



BUMBLE BEE BRIGADE

2024 Year-In-Review

In 2024, we once again set a record year for number of participants with 288 volunteers reported for this season! We deeply appreciate your enthusiasm and dedication to helping pollinators. Sadly, bee numbers didn't keep up with participants. Volunteers logged +4,400 observations and counted about 14,000 bees. This is about two-thirds as many observations and half the number of individual bees compared to 2023. Total reported time volunteered was +1,160 hours. Although not the data we'd like to see, it's vital to be able to track this so that we can recognize when species have a bad year and take action to help them. Thank you for making this possible!

-Elizabeth, Jay, Judy, and Terrell (The B3 Team)

B3 Contributions	Number* Reported 2024
Volunteers	288
Species Observed	19
# Bees	14,330
Observations	4,507
Surveys	2,087 total (1,768 incidental surveys & 319 small area surveys)
Sites	825
Counties with Surveys	64
Nests	20



Confusing (*B. perplexus*) male from Bayfield County on Joe-Pye weed
Photo: Lucy Tyrrell



*Includes historical observations submitted in 2024

2024 Results

Species	# Sites
<i>B. frigidus</i> (Frigid)	2
<i>B. fraternus</i> (Southern plains)	3
<i>B. flavidus</i> (Fernald cuckoo)	12
<i>B. insularis</i> (Indiscriminate cuckoo)	14
<i>B. sandersoni</i> (Sanderson's)	17
<i>B. pensylvanicus</i> (American)	17
<i>B. terricola</i> (Yellowbanded)	19
<i>B. perplexus</i> (Confusing)	25
<i>B. borealis</i> (Northern amber)	36
<i>B. ternarius</i> (Tricolored)	68
<i>B. fervidus</i> (Yellow)	99
<i>B. auricomus</i> (Black and gold)	101
<i>B. citrinus</i> (Lemon cuckoo)	119
<i>B. vagans</i> (Half-black)	166
<i>B. rufocinctus</i> (Redbelted)	185
<i>B. affinis</i> (Rusty Patched)	224
<i>B. bimaculatus</i> (Twospotted)	230
<i>B. griseocollis</i> (Brownbelted)	263
<i>B. impatiens</i> (Common eastern)	396

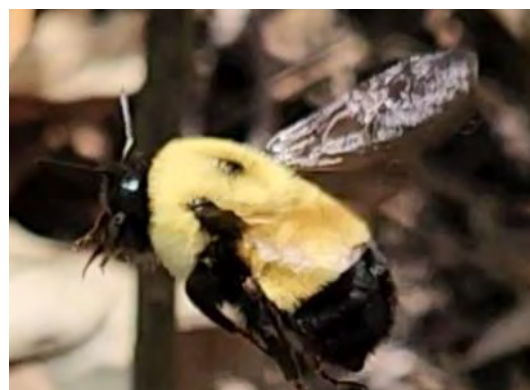
Note: Number of sites do not necessarily mean that the bee is more common throughout the state, just that it was reported more frequently.



Is it an American bumble bee (State Species of Greatest Conservation Need) or a Black and Gold? It's an American bumble bee! Michael reported 24 Black and Gold and 1 American bumble bee this past year on his property. Photo: Michael Ross



A beautiful photo of Sanderson's bumble bee (*B. sandersoni*) in Clark county. This was a county record! Dan Jackson found an impressive five county records this year. Photo: Dan Jackson



Rusty patched bumble bee (*B. affinis*) queen from Milwaukee county.
Photo: Milwaukee County Parks



Survey Results: Comparing Between Years

Overall, despite record numbers of volunteers, we had far fewer bees observed per observer this year compared to last year despite a strong early start with plenty of spring queens observed. We saw this in both small area surveys and incidental surveys.

