BUMBLE BEE BRIGADE

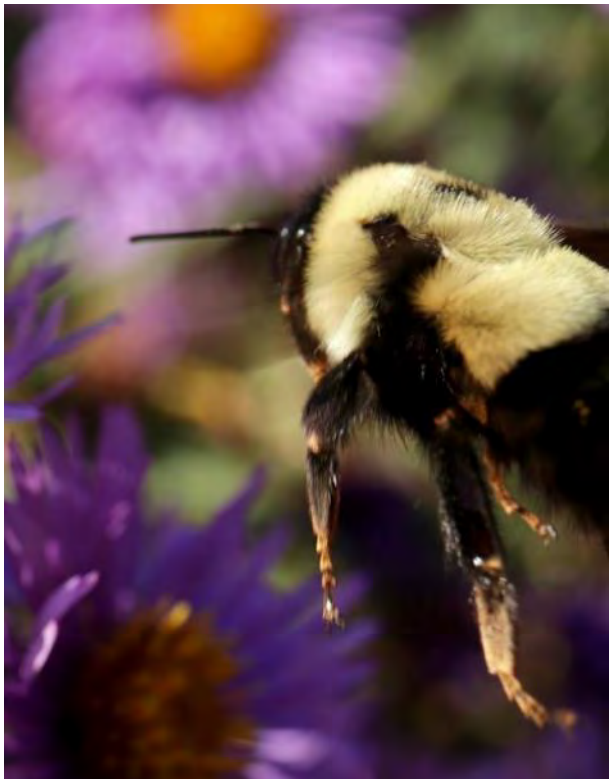
2022 Year-In-Review

Can you bee-lieve that you have conducted 3,500 surveys and counted 11,948 individual bees this year? B3 volunteers contributed +3,200 hours to this project in 2022 alone. We are so impressed and grateful to all of you! Although we have seen some decreases in total surveys as people begin to enjoy traveling, hobbies, and other activities put on hold during the pandemic, we saw a strong showing of new and returning volunteers. Your dedication to monitoring and conservation Wisconsin's bumble bees is making a difference. Thank you all!

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

B3 Contributions	Number*
Volunteers	227
Species Observed	18
Observations	3500
Surveys	1,510 (188 small area & 1,322 incidental)
Sites	1,858
Counties with Surveys	63

*Includes historical observations submitted in 2022



A Rusty patched gyne heads towards asters. Photo: Gail Vann

Your data in action

RESEARCH

- Researchers at UW Green Bay and B3 members used B3 data to publish on what flowers Rusty patched bumble bees used most frequently (https://doi.org/10.3375/22-2)
- B3 volunteers Judy Cardin and Bob Plamann recorded and shared Rusty patched bumble bee floral phenologies, with helpful photos and recommendations for spring blooming plants (https://online.flippingbook.com/view/810946527/)
- Several B3 members participated in USGS surveys. Thanks to these, researchers found that if you think Rusty patched bumble bees are at a site, you have a very high chance of finding them if you survey up to six times at that site in early July (https://doi.org/10.1093/ee/nvac090)
- Researchers at UW Madison are using B3 data to study population dynamics so we can learn where they are and how to help them. Small area surveys were vital to this study.

