Designing a Landscape for Pollinators

WOODLAND PARK ZOO

Agenda

- What is pollination
- Who are pollinators
- Why is pollination important
- Garden elements needed for pollinators
- Resources
- Discussion and questions

What is Pollination?

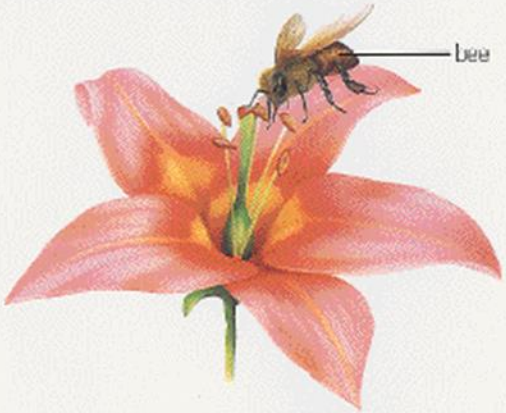
POLLINATING AGENTS

WIND

Ripe flowers scatter pollen which is then carried by the wind to other flowers.

INSECTS

Ripe pollen from a flower's stamens sticks to an insect's body. The insect then flies to another flower and deposits the pollen on the receptive stigma.



TYPES OF POLLINATION

SELF
From anther of a flower to stigma of the same flower.

SELF
From anther of one flower to stigma of another flower on the same plant.

CROSS
From anther of one flower to stigma of another flower on a different plant of the same type.

ARTIFICIAL
Pollen taken from one flower and placed by hand on the receptive stigma of another flower.

Importance of Pollinators

- More than 75% of flowering plants depend on animal pollinators
- In U.S., over 100 crop plants depend on animal pollinators (value >$15 Billion)
- Most natural ecosystems would collapse without animal pollinators
- Some plants are endangered because of diminished pollination
- Chocolate depends on pollinators!!

What is a Pollinator?

A pollinator is an animal that causes plants to make fruit or seeds. They do this by moving pollen from one part of the flower of a plant to another part. This pollen then fertilizes the plant. Only fertilized plants can make fruit and/or seeds, and without them, the plants cannot reproduce.

What Makes a Good Pollinator?