Year	# Bees	# Observations	# Observers	# Bees / Observer	# Bees / Observation
2020	12,101	4,090	148	81.8	2.96
2021	13,862	4,129	204	68.0	3.36
2022	14,831	3,904	227	65.3	3.80
2023	30,105	6,680	278	108.3	4.51
2024	14,330	4,507	288	49.8	3.18

Table 1 (Above): Shows the relative number of bees found per observer during a year. As you can see, we had a very high number last year, and a rather low number this year. Note that this is a rough estimate, since all observers may not find equal numbers of bees. Observations reflect when people found a species of bee; number of bees reflect the abundance of bees. If someone found 12 Common eastern bumble bees, they would have 1 observation and a count of 12 bees.

WI Bumble Bee Brigade Observations by Gender 2022-2024

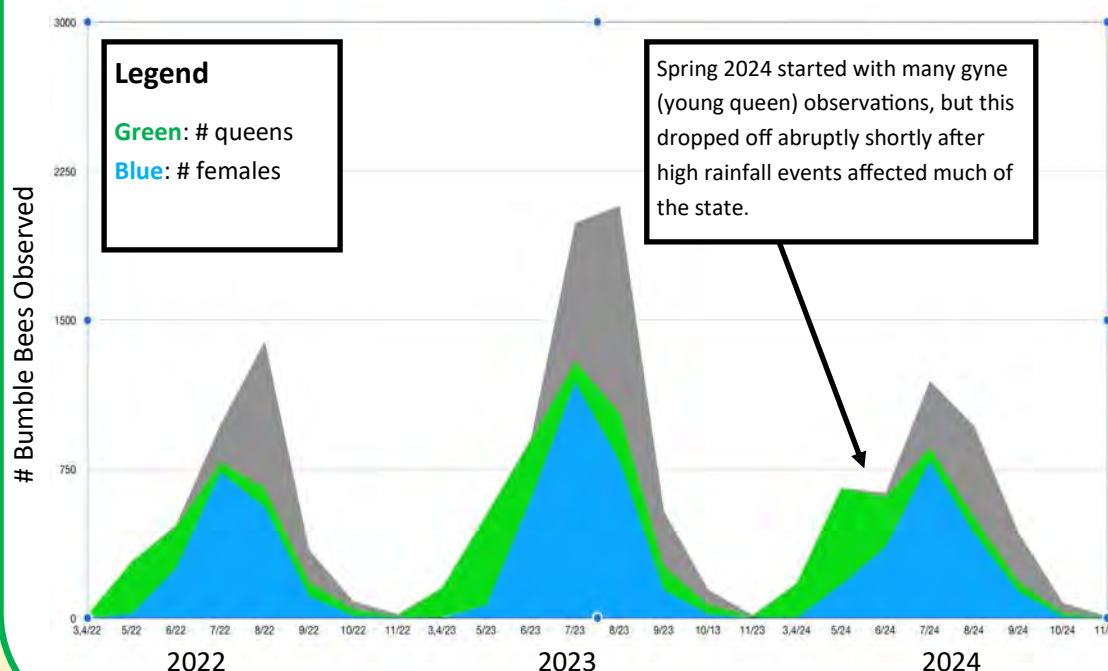


Figure 1 (Left): X-axis is time, y-axis is number of bees observed. Figure 1 shows the number of bees observed over three years from 2022—2024. In 2024, we started strong with many spring queens, but numbers dropped dramatically soon after. One hypothesis is that this was caused by the flooding many parts of the state experienced in early summer.