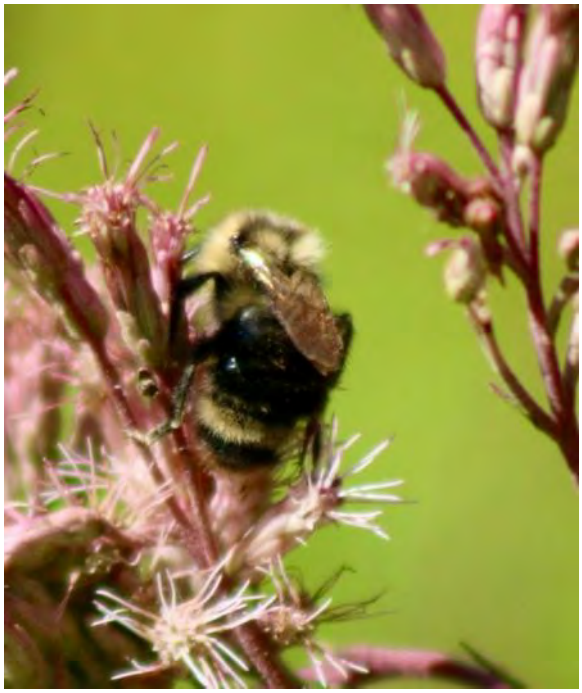
HABITAT

- B3 data is shared with the U.S. Fish and Wildlife Service to create High Potential Zones for Rusty patched bumble bees. These zones impact habitat management on those sites.
- B3 data was used to provide valuable reporting information for a National Resources Foundation NFWF grant. This grant supported a landscape-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 valuable reporting information for surveys across the Great Lakes basin. These surveys identified priority areas for management and resulted in improved habitat and prairie planting at key sites.

2022 Fast Facts

- B3 volunteers added new county records for the federally endangered Rusty patched bumble bees (*B. affinis)* in Richland county, Dunn County, and Calumet county
- The Rusty patched bumble bee was reported 404 times across 226 sites.
- B3 volunteers added new county records for Fernald cuckoo (*Bombus flavidus)* in Florence, Lincoln, and Wood counties, and a new county record for the Tricolored bumble bee *(B. ternarius)* in Rock county.
- American bumble bees (*B. pensylvanicus)* were reported 23 times across 19 sites.
- Some of the largest aggregations of bees of the same species reported in a single observation was a group of 500+ Common eastern bumble bees (*B. impatiens)* in Sauk county, 500+ Common eastern bumble bees in Dane county, and, excitingly, 150 Tricolored bumble bees in Bayfield county.
- The Fernald cuckoo and Sanderson's bumble bee *(B. sandersoni)* were verified at <10 sites, while the Common eastern bumble bee was the most widely reported at + 300 sites. *Please note that these numbers don't fully represent how rare or common a species is. Reporting bias, location of volunteers, and difficulty in identifying some species in photos all play a role in the number of sites at which a species is verified.*
- 36 bumble bee nests were verified, representing 10 species. This is a substantial increase from eight in 2019. Neat nest finds included nests of the American bumble bee and Yellow bumble bee, which are both Species of Greatest Conservation Need, some waxworms parasitizing a Black and gold bumble bee (*B. auricomus)* nest, some bumble bees using an old gopher hole, and lots of bees using old vole or other rodent nests.

One of only two Sanderson's bumble bee observations from 2022 Photo: Washburn Ranger District



A new county record for the Fernald cuckoo in Florence
Photo: B3 volunteer Judy Cardin

2022 Preliminary Results

Species	2022 Sites
B. nevadensis (Nevada)*	1
B. sandersoni (Sanderson's)	2
B. flavidus (Fernald cuckoo)	8
B. insularis (Indiscriminate cuckoo)	13
B. perplexus (Confusing)	19
B. pensylvanicus (American)	19
B. terricola (Yellowbanded)	21
B. ternarius (Tricolored)	47
B. borealis (Northern amber)	51
B. citrinus (Lemon cuckoo)	98
B. fervidus (Yellow)	118
B. auricomus (Black and gold)	132
B. vagans (Half-black)	160
B. rufocinctus (Redbelted)	184
B. bimaculatus (Twospotted)	210
B. affinis (Rusty patched)	226
B. griseocollis (Brownbelted)	239
B. impatiens (Common eastern)	310

*Preliminary male-only observation

Above: This bee was suspected to be *B. nevadensis* due to its coloration on T1-4, but an examination of its genitals under a microscope revealed it to be *B. auricomus*. Found by Jay Watson.
Below: *B. Insularis.* Photo: Alyssa Powell

B. pensylvanicus near a nest. Photo: Zach Kastern

B perplexus . Photo: Angus Mossman

Spotlight on B3 Volunteers

STORIES FROM PARTICIPANTS

Hallie at Milwaukee County Parks

"One of the biggest highlights of the season was our record-breaking Bombus affinis sighting day. We went out with our entire seasonal staff on the first Friday in August to survey exclusively for rusty-patches at as many new sites as possible. We found them at 7 separate sites that day with 6 of them being new. What really contributed to the excitement was that at each site a different member of our staff was the first to spot this species." Hallie Minser, Restoration Ecologist

Milwaukee County Parks participants also confirmed their first *B.perplexus* in 2022. Exciting work! You can check out more here: https://county.milwaukee.gov/EN/Parks/What-We-Do/Conservation

Photo: Hallie Minser

Bob at AriensCo.

