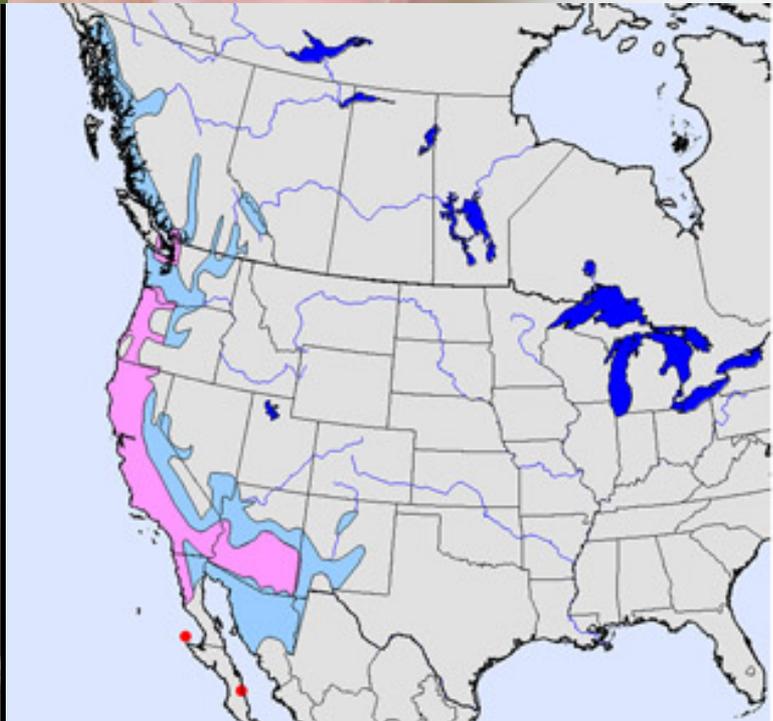
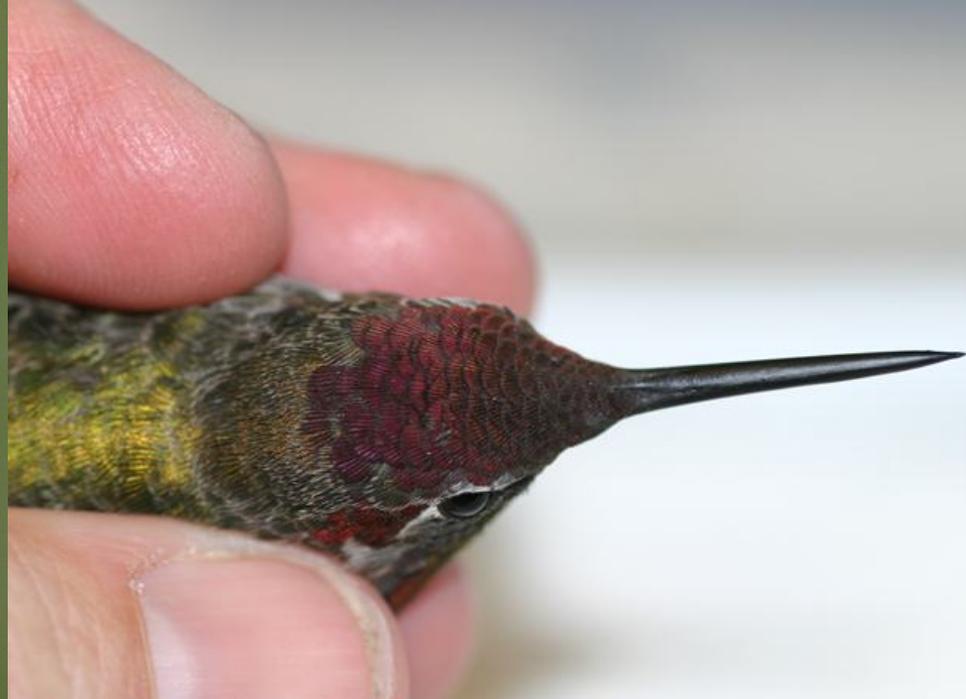
Pollinators - Hummingbirds