Figure by Judy Cardin

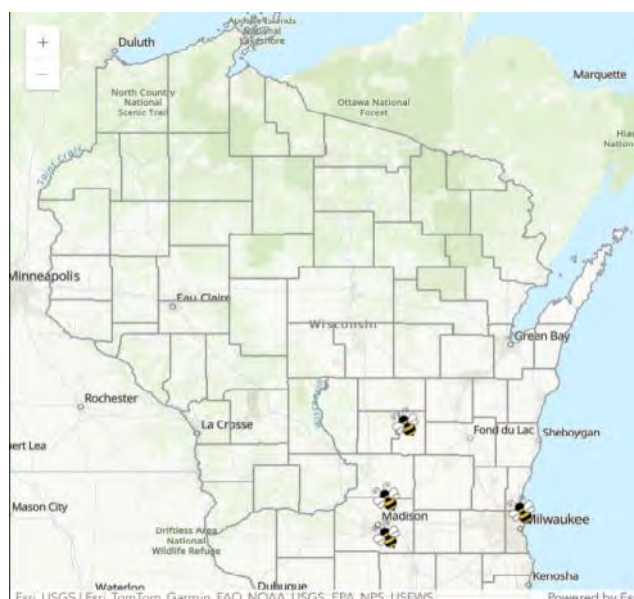
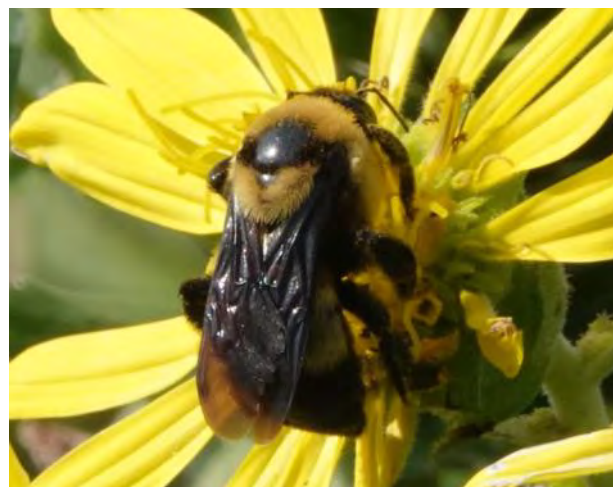
WANTED ALIVE: SOUTHERN PLAINS BUMBLE BEE

Alias: *Bombus fraternus*



Description:

- Short black face
- Black vertex
- Thorax band
- Usually dark on sides of thorax under wing
- T1-2 yellow
- T3-6 black
- Abdomen has a flattened, rectangular appearance
- Hair very short and even
- Large size



Top: Southern Plains female in Dane county. Photo by Bob Honig

Bottom: Map of approximate Southern Plains findings in Wisconsin since 2023

Poster photo: Wanted poster photo of Southern Plains female in Green Lake County, photo by Ben Grady

A Big Year for *Bombus Fraternus*

Thank you for keeping an eye out for the elusive Southern Plains bumble bee! We were excited to see the Southern Plains bumble bee for the first time in 2023 along the southern border of Wisconsin. The Southern Plains bumble bee is a large bumble bee that resembles the Black and Gold bumble bee, but with slightly different coloration and a flattened abdomen. Similar to Black and Gold bumble bees, males of this species are known to perch and “chase moving objects in search of mates” (Williams 2014, in NatureServe species description). They inhabit open prairies, meadows, and grasslands. Historically, the Southern Plains bumble bee had an extremely wide range across 26 states, from the southeast to the plains and Midwest. It was a fairly common bee (US Fish and Wildlife Service). However, NatureServe estimates it has declined by about 56% in relative abundance and range. Today, the Southern Plains bumble bee is being considered by the U.S. Fish and Wildlife Service for protection under the U.S. Endangered Species Act, and it is ranked in NatureServe as globally vulnerable. We were surprised and excited when Lauren found one in Juneau county, Maggie Honig, Bob Honig, and Gail Schaefer found one in Dane county, and Amy Hussin found one in Milwaukee county. Is it moving north? Time will tell.

Your participation in action

City of Middleton Uses B3 Data to Inform 2025-2030 Conservancy Lands Plan

"The City of Middleton has over 770 acres of Conservancy Lands, which it works to maintain as native habitat for wildlife like Wisconsin's bumble bees. In 2024, the City's staff along with contractor Adaptive Restoration LLC began updating the Conservancy Lands Plan, which was last completed in 2018. In order to inventory the wildlife that use the Conservancies, the staff asked for data on bumble bees documented through the Bumble Bee Brigade. Eight species had been documented in the Conservancies, including two sightings of the rusty-patched bumble bee (*Bombus affinis*). This information will help City staff plan future restoration and vegetation management activities."

