

wiatri.net/inventory/bbb





WI Bumble Bees Need Our Help



rufocinctus









griseocollis



impatiens

bimactulatus



borealis



vagans

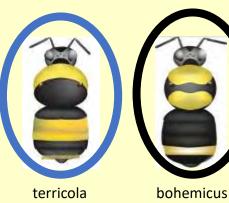


pensylvanicus





auricomus





citrinus

variabilis





Causes of Population Decline

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



Mission

To improve our understanding, management, and conservation activities of 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:

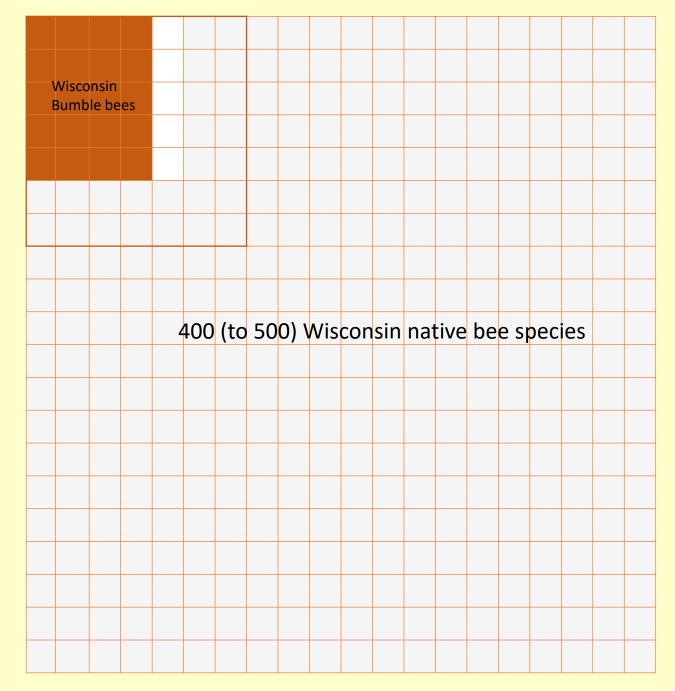
85% are solitary bee species

15% are social or semi-social bees



Social, perennial, European Honey bee:

1

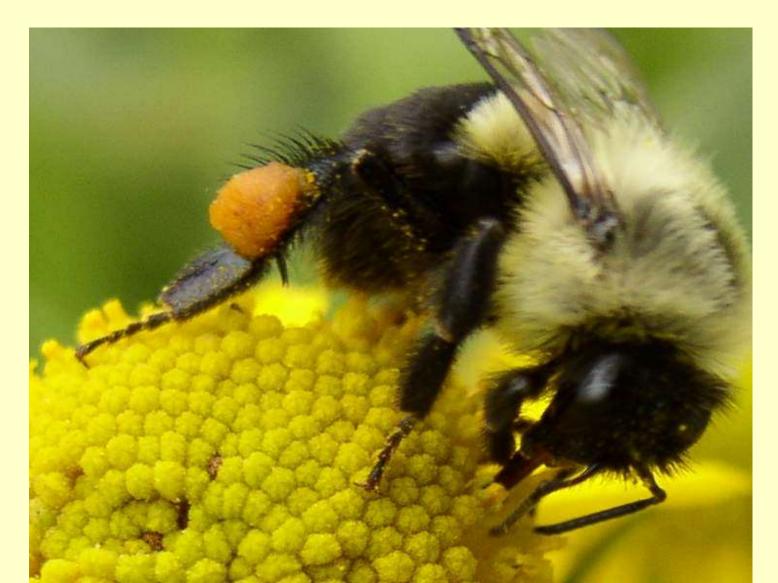


- Social (queens, workers & males), annual colony
- Wide variety of habitats
- Most diverse in temperate & montane areas
- WI active mid April early October (varies by species)
- Very hairy bodies, active early & later in day
- <u>Buzz pollination</u>

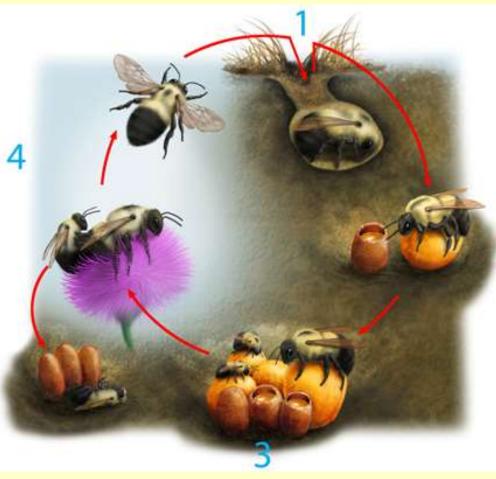




• Corbicula – pollen carrying structure



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



When her daughters emerge as adults, they take over foraging and other duties She creates wax pots to hold nectar and pollen, in which she lays and incubates her eggs.

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- Nesting

- 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









Overwintering B. affinis gyne

Photo credit: Brad Herrick

Cuckoo Bumble Bees

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



Lemon Cuckoo

Indiscriminate Cuckoo

Cuckoo Bumble Bees

- Two very rare (possibly extirpated) from WI
- No recent records in WI



Ashton Cuckoo



Commercial Bumble Bees



- Tomatoes
- Peppers
- Squash
- Strawberries
- Blueberries
- Cranberries

Things Bumble Bees Need

- Nesting Habitat
- Floral Resources
- Overwintering Habitat
- Water



THE WISCONSIN POLLINATOR PROTECTION PLAN

In Wisconsin, pollinator dependent crops account for over \$55 million in annual production.





Conserving Bumble Bees

Guidelines for Creating and Managing Habitat for America's Declining Pollinators



Rich Hatfield, Sarina Jepsen, Eric Mader, Scott Hoffman Black, and Matthew Shepherd THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION

Habitat: A bee's eye view

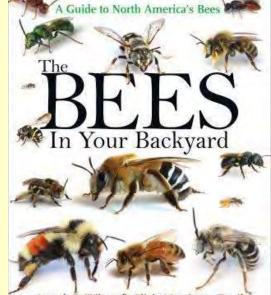


Native plant gardens with diverse, abundant floral resources; suitable nest sites, late season flowers and overwintering sites; no insecticides, especially systemic ones.