The Rufous is the best flyer of the two main species we have in the valley



Male Anna hummingbird

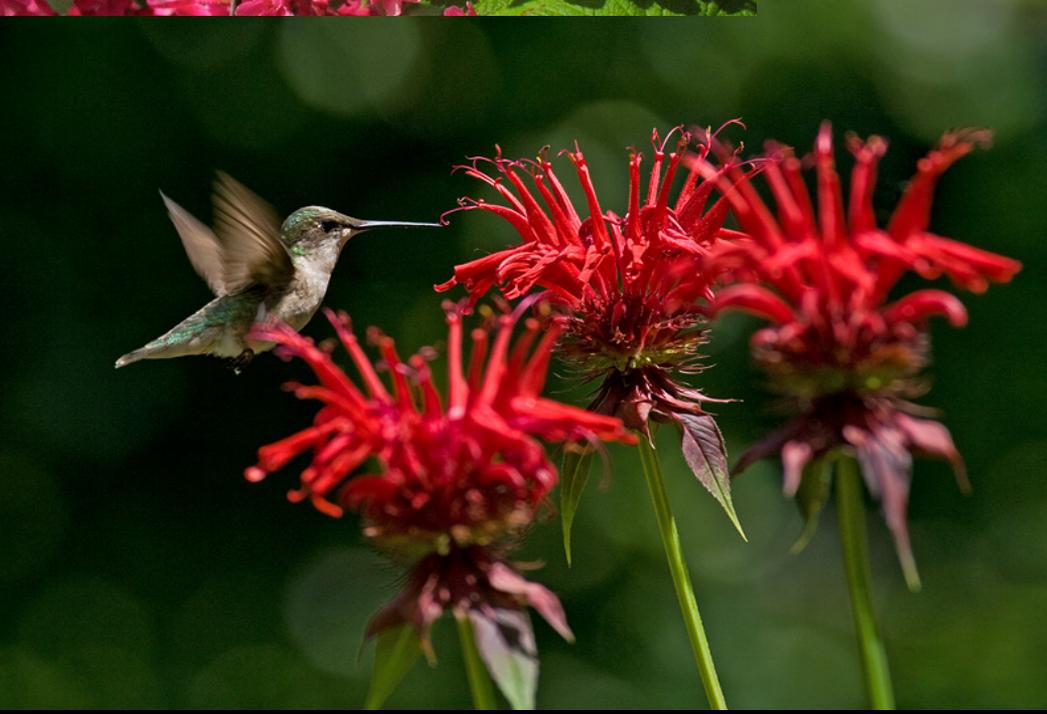




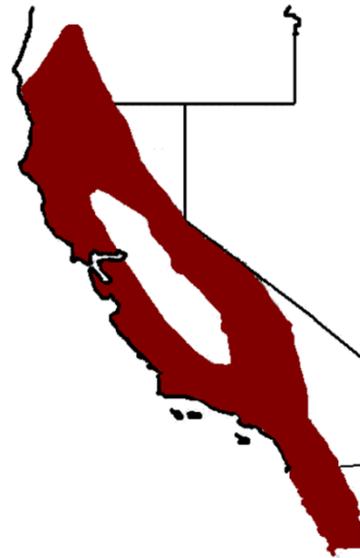
Anna's Hummingbird
Calypte anna

- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Introduced
- Uncertain Status
- Vagrant

Map created by Terry Sohl,
Data from NatureServe



Mimulus cardinalis Hummingbird flower



Mimulus cardinalis



Mimulus cardinalis – Scarlet monkeyflower **Native** nectar source for hummingbirds



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 Greenleaf manzanita

Important native nectar source for both migrating hummingbirds . The Anna doesn't migrate (*Calypte anna*) but manzanita supplies nectar early in the season..



Hummingbirds on an *Arctostaphylos* species in late January ..



Nectar plants for hummingbirds

Supply nectar plants for all seasons you have the hummingbirds.

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

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

C. Late Season – *Fuchsia mangellanica*,
Kniphofia or Hot Poker plant (Non natives)



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**



A photograph of two Bullock's Orioles perched on yellow flower spikes. The birds are bright yellow with black throats and faces. They are surrounded by green foliage and more yellow flowers. The image is used as a background for text.

Excellent non-native plant to attract some of our less common native birds

Bullock's Oriole _ During the breeding season they can be found in the eastern foothills of the Cascade range.

This little female hummingbird isn't about to let any unwelcome intruder steal her nectar source.



Back to natives

Less disease problems- Less maintenance

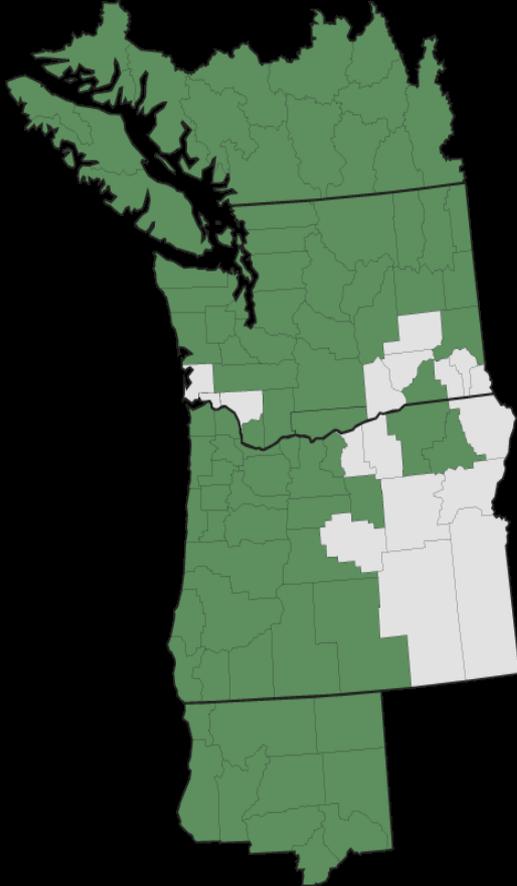
Other natives like Oregon grape and huckleberry provide food for other birds. Ideal understory evergreen shrub

Oregon grape (*Mahonia aquifolium*)



Evergreen Huckleberry (*Vaccinium ovatum*)

Mahonia aquifolium – Oregon grape is a native shrub best grown as an understory plant 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







Trumpet vine

Two Non-natives that are hummingbird favorites



Monarda didyma - Bee Balm



Aquilegia formosa - Western Columbine



Lonicera cilosa - Native Honeysuckle

Neither of these plants are native

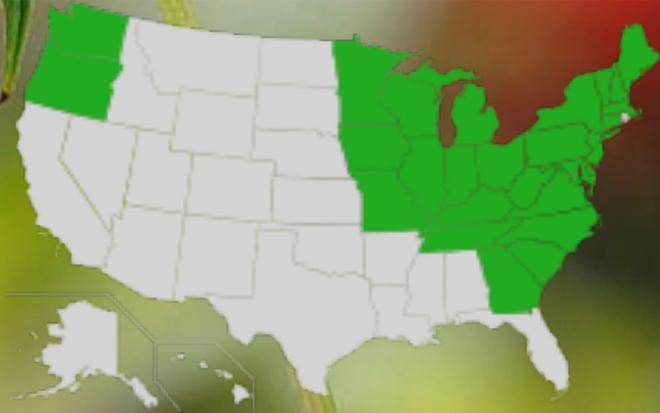
Lonicera ciliosa –
Orange honeysuckle



A few non-natives
for excellent nectar sources



Range map of monarda didyma



Monarda didyma – Non- native, Great nectar source



A perfect match: – *Lobelia cardinalis* and Hummingbirds non-native



Lobelia cardinalis. 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...