"I've greatly enjoyed partaking in the conservation efforts at AriensCo the last three years. It's been a joy to work with the members of the team, learning from them and sharing my knowledge on bluebirds and purple martins… I never anticipated being involved with bumble bee studies, but [after our conservation intern Rachel's dedication to beginning the surveys] I took a late season crash course, and immediately discovered a meaningful new interest, fueled by the discovery of the Rusty Patched. Two months earlier, I might have walked right past this endangered bee without giving a second look. Now, I'm anxiously awaiting the arrival of spring to continue honing my identification skills as I search for the first gynes of the season." - Bob Ring, AriensCo Team member

The company Ariens Co. has been hard at work creating habitat and helping wildlife for many species, including bluebirds, tree swallows, purple martins, butterflies, and bees. As part of conservation efforts, they have been planting earlier and later blooming flowers to support bumble bees throughout their entire life cycle, and everyone was delighted when Bob found the first Rusty patched bumble bee in Calumet county this summer.

Photo: Rachel Padour

Spotlight on B3 Volunteers

STORIES FROM PARTICIPANTS

A big thank you to Alex Lehner, Angus Mossman, Ann P. Reilly, Beth Whitaker, Bob Ring, Christy Poniewaz, Clare Carlson, Connie Weedman, Gail Vann, Harold Ehrenreich, Jeff Verdoorn, Jennifer Ambrose, Jennifer Beil, Jim Knickelbine, Judy Cardin, Julia RobsonJustin Nooker, Marnie Schulenburg, Melody Orban, Robert Berrie, Sudeep Samanta, Susan Carpenter, Tyler Boudry, Zach Kastern, and all the other B3 volunteers who shared the buzz on pollinators by giving talks, writing blogs, and or other educational outreach for the public in 2022!

B3 volunteer Angus Mossman has found over 40% of all of our bumble bee nests this year! Nests are notoriously hard to find, so shout out to Angus for all the great information!

Photo: Elizabeth Braatz

Shout out to B3 volunteers Judy Cardin and Zach Kastern for managing the Wisconsin Bumble Bee Observers Facebook page. This 800+ member community has been vital to helping bee enthusiasts connect and learn. Check out Judy's Spring Queen posts to learn how to ID queen bumble bees.