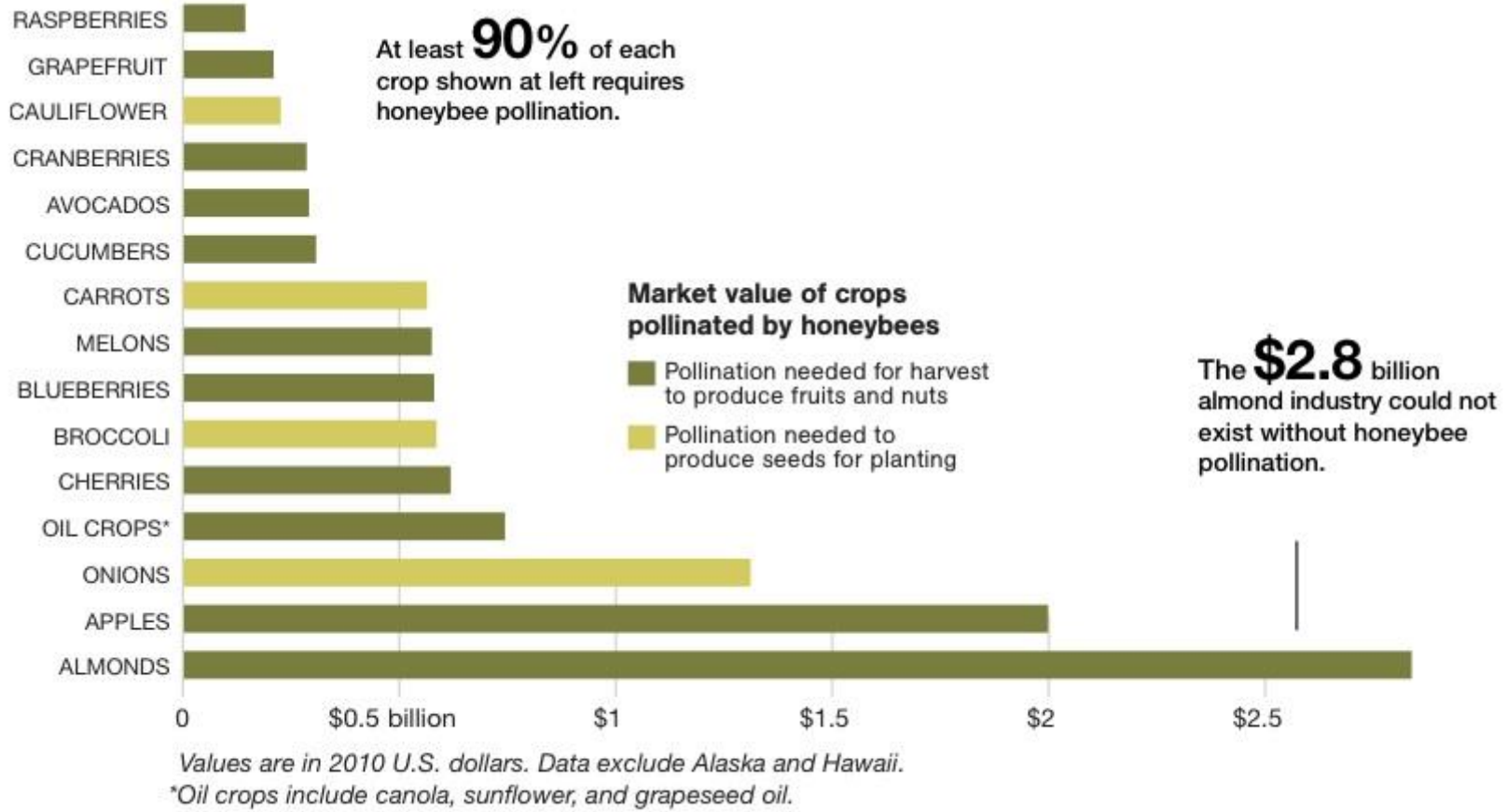
- Highly mobile
- Pollen can attach to it (hairs, scales, feathers)
- Adapted to feeding on flowers/nectar/pollen
- May have specialized feeding structures
- Visits a limited number of plant species

Pollinators in Decline

- Habitat loss, fragmentation
- Invasive species
- Pesticides
- Diseases
- Parasites
- Lack of Understanding and awareness

Colony Collapse Disorder

If we die,
we're taking
you with us.



Values are in 2010 U.S. dollars. Data exclude Alaska and Hawaii.
**Oil crops include canola, sunflower, and grapeseed oil.*