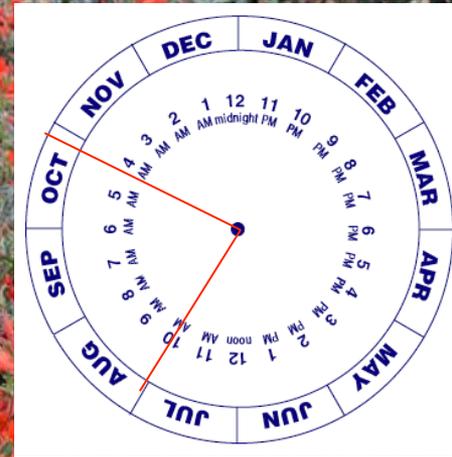
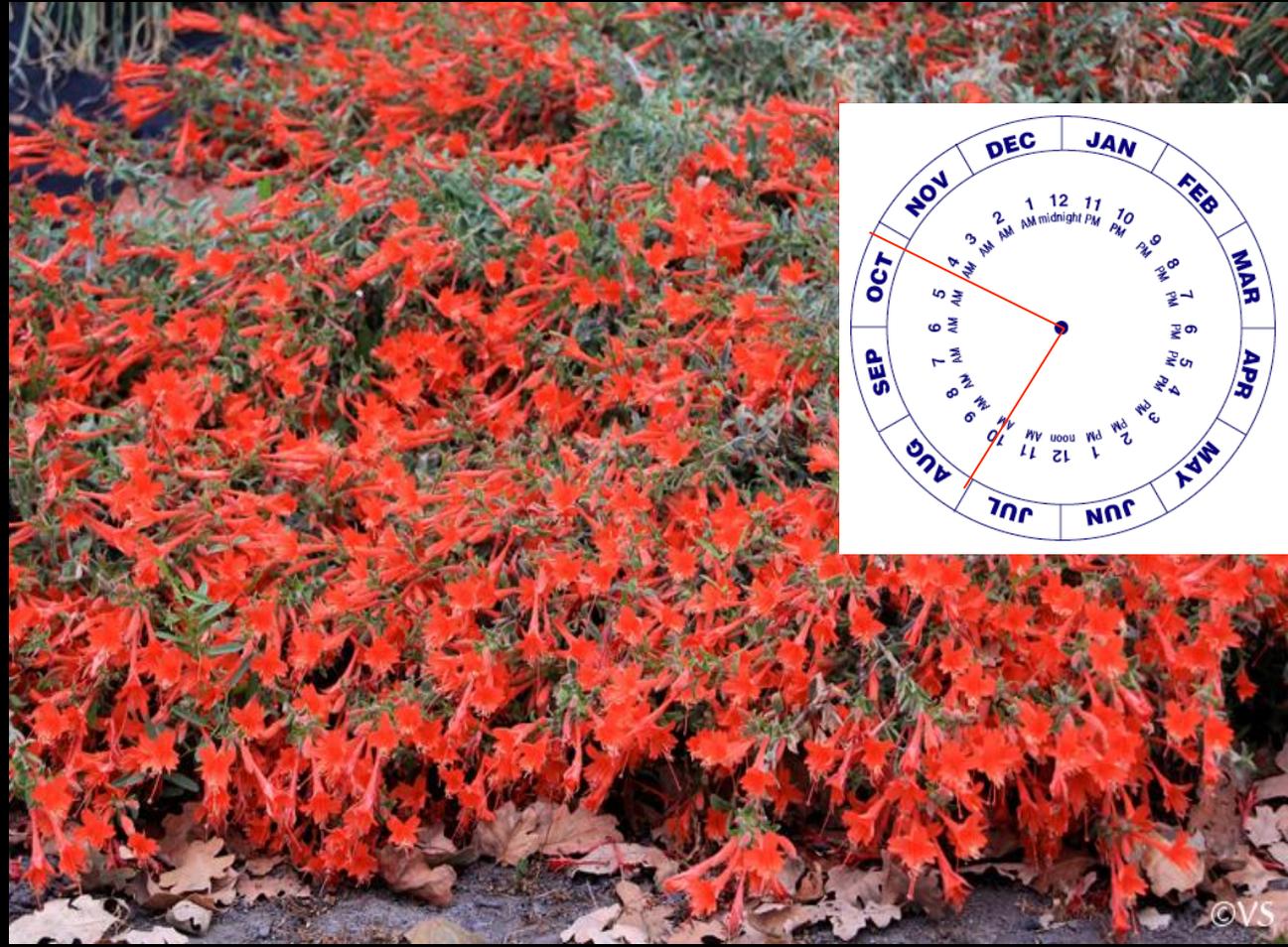
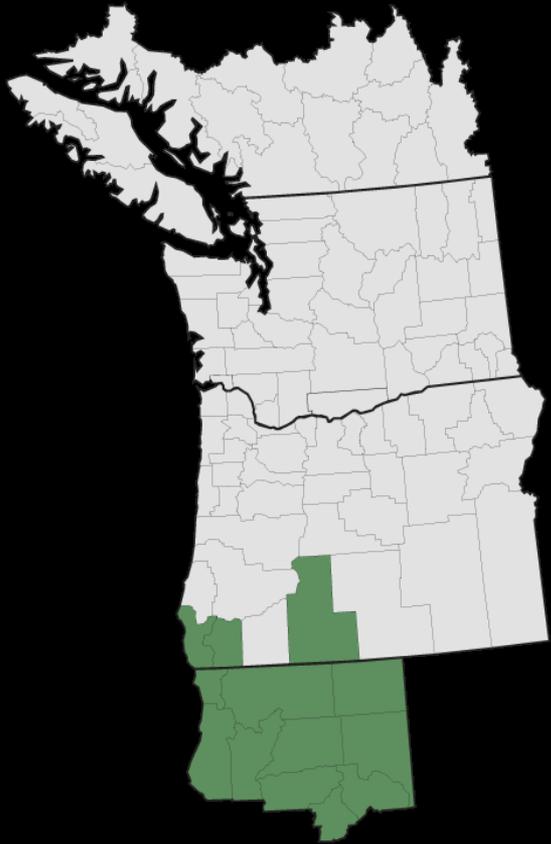




