

Pollinator Steward Certification



A PROGRAM OF
POLLINATOR PARTNERSHIP

Module 6: Identification and Monitoring

Tuesday, April 9th, 2024

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Pollinator Partnership

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Pollinator Partnership

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PARTNERSHIP**

Protect their lives. Preserve ours.

Land Acknowledgment

The land where I live and work is in Sò mba k'è, Denendeh (Yellowknife, Northwest Territories, Canada) located in Chief Drygeese territory, traditional land of the Yellowknives Dene First Nation.



Housekeeping:

- Recordings will be shared and be available until December 31st, 2024
- Closed captioning is available – enable in your controls.
- Please put questions in the Q&A box; UPVOTE questions you like!
- Questions for panelists will be answered at the end of the session.
- Contact stewards@pollinator.org for registration issues, questions, etc.
- Engage in respect and kindness with each other in the chat.
- We suggest that you write down in point form or 1-2 sentences the key takeaways from each training while you are attending live.



Course Information Page:

The Course Information page will be your homebase for module recordings, updates, and program resources. Login to the Course Information page using the following username and password:

website: <https://www.pollinator.org/psc/course-info>

username: PollinatorSteward

password: psc2024

Please do not share the username and password as this page is only for registered participants of the 2024 Pollinator Steward Certification program.



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Tonight's Speakers!



Anthony Colangelo
Outreach and Education Specialist
Pollinator Partnership



Lora Morandin, PhD
Associate Director
Pollinator Partnership

A vibrant field of wildflowers, including yellow and white blossoms, under a bright sky. A semi-transparent white rectangular box is centered over the image, containing the text "How do we know if it works?".

How do we know if it works?

The beginning of an urban native plant garden patch in 2019 – filled with construction rubble, Japanese knotweed, goutweed, plant remains, and dry/compact soil (Parkdale, Toronto, Canada)



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Urban native plant patch (5 square metres) summer 2021 – 23 native plant species, reduced invasive species, all-season bloom, 19 different pollinator species identified! (Parkdale, Toronto, Canada)



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What can we monitor?



PLANT SUCCESS



PLANT
ESTABLISHMENT



CHANGE OVER
TIME



POLLINATOR
OCCURRENCE,
HABITAT USE

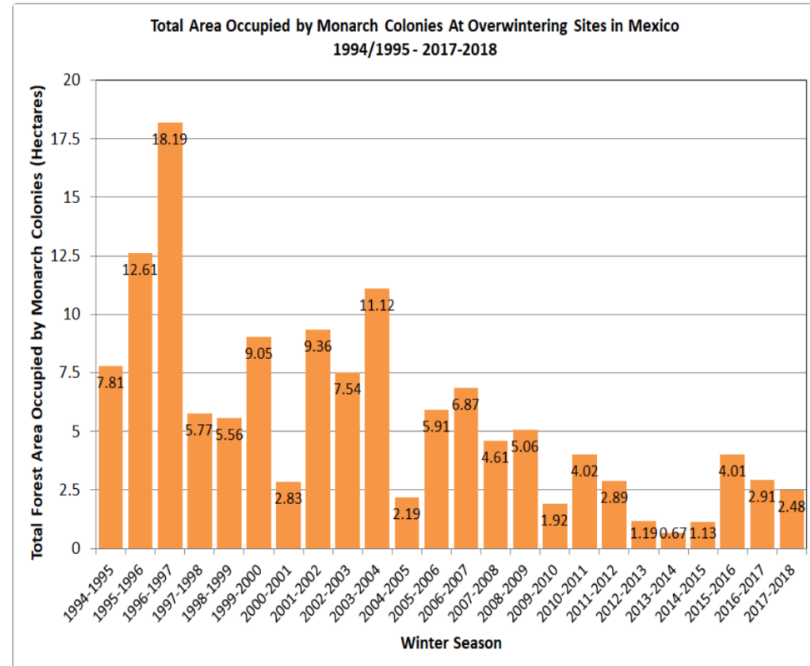


PUBLIC
IMPRESSIONS

Long Term Data: Monarch Butterfly Overwintering Counts

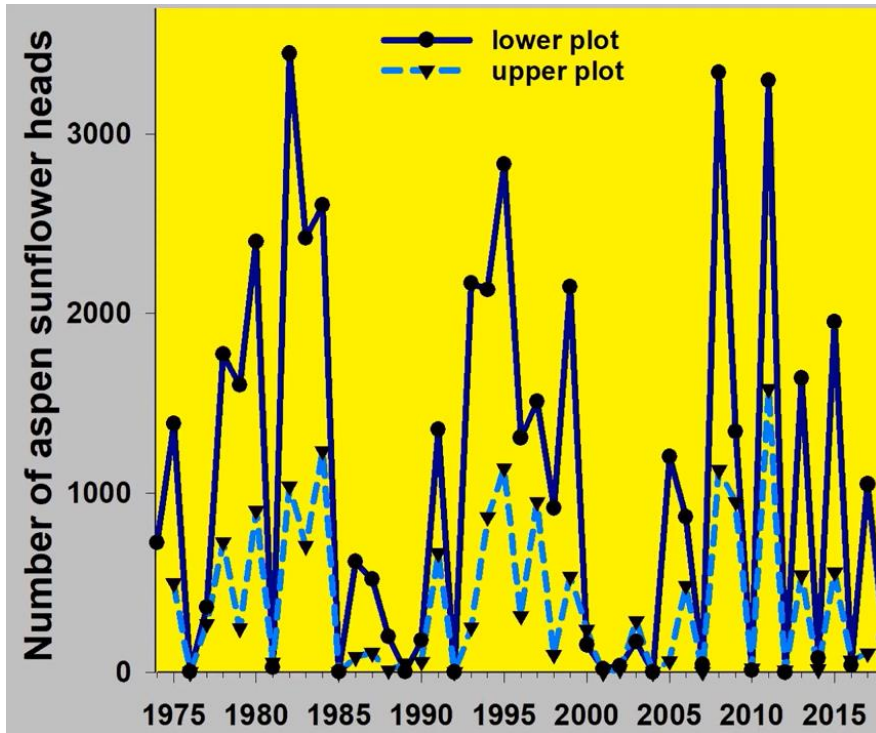


[This Photo](#) by Unknown Author is licensed under [CC BY](#)