- Evelyn Williams, Adaptive Restoration LLC

Photo: Evelyn Williams

2025-2030 CONSERVANCY LANDS PLAN

CITY OF MIDDLETON



Conservancy Lands Plan 2025-2030 DRAFT

Your participation in action

Collaborations between Researchers and Nonprofits

- ◆ UW-Green Bay research on flower preferences (Dr. Amy Wolf lab)
- ◆ UW-Madison research on rural-urban gradients and fire regimes (Dr. Claudio Gratton Lab)
- ◆ UW-Parkside research on bumble bees across the landscape (Dr. Jessica Orlofske lab)
- ◆ BeeMachineAI—Photos used for training AI, a tool for people studying bees (Dr. Brian Spiesman, KS State)
- ◆ Informed National Fish and Wildlife Federation Landscape—scale grant site selection (A \$100,000 grant for habitat restoration across Wisconsin)
- ◆ Used for reporting in Great Lakes Restoration—US Fish and Wildlife Service Threatened and Endangered Species Template

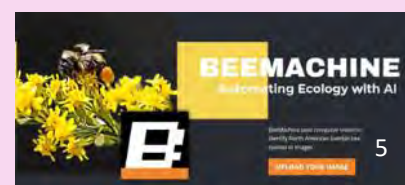
Good things come in pairs! A pair of Rusty patched bumble bee males (*B. affinis*) in Brown county.
Photo: Gail Vann



UNIVERSITY of WISCONSIN
GREEN BAY



UNIVERSITY of WISCONSIN
PARKSIDE



Your participation in action

B3 Data used by state and federal organizations

Rusty patched bumble bee male
Photo: Dawn Williams

From 2024

- ♦ B3 volunteers' hours will be used as \$49,000 in match to help the WI DNR get federal grants, which will be used for various operations and habitat conservation with the Natural Heritage Conservation Bureau
- ♦ B3 data was shared with the U.S. Fish and Wildlife Service to create High Potential Zones (HPZs). These zones impact habitat management on those sites and require environmental review in Wisconsin.
- ♦ U.S. Fish and Wildlife Service (USFWS) proposed to designate 1,635,746 acres of occupied critical habitat across 33 counties in Illinois, Iowa, Minnesota, Virginia, West Virginia and Wisconsin for the endangered rusty patched bumble bee under the Endangered Species Act.
- ♦ Environmental Protection Agency (EPA) – Is working on developing population models for key native pollinators to inform the pesticide risk assessment process. B3 data were used to help parametrize and validate these models by comparing model predictions of bee density to empirical data. This research will improve protections of native and endangered bees including RPBB by allowing the EPA to consider these species when regulating the sale and use of pesticides.

In Previous Years

- ♦ B3 data was used to provide valuable reporting information for a national federation of Wildlife (NFWF) grant. This grant supported a landscape-e scale project that created and improved 2,000 acres of pollinator habitat across priority areas in SW Wisconsin. Some of this habitat included some public land in Iowa county that was converted from row crops to permanent prairie close to a 2022 Rusty patched bumble bee B3 observation. Fingers crossed the bees find their way over!
- ♦ B3 data was also used to provide information on pollinators across the Great Lakes basin. These surveys identified priority areas for management and resulted in improved prairie planting at key sites.

Map of High Potential Zones., 2024
Created by U.S. FWS

Earthstar Geographics | Sources: Esri; U.S. Department of Commerce, Census Bureau; U.S. ...

Finding Bees and Inspiring People: The First B3 Ambassadors Cohort



To conserve pollinators, it's vital that we not only find bees, but inspire people. Each year, staff members at the DNR have the happy challenge of having far too many good event requests and opportunities around the state each to do outreach than we have time to do them. This year, we were very excited and grateful to be able to partner with the Wisconsin Master Naturalists to launch an advanced Master Naturalist 'train the trainers' Bumble Bee Brigade Ambassadors program. Brooke Gilley at Wehr Nature Center generously hosted and co-organized it. New Bumble Bee Brigade Ambassadors attended a full day of training that covered both bee biology and identification and tips on tabling, outreach, frequently asked questions, and more. Attendees then planned to do one outreach event and two bumble bee surveys over the next year. The project was a huge success! DNR parks and nature preserves were very grateful to have help with outreach events, and it was so exciting to see more people around the state learning about and appreciating pollinators.

