Pollinator Conservation and Habitat

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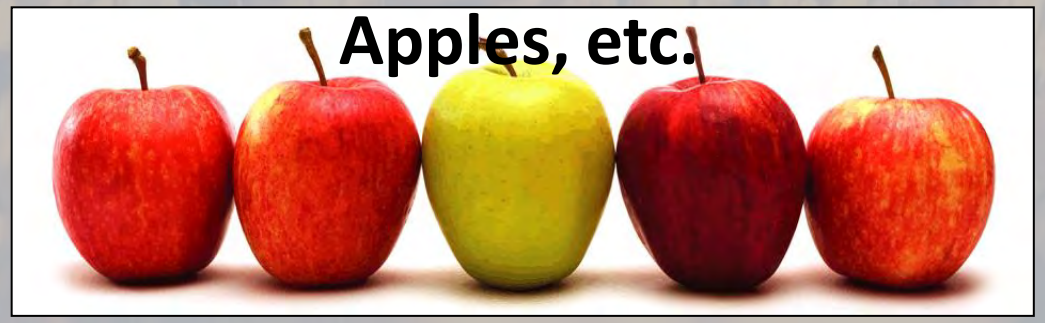
Why care about pollinators?

Pollination services to U.S. Agriculture is valued at

> $20 billion/year



Food for Wildlife!

Pollinators support native plant communities that provide food for wildlife (birds, mammals, etc.)

Pollination is Beneficial to the Insect and the Plant!

The Insect gets food

The plant increases probability of successful reproduction

Flowers have changed their anatomy to make it easy for pollen to be picked up and moved!!

Flowers like to cater to their Pollinators

Since bees can see certain colors better than others (including UV), bee-pollinated flowers often have UV markings

Flowers that like to cater to beetles and flies are shallower, allowing these insects to get to the nectar/pollen more easily

Some are generalists

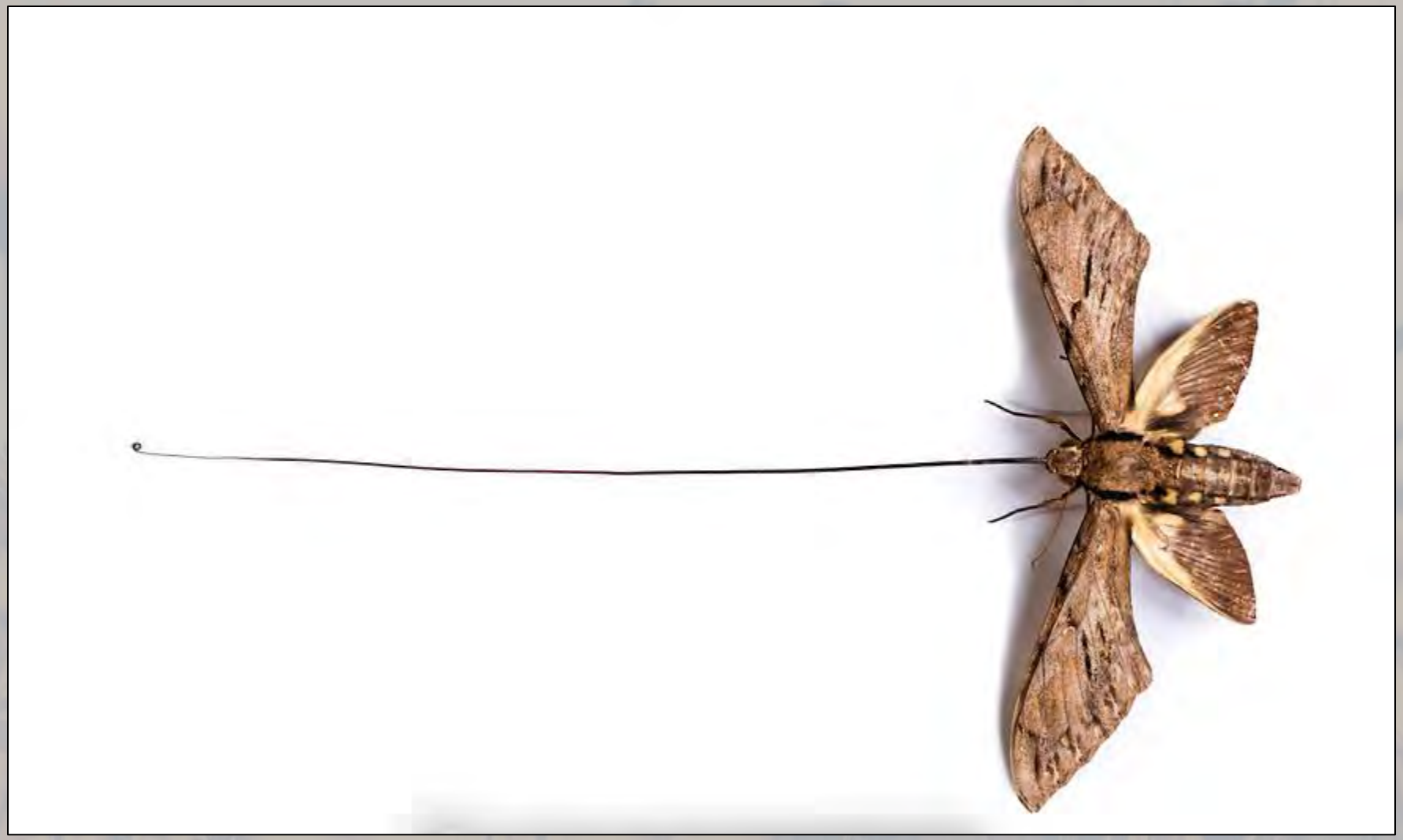
Some are extremely specialized!

Very specific relationship between two organisms

Plants sometimes ‘trick’ these insects into visiting them!