Types of Bees

Western Bumble Bee

Social Insects

Solitary Bees

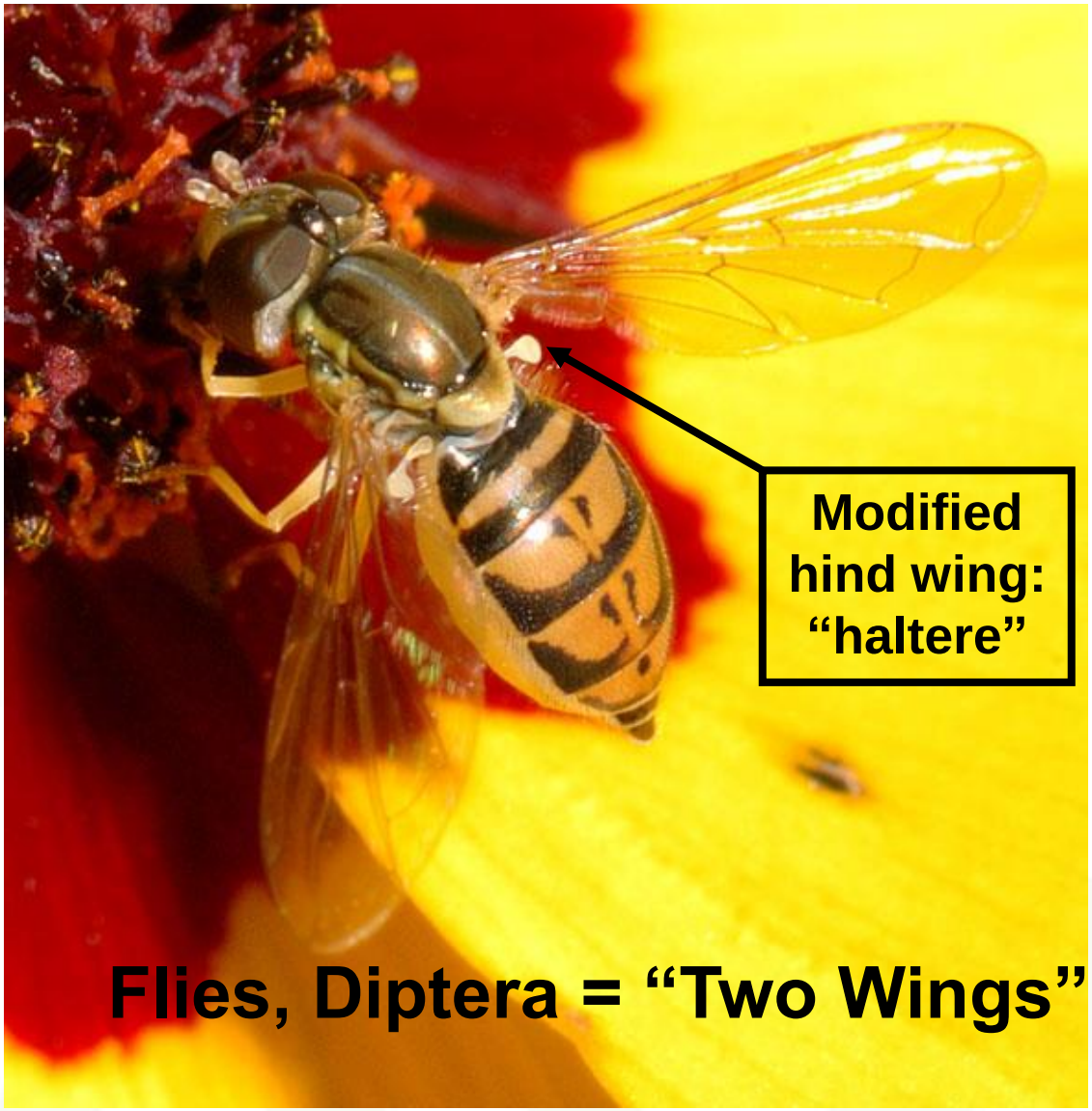
Mason Bees

Leaf Cutter Bee

Sweat Bees

Flies

Flies



Flies, Diptera = "Two Wings"

What do pollinators need?

- Food
  - Nectar
  - Pollen
  - Larval food source
- Water
- Shelter
  - Ground nesting
  - Cavity nesting
  - Overwintering Sites