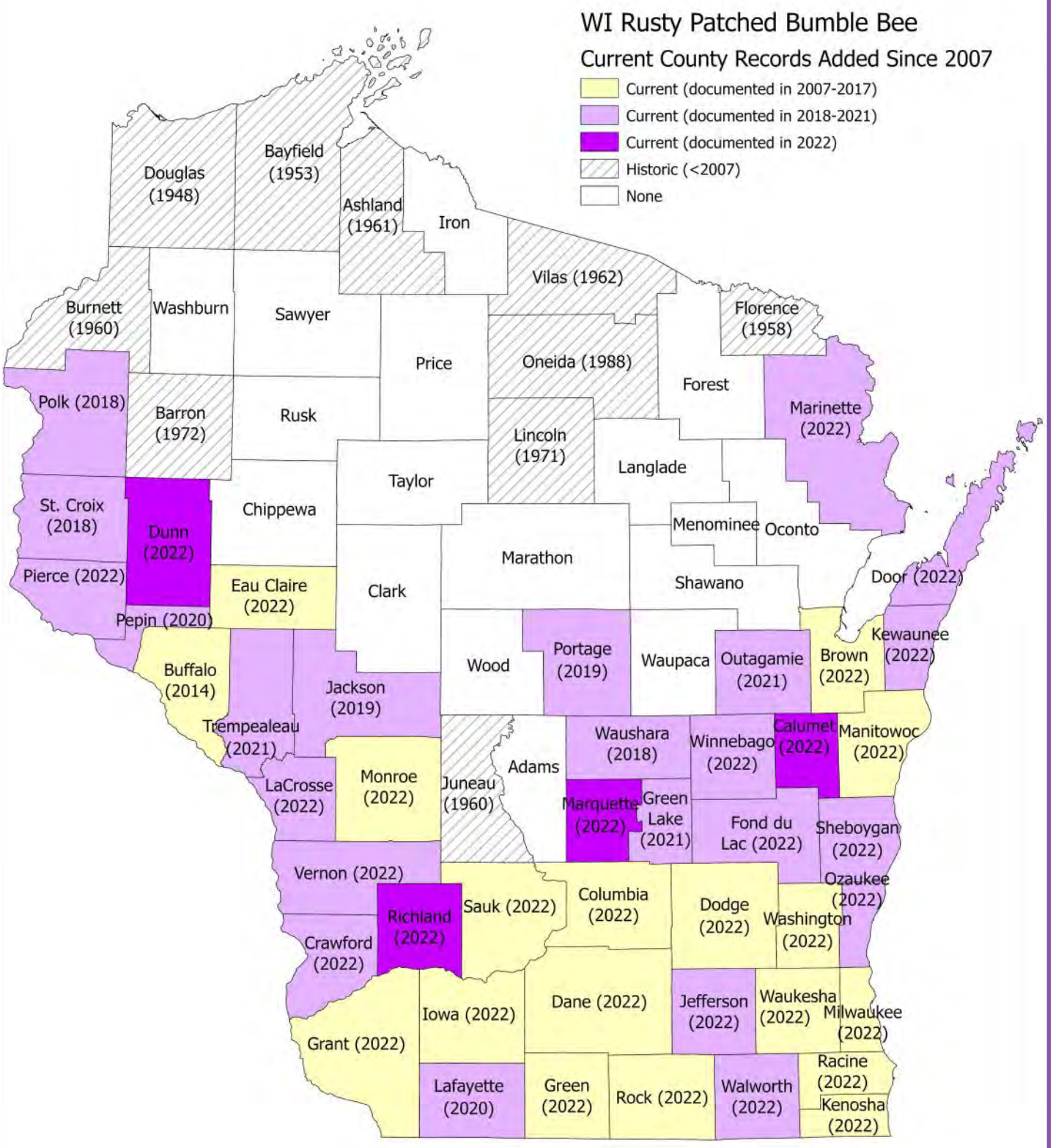
"Diane and I enjoy exploring various properties and environments while making bumblebee observations."

- Rory Williams, B3 Volunteer (bottom photograph)

Rory, Diane Perschbacher, and other B3 volunteers' Rusty patched bumble bee observations and detailed habitat notes were vital for grant reporting and management planning.

Photo: Rory Williams

Known Distribution of the Rusty Patched Bumble Bee



Map of B3 Impacts Across Wisconsin: B3 and other efforts since B3 was launched have considerably added to our knowledge about Rusty patched bumble bee current distribution in the state (purple).

Resources for Bees and Resources for You

Planting for Pollinators: According to surveys from both *Wolf et al. (2022)* and Judy Cardin and Bob Plamann's guide, great flowers for Rusty Patched bumble bee gynes include:

- **Spring Standouts:** Dutchman's breeches (*Dicentra cucullaria*), eastern bluebells (*Mertensia virginica*), wild lupin (*Lupinus perennis*) , Virginia spring beauty (*Claytonia virginica*), and Virginia Waterleaf (*Hydrophyllum virginica*)
- **Summer Survivors**: Wild bergamot (*Monarda fistulosa)*, Spotted beebalm (*Monarda punctata)*, Joe-Pye weeds (*Eutrochium*), Culver's Root (*Veronicastrum virginicum*), Purple Giant Hyssop (*Agastache scrophulariifolia*), St. John's wort (*Hypericum* spp.), and Anise Hyssop (*A. foeniculum*). And don't forget native Milkweed (*Asclepias)* species for monarchs!
- **Fantastic Fall**: Native thistles like Field Thistle (*Cirsium discolor*), Showy Goldenrod (*Solidago speciosa*), and New England Aster (*Symphyotrichum novae-angliae*)