The Mystery of Darwin's Star Orchid

Darwin's Hawk Moth!

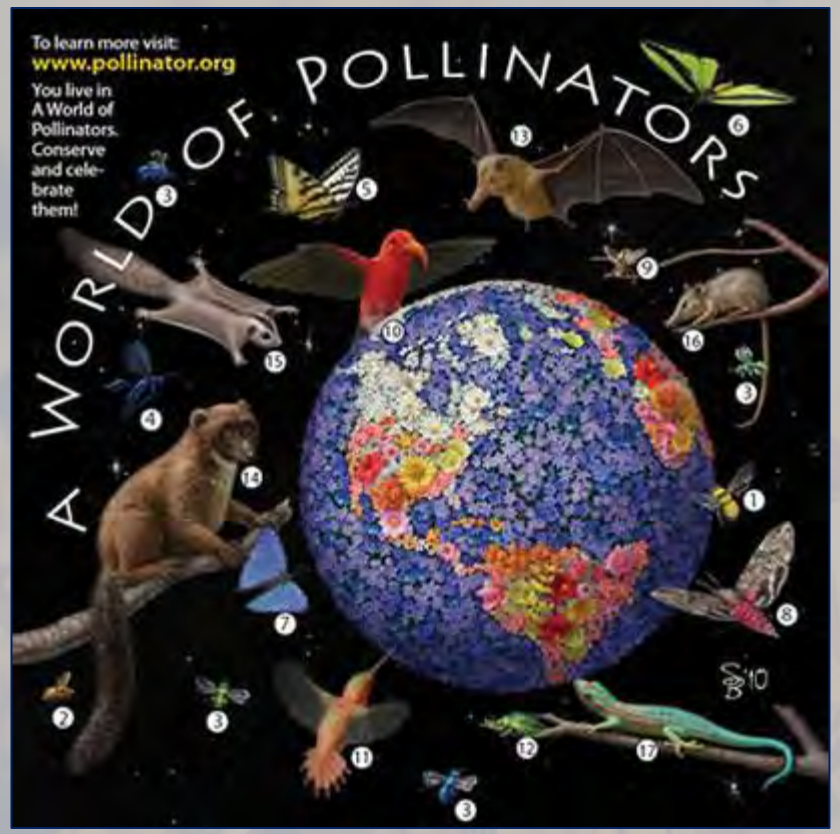


A Beautiful Partnership!

These Plant & Pollinator relationships are abundant, around the world!

We are only beginning to scratch the surface!

80% of Plant Species Depend on Animals for Pollination



Bees are the **MOST IMPORTANT** Pollinators!

Bees are Pollen Specialists!

Honey bees are of European Origin

Brought to North America by early colonists in the early 1600s

Honey bees (Apidae)

Besides honey bees…

North America is home to more than 4000 species of wild bees!

Besides honey bees…

MONTANA is home to ~ 450-1000 SPECIES!

Including the MOST BUMBLEBEES in any state (28-32 species)

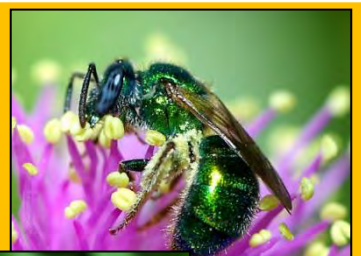
Types of Wild Bees

Bumble bees (Apidae)



Mason bees, leafcutter bees (Megachilidae)


Sweat Bees (Halictidae)



Mining bees (Andrenidae)


Why are ALL bees declining?

Habitat loss!

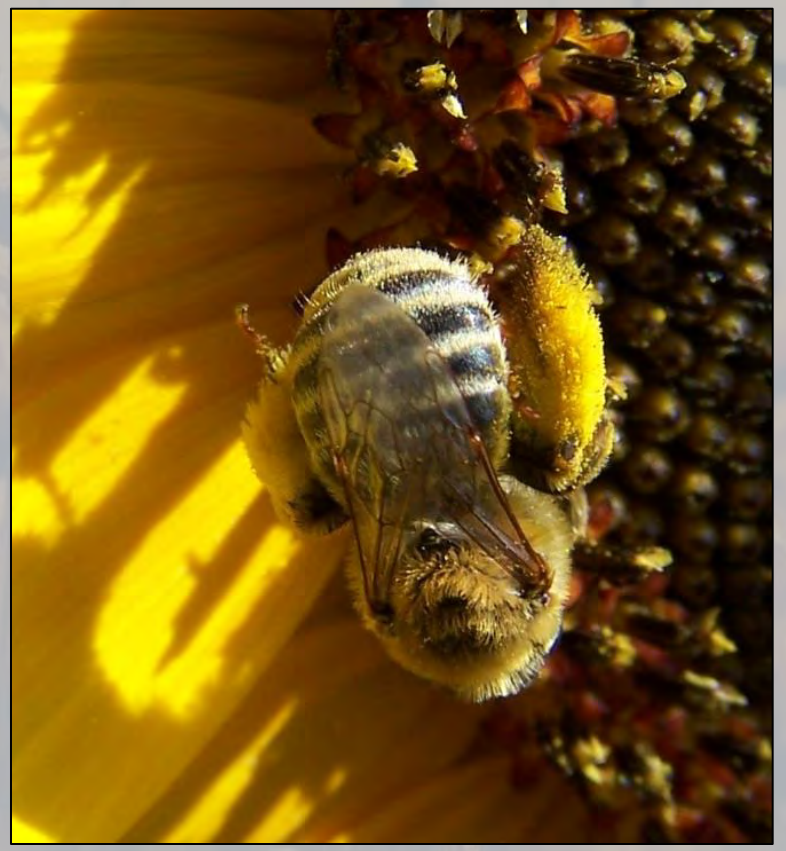
Why are ALL bees declining?