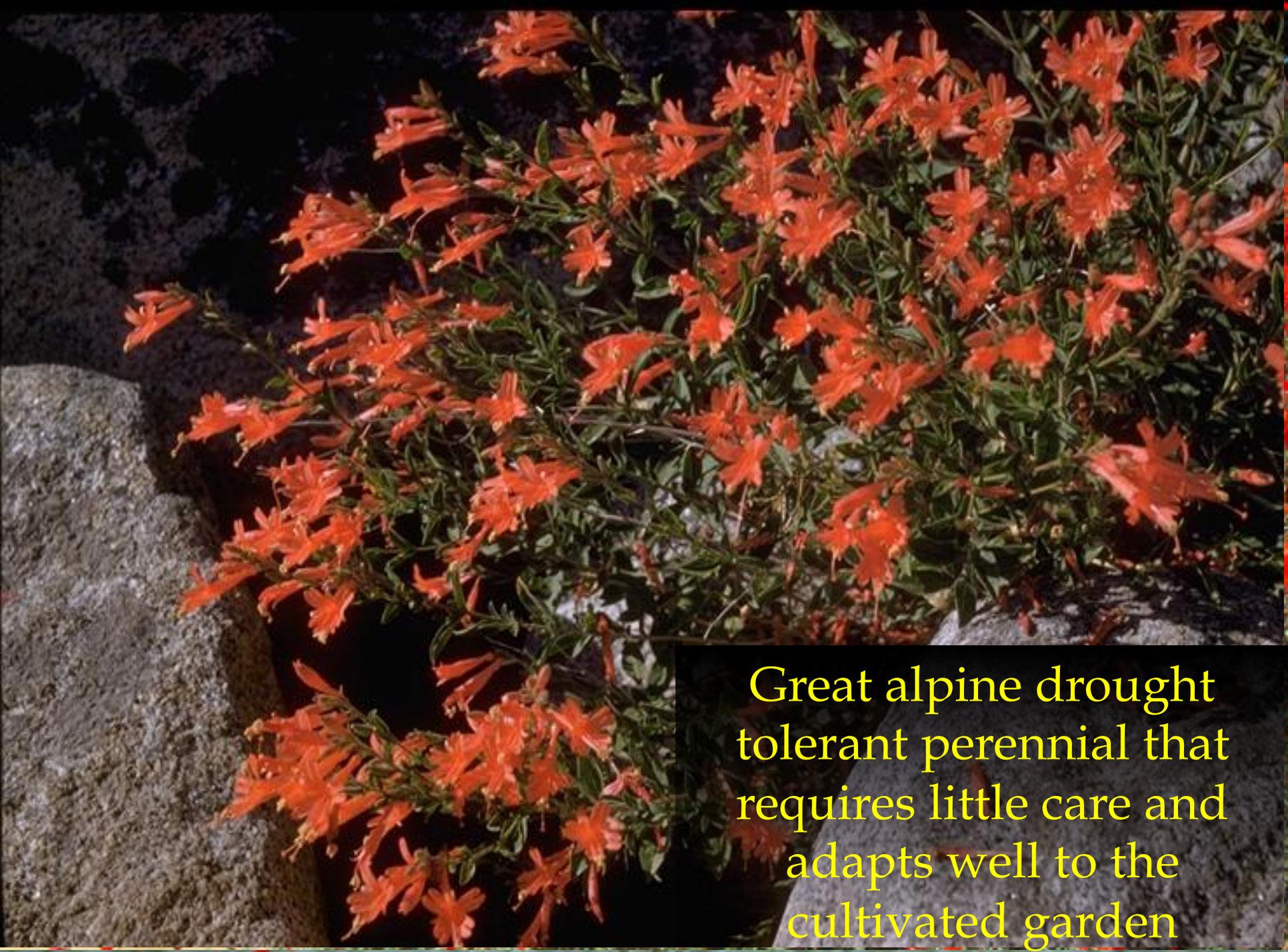
From the bog - to summer drought conditions

Epilobium canum ssp. *Latifolium* - Hummingbird Trumpet

Flowering Time: **Late Summer-Autumn**







Great alpine drought tolerant perennial that requires little care and adapts well to the cultivated garden