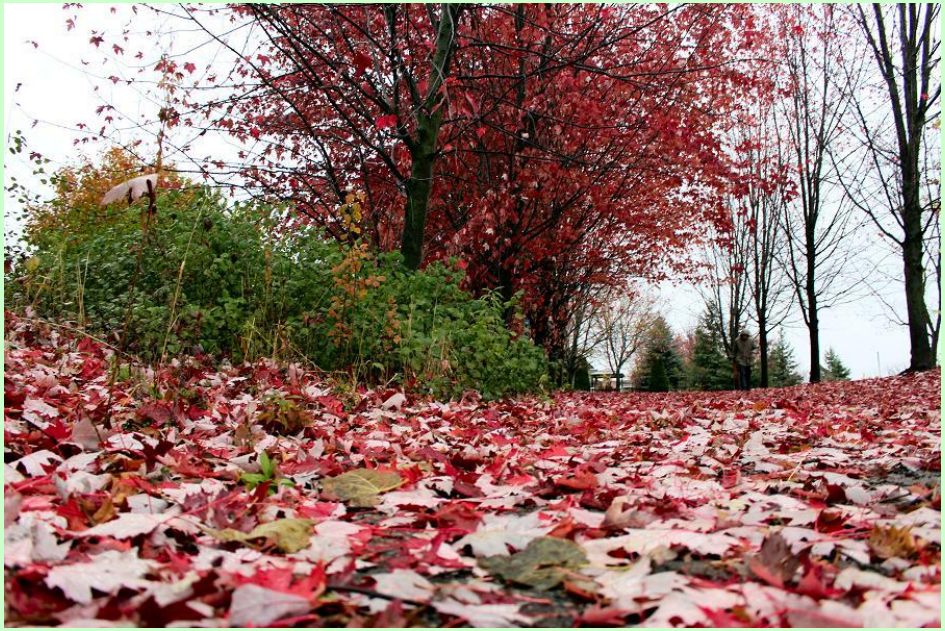
Basic Question to Clients

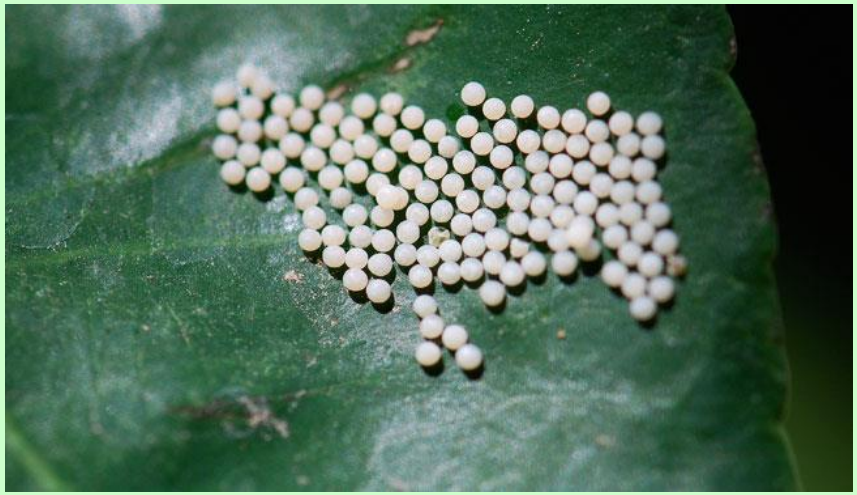
- Do you want pollinators visiting your garden or living and reproducing in your garden?

Water

Basking

Overwintering





Plant Picks

Native vs. Non-Native

Philadelphus lewisii

Mock Orange

Single vs. Double Flowers

Twinberry *Lonicera involucrata*

Sea Thrift
Armeria maritima

Pacific Madrone,
Arbutus menziesii

Red osier dogwood
Cornus stolonifera

Lilac

Ceanothus, California Lilac

Clethra alnifolia Summersweet

Aster

Purple Cone Flower
Echinacea purpurea

Black-eyed Susan
Rudbeckia hirta

Gold Yarrow
Achillea filipendulina

Lavender
Lavendula

A word on Butterfly bush
Buddleia davidii

Orange Butterfly bush
Buddleia globosa

Designing for Pollinators: General guidelines

- Native plants
- Microclimates
- Extended blooming season
- Diversity of flower size and shape
- Single flowers
- Right color
- Be lazy

Maintaining the Garden

For healthy pollinator habitat, be sure to:

- Leave some areas in the garden “wild”
- Avoid pesticides
  - Health of pollinators at all stages of life
  - Health of children
  - Health of pets
  - Health of other wildlife
- Watch out for eggs, larva, pupa, and roosting, hibernating adults or birds nesting when pruning plants