Management practices


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

What do bees need?

- Low chemical input
- Food
- Nesting Habitat



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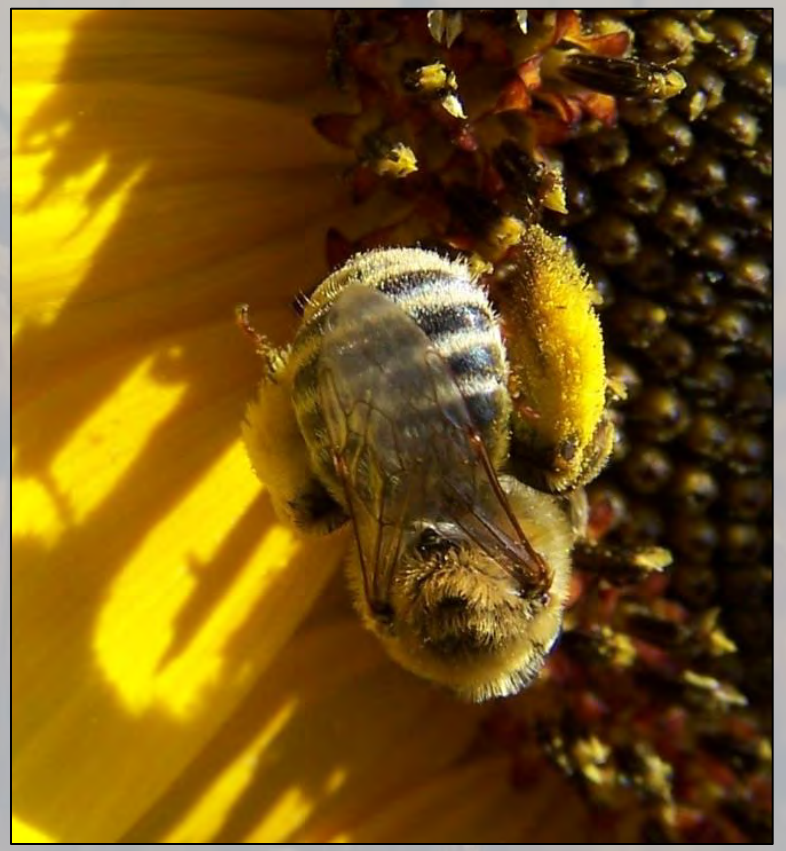
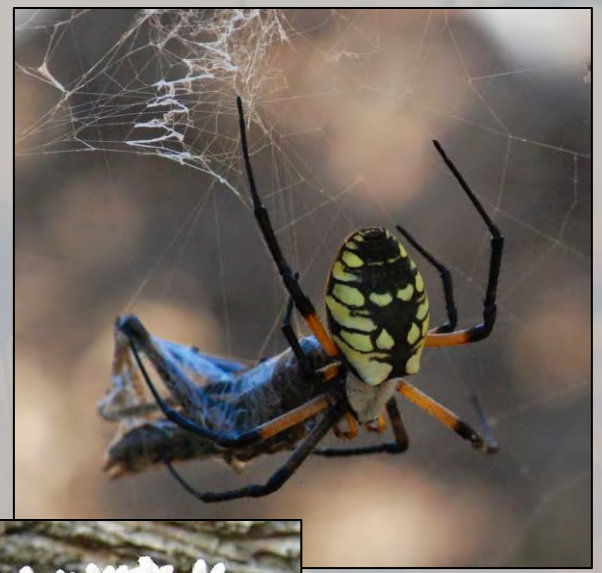


70% of Pesticide use is for Aesthetic Reasons

99% of “bugs” in your garden are BENEFICIAL.



Safeguard bees when using insecticides

- **Follow label precautions**
- DON’T overspray plants in bloom
- Mow or prune off oversprayed blooms
- Choose products that are relatively non-hazardous to bees

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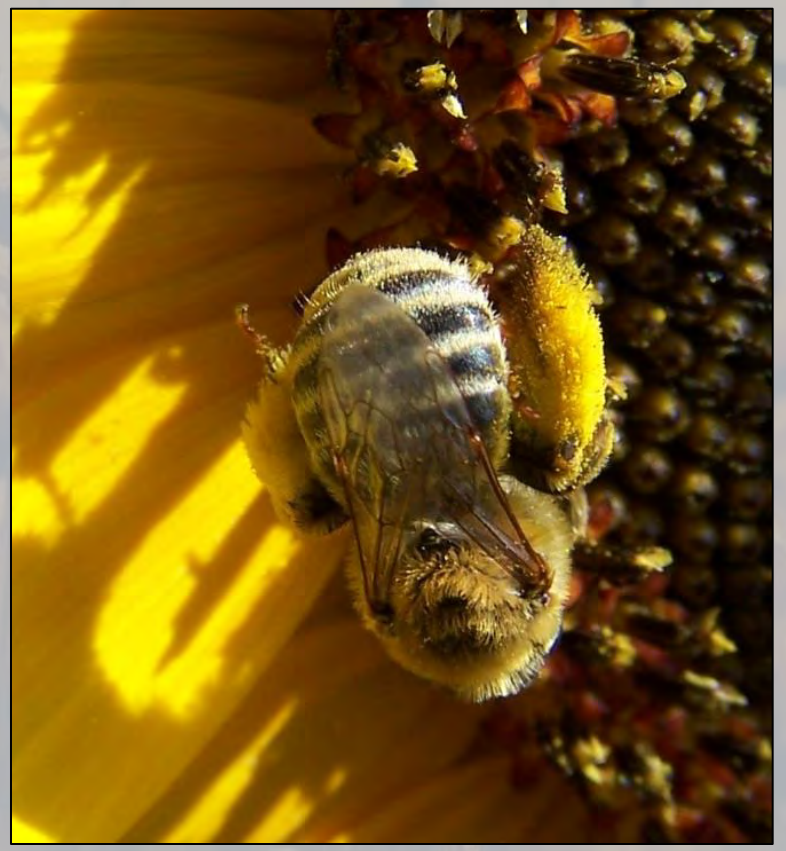
What Can You Do to Help Pollinators?