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

Winterberry for Cedar Waxwings when insects are scarce – Winter months



2.000 flowers a day from February until 21 days later at fledgling



Flowering currant in the **Spring**



956425 © Mark Turner
www.turnerphotographics.com





Ipomopsis aggregata – Scarlet gilia



Ipomopsis aggregata – Scarlet Gilia



Pacific Northwest Native



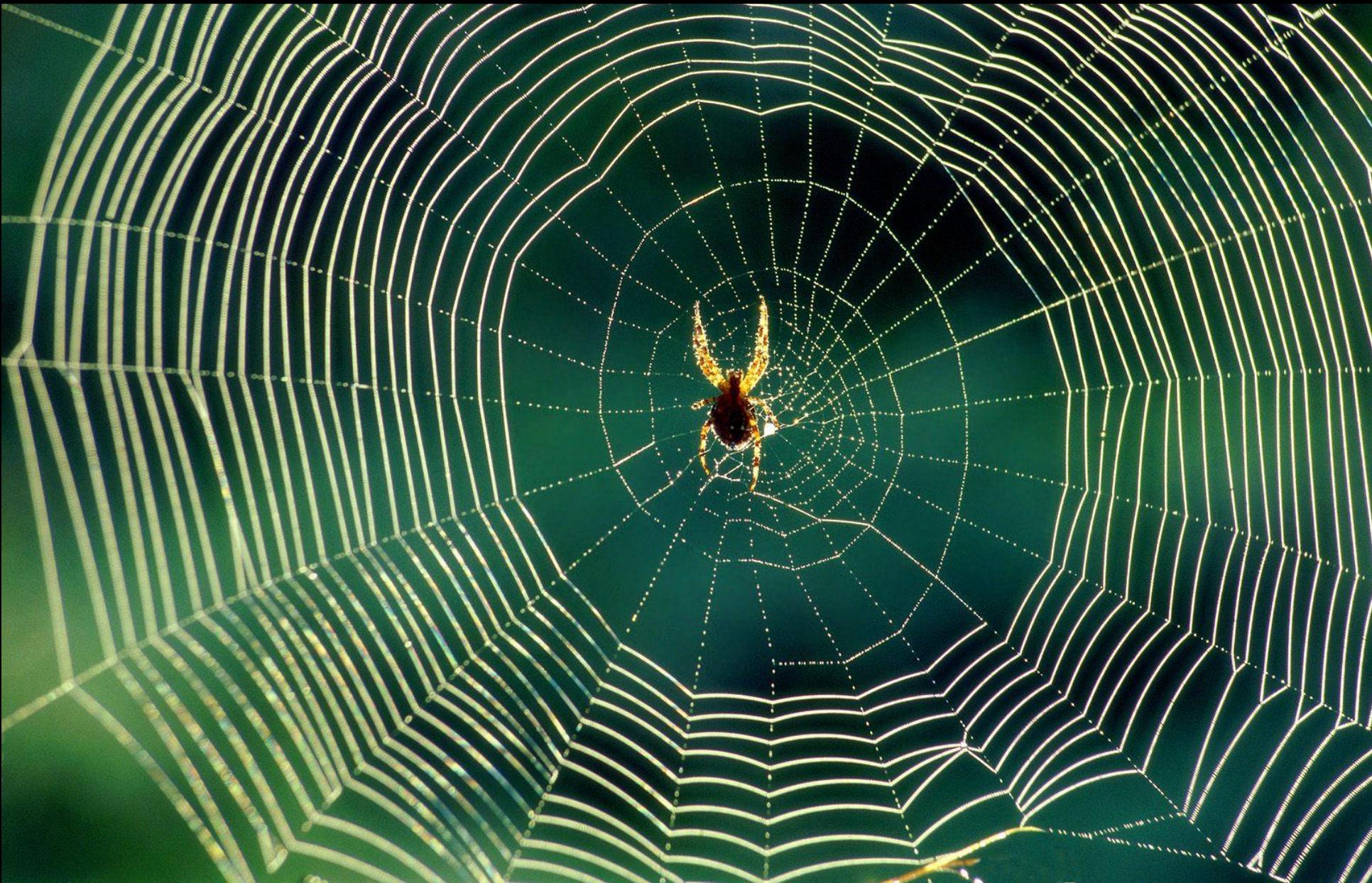


One of the non-native trees we planted to attract hummingbirds is the Chilean tree of fire

