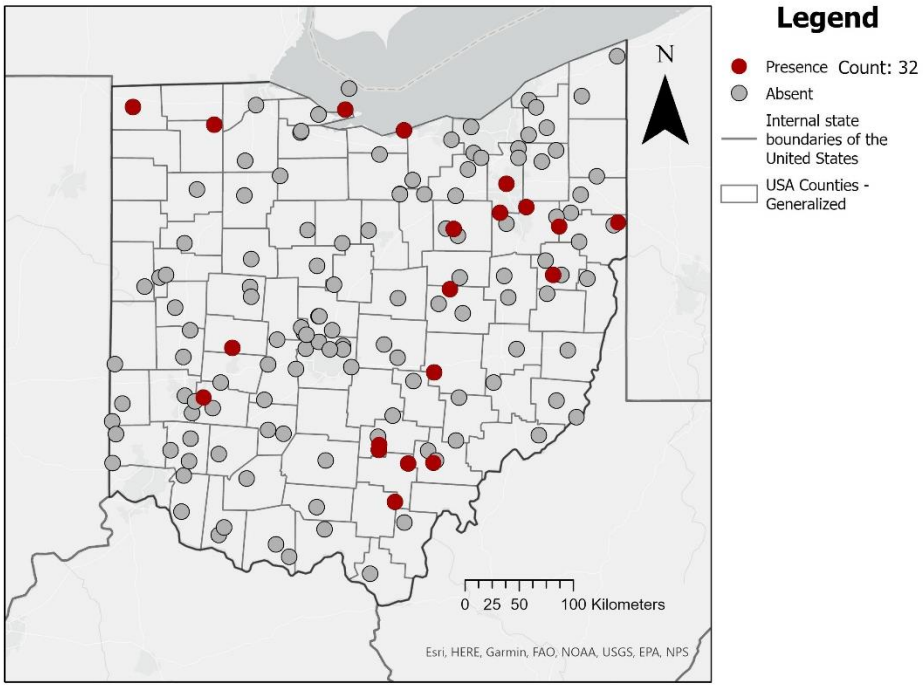
Appendix B. Species distributions and abundances from the 2020 Ohio Bee Survey.

Maps of each species collected by volunteers in water bowl traps set out up to weekly from May - September 2020 were made in ArcGIS. Each dot indicates a sampling location. Note that an absence does not necessarily signify that the species does not occur at that site because detectability is not perfect and depend on an interaction between sampling method, sampling effort and species abundance. Taxon profiles summarizes key taxonomic and ecological information available for each species. Species are arranged in alphabetical order by genus.

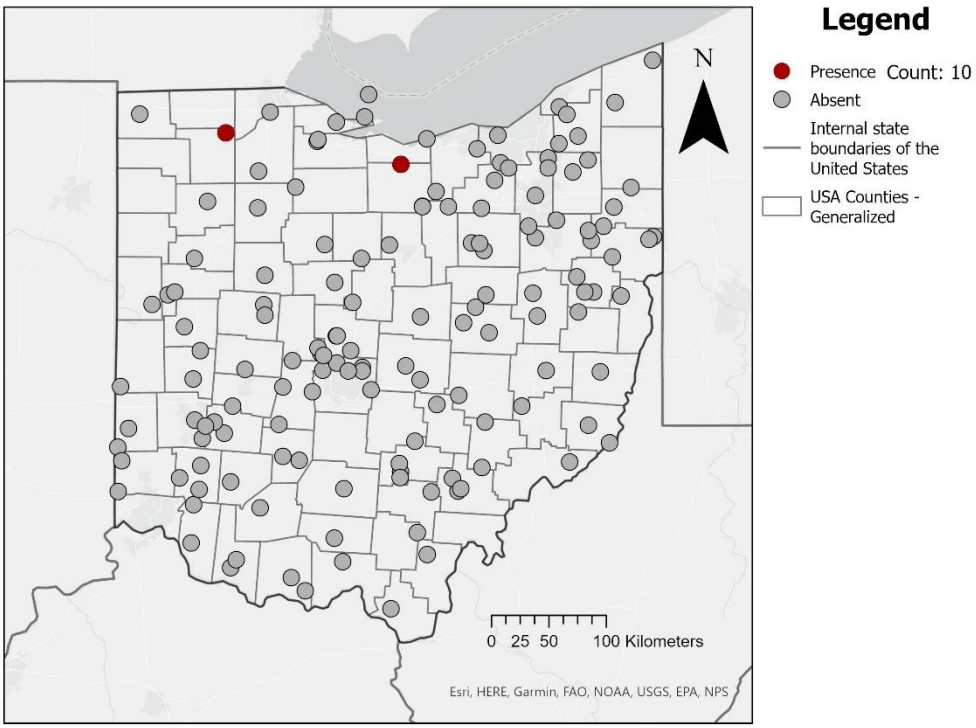
Agapostemon sericeus



Agapostemon sericeus is a bee in the family Halictidae. *Agapostemon sericeus* is a species of ground nesting, generalist bee that is found across Ohio. Females are entirely green with clear wings, whereas males have a green thorax and black and yellow abdominal bands.

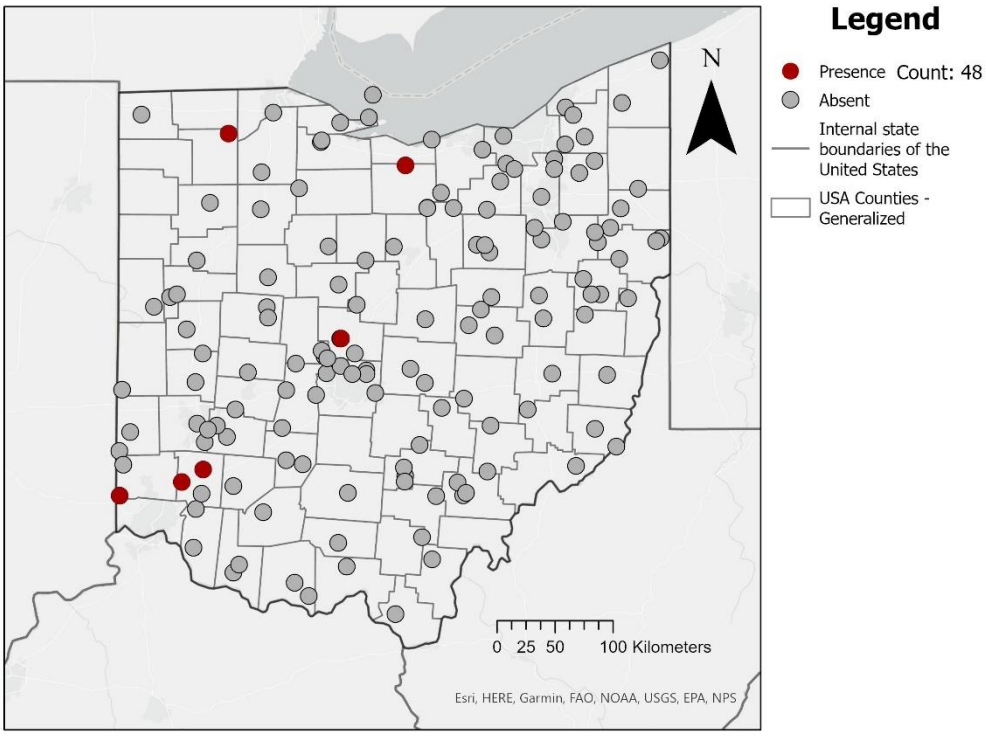
Size: 10-15 mm

Agapostemon splendens

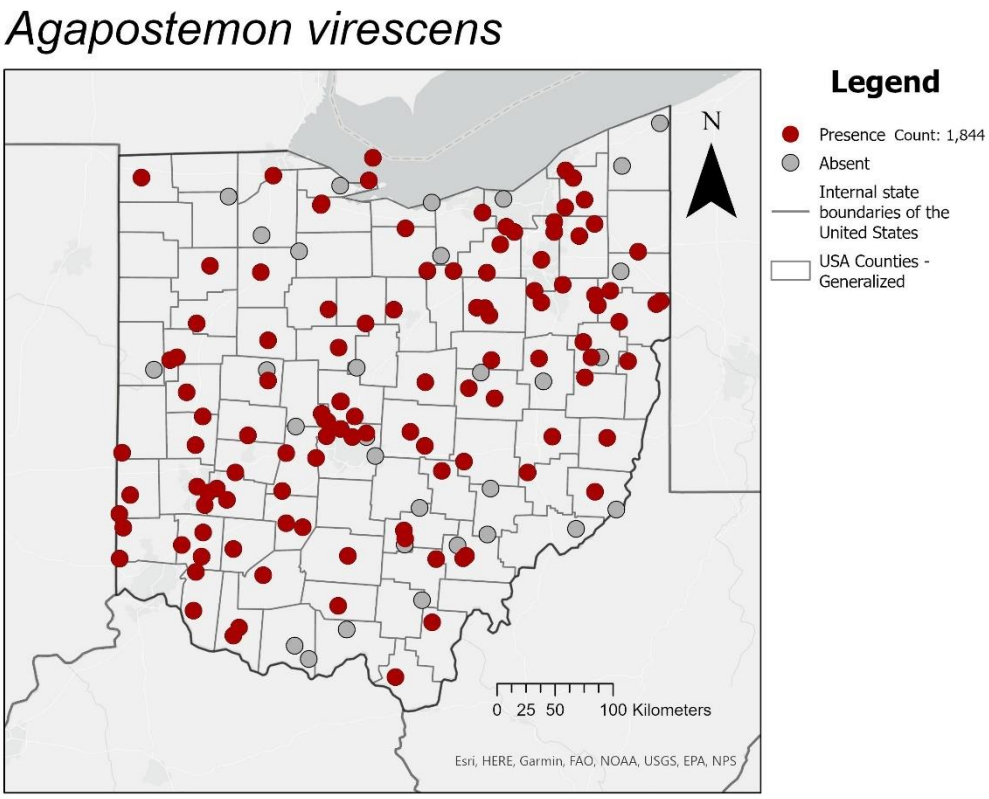


Agapostemon splendens is a bee in the family Halictidae. *Agapostemon splendens* is a species of ground nesting, generalist bee that is found across Ohio. They are thought to be associated with sandy habitats and thus uncommon in Ohio since we have limited locations with abundant sand. Females are entirely green with dark wings, whereas males have a green thorax and black and yellow abdominal bands.

Agapostemon texanus



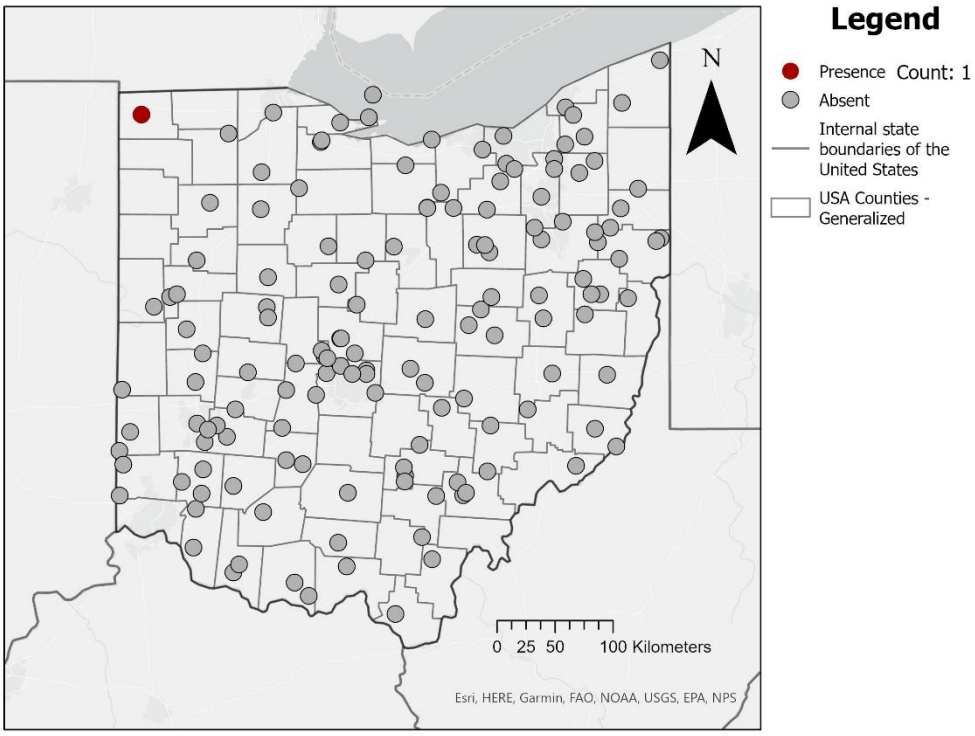
Agapostemon texanus is a bee in the family Halictidae. *Agapostemon texanus* is a species of ground nesting, generalist bee that is found across Ohio. Females are entirely green with clear wings, whereas males have a green thorax and black and yellow abdominal bands.



Agapostemon virescens is in the family Halictidae. *Agapostemon virescens* is our most common species of *Agapostemon* in the state. It is a species of ground nesting, generalist bee that is found across Ohio. Females have a green thorax with black and white abdomen, which separates this species females from the other females in the genus. Meanwhile, all males in the genus Agapostemon have a green thorax and black and yellow abdominal bands and need microscopic examination to identify to species.

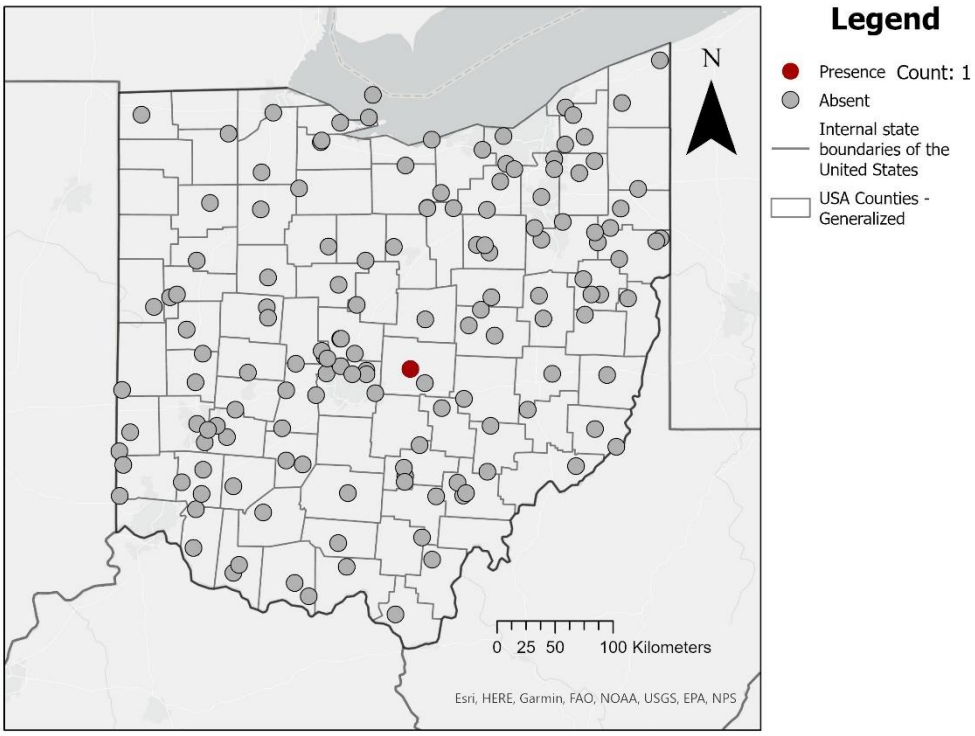
Photo of *Agapostemon virescens* female on clover.

Andrena alleghaniensis



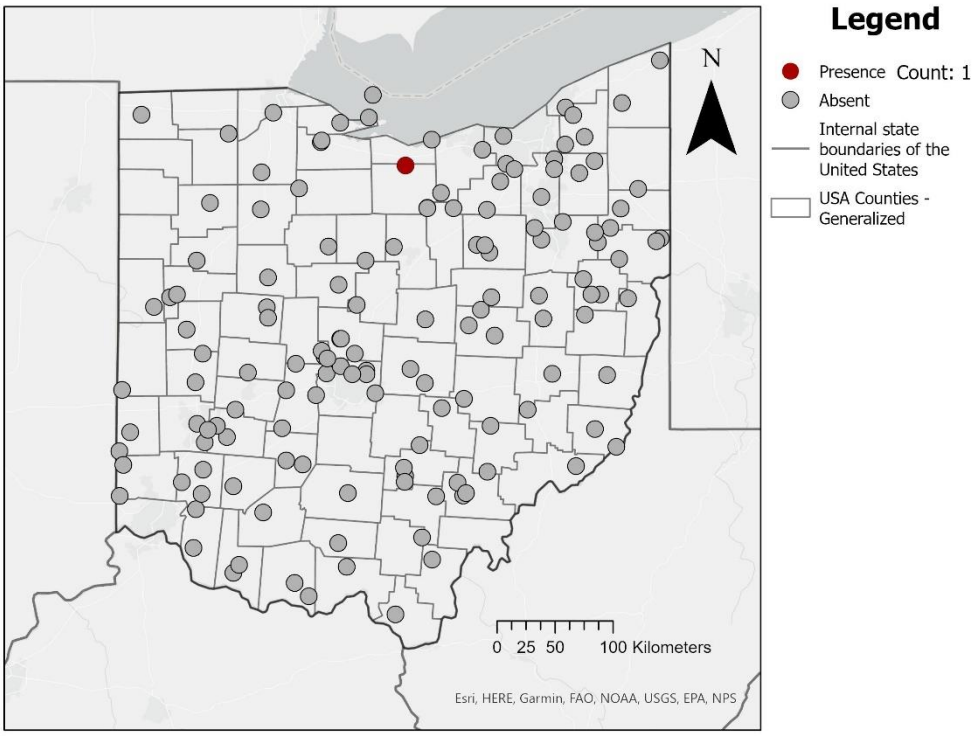
Andrena alleghaniensis is a bee in the family Andrenidae. *Andrena alleghaniensis* is an uncommon spring mining bee that nests in the soil. It is an unusual species of Andrena that has extremely short hair on the thorax and a very rough propodeum.

Andrena arabis



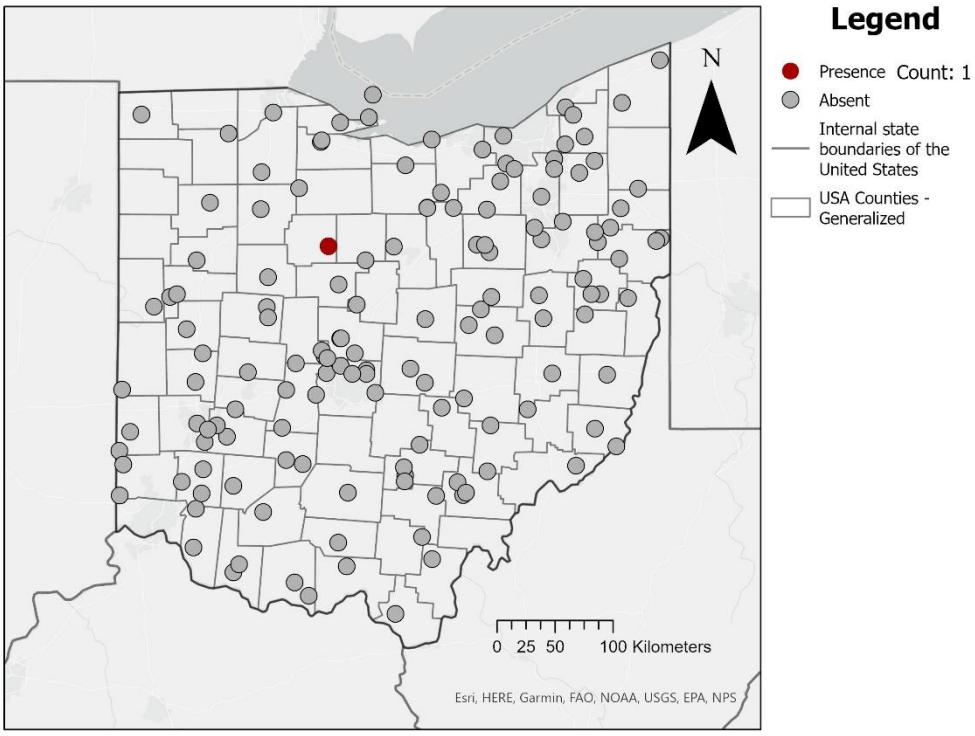
Andrena arabis is a bee in the family Andrenidae. It is a spring flying species of ground nesting bee. They are specialists on *Arabis* and *Cardamine* (Fowler and Droege, 2020).

Andrena asteris



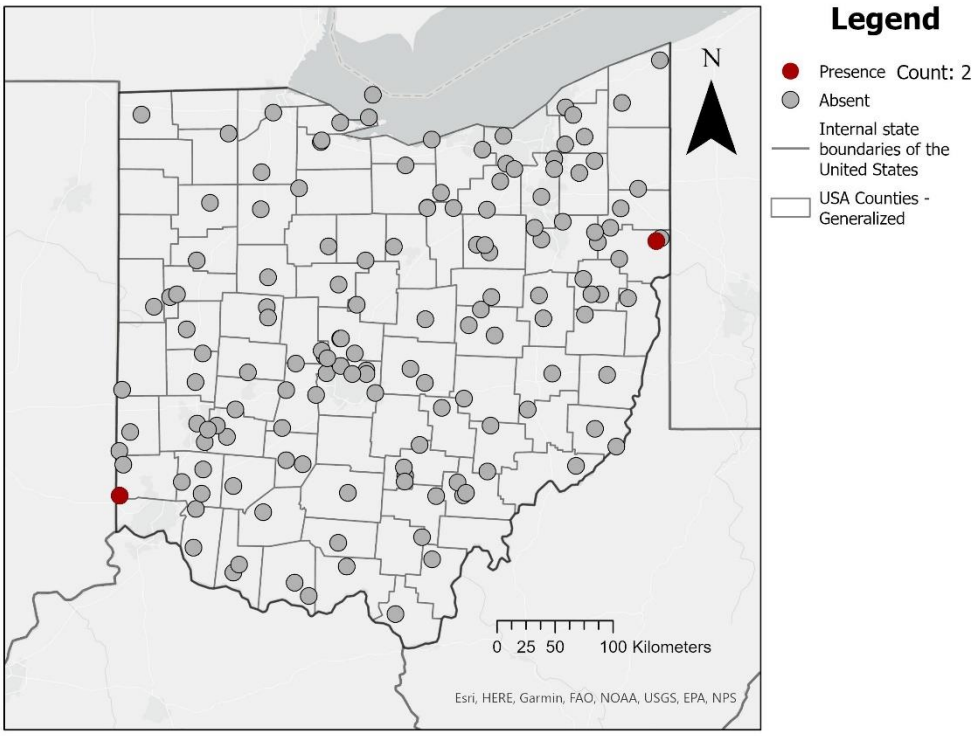
Andrena asteris is a bee in the family Andrenidae. It is a fall flying bee that nests in the ground. It is a specialist of Asteraceae including *Eurybia, Solidago*, and *Symphyotrichum* (Fowler and Droege, 2020).

Andrena barbilabris



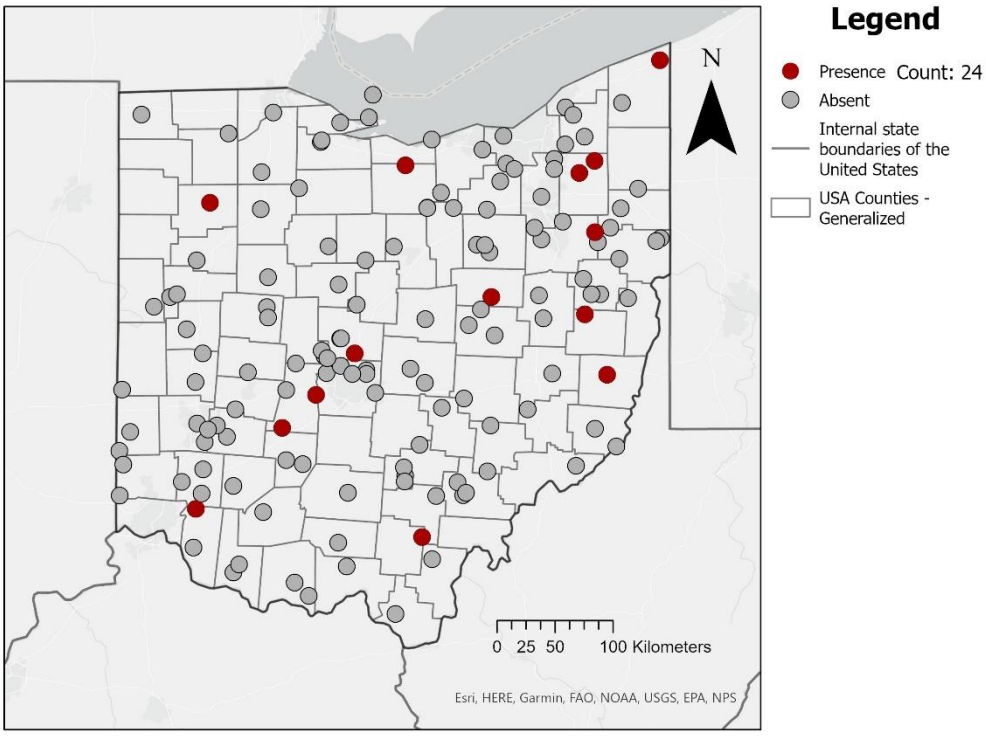
Andrena barbilabris is a bee in the family Andrenidae. It is a generalist bee that emerges in the spring and nests in the soil. Without microscopic examination, it looks like most other *Andrena*.

Andrena brevipalpis



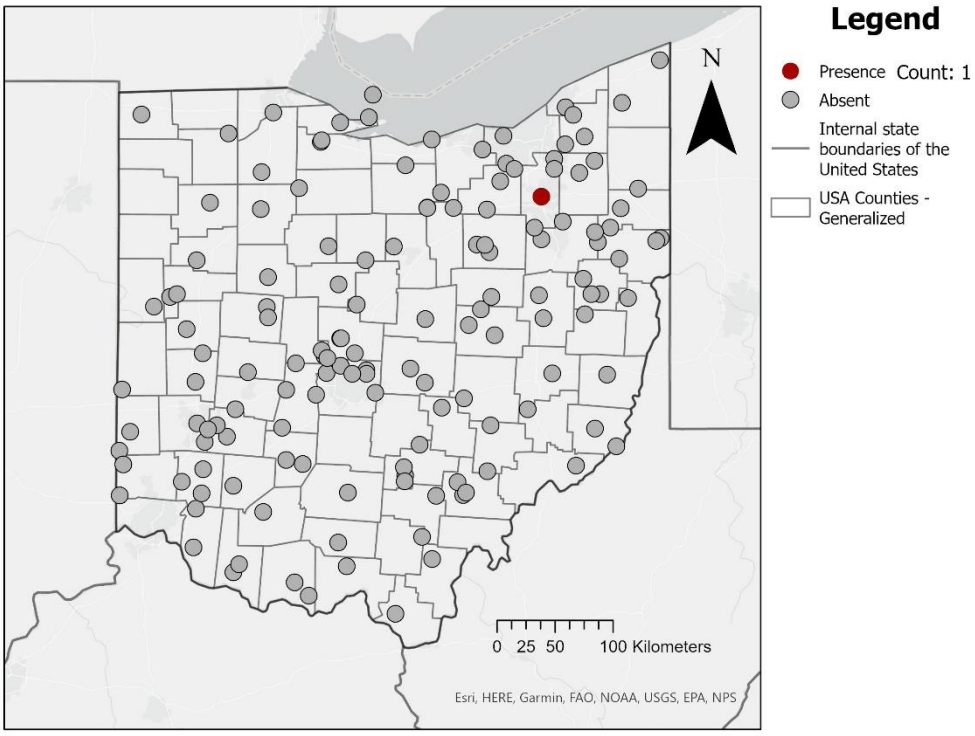
Andrena brevipalpis is a bee in the family Andrenidae. It is a generalist bee that emerges in the spring and nests in the soil. Without microscopic examination, it looks like most other *Andrena*.

Andrena carlini



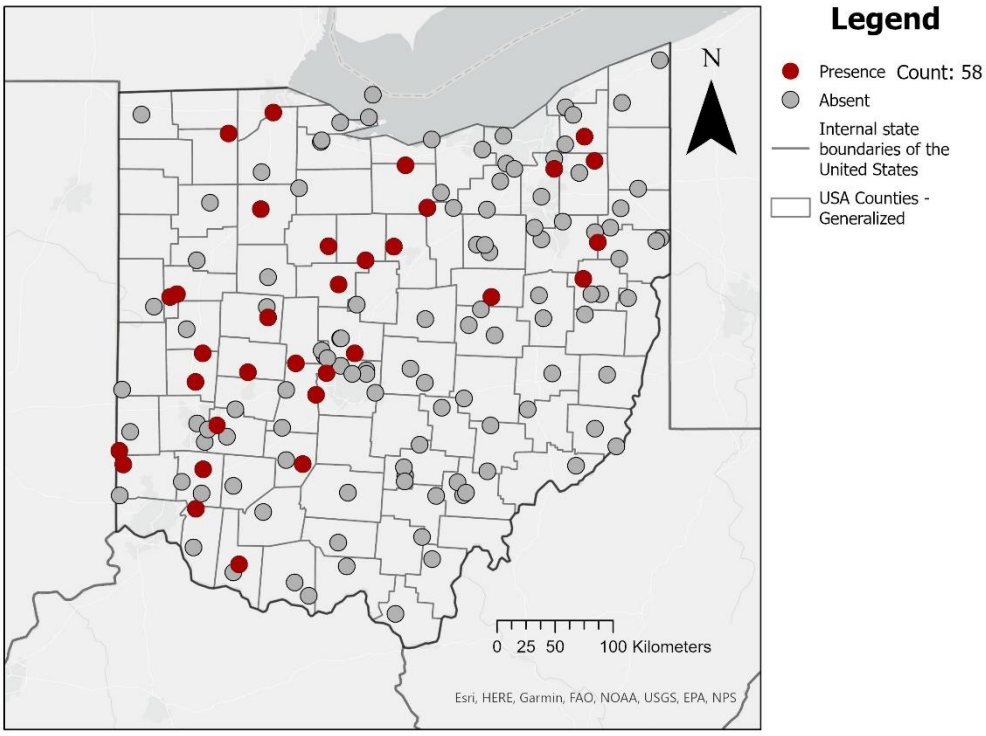
Andrena carlini is a bee in the family Andrenidae. It is a large generalist mining bee that nests in the soil and is active in the spring. It is one of the few larger *Andrena* that has black hair on hind legs (compared to yellow or pale hairs). *Andrena carlini* is regularly confused with bumble bees by novice bee enthusiasts because it is yellow and black and somewhat fuzzy, but the thinner body and visible facial fovea (vertical eyebrows) are a way to differentiate them. More advanced bee enthusiasts might confuse *Andrena carlini* with *Andrena vicina*, but *carlini* has dark cheek hair, whereas *vicina* has pale cheek hairs.

Andrena chromotrica



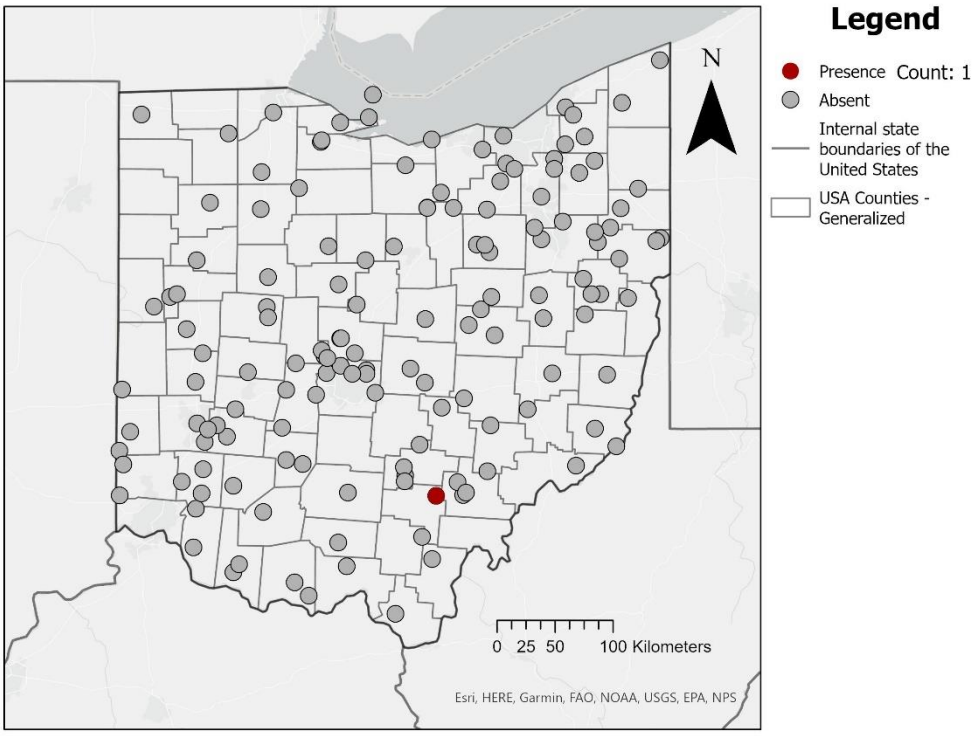
Andrena chromotricha is a bee in the family Andrenidae. It is a fall emerging mining bee with very dark wings. It is a ground nesting species.

Andrena commoda



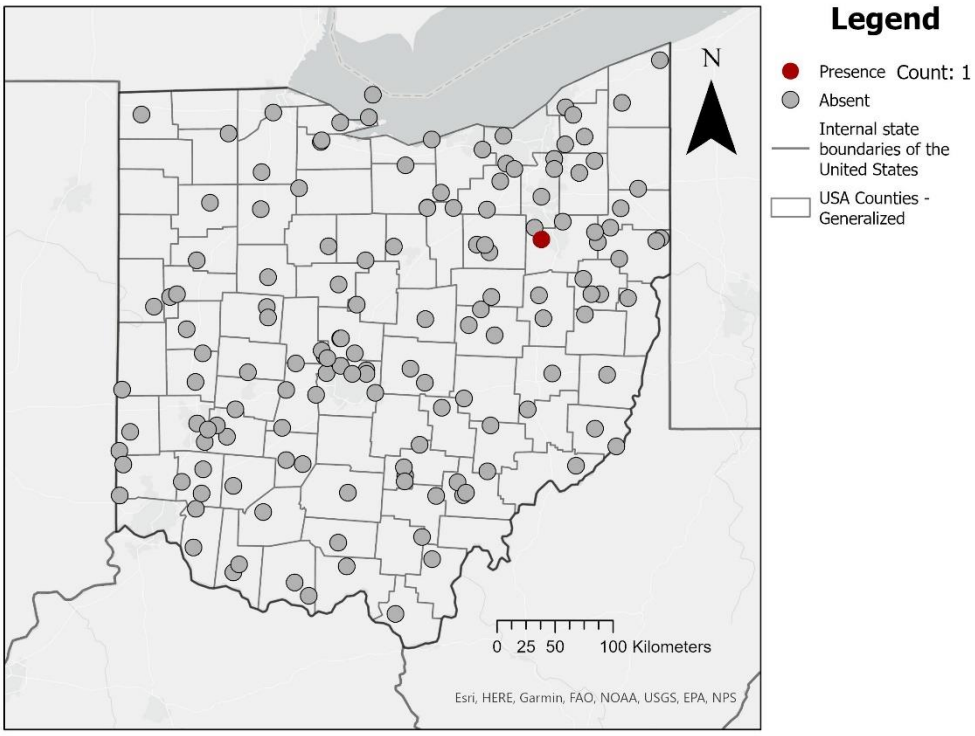
Andrena commoda is a bee in the family Andrenidae. It is a spring emerging generalist mining bee that nests in the soil. It is one of the larger *Andrena* species.

Andrena confederata



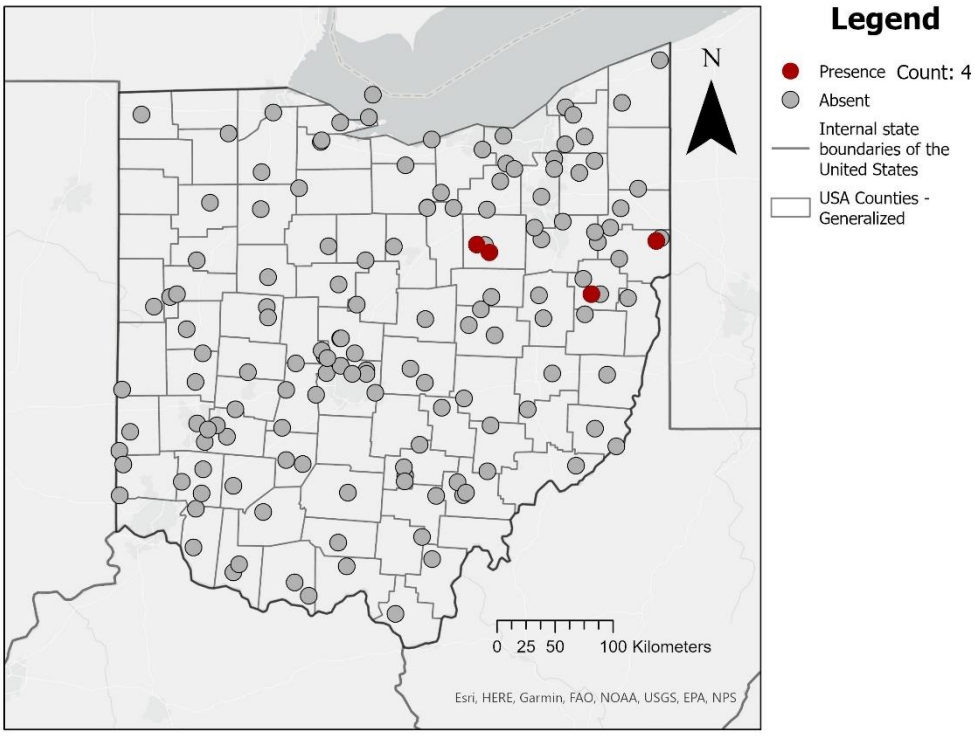
Andrena confederata is a bee in the family Andrenidae. It is an uncommon larger species of *Andrena*. It is a spring species that nests in the ground.