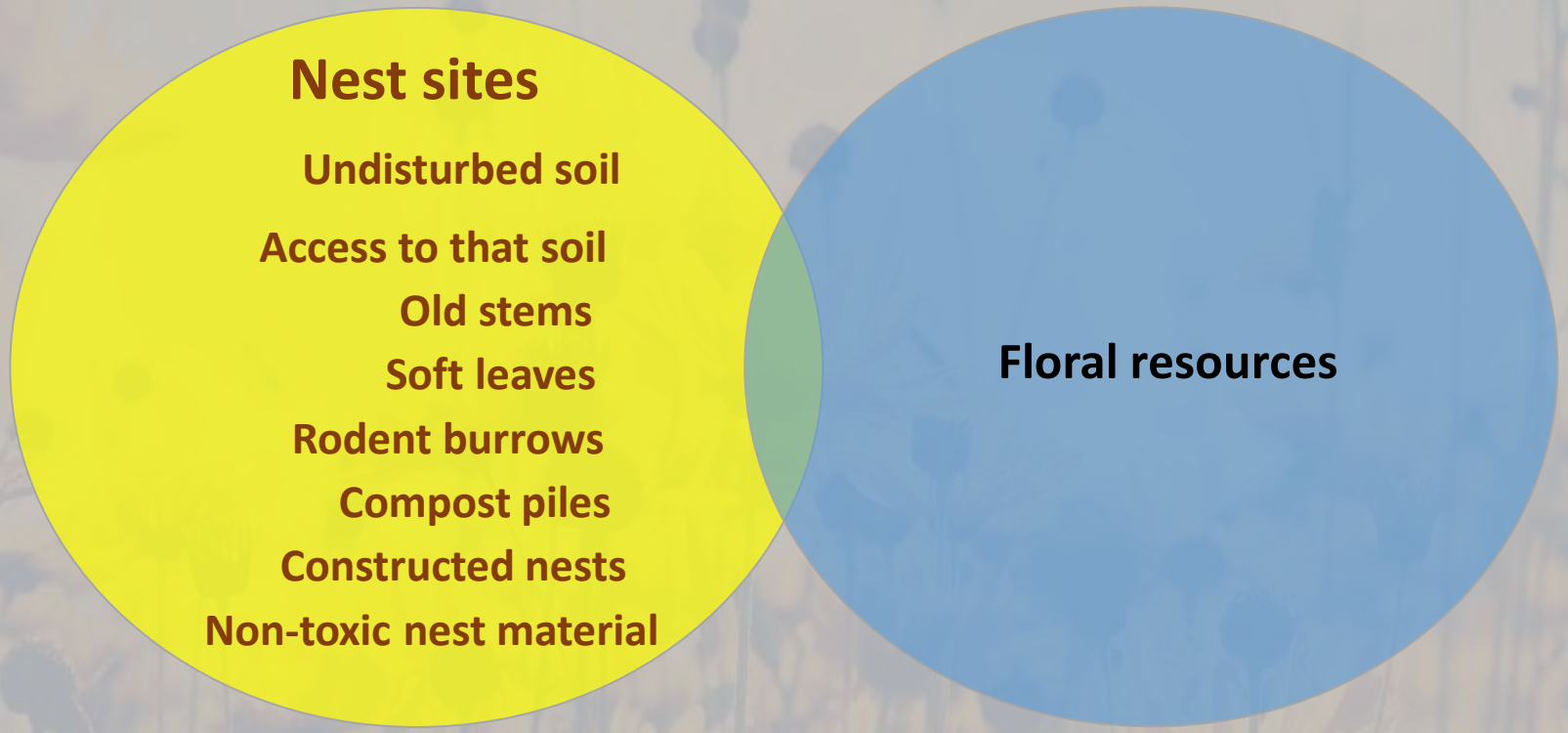
Know WHEN to spray, and if it will be worth the risk to bees. Can the situation be managed in other ways?

What do bees need?

- Low chemical input
- **Food**
- **Nesting Habitat**



What do wild bees need?