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.P



The End







2



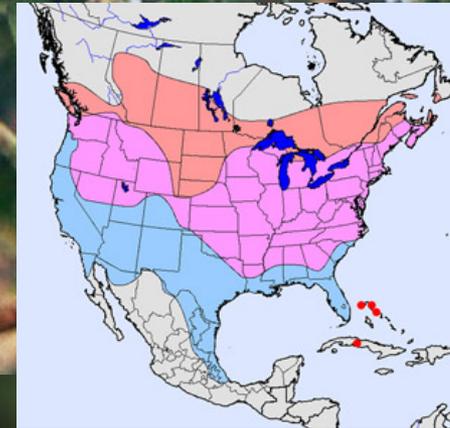
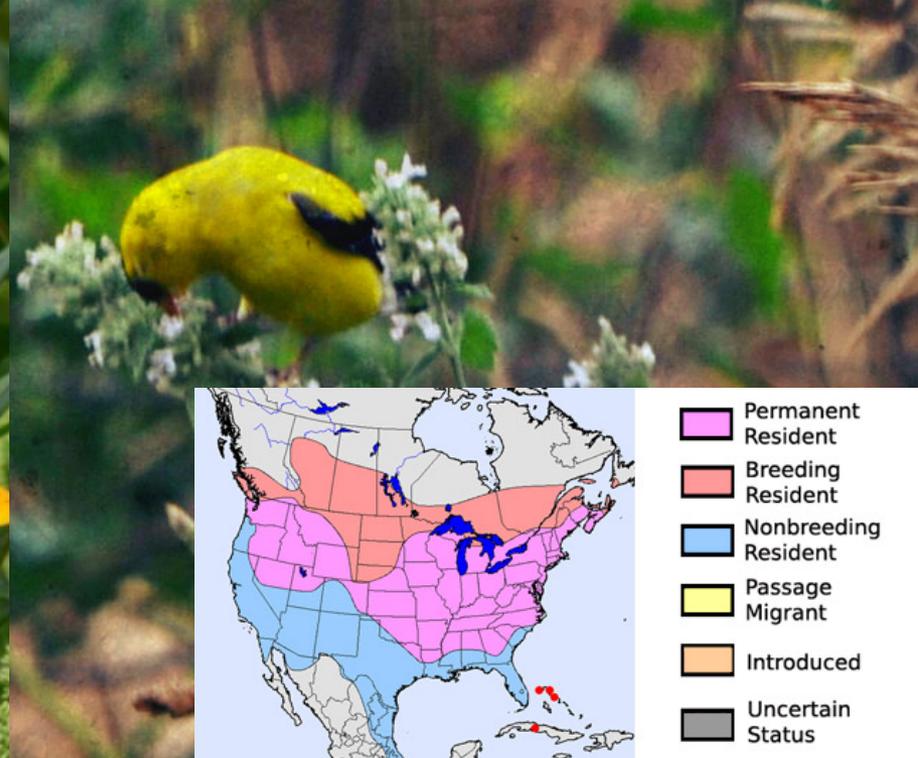
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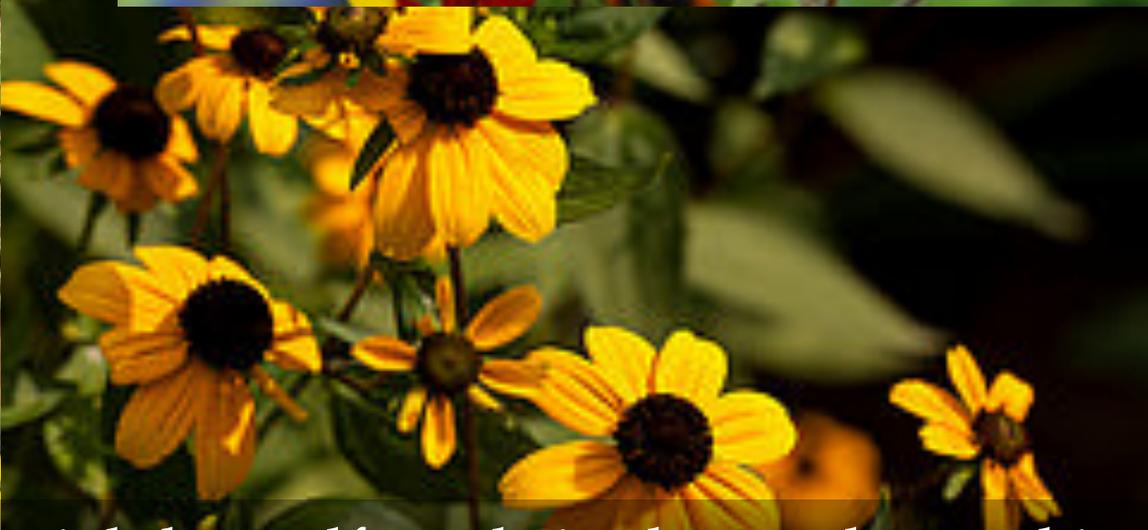
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- Permanent Resident
- Breeding Resident
- Nonbreeding Resident
- Passage Migrant
- Introduced
- Uncertain Status
- Vagrant



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
Symphotrichum novae-angliae

COMMON BONESET
Eupatorium perfoliatum



WHITE TURTLEHEAD
Chelone glabra

PRAIRIE BLAZINGSTAR
Liatis 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.

COMMON NATIVE BEES in the upper midwest



Mining Bees
Andrena spp.



Sm. Carpenter Bees
Ceratina spp.



Mason Bees
Osmia spp.



Yellow Faced Bees
Hylaeus spp.



Green Sweat Bees
Agapostemon spp.



Small Sweat Bees
Lasioglossum spp.



Sweat Bees
Halictus spp.



Leafcutter Bees
Megachile spp.



Bumble Bees
Bombus spp.



Long-horned Bees
Melissodes spp.



Long-horned Bees
Melissodes spp.



Digger Bees
Anthophora spp.



Cuckoo Bees
Nomada spp.



Cuckoo Bees
Triepeolus spp.



Cuckoo Bees
Coelioxys spp.



Cuckoo Bees
Sphecodes spp.

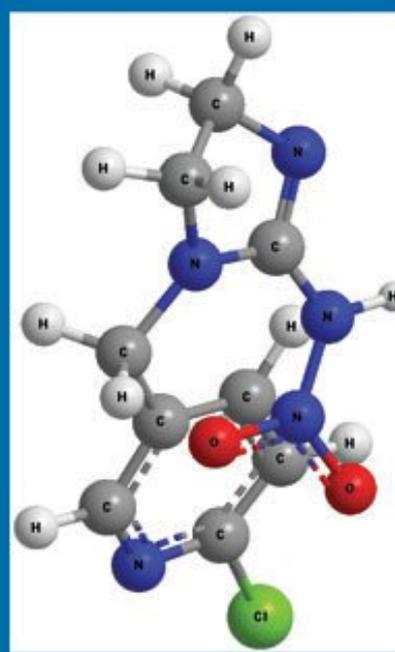
**Advantages of planting seed
over buying nursery grown
plants is that you can avoid
using plants treated with the
insecticide**

Imidacloprid

**We purchased our seed from
Applewood Seed Co. to avoid
introducing Imidacloprid from
nursery grown stock**

IMIDACLOPRID

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.



All of these “pesticides” are deadly to bees...