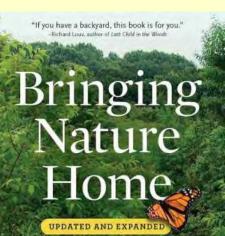
Resources



http://bugguide.net http://www.discoverlife.org/

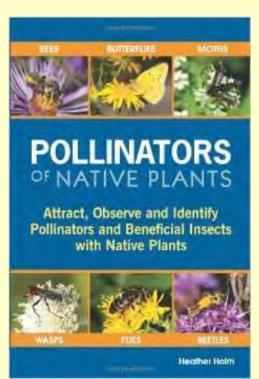


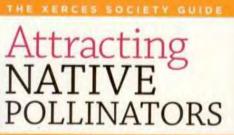
Joseph Ŝ. Wilson & Olivia Messinger Carril



How You Can Sustain Wildlife with Native Plants

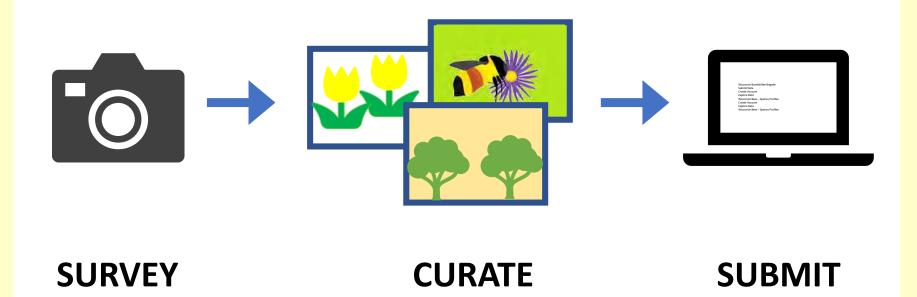
Douglas W. Tallamy With a Foreword by Rick Darke







Methods



Photography-Based



2.4

Two Ways to Contribute

- Incidental observations are basic, 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 this manual.

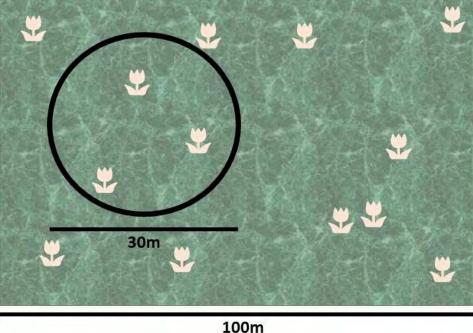
BOTH REQUIRE PHOTO VOUCHERS

Small Area Surveys

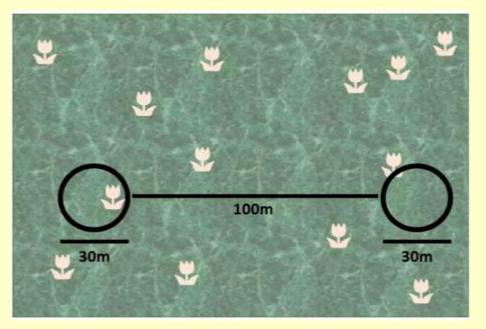
- Record basic survey information
- Stay within a 30m diameter area
- Count the number of bumble bees of each morph that you see
- Photograph at least one bee per morph
- Record number of bees (by male, female, queen), presence of nests, & photo names on Data Sheet
- Curate photos
- Summarize data on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

Small Area Surveys- Where & When

- Site: general location, anywhere with blooming plants
- Survey location: specific area you survey (30m diameter)

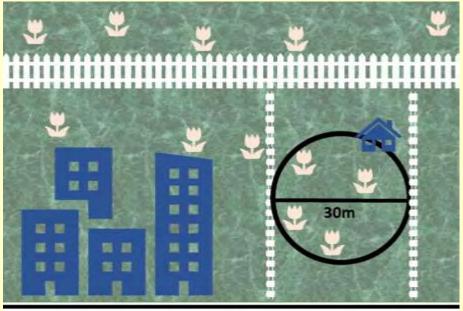


Small Area Surveys- Where & When



Large site: multiple surveys 100m apart

Obstructed site: survey open space in the circle



Small Area Surveys- Where & When

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



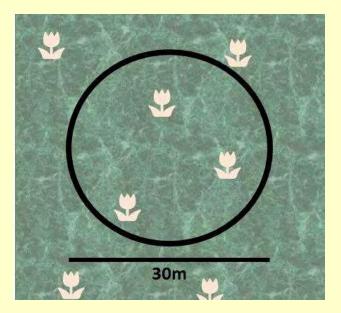
Small Area Surveys- Tallying Morphs

- Count the number of individuals of each morph seen
- 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



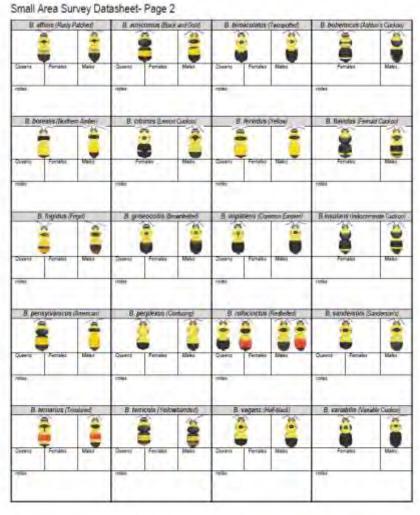
Small Area Surveys- Survey Technique

- Use a measuring tape, pre-measured piece of rope, or your known stride length to measure a 30m diameter circle
- Check all flowering plants within the circle for bumble bees
- Tally each bee seen according to morph and take photos of each morph (not of every single bee)
- Do your best to avoid double-counting bees



Small Area Surveys- Data Sheet

Psisary Observar				Additional Observers			
Date Starr Tore				End Tene			
LOCATION		1		-			
Side Name				Overall to that over	ry location		
Lattude (00) (creptude (00)			· · · · · ·				
Agricultural D. Fore	er II. Grassian	id Shrubland []; Wet	and D. Shoreine	D urbanitscourban Par	al Development (2: Right-Ol-Way El		
ELLINNU, F FLATE CHOSEN	WATHONS						
Species & Caste (Viknown)		Morph Descript (color patient) size	inn shape;	Nitmiliee (e.g. 3 or III)	Additional Notes to here with El (rector plants, photo runnemumper)		
	1						
	6-1						
	-						
	100						
	4			_			
	12						
	2						
	1						
	-						
_							
 Bumble beis riest observed 	Spec	HESE .	Deach	\$507			



a set of the second second

Subrat survey data to Waccomin Sumble Bee Brigade - http://wethunet/investory/bot