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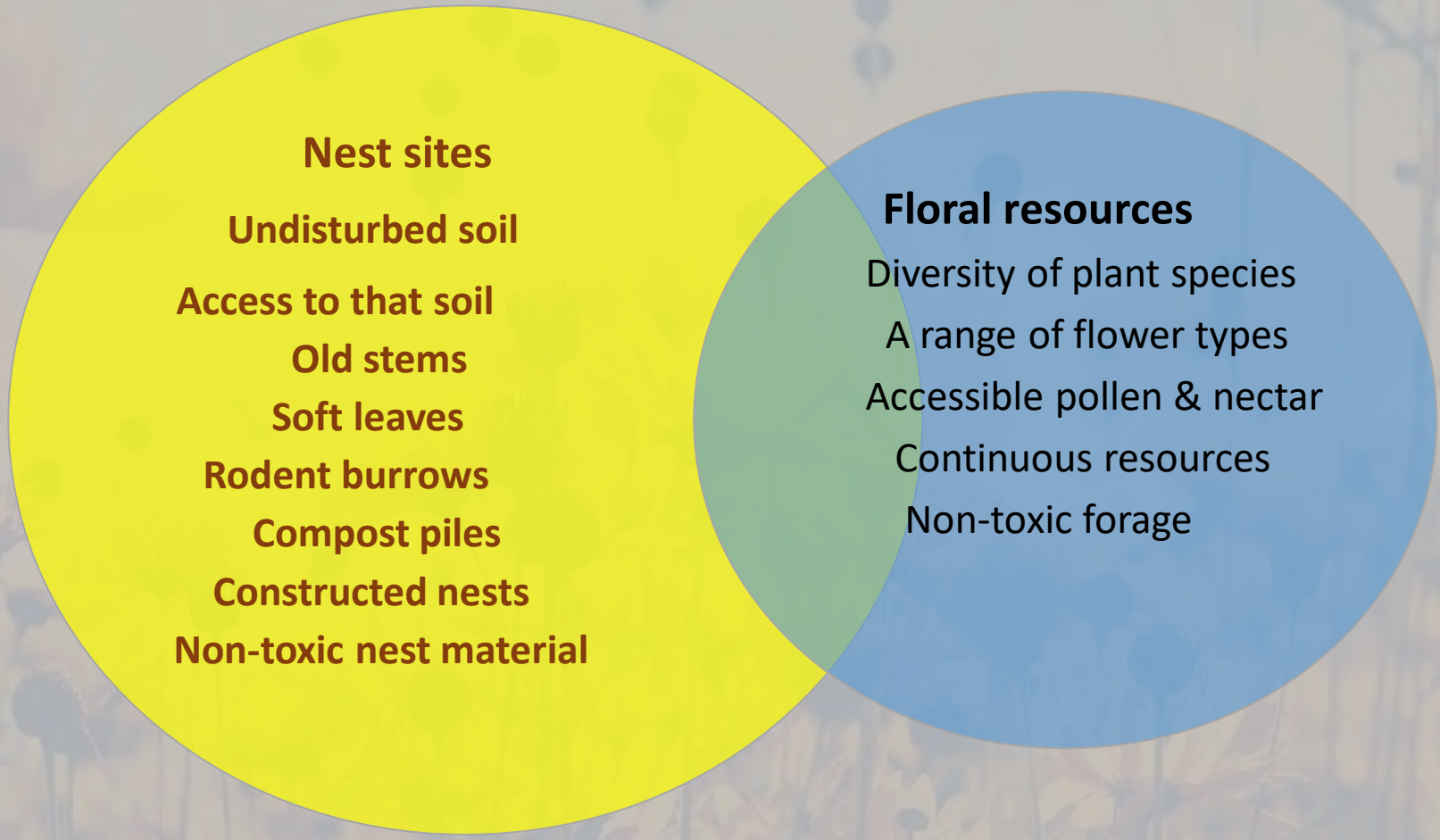

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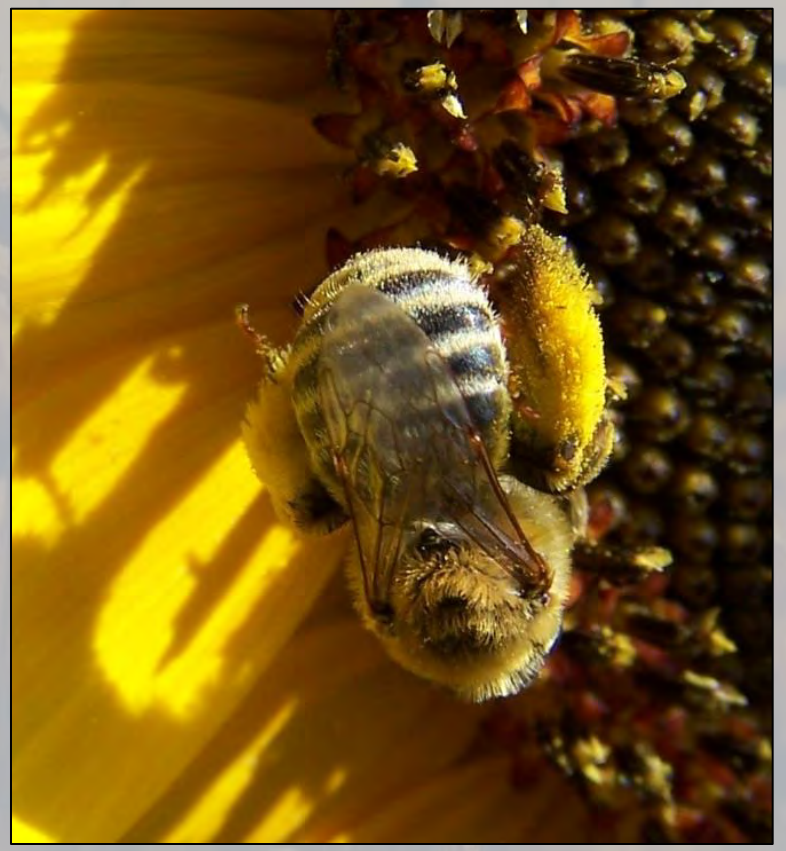


Food for bees:

<u>Food Proximity</u>:

Availability of optimal food resources in close proximity to ideal nesting habitat.

Food for bees:

Food Diversity:

Diversity of plant species with succession of bloom from early spring through fall