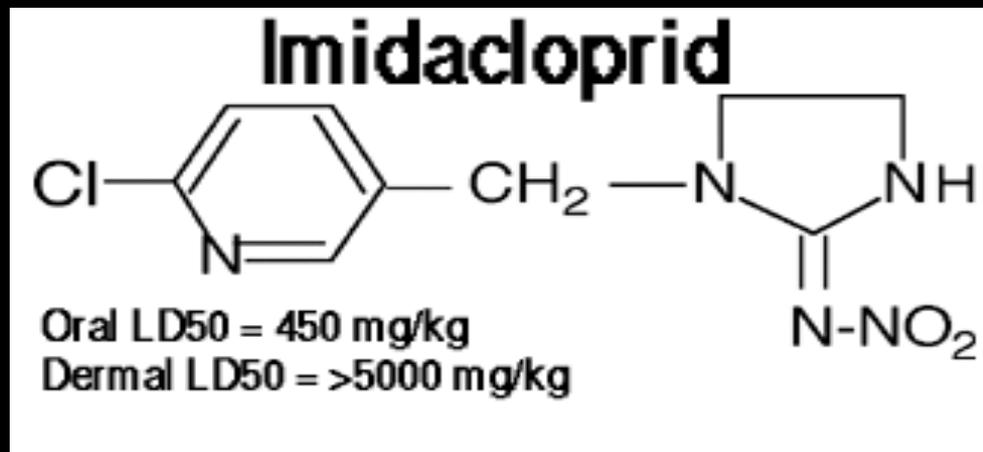
IMIDACLOPRID -

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.

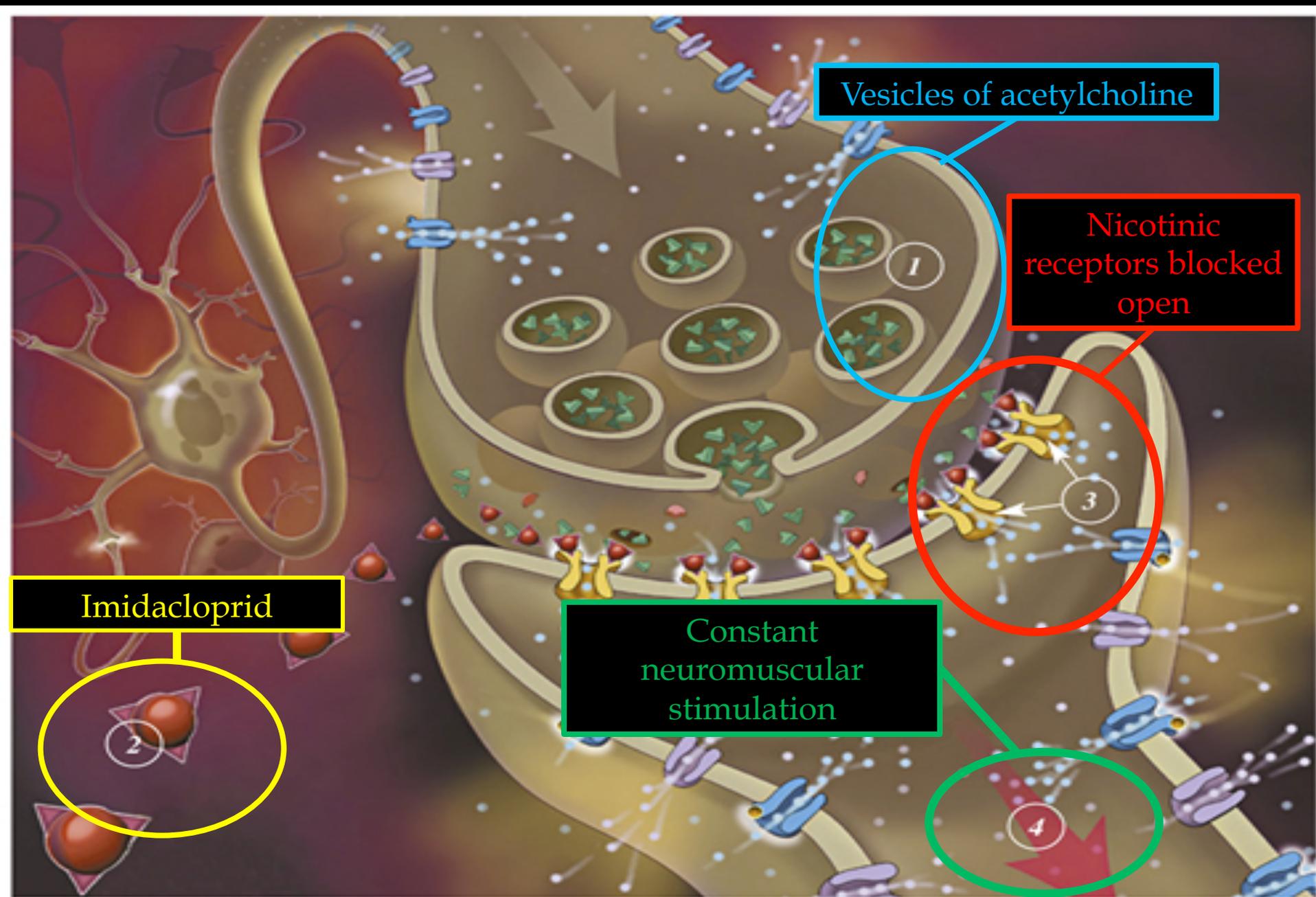


The binding affinity of imidacloprid at the nicotinic receptors in mammals is much less than that of insect nicotinic receptors. This is why the flea medicine doesn't kill your cat or dog, but kills the fleas... Imidacloprid is part of the neonicotinoids class of insecticides and **acts upon the nervous 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