Small Area Surveys- Data Sheet

Primary Observer:	The I w	made with	Additional Observers Jacy Watson			
Princey Observer: EVA Lewandowski. Delle 5/26 Star Terre 3:05 berg			End Time: 8: 65000			
PORTINE	~	1				
Lettinde (DD) Port Longitude (DD)			Details to that survey location from Those where the second of the second strend to have a			
		Sphipping Cl, Welland Cl; Showine C); Urban/Saburbán/Ru	and Development W. Right Of Way 🗆		
Buver a Bre Cetanivations Species & Casta (Extrover)		Morph Description (color politers, size, shape)	Number (a.g., 3 or (0)			
Female unKnown	- Welling red, and black in		itt	140005 2-9, 15-19, 23-26		
	i.					
	-					
	8					
	d.					

Small Area Survey Datasheet- Page 2 B. bohemicus (Anthony Carlord 8. affinis (Rusty Patchad) B. suricomus /Back and Guidi B. Bimaculatus (Tempoliyo) 24 26 2 25 2 • . 100 Malei Queen LL **Ferral**ia Templeri Queers Ferreiri Maine (Queen Permit Dunning 245 eitei inde: E. Nevidus (Femald Cuckoo) H. bornalis Northun Arthan B. citrinus (Lamon Cickoo) B. fervictus (Yeilow) 200 24 ā -1000 --the. Made: Chemre **Farmer** 100 iche 100 苗. frigidus (Fran B. gviseocollis (Browsbridge) 8. Impatients (Common Esslwrit B.Insularis (Indecentrale Cuckod) 26 36 24 U × Terrakis Adda Man Quinen Questo Dances Commun Lieramo Langelin 71-----Females 1 icolini MAG 100 a dei 01,45 10-14, 20-22 via oh! B. nufocinctus (Philbeted) B. sandersoni (Sandersonit) B. perpiesses (Confight) El poneytranicos (Aramari 30 --Miles Time Maker Gain Mann Parahi 15.5 Canital FORMER Cumrti Gastore No. 1040 riden ACRES 1 phillip 27-33 B. terricola (Vsibwitavdoci) A warrans (Hall/black) B. variabilits Stanitile Carkool B. ternarius (7/colored) 24 24 -24 20 15 144 -(--) 7 2 120 -. Trenting Generat Links Fermine Male Downi Filmen Overse Queena noins Teahni 100 (Male)

Submit survey data to Wacansin Bundaio Eee Brigade - http://www.wet/membre.toto

Submit survey data to Wisconsin Burntile Bee Brigade - http://www.red/twentow/btb

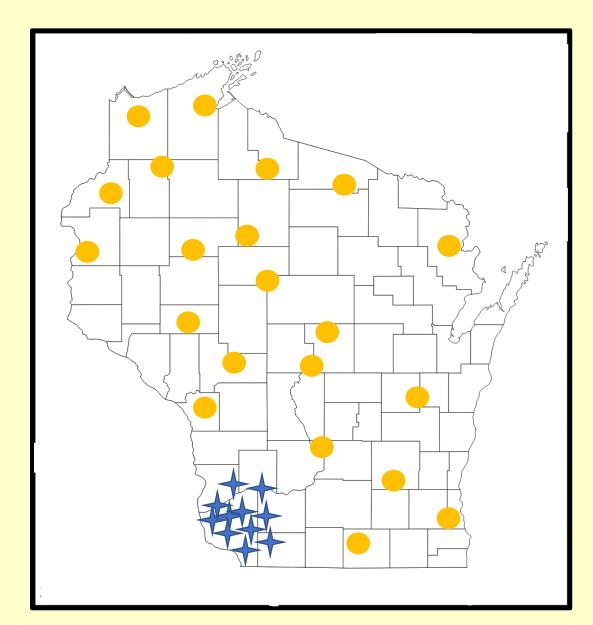
Small Area Surveys- Curating Photos

- 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

Small Area Surveys- Summary Sheet

Survey Date 5/1/18 Site Name Tenney Park									
Species (scientific name, common name)	Number of Males	Number of Females	Number of Queens	Nest (Y/N)	Photo Name/ID				
B. affinis, rusty patched									
B. <i>ouricomus,</i> black and gold		1		-					
B. bimaculatus, twospotted									
B. bohemicus, Ashton's cuckoo									
B. borealis, northern amber	1								
B. citrinus, lemon cuckoo	· · · · · ·								
B. fervidus, yellow									
B. flavidus, Fernald cuckoo				1					
B. frigidus, frigid									
B. griseocollis, brown-belted									
B. Impatiens, common eastern	-	11		Y	20-22				
B. Insularis, indiscriminate cuckoo				1					
B. pensylvanicus, American		1		1.00	27, 30, 31				
B. perplexus, confusing					and see at				
B. rufocinctus, redbelted	1	111			15-19				
B. sandersoni, Sanderson's				11111	1.1.1				
B. ternarius, tricolored									
B. terricola, yellowbanded									
B. vagans, half-black									
B. variabilis, variable cuckoo									
Unknown Bombus 1	1								
Unknown Bombus 2									
Unknown Bombus 3	-		-	-					