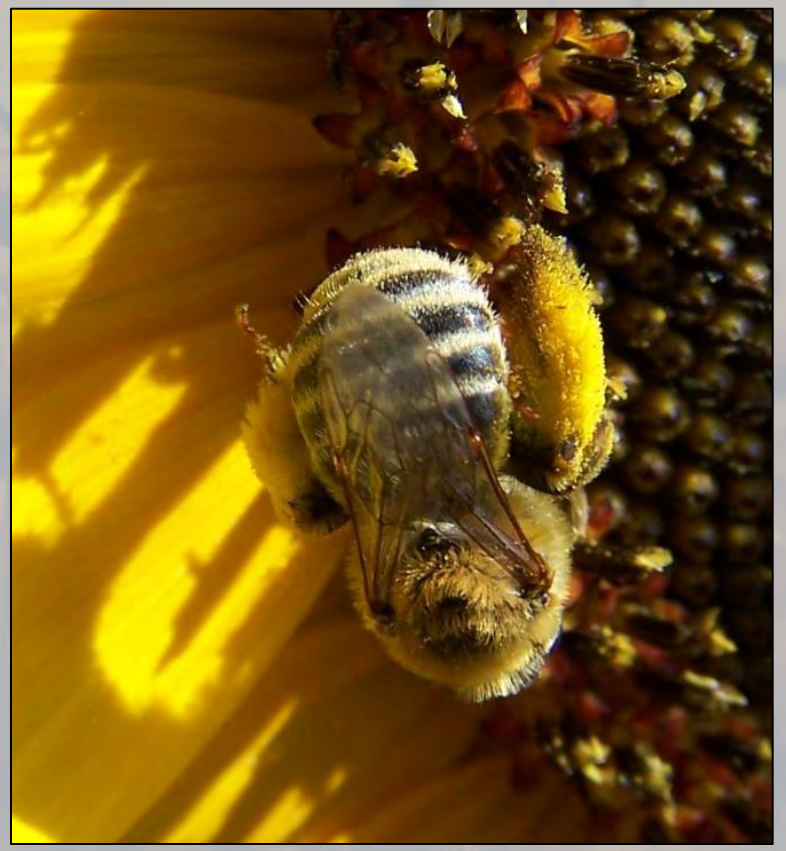
Food for bees:

<u>Food Succession</u>:

Mixture of flowering plants, planning for something in bloom throughout the growing season.

What do bees need?

- Low chemical input
- Food
- **Nesting Habitat**



Bee Nesting Habitats

70 % of Bee Species: Ground Nesting

30 % of Bee Species: Cavity Nesting

If you were a pollinator…

If you were a pollinator…

Bee Nesting Habitats

70 % of Bee Species: Ground Nesting

30 % of Bee Species: Cavity Nesting

Ground Nesting Bees

Dig out their own Nests

Utilize Existing Holes

URBAN AND SUBURBAN LANDSCAPES:

Leave Bare Soil for Bees!

“Ideal” home lawn in the USA

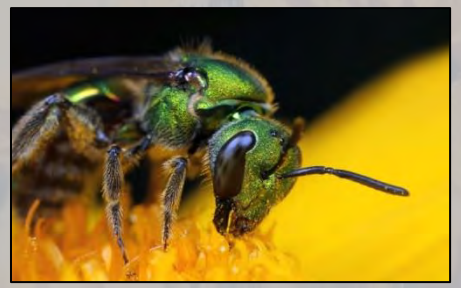
Dense, green, monoculture

Lawns in the USA ...

Lawns in the USA…

37 species of bees, including several rare and declining native bumble bees, foraging on lawn weeds

- Larson & Potter, Journal of Insect Conservation (2014)





Lawn weeds help to sustain urban bee populations

These patches act as stepping stones between remnants of natural habitat

What Can You Do to Help Bees?

What level of lawn “excellence” are able to accept/maintain/overlook?

What Can You Do to Help Pollinators?

Pollinator-Friendly Lawn-Alternatives

Micro-Clover

Rock Lawn

RURAL, RANGELAND & WILD LANDSCAPES:

RURAL, RANGELAND & WILD LANDSCAPES:

Best Practices:

→ **Minimal interface with**:
Herbicides, Fungicides, Miticides, Insecticides, and other Pesticides

→**Do not mow/graze more than 1/3 of habitat at one time**

→**Keep 'buffer areas' un-mowed/un-grazed (These act as pollinator refuges, and will be a source of pollinators after mowing/grazing in the landscape)**

RURAL, RANGELAND & WILD LANDSCAPES:

Reduce large scale contiguous operations:

Create pollinator strips in between sections of agricultural land.

Bee Nesting Habitats

70 % of Bee Species: Ground Nesting

30 % of Bee Species: Cavity Nesting

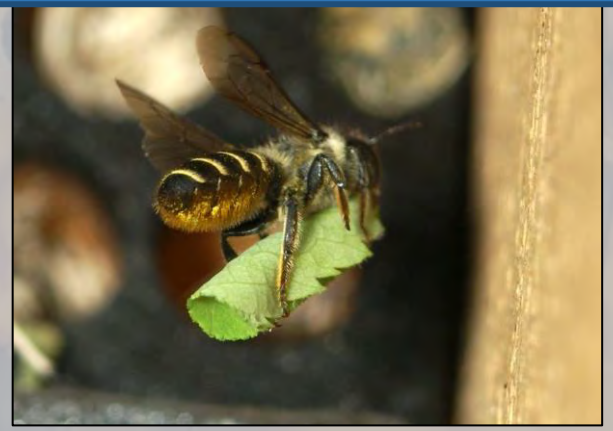
What Can You Do to Help Bees?

Blue orchard bee

Provide nesting structures

Mason Bees , Leafcutter Bees , Resin Bees , Chimney Bees , and Masked Bees .

“Mason Bees”



Solitary Pollinators – Cavity Nesters

Essentially referred to as Mason Bees / Cavity Bees

Leaves

Resin or "Cellophane"

Mud

Plant hairs

beediverse.com

https://resonatingbodies.files.wordpress.com/2011/11/hylaeus-m-h-pupa-sm.jpg

Mason Bees: Solitary Cavity Nesting Bees

- Solitary
- Nest close together
- Not aggressive
- Easy to house
- Minimal maintenance
- Easily purchased
- A great Honey Bee alternative!

Mason Bees: Solitary Cavity Nesting Bees

Nesting Materials:

→Hollow tubes
- Cardboard
- Bamboo

→Drilled wooden blocks
- Untreated wood
- 4 to 8 inches deep
- Varying diameters

→Bundles of pith
- twigs/brambles/branches

Mason Bees: Cavity Nesting Bees

Drilling your very own Bee Hotel!