1 Vesicles of acetylcholine
2 Imidacloprid

3 Nicotinic receptors blocked open
4 Constant neuromuscular stimulation

PLANTS TO ATTRACT NATIVE WILDLIFE BY SEED

APPLEWOOD SEED CO

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



Wildflower, Garden Flower
& NATIVE GRASS SEED

**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.**

2014

COMMERCIAL & RESIDENTIAL
GOLF COURSES
ROADSIDE VEGETATION
EROSION CONTROL
POLLINATOR COORDINATION



Silene armeria - Catchfly





Clarkia amoena – Dwarf Godetia

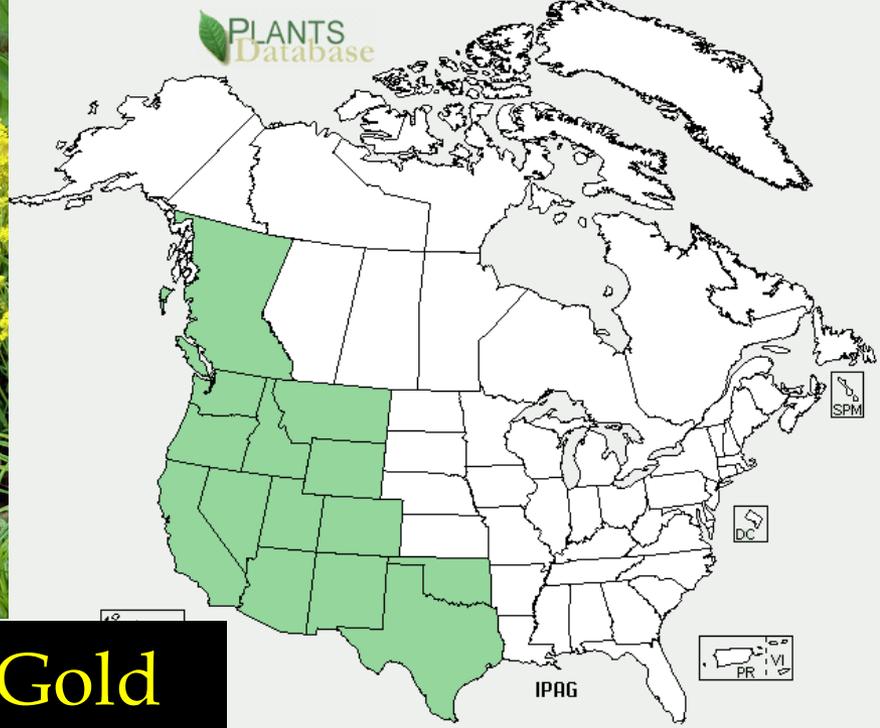


Leaf cutter bee.



Adonis aestivalis – Pheasant





Alyssum saxatile – Basket of Gold





Monarda citriodora – Lemon Mint





Penstemon eatonii
Eaton's Penstemon





Cheiranthus allionii –
Siberian Wallflower



Cedar Waxwing - *Bombycilla cedrorum*

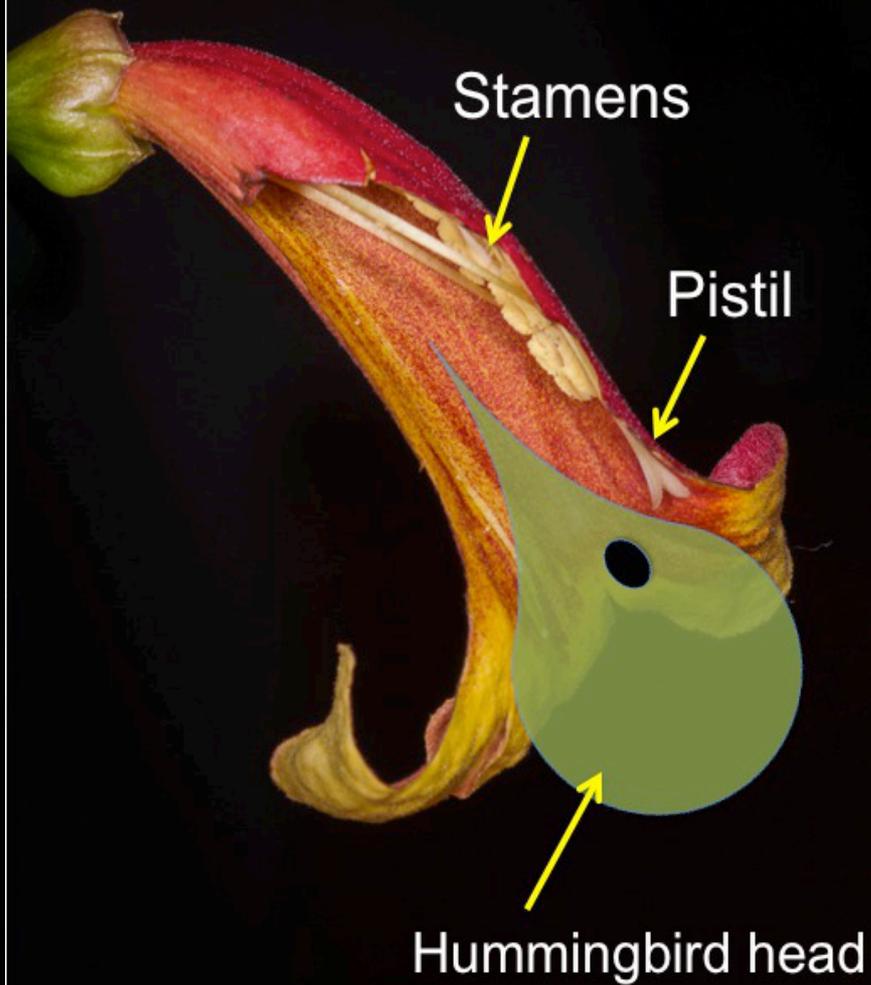




Birds that visit Willamette University grounds



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*



Best plants for hummingbirds

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