How many *Bombus* species in Ohio?

- We observed 9 species in 2017, through >10,000 observations
- There are 10 others in the region that are rarely seen in Ohio

### How common is each species?

<table>
<thead>
<tr>
<th>Species</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>B. impatiens</em></td>
<td>frequent</td>
</tr>
<tr>
<td><em>B. griseocollis</em></td>
<td>frequent</td>
</tr>
<tr>
<td><em>B. bimaculatus</em></td>
<td>frequent</td>
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<tr>
<td><em>B. auricomus</em></td>
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</tr>
<tr>
<td><em>B. fervidus</em></td>
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</tr>
<tr>
<td><em>B. citrinus</em></td>
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</tr>
<tr>
<td><em>B. vagans</em></td>
<td>frequent</td>
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<tr>
<td><em>B. pensylvanicus</em></td>
<td>frequent</td>
</tr>
<tr>
<td><em>B. perplexus</em></td>
<td>frequent</td>
</tr>
</tbody>
</table>

Other regional species not observed (alphabetically): *B. affinis, B. ashtoni, B. borealis, B. fernaldae, B. fraternus, B. insularis, B. rufocinctus, B. ternarius, B. terricola, B. variabilis*

### How to recognize the most common bumble bee species in Ohio

- **Male or Female?**
  - Female (Queen, Worker): broader abdomen, with sting!
  - Male: long & narrow abdomen

- **Male or Female?**
  - Longer antennae, bigger eyes, yellow hair on face
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Queen or Worker?

Size

- B. impatiens Queen (17-21 mm)
- B. impatiens Worker (8-16 mm)

Timing

April | May | June | July | August | September | October

Workers: 8-16 mm

Key places to look in those 3 seconds when it’s sitting on that flower

- pollen basket?
- abdomen hair color pattern
- thorax hair color

Using the Identification Key from BeeSpotter

- for females: thorax color, then T1 & T2 on abdomen, then face
- for males: abdomen color, then facial features

B. impatiens (common eastern bb)

- nest: underground
- tongue: medium

B. griseocollis (brown-belted bb)

- nest: at surface
- tongue: medium

B. bimaculatus (two-spotted bb)

- nest: underground, at surface
- tongue: medium
**B. fervidus (yellow/golden northern bb)**
- nest: underground or at surface
- tongue: long

**B. vagans (half black bb)**
- nest: underground or at surface
- tongue: medium

**B. auricomus (black and gold bb)**
- nest: underground
- tongue: long

**B. pensylvanicus (American bb)**
- nest: at surface
- tongue: long

**B. perplexus (confusing bb)**
- nest: at surface (fallen logs)
- tongue: medium

**B. citrinus (lemon cuckoo bb)**
- nest: nests of B. impatiens, B. bimaculatus, B. vagans
- tongue: medium

*Female* and *Male* are indicated in the diagrams.
B. affinis (rusty-patched bb)

- nest: underground
- tongue: short

https://www.fws.gov/midwest/endangered/images/insects/rpbb/RustyPatchedByDanMullenCreativeCommons.jpg

On the Wing: Species ID Quiz

use your species key and/or from memory

B. fervidus (yellow/golden northern bb)

https://www.sharpeatmanguides.com/bumble-bees

B. impatiens (common eastern bb)

https://www.sharpeatmanguides.com/bumble-bees
B. griseocollis (brown-belted bb)

B. vagans (half black bb)

B. auricomus (black and gold bb)
B. impatiens (common eastern bb)

B. bimaculatus (two-spotted bb)

B. pensylvanicus (American bb)
Don’t forget to submit your photos and observations to iNat this summer

Bumble bees are diet generalists, but visit some plants more than others

B. fervidus (yellow/golden northern bb)

B. affinis (rusty-patched bb)

Bee life cycle spans months, rely on many plants with overlapping bloom

>10,000 bumble bees on 113 spp of flowers (Jun - Aug 2017)

Join the Bee Team!

Ohio Bee Atlas

http://www.ohiobeeatlas.org
20 most-visited bumble bee food plants in our 2017 survey

1. *Monarda fistulosa* (bee balm) 1773 bees, 8 spp
2. *Trifolium pratense* (red clover) 903 bees, 8 spp
3. *Securigera varia* (crown vetch) 784 bees, 6 spp
4. *Solidago spp.* (goldenrod) 498 bees, 3 spp
5. *Lotus corniculatus* (birdsfoot trefoil) 400 bees, 4 spp
6. *Trifolium repens* (white clover) 363 bees, 6 spp
7. *Verbesina alternifolia* (wingstem) 330 bees, 2 spp
8. *Daucus carota* (queen anne’s lace) 322 bees, 3 spp

Number of bumble bee species observed visiting

- 5 or more
- 3-4
- 1-2

*B. affinis* favored native food plants (USFWS)
9. **Echinacea purpurea** (purple coneflower)

289 bees, 6 spp

10. **Pycnanthemum tenuifolium** (narrow leaved mountain mint)

285 bees, 3 spp

11. **Penstemon digitalis** (beard tongue)

262 bees, 6 spp

12. **Asclepias syriaca** (milkweed)

272 bees, 4 spp

13. **Prunella vulgaris** (heal-all, self heal)

223 bees, 6 spp

14. **Cirsium arvense** (thistle)

222 bees, 4 spp

15. **Eutrochium** spp. (Joe-Pye weed)

158 bees, 7 spp

16. **Vicia** spp. (vetch)

218 bees, 4 spp

17. **Dipsacus** spp. (teasel)

402 bees, 5 spp

18. **Centaurea** spp (knapweed)

146 bees, 5 spp

19. **Eryngium yuccifolium** (rattlesnake master)

303 bees, 2 spp

20. **Ratibida pinnata** (gray cone flower)

181 bees, 5 spp

20 most-visited bumble bee food plants in our 2017 survey
Honorable mentions

- Cichorium intybus (chickory)
- Vernonia spp (ironweed)

Honorable mentions

- Verónicastrum virginicum (Culver’s root)
- Cirsium vulgare + C. discolor (big thistles)

Bumble bees on reclaimed mines (SE Ohio)

1675 bumble bees, 73 wildflower spp (2015 - 2016)

Almost identical “top 20” plant list

Bumble Bee Colony Pollen Use on Reclaimed Mines

Did bumble bees use the species planted during reclamation or surrounding areas?

Study Sites & Methods

12 sites, ranged in age, size, & land use
2 commercial Bombus impatiens colonies per site (2014)

Reclaimed mine lands

species frequently observed in worker pollen loads

- **herbaceous legumes** (Trifolium spp, Melilotus, Lotus corniculatus)
- **shrubs & woody plants** (Rhus copallinum, Rubus, Rosa, Hypericum prolificum, Lonicera maackii)
- **mints** (Monarda, Pycnanthemum, Prunella vulgaris)
Adjacent forest species frequently observed in worker pollen loads

- trees (Liriodendron tulipifera, Oxydendrum arboreum, Tilia americana)
- shrub/woody (Cornus, Salix, Viburnum, Rubus, Rosa)
- herbs (Hydrophyllum)

Spring Flowers for Bumble Bees

Photos: Jessie Lanterman

Spring herbs for bumble bees

- Martensia virginica (bluebells)
- Dicentra canadensis (squirrel corn)
- Erythronium (trout lilies)
- Hydrophyllum (waterleaf)

Spring shrubs for bumble bees

- Salix (willow)
- Rhododendron (azalea, rhododendron)
- Rubus, Rosa (raspberries, roses)
- invasive shrubs (honeysuckle, autumn olive)

Spring trees for bumble bees

- Cercis canadensis (rebud)
- Robinia pseudoacacia (black locust)
- Tilia americana (linden/basswood)
- Rosaceae (apple, pears, cherry, hawthorn)

No data on these next slides because our survey started in June.
Coming soon to a meadow near you

Thanks & Acknowledgements

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