Big thank you to Bumble Bee Brigade Ambassadors from 2024: Amy Harbach, Bob Ring, Bridie Fanning, Carol Elkins, Dennis Reynolds, Diane Reynolds, Ellen Orlowski, Glenn Chadwick, Howard Aprill, Jasmine Vigas, Jennifer Yunker, Jeanne Meyer, Jeffrey Veglahn, Jennifer Lazewski, Katharine O'Connell Valuch, Maggie Toole, Marge Wappler, Mary Cieslewicz, Mary Wagner, Meg Shad, Pam Shefchik, Paul Akert, Paul Sparks, Rachel Padour, Robert McKee, Sam Holm, Teri Quaintance, Terri Hart-Ellis, and Tracy Fliess

Table of County Records from B3 in 2024

Bumble bee Species	County
American (<i>B. pensylvanicus</i>)**	Buffalo, Marquette
Black and Gold (<i>B. auricomus</i>)	Burnett, Waushara
Confusing (<i>B. perplexus</i>)**	Clark, Wood
Fernald cuckoo (<i>B. flavidus</i>)*	Door, Wood
Frigid (<i>B. frigidus</i>)	Douglas
Indiscriminate Cuckoo (<i>B. insularis</i>)**	Portage
Lemon cuckoo (<i>B. citrinus</i>)	Adams, Burnett, Lafayette
Northern amber (<i>B. borealis</i>)	Marquette, Pierce, Vernon
Redbelted (<i>B. rufocinctus</i>)	Sawyer
Sanderson's (<i>B. sandersoni</i>)**	Clark, Dunn, Eau Claire, Manitowoc, Price, Sawyer
Southern plains (<i>B. fraternus</i>)	Columbia, Dane, Green Lake, Juneau, Milwaukee
Twospotted (<i>B. bimaculatus</i>)	Pierce, Price, St. Croix
Yellow (<i>B. fervidus</i>)**	Adams, St. Croix, Waushara
Yellowbanded (<i>B. terricola</i>)**	Calumet

*State Species of Greatest Information Need

**State Species of Greatest Conservation Need

County Record Rockstars 2024

Check here to see if you found a county record!

Name	County Records
Amy Hussin	Southern Plains (<i>B. fraternus</i>) in Milwaukee county
Annie Leffel	Confusing (<i>B. perplexus</i>) in Clark county
Ben Grady	Southern Plains (<i>B. fraternus</i>) in Green Lake
Bob Plamann and Judy Cardin	Sanderson's (<i>B. sandersoni</i>) in Price county, Twospotted (<i>B. bimaculatus</i>) in Price
Bob Honig	Southern plains (<i>B. fraternus</i>) in Dane county
Cheryl Muller	Sanderson's (<i>B. sandersoni</i>) in Dunn county, Sanderson's (<i>B. sandersoni</i>) in Eau Claire
Dan Jackson	Lemon cuckoo (<i>B. citrinus</i>) in Burnett county, Northern amber (<i>B. borealis</i>) in Vernon county, Northern Amber (<i>B. borealis</i>) in Vernon county, Sanderson's bumble bee (<i>B. sandersoni</i>) in Clark county, Sanderson's bumble bee (<i>B. sandersoni</i>) in Sawyer county
Debbie Walters	Twospotted (<i>B. bimaculatus</i>) in St. Croix county, Yellow (<i>B. fervidus</i>) in St. Croix county,
Eric Howe	Fernald cuckoo (<i>B. flavidus</i>) in Door county
Elizabeth Braatz	Frigid (<i>B. frigidus</i>) in Douglas county

*State Species of Greatest Information Need

**State Species of Greatest Conservation Need

***Federally Endangered

County Record Rockstars 2024 Continued...

Check here to see if you found a county record!