Microsoft Pollinator Patio

http://www.zoo.org/pollinators

Providing for butterflies at all stages of life

Plant a diversity of fragrant, brightly colored flowers with large compact heads for adult butterflies to feed on

Provide basking areas—such as open, sunny areas and large, flat rocks—for butterflies to warm their blood and flight muscles

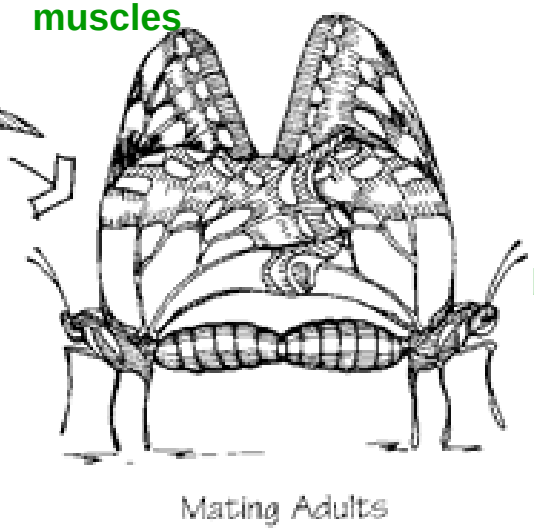
Include bushes, tall grasses, or piles of leaves or sticks for pupae to attach to (and for adults to roost during the night and during cold, wet weather)

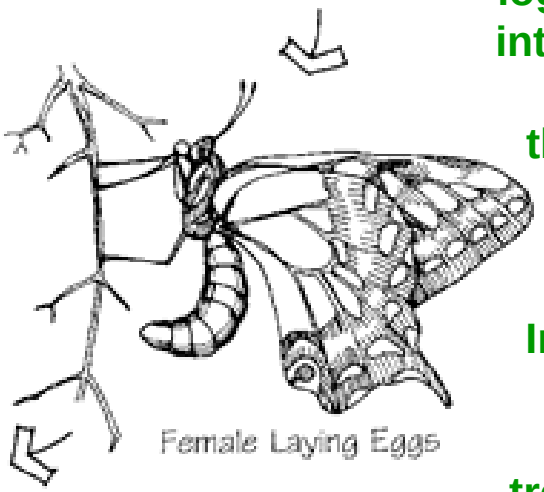
Maintain a constant mud puddle for male butterflies to get nutrients

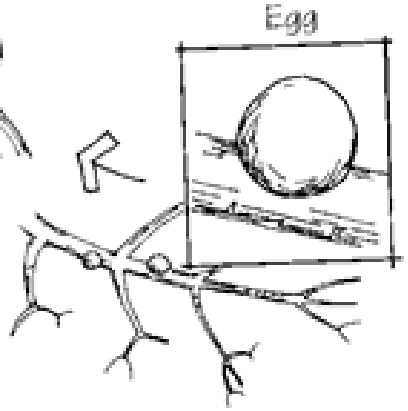
Incorporate a log or brush pile into your garden for butterflies that overwinter as adults

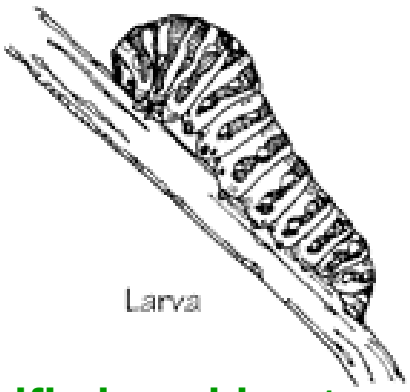
In windy areas, provide a windbreak of trees, shrubs or vines on a trellis

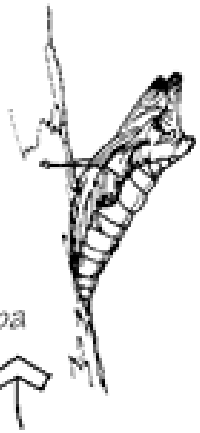
Plant specific larval host plants for the butterflies in your area