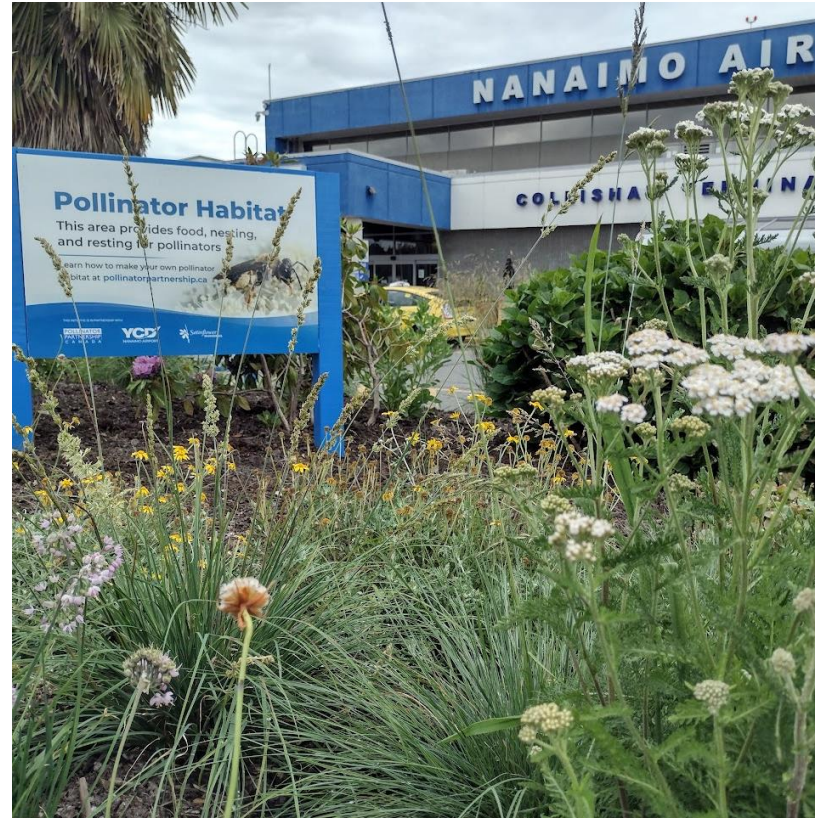
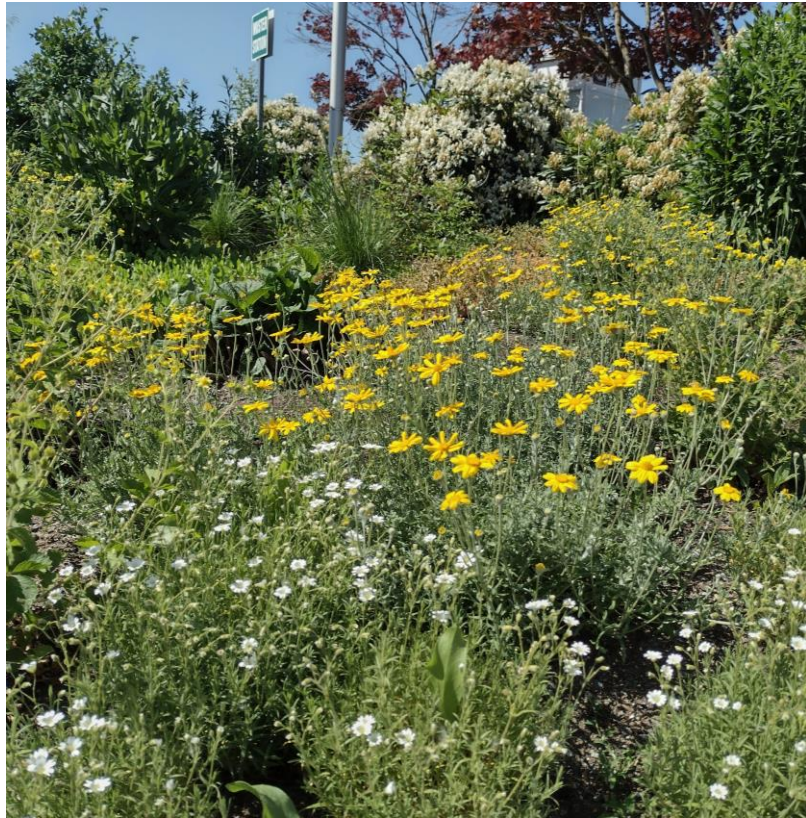
Data from 1994-2003 were collected by personnel of the Monarch Butterfly Biosphere Reserve (MBBR) of the National Commission of Protected Natural Areas (CONANP) in Mexico. Data from 2004-2018 were collected by the WWF-Telcel Alliance, in coordination with the Directorate of the MBBR. 2000-01 population number as reported by Garcia-Serrano et. al (The Monarch Butterfly : Biology and Conservation, 2004)

Long Term Data: Sunflowers and Frost

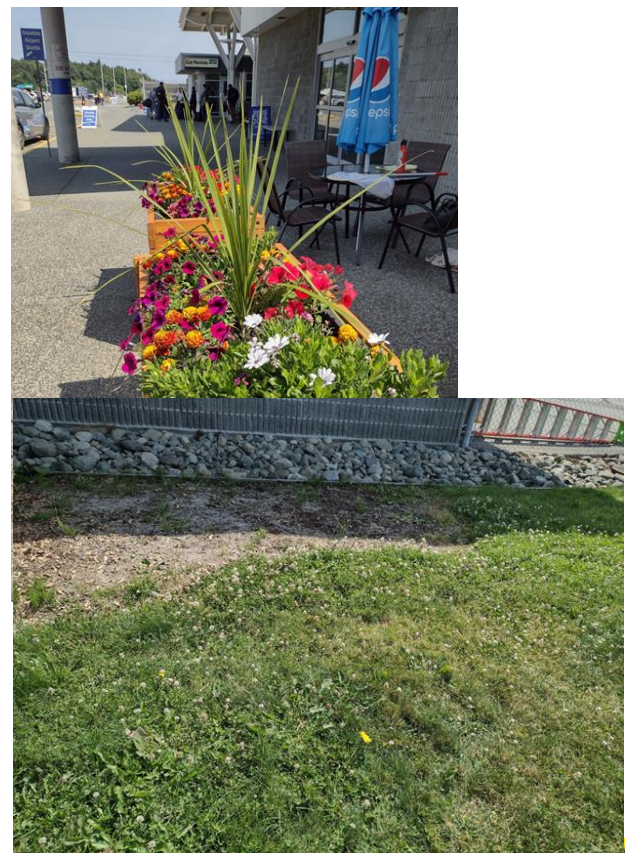
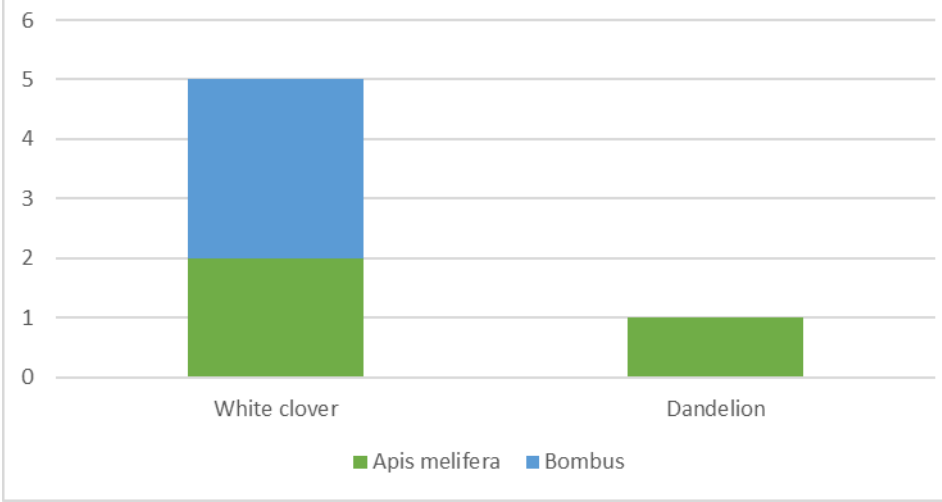