Andrena cornelli



Andrena cornelli is a bee in the family Andrenidae. It is a specialist of *Rhododendron* (Fowler and Droege, 2020). It is a spring to early summer species that nests in the ground.

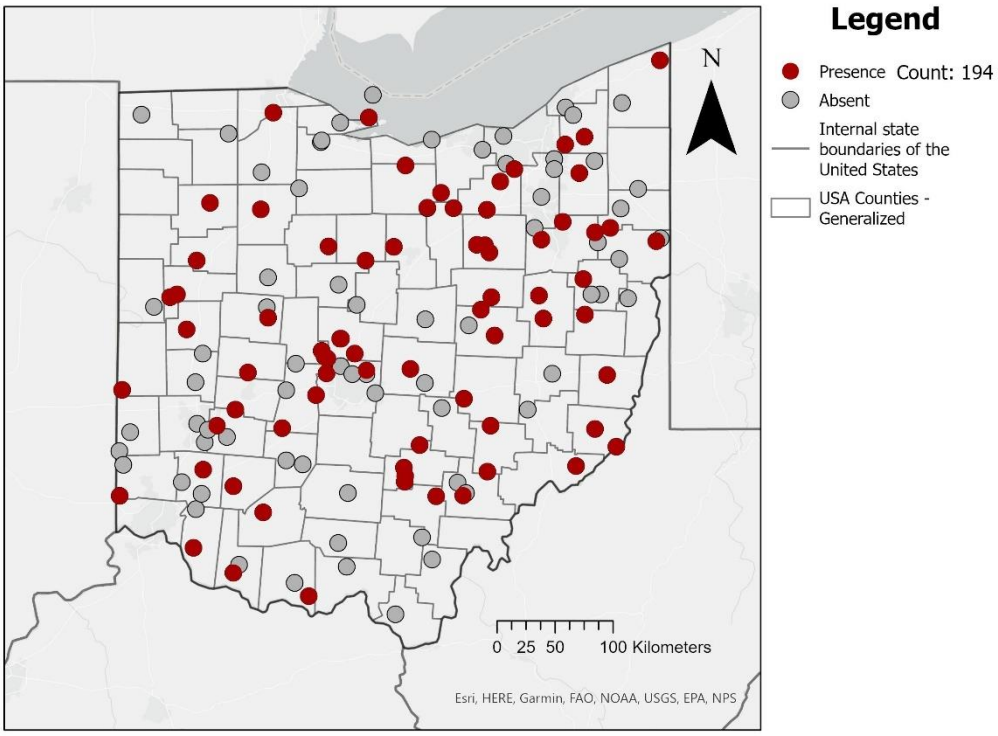
Andrena crataegi



Andrena crataegi is a bee in the family Andrenidae. It is a large late spring species of mining bee. It visits a variety of floral resources and nests in the ground. This species is in the coarse propodeum group and has distinct inner tibial spurs that are widened at the base and cause the spur to bend.

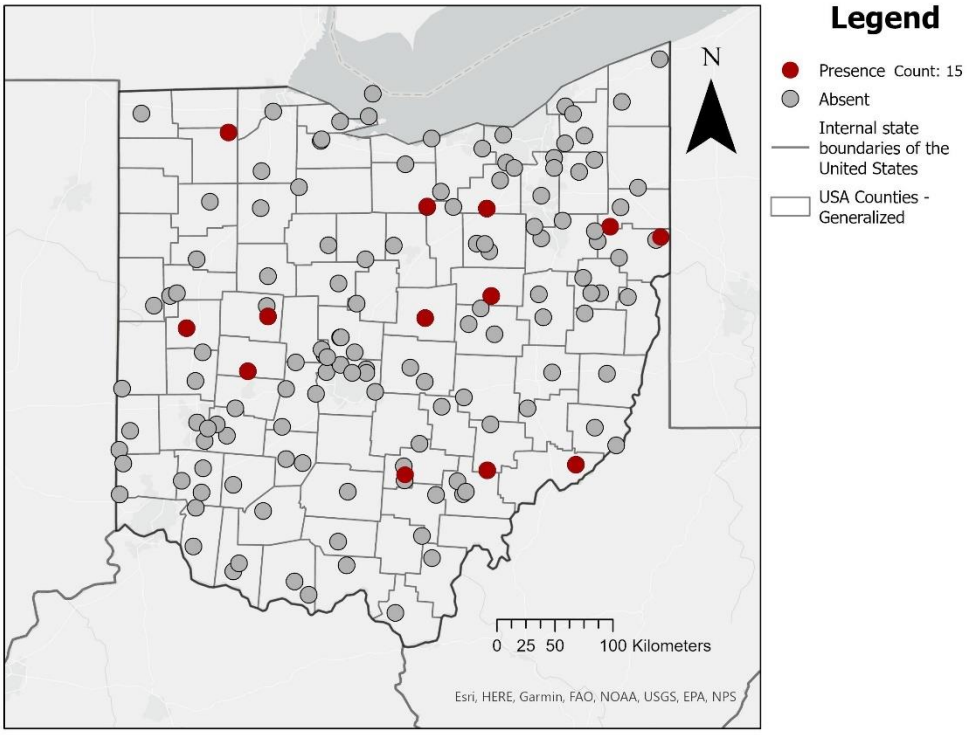
Size range: 10-13 mm (female), 9 – 12 mm (male)

Andrena cressonii



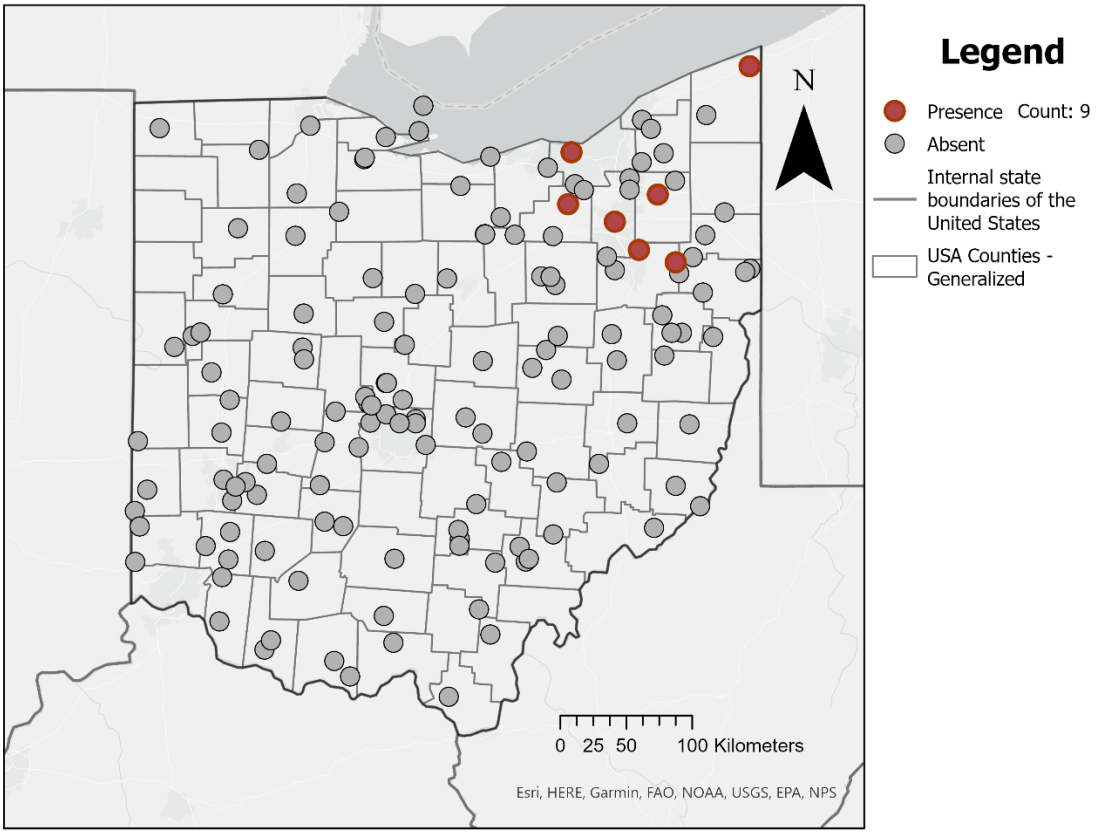
Andrena cressonii is a bee in the family Andrenidae. It is one of our most common species of *Andrena* in Ohio. It is found on a wide host of plants and nests in the soil. It has a very narrow vertex, short labral process, and very dense pitting on the second abdominal segment.

Andrena distans



Andrena distans is a bee in the family Andrenidae. It is a specialist of wild *Geranium* (Fowler and Droege, 2020). It is a spring species that nests in the soil. It is expected to occur wherever wild geranium is found. They are very similar to *Andrena erigeniae* and are best identified under a microscope.

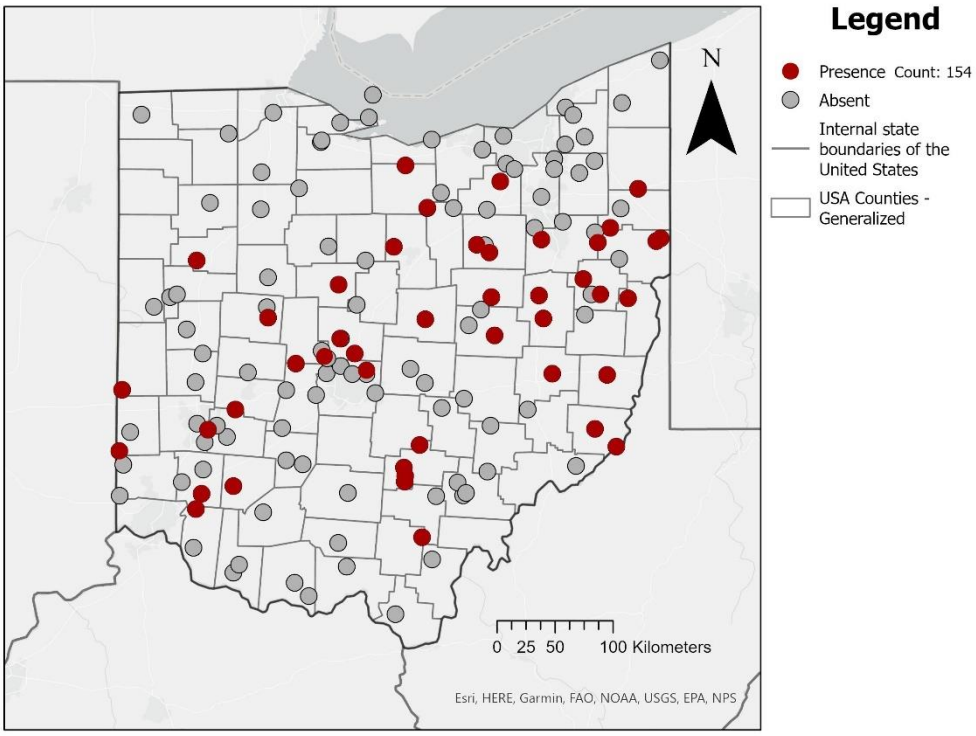
Andrena dunningi



Andrena dunningi is a bee in the family Andrenidae. It is a spring emerging mining bee that uses a variety of floral hosts. It is one of our larger *Andrena* and nests in the ground.

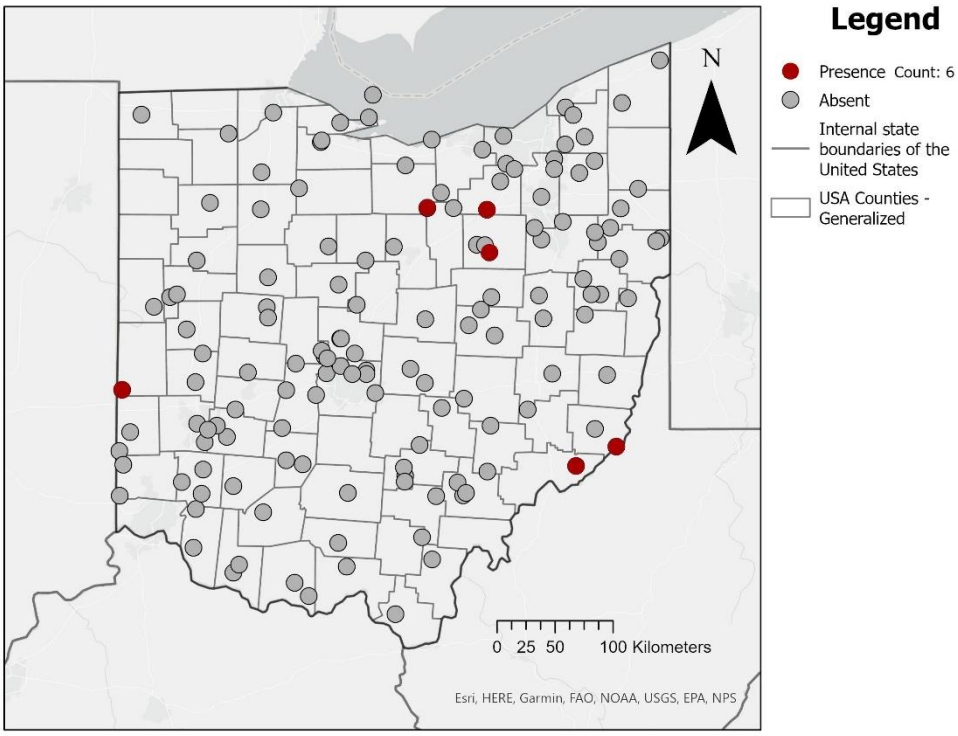
Size range: 10 – 13 mm (female), 8 – 12 mm (male)

Andrena erigeniae



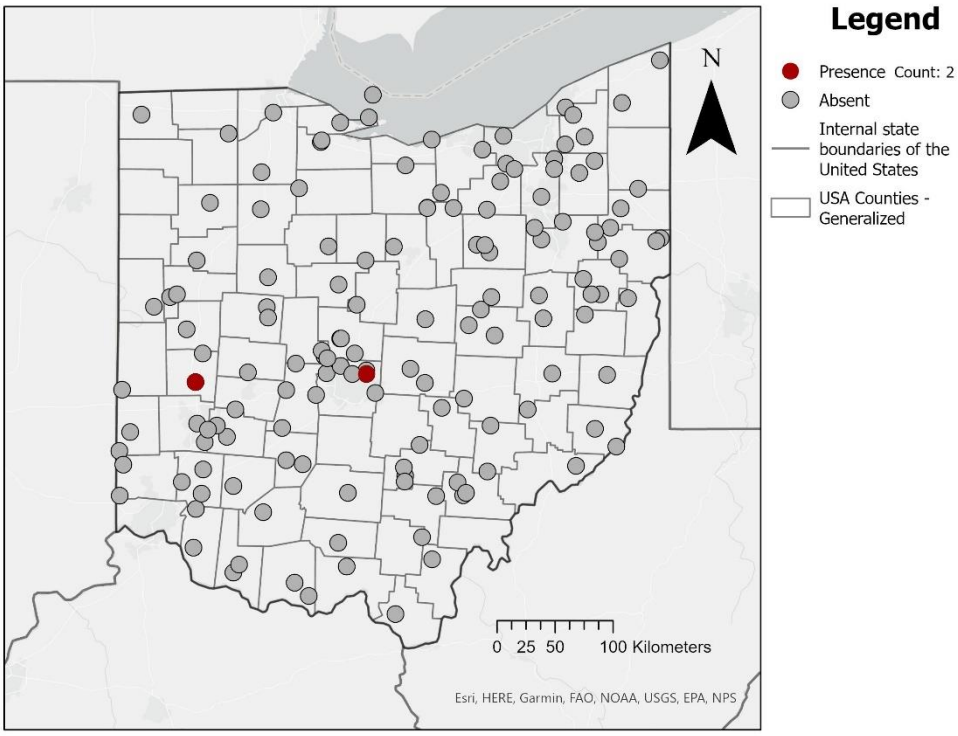
Andrena erigeniae is a bee in the family Andrenidae. It is a specialist of *Claytonia*, which are known as Spring Beauties (Fowler and Droege, 2020). This is one of our easiest spring specialist bees to find and can be found at most sites that have spring beauties. The bees nest in the soil and are parasitized be bees in the genus *Nomada.* It is not uncommon to find both *Andrena erigeniae* and *Nomada* on the spring beauty flowers.

Andrena forbesii



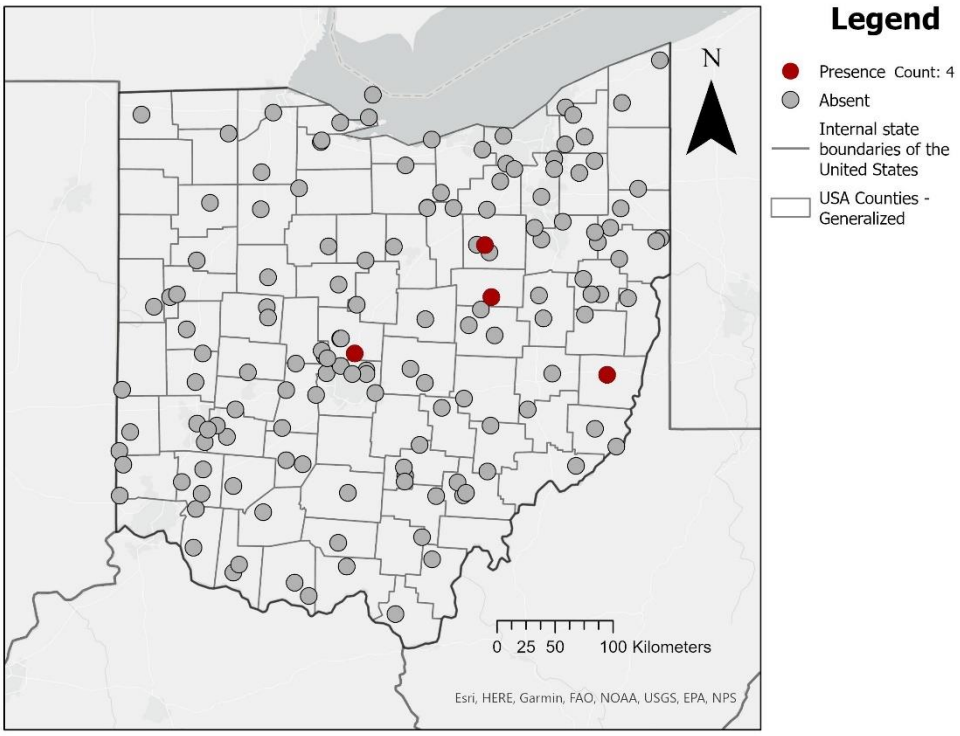
Andrena forbesii is a bee in the family Andrenidae. It is a spring emerging mining bee that nests in the soil. It is one of the harder Andrena to identify and needs microscopic examination to be sure. It is in the coarse propodeum group.

Andrena geranii



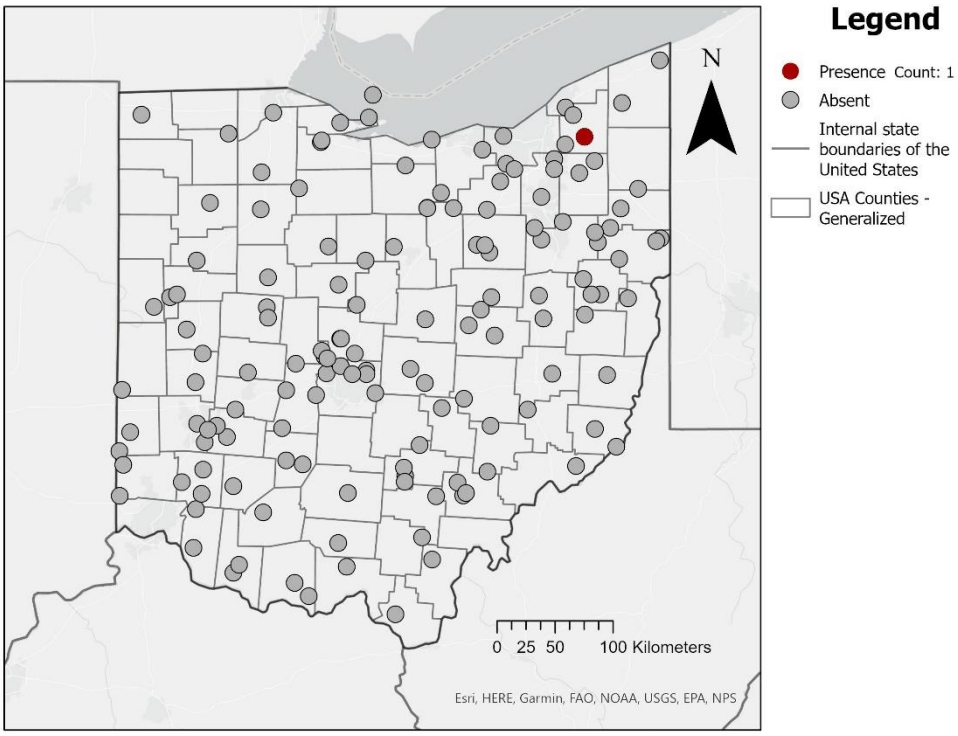
Andrena geranii is a bee in the family Andrenidae. It is, ironically, a specialist of *Hydrophyllum* (waterleaf) and not geranium (Fowler and Droege, 2020). The geranium specialist is *Andrena distans*. *Andrena geranii* can be locally abundant at sites with ample waterleaf. It is a spring emerging species of mining bee that nests in the soil. It is a medium sized *Andrena* that has a slight metallic tint when viewed under the microscope. This species is expected to be common across Ohio wherever there is abundant waterleaf. Targeted samples monitoring waterleaf flowers yielded many records of this species.

Andrena hippotes



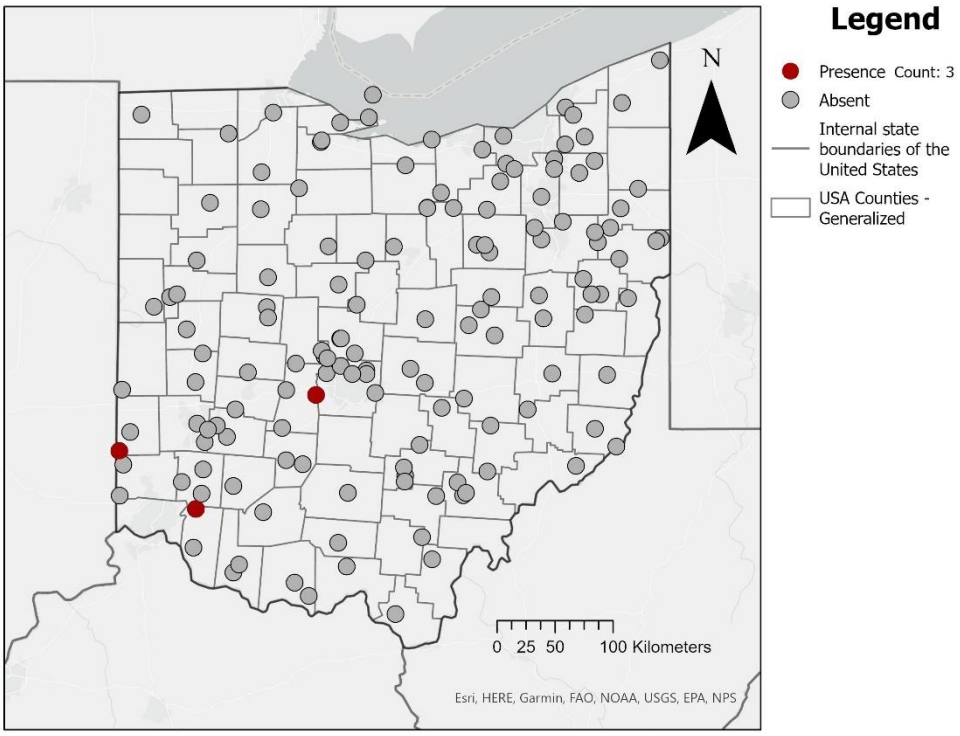
Andrena hippotes is a bee in the family Andrenidae. It is a spring emerging species of mining bee that visits a variety of flowers. It is a relatively non-descript species of *Andrena* with the exception that it typically has orange-colored hind legs (the integument, not the hair). There are a few other Andrena that also have orange hind legs, so microscopic examination is still needed. Size range: 8 – 11 mm (female), 7 – 10 mm (male)

Andrena hirticincta



Andrena hirticincta is a bee in the family Andrenidae. It is a fall flying specialist of *Euthamia, Solidago*, and *Symphyotrichum* (Fowler and Droege, 2020). It nets in the soil. *Andrena hirticincta* is regularly confused for honey bees by novice bee enthusiasts, but has longer hair on the abdomen.

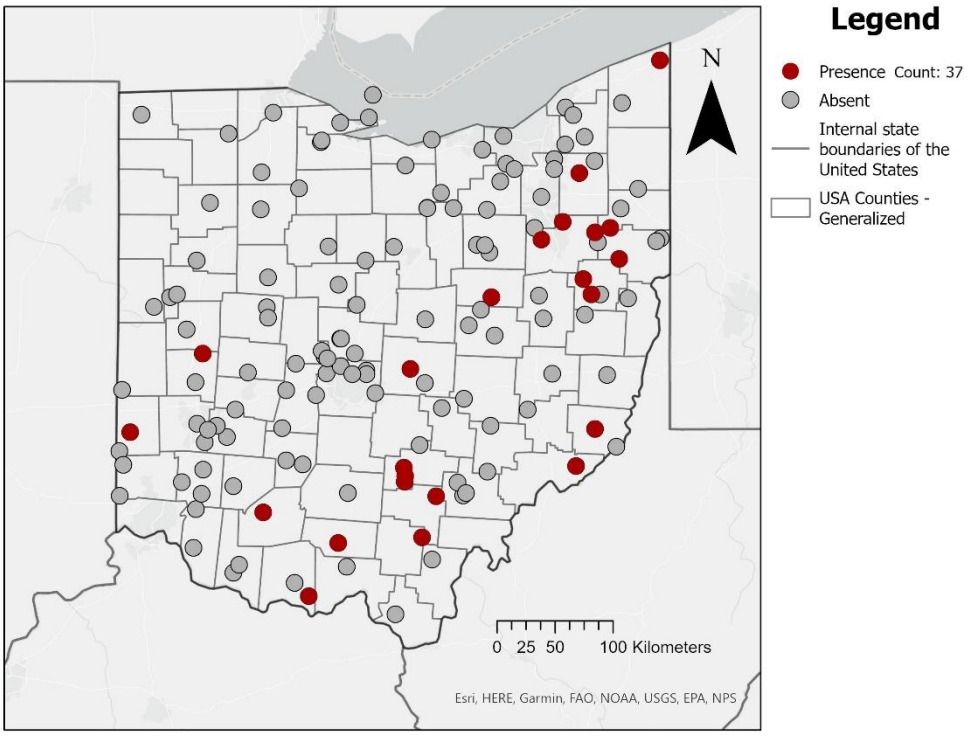
Andrena illini



Andrena illini is a bee in the family Andrenidae. It is one of our biggest species of *Andrena*. They are ground nesting bees and have dark wings.

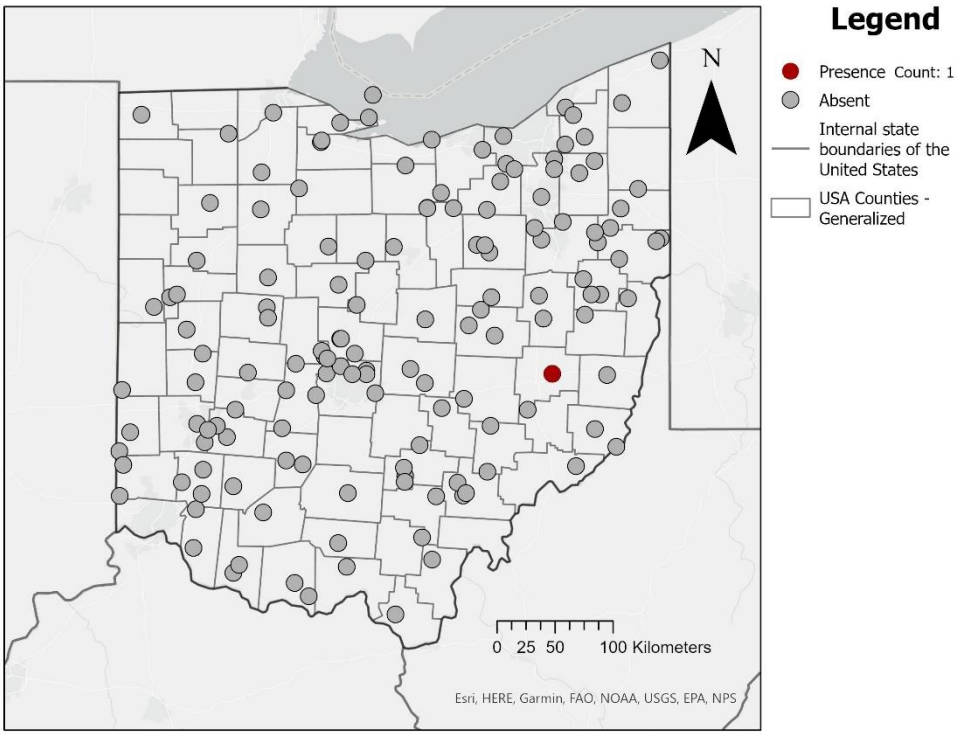
Size range: 13-15 mm (female), 9-14 mm (male)

Andrena imitatrix



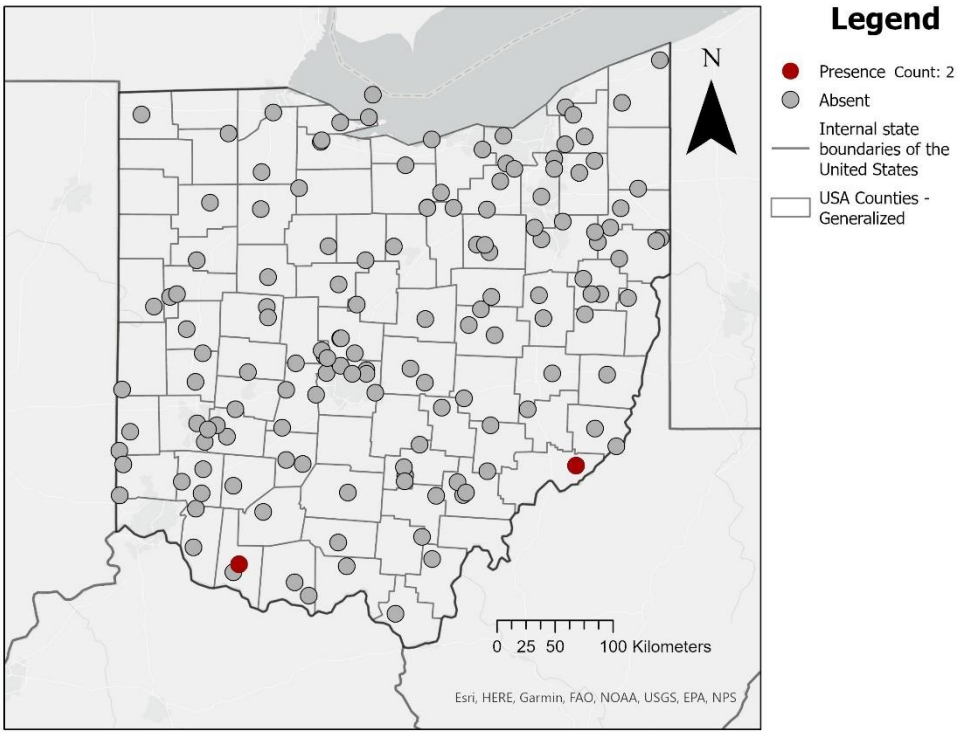
Andrena imitatrix is a bee in the family Andrenidae. It is a spring flying mining bee that nests in the soil. It is one of the tricky groups of *Andrena* to identify.

Andrena krigiana



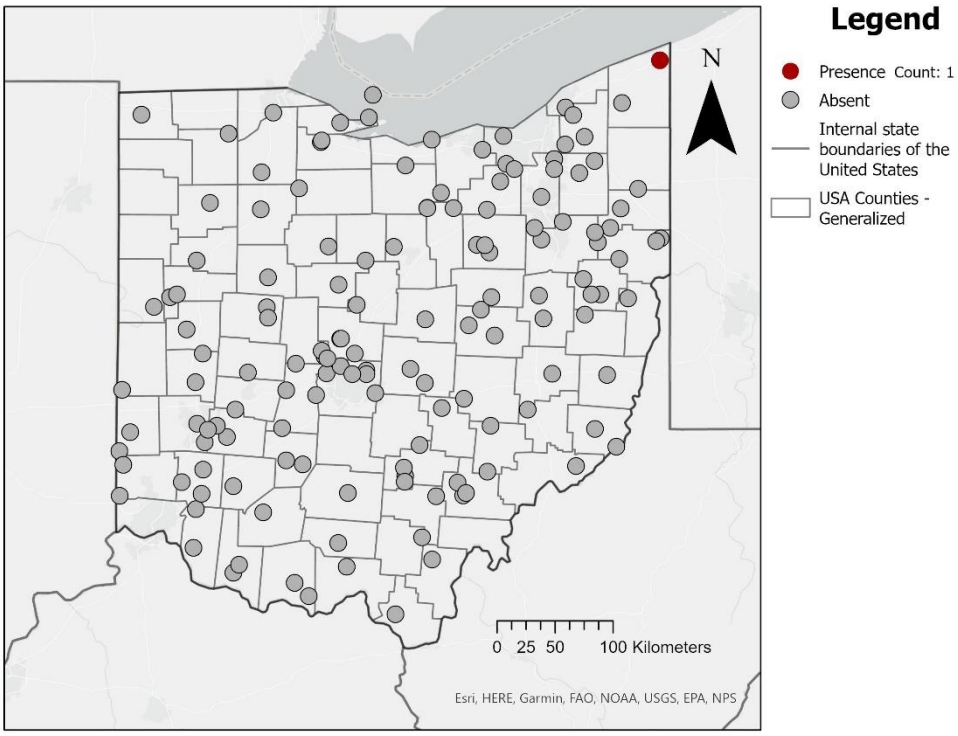
Andrena krigiana is a bee in the family Andrenidae. It is a specialist of Cichorieae: *Hieracium* and *Krigia* (Fowler and Droege, 2020). It is a spring emerging species that nests in the soil.

Andrena lamelliterga



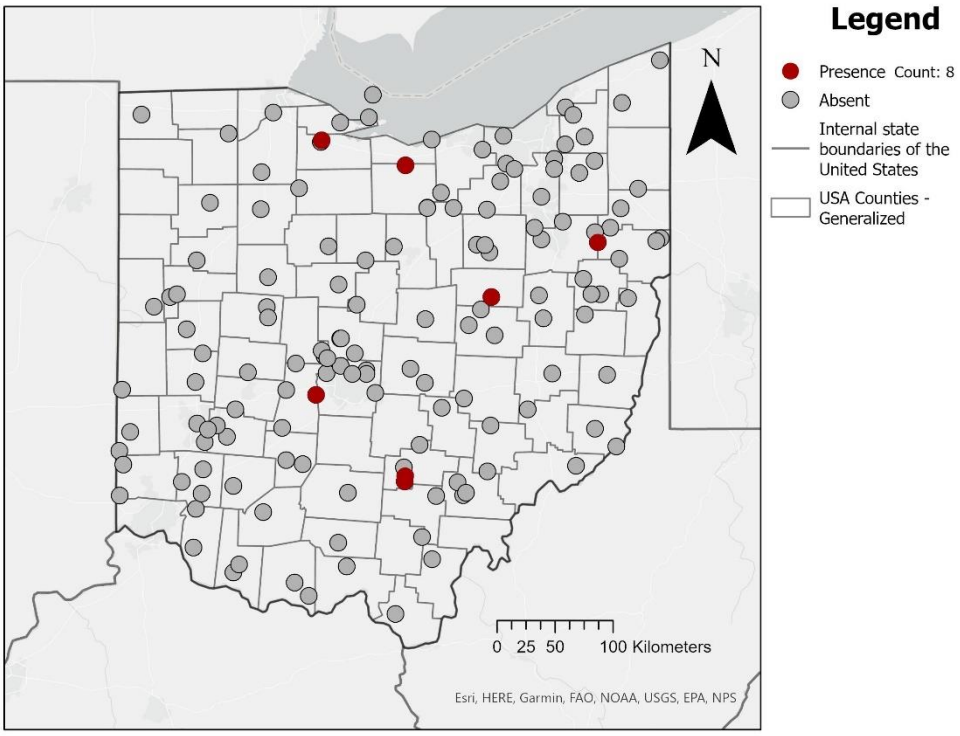
Andrena lamelliterga is a bee in the family Andrenidae. It is a specialist of *Phacelia* (Fowler and Droege, 2020). It is one of our smallest *Andrena* and challenging to identify. It is a spring species that nests in the soil.

Andrena mandibularis



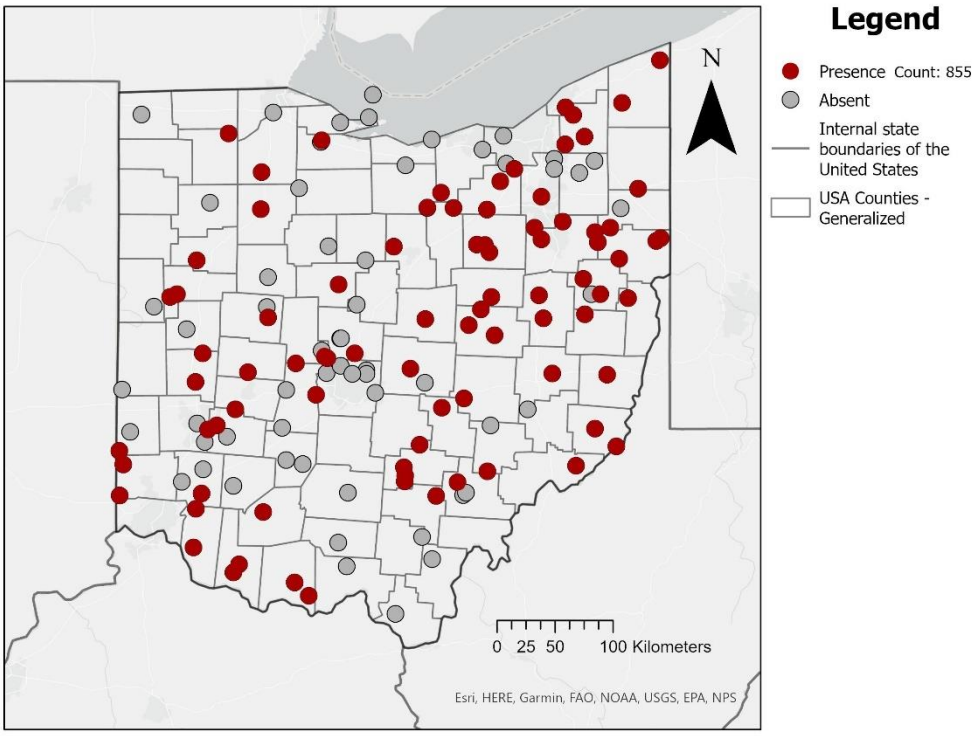
Andrena mandibularis is a bee in the family Andrenidae. It is a spring emerging ground nesting bee. The males have a small triangle on the underside of the mandible near the base.