Basic Needs

- Food
  - Nectar plants
  - Larval host plants
- Water
- Shelter
  - Protection from wind
  - Basking
  - Overwintering

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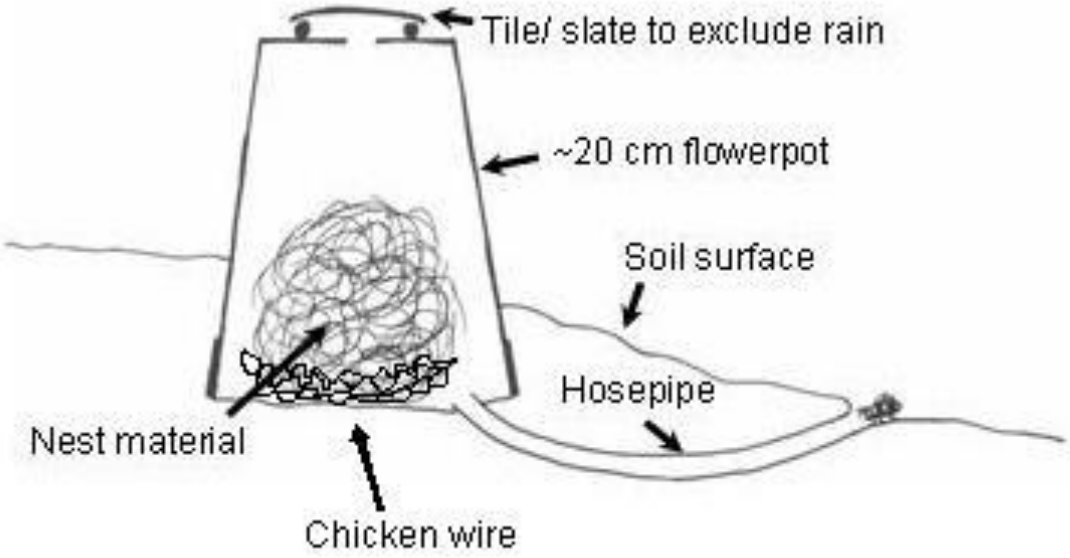
  - ENJOY THE VIEW

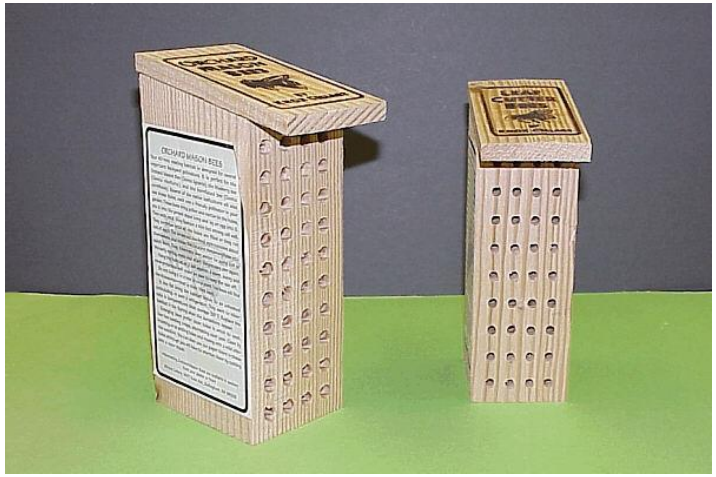
Bumble Bee Homes

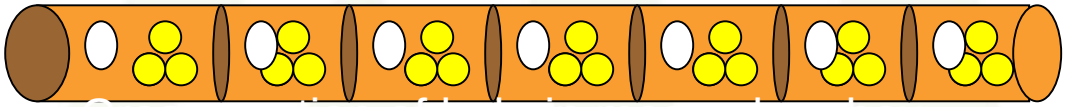
Teapot Home

Bumble Bee Homes



Mason bee nests





Cros[illegible]ion of [illegible] In mas[illegible] box –
fema[illegible] eposi[illegible]len, la[illegible]g, built