Half-black bumble bee queen.
Photo: Gail Vann

Online Resources

Ohio State University Bumble Bee Short Course

A six-session short course for all things bumble. Very informative! https://u.osu.edu/thebumblebeeshortcourse/

Bumble Bees of the Eastern United States

A free booklet with detailed photos and identification guides by the Pollinator Partnership and U.S. Forest Ser vice https://www.pollinator.org/pollinator.org/assetsgeneralFilesBumbleBeeGuide2011.pdf

Wisconsin Bumble Bee Observers Facebook Page

A great way to connect with a community of volun teers. https://www.facebook.com/groups/555238811914604/?mibextid=6NoCDW

Questions? Email us at
dnrfwpwibumblebeebrigade@wisconsin.gov

Keep an eye out!

What bees are we trying hardest to find?

- The Federally Endangered Rusty patched bumble bee (*B. affinis*)
- State Species of Greatest Conservation Need

  Frigid bumble bee (*B. frigidus*), Yellow bumble bee (*B. fervidus*), Confusing bumble bee (*B. perplexus*), Sanderson's bumble bee (*B. sandersoni*), American bumble bee (*B. pen sylvanicus*), Yellow-banded bumble bee (*B. terricola*), Indiscriminate cuckoo bumble bee (*B. insularis*)
- State Species of Greatest Information Need

  Ashton's cuckoo (*B. bohemicus*), Variable cuckoo (*B. variablis*), Fernald cuckoo (*B. fla vidus*)

Least Found Species in 2022

Sanderson's bumble bee
Only 2 observations
Photo: Judy Cardin

Nevada bumble bee
Only 2 observations of males
Photo: Bob Plamann

Fernald cuckoo
Only 10 observations
Photo: Ryan Brady

American bumble bee
Only 23 observations
Photo: DW Benson

Confusing bumble bee
Only 25 observations
Photo: Cheryl Muller

Least Surveyed Counties

0 Surveys were conducted in Menominee county and only 3 surveys were conducted in Barron and Clark counties since 2018

2022 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	2	1	1	1
Ashland	9	10	9	5
Bayfield	11	50	23	8
Brown	12	103	32	20
Burnett	11	5	5	1
Calumet	11	39	9	5
Chippewa	8	2	2	1
Clark	2	1	1	1
Columbia	3	4	4	4
Crawford	8	5	5	4
Dane	12	254	114	47
Dodge	6	4	4	4
Door	10	18	10	5
Douglas	1	2	2	2
Dunn	9	6	5	2
Eau Claire	12	23	12	2
Florence	10	5	5	2
Fond du Lac	10	11	7	5
Forest	5	6	2	2
Grant	2	4	2	2
Green	7	9	9	4
Green Lake	6	4	4	3
Iowa	10	77	26	10
Iron	6	3	2	2
Jackson	5	4	3	3
Jefferson	9	48	9	5
Juneau	6	3	3	3
Kenosha	9	26	12	7
Kewaunee	7	3	3	2
La Crosse	10	81	17	8

*Counties not listed did not have data submitted in 2022

2022 Participation by County, continued

County	Species Verified	Surveys	Sites	Participants
Lincoln	1	1	1	1
Manitowoc	11	13	9	7
Marathon	7	8	5	5
Marinette	11	5	5	4
Marquette	10	5	3	2
Milwaukee	11	267	120	32
Monroe	7	19	13	7
Oconto	1	1	1	1
Oneida	7	11	3	3
Outagamie	10	9	8	5
Ozaukee	7	13	5	4
Pierce	3	3	2	2
Polk	7	11	2	2
Price	1	1	1	1
Racine	9	45	14	6
Richland	4	4	4	2
Rock	11	46	13	4
Rusk	0	1	1	1
Sauk	13	49	21	5
Sawyer	1	3	2	2
Sheboygan	10	9	9	6
St. Croix	2	2	2	2
Taylor	1	1	1	1
Trempealeau	7	6	4	3
Vernon	8	9	6	5
Vilas	1	1	1	1
Walworth	10	42	18	11
Washington	7	12	10	7
Waukesha	9	74	42	31
Waupaca	5	7	2	2
Waushara	8	5	5	4
Winnebago	9	15	8	2
Wood	1	1	1	1