Courtesy of David Inouye and the Rocky Mountain Biological Lab

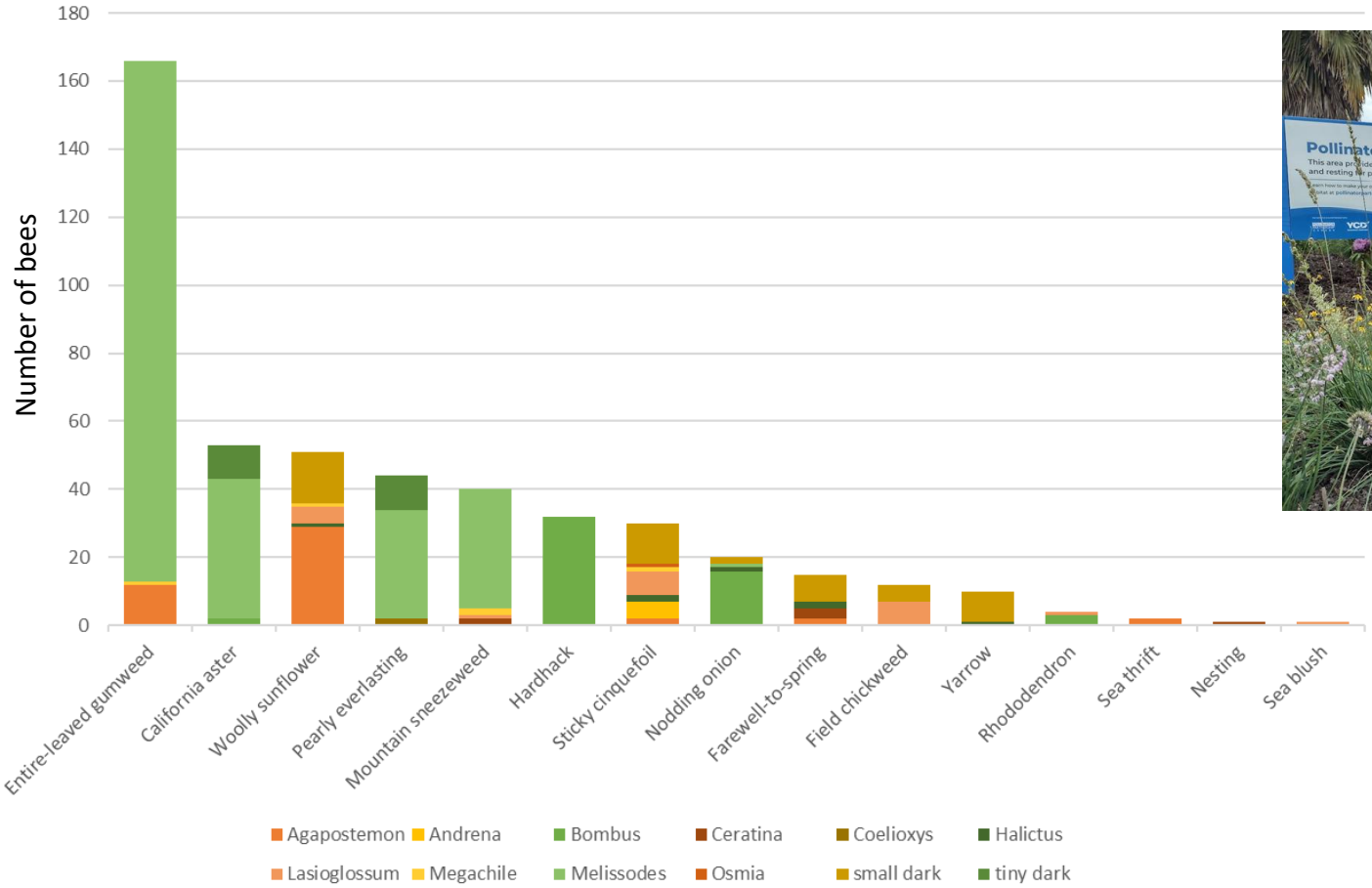




Bees Nanaimo Airport Ornamental Gardens 2023

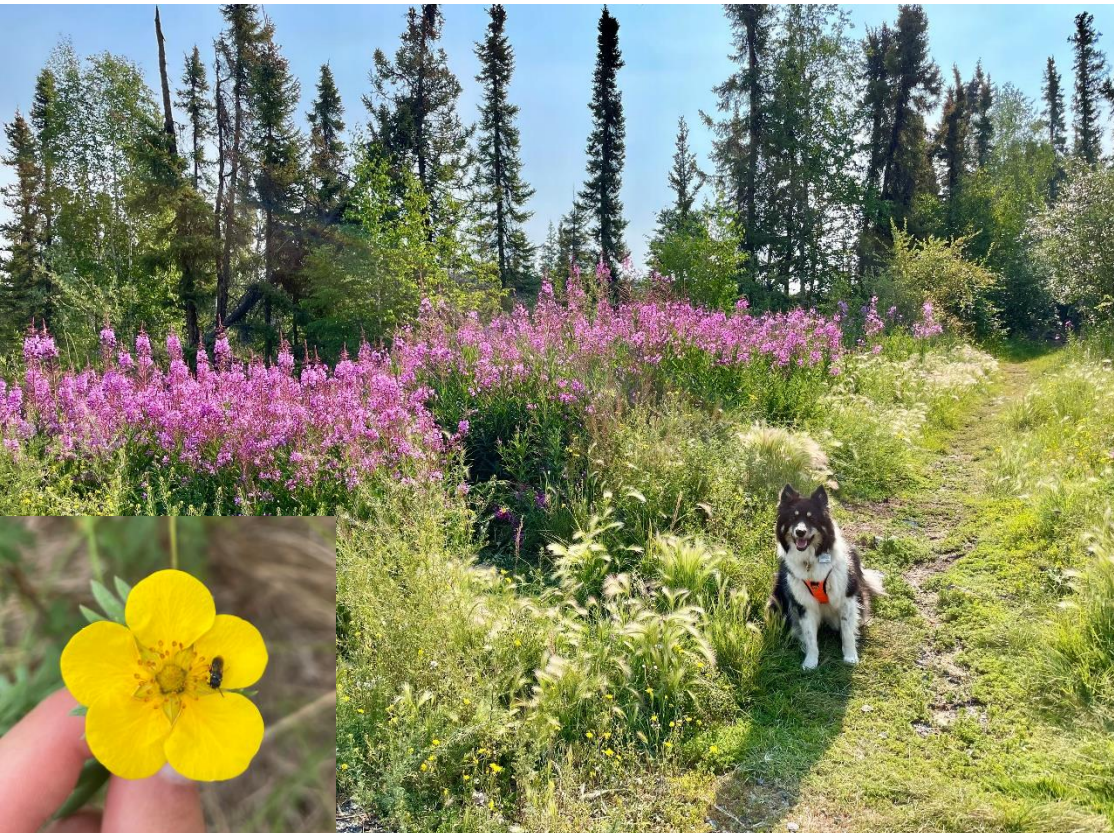


Native Bees Nanaimo Airport Pollinator Garden 2023



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Monitoring for Pollinators!



Baseline

- current garden plans
- list of species of interest
- list of noxious, invasive
- **before and after photos**

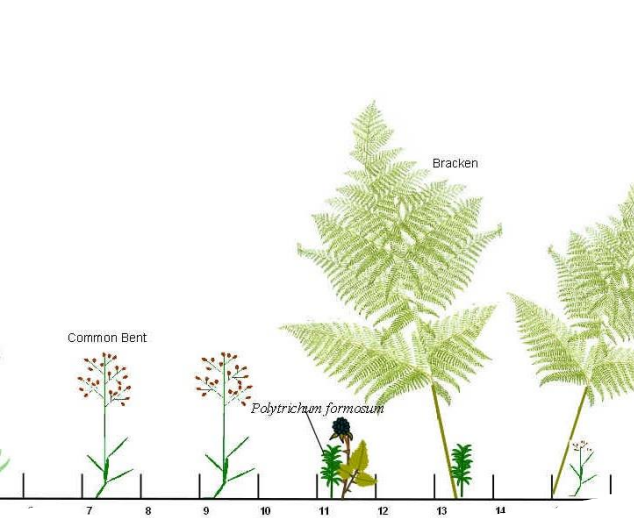
Species, Population, and Community Data



- occurrence, new records
- richness, abundance, diversity
- survivorship
- structure and composition

Species Lists and Surveys

- The easiest data to collect
- Add value by:
 - Repeating the sample over time
 - Frequency counts
 - Adding habitat associations



Landscape Survey Methods

Transects and quadrats

Lists and distribution

Species presence, dominance, frequency, density

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Community Science Programs

iNaturalist



Explore

Community ▾

More ▾

Log In or Sign Up



Ashutosh Shinde - Mantid from Thane, India

Connect with Nature

Explore and share your observations from the natural world.

SIGN UP ↗

EXPLORE ↗



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SCIENCES



NATIONAL
GEOGRAPHIC

iNaturalist is a joint initiative of the
California Academy of Sciences and the
National Geographic Society.