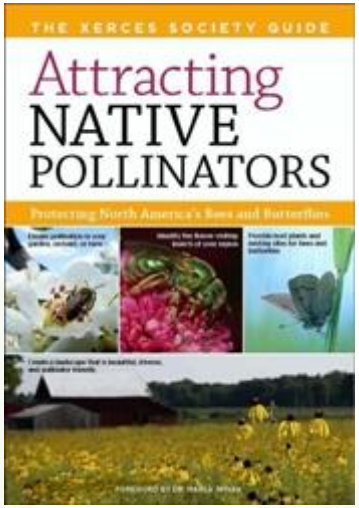
Cross-section of mason bee box

What You Can Do

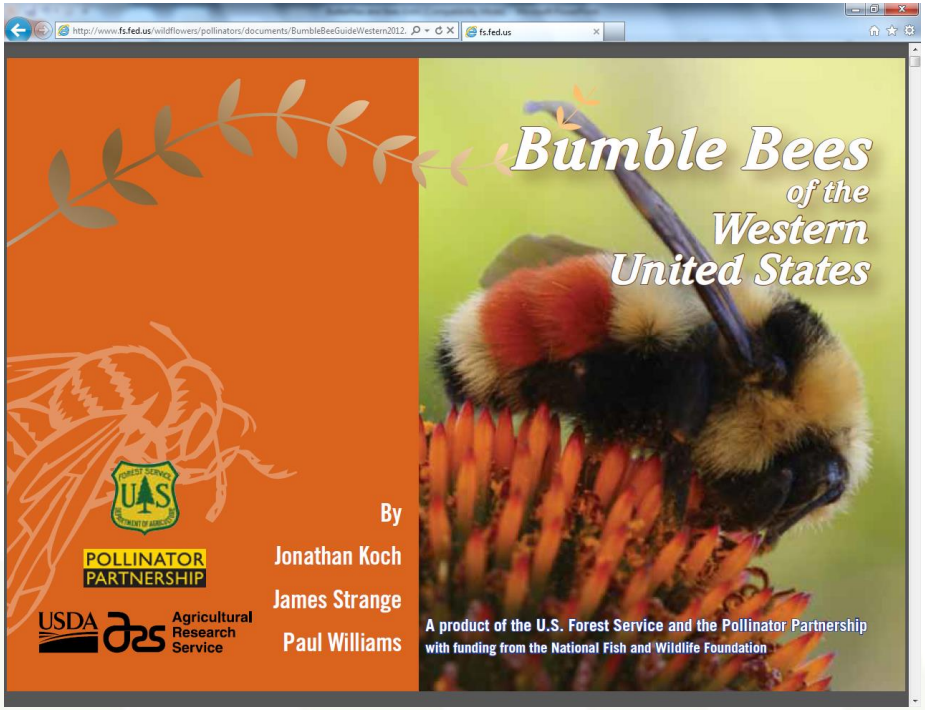
- Know what is in your backyard (iNaturalist)
- Limit pesticide use
- Provide Food &Water
  - Plant a garden
  - Add a water feature
- Provide a place to live
  - Put up bee nesting boxes
  - Provide bare ground for ground nesting bees
- Provide for all life stages
- Ask questions about the plants

A homemade bee nesting block


THE XERCES SOCIETY
FOR INVERTEBRATE CONSERVATION


THE XERCES SOCIETY GUIDE
Attracting
NATIVE
POLLINATORS
Protecting North America's Bees and Butterflies


Conserving Bumble Bees
Guidelines for Creating and Managing Habitat for America's Declining Pollinators
THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION


Bumble Bees
of the
Western
United States
POLLINATOR
PARTNERSHIP
USDA
Agricultural
Research
Service
By
Jonathan Koch
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