Name	County Records
James Otto	Southern Plains (<i>B. fraternus</i>) in Columbia
Jay Watson	American (<i>B. pensylvanicus</i>) in Buffalo
Judy Cardin	Black and Gold (<i>B. auricomus</i>) in Burnett county
Kathryn Gottwald	Indiscriminate cuckoo (<i>B. insularis</i>) in Portage county
Lauren	Southern Plains (<i>B. fraternus</i>) in Juneau
Lainie Heizler	American (<i>B. pensylvanicus</i>) in Marquette county, Northern amber (<i>B. borealis</i>) in Marquette county
Liam E Guenin	Sanderson's (<i>B. sandersoni</i>) in Manitowoc county
Mlind	Fernald cuckoo (<i>B. flavidus</i>) in Wood county
Mitch Bergeson	Northern amber (<i>B. borealis</i>) in Pierce county, Twospotted (<i>B. bimaculatus</i>) in Pierce county
Timothy Holme	Black and Gold (<i>B. auricomus</i>) in Waushara county, Lemon cuckoo (<i>B. citrinus</i>) in Adams county, Yellow (<i>B. fervidus</i>) in Adams, Yellow (<i>B. fervidus</i>) in Waushara
Pamela Tesch	Confusing (<i>B. perplexus</i>) in Wood county
Rachel Padour	Yellowbanded (<i>B. terricola</i>) in Calumet county
Rachel Veltman	Lemon cuckoo (<i>B. citrinus</i>) in Lafayette county
Rick Kaiser	Redbelted (<i>B. rufocinctus</i>) in Sawyer county

*State Species of Greatest Information Need

**State Species of Greatest Conservation Need

***Federally Endangered

2024 Participation by County

B3 participation varies a great deal by county, with the most populous counties tending to have more volunteers. The number of species verified in a county doesn't always represent the diversity of bumble bee species present. Instead, it often relates to the number of volunteers participating in that county or how often they survey.

County	Species Verified	Surveys	Sites	Participants
Adams	8	10	6	4
Ashland	6	2	2	2
Bayfield	14	57	29	6
Brown	13	88	30	17
Buffalo	2	2	2	2
Burnett	12	15	11	4
Calumet	12	75	21	8
Chippewa	4	2	2	2
Clark	6	5	5	3
Columbia	7	5	5	4
Crawford	7	9	5	4
Dane	12	360	129	66
Dodge	5	15	6	6
Door	13	38	19	11
Douglas	9	6	4	3
Dunn	7	5	3	2
Eau Claire	11	13	10	5
Fond du Lac	3	4	4	4
Forest	1	1	1	1
Grant	10	13	6	4
Green	5	6	3	3
Green Lake	7	6	6	4
Iowa	9	30	13	5
Iron	3	5	1	1
Jackson	11	15	13	7
Jefferson	9	27	6	3
Juneau	7	8	7	6
Kenosha	8	30	17	8
La Crosse	12	224	25	9
Lafayette	5	3	2	2
Manitowoc	11	42	21	14
Marathon	6	12	7	6

*Counties not listed did not have data submitted in 2024

2024 Participation by County, continued

County	Species Verified	Surveys	Sites	Participants
Marinette	3	3	3	3
Marquette	3	4	4	4
Milwaukee	11	340	135	48
Monroe	9	17	8	3
Oconto	2	1	1	1
Oneida	6	11	4	4
Outagamie	9	38	15	9
Ozaukee	8	53	8	4
Pierce	8	11	4	3
Polk	3	4	4	4
Portage	9	11	9	9
Price	11	7	7	3
Racine	9	79	19	7
Richland	2	1	1	1
Rock	8	22	9	9
Rusk	9	4	4	3
Sauk	12	40	17	8
Sawyer	9	13	11	6
Shawano	7	8	7	2
Sheboygan	7	12	10	8
St. Croix	4	4	3	1
Taylor	2	1	1	1
Trempealeau	8	11	4	2
Vernon	11	24	9	3
Vilas	1	2	2	2
Walworth	10	62	11	9
Washington	7	20	11	7
Waukesha	9	60	35	20
Waupaca	7	3	1	1
Waushara	8	11	9	4
Winnebago	11	37	17	10
Wood	8	13	4	3

*Counties not listed did not have data submitted in 2024