Small Area Surveys- Null Data



Safety First



Photographing and IDing Bumble Bees



Photographing and IDing Bumble Bees

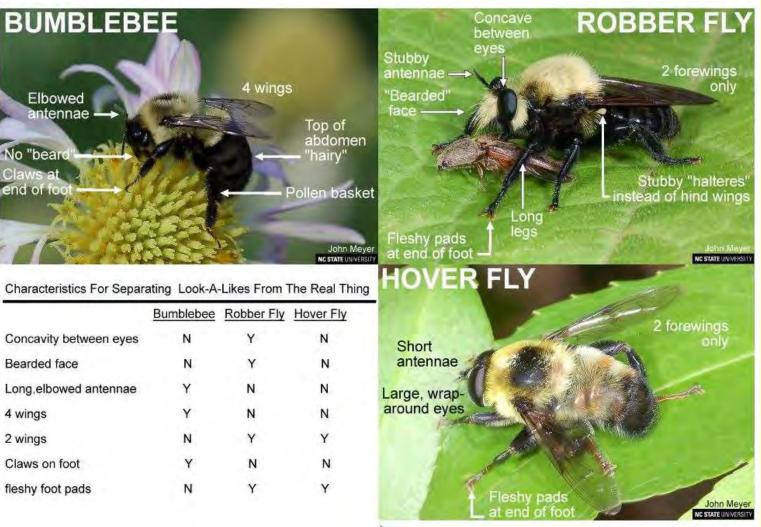


Photographing and IDing Bumble Bees



Bumblebees are valuable pollinators that can sting

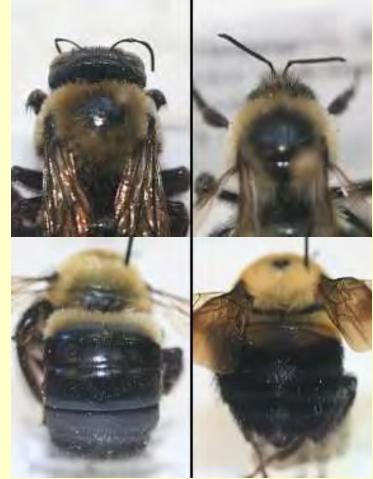
The two predatory flies This is done to fool potential shown here are bee mimics prey or their own predators



Bumble Bee vs similar looking bees



Eastern Carpenter Bee - Xylocopa virginica - Female



https://beespotter.org/topics/mimics/

Bumble Bee vs similar looking bees



Mining Bee (Andrena sp.)

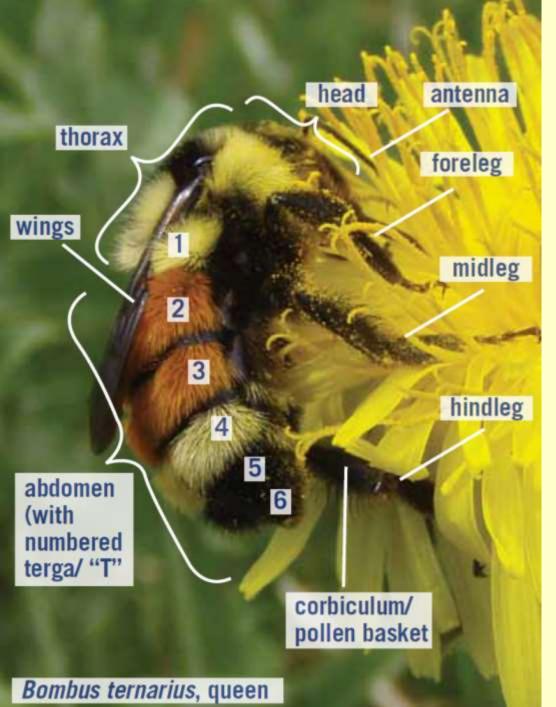
Carlin's Miner (Andrena carlini)