Andrena miserabilis



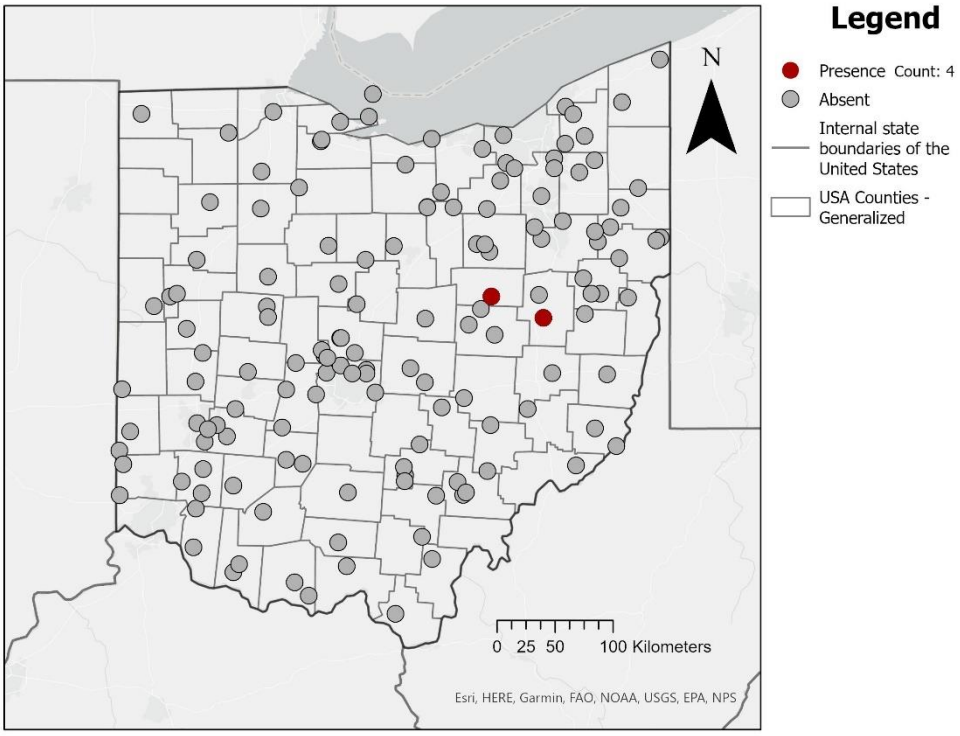
Andrena miserabilis is a bee in the family Andrenidae. It is a spring and early summer species of mining bee that nests in the ground. The females have a dark face, whereas males have a bright yellow clypeus (but no yellow in the paraocular area). Like most other *Andrena*, this species is tricky to identify without microscopic examination of key characters. It has also been referred to as the Miserable Mining Bee, perhaps in part because it is a variable species that is tricky to identify.

Andrena nasonii



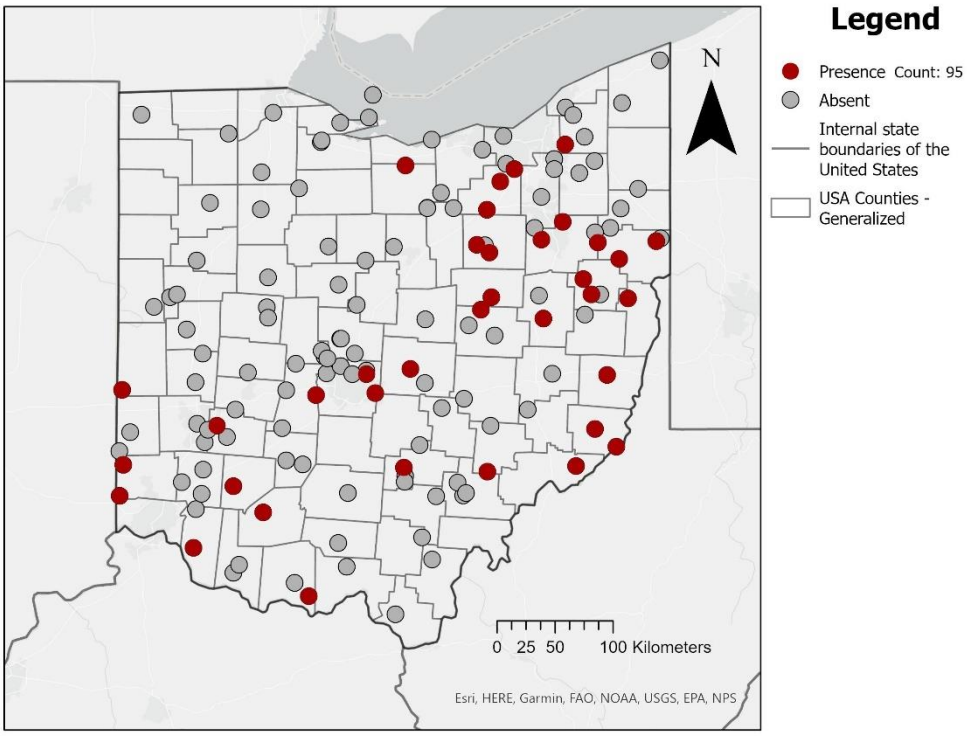
Andrena nasonii is a bee in the family Andrenidae. It is a common species of spring Andrena that uses a variety of plant floral resources. It nests in the ground. It is a medium sized *Andrena* with triangular (cuneate) hind tibia and very broad facial fovea. There is also a bump on the underside of the thorax.

Andrena nuda



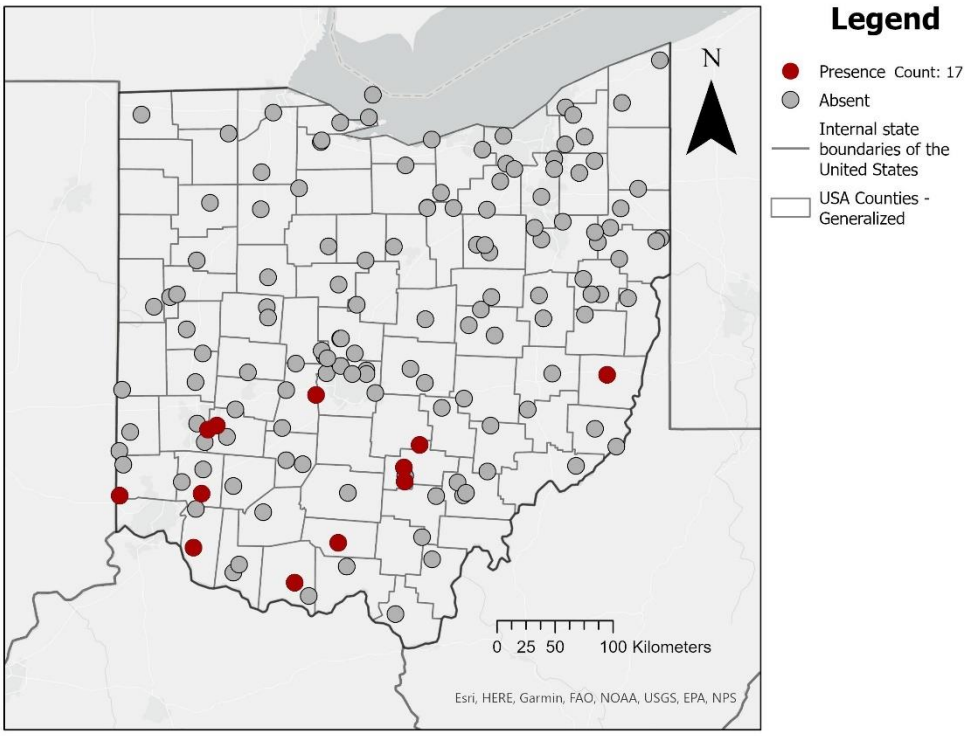
Andrena nuda is a bee in the family Andrenidae. It is a distinct species of *Andrena* with minimal pitting or hairs on the scutum, very rough propodeum, and facial fovea greatly narrowed at the base. It visits a variety of forest flowers.
Size range: 8 – 10 mm (female), 7 – 9 mm (male)

Andrena perplexa



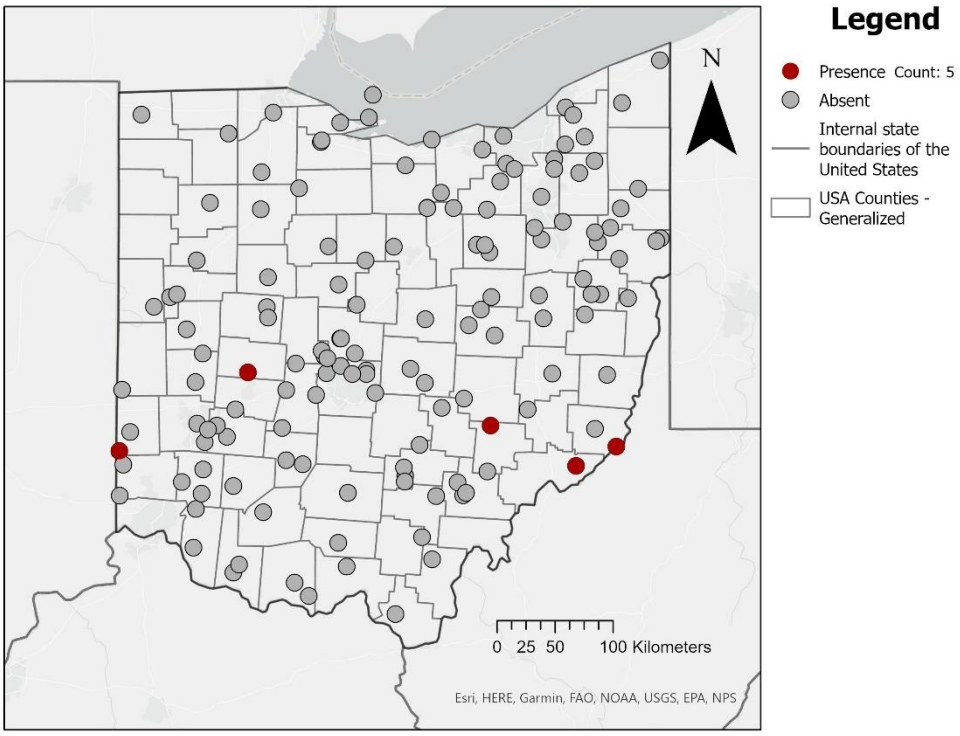
Andrena perplexa is a bee in the family Andrenidae. It is sometimes called the perplexing mining bee. It is an early season species that nests in the soil. They are one of the larger *Andrena*, but still smaller than the average bumble bee or honey bee. They have a distinct ridge or angle on the pronotum and the apical region of the second abdominal segment has minimal to no pitting.

Andrena personata



Andrena personata is a bee in the family Andrenidae. It is a tricky, small mining bee in the subgenus Micrandrena. It seems to be our most common species in this subgenus, but the group is tricky to identify. Males have a yellow face.

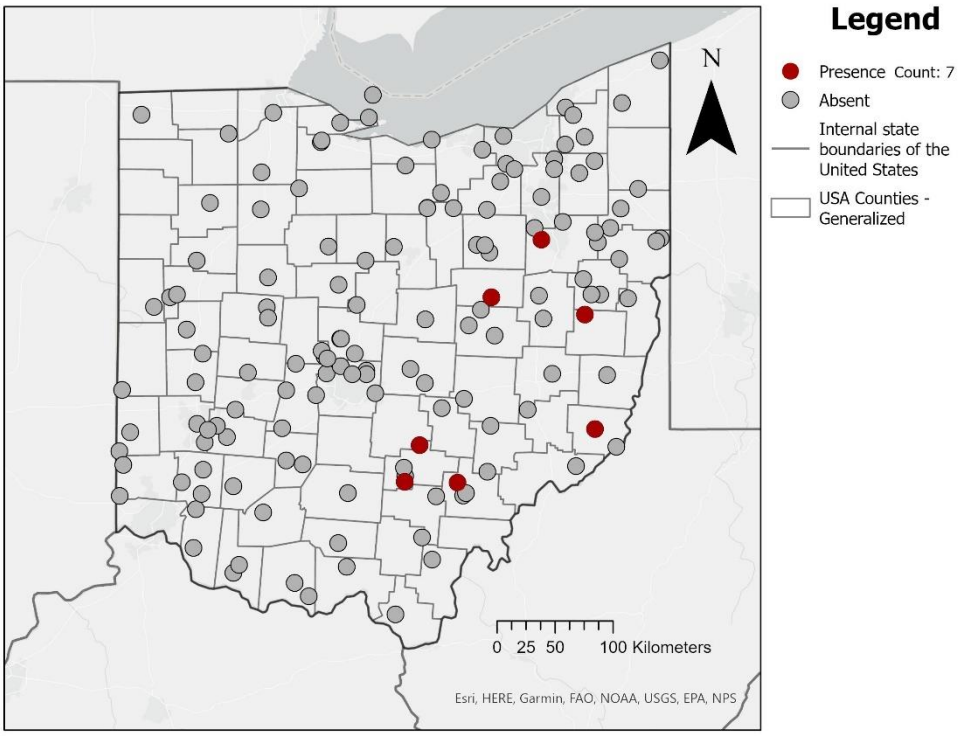
Andrena phaceliae



Andrena phaceliae is a bee in the family Andrenidae. It is a pollen specialist of *Phacelia* (Fowler and Droege, 2020). It is a spring emerging species, matching up with the host plant. It also nests in the soil.

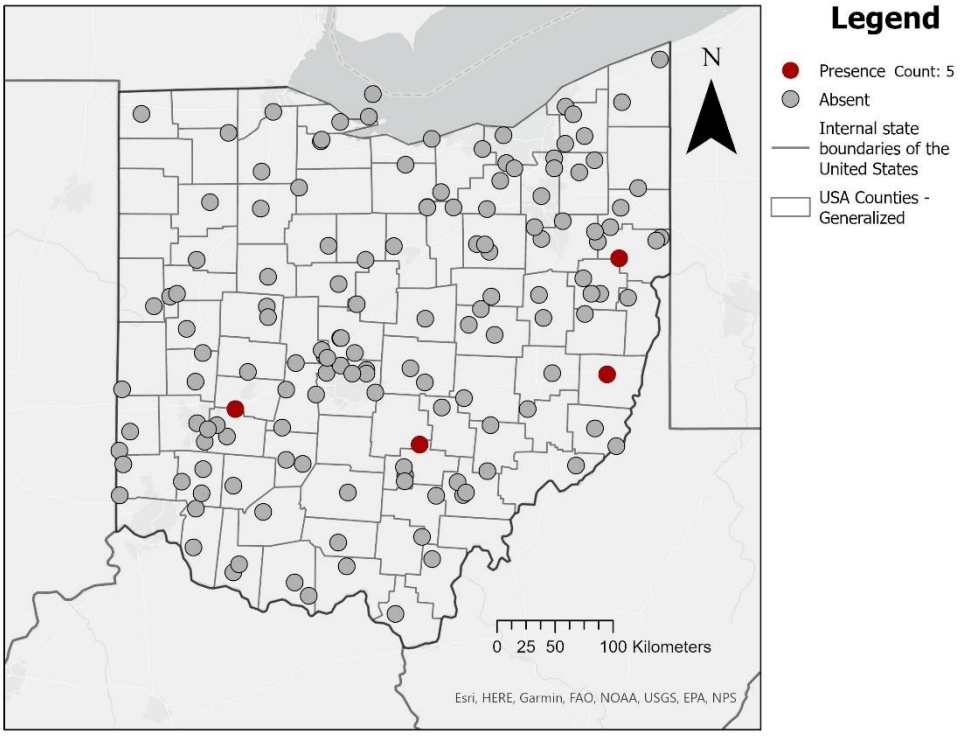
Size range: 8 – 10 mm (female), 7 – 9 mm (male)

Andrena pruni



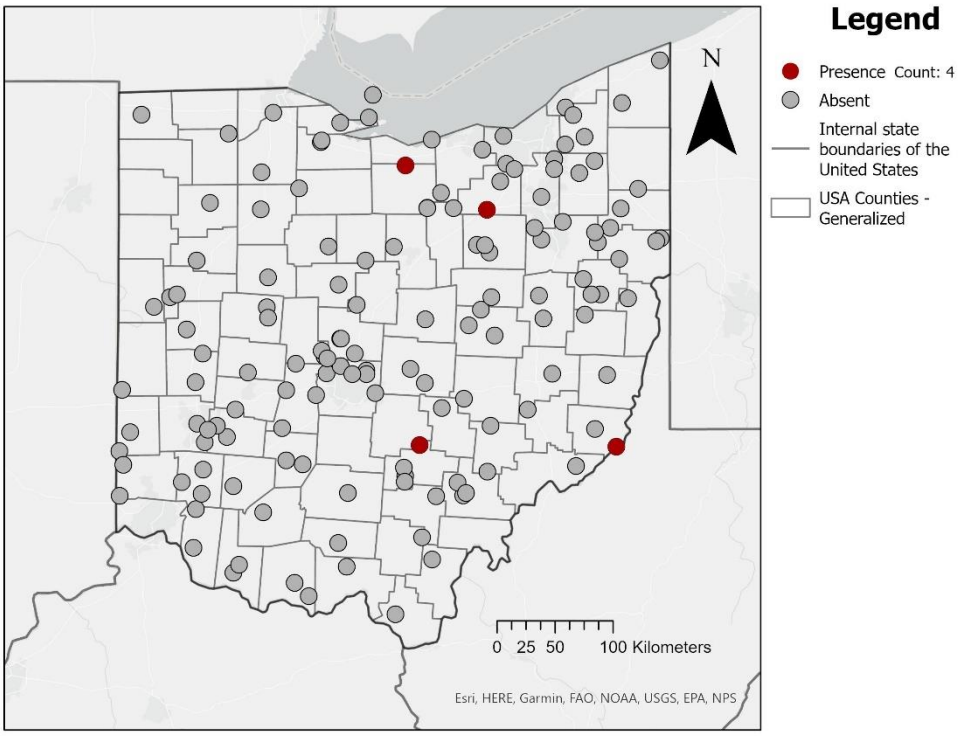
Andrena pruni is a bee in the family Andrenidae. It is one of the larger *Andrena* with narrow facial fovea in the females. The males have a distinct tuft of hair on the underside of the last abdominal segment. This is a ground nesting bee that visits a variety of floral resources.

Andrena robertsonii



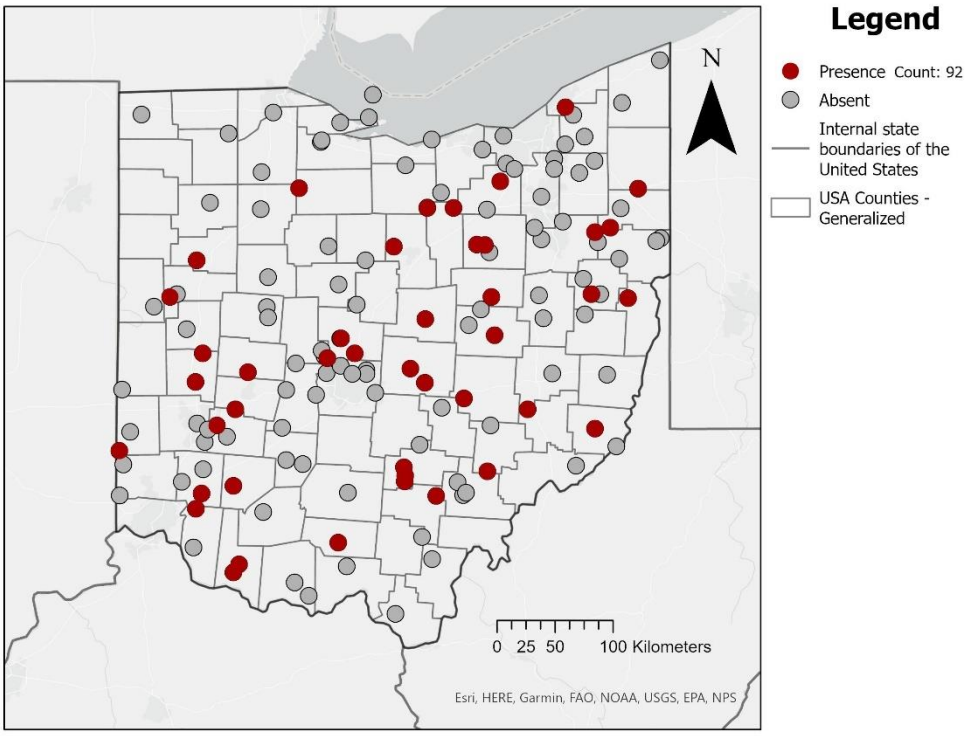
Andrena roberstonii is a bee in the family Andrenidae. It is a spring emerging mining bee that nests in the soil. It uses a variety of floral resources.

Andrena rugosa



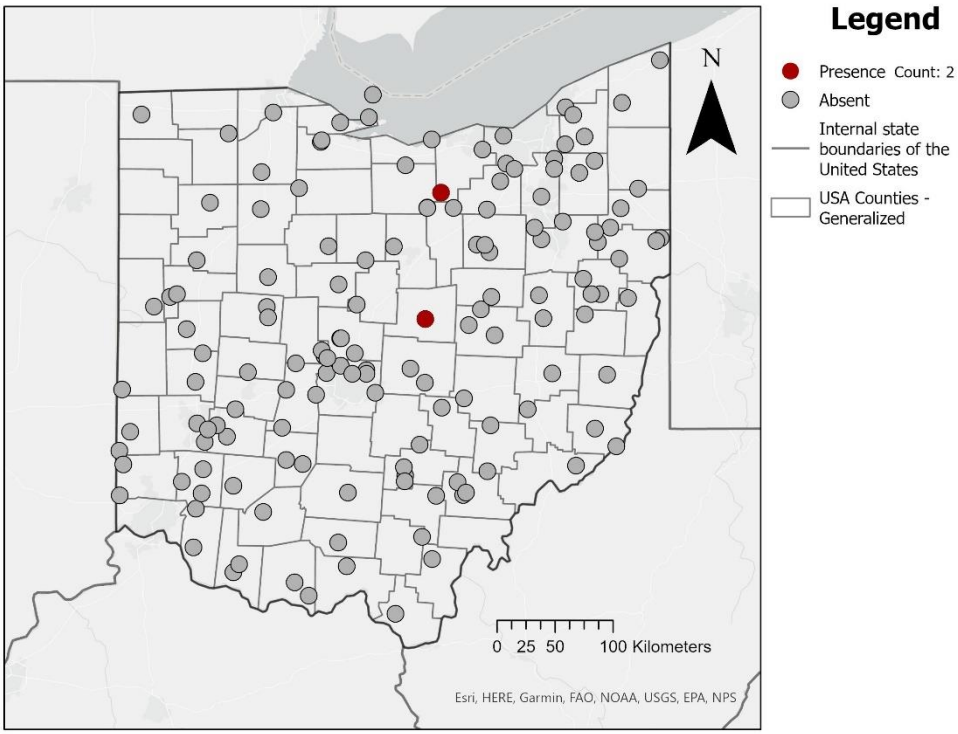
Andrena rugosa is a bee in the family Andrenidae. It is another very distinct species when viewed under the microscope. *Andrena rugosa* has a very rough propodeum, facial fovea very narrowed below, and the fovea at least one ocular distance away from the inner margin of the eye. It is a spring emerging species that flies into June. It nests in the soil and is more often found in forested habitats.

Andrena simplex



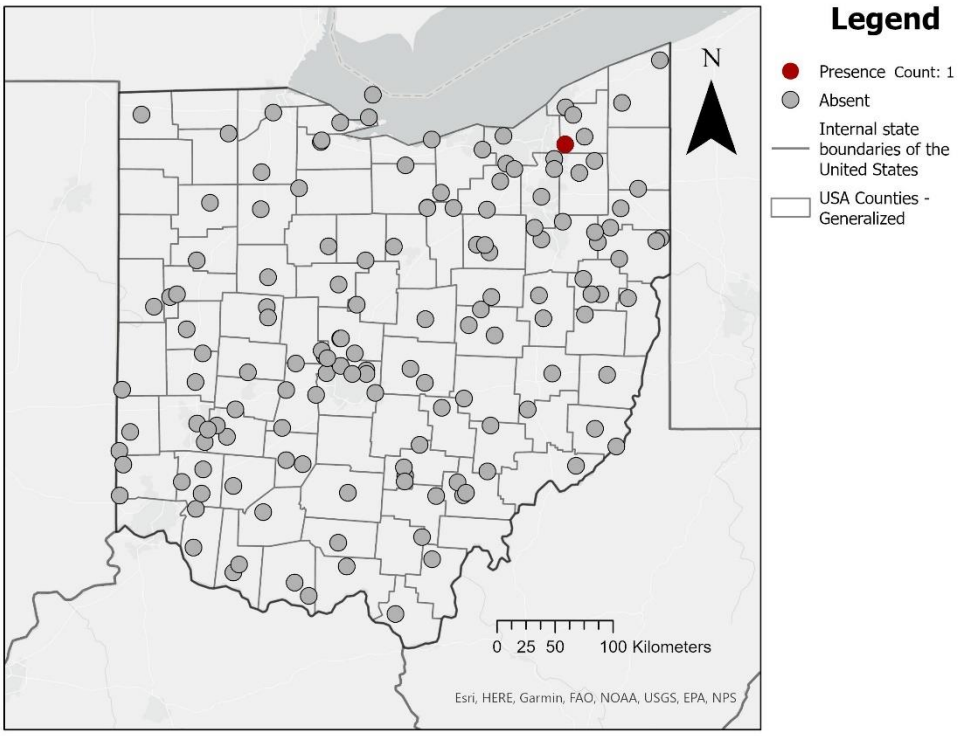
Andrena simplex is a bee in the family Andrenidae. It is a specialist of *Eurybia*, *Solidago*, and *Symphyotrichum* (Fowler and Droege, 2020). This is one of our few fall flying *Andrena*, but we expect it across Ohio. As with other *Andrena*, it nests in the soil.

Andrena spiraeana



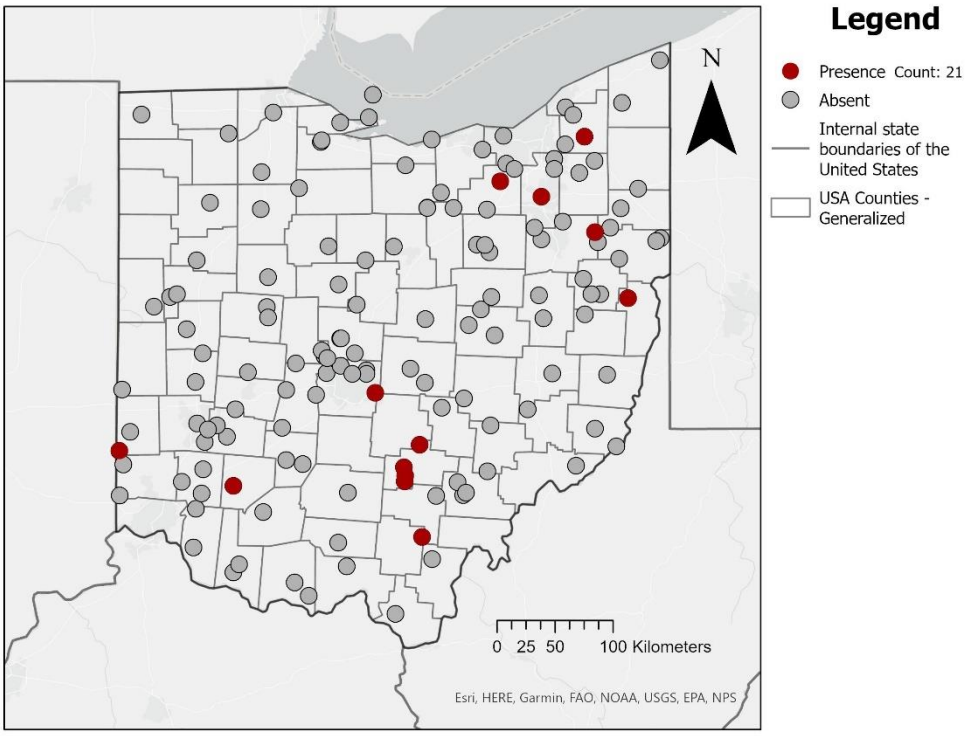
Andrena spiraeana is a bee in the family Andrenidae. It is one of the rough propodeum group *Andrena*. This is a spring emerging, ground nesting species.

Andrena tridens



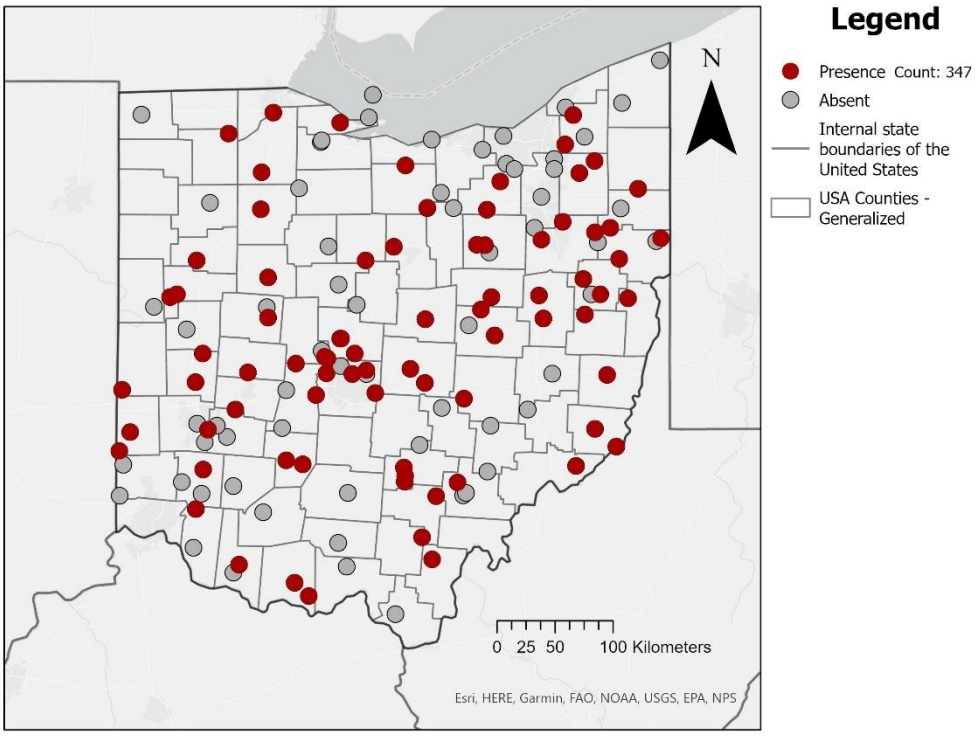
Andrena tridens is a bee in the family Andrenidae. It is another tricky to identify *Andrena*. This is a spring emerging, ground nesting species.

Andrena vicina



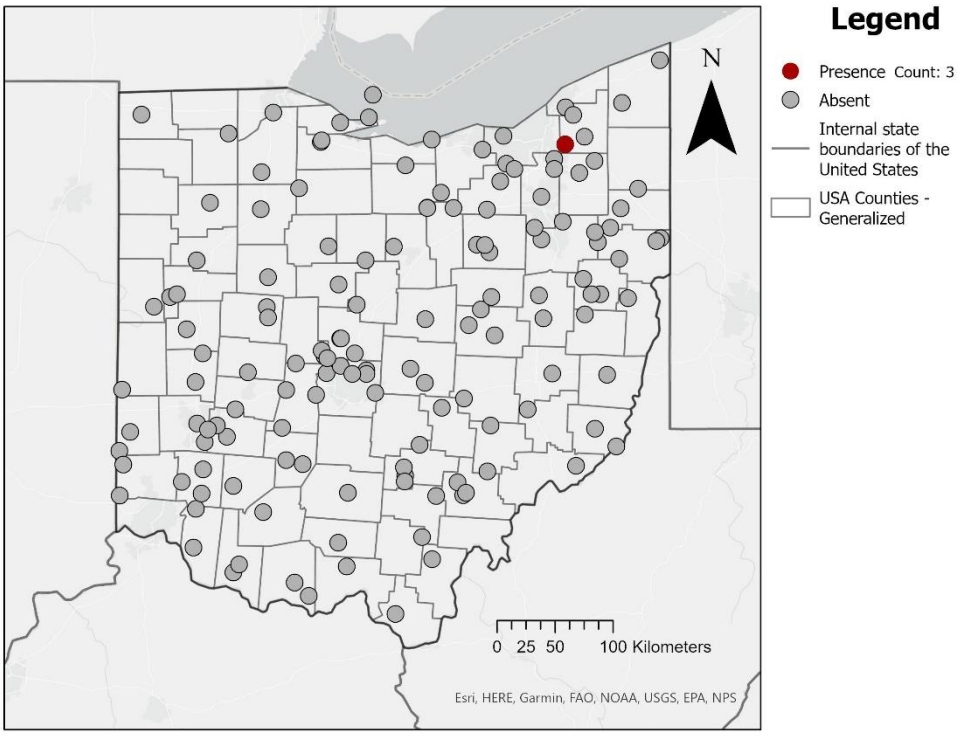
Andrena vicina is a bee in the family Andrenidae. It is one of the larger *Andrena* and sometimes confused for a thin bumble bee. It is most similar to *Andrena carlini*, but *vicina* has light pale hairs on the cheek (gena) instead of the dark hairs found on *carlini*. Both *carlini* and *vicina* have black hindleg hairs, whereas most *Andrena* have pale hairs. This is a spring emerging, ground nesting species.

Andrena violae



Andrena violae is a bee in the family Andrenidae. It is a specialist of *Viola* (Fowler and Droege, 2020). The violet miner is especially common in the bowl samples, perhaps because their flower host also grows so low to the ground. We caught many in our bowl survey, though people rarely actually see them on the flowers. This is a spring emerging, ground nesting species. We expect it to occur in all of Ohio. The female *violae* have densely punctate abdomens and a bulging face when viewed from the side. The labral process is also very long.

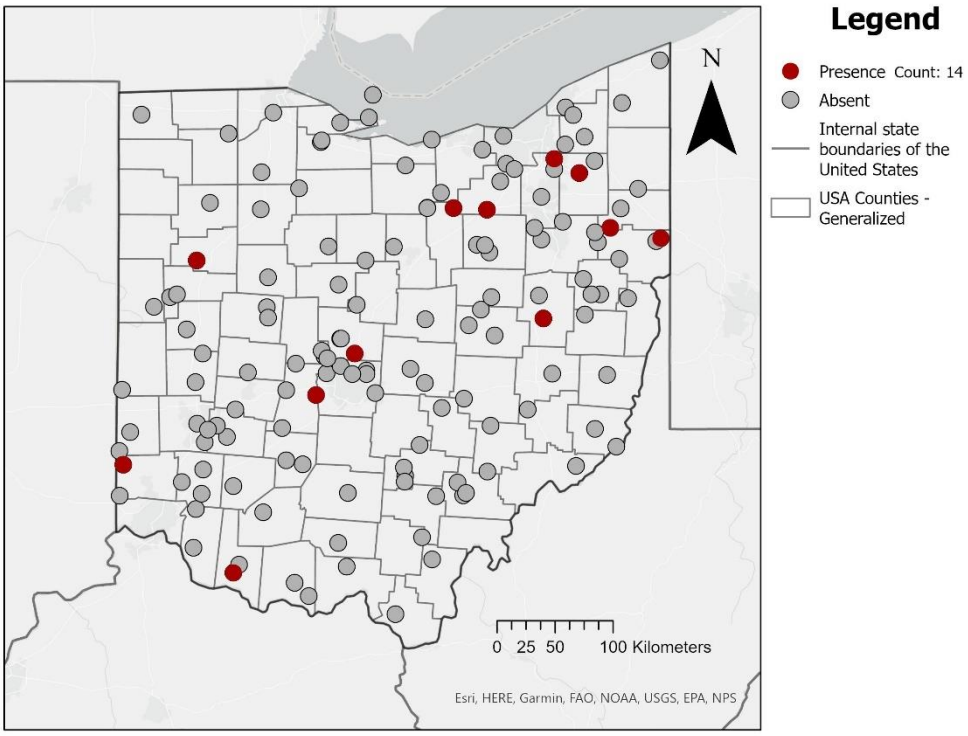
Andrena wheeleri



Andrena wheeleri is a bee in the family Andrenidae. It is a spring emerging, ground nesting species of bee. It uses a variety of floral resources.