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Overview

845
OBSERVATIONS

72
SPECIES

95
IDENTIFIERS

11
OBSERVERS

⚡ Stats

📍 Map

🗪 Grid

☰ List

🛡️ Identify

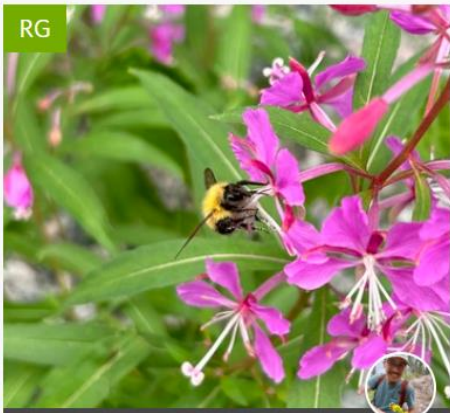
🔍 Search

📄 Export Observations



Western Honey Bee
Apis mellifera

🛡️ 3 3 months ago



Perplexing Bumble Bee
Bombus perplexus

🛡️ 3 3 months ago



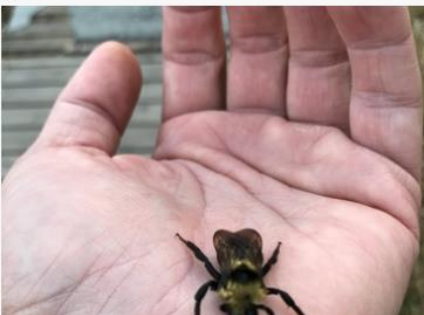
Western Honey Bee
Apis mellifera

🛡️ 3 3 months ago



Perplexing Bumble Bee
Bombus perplexus

🛡️ 2 3 months ago



545
OBSERVATIONS

44
SPECIES

33
IDENTIFIERS

1
OBSERVER

Map

Grid

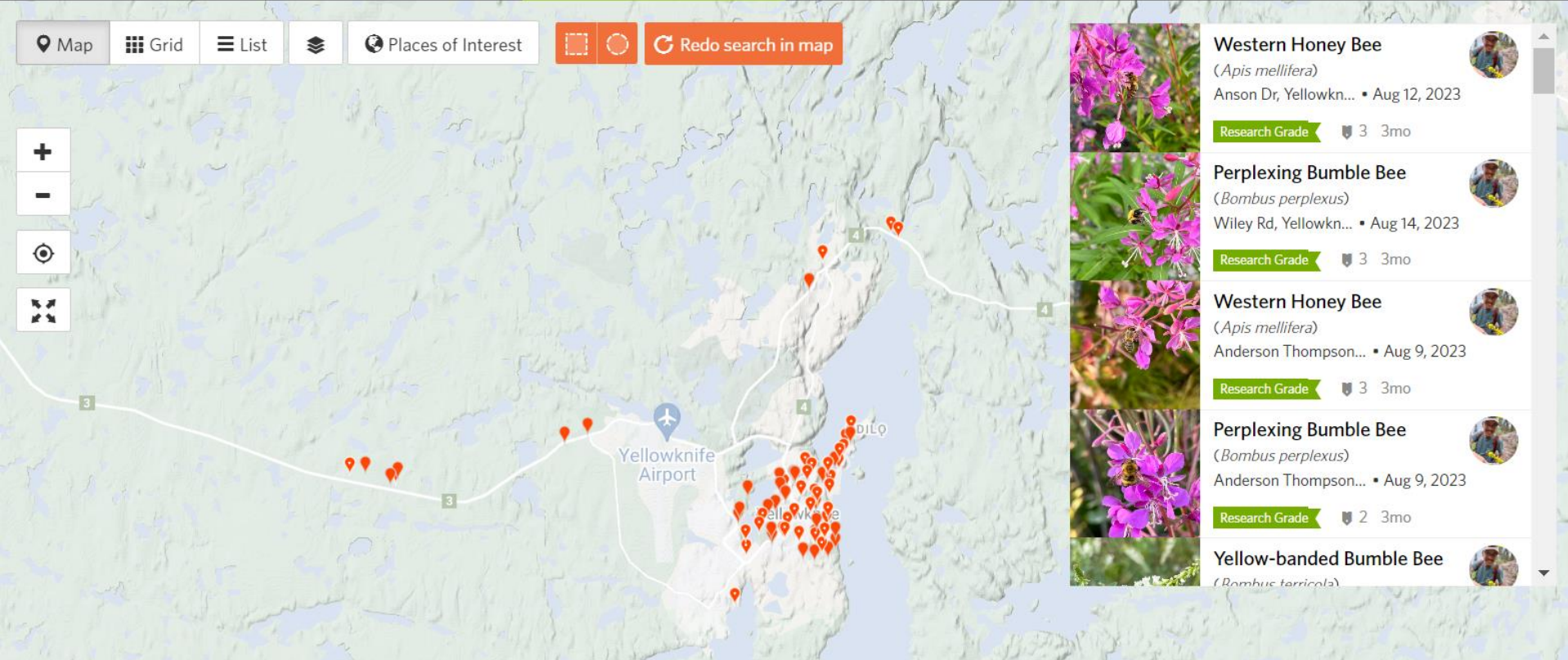
List



Places of Interest



Redo search in map



Western Honey Bee

(*Apis mellifera*)

Anson Dr, Yellowkn... • Aug 12, 2023

Research Grade

3 3mo



Perplexing Bumble Bee

(*Bombus perplexus*)

Wiley Rd, Yellowkn... • Aug 14, 2023

Research Grade

3 3mo



Western Honey Bee

(*Apis mellifera*)

Anderson Thompson... • Aug 9, 2023

Research Grade

3 3mo



Perplexing Bumble Bee