Bumble bee vs similar looking bees

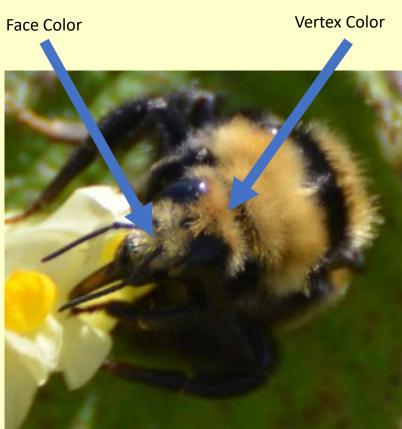


Honey bee

Bumble bee

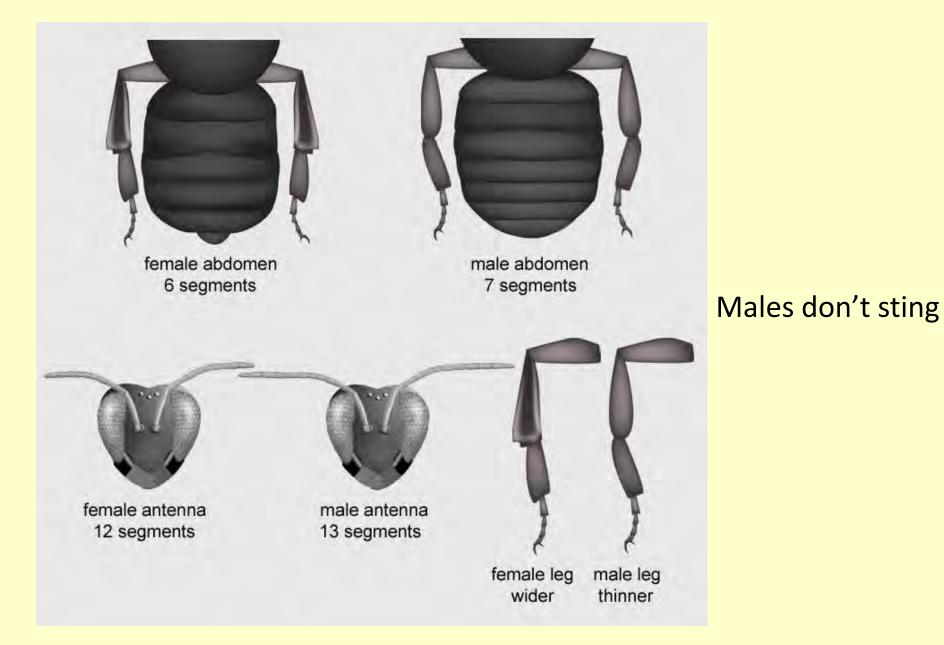


Key Features



Bombus borealis

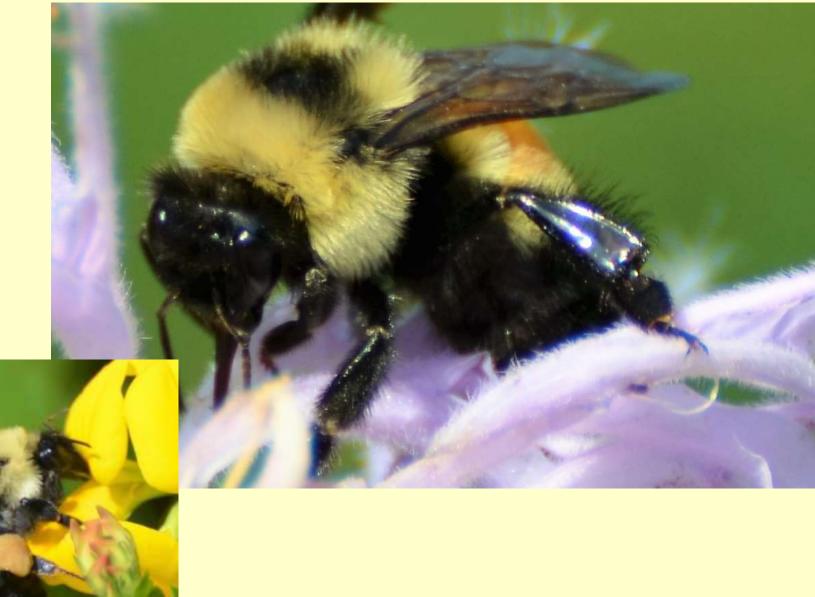
Female vs Male



Female vs Male



Corbicula



Bombus impatiens common eastern bumble bee



Bombus bimaculatus twospotted bumble bee



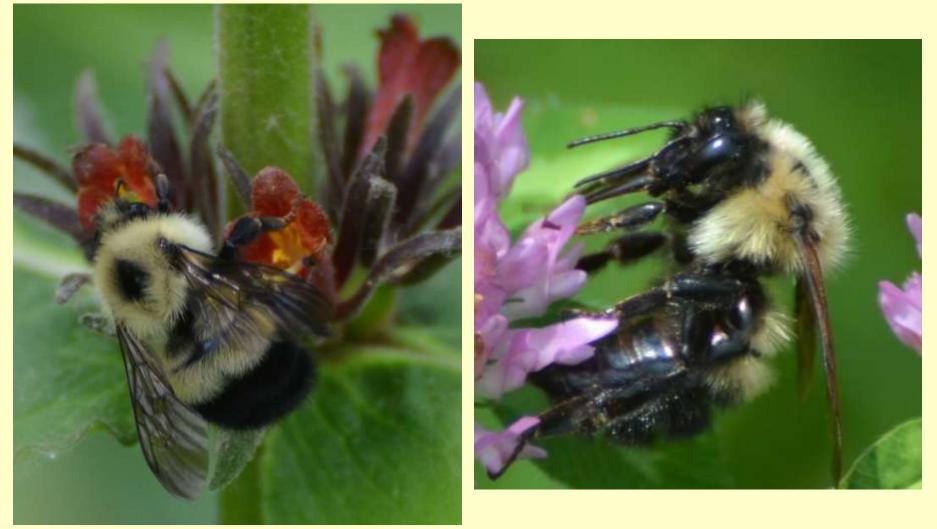
Bombus griseocollis brownbelted bumble bee



Bombus auricomus black and gold bumble bee



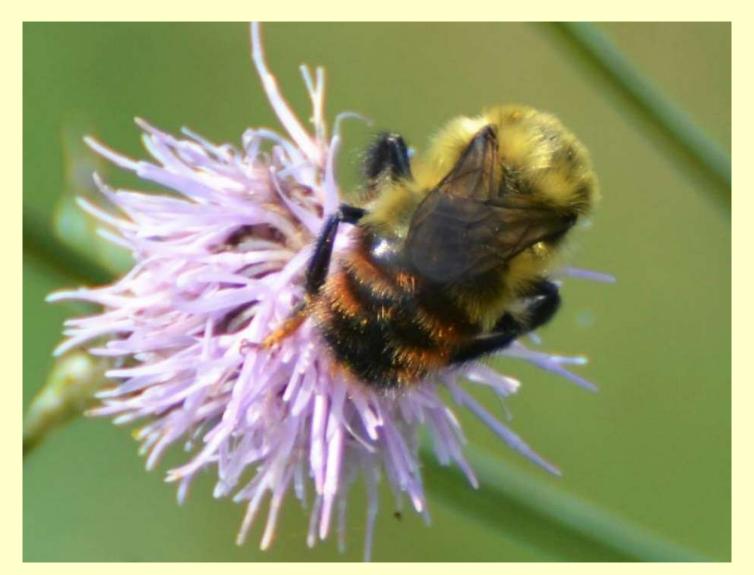
Bombus vagans half black bumble bee



Bombus affinis rusty patched bumble bee



Bombus rufocinctus redbelted bumble bee



Bombus ternarius tricolored bumble bee



Bombus terricola yellow-banded bumble bee



Species often confused with yellow-banded



B. auricomus

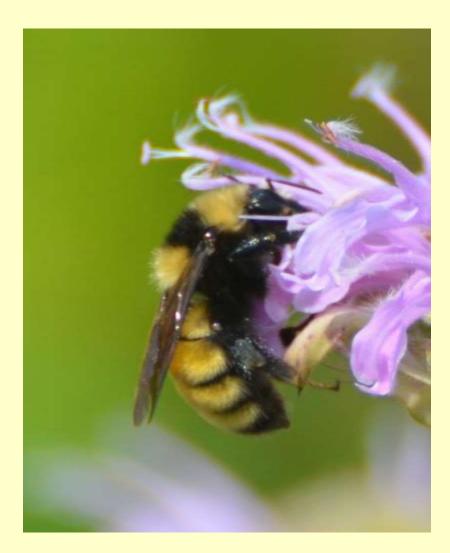
B. pensylvanicus

Species often confused with yellow-banded



Bombus terricola (left), Bombus pensylvanicus (center) and Bombus auricomus (right)

Bombus borealis northern amber bumble bee



Photography Tips

Camera type

- point & shoot, DSLR & phone cameras (>=8 megapixels)
- Experiment with your camera
 - macro setting, auto exposure and auto focus might be best
- Be calm. While the bees are nectaring and/or collecting pollen, you can be quite close without disturbing them.