Mason Bees: Cavity Nesting Bees

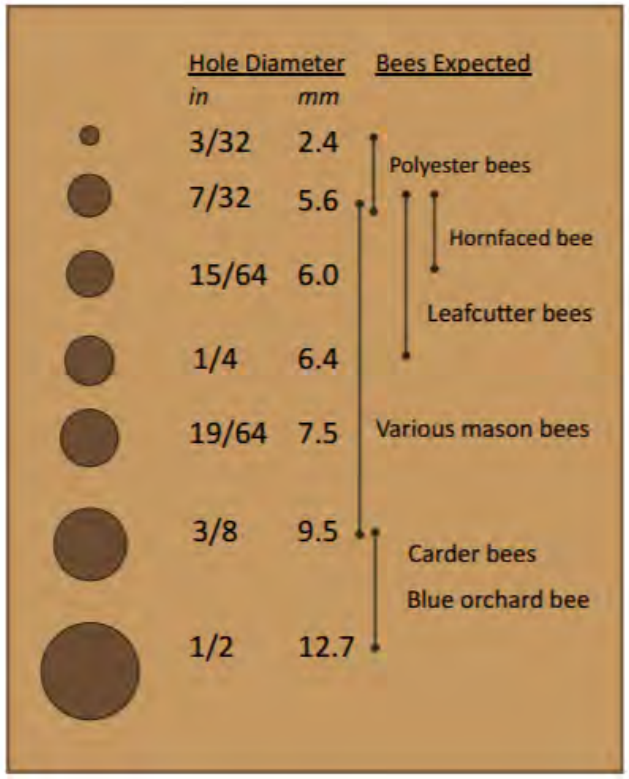


Figure 8. Hole diameter affects the type of bee that will be attracted to the nesting block. Illustration: University of Nebraska–Lincoln

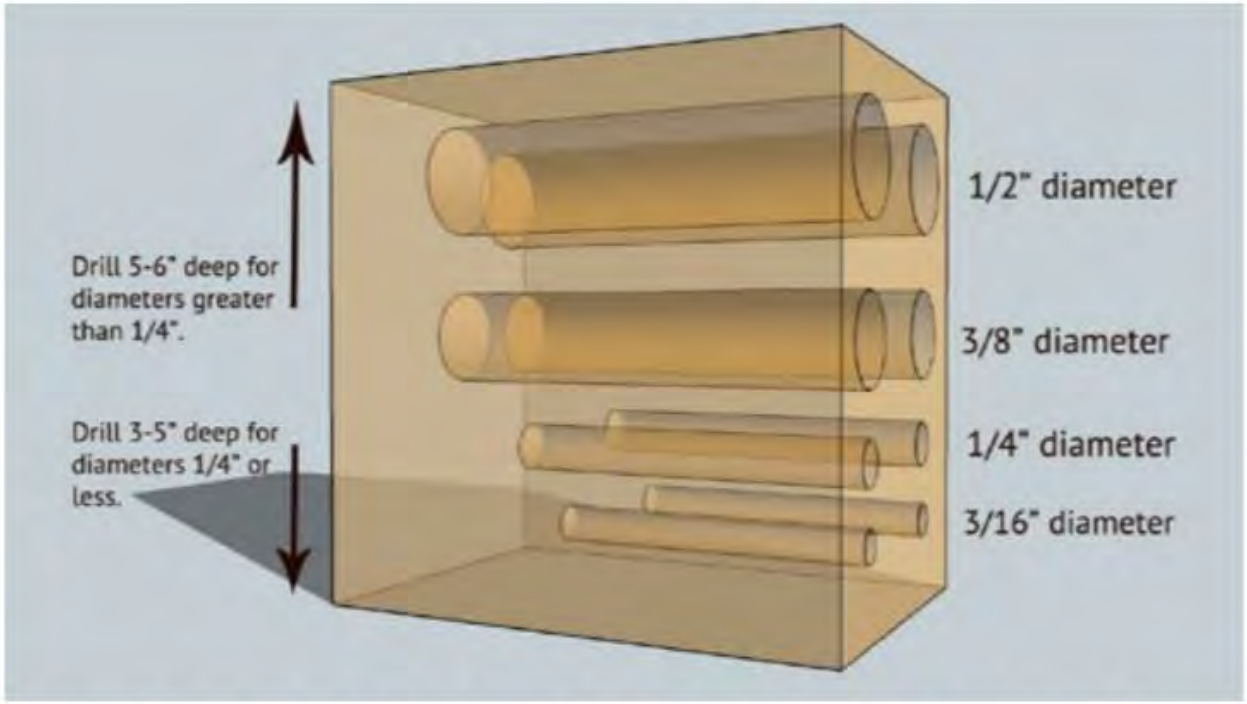
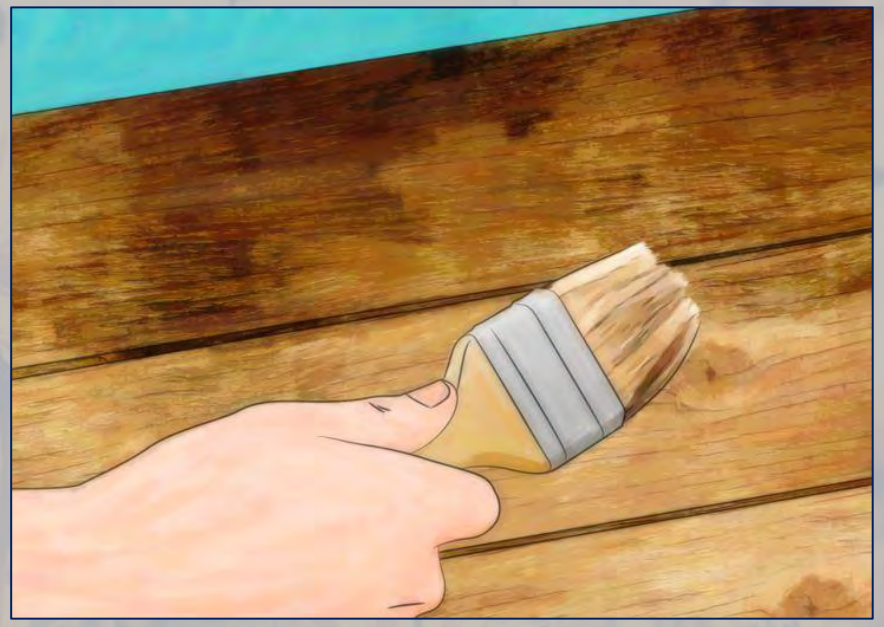