(*Bombus perplexus*)

Anderson Thompson... • Aug 9, 2023

Research Grade

2 3mo



Yellow-banded Bumble Bee

(*Bombus terricola*)





Perplexing Bumble Bee
(*Bombus perplexus*)



Frigid Bumble Bee
(*Bombus frigidus*)



Yellow-Banded Bumble Bee
(*Bombus terricola*)



Mining Bees
(Genus *Andrena*)



Masked Bees
(Genus *Hylaeus*)



Mason Bees
(Genus *Osmia*)



Cryptic Bumble Bee
(*Bombus cryptarum*)



Fuzzy-Horned Bumble Bee
(*Bombus mixtus*)



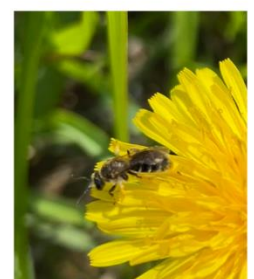
Heath Bumble Bee
(*Bombus jonellus*)



Cellophane Bees
(Genus *Colletes*)



Leafcutter Bees
(Genus *Megachile*)



Sweat Bees
(Genus *Halictus*)



Orange-Rumped Bumble Bee
(*Bombus melanopygus*)



Yellow-Fronted Bumble Bee
(*Bombus flavifrons*)



Yellowish Cuckoo Bumble Bee
(*Bombus flavidus*)



Bumble Bee-Like Digger Bees
(*Anthophora bomboides*)



**Orange-Legged
Drone Fly**

(Eristalis flavipes)



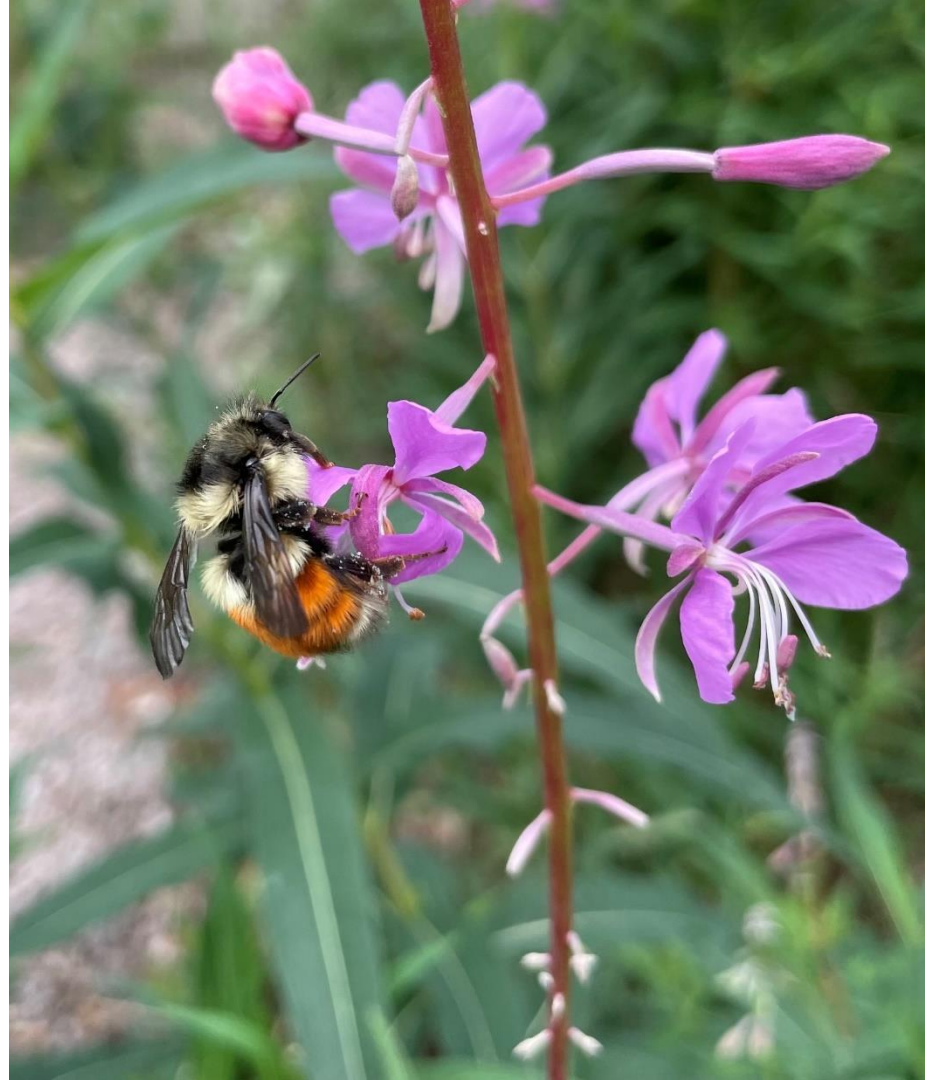
Golden-Belted Bumble Bee

(Bombus kirbiellus)



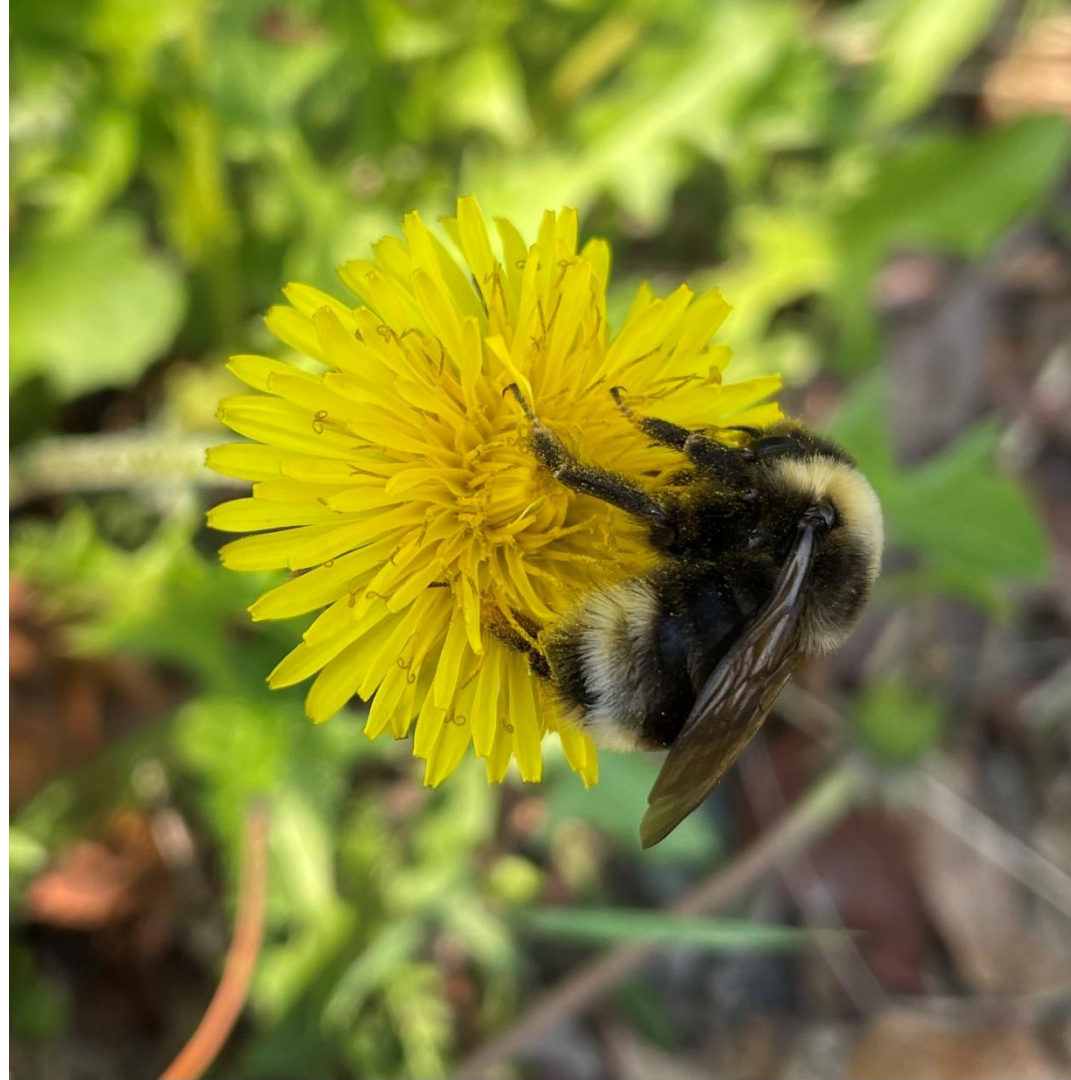
Orange-Rumped Bumble Bee

(Bombus melanopygus)



**Ashton's Cuckoo
Bumble Bee**

(Bombus ashtoni)





Showy Locoweed
(*Oxytropis splendins*)



Fireweed (*Chamaenerion angustifolium*)



Bumble Bees Observed

Perplexing Bumble Bee (*Bombus perplexus*)
Frigid Bumble Bee (*Bombus frigidus*)
Yellow-Banded Bumble Bee (*Bombus terricola*)
Cryptic Bumble Bee (*Bombus cryptarum*)
Fuzzy-Horned Bumble Bee (*Bombus mixtus*)
Heath Bumble Bee (*Bombus jonellus*)
Orange-Rumped Bumble Bee (*Bombus melanopygus*)
Yellow-Fronted Bumble Bee (*Bombus flavifrons*)
Yellowish Cuckoo Bumble Bee (*Bombus flavidus*)

Other Bees Observed

Masked Bee (Genus *Hylaeus*)
Bumble Bee-like Digger Bee (*Anthophora bomboides*)
Leafcutter Bees (Genus *Megachile*)

Other Pollinators Observed

Orange-Legged Drone Fly (*Eristalis flavipes*)
Hummingbird Clearwing Moth (*Hemaris thysbe*)
Northern Aerial Yellowjacket (*Dolichovespula norvegica*)

Prickly Wild Rose (*Rosa acicularis*)



Bumble Bees Observed

Perplexing Bumble Bee (*Bombus perplexus*)
Frigid Bumble Bee (*Bombus frigidus*)
Yellow-Banded Bumble Bee (*Bombus terricola*)
Cryptic Bumble Bee (*Bombus cryptarum*)
Fuzzy-Horned Bumble Bee (*Bombus mixtus*)
Yellow-Fronted Bumble Bee (*Bombus flavifrons*)

Other Bees Observed

Mining Bees (Genus *Andrena*)
Leafcutter Bees (Genus *Megachile*)

Other Pollinators Observed

Orange-Legged Drone Fly (*Eristalis flavipes*)
Dusky Drone Fly (*Eristalis obscura*)
Orange-Spined Drone Fly (*Eristalis nemorum*)

Shrubby Cinquefoil (*Dasiphora fruticosa*)



Bumble Bees Observed

Perplexing Bumble Bee (*Bombus perplexus*)
Frigid Bumble Bee (*Bombus frigidus*)
Yellow-Banded Bumble Bee (*Bombus terricola*)
Cryptic Bumble Bee (*Bombus cryptarum*)
Fuzzy-Horned Bumble Bee (*Bombus mixtus*)
Heath Bumble Bee (*Bombus jonellus*)

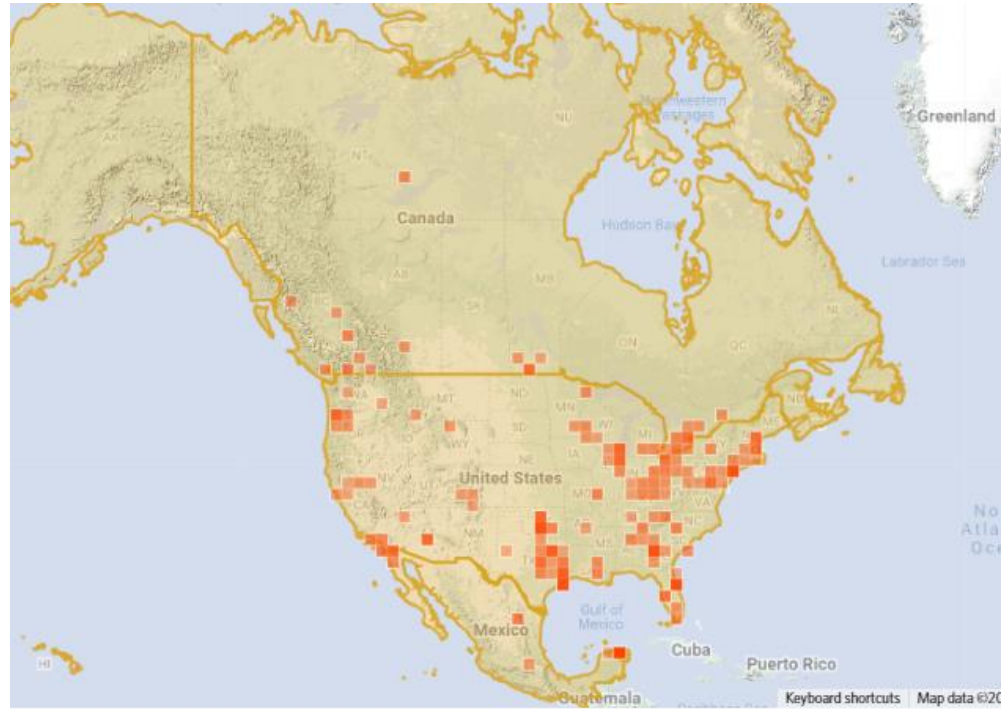
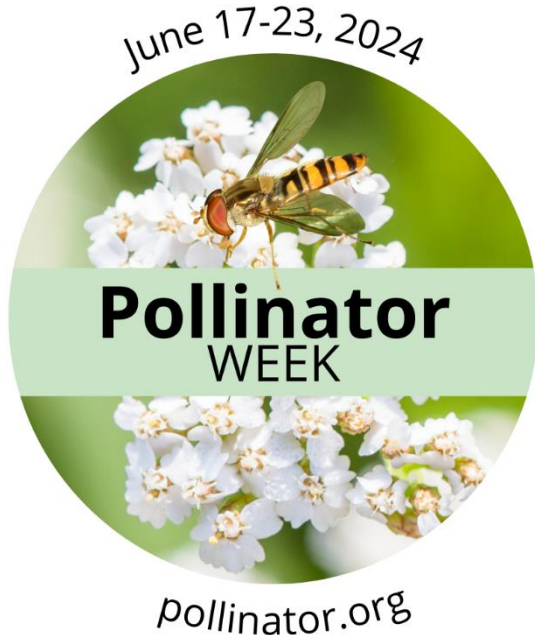
Other Bees Observed

Mining Bees (Genus *Andrena*)
Masked Bee (Genus *Hylaeus*)
Leafcutter Bees (Genus *Megachile*)

Other Pollinators Observed

Dusky Drone Fly (*Eristalis obscura*)
Orange-Spotted Drone Fly (*Eristalis anthophorina*)

Pollinator Week Bioblitz



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Community Science Programs

Bumble Bee Watch

[Sign In](#) / [Sign Up](#)

[Home](#) [About](#) [Record a Sighting](#) [Bumble Bee Species](#) [Map](#) [Gallery](#) [Explore Data](#) [Resources](#)

1

Welcome to Bumble Bee Watch!

2

*The yellow faced bumble bee (*Bombus vosnesenskii*) on arrowleaf balsamroot. Photo by Rich Hatfield.*

3

4

5

6

7



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Community Monitoring Programs

- <https://www.bumblebeewatch.org/>
- iNaturalist – regional databases, project specific monitoring, checked by other local experts
- www.ebird.org
- <https://www.e-butterfly.org/>
- <https://nationalmothweek.org/how-to-submit-data-2/>
- BAMONA -
<https://www.butterfliesandmoths.org/>

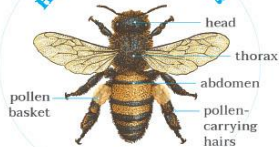
BEE IDENTIFICATION GUIDE

Bees are beneficial insects that pollinate flowering plants by transferring pollen from one flower to another. This is important for plant reproduction and food production. In fact, pollinators are responsible for 1 out of every 3 bites of food you take. While the honey bee gets most of the credit for providing pollination, there are actually about 4000 species of bees in North America!

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How to Identify Bees



All bees have three body segments, a **head**, **thorax**, and **abdomen**. The head is where large multi-faceted eyes, long slender antennae, and mouthparts are found. The thorax is the middle segment where the wings and legs attach. Last is the abdomen, which for female bees ends in a stinger for some types of bees.

Special **pollen-carrying hairs** unique to female bees resemble dense broom bristles, and are commonly found on the rear legs or the underside of the abdomen. Some carry pollen in an almost hairless, flattened **pollen basket** on the rear legs.

Using this Guide

This card provides key features needed to identify 10 types of bees found in home landscapes. The approximate size of each bee is listed in millimeters. The following symbols will help along the way:



Common nesting locations.



Identifying behaviors to watch for.



Additional ID features that may be seen with the aid of a hand lens.



Honey Bee
Apis mellifera 12-15mm

Light to dark brown body with pale and dark hairs in bands on abdomen. Pollen basket present. Abdomen barrel-shaped. Head heart-shaped.

Colonies nest in human-made hives, in the open, and in cavities. Swarm to locate new nest.

Honey bees have hairy eyes!



Leaf Cutting Bee
Megachile spp. 7-15mm

Black body with light or dark hairs. Pollen-carrying hairs beneath abdomen. Head is as broad as the thorax with large mouthparts used to cut leaves.

Solitary, but nest in aggregations in above-ground pre-existing holes, natural or man-made.

They cut circular pieces from leaves which are used to line their nests!



Bumble Bee
Bombus spp. 8-21mm

Black body, extensively covered with black and yellow hairs on all body segments. Pollen basket present. Robust body. Long face.

Colonies often nest underground, commonly in old rodent burrows.

Bumble bees pollinate in cool, cloudy weather when most bees are at home!



Large Carpenter Bee
Xylocopa spp. 15-23mm

Black body with light or dark hairs. Pollen-carrying hairs on rear legs. Similar body shape to bumble bee, but abdomen shiny and mostly lacking hair. Round face.

Nests are burrowed into wood, often in roof eaves.

Fly fast and erratically like a hummingbird!



Sweat Bee
Halictidae 3.5-11mm

Two forms: 1) bright metallic green or 2) black/brown with light bands of hair on the abdomen. Pollen-carrying hairs on rear legs. Slender body.

Nest in the soil, solitary to communal nesters.

Some are attracted to the salt in your sweat!



Small Carpenter Bee
Ceratina spp. 5-8mm

Dark blue-green and shiny, appearing hairless on all body segments. Pollen-carrying hairs on rear legs. Slender with shield-shaped abdomen.

Solitary, nest in twigs and stems.

Pale yellow marks on face. Females have vertical bar, males have upside-down "Y".



Mason Bee
Osmia spp. 7-16mm

Two forms: 1) black body covered in pale hairs or 2) dull metallic green-blue and less hairy. Pollen-carrying hairs beneath abdomen. Head as broad as thorax, robust body.

Solitary, but nest in aggregations in above-ground pre-existing holes.

Collect mud to line their nests!



Mining Bee
Andrena spp. 5.5-15mm

Black body, with black, yellow, and sometimes rust-colored hair on most of the body. Pollen is carried on the hairy back legs.

Dig solitary ground nests. Prefer sandy soils.

Shallow depressions between their eyes and antennae hold short velvety hairs!



Squash Bee
Peponapis pruinosa 11-14mm

Brown body covered in dense light hair on the thorax and in bands on abdomen. Pollen-carrying hairs on rear legs. Long antennae. Appear to have protruding "nose".

Ground nesting, mostly near squash and pumpkin fields.

Only collects pollen from squash/pumpkin plants!



Long Horned Bee
Melissodes spp. 8-16mm

Black body covered in dense pale or dark hairs. Pollen-carrying hairs on rear legs may be very long. Stout-bodied. Males have extremely long antennae.

Solitary to communal ground nesters.

Some are especially attracted to asters, sunflowers, and daisies!



A Bee, or Not a Bee?

Some insects that you will see visiting flowers are bee mimics. While they are not bees, they may resemble them in appearance.

Common bee mimics are flies and wasps. A fly has only 2 wings, while a bee has 4. Flies have sucking mouth parts, not the jaws of a bee, and their antennae are not long and slender like a bee, but short and stubby or feathery. Some flies are easy to spot because their eyes meet in the center at the top of their head.

A wasp has 4 wings, chewing mouthparts, a sting, and long antennae like a bee. Wasps are smooth and almost hairless, while bees are generally covered with hair on their bodies and legs. Wasps have slender waists and they will never have pollen-carrying hairs. Certain wasps make paper nests that hang from a tree or building, bees do not.

A final clue: If an insect is eating another insect, it may be a fly or wasp. Bees are vegetarians and only eat pollen and nectar from flowers!

Now that you are a bee and bee mimic expert, try your hand at identifying these insects! Answers are at the bottom.



For more information, visit us online at:

www.pollinator.org
www.epri.com/pollinators
#PwerinPollinators

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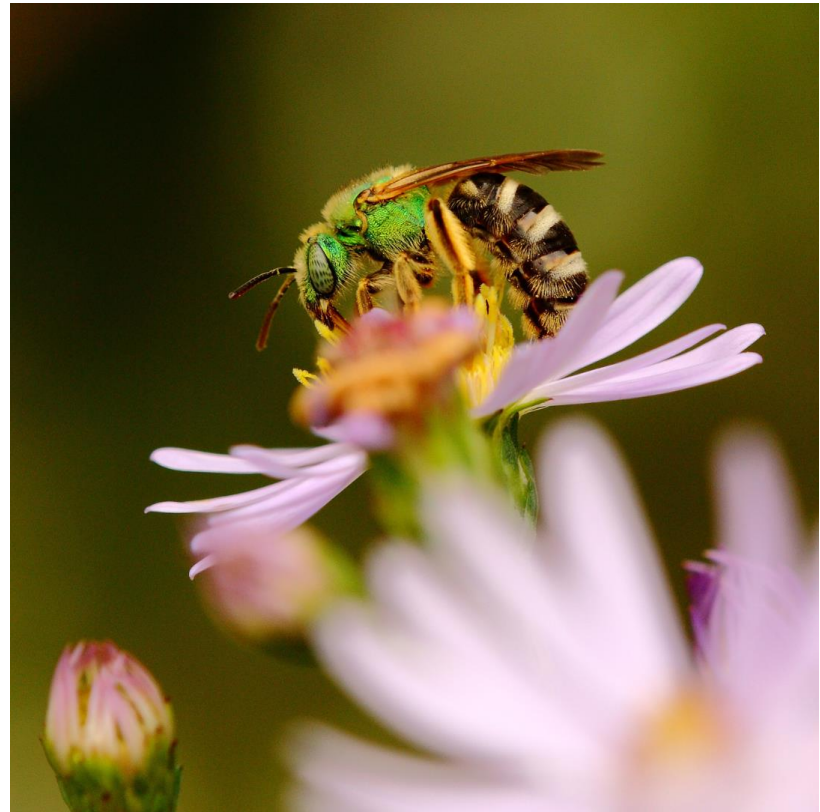
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Wrap Up and Next Session:

- Recordings and resources will be shared on the Course Information page by next week.
- Tuesday, April 16th, 4 pm PST/7pm EST
 - Module 7: Expand Your Impact! This will be our final module.
 - More info on the Step 1 and Step 2 Forms will be discussed next week.



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