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

Key Views to Photograph







Lemon Cuckoo (*Bombus citrinus*) - female



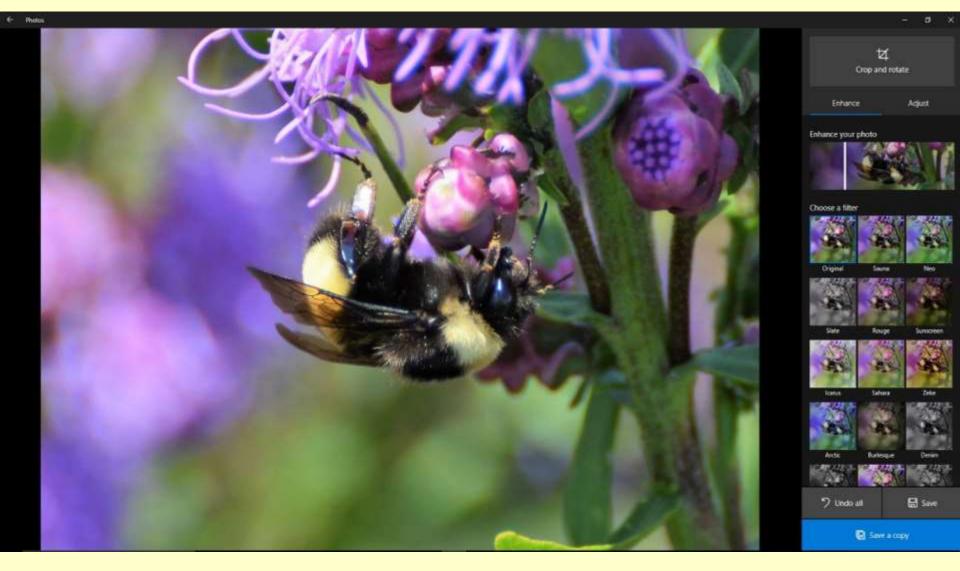


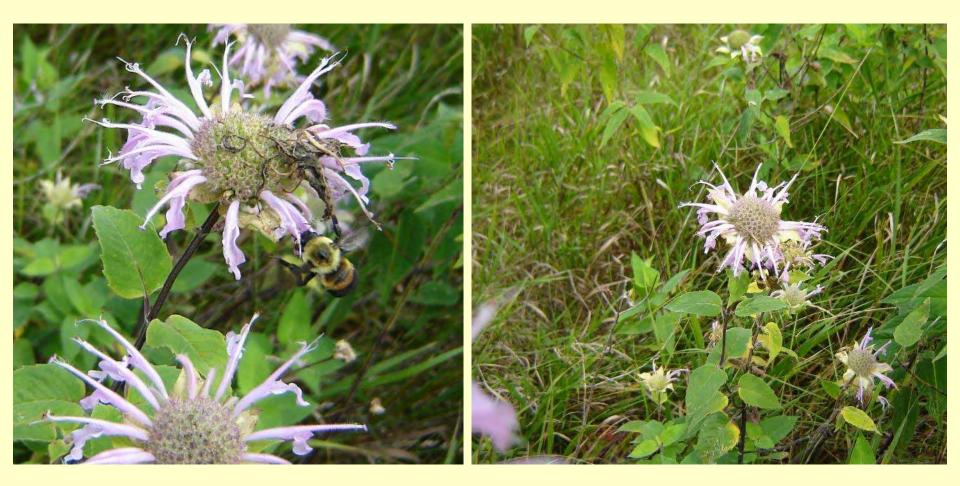
- Identify morphs in each image
- Select best photos of each morph's head, dorsal, and side views
- Crop and center selected images
- Ensure file size is less than 1MB

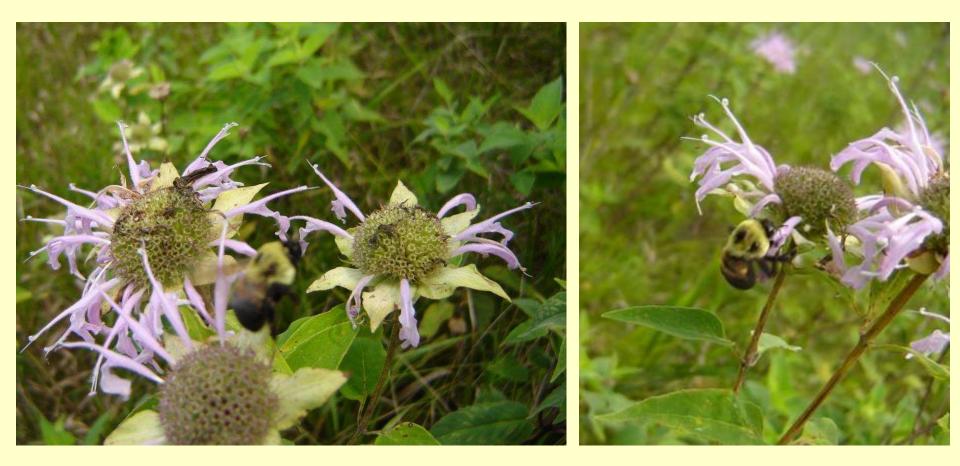
DSC_1605JPG - Photos

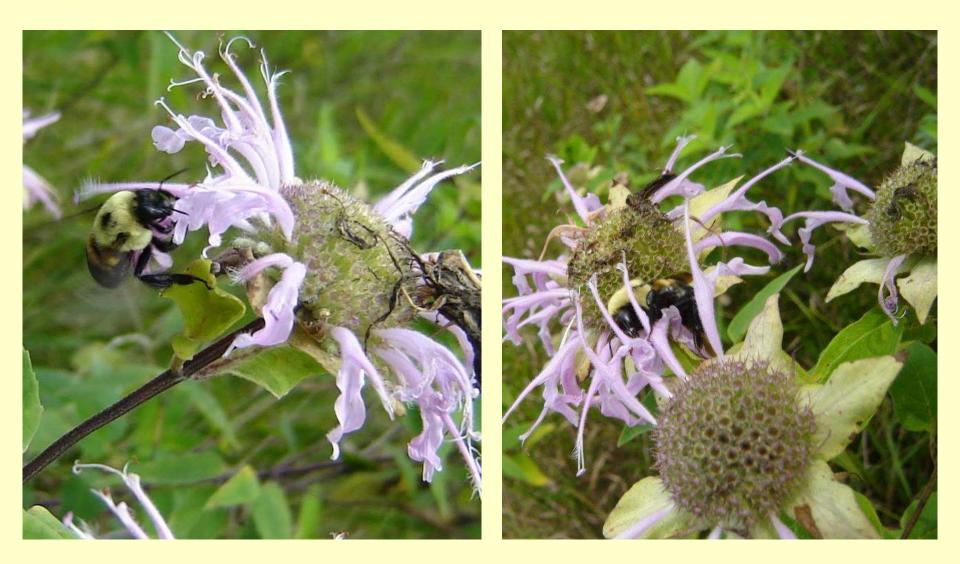
🖻 Share 🔍 Zoom 🔟 Sideshow 🥂 Draw 🙀 Edit 🥥 Rotate ... 📉 View all photos

Yellowbanded bumble bee (B. terricola)

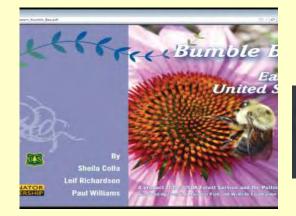




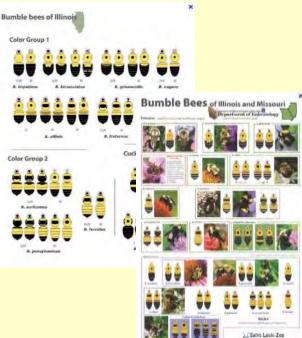


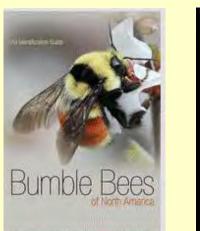


Resources to identify your photos









Paul Villiams, Robin Thorp, Lett Richardsont & Shoha Colut.



PRODUCES

ap been created

Colondar

Provide of Interior and people from the place



All Abure About Bugst



we endow the opportunity teschration and appreciate the intrase flows of these creatures.

Our Hission

Using the best resources i are creating a brookinges and the online community We summation our finding

Dur Hethout

We collect photographic of States and Canada for Ide



Our mission is to assemble and share knowledge in order to improve education, health, agriculture, economic development, and conservation throughout the world.

Bumble Bee Watch

en diese Renalt allighting Beatle for facility Ray College Lightin Date Marchine Marchine



Your Verifications

WI Bumble Bee Brigade Account

Eva Lewandowski 608-264-6057 eva.lewandowski@wisconsin.gov Edit Information Change Password

Add/View Observations

Observation List

Export Observations to Excel

(Click year to see list of observations for that year)

Survey Year: 2018

Survey Date	Site Name	Observation	Date Submitted	Date Verified
09/19/2018	Empire Prairies Westport Drumlin SNA	14 Male Bombus impatiens		11/08/2018
09/19/2018	Empire Prairies Westport Drumlin SNA	2 Female Bombus impatiens		11/20/2018
09/16/2018	Tenney Park	3 Male Bombus impatiens		10/23/2018
08/31/2018	Tenney Park	1 Male Bombus impatiens		09/12/2018
08/31/2018	Tenney Park	5 Female Bombus impatiens		09/12/2018
08/31/2018	Burr Jones Park	None - unverified		
08/26/2018	Chaffee Creek Meadow	1 Male Bombus vagans		10/11/2018
08/26/2018	Worzella Pines Park	1 Female Bombus impatiens		08/31/2018
08/26/2018	Chaffee Creek Meadow	1 Unknown <i>Bombus impatiens</i> [Reported as Female]		09/12/2018
08/26/2018	Chaffee Creek Meadow	2 Female Bombus vagans		10/11/2018
08/26/2018	Chaffee Creek Meadow	3 Queen Bombus griseocollis		11/08/2018
07/28/2018	Warner Park	1 Female Bombus impatiens		08/17/2018
07/28/2018	Warner Park	2 Male Bombus bimaculatus		08/15/2018
07/28/2018	Warner Park	1 Female Bombus auricomus		08/15/2018
07/27/2018	Burr Jones Park	10 Male Bombus griseocollis		07/27/2018
07/26/2018	Tenney Park	2 Female Bombus impatiens		07/27/2018
07/26/2018	Tenney Park	3 Male Bombus griseocollis		07/27/2018
07/26/2018	Tenney Park	1 Female Bombus rufocinctus		07/27/2018
07/26/2018	Tenney Park	1 Female Bombus griseocollis		07/27/2018

SUBMIT YOUR PHOTOS!!!!

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





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.



			WI Bu	mble B	ee Brigad	e Account	
Eva Lewandowski 608-264-6057 eva Lewandowski					Edit Holorn Change Pa		
Observatio	on List			Esport	Observations to Exc		
Survey Year: 20		trust year)					
Totals by S	Site/Surv	ey/Spec	ies				
Tally			Life	2019	Last 30 Days	2018	
Total species (ve	rified)		i i i i i i i i i i i i i i i i i i i	0	0	0	
Total species (ve				D.	D	1	
Total sarveys			22	0	D	22	
Sites surveyed			14	0	0	14	
Percent of specie where submitted (verified observa	t = verified		97%			97%	
Total Spec	ies Obse	rved by (County				
County	Life	2019	Last 30 Days	201	6		
Brown	ł	ú	a	3			
Dane	5	Q	μ.	5			
Marquette	E.	ò	۵	3			
Portage	1	0	Ū.	1			
Vernon	1	0	D	1			
				Adm		5	