Figure 9. Depth depends on the diameter of the hole, with larger diameters requiring deeper drilling. Illustration: University of Nebraska–Lincoln

Mason Bees: Cavity Nesting Bees

What NOT to do:



- ✓ Pay attention to entrance diameter (width) and depth
- ✓ Drill evenly: remove debris & jagged edges
- ✓ Do not use varnished or painted wood (untreated is best)

Mason Bees: Cavity Nesting Bees

Purchasing Bee Hotel Materials!

Mason Bees: Cavity Nesting Bee

Purchasing supplies:

Countless styles, shapes, designs, materials, etc.!

Mason Bees: Cavity Nesting Bees

What NOT to buy:

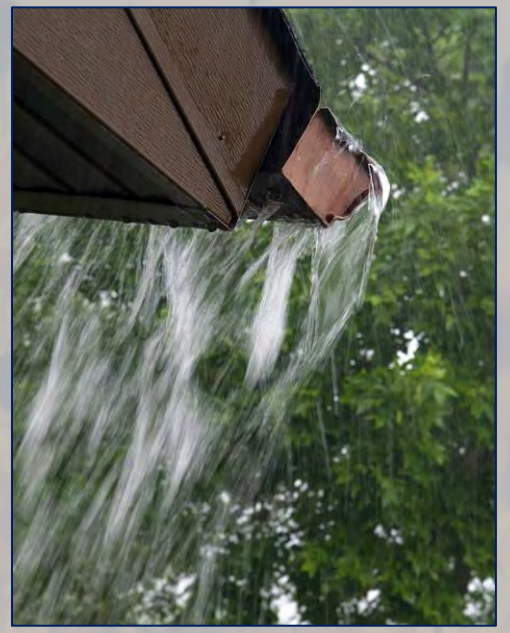
- ✓ Minimize use of plastic for nesting materials
- ✓ Pay attention to entrance diameter (width) and **depth**
- ✓ Pay attention to color and material (too hot, no ventilation, etc.)

LOCATION, LOCATION, LOCATION!

- **Between 3-5 feet above ground level**
- **Bright morning sun**
- **Sheltered (under an overhang or waterproofed covering)**
- **Secure spot (not easily knocked off or moved with the wind)**
  → Walls are best
- **South-Eastern direction**
- **Away from foot traffic and predators**

Mason Bees: Cavity Nesting Bees

Where NOT to put them:



- ✓ Avoid areas where predators can have easy access to a bee buffet
- ✓ Avoid areas with lots of water run-off, harsh winds, and too much heat
- ✓ Avoid high-traffic areas such as doorways, frequently used patios, etc.

Summary:
What can you do to help Pollinators?

What Can You Do to Help Pollinators?

Do NOT spray flowers in bloom, and avoid pesticide drift to adjacent plants

Read and follow label directions

What Can You Do to Help Pollinators?

Provide Floral Resources:

Diversity of plant species with succession of bloom from early spring through fall

What Can You Do to Help Pollinators?

Provide Nesting Habitat:

- Bare Soil
- Nesting Structures

What Can You Do to Help Pollinators?

Create a Pollinator Patch!

Devote a small space in your yard as 'designated bee habitat'!

What Can You Do to Help Pollinators?

‘MULLET’ GARDENS

“Business in the front, Party in the Back!”

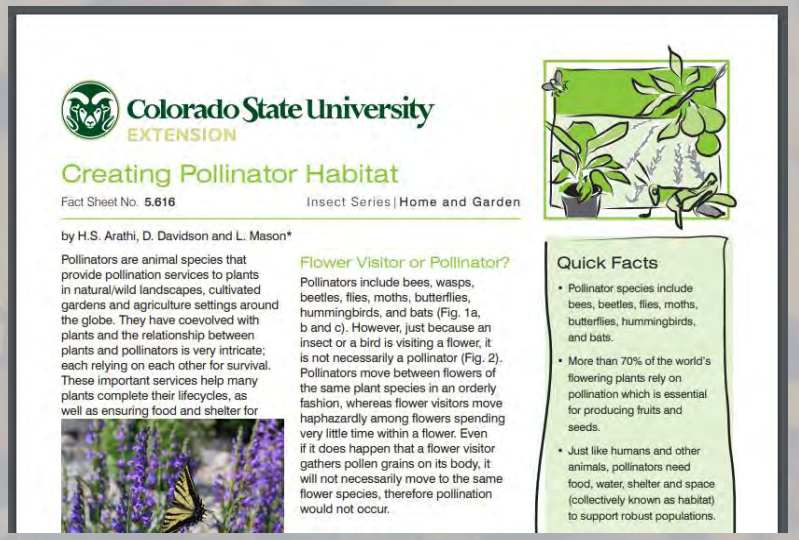
What Can You Do to Help Pollinators?

Keep Learning:

Xerces.org

montana.edu/pollinators

pollinators.msu.edu



http://extension.colostate.edu

What Can You Do to Help Pollinators?

Educate Others!


QUESTIONS?
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