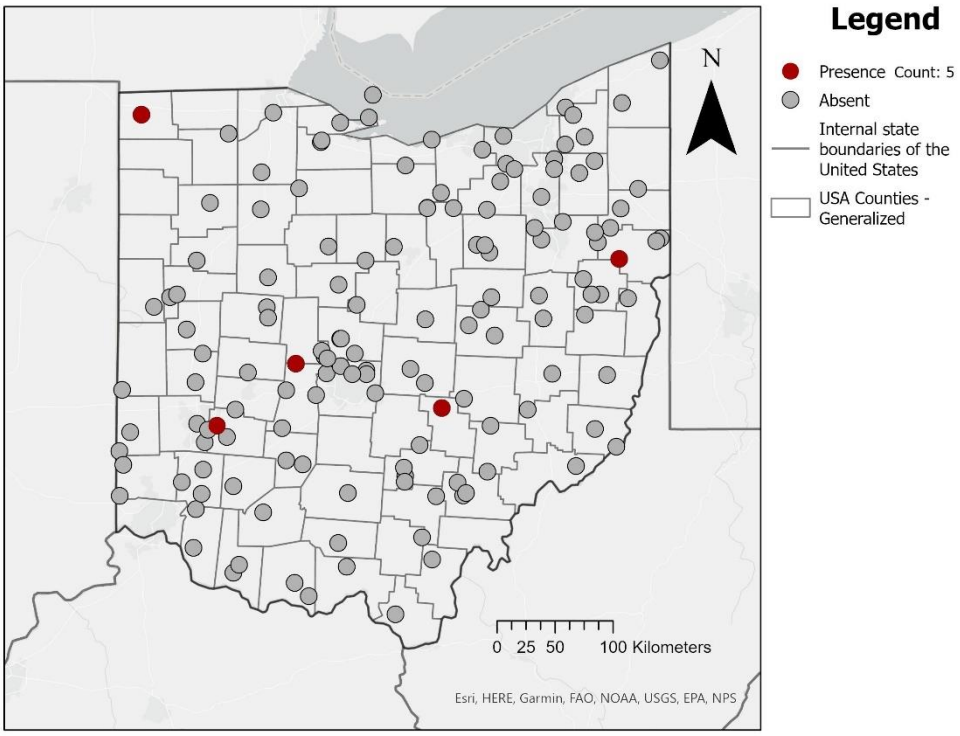
Size range: 7.5 mm (female), 5 mm (male)

Andrena wilkella



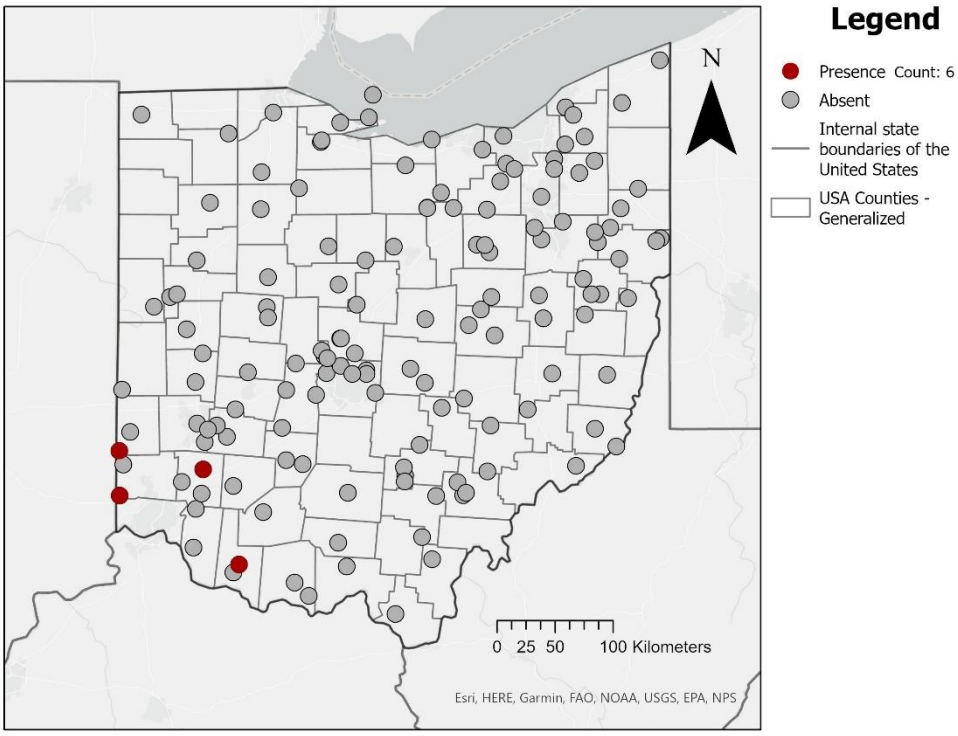
Andrena wilkella is a bee in the family Andrenidae. It is a non-native species of *Andrena* that is most often observed in mid to late June in Ohio. It is also one of only a few non-native species of ground nesting bees that have established in North America. It uses a variety of floral resources.

Andrena wilmattae



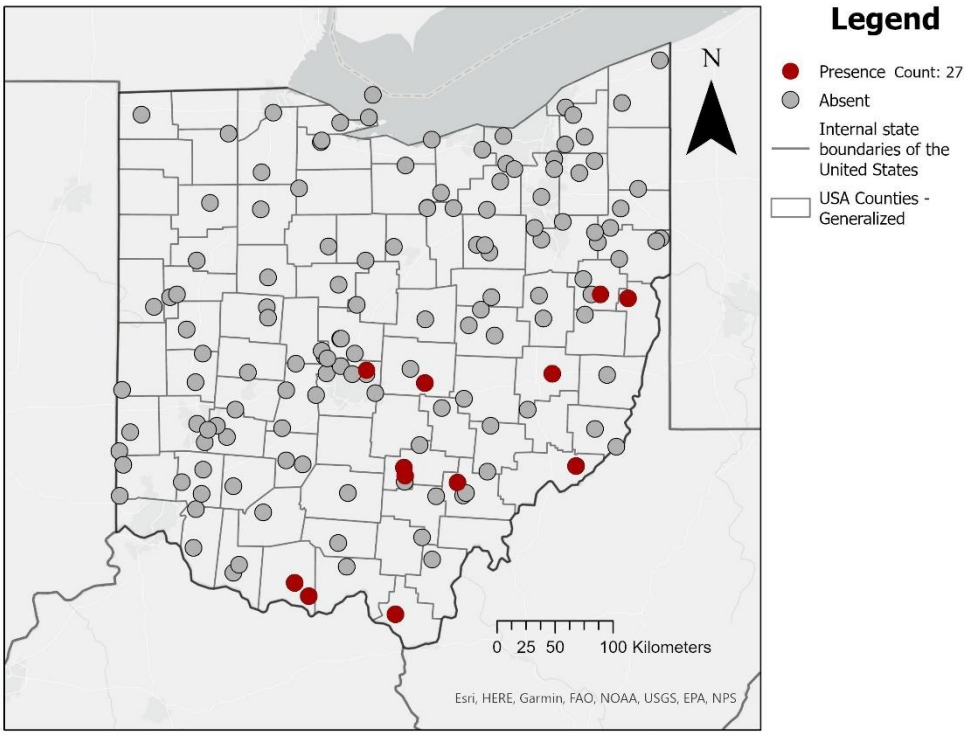
Andrena wilmattae is a bee in the family Andrenidae. It is another one of the bigger *Andrena*. They are a spring species and nest in the ground. They have a smooth propodeum, narrow vertex, and dense pitting on the second abdominal segment.

Andrena ziziae



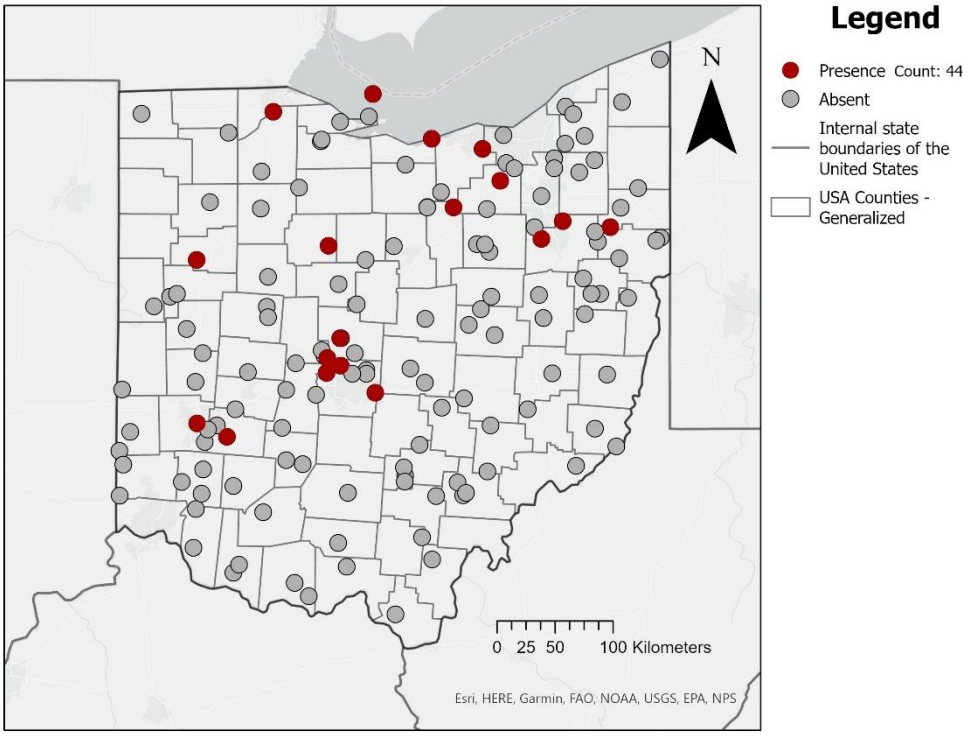
Andrena ziziae is a bee in the family Andrenidae. It is a spring flying specialist bee that nests in the ground. It is a specialist of *Zizia* (Fowler and Droege, 2020). It is in the tricky subgenus of Micrandrena and is taxonomically challenging to separate from other species.

Andrena ziziaeformis



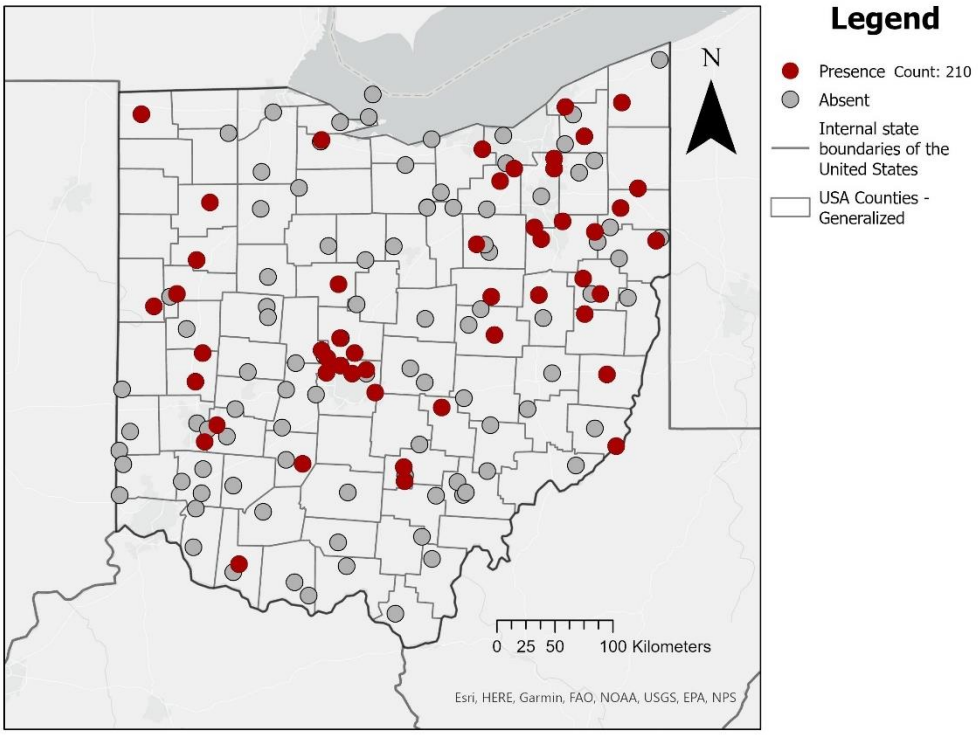
Andrena ziziaeformis is a bee in the family Andrenidae. It is a spring flying specialist bee that nests in the ground. It is a specialist of *Potentilla* and *Waldsteinia* (Fowler and Droege, 2020).

Anthidium manicatum



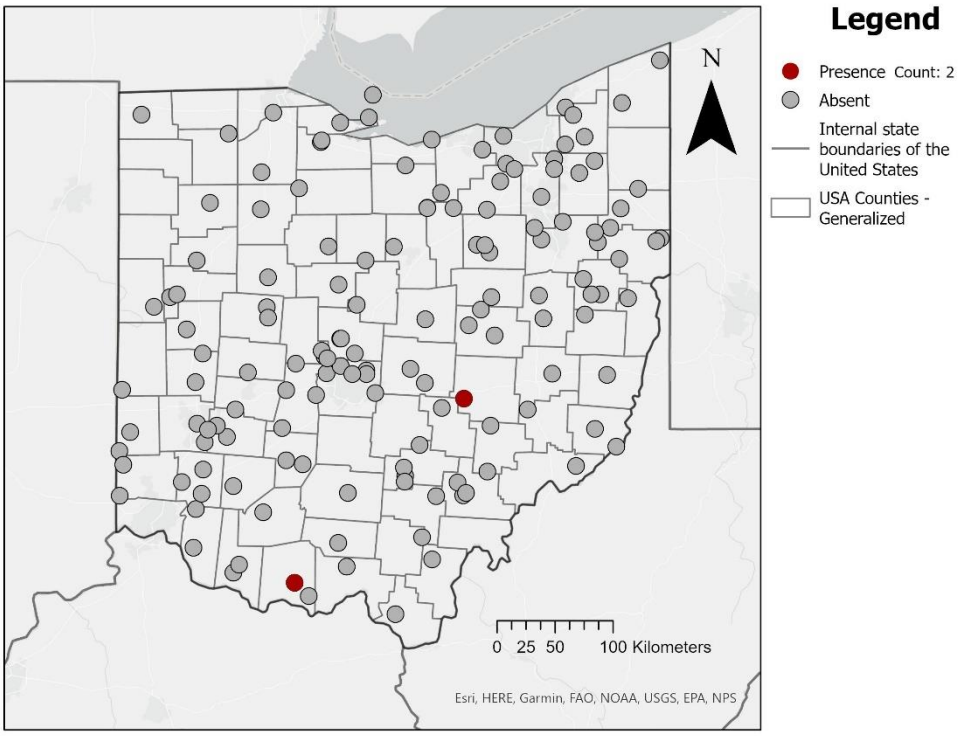
Anthidium manicatum is in the family Megachilidae. It is a non-native species of cavity nesting bees. They line their nests with plant fibers and can be observed carrying white balls of fluff to their nests. Males of this species can be aggressive to other insects around flower patches. The males can sometimes even be territorial towards humans, though not as much as the male large carpenter bees. Thankfully, males cannot sting. These are expected to occur in most urban areas. Below is an example of a female visiting Anise Hyssop.

Anthidium oblongatum



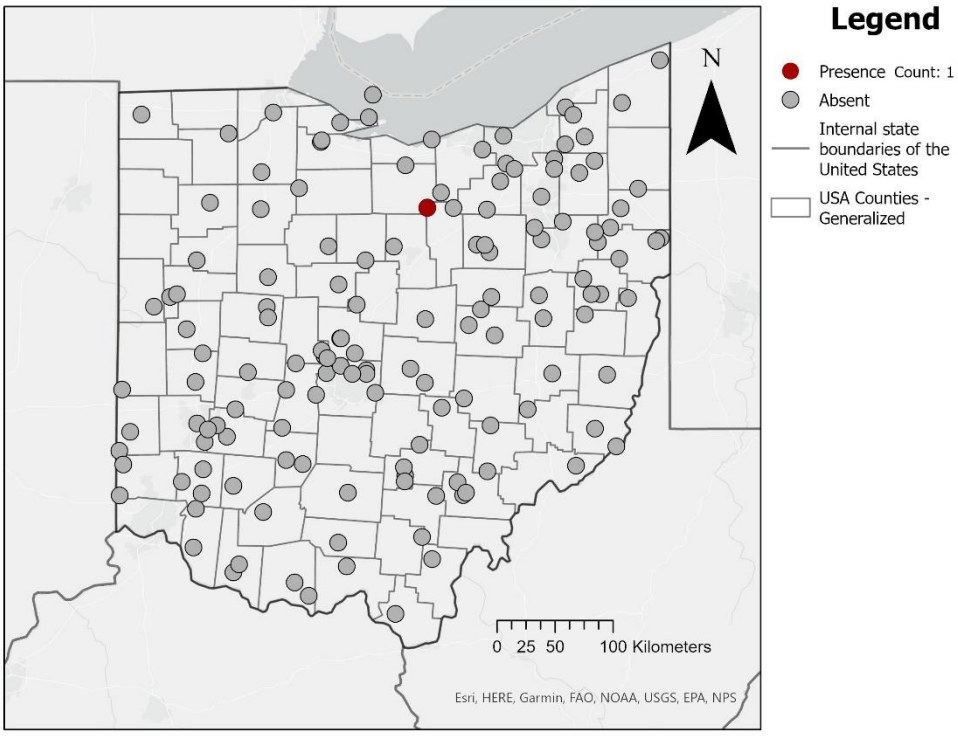
Anthidium oblongatum is in the family Megachilidae. It is a non-native species of cavity nesting bees. They line their nests with plant fibers and can be observed carrying white balls of fluff to their nests (example image below). Males of this species can be aggressive to other insects around flower patches. The males can sometimes even be territorial towards humans, though not as much as the male large carpenter bees. Thankfully, males cannot sting. These are expected to occur in most urban areas.

Anthophora abrupta



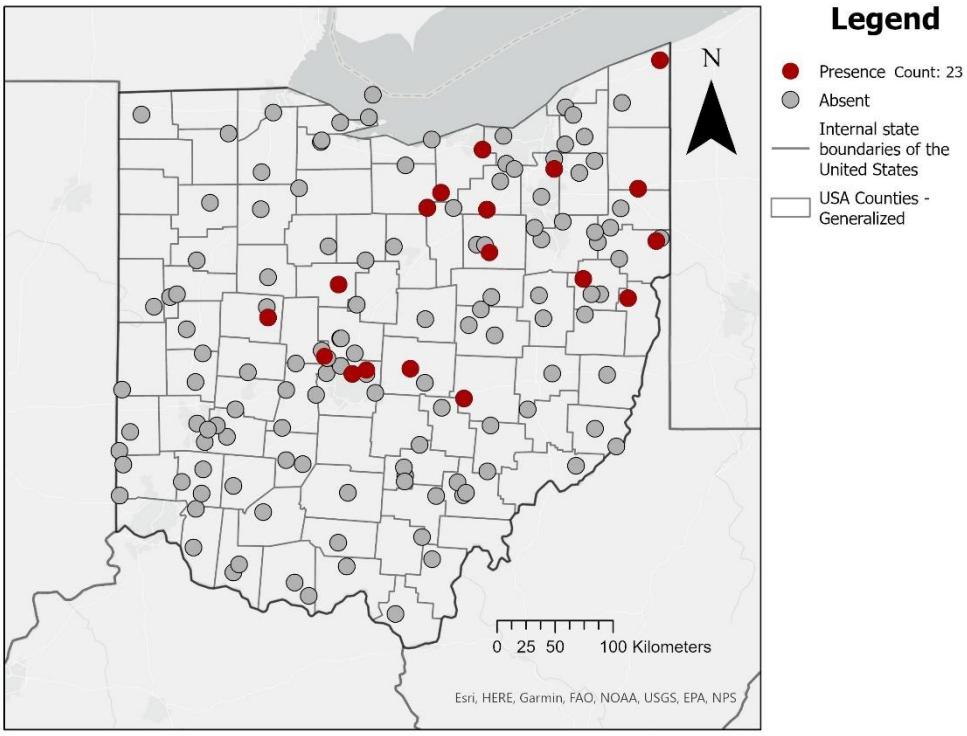
Anthophora abrupta is in the family Apidae. It is a native ground nesting species that builds small turrets around their nest entrances. They are regularly confused with bumble bees as they are similarly colored and fluffy. The male *Anthophora abrupta* has a yellow face (not just yellow hair like in bumblebees, but the integument is yellow).

Anthophora bomboides



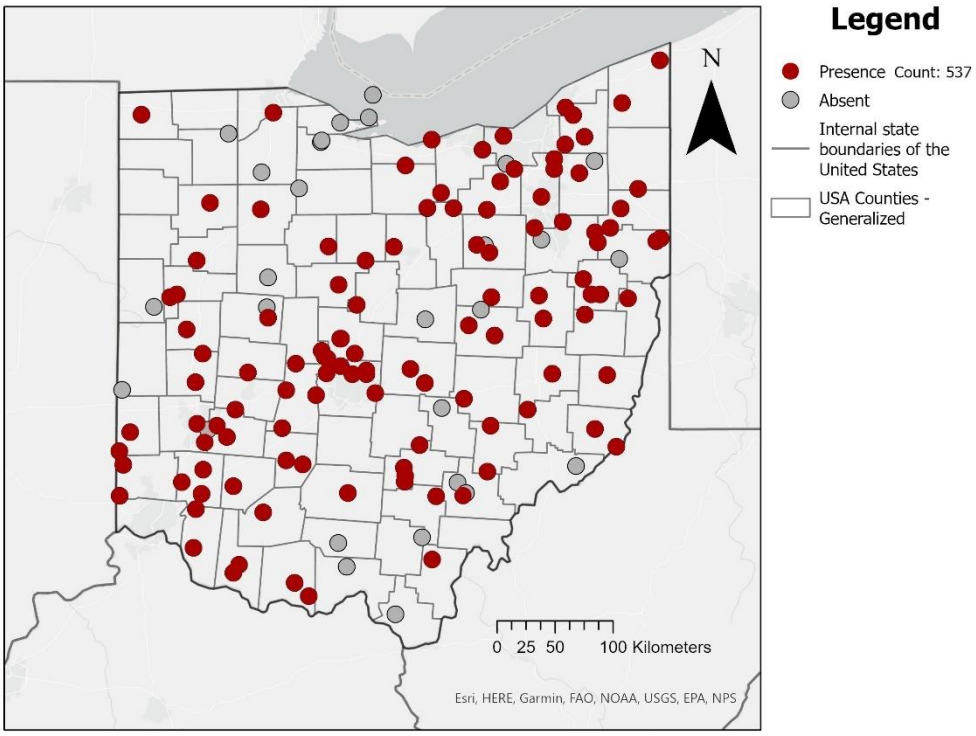
Anthophora bomboides is in the family Apidae. It is a native ground nesting species that builds small turrets around their nest entrances. They are regularly confused with bumble bees as they are similarly colored and fluffy. The male *Anthophora bomboides* has a yellow face (not just yellow hair like in bumblebees, but the integument is yellow).

Anthophora terminalis



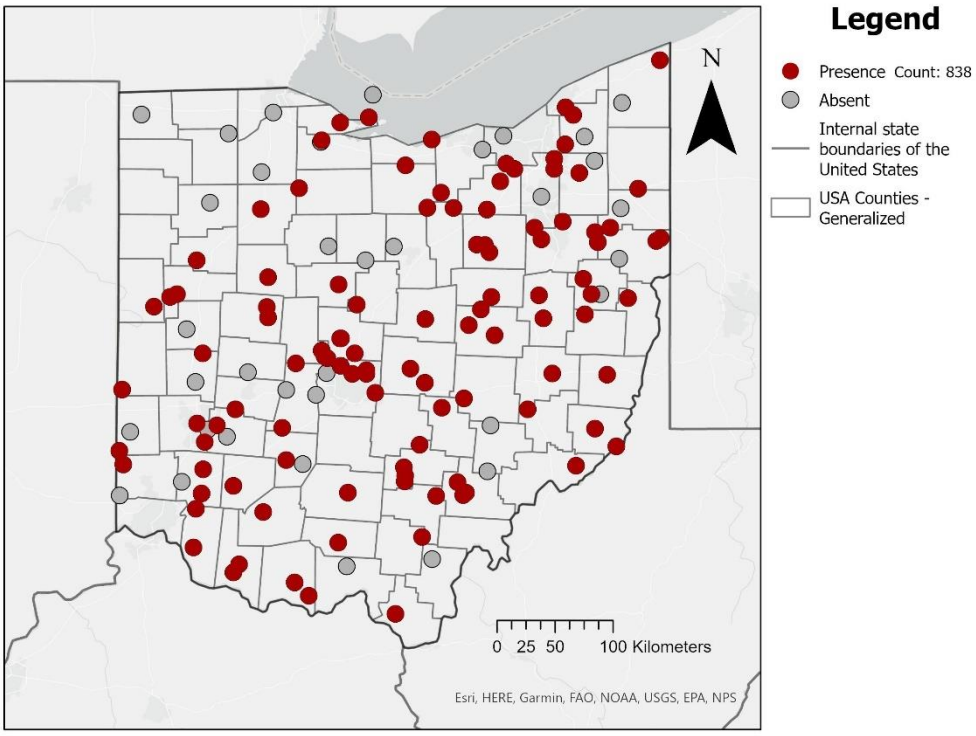
Anthophora terminalis is in the family Apidae. It is a gray, medium sized native species of bee. Their mandibles have 3 rounded teeth that are distinct in the family. The body hairs are mostly gray, with orange hairs on the end of the abdomen.

Apis mellifera



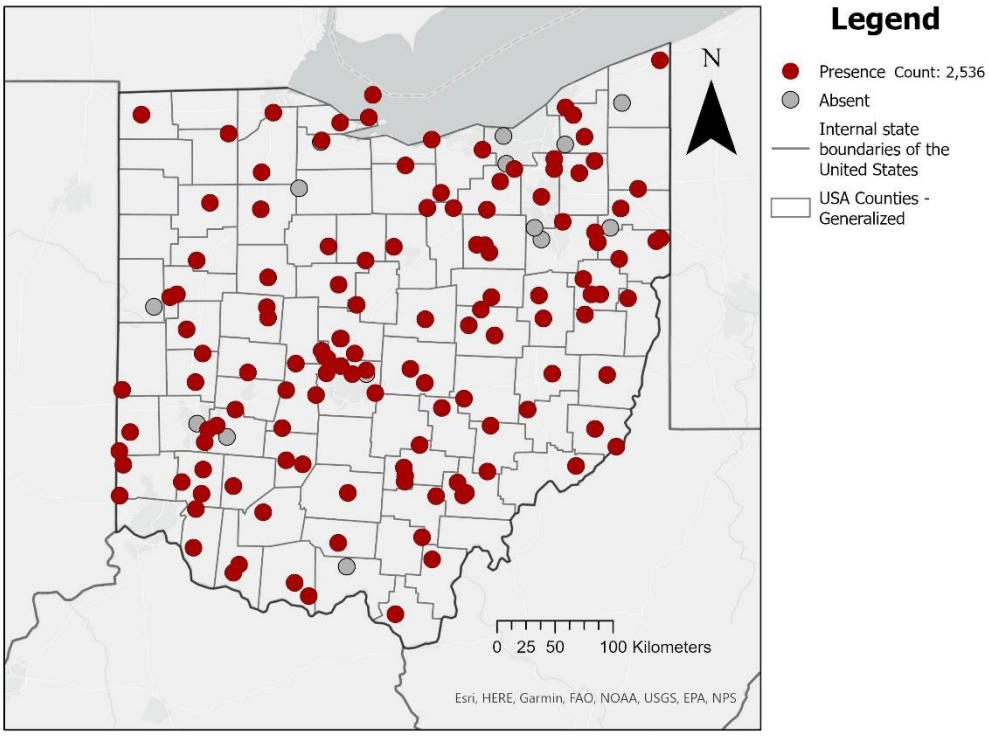
Apis mellifera is in the family Apidae. It is the only species of honey bee in North America. It is a non-native species that nests in cavities or boxes provided by humans. They are generalists and social, which means they have a queen and workers. Most other species of bees are solitary and do not have the queen social structure found in honey bees. They are the only bee in North America that makes what can be considered USDA grade honey.

Augochlora pura



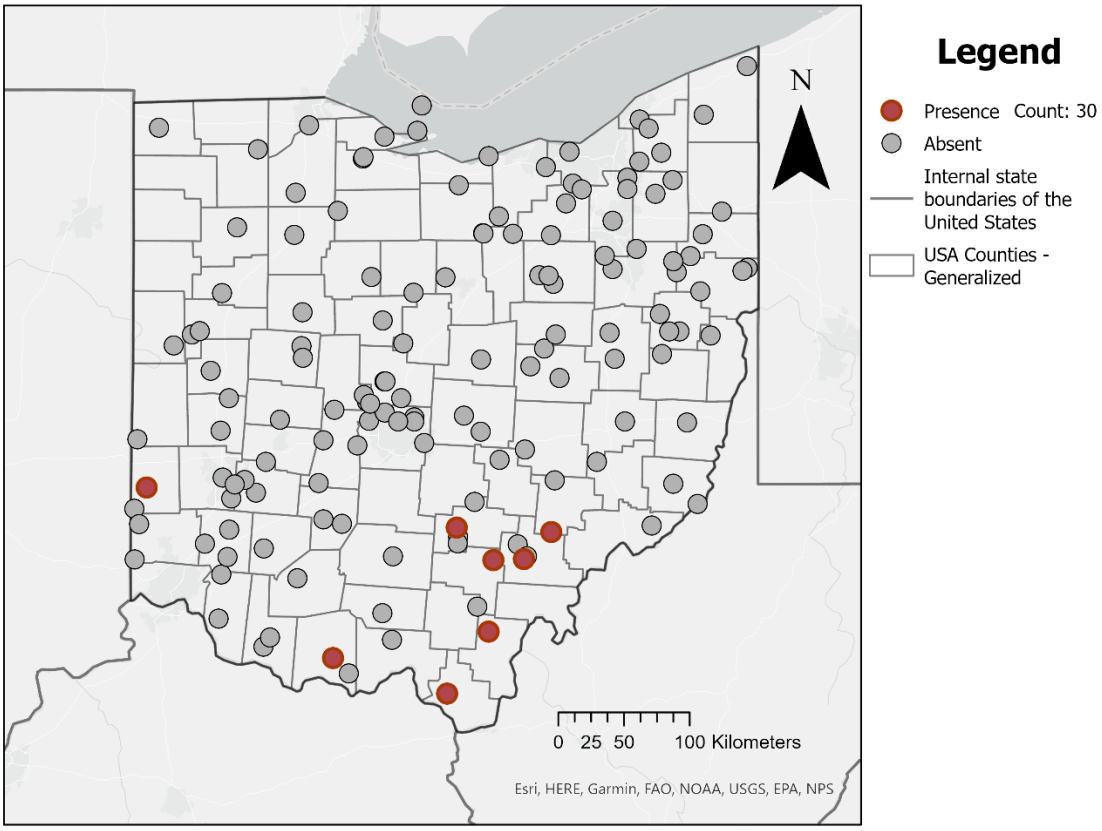
Augochlora pura is in the family Halictidae. It is a species of bright green sweat bee that is common across Ohio. They are more often found at forested sites that have ample downed logs. They nest in logs that are heavily rotten to the point of being almost humus. They are generalist bees that use many different floral resources to provision their nests. They are most similar to *Augochlorella aurata*, but need a clear view of the truncate apical part of the marginal cell or close up of the face to differentiate. *Augochlora pura* is the only species of *Augochlora* in Ohio.

Augochlorella aurata



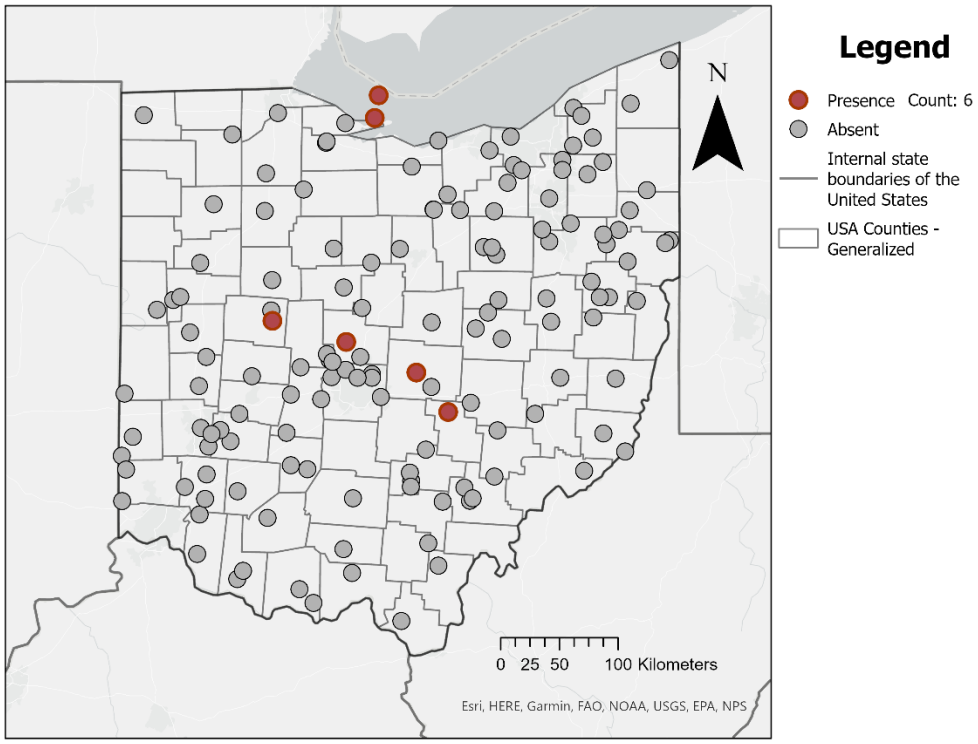
Augochlorella aurata is in the family Halictidae. It is another common species of bright green sweat bee. They nest in the soil and are floral generalists. Within the same genus, they are similar to *persimilis*, albeit slightly larger (7-8 mm vs 5mm) and have striations reaching the rim of the propodeum. In general, *Augochlorella aurata* is our most common species of *Augochlorella* and all other species are rare. *Augochlorella aurata* is most often confused with *Augochlora pura*, which is a different genus. *Augochlorella aurata* has a marginal cell that connects directly to the wing edge instead of truncate as in *Augochlora pura*.

Augochlorella persimilis



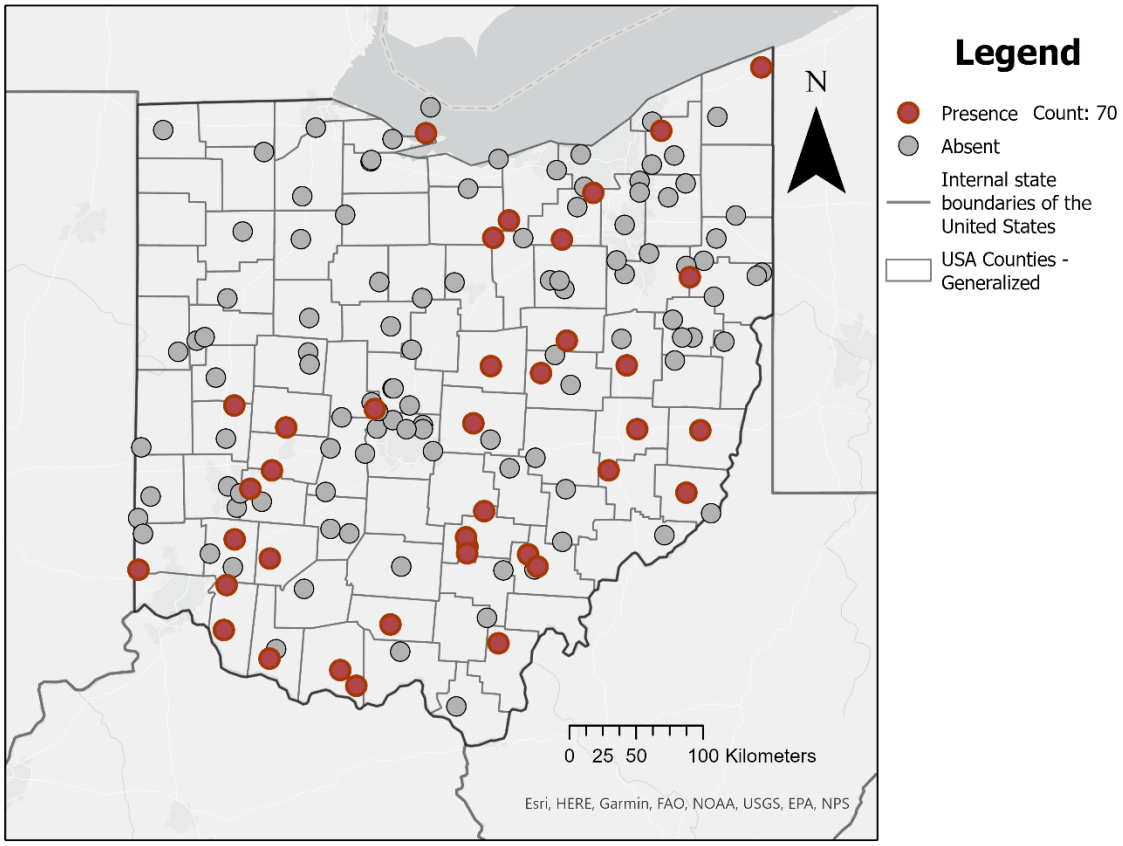
Augochlorella persimilis is in the family Halictidae. It is a rare species of *Augochlorella*. It is much smaller than *aurata* and the propodeal striations do not reach the rim. It was found in southern Ohio at mostly forested sites.

Augochloropsis metallica



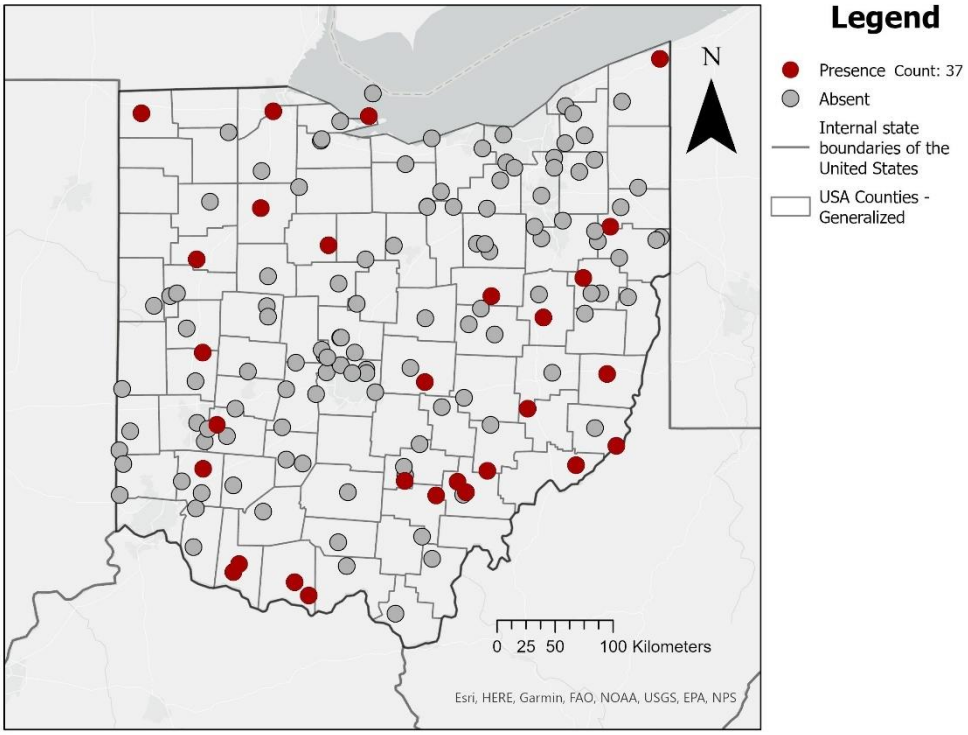
Augochloropsis is in the family Halictidae. It is the genus of bright green sweat bees that have a bright green tegula with an indent that makes it bean shaped. They are larger than *Augochlora* and *Augochlorella* and more likely to be confused with the all green *Agapostemon*. They are generalist, ground nesting bees. This group was recently revised, moving most of what had been considered *Augochloropsis metallica* into *Augochloropsis viridula* instead (Portman et al., 2022). Anything we call *metallica* (5 males and 1 female) is based on the characters in that paper.

Augochloropsis viridula

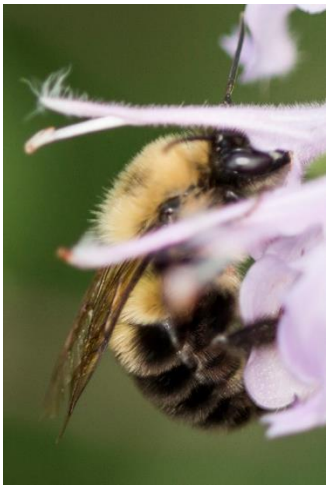


Augochloropsis is in the family Halictidae. It is the genus of bright green sweat bees that have a bright green tegula with an indent that makes it bean shaped. They are larger than *Augochlora* and *Augochlorella* and more likely to be confused with the all green *Agapostemon*. They are generalist, ground nesting bees. This group was recently revised, moving most of what had been considered *Augochloropsis metallica* into *Augochloropsis viridula* instead (Portman et al., 2022). Anything we call *viridula* is based on the characters in that paper. Oddly, we did not get many records of this species in northwestern Ohio, though the reason for that lack of representation is unclear.

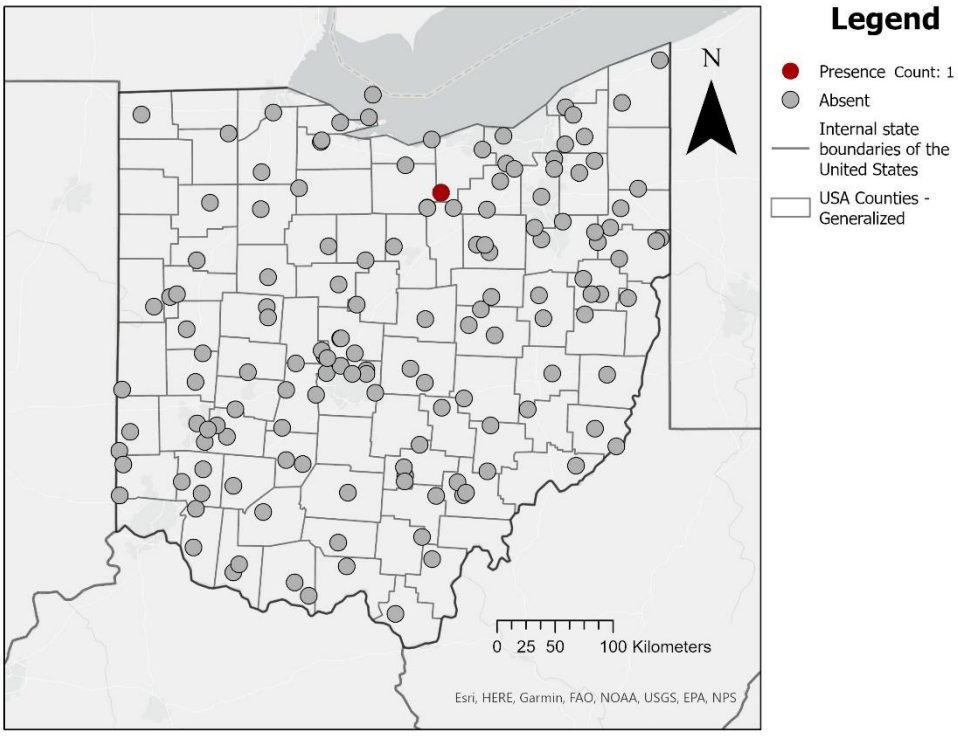
Bombus bimaculatus



Bombus bimaculatus is in the family Apidae. It is a social bumble bee that nests in cavities. It is typically an earlier season species that finishes sooner than other bumble bee species, often done for the year by August. Workers of *Bombus bimaculatus* often have the first abdominal segment all yellow, with the second abdominal segment partly yellow in the center where it looks like two spots. The rest of the abdomen is black. They are most often confused with the brown belted bumble bee (*Bombus griseocollis*), which has the second abdominal segment slightly more brown than yellow, and the brown is more widely distributed across the width of the segment instead of mostly in the center.

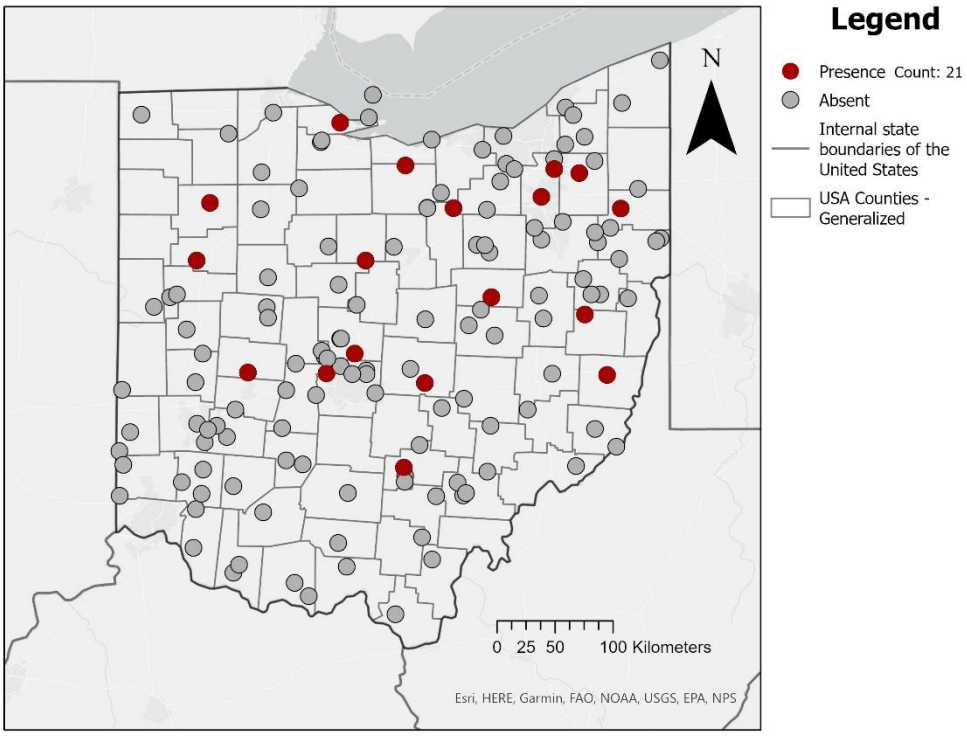


Bombus citrinus



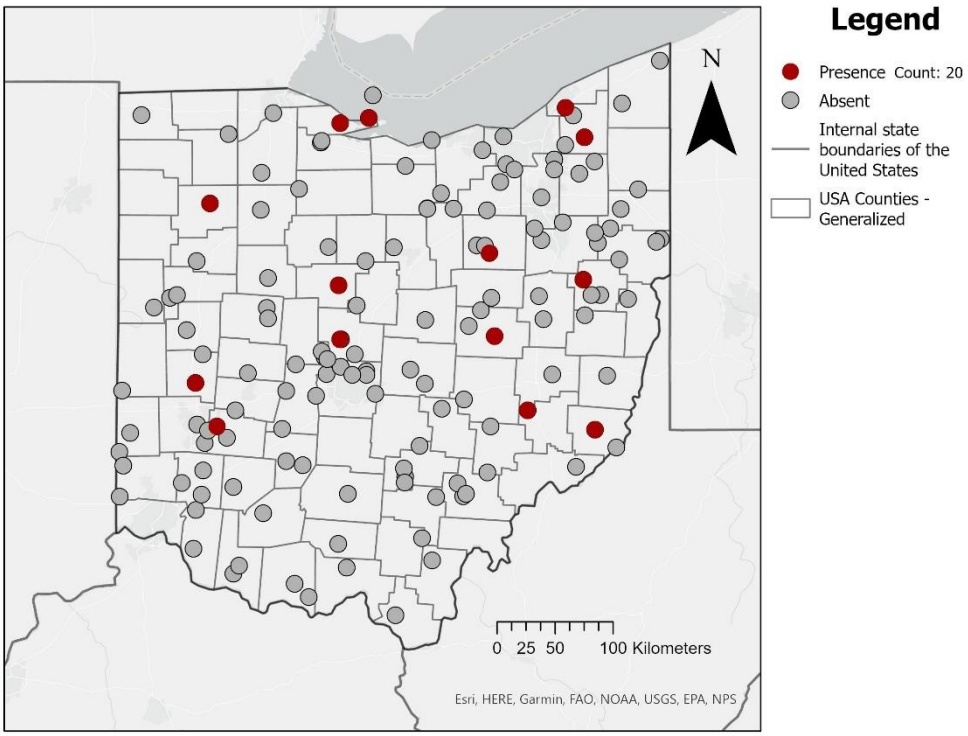
Bombus citrinus is in the family Apidae. It is a cleptoparasitic species of *Bombus* that invades nests of other bumblebees. The females have a modified and curved ovipositor, which allows them to more easily lay eggs into another queen's egg provisions. Bumble bees in general are more easily able to escape the bowl traps, and we were lucky that even one of the parasitic queens managed to get caught in one of the traps. Example image of *Bombus citrinus* below.

Bombus fervidus

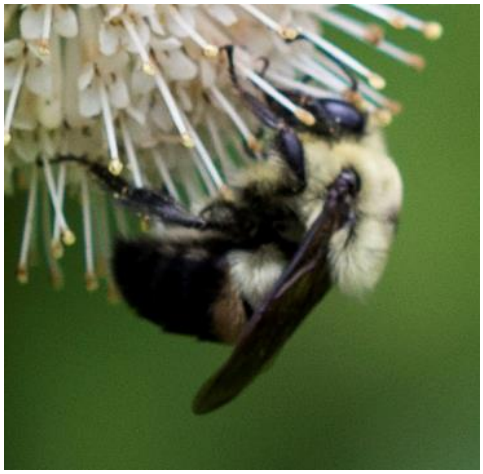


Bombus fervidus is in the family Apidae. It is a common species of cavity nesting bumble bee in Ohio. Like other bumble bees, it is a social species. It is one of our most yellow bumble bee species. The sides of the thorax and almost the entire abdomen is yellow. It is most likely to be confused with *Bombus pensylvanicus, auricomus*, or *borealis*. Example image of a male and queen below.

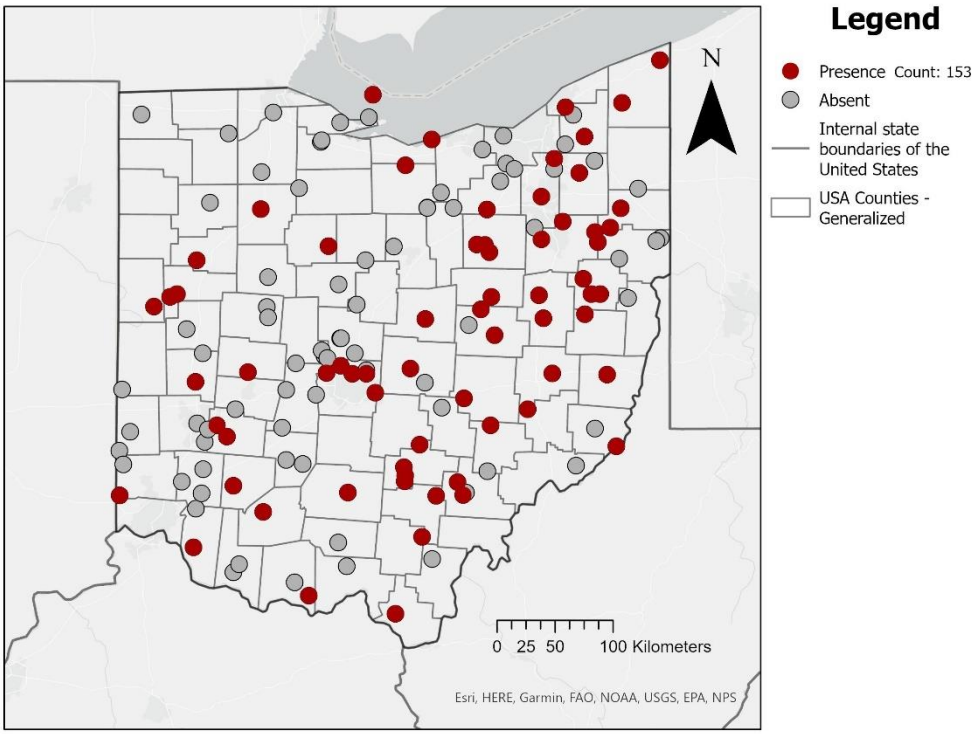
Bombus griseocollis



Bombus griseocollis is in the family Apidae. It is known as the Brown-Belted Bumble bee and is common across Ohio. It is a cavity nesting, social species. It is a large species and like most other large bees, was not often caught in bowl traps. However, being so large, they could more easily escape the bowls. The males are known to "hilltop" where they sit on top of plants and peer out over an area, surveying for females or competing males. The workers are somewhat easy to ID as they have dark wings, and the second abdominal segment is generally partly brown. They are most likely to be confused with *Bombus bimaculatus*. The males are similar to the workers, but have large almost bulbous eyes.

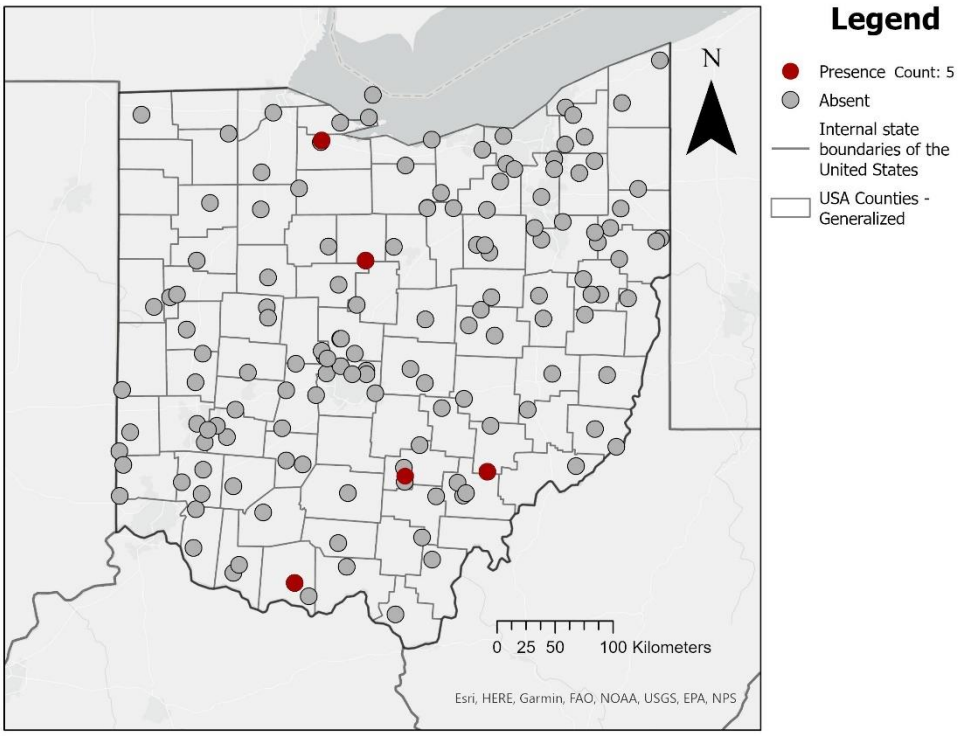


Bombus impatiens



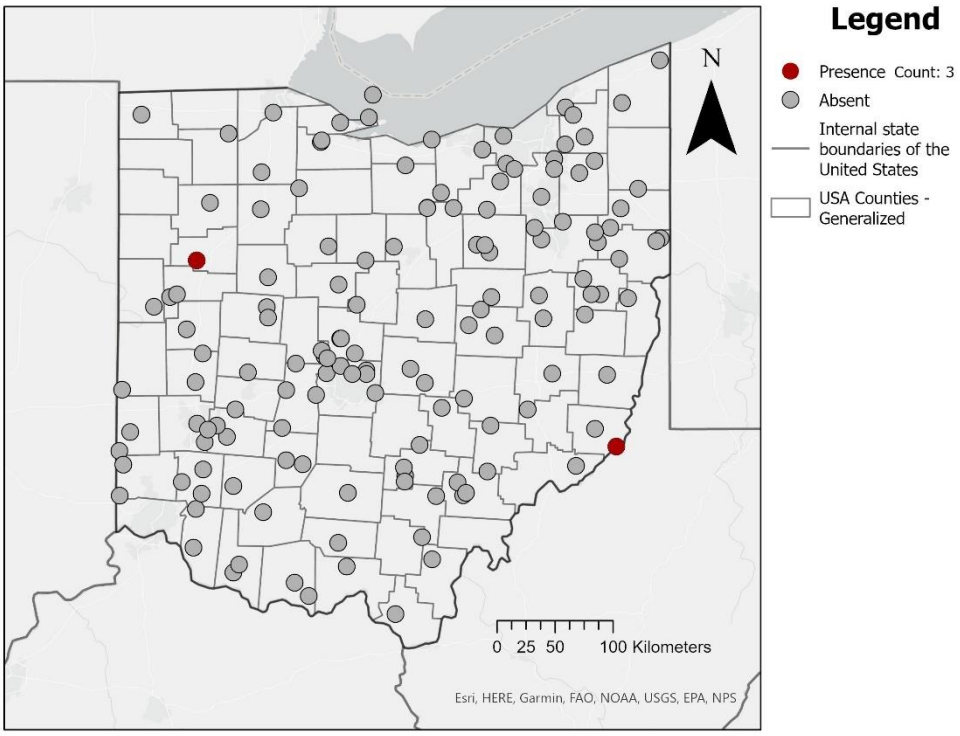
Bombus impatiens is in the family Apidae. It is the most common species of bumble bee in Ohio. The common name is the Common Eastern Bumble Bee. It is a cavity nesting species that forages on a very large range of plant species. Although we only collected 150 specimens as part of our bowl survey, they are one of the most commonly reported species of bees when using other methods. The larger the bee, the less likely they were to be caught in our bowls, which is why the numbers were so low for some of our bigger bees. Both males and workers have a mostly black abdomen, with only the first abdominal segment having yellow hairs. Example image of a worker below.

Bombus pensylvanicus



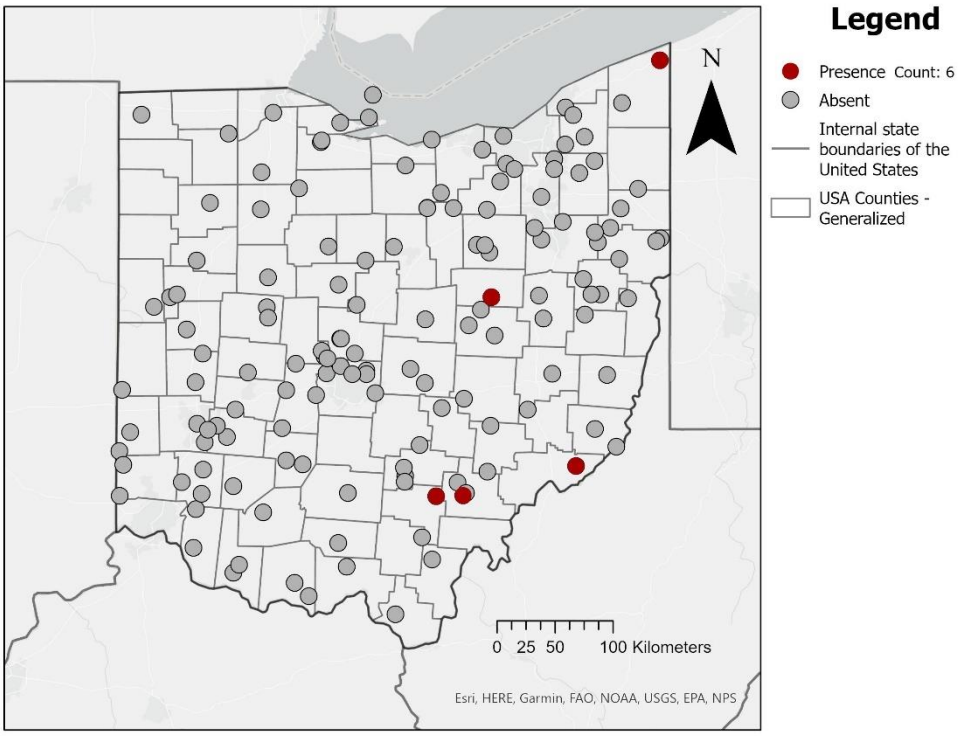
Bombus pensylvanicus is in the family Apidae. It is an uncommon species of large bumble bee in Ohio. It is also tricky to differentiate from *Bombus auricomus* and many identifiers lump the two together when they cannot view the specimen under a microscope to confirm the correct ID characters. They both have much more yellow on them compared to *impatiens*, *bimaculatus*, and *griseocollis*, but not as much yellow as *fervidus*.

Bombus perplexus



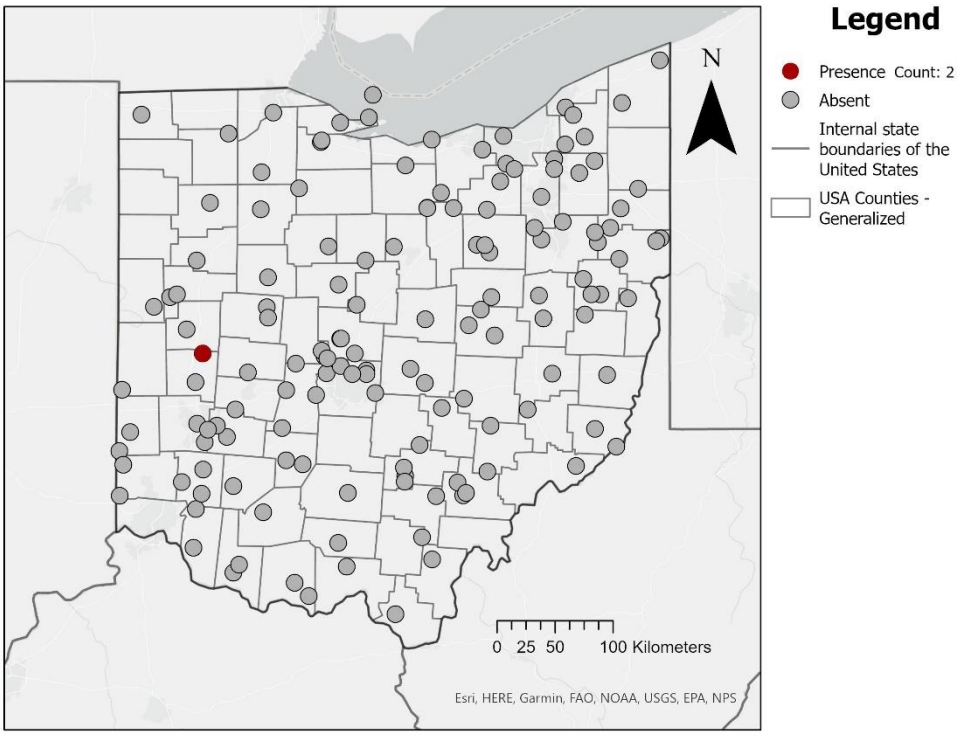
Bombus perplexus is in the family Apidae. It is known as the Perplexing Bumble Bee, probably because it can be a pain to identify and is regularly mistaken for other species of bumble bees. The color pattern is variable, which adds to the identification headache. It is generally a very yellow species.

Bombus vagans



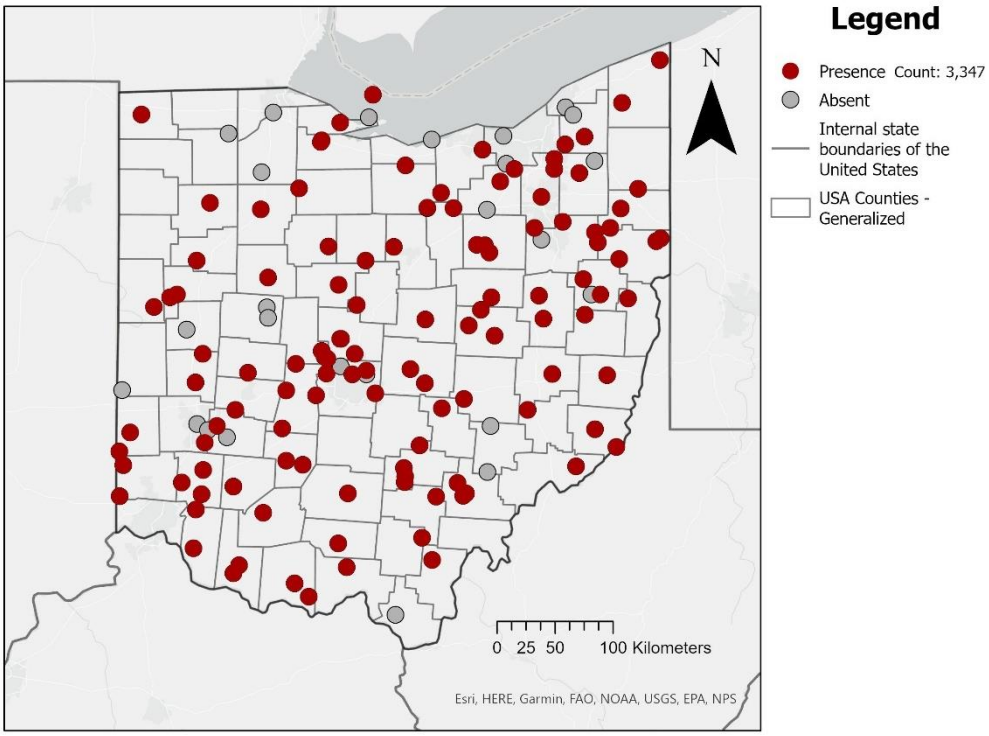
Bombus vagans is in the family Apidae. It is known as the Half-Backed Bumble bee. It is a social generalist and nests in cavities. It is thought to be associated with forests. It is often confused with *Bombus impatiens*, but *impatiens* only has the first abdominal segment yellow, whereas *vagans* has the first and second yellow.

Brachymelecta californica



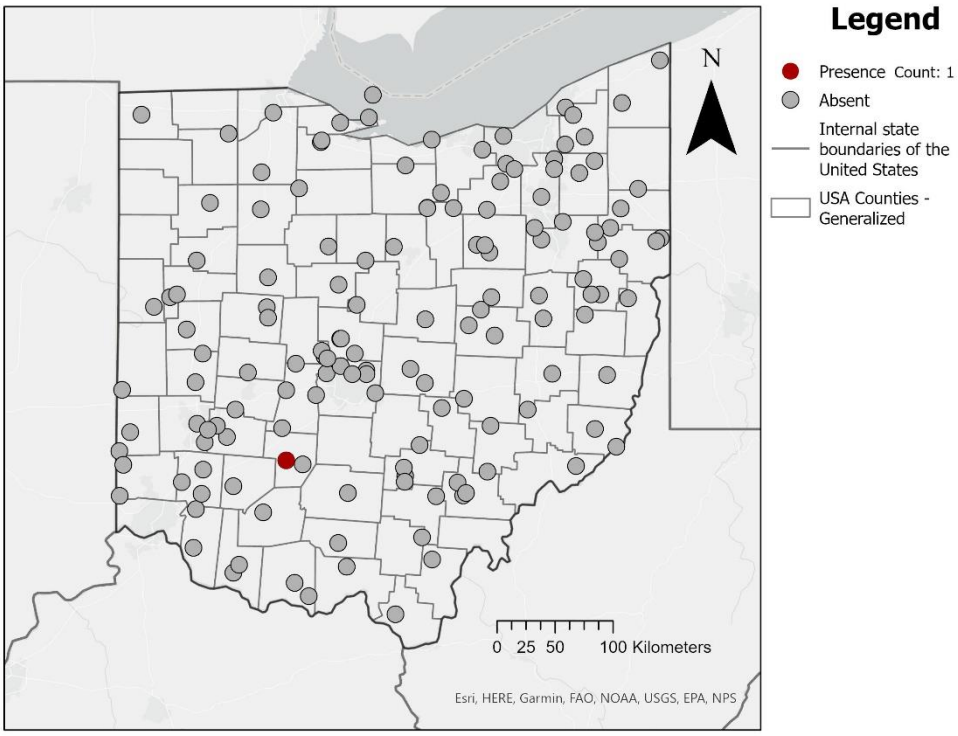
Brachymelecta californica is in the family Apidae. A particularly exciting find, these two specimens represent the first known collected records of *Brachymelecta californica* in Ohio. Prior to 2019, there were no known records of this species east of the Mississippi. This is a cleptoparasitic species that invades nests of Anthophora. It is expected to occur anywhere that there are large aggregations of *Anthophora*. Image of our specimen is below.

Calliopsis andreniformis



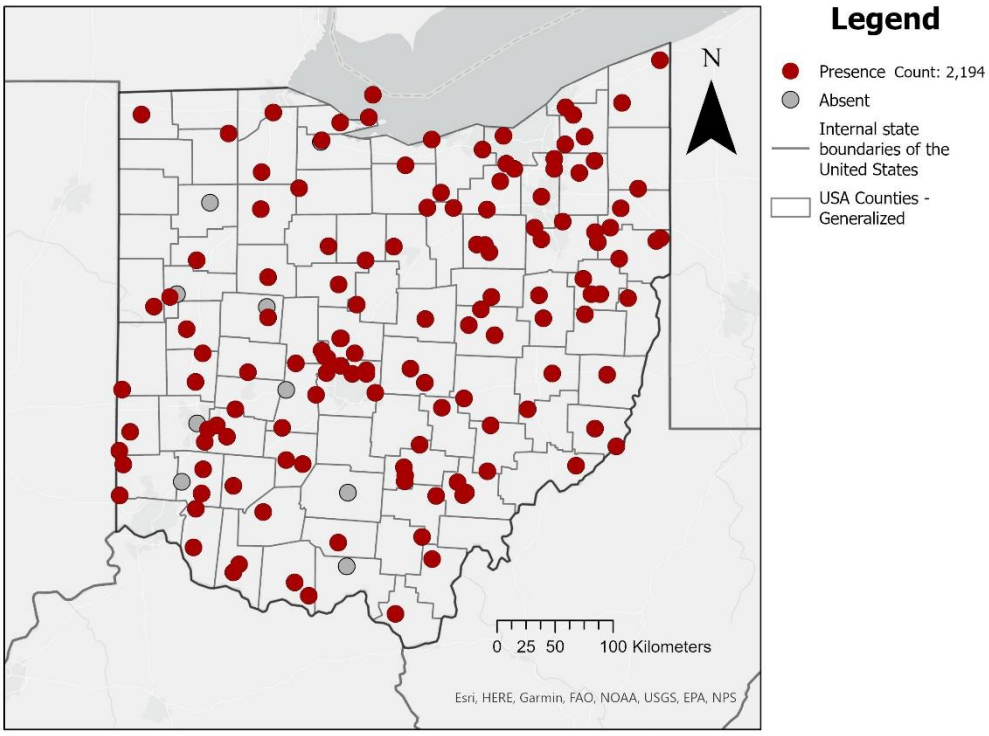
Calliopsis andreniformis is in the family Andrenidae. Oddly rarely photographed, *Calliopsis andreniformis* was the most common species of bee collected in the bowl survey. There are questions as to why we caught so many when we rarely ever see them in the field. The running hypothesis is that they might fly only really low to the ground, which would explain why we do not often see them, but why they showed up in our bowls en masse. Example image of male below. They are parasitized by the bee *Holcopasites calliopsidis*.

Cemolobus ipomoeae



*Cemolobus ipomoea*e is in the family Apidae. Another really rare bee, *Cemolobus ipomoea*e is a tricky one to document. It is a specialist bee of Wild Potato Vine (*Ipomoea pandurata*) and also is crepuscular (meaning it only flies really early in the morning). Only one was documented as part of our bowl survey, though a few others have recently been documented in Ohio thanks to concerted efforts by James Hung and several others. The face is distinct, with a large undulating clypeus. It is a specialist of *Ipomoea* and *Calystegia* (Fowler and Droege, 2020).

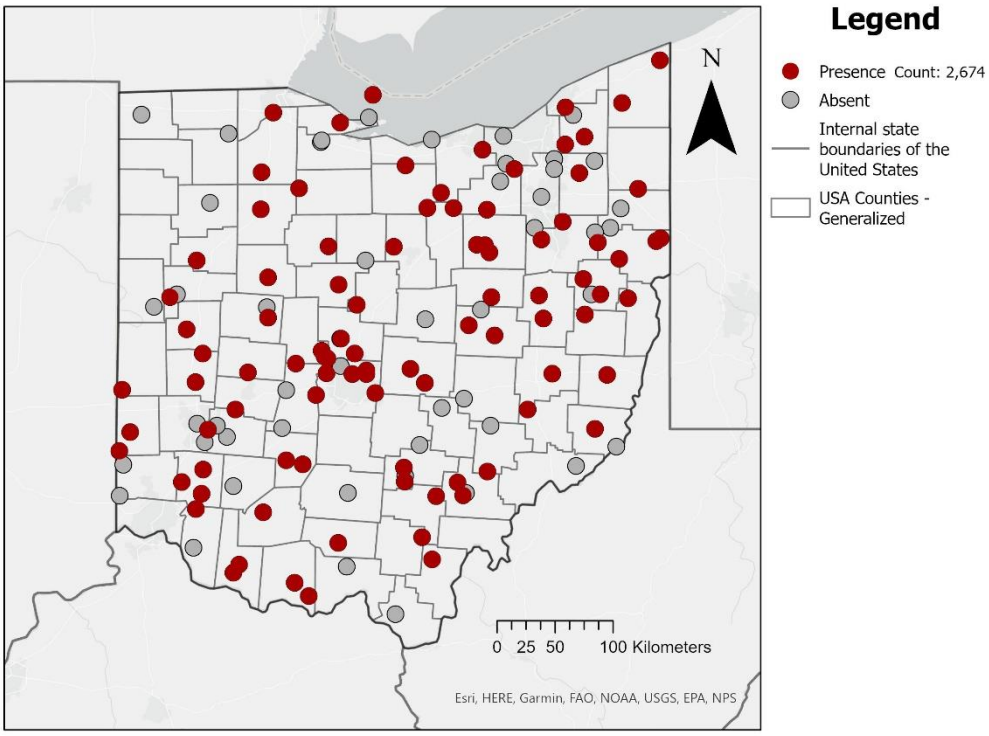
Ceratina calcarata



Ceratina calcarata is in the family Apidae. It is our most common small carpenter bee. These are a semi-social group of bees that nest in pithy stems in plants. They chew out the pith of the stems to make their nests. The females have less punctation on their thorax compared to *dupla*, less yellow on the foreleg compared to *strenua*, and more hair compared to *mikmaqi*. The males have a widened hind femur (rules out *dupla* and *mikmaqi*) and wide terminal flange (rules out strenua).

Example of a *Ceratina* bee with the butt sticking out of the pithy

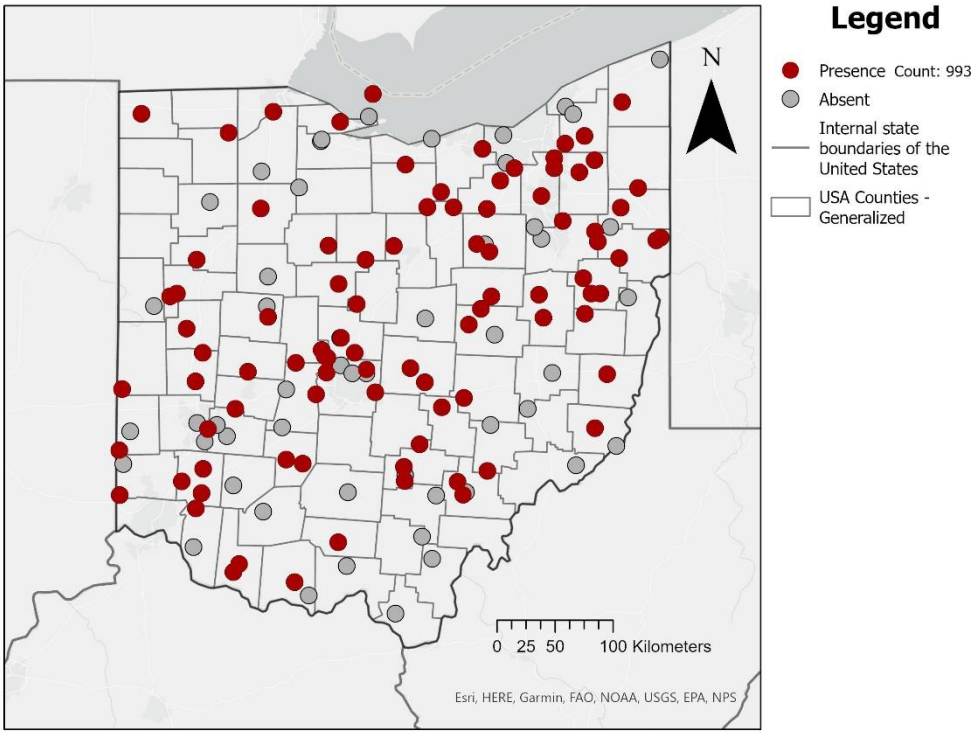
Ceratina dupla



Ceratina dupla is in the family Apidae. It is a common small carpenter bee. These are a semi-social group of bees that nest in pithy stems in plants. They chew out the pith of the stems to make their nests. The females can be separated from *calcarata* and *mikmaqi* based on their densely punctate scutum. The females can be separated from *strenua* by their foreleg having only a reduced amount of yellow. The males are harder to identify, as they need a clear view of the hind femur edge.

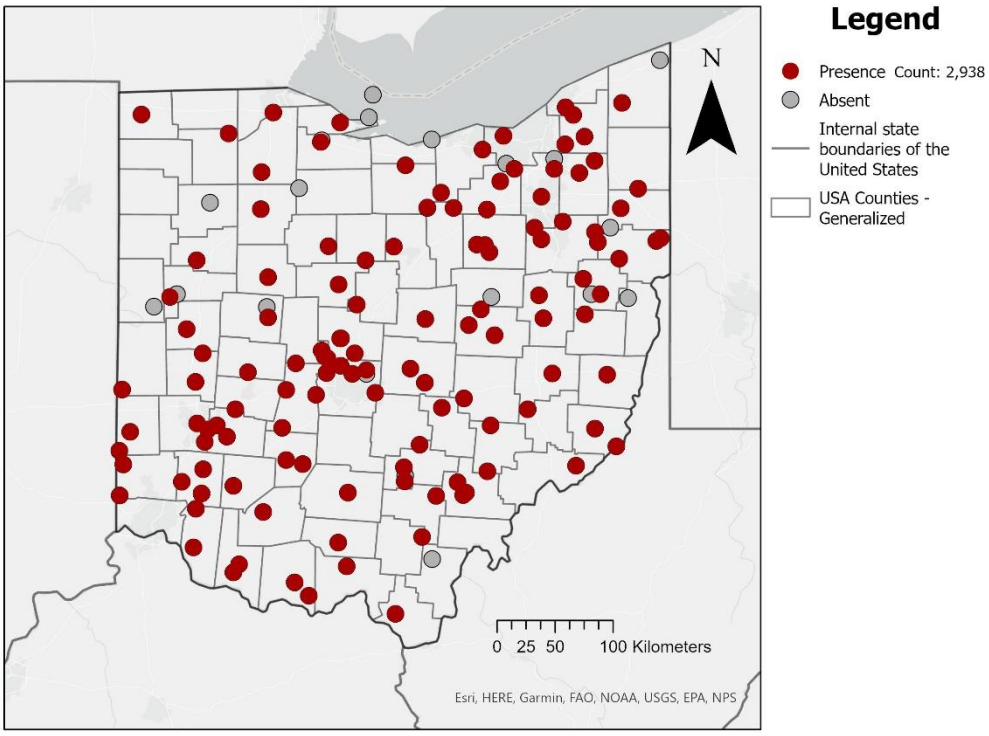
Image of a female showing the double rows of dense punctation on the scutum and only reduced spot of yellow on the foreleg.

Ceratina mikmaqi



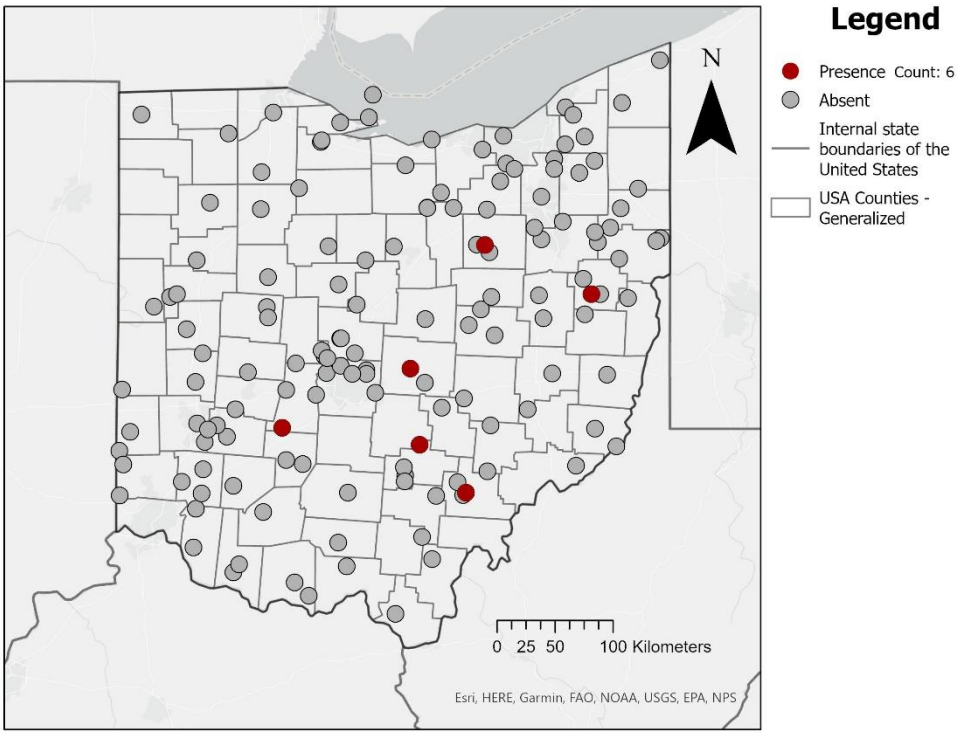
Ceratina mikmaqi is in the family Apidae. It is a common small carpenter bee. These are a semi-social group of bees that nest in pithy stems in plants. They chew out the pith of the stems to make their nests. The females have less punctation on their thorax compared to *dupla*, less yellow on the foreleg compared to *strenua*, and minimal hair on the underside of the abdomen compared to *calcarata*. The males have only a slightly widened hind femur (rules out *strenua* and *calcarata*), but separating male *dupla* from *mikmaqi* can be a challenge.

Ceratina strenua



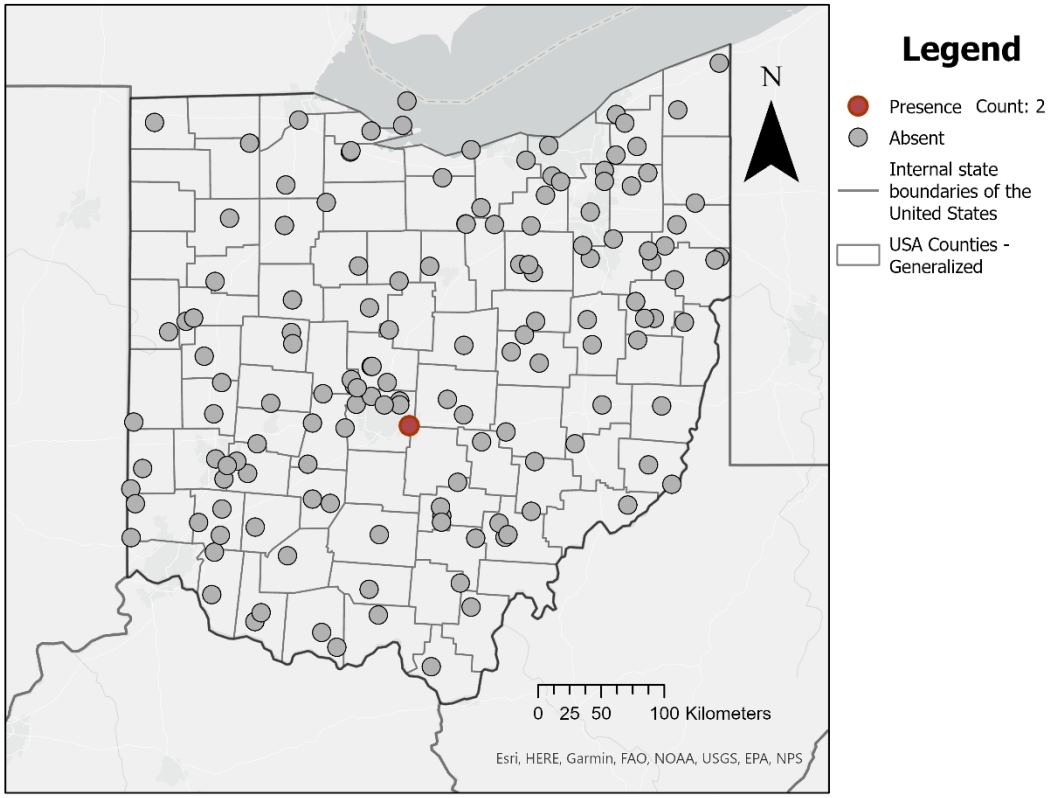
Ceratina strenua is in the family Apidae. It is a common small carpenter bee. These are a semi-social group of bees that nest in pithy stems in plants. They chew out the pith of the stems to make their nests. The females have a foreleg with a long stripe of yellow (compared to a reduced dot of yellow in the other species females). The males have a widened hind femur (rules out *dupla* and *mikmaqi*) and narrow terminal flange (rules out *calcarata*).

Chelostoma philadelphi



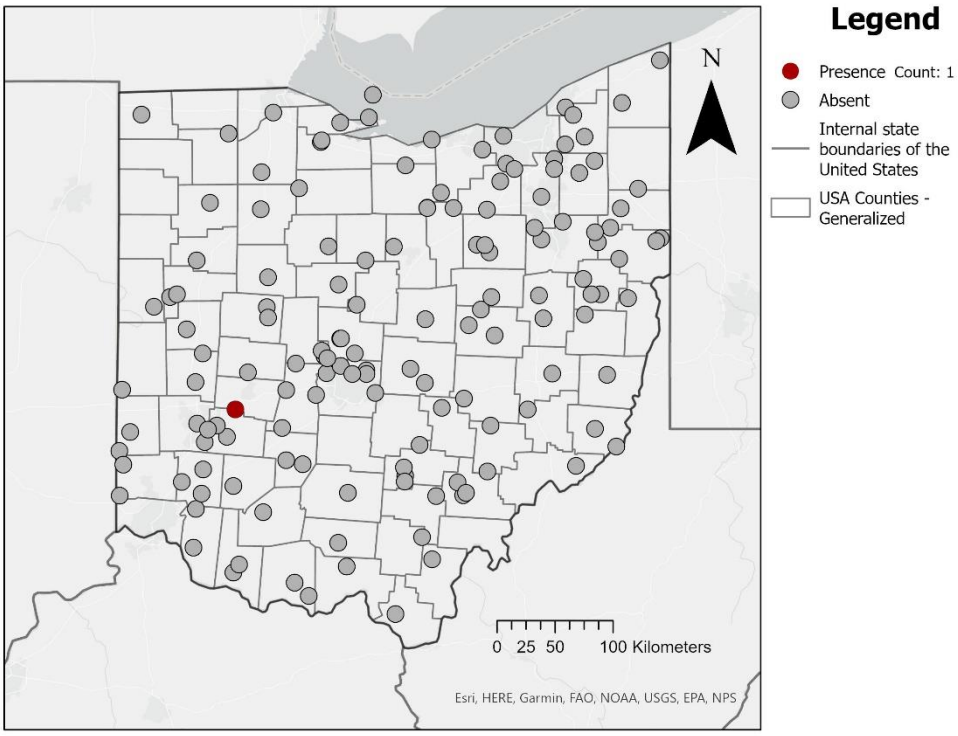
Chelostoma philadelphi is a cavity nesting bee in the family Megachilidae. *Chelostoma* are some of the thinnest bees in the family, with most other genera having a wider overall body. *Chelostoma philadelphi* is sometimes called the Mock-orange scissor bee and thought to be associated with Mock-orange (genus *Philadelphus*).

Chelostoma rapunculi



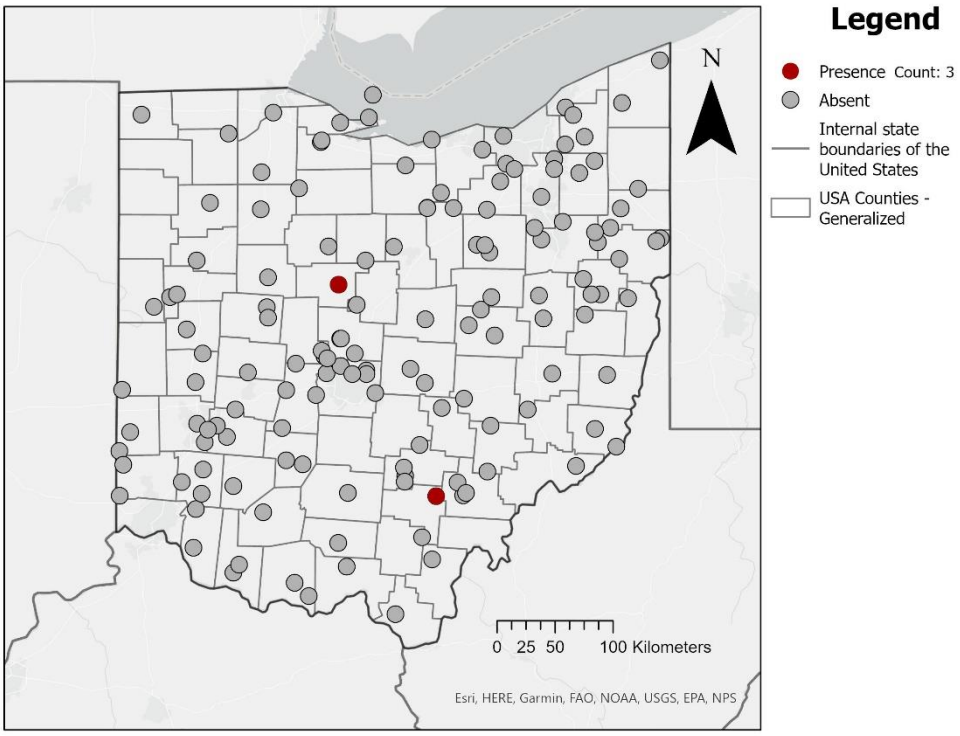
Chelostoma rapunculi is in the family Megachilidae. It is a new, non-native, cavity nesting species in our area. These specimens represent the first known specimen records for the state. It was introduced from Europe. It is otherwise superficially similar to *Chelostoma philadelphi*, but has unbranched basitarsi hairs, mandibles ¾ as long as the eye, and hair bands on the abdomen.

Coelioxys modestus



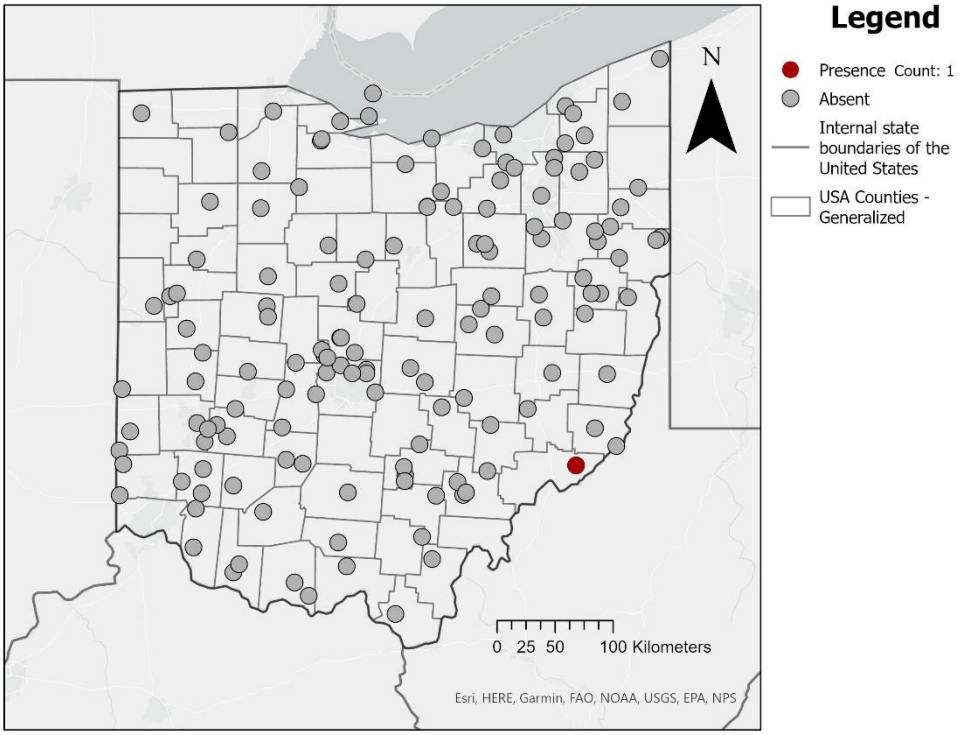
Coelioxys modestus is a group of parasitic bees in the family Megachilidae. They superficially resemble leafcutter bees in the genus *Megachile*, but have spines on the scutellum and end of abdomen.

Coelioxys sayi



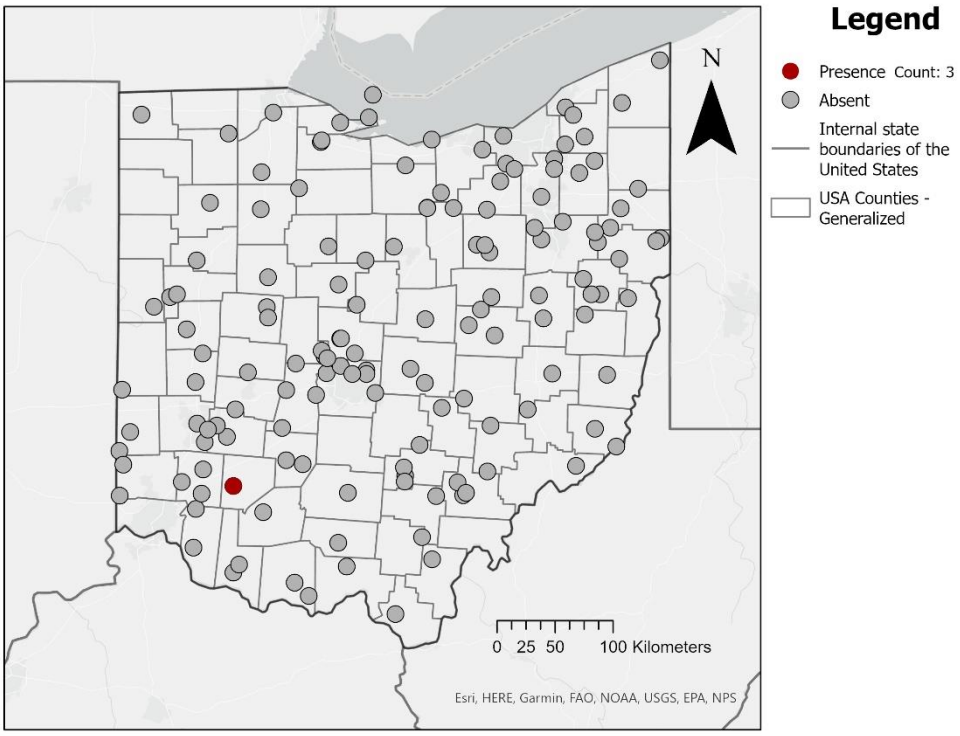
Coelioxys sayi is a parasitic bee species in the family Megachilidae. They superficially resemble leafcutter bees in the genus *Megachile*, but have spines on the scutellum and end of abdomen. Size range: 9.5-12 mm (female), 9-10 mm (male)

Colletes compactus



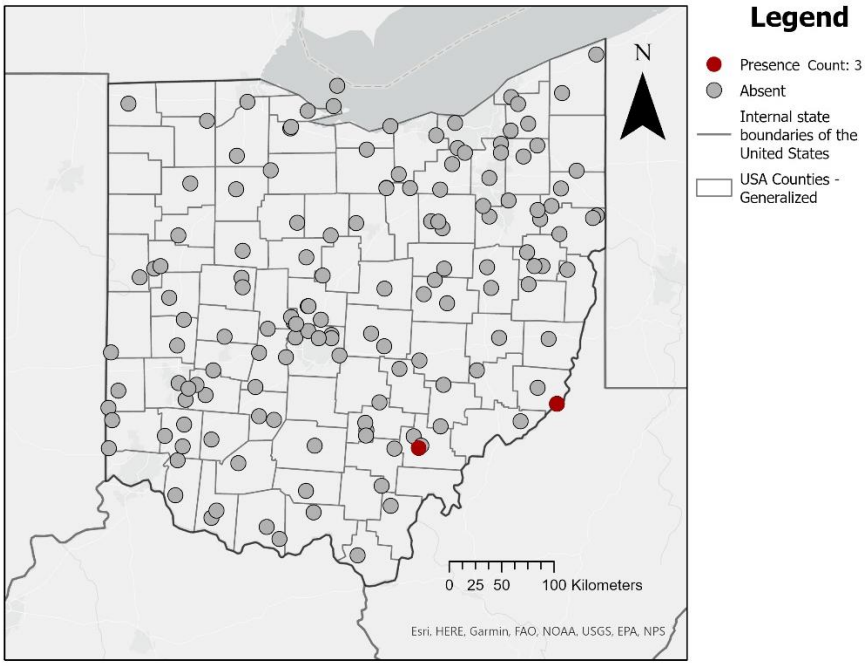
Colletes compactus is in the family Colletidae. Oddly, we only collected a single individual of the genus *Colletes* as part of our survey, despite the fact that they are otherwise abundant across Ohio. It is possible they do not go to bowl traps or are very good at escaping bowls. It is a specialist of Asteraceae, including *Bidens*, *Chrysopsis*, *Rudbeckia*, *Solidago*, and *Symphyotrichum* (Fowler and Droege, 2020). This genus is sometimes called Polyester bees because they line their nests with a polyester-like material that makes them more water resistant. *Colletes compactus* is a fall species that can form large ground nesting aggregations.

Epeolus autumnalis



Epeolus autumnalis is in the family Apidae. It is a fall flying cleptoparasitic species of bee. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. The genus *Epeolus* is superficially very similar to the genus *Triepeolus*. Size range: 9-11 mm (female), 8-11 mm (male)

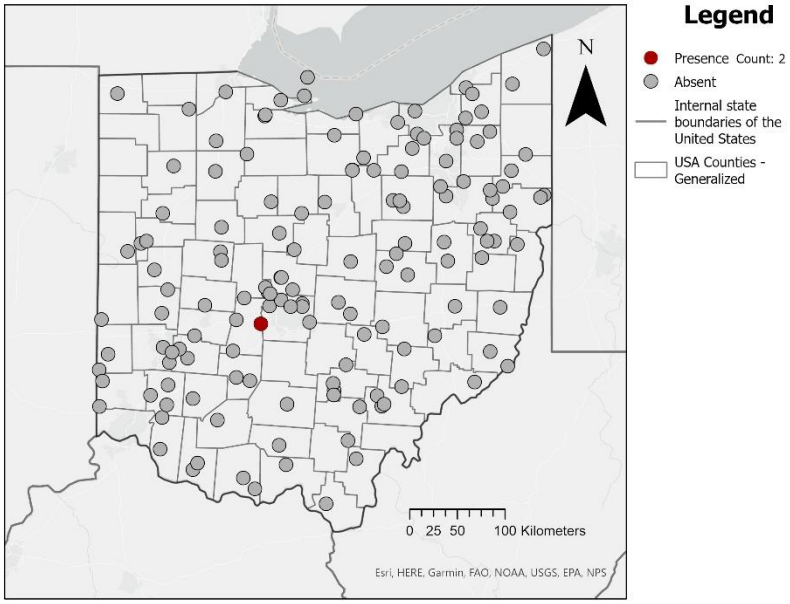
Eucera atriventris



Eucera atriventris is a large ground nesting bee in the family Apidae. Most of the bees in the genus *Eucera* are relatively uncommon in Ohio, despite varied survey efforts to document them. They are superficially similar to bumble bees and carpenter bees, but have different wing venation and facial structures. The males also have very long antennae that often reach past the end of the thorax when at rest.

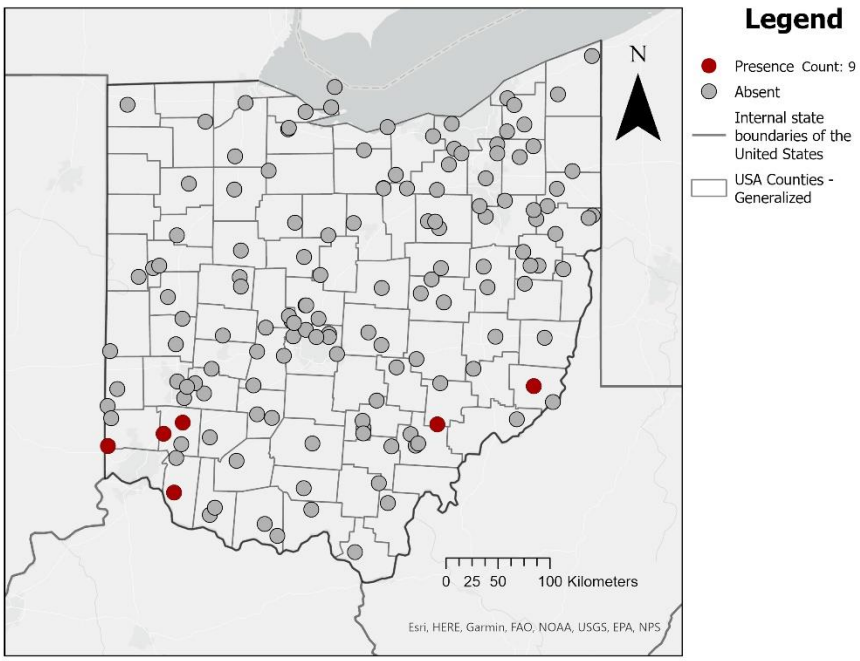
Size range: 13 – 15 mm (females and males)

Eucera belfragei



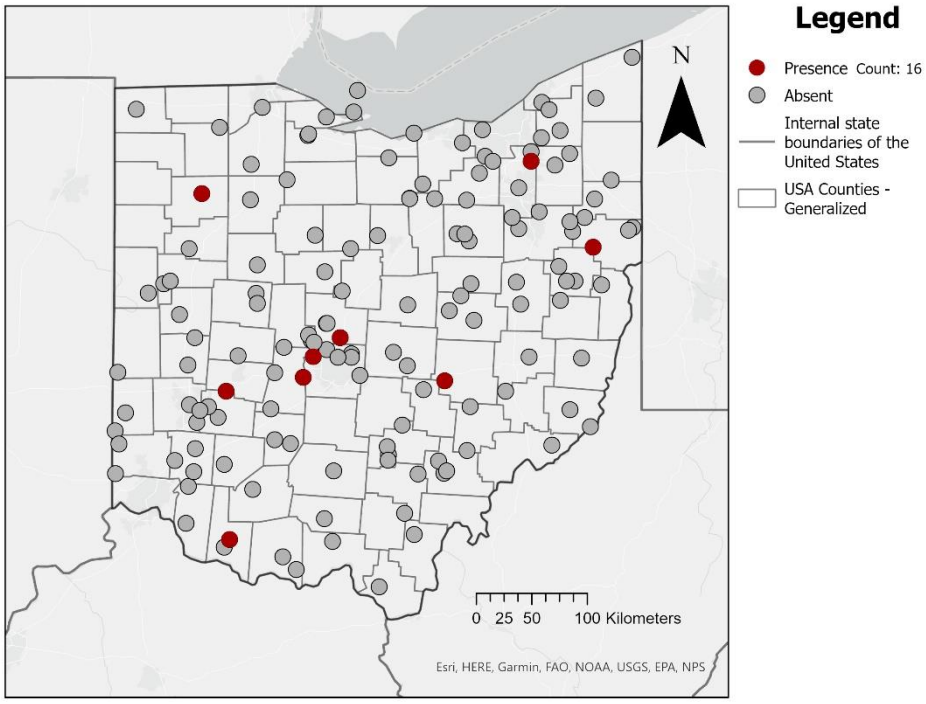
Eucera belfragei is a large ground nesting bee in the family Apidae. Most of the bees in the genus *Eucera* are relatively uncommon in Ohio, despite varied survey efforts to document them. They are superficially similar to bumble bees and carpenter bees, but have different wing venation and facial structures. The males also have very long antennae that often reach past the end of the thorax when at rest.

Eucera dubitata

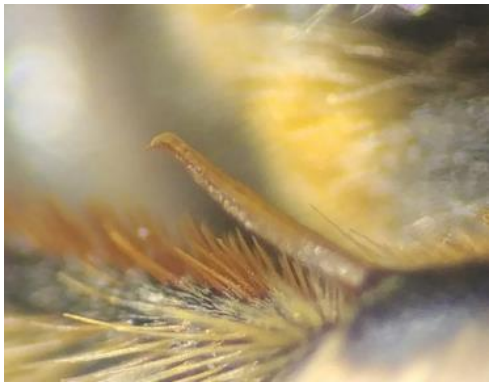


Eucera dubitata is a large ground nesting bee in the family Apidae. Most of the bees in the genus *Eucera* are relatively uncommon in Ohio, despite varied survey efforts to document them. They are superficially similar to bumble bees and carpenter bees, but have different wing venation and facial structures. The males also have very long antennae that often reach past the end of the thorax when at rest.

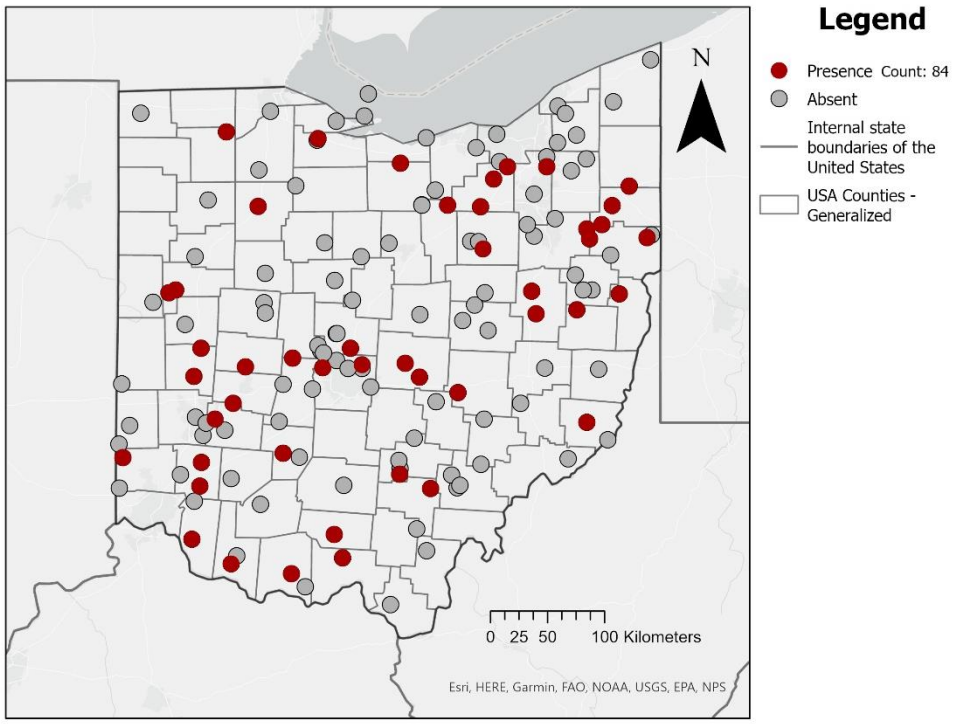
Eucera hamata



Eucera hamata is a large ground nesting bee in the family Apidae. Most of the bees in the genus *Eucera* are relatively uncommon in Ohio, despite varied survey efforts to document them. They are superficially similar to bumble bees and carpenter bees, but have different wing venation and facial structures. The males also have very long antennae that often reach past the end of the thorax when at rest. This species has a distinct apical hook on the inner tibial spurs that separates it from the other *Eucera* bees and is thus sometimes called the Hook-spurred Longhorn.

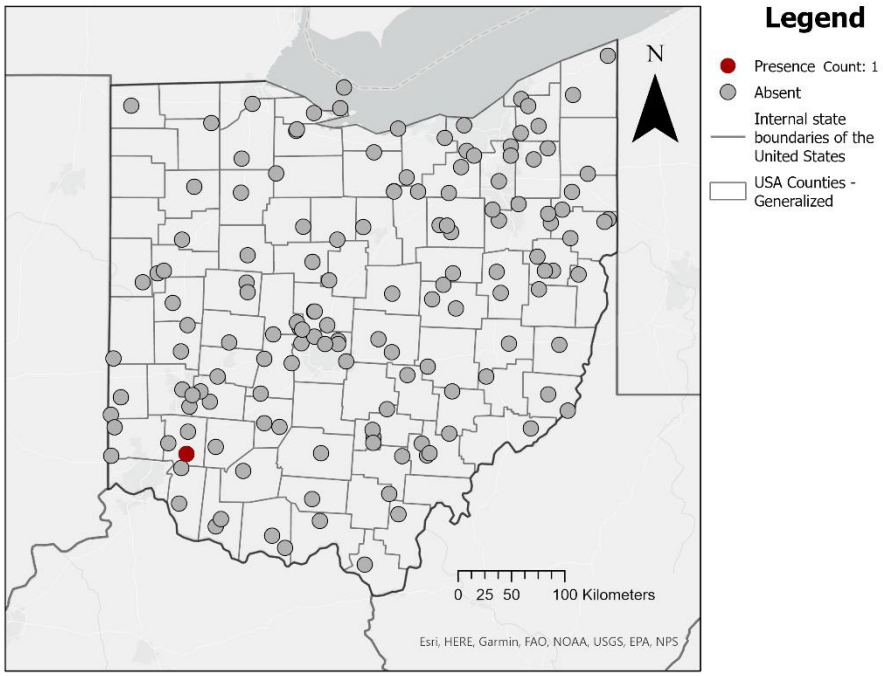


Eucera pruinosa



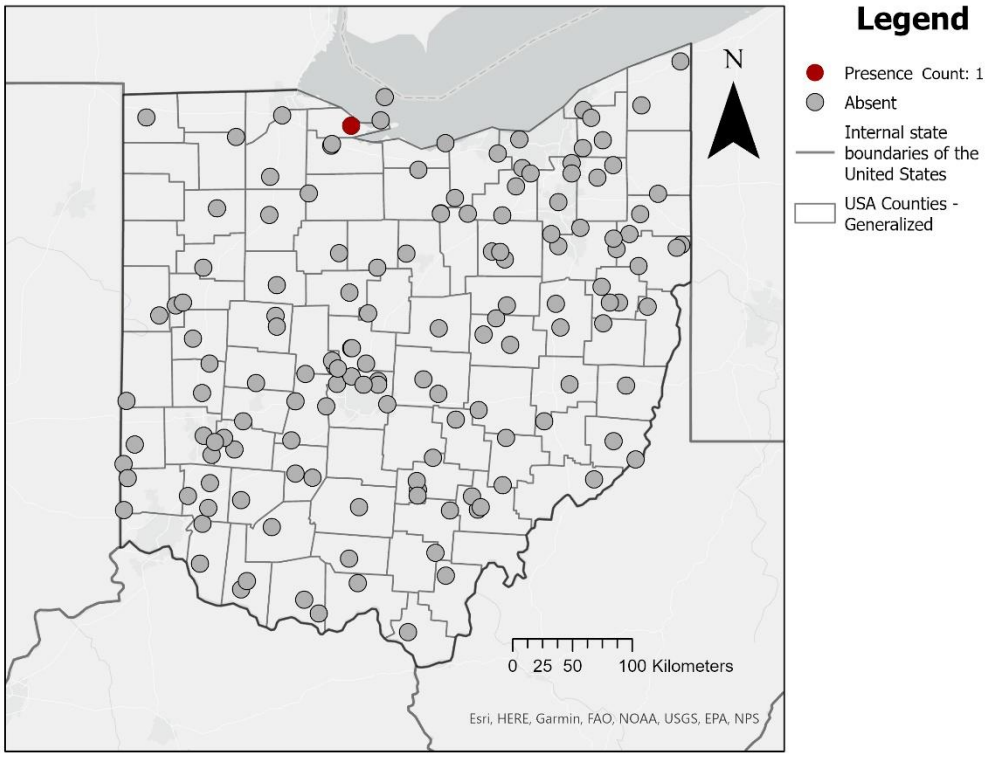
Eucera pruinosa is in the family Apidae. It was previously in the genus *Peponapis*, which has since been moved as a subgenus of *Eucera*. This bee is commonly referred to as the Squash bee and is a floral specialist of squash and related plants. During a hot day after the squash flowers close, male squash bees can often be found sleeping inside the squash flowers. They are a ground nesting species that is expected to occur across all of Ohio.

Eucera strenua



Eucera strenua is a large ground nesting bee in the family Apidae. Most of the bees in the genus *Eucera* are relatively uncommon in Ohio, despite varied survey efforts to document them. They are superficially similar to bumble bees and carpenter bees, but have different wing venation and facial structures. The males also have very long antennae that often reach past the end of the thorax when at rest.

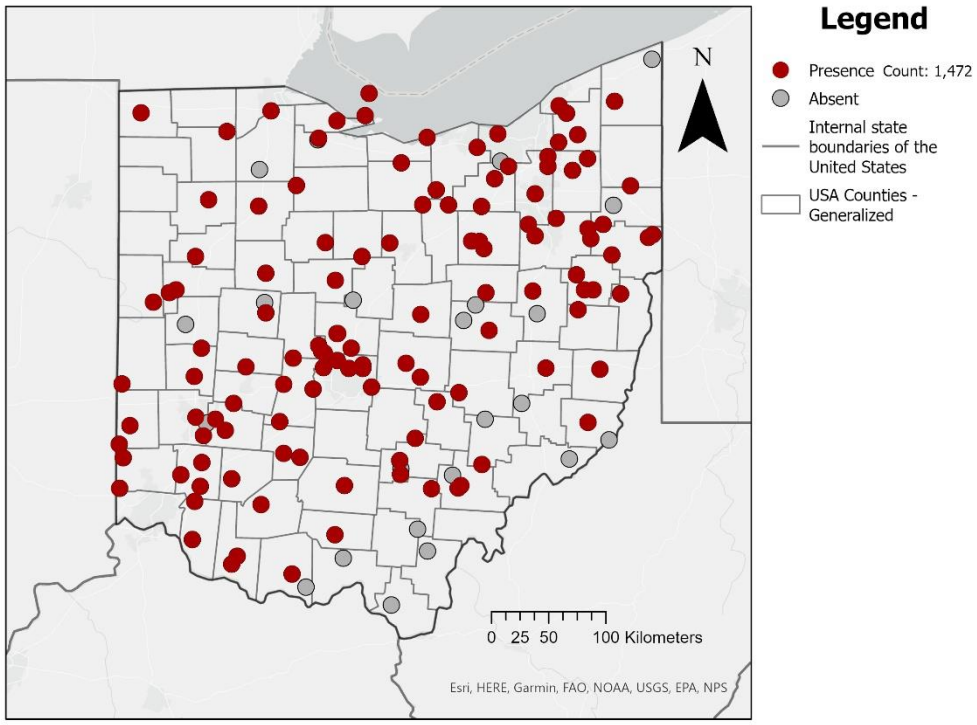
Florilegus condignus



Florilegus condignus is in the family Apidae. It is a specialist of pickerelweed in the genus *Pontederia* (Fowler and Droege, 2020.) This is a gray, longhorn bee that is otherwise rare and hard to document since the host plant is an aquatic species that is hard to access from solid land.

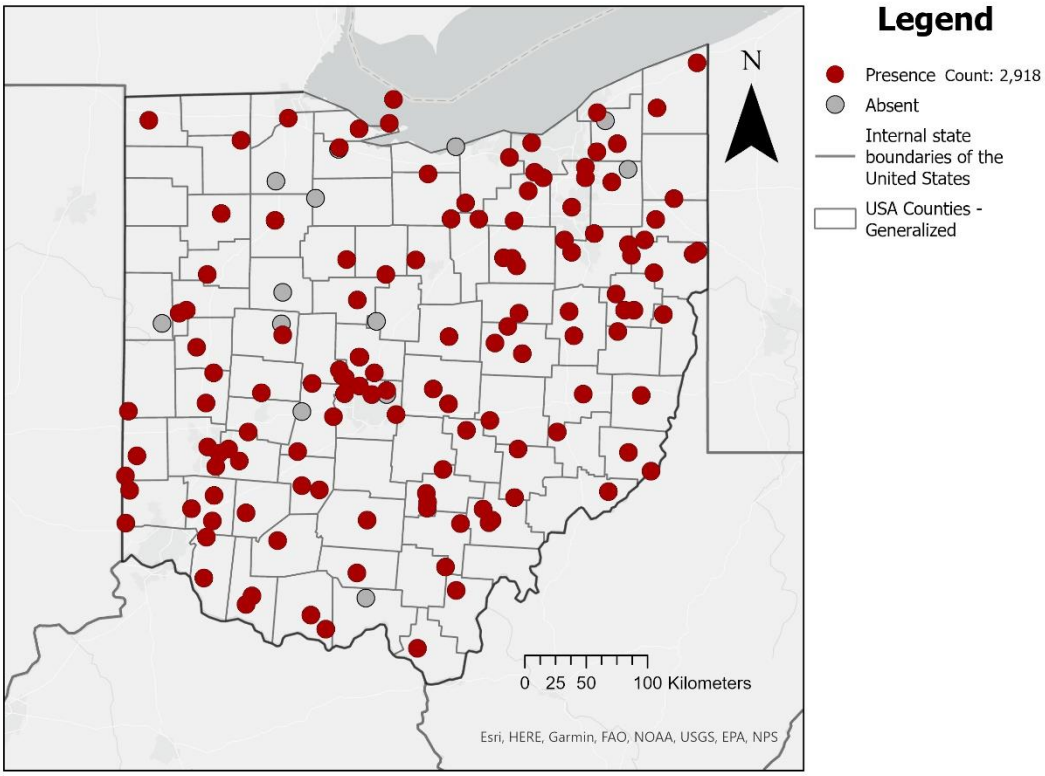
A photo of our bedraggled male

Halictus confusus



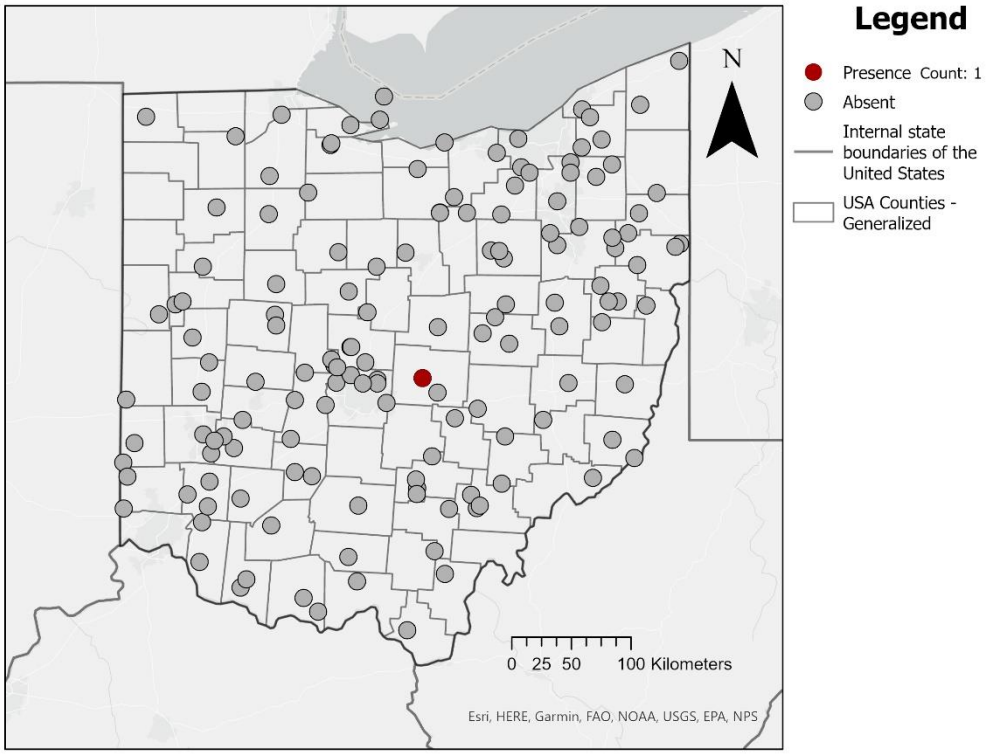
Halictus confusus is in the family Halictidae. It is sometimes called the confusing furrow bee. It is a dull green sweat bee that is most likely to be confused with the dull green sweat bees in the genus *Lasioglossum*. However, *Halictus* has apical hair bands (instead of basal or absent in *Lasioglossum*), stronger wing veins, and a very densely punctate scutum (rarely densely punctate in *Lasioglossum*). *Halictus confusus* is the only species of *Halictus* in our area that has metallic reflections. This is a common ground nesting bee that can be found most of the flight season.

Halictus ligatus



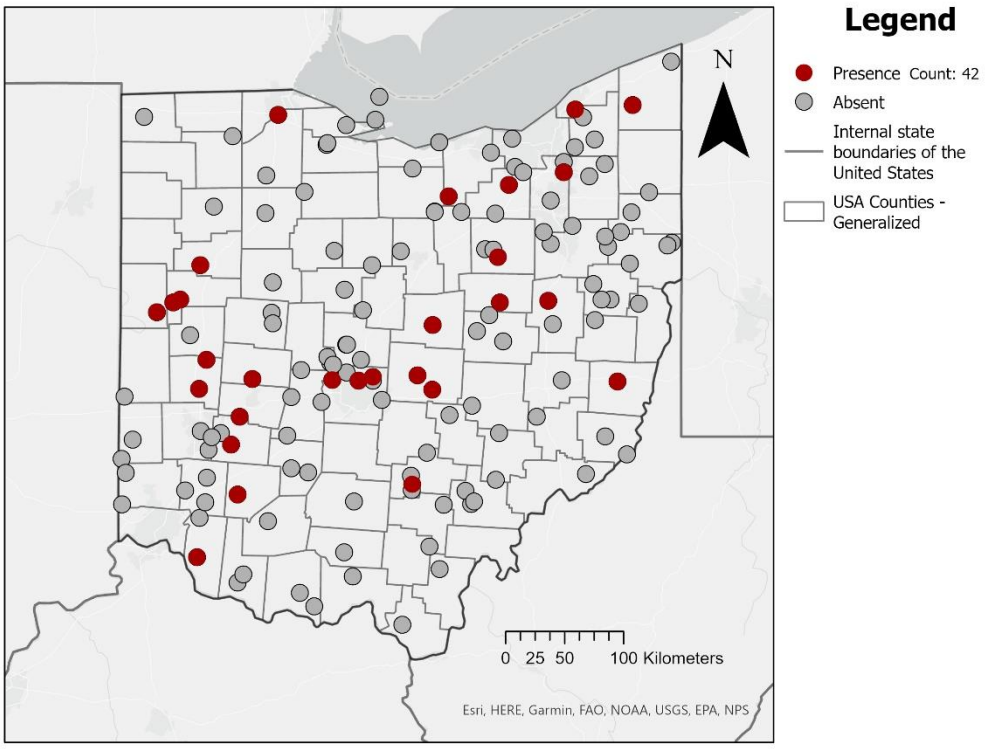
Halictus ligatus is in the family Halictidae. It is a common species of ground nesting bee that can be found across the entire flight season. It is a medium sized black bee with white apical hair bands on the abdomen. The females have distinct points on the cheeks (gena) that make the cheek much wider in comparison to the other black *Halictus*.

Halictus parallelus



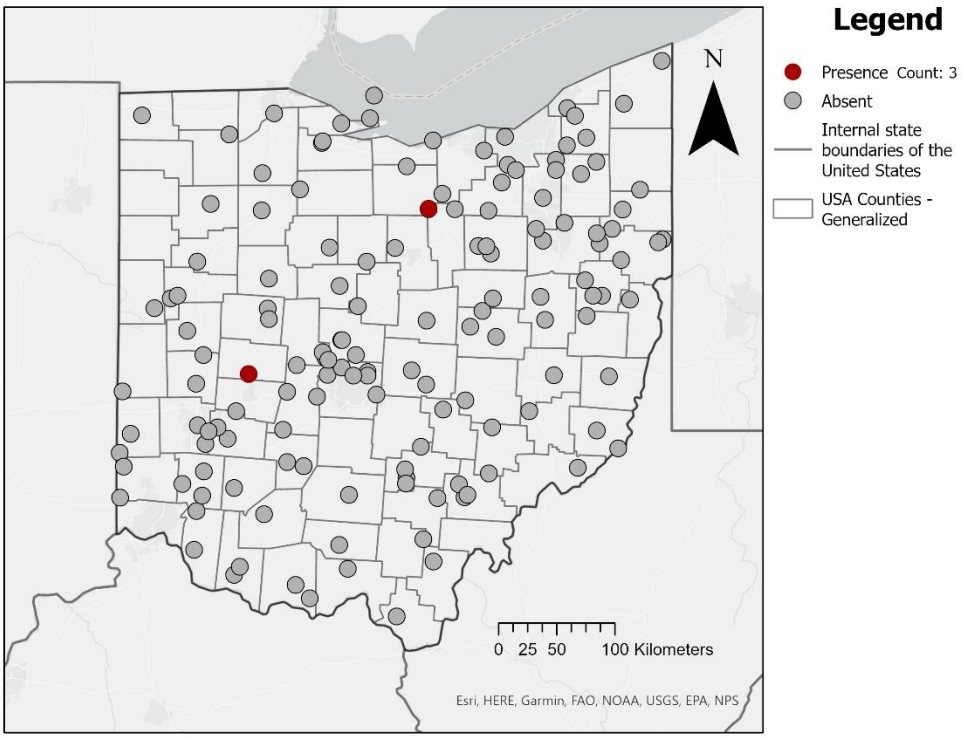
Halictus parallelus is in the family Halictidae. It is an uncommon species of *Halictus* that is generally larger than ligatus, with darker wings, and lacks wide cheeks. It is thought to be associated with sandy habitats, which could explain its otherwise rarity in Ohio.

Halictus rubicundus



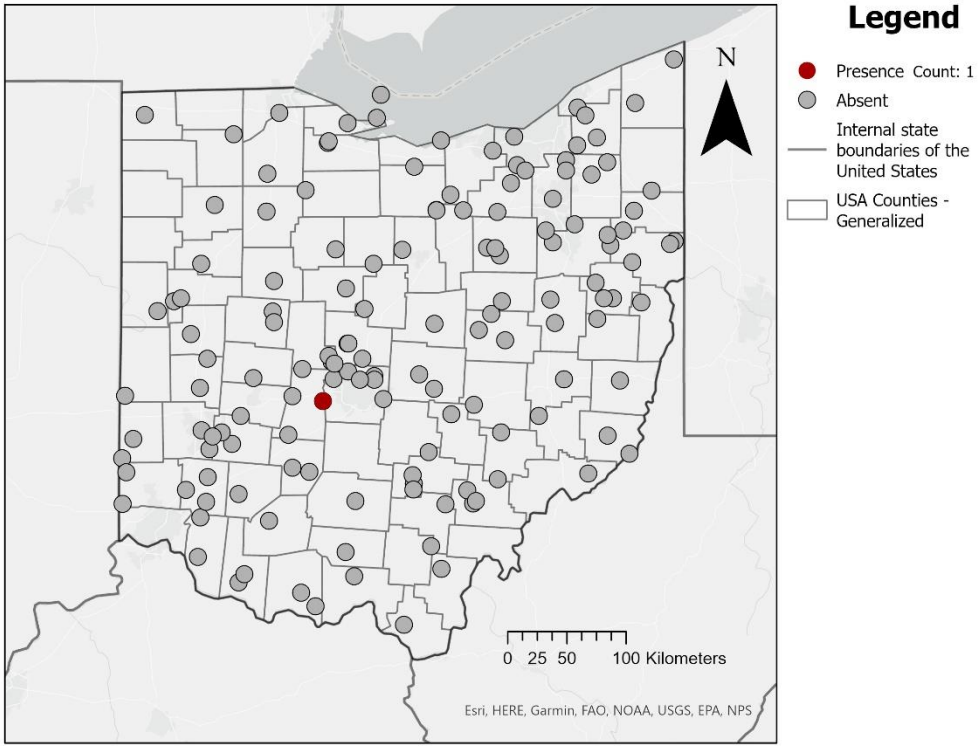
Halictus rubicundus is in the family Halictidae. It is an uncommon species of *Halictus* that is expected to occur across Ohio. It is most similar to *Halictus ligatus*, but has a rounded, thin cheek. The clear wings and inner tibial spur with fewer teeth separate it from *parallelus*.

Heriades carinata



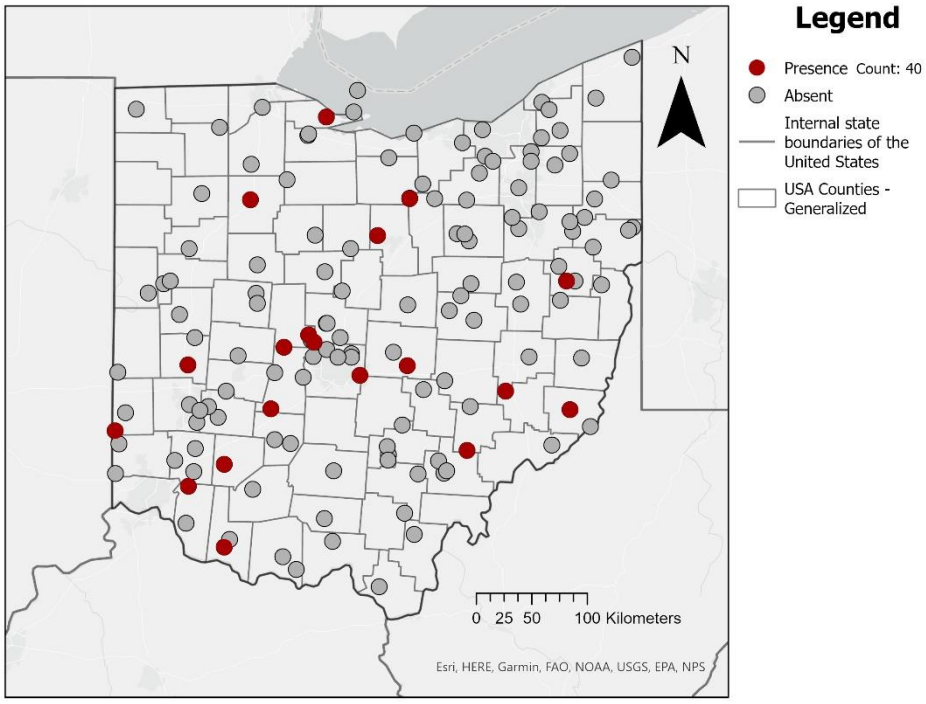
Heriades carinata is a small bee in the family Megachilidae. This genus is superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Heriades carinata* has a distinct ridge on the mandible of females. Although rare in our collections, we expect this species to occur across all of Ohio.

Heriades leavitti



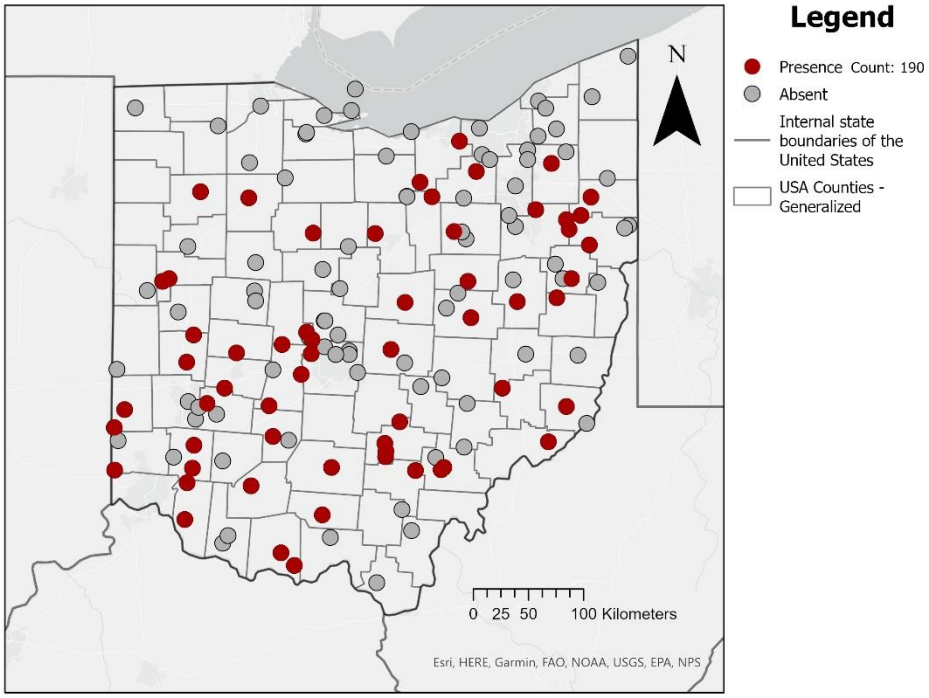
Heriades leavitti is a small species of bees in the family Megachilidae. They are superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Heriades leavitti* is challenging to differentiate from *variolosa*.

Heriades variolosa



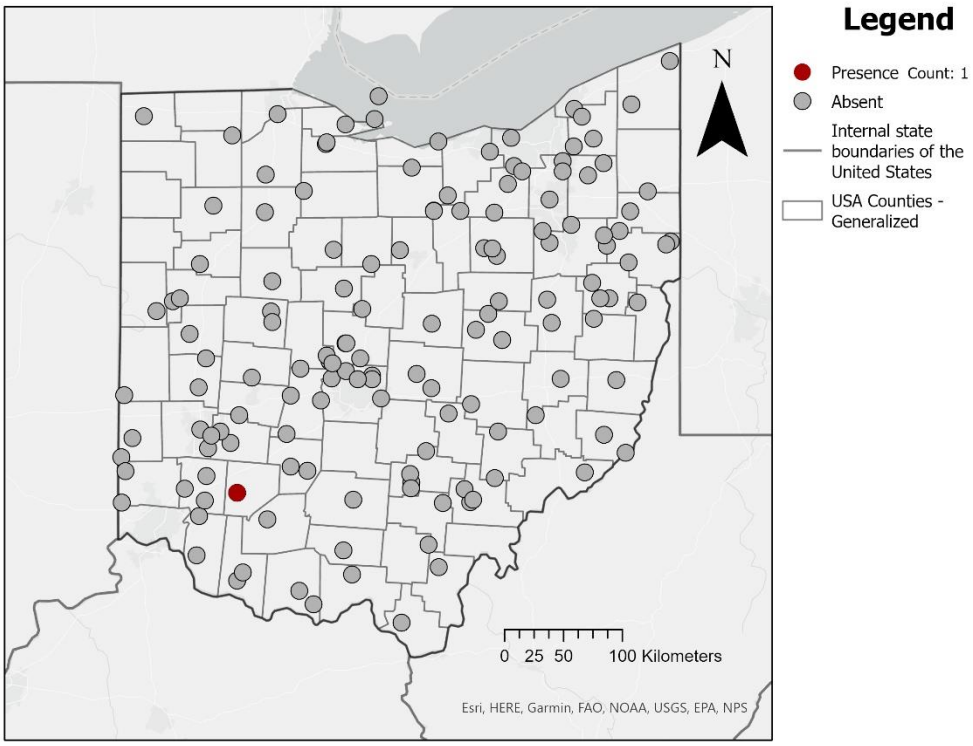
Heriades variolosa is a small species of bees in the family Megachilidae. They are superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Heriades variolosa* is challenging to separate from *leavitti*.

Holcopasites calliopsidis



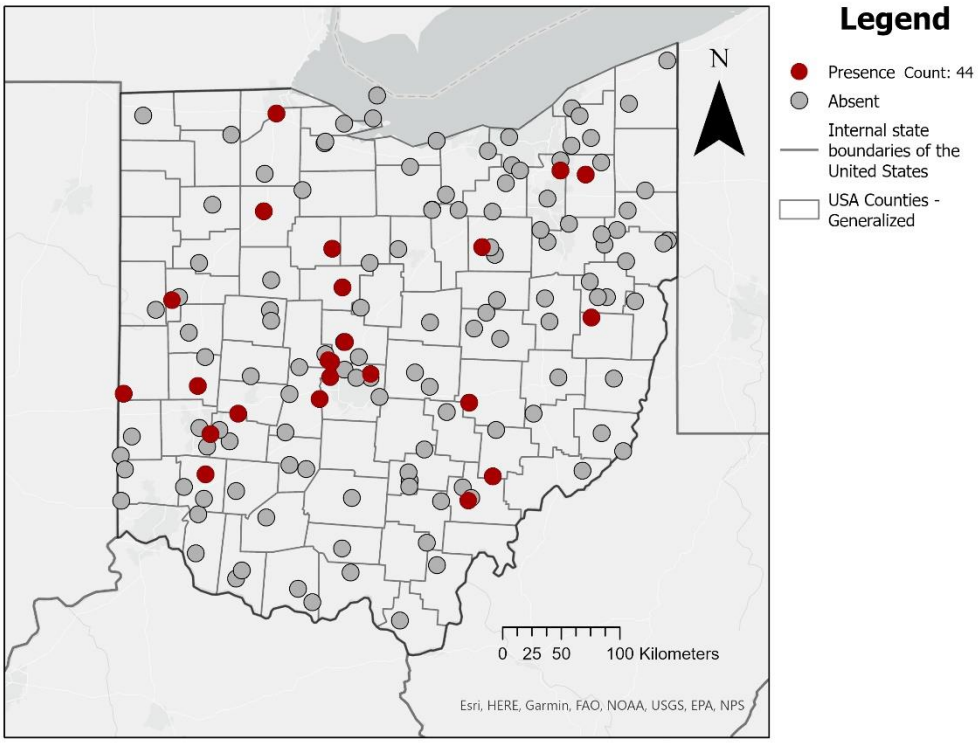
Holcopasites calliopsidis is a bee in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Holcopasites calliopsidis* is specifically a cleptoparasite of bees in the genus *Calliopsis*. The adults have a black thorax with a red abdomen with several white spots on each abdominal segment. The other species of *Holcopasites* in our area will have either white lines instead of spots on the abdomen or a black abdomen with small spots. *Holcopasites* adults can often be found on fleabane flowers in the summer. They also have a distinct wing positioning (see below), with the wings angled and tucked in along the side of the body when they are alive. That wing positioning is lost after they die.

Hoplitis micheneri



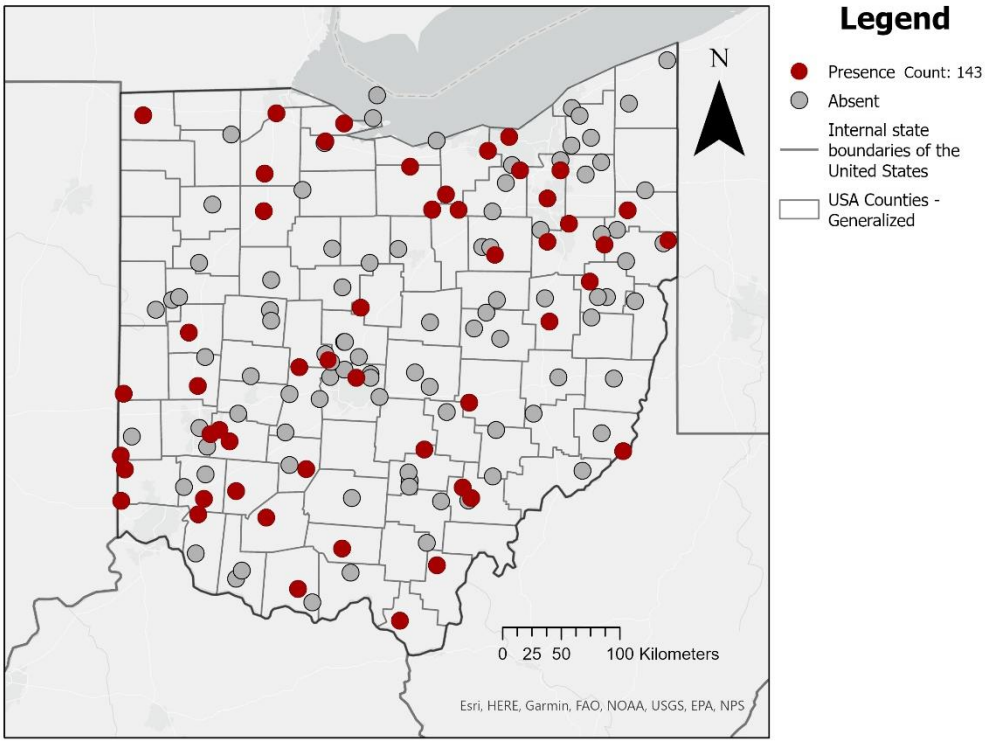
Hoplitis micheneri is a small species of bees in the family Megachilidae. They are superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Hoplitis micheneri* is a specialist of *Amorpha* (Fowler and Droege, 2020). The one site where *Hoplitis micheneri* was collected has a persistent population of *Amorpha*. It is likely that targeted sampling of *Amorpha* elsewhere in the state will yield more locations of this bee. This specimen is a state record.

Hoplitis pilosifrons



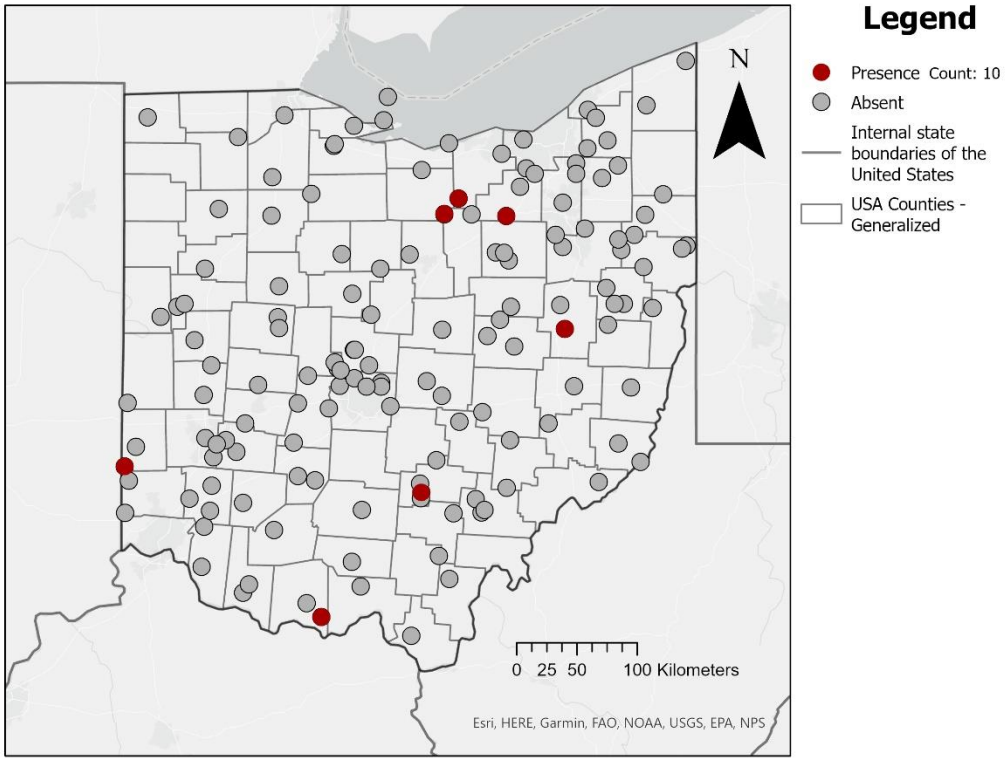
Hoplitis pilosifron is a small species of bees in the family Megachilidae. They are superficially similar to bees in the genus Megachile, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Hoplitis pilosifrons* is one of our most common species of *Hoplitis* in Ohio. Males of *Hoplitis pilosifrons* have the end of the antennae narrowed to a sharp point and slightly curved. *Hoplitis pilosifrons* is most likely to be misidentified as *Hoplitis producta*. *Hoplitis pilosifrons* is known to be parasitized by the cuckoo bee *Stelis lateralis* (Michener, 1955).

Hoplitis producta



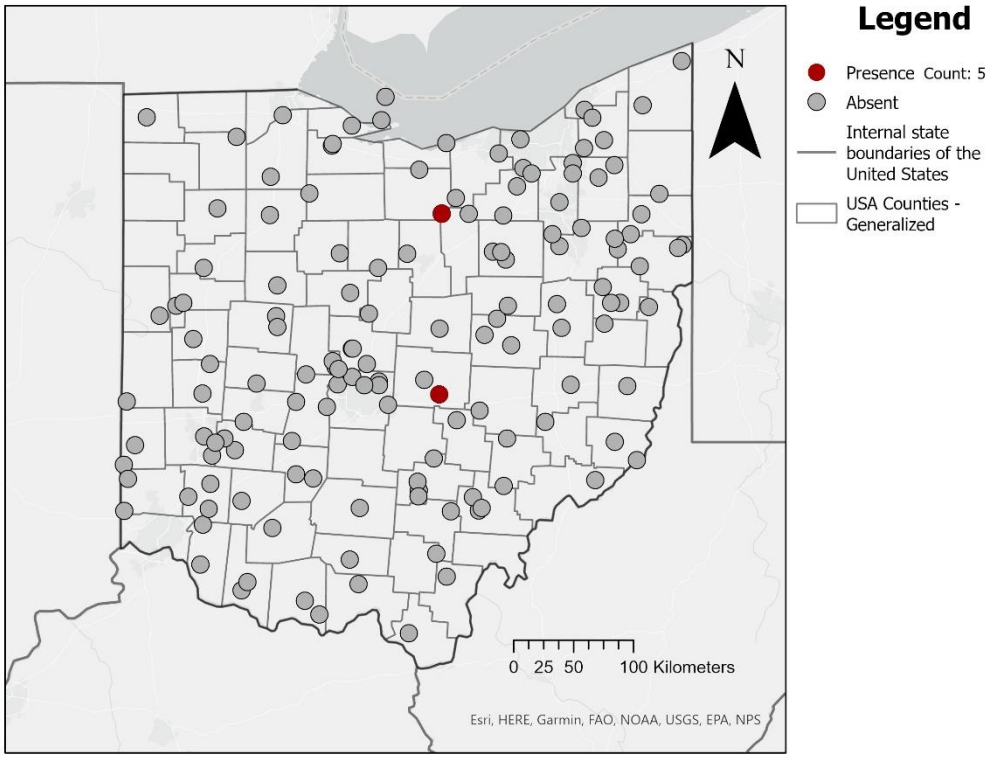
Hoplitis producta is a small species of bees in the family Megachilidae. They are superficially similar to bees in the genus Megachile, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Hoplitis producta* is our most common species of Hoplitis in Ohio. Males of *Hoplitis producta* have the end of the antennae narrowed to a sharp point and slightly curved. They are most likely to be confused with *Hoplitis pilosifrons*. *Hoplitis producta* is known to be parasitized by the cuckoo bees *Stelis labiata* and *Stelis lateralis* along with the chalcidoid wasp *Leucopsis affinis* (Medler, 1961).

Hoplitis simplex



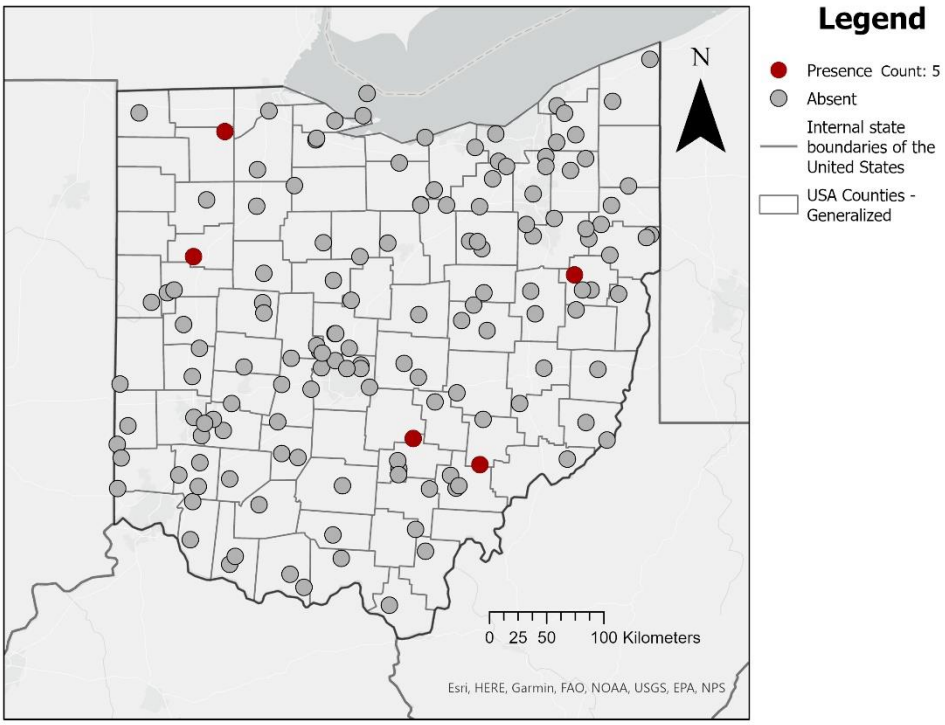
Hoplitis simplex is a bee in the family Megachilidae. It is a specialist of *Nemophila* and *Phacelia* (Fowler and Droege, 2020). They are superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary.

Hoplitis spoliata



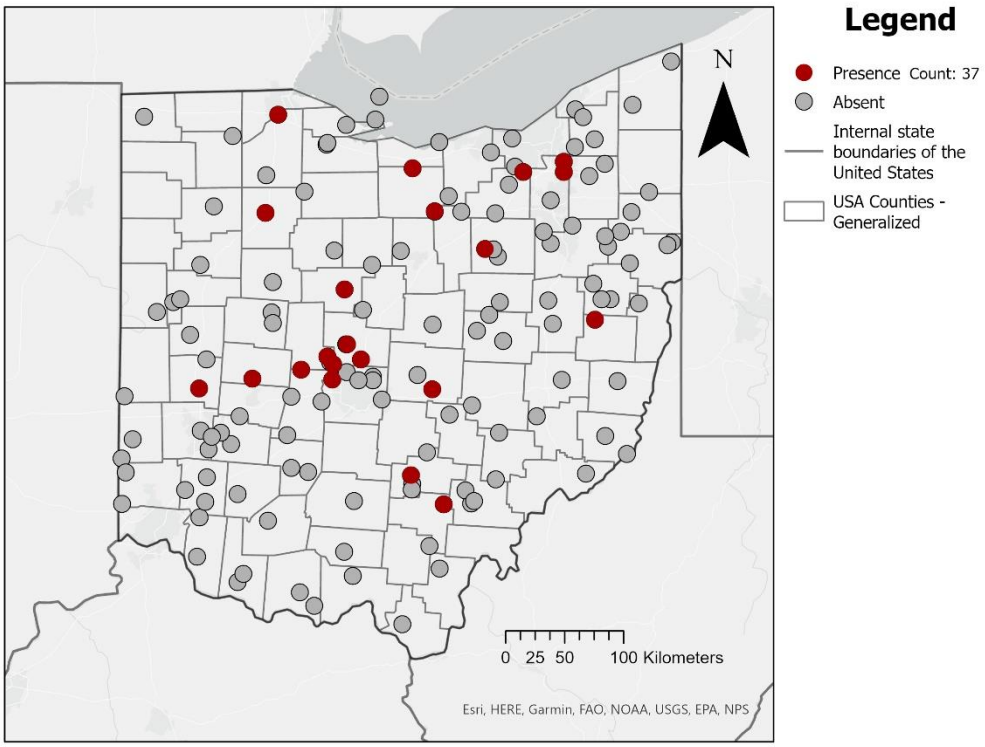
Hoplitis spoliata is in the family Megachilidae. It is one of the larger *Hoplitis* species that occurs in Ohio. The males have an unusual widening of the antennae in the middle of the antennae. Hoplitis are a group of bees in the family Megachilidae. They are superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. *Hoplitis spoliata* is known to be parasitized by the cuckoo bees: *Stelis lateralis* and *labiata* (J. T. Medler, 1967).
Size range: 10 – 12 mm (female), 9 – 12 mm (male)

Hoplitis truncata



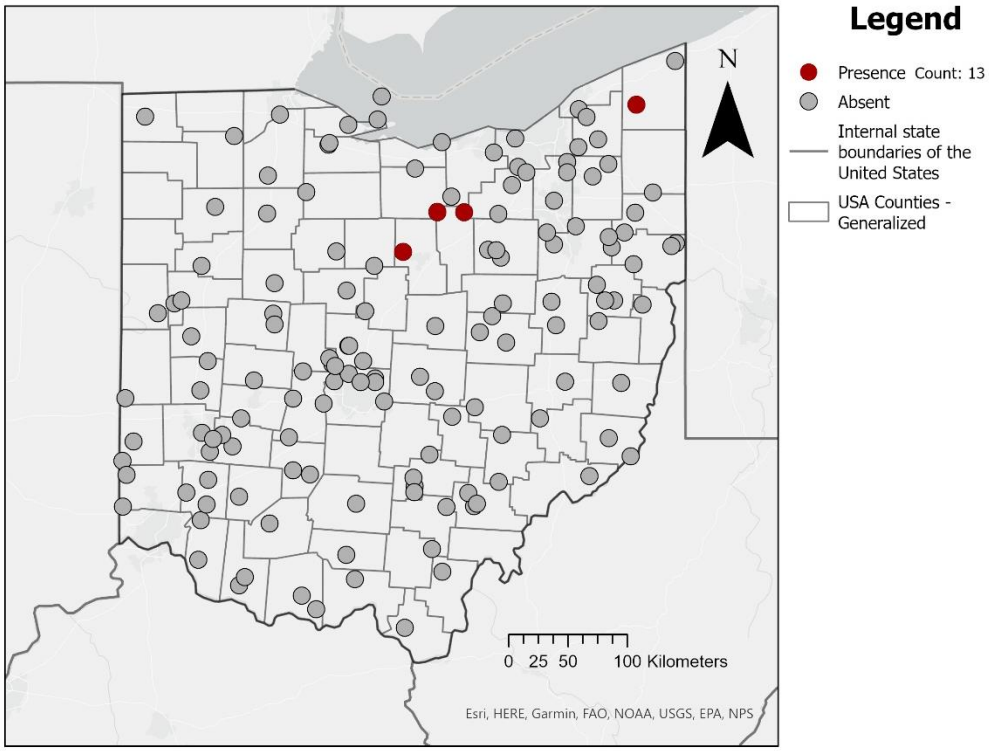
Hoplitis truncate is in the family Megachilidae. It is an uncommon species of *Hoplitis* that is expected to occur across Ohio. It is a mid-summer species and most likely to be found in July or August. The males have a widened 7th abdominal segment. *Hoplitis* are a group of bees in the family Megachilidae. They are superficially similar to bees in the genus *Megachile*, but are on average much smaller. Like *Megachile*, they are cavity nesting species and are considered solitary. Size range: 8.5 – 9.5 mm (female), 8 – 8.5 mm (male)

Hylaeus affinis

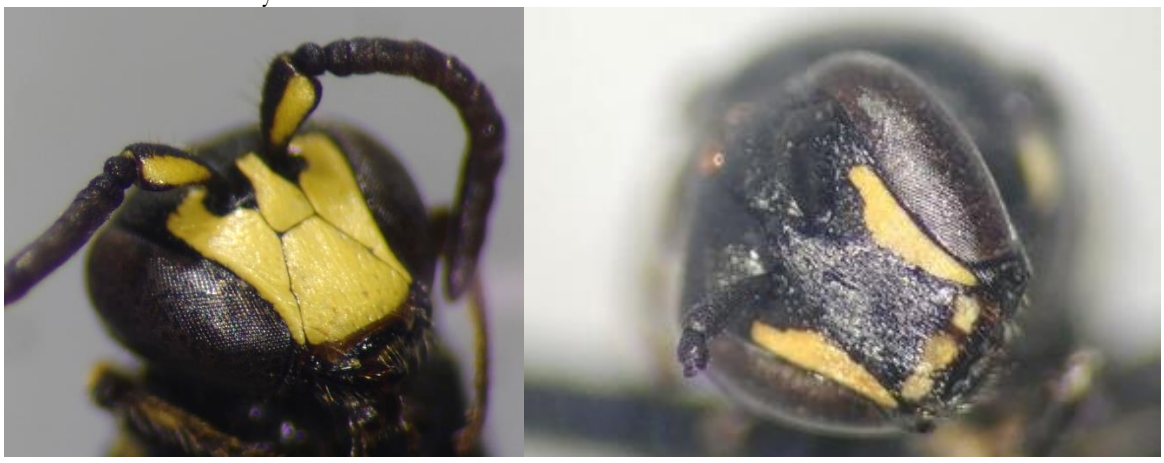


Hylaeus affinis is a species of cavity nesting bees in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. Any specimens identified as *Hylaeus affinis* were males and identified based on the amount of yellow on the face.

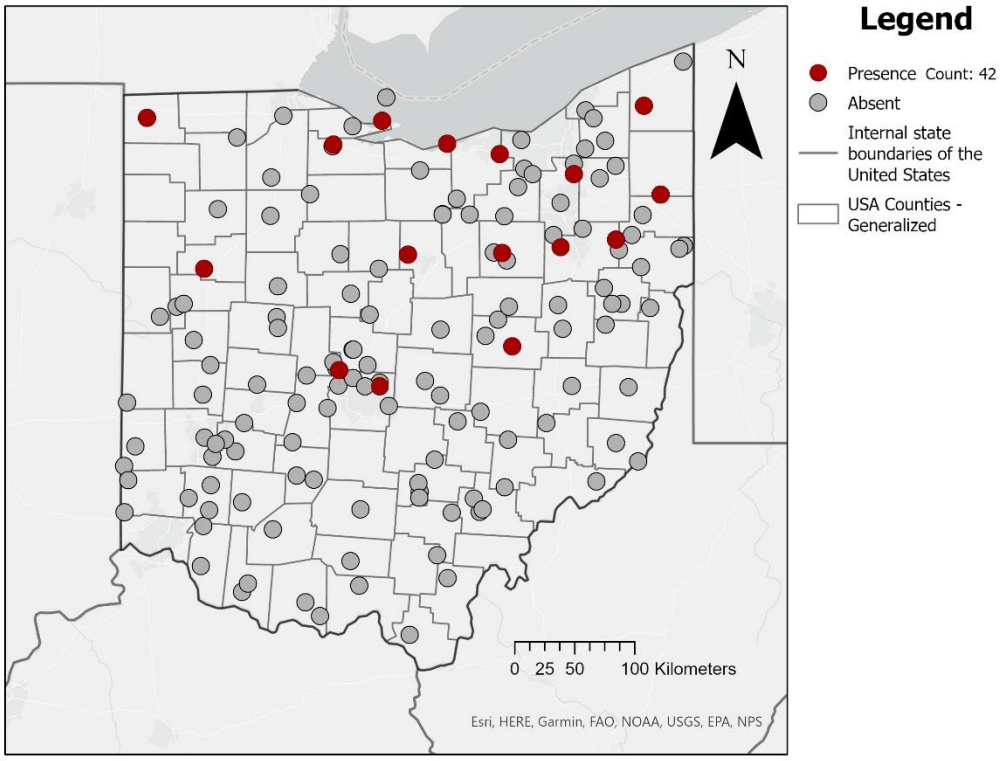
Hylaeus annulatus



Hylaeus annulatus is a species of cavity nesting bees in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. *Hylaeus annulatus* is an uncommon species, but the males have a widened scape of the antennae that is half yellow.

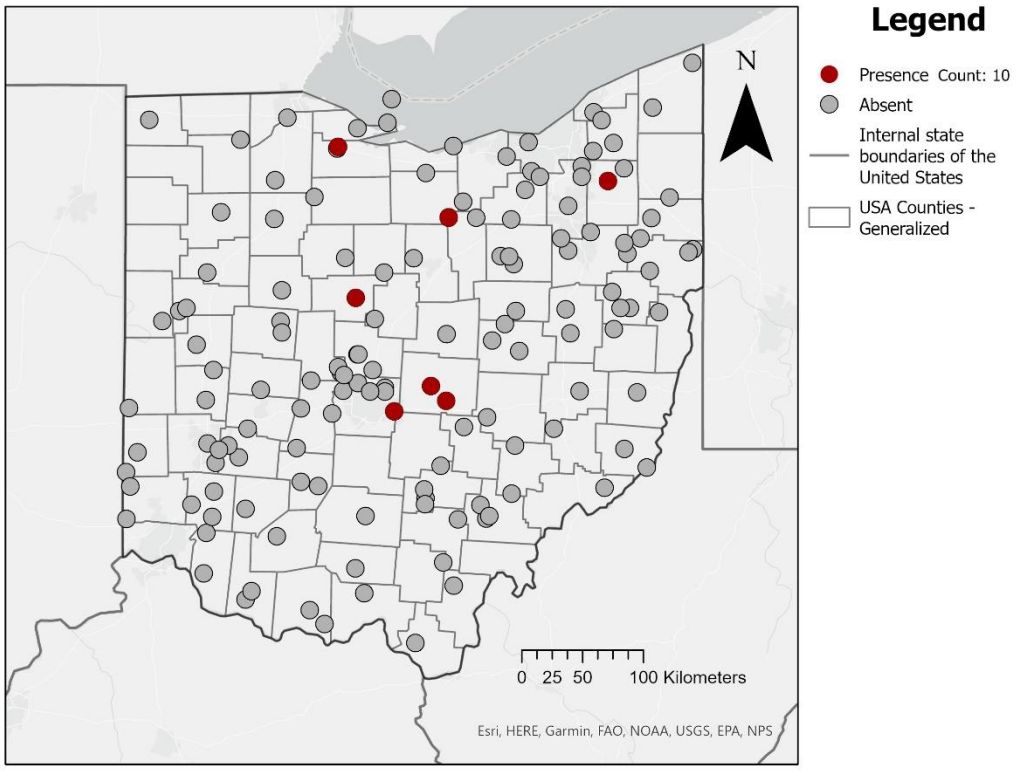


Hylaeus hyalinatus



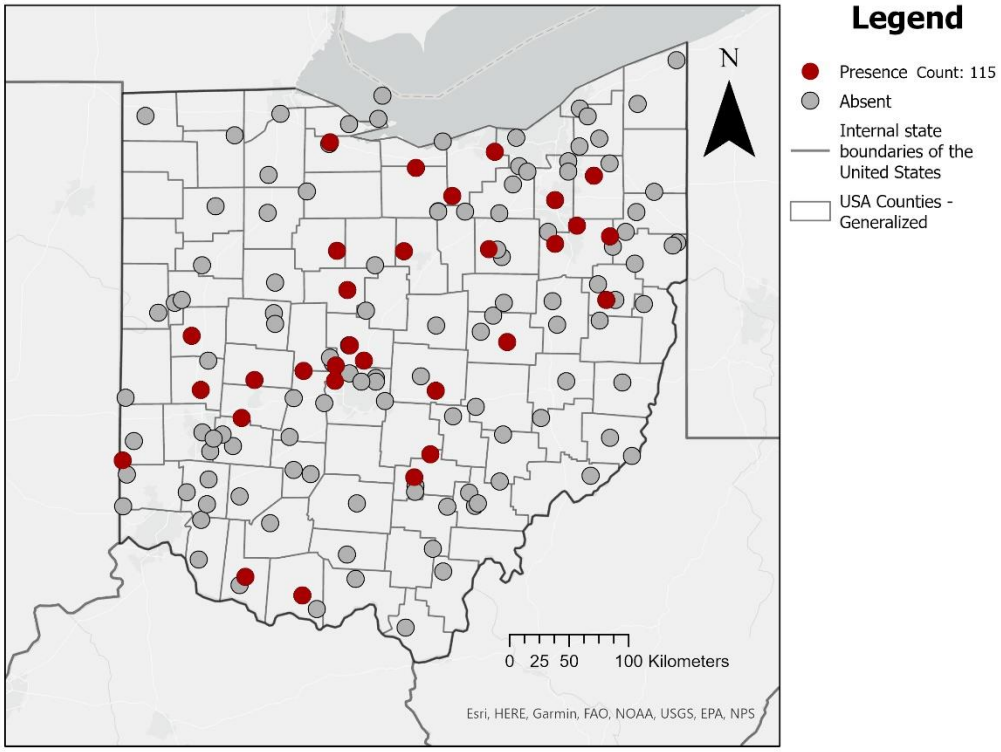
Hylaeus hyalinatus is a species of cavity nesting bees in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. *Hylaeus hyalinatus* is an introduced, non-native species that is slowly spreading across the US. It has a distinct ridge on the thorax and puncture spacing.

Hylaeus illinoisensis



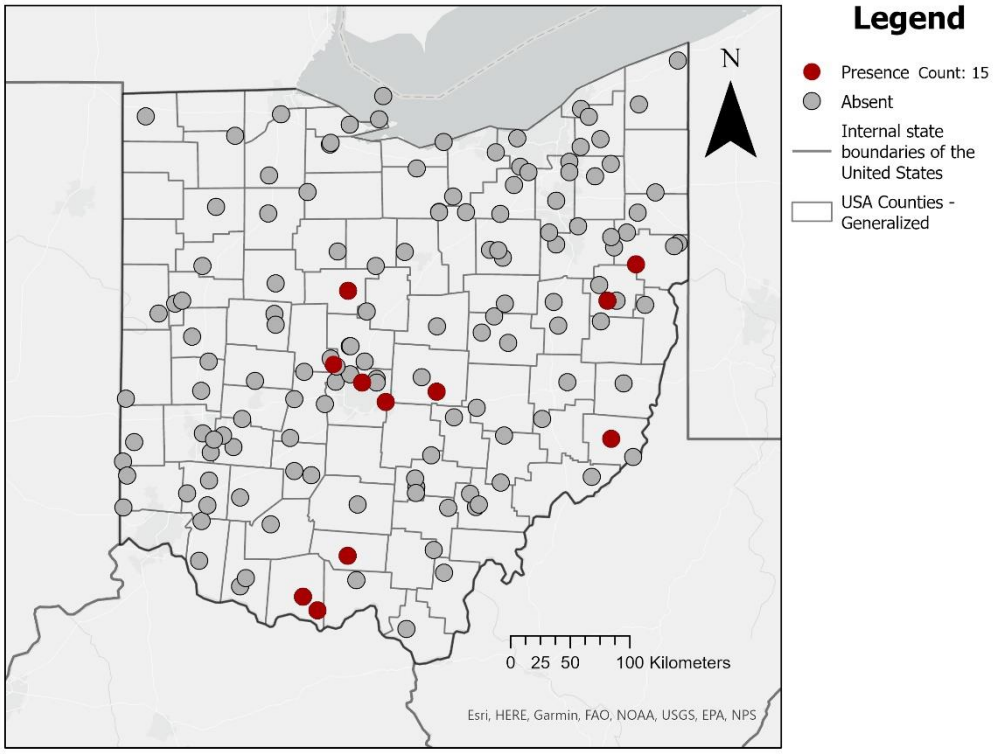
Hylaeus illinoisensis is a species of cavity nesting bees in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. Any specimens identified as *Hylaeus illinoisensis* specimens were males and identified based on the amount of yellow on the face along with other characters.

Hylaeus mesillae



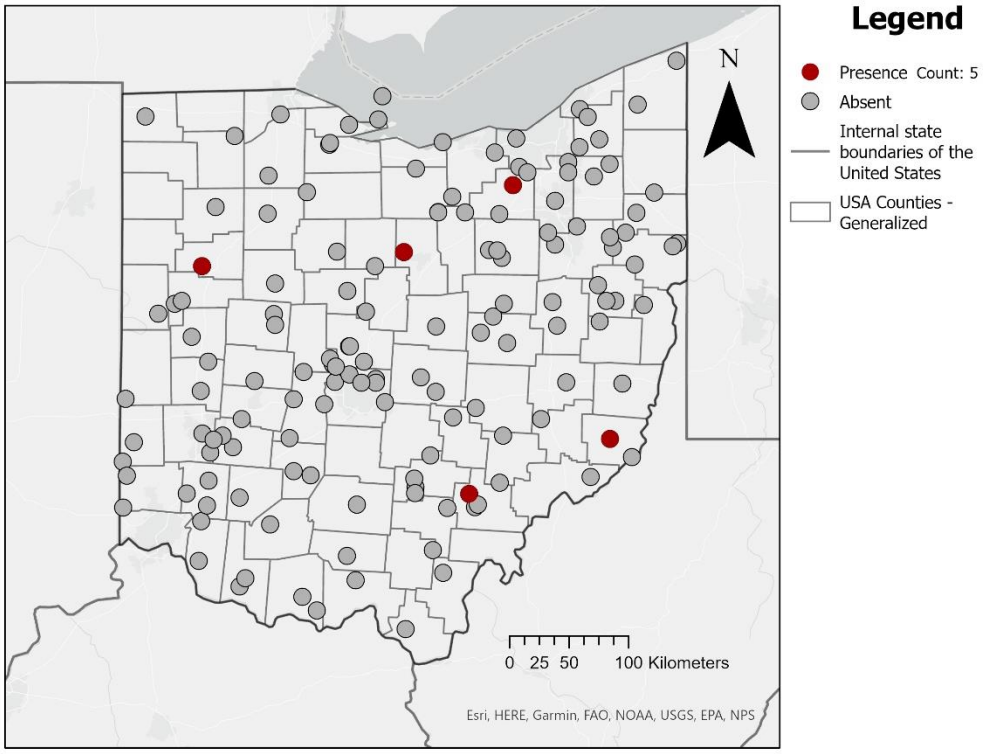
Hylaeus mesillae is a species of cavity nesting bees in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. *Hylaeus mesillae* is one of the more common species that we expect to occur across the state.

Hylaeus modestus



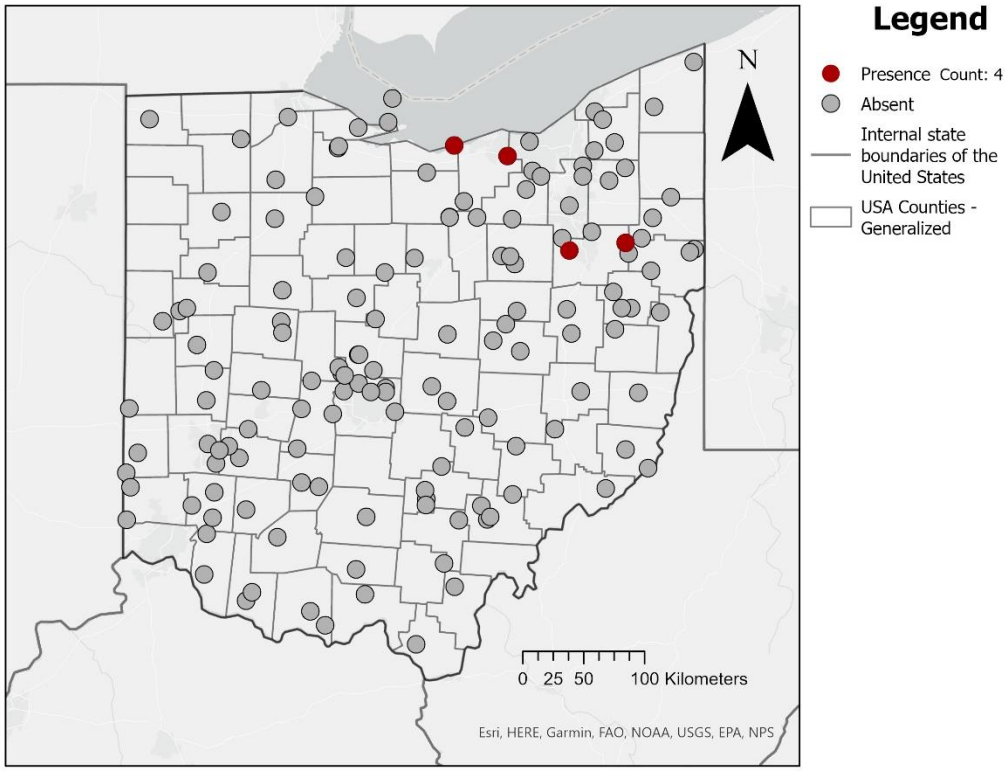
Hylaeus modestus is a species of cavity nesting bees in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. Any specimens identified as *Hylaeus modestus* specimens were males and identified based on the amount of yellow on the face along with other characters.

Hylaeus nelumbonis



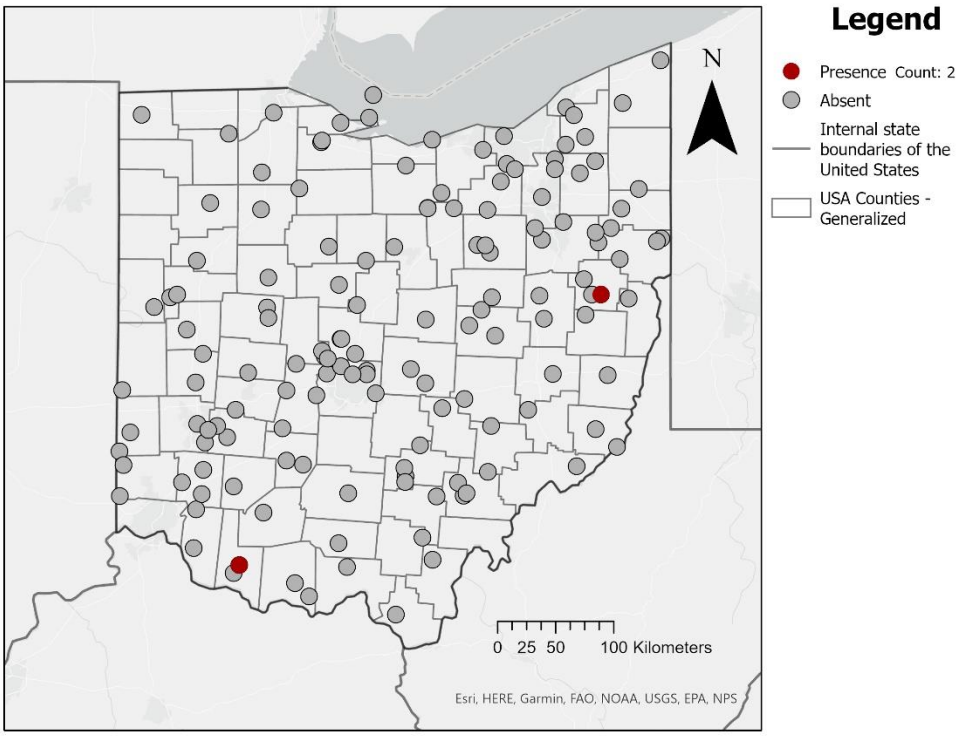
Hylaeus nelumbonis is a cavity nesting bee in the family Colletidae. These tiny black and yellow bees are often mistaken for wasps or other insects because they are so slender and without much hair. *Hylaeus nelumbonis* is thought to be associated with wetlands. It can be found foraging on water lilies in the genus *Nuphar*, but it has been documented foraging on many other wetland plants, so does not count as a specialist bee (Fowler, 2016). It is also a distinct species of *Hylaeus* that has a large amount of red on the first segment of the abdomen.
Size range: 7 – 8 mm (female), 6 mm (male).

Hylaeus pictipes



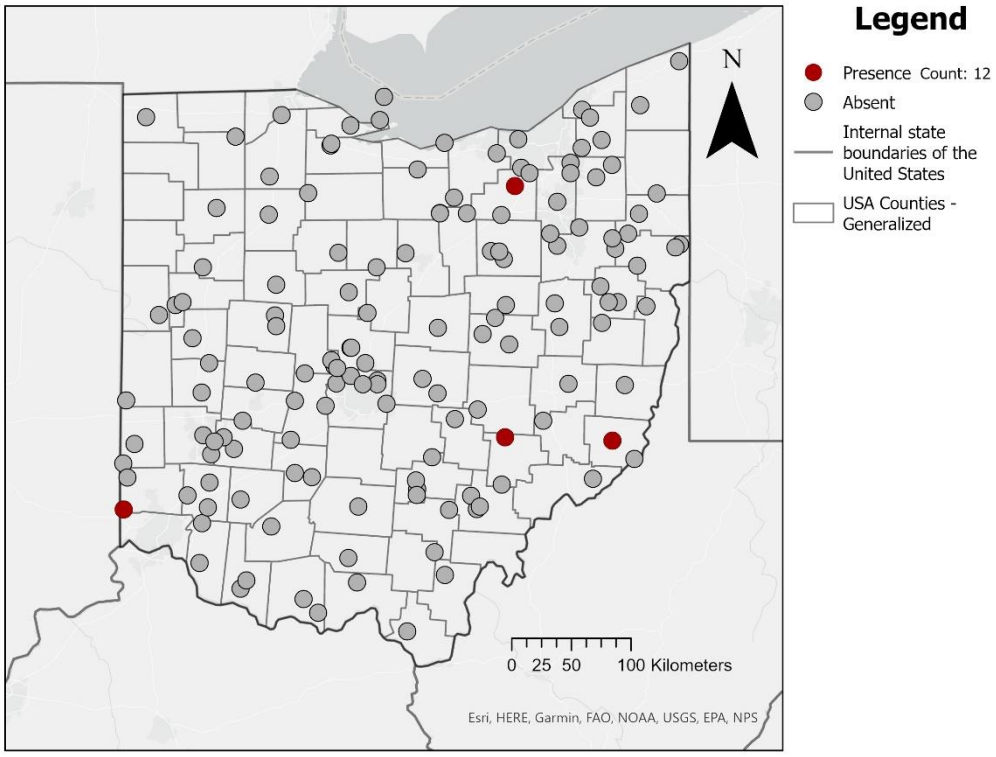
Hylaeus pictipes is a cavity nesting bee in the family Colletidae. These tiny black and yellow bees are often overlooked by bee enthusiasts since they are so slender and without much hair. *Hylaeus pictipes* is an introduced, non-native species that is slowly spreading across the US. The earliest known North American records are from Ohio in 2014 (Gibbs and Dathe, 2017). It has been documented in Pennsylvania and Ontario, Canada. Size range: n.d.

Lasioglossum abanci



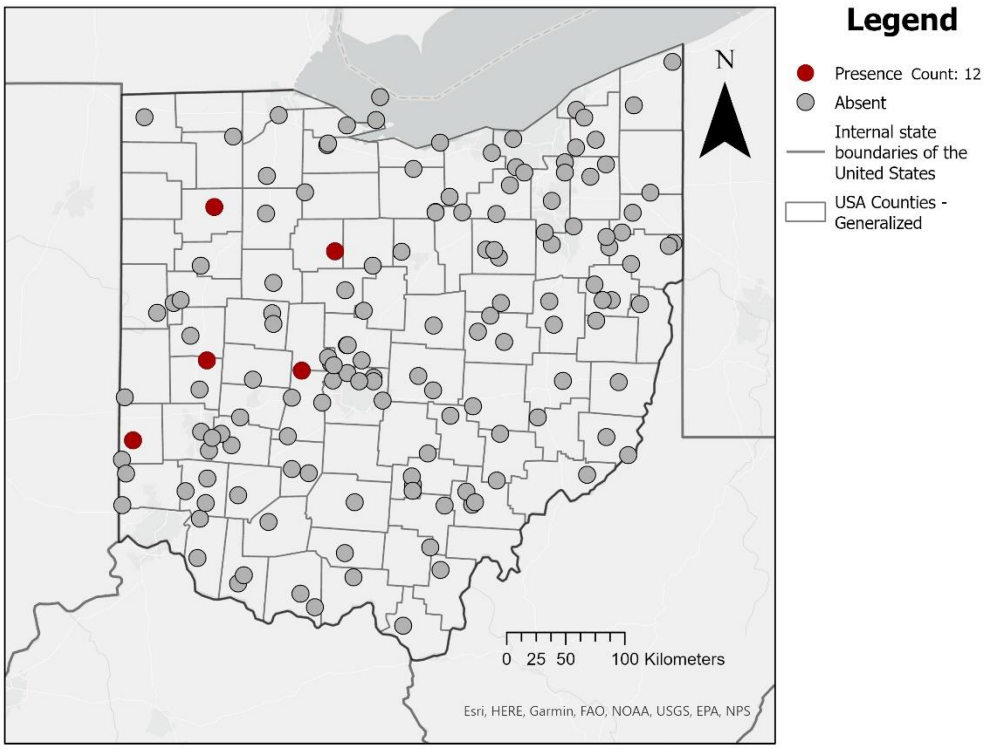
Lasioglossum abanci is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum abanci* is one of the more challenging species and often confused with *subviridatum*. These two species both have a polished scutum, and minimal hair on the abdomen. Anything we call abanci has minimal punctation in the apical area of the second abdominal segment.

Lasioglossum admirandum



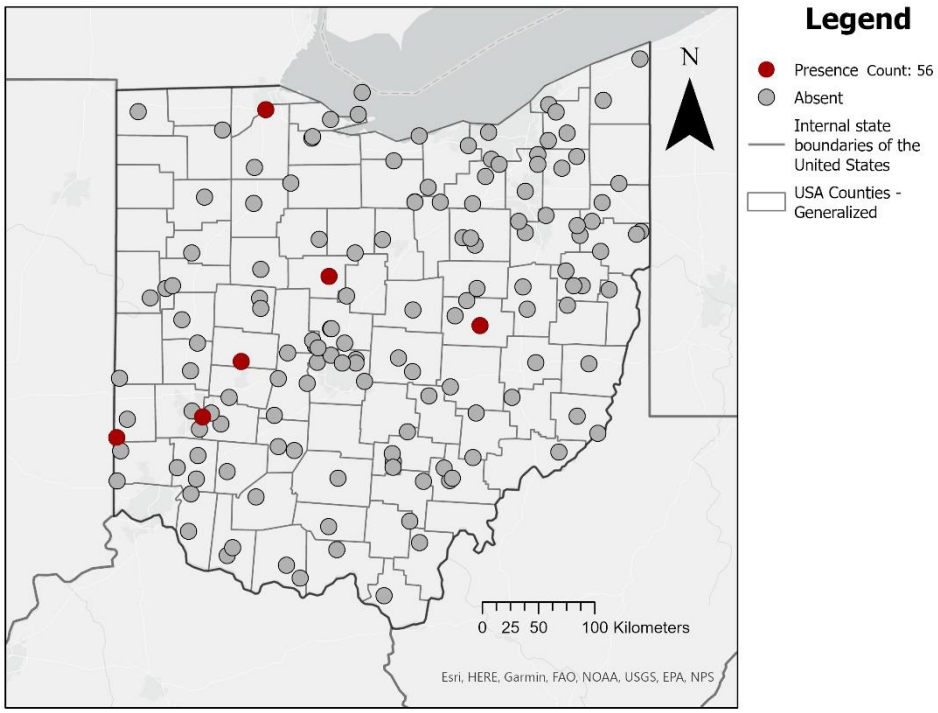
Lasioglossum admirandum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum admirandum* is in the taxonomically problematic viridatum group. *Lasioglossum admirandum* has a pale tegula, clypeus protruding beneath the eyes, and the second abdominal segment with a wide, see-through border.

Lasioglossum albipenne



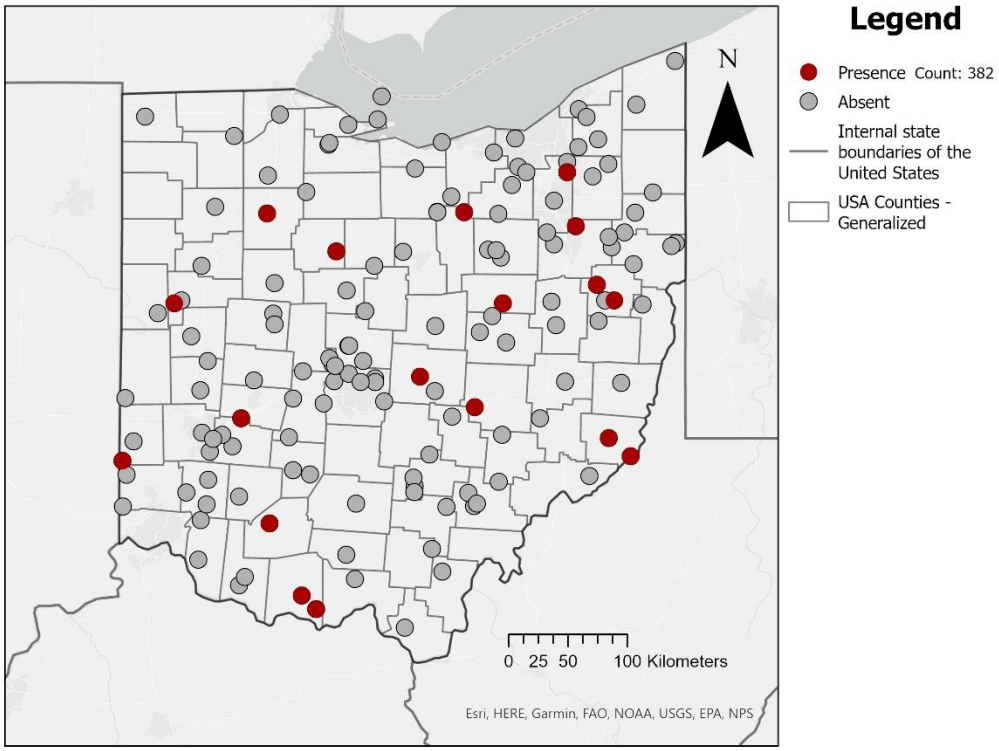
Lasioglossum albipenne is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most Lasioglossum bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum albipenne* is one of the nicer species in what we call the coarse propodeum group. These bees have a particularly rough propodeum that more easily separates them from other species of *Lasioglossum*. The scutum is punctate (not reticulate-rugose), the transverse propodeal carina is weakened in the center. Then separating from cressonii is based on integument color (*cressonii* is more green, whereas albipenne is more blue-ish), and wing vein color, with *albipenne* having almost milky white wing veins. The wing veins are also part of why it is sometimes referred to as the White-winged Sweat bee.

Lasioglossum anomalum



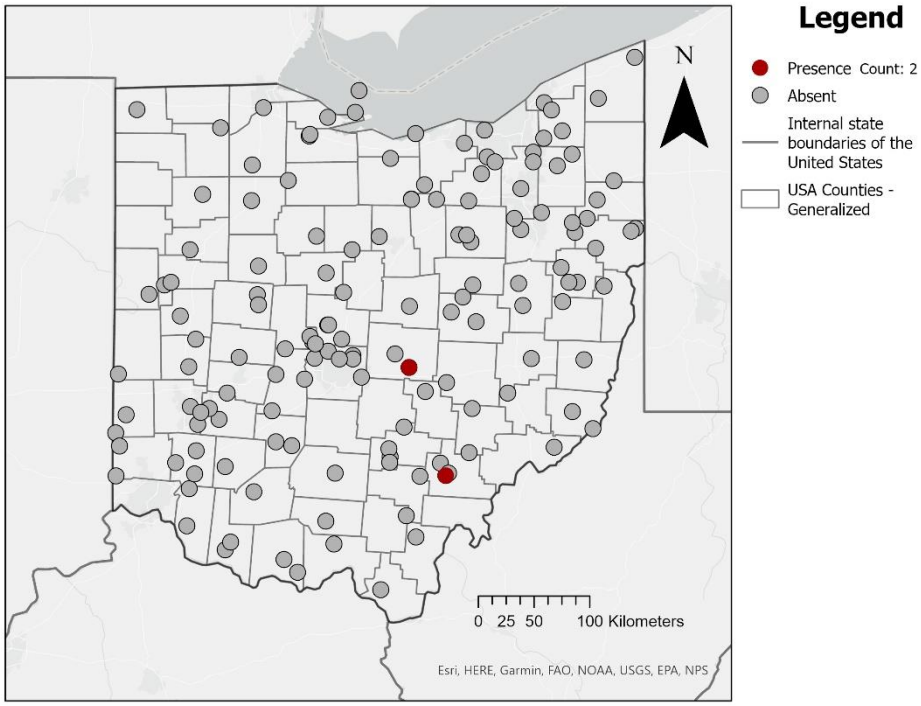
Lasioglossum anomalum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum anomalum* is an unusual species of *Lasioglossum* in that it is one of the few that always has only two submarginal cells in both wings instead of three as in other *Lasioglossum*.

Lasioglossum apocyni



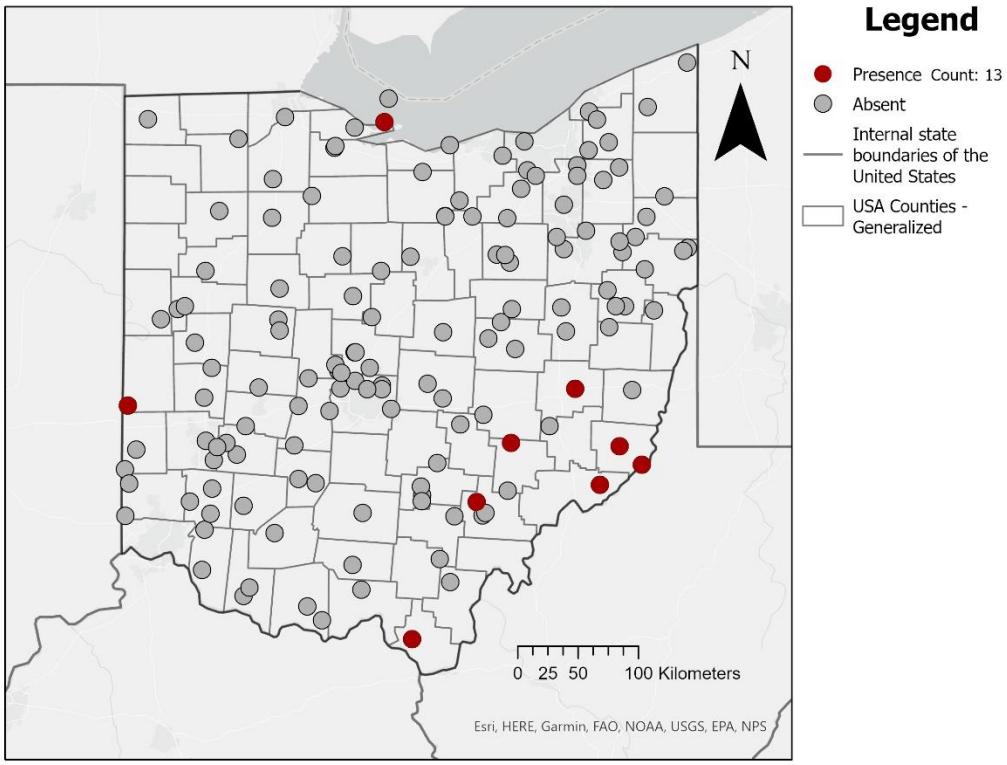
Lasioglossum apocyni is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum apocyni* is one of the few non-parasitic species of *Lasioglossum* with an extra wide cheek. The surface of the first abdominal segment is dulled due to microsculpture. This is an otherwise rare species, so it was interesting to see how many sites we found it. A majority of specimens were collected from a single location along a forested roadside in Muskingum County. Interestingly, a 2015 and 2016 survey in that same region of Ohio, Lasioglossum apocyni was the most abundant species of *Lasioglossum* (Novotny and Goodell, 2020).

Lasioglossum ascheri