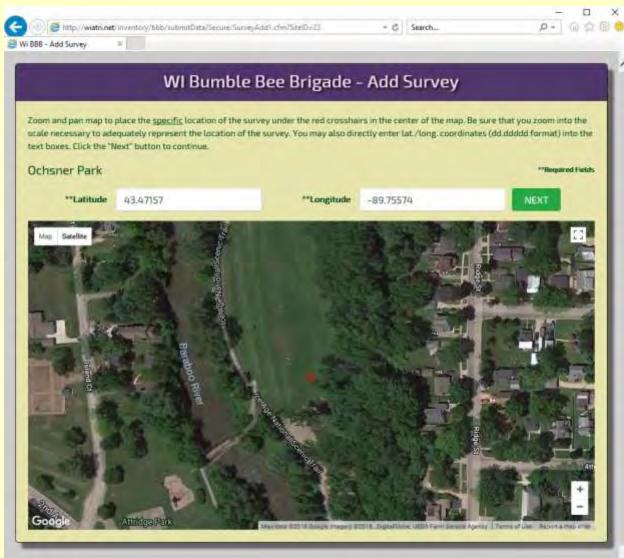
nformation ge Password	
ge Password	

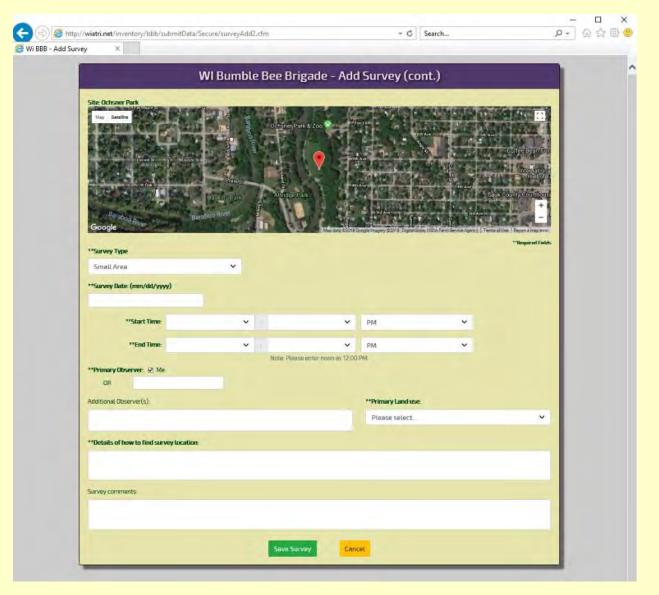
	WI Bumble Bee Brigade - Add Site
	**Required Fields
**Site Name:	
	The site serves as a <u>general</u> location within which more specifically located surveys are done. Please be descriptive when naming your site. Public property names, street addresses, and nearest intersection road names are examples of good site names (e.g., "UW Arboretum" or "Intersection of Hwy 12 and Park Street" or "My House").
**County:	~
	Select the county where your site is located. If you are unsure of the county but have coordinates or can zoom into the observation site using a map, select "Unknown" for county,

ble Bee Brigade -	Add Site (co	ont.)	
and the second		and the second second	
			E You may also
			And income which a
			**Required Fields
**Longitude	-89.75588		VEXT
		-	
UP OF			13
Domino's Pizza	with down .	Intain .	
- u cute.		1 percent	
Sutabon Run		8th Ave	-
	1	Sile 3	-
	/ll/Ave		
Ochsner Park & Zop 😋	and the second second		
		1997 August	Ant Avia
*		The second	
	OTE Aut		
		(Sector)	
	Whi dow	44.7	
Altridge Park			Sauk Cor
	and here		ANI ANI
	F 7		+
	ion of the site under the red crosshairs i are done. Be sure that you zoom into th format) into the text boxes. Click the '? **Longitude	on of the site under the red crosshairs in the center of the map are done. Be sure that you zoom into the scale necessary to add format) into the text boxes. Click the "Noxt" button to continue "Longitude -89.75588 Domino's Ptzza ***** ath Ave Ochaner Park & Zoo	Domino s Pizza With Ave ath Ave Ochsner Park & Zoo O With Ave With Ave

WI	Bumble Bee Bri	gade - Add Site	(cont.)	
Ochsner Park - Sauk County			(43.47	7284, -89.75565)
a Map Satellite Linn St	Baraboo River		8th Ave	
dar St WMalnut, W Maple St		9 7th Ave	nter St	ch St
	ochsner Park &	Z00		
The Land	Ochšner Park &		6th Ave	<u>6</u> th Ave
Locust St g Locust St		5th Ave		Co
W Oak St	Shaw St	C THE PARTY	America St.	+
Google		4th Ave	4th Av	e Report a map erfor
**Directions to Site:				**Required Fields
**Ownership Type				
~				

3B - Site Details 🛛 🗶		
WI Bumble Bee B	rigade - Site Details	
Account / Site Details		
Map Satellite Max J. Hill Park	Site Location: walk in from 1927 Park St, Baraboo Ownership Type: Unknown	Edit
St Ochsner Park & Zoo 💝 St Ave	● Add Survey	
W Oak St Shaw St Shaw St Attridge Park	Back to Account	





	WI Bumble Be	e Brigade - Surve	v Details	
	in Bumble Be	e Brigade Barv	ybetuits	
Account / Site Detail	ls / Survey Details			
				_
Site: Ochsner Park	740	AVO		
Value a composition		Survey Vne-Small	Area	it in
Map Satellite	Zoo Lo	Survey Type: Small Survey Date: 25-Ap		Edit
Map Satellite	rr Park & Zoo	Survey Date: 25-Ap Start Time: 8:01	r-2018 AM	Edit
Map Satellite	rr Park & Zoo	Survey Date: 25-Ap Start Time: 8:01 End Time: 8:07 /	r-2018 AM M	Edit
Map Satellite	rr Park & Zoo	Survey Date: 25-Ap Start Time: 8:01	r-2018 AM M	Edit
Map Satellite	rr Park & Zoo	Survey Date: 25-Ap Start Time: 8:01 End Time: 8:07 / Primary Observer:	r-2018 AM M	Edit

WI Bi	ımble Bee Brigade	- Add Observa	tion	
			**Required Field:	s
	ou did not see any bumble bees, sele ccies: B. impatiens (Common E			
	B. Inpatiens (common e	asterny		
	**Sex Please select	*		
**Number Obse	rved:			
Comments about observa	ation:			

WI Bumble Bee Brigade - Upload Photo

- Please keep images smaller than 1Mb. Only images with the .jpg/.jpeg file extension will be accepted.
- Click on the "Browse" or "Choose File" button (depending upon browser) to locate your image, and then click the "Load Image" button.
- Upload could take some time depending upon the size of the image and your connection speed.
- If you receive an error while trying to upload, refresh your browser and try again. It may require
 several attempts before it works. If the error persists, please email your photo, and indicate on your
 report that a photo was sent.
- You may upload up to 5 photos (3 is preferred). For information on selecting which photos to submit, please see the volunteer manual.

		Browse
Load Image	Cancel	
	_	

WI Bu	mble Bee Brigade	e - Observation	Details	
Account / Site Details / Survey D)etails / Observation Details			
Bombus impatiens (Comm	on Eastern Bumble Bee)			
1 Female Count includes queen			Edit	

WI Bumble Bee Brigade - Survey Details

Account / Site Details / Survey Details

Site: Ochsner Park



Edit Survey Location

My Observations (Click on name to open observation details.)

A 1 Female Bombus impatiens (1 photo) - unverified

Survey Type: Small Area Survey Date: 25-Apr-2018 Start Time: 8:01 AM End Time: 8:07 AM Primary Observer: Eva Lewandowski

Land use: Urban/Suburban/Rural Development Survey Location: From Park street, head towards bottom of big field. Survey was along woods/field border. fake fake fake Survey Comments: fake

Add Observation

Back to Site Details

Edit

14