



Wisconsin Bumble Bee Brigade

Jay Watson

Wisconsin Department of Natural Resources



Bumble Bees in Decline

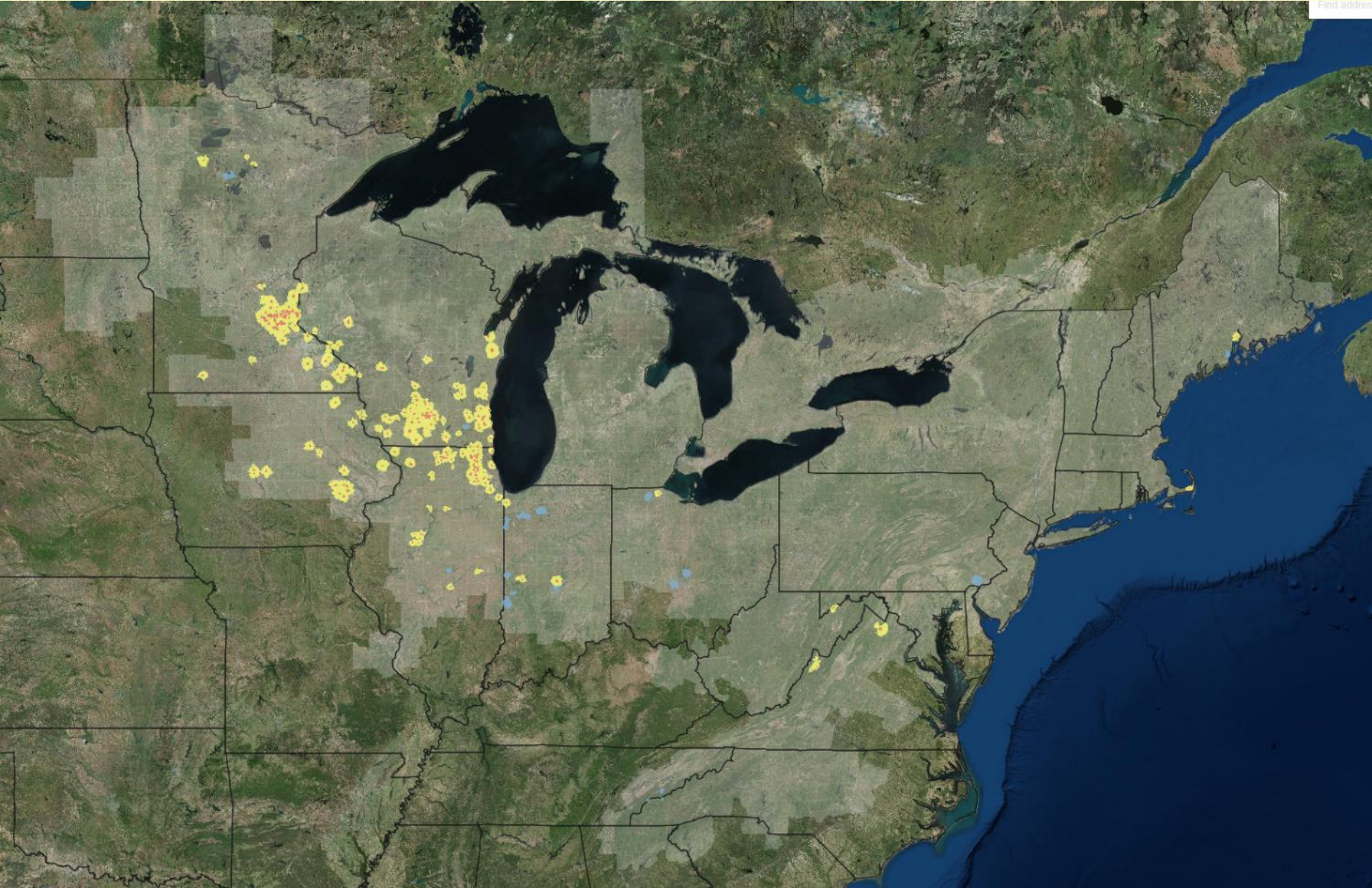


Rusty Patched Bumble Bee

- Declined by at least 87% in last 20 years
- Most remaining populations are in Wisconsin



Rusty Patched Bumble Bee Range



WI Bumble Bees Need Our Help



rufocinctus



ternarius



frigidus



affinis



griseocollis



impatiens



bimactulatus



fervidus



borealis



perplexus



vagans



sandersoni



pensylvanicus



auricomus



terricola



bohemicus



citrinus



variabilis



insularis



flavidus

Causes of Population Decline

- Habitat Loss
- Intensive Agriculture (pesticides, decreased floral diversity, disease and competition from commercial bees)
- Pesticides
- Disease
- Climate Change





BUMBLE BEE BRIGADE

wiatri.net/inventory/bbb

Why CBM

- Proven track record of CBM successes in NHC
- Bumble bees are easily photographed and identified by those photographs
- Huge public interest in pollinators, especially bees
- Existing bumble bee citizen science projects to build on

Mission

To improve our understanding, management, and conservation activities related to Wisconsin bumble bees.



Long-Term Objectives

- Develop an accurate map of species distributions
- Identify species-habitat associations
- Assess habitat conditions and determine conservation threats
- Determine baseline population status and monitor trends over time

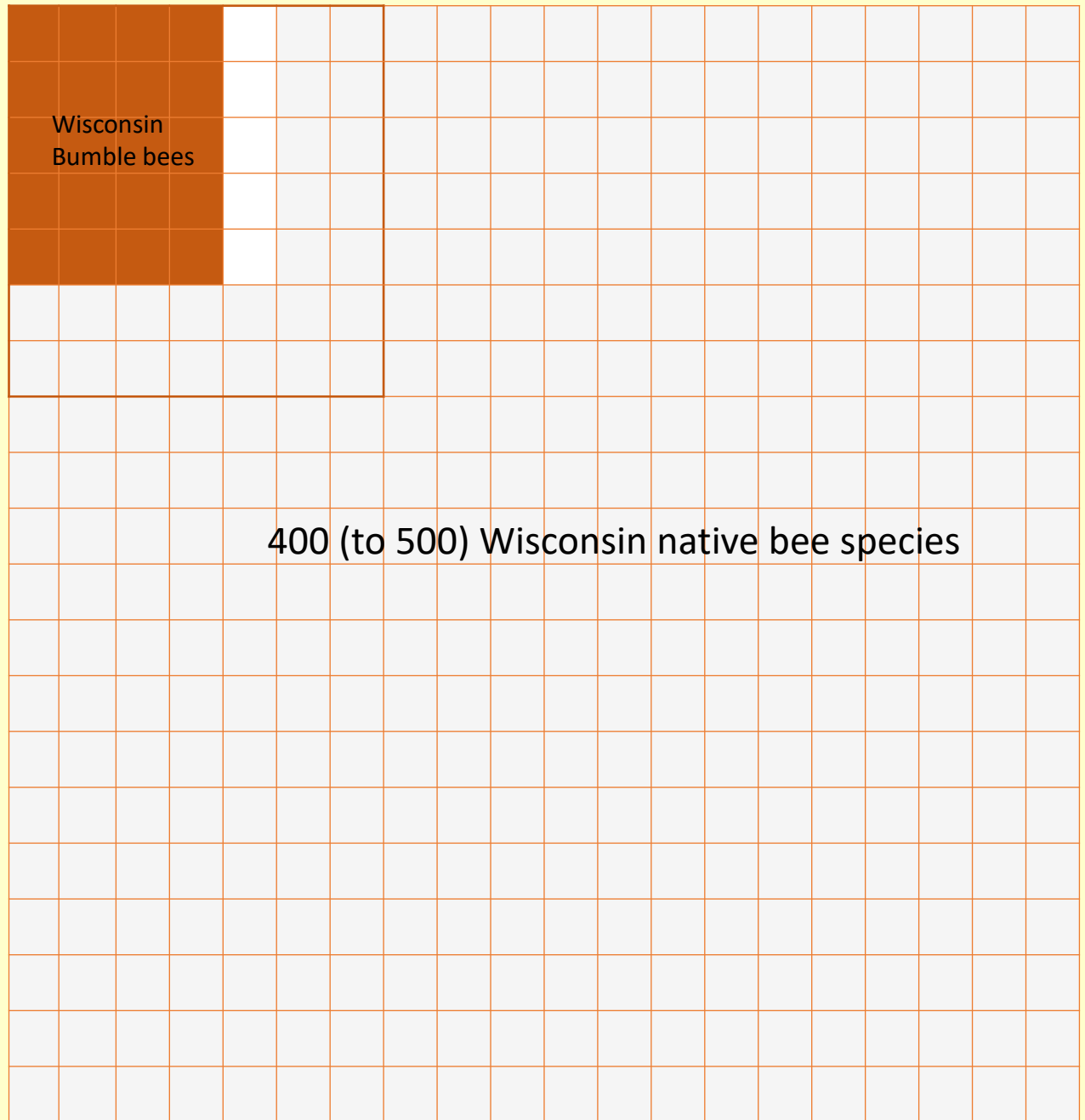
Wisconsin bee diversity:

85% are solitary
bee species

15% are Social or
semi-social bees



Social, perennial,
European Honey bee:



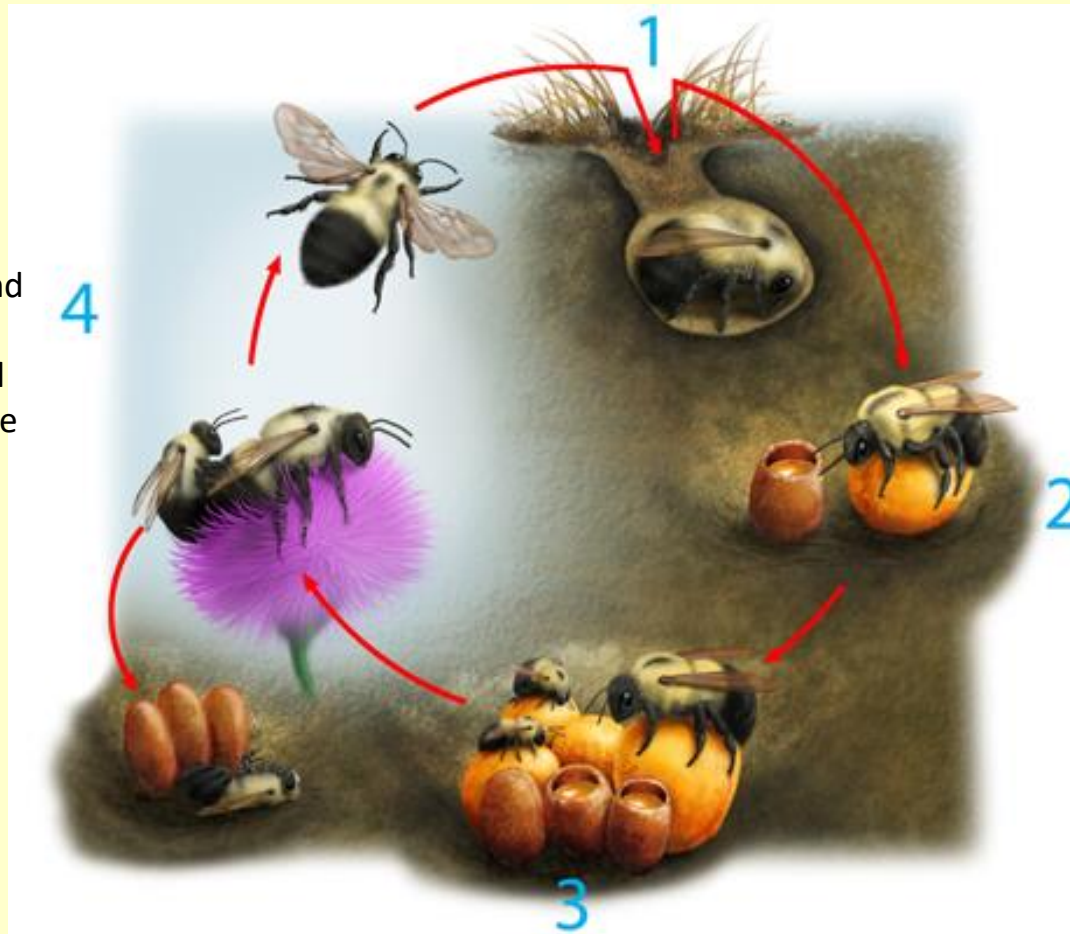
Biology- Overview

- Social (queens, workers & males), annual colony
- Wide variety of habitats
- Most diverse in temperate & montane areas
- WI active mid April – early October (varies by species)
- Very hairy bodies, active early & later in day
- [Buzz pollination](#)



Biology- Life Cycle

A queen emerges from hibernation in spring and finds a nest site, such as an abandoned rodent burrow.



She creates wax pots to hold nectar and pollen, in which she lays and incubates her eggs.

When her daughters emerge as adults, they take over foraging and other duties

In autumn the colony produces new queens and male bees, who leave to find mates. Newly mated queens hibernate and the rest of the bees die.

Biology- Nests & Colonies

- Social colonies founded by single queen
- Annual colonies--last only one season
- Nests have ~100-400 workers
- Nest in abandoned rodent burrows or under lodged grasses

*Conserve brush piles,
unmown areas*



Bombus vagans on clover

Photos: Elaine Evans, Nancy Adamson, Eric Mader



Photography-Based



Arboretum

Before European settlement in Wisconsin, cedar-bark glades grew where prairie fires were prevented from burning intensely – places such as rock outcroppings or steep slopes.

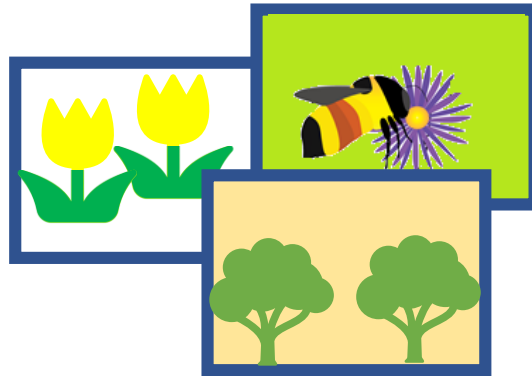
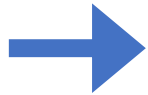
There are larger areas across the landscape, and some are being restored to their original state. Black and cedar trees are important components of these ecosystems.



Black and cedar trees are important components of these ecosystems. They are being restored to their original state. Black and cedar trees are important components of these ecosystems.

Black and cedar trees are important components of these ecosystems. They are being restored to their original state. Black and cedar trees are important components of these ecosystems.

Methods



SURVEY

CURATE

SUBMIT

When to Volunteer

- April/May-October
- Avoid rain, high winds, and severe weather
- Easier to photograph when cool



Two Ways to Contribute

- ***Incidental observations*** are casual or unplanned sightings
- ***Small area surveys*** are conducted when you purposefully look for, photograph, count, and record the bumble bees that you see at a single location, following the guidelines in the volunteer manual.

BOTH REQUIRE PHOTO VOUCHERS

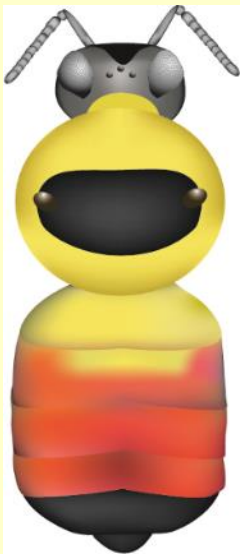
Small Area Surveys

- Record basic survey information
- Stay within a 30m diameter area (or less)
- Count the number of bumble bees of each morph that you see
- Photograph at least one bee per morph
- Record number of bees, presence of queens, presence of nests, & photo names on Data Sheet
- Curate photos
- Summarize data on Summary Sheet
- Submit data online

Morphs

Morphs are visually distinct groups based on

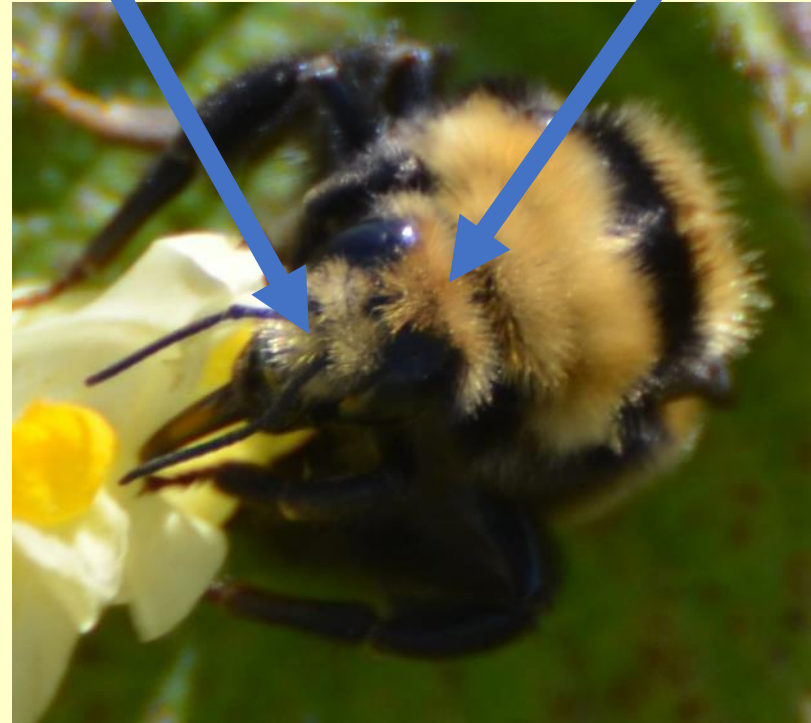
- Color patterns
- Size
- Number of abdominal segments (males 7, females 6)
- Presence of corbicula (pollen basket) on legs



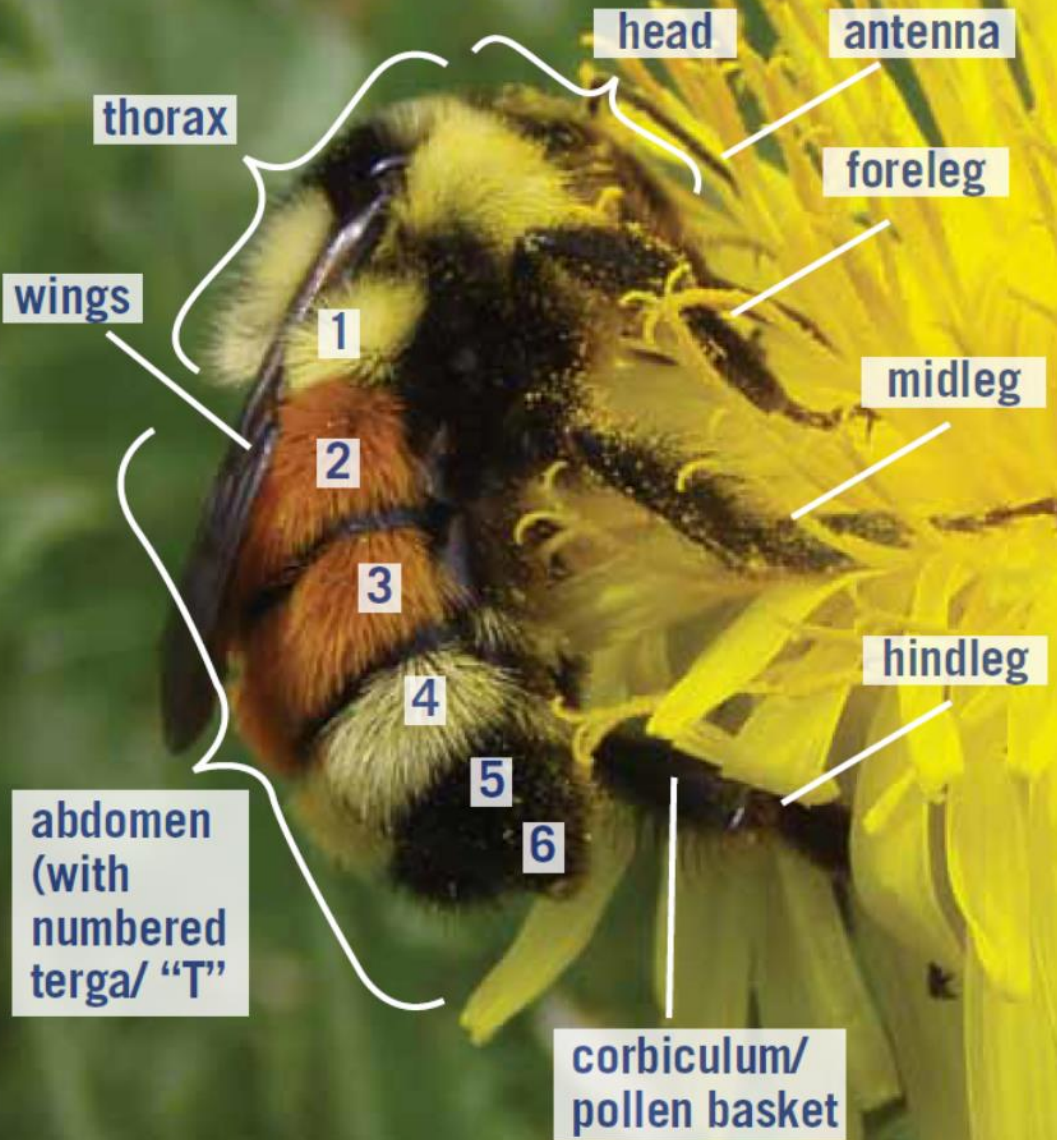
Key Features

Face Color

Vertex Color



Bombus borealis



Bombus ternarius, queen

Corbicula



Cuckoo Bumble Bees

- 5 species in WI
- Social parasite, no corbicula on hind tibia
- Parasitize nests of other species



Lemon Cuckoo



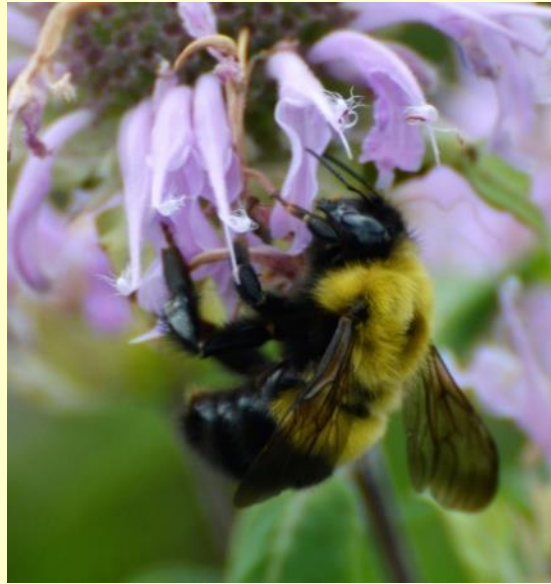
Fernald Cuckoo



Indiscriminate Cuckoo

Photography Tips

- Series of photos
 - dorsal (top), side & face views
- After taking photos of one bee, take a “spacer” photo
- Patience & practice



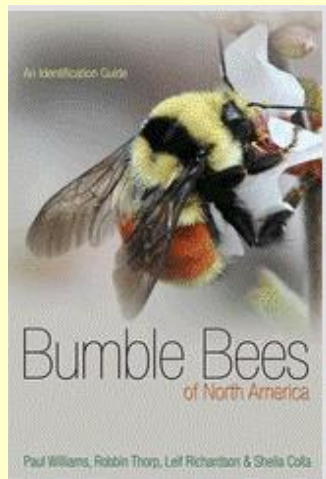
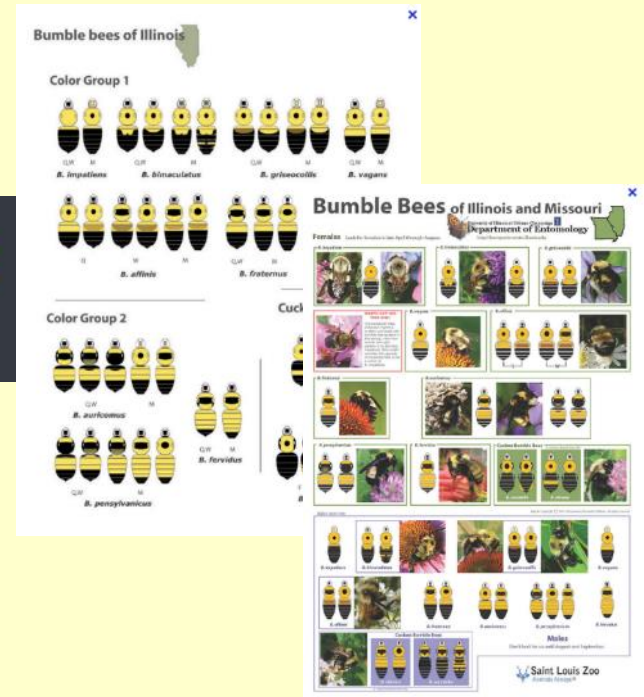
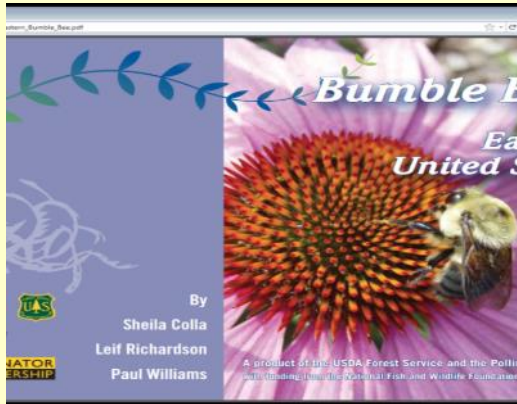
Confusing Bumble Bee (*Bombus perplexus*) - queen

Curating Photos



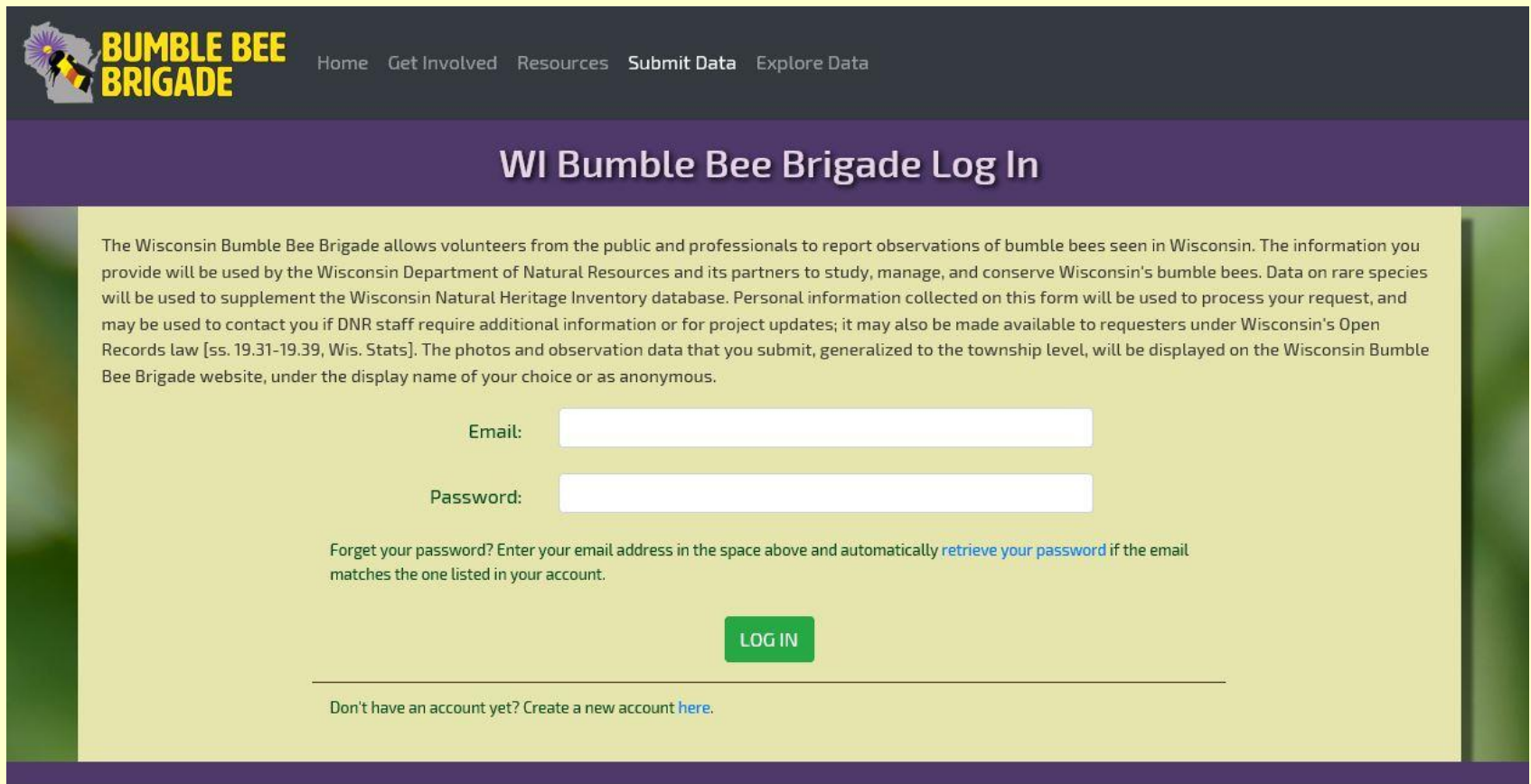
- Identify morphs in each image
- Select best photos of each morph's head, dorsal, and side views
- Crop and center selected images
- Ensure file size is less than 1MB

Resources to identify your photos



SUBMIT YOUR PHOTOS!!!!

- To the Bumble Bee Brigade website to verify ID & to document/map bumble bee distributions



BUMBLE BEE BRIGADE Home Get Involved Resources **Submit Data** Explore Data

WI Bumble Bee Brigade Log In

The Wisconsin Bumble Bee Brigade allows volunteers from the public and professionals to report observations of bumble bees seen in Wisconsin. The information you provide will be used by the Wisconsin Department of Natural Resources and its partners to study, manage, and conserve Wisconsin's bumble bees. Data on rare species will be used to supplement the Wisconsin Natural Heritage Inventory database. Personal information collected on this form will be used to process your request, and may be used to contact you if DNR staff require additional information or for project updates; it may also be made available to requesters under Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats]. The photos and observation data that you submit, generalized to the township level, will be displayed on the Wisconsin Bumble Bee Brigade website, under the display name of your choice or as anonymous.

Email:

Password:

Forget your password? Enter your email address in the space above and automatically [retrieve your password](#) if the email matches the one listed in your account.

LOG IN

Don't have an account yet? [Create a new account here.](#)

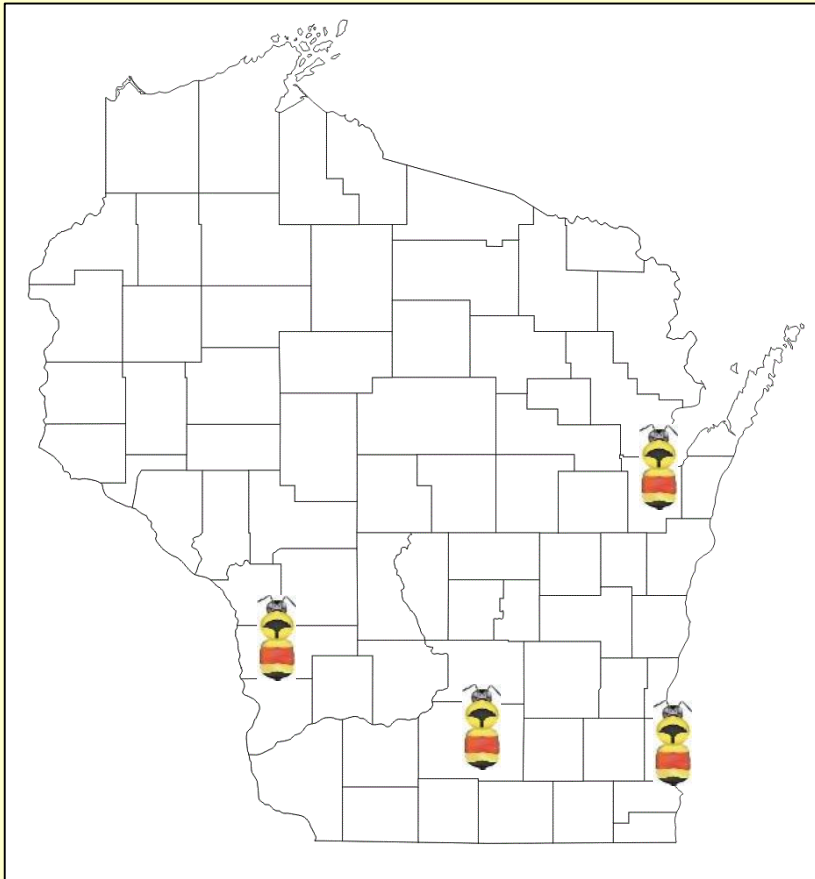


This site is produced in conjunction with the [Wisconsin Aquatic and Terrestrial Resources Inventory](#) and sponsored by the [Wisconsin Department of Natural Resources](#). The information presented on this site is subject to the Wisconsin Department of Natural Resources' [Legal Notices, Disclaimers, and Terms of Use](#).



2018 Trainings

- 4 trainings
- 4 hours, indoor and outdoor components
- 83 people trained



Successes

- 78 new sites for Species of Greatest Conservation Need



One of 32 observations of *Bombus fervidus*, the yellow bumble bee, submitted to B3. Photo: Adrian Konell

B3 Contributions	Number
Volunteers	102
Species Observed	16
Observations	1165
Surveys	645 (143 small area & 502 incidental)
Sites	272
Counties with Surveys	57

Successes

- Amazing photos that capture the flower visited!!

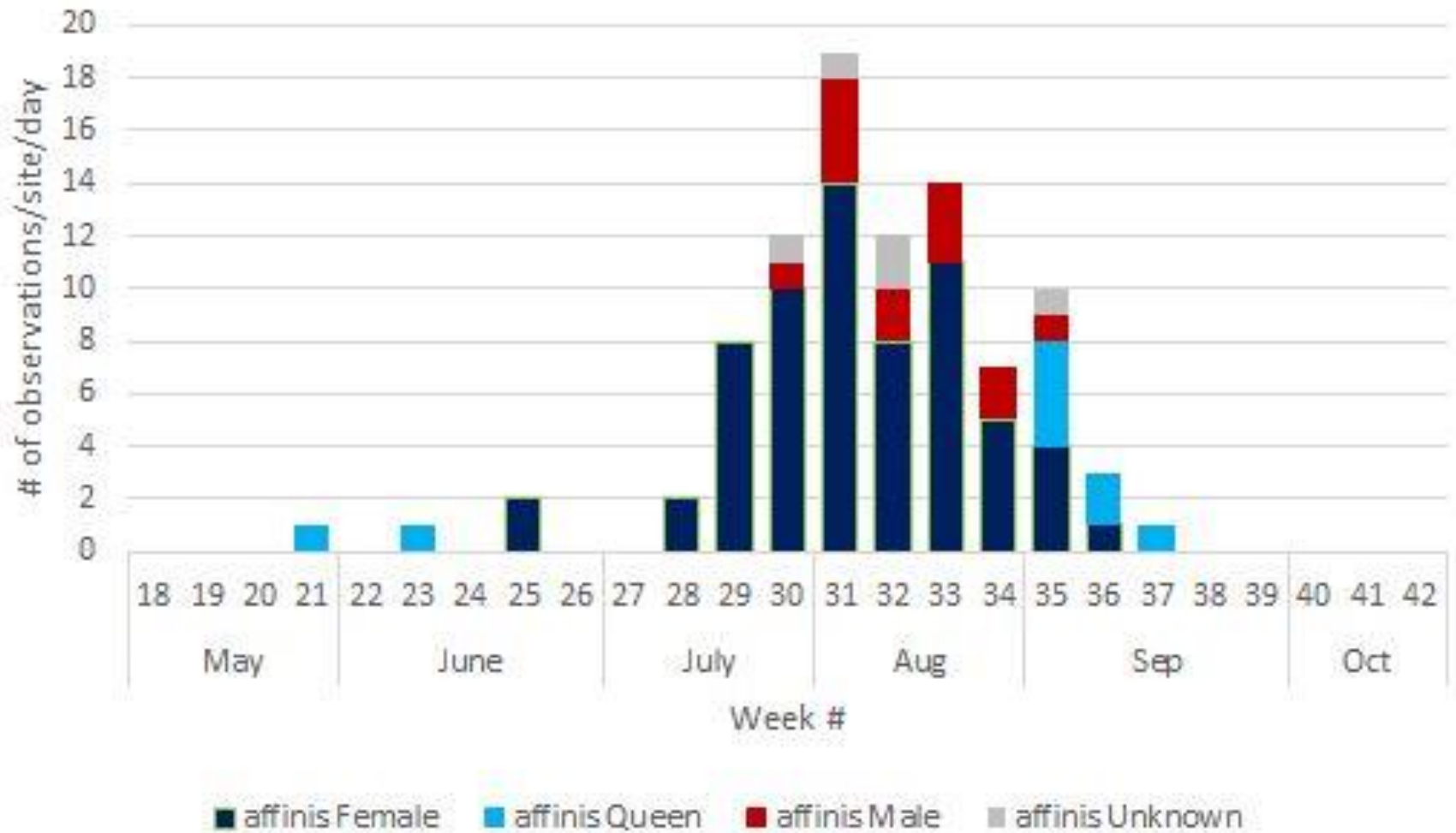


Bombus impatiens, Ed Buchs



Bombus perplexus, Mary Nelson

Bombus affinis flight season



Data from verified 2018 BBB observations

Coming Soon

Explore Data

Search verified observations

Species:

Sex:

County:

Observation Occurred Between:

And:

Survey Method:

SEARCH

RESET

OR

View checklist of current and historical observations by county

Select County:

Coming Soon



[--- Export Data to Excel ---](#)

[--- New Search ---](#)

94 Verified Records Returned

Showing records 1 - 20

Page: 1

[GO](#)

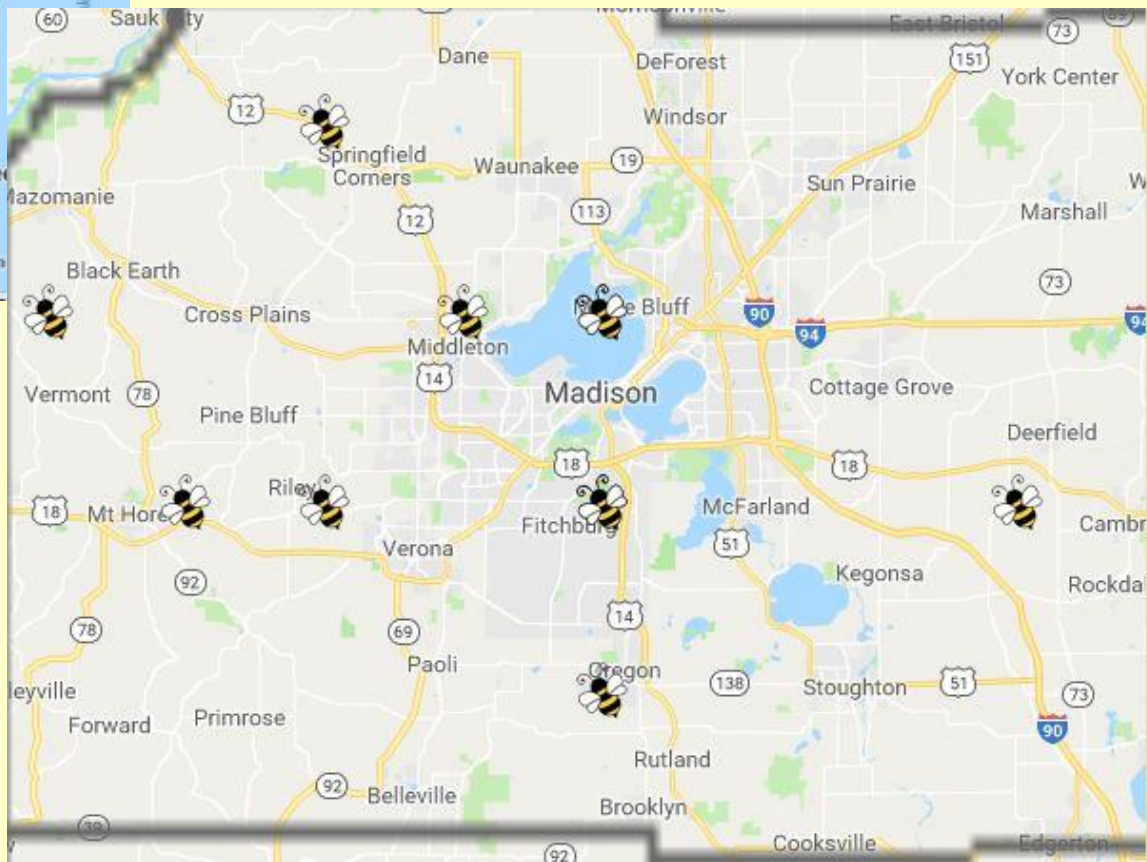
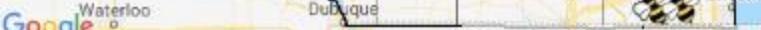
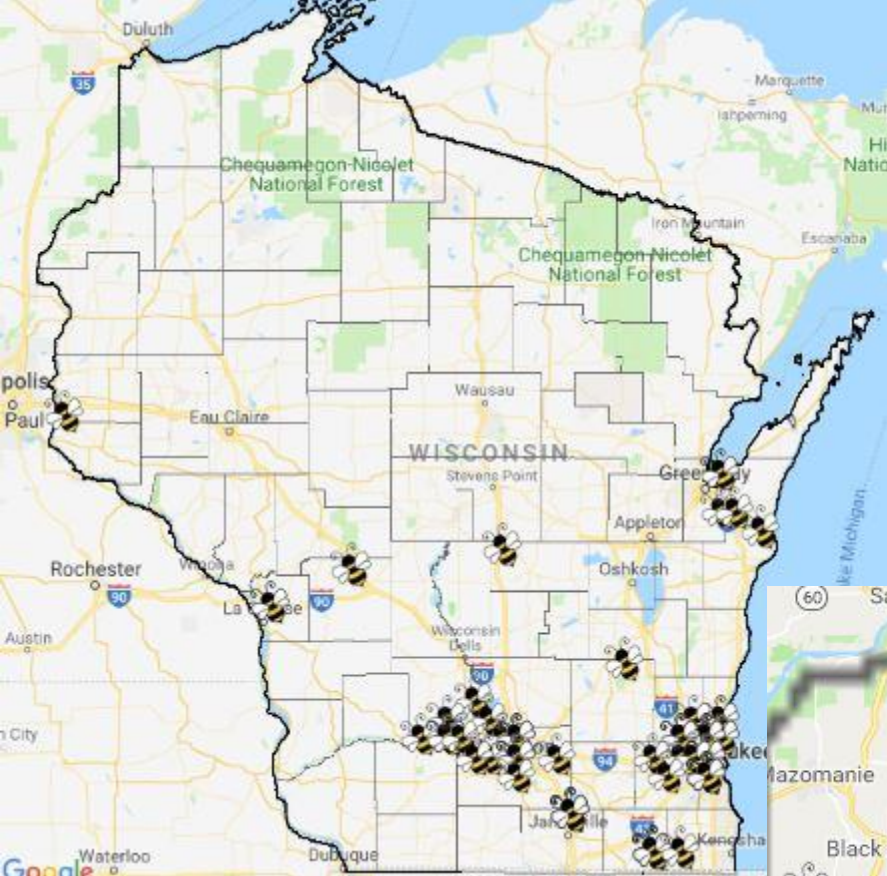
of 5

[Next Page](#)

[Last Page](#)

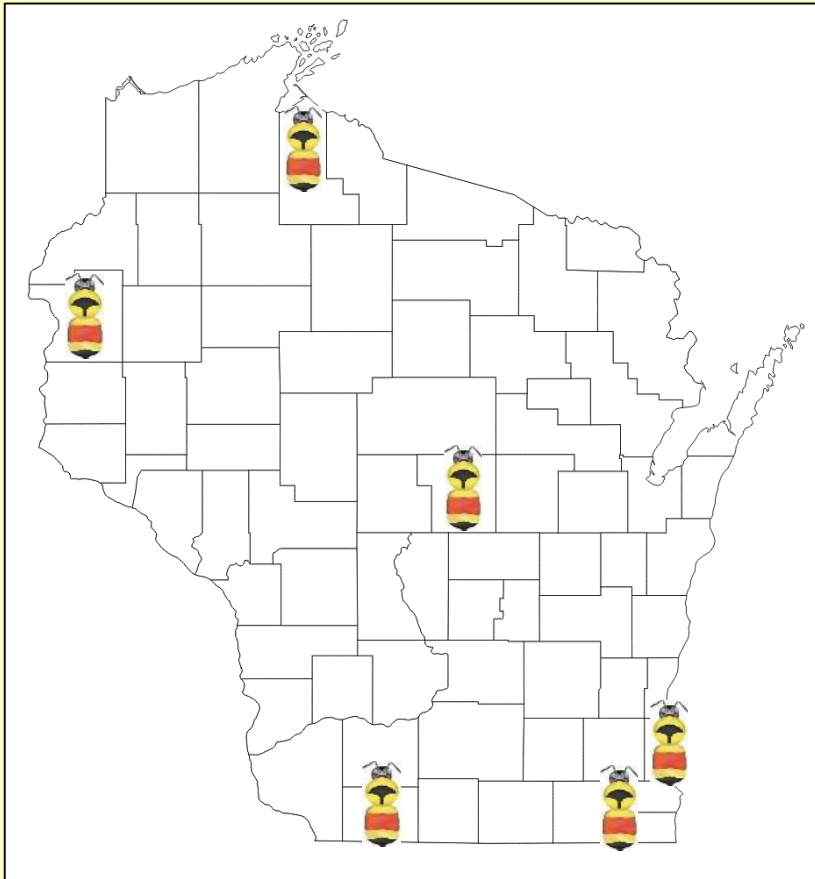
(Click on heading to sort by column. 'date observed' to view observation details and observer's photos, and 'species' name to learn more about the species.)

Date Observed	#	Sex	Species	County	Survey Method
14-Sep-2018	1	Queen	B. affinis (Rusty Patched)	Milwaukee	Incidental
6-Sep-2018	1	Queen	B. affinis (Rusty Patched)	Milwaukee	Incidental
4-Sep-2018	1	Female	B. affinis (Rusty Patched)	Rock	Incidental
2-Sep-2018	1	Queen	B. affinis (Rusty Patched)	Walworth	Incidental
1-Sep-2018	1	Queen	B. affinis (Rusty Patched)	Walworth	Incidental
31-Aug-2018	1	Queen	B. affinis (Rusty Patched)	Walworth	Incidental



2019 Trainings

- 6 trainings
- 4.5 hours, indoor and outdoor components
- 45 people signed up so far



2019 Trainings

wiatri.net/inventory/bbb

June 18th, 9am-1:30pm
Hawthorn Hollow Nature Sanctuary and Arboretum
880 Green Bay Rd, Kenosha



June 24th, 9am-1:30pm
Schmeekle Reserve
2419 North Point Drive, Stevens Point

June 27th, 9am-1:30pm
Belmont School
646 E. Liberty Street, Belmont

June 29th, 9am-1:30pm
Wehr Nature Center
9701 W College Ave, Franklin

July 2nd, 9am-1:30pm
St. Croix River Visitor Center
401 N. Hamilton Street, St. Croix Falls

July 11th, 9am-1:30pm
Northern Great Lakes Visitor Center
29270 County Highway G, Ashland



Get Involved!



We need your help to monitor our native bumble bees! The Wisconsin Bumble Bee Brigade is a photography-based volunteer monitoring project. As a volunteer, you will submit photos and additional information on the bumble bees that you observe. There are two ways that you can contribute:



Incidental observations are casual or unplanned sightings made when your primary motive or activity was not monitoring for bumble bees. This also includes observations made immediately before or after a small area survey. All incidental observations require a photograph voucher.

Small area surveys are conducted when you purposefully look for, photograph, count, and record the bumble bees that you see at a single location, following the guidelines in the Volunteer Manual. We recommend conducting small area surveys with a partner or small group. If you conducted a survey and did not observe any bumble bees, please still submit a record of your survey.

To become a Bumble Bee Brigade Volunteer:

- ✓ [Attend a Training](#)
- ✓ Read the [Volunteer Manual](#)
- ✓ Use the [Field Guide](#)
- ✓ Collect data with the [Small Area Survey Datasheet](#)
- ✓ Use the [Summary Sheet](#)
- ✓ [View Training Slides](#)
- ✓ Read [Frequently Asked Questions](#)
- ✓ [Create an Online Account](#)
- ✓ [Submit Your Data](#)

Questions? Email [Eva Lewandowski](mailto:eva.lewandowski@wisconsin.gov) at eva.lewandowski@wisconsin.gov.

Resources

- Q [Get information on volunteering](#) with the Wisconsin Bumble Bee Brigade.
- Q View photos and learn about the biology of [Wisconsin's bumble bee species](#).
- Q Find out about native pollinator conservation at the [Wisconsin DNR's pollinator page](#).
- Q Explore additional identification resources:

[Wisconsin Bumble Bee Brigade Field Guide](#)

Bumble Bees of North America: An Identification Guide. 2014. Williams, P; Thorp, R; Richardson L & Colla, S. Princeton University Press.

[Bumble Bees of the Eastern United States](#). 2011. Colla, S; Richardson, L & Williams, P. USDA Forest Service and the Pollinator Partnership.

[Minnesota Bee Atlas](#) - online bumble bee tutorial, flashcards, and species identification slides. University of Minnesota Extension.

[Bee Spotter Keys](#) to Bumble Bees of Illinois, Missouri, Ohio, and Indiana.

[Bumble Bee Watch](#) - species identification key and anatomy resources.

[Wisconsin Wild Bee Guide](#). University of Wisconsin Great Lakes Bioenergy Research Center.

[Bumble Bee Identification Guide](#). Discover Life.

[Bumble Bees of Wisconsin](#). University of Wisconsin-Madison

DNR.WI.GOV Keyword "ER"



**TAX
CHECK
OFF**

**DIRECT
GIFTS**

**EAGLE
PLATE**



**STAND UP
FOR ENDANGERED SPECIES**

THANKS!!!!



**BUMBLE BEE
BRIGADE**

wiatri.net/inventory/bbb

- B3 Team
 - Eva Lewandowski
 - Terrell Hyde
 - Jill Rosenberg
 - Susan Carpenter
 - Owen Boyle
- All the Volunteers!!!!



jay.watson@wisconsin.gov

Bombus impatiens
common eastern bumble bee



Bombus bimaculatus
twospotted bumble bee



Bombus griseocollis
brownbelted bumble bee



Bombus auricomus
black and gold bumble bee



Bombus vagans
half black bumble bee



Bombus affinis
rusty patched bumble bee



Bombus rufocinctus
redbelted bumble bee



Bombus ternarius
tricolored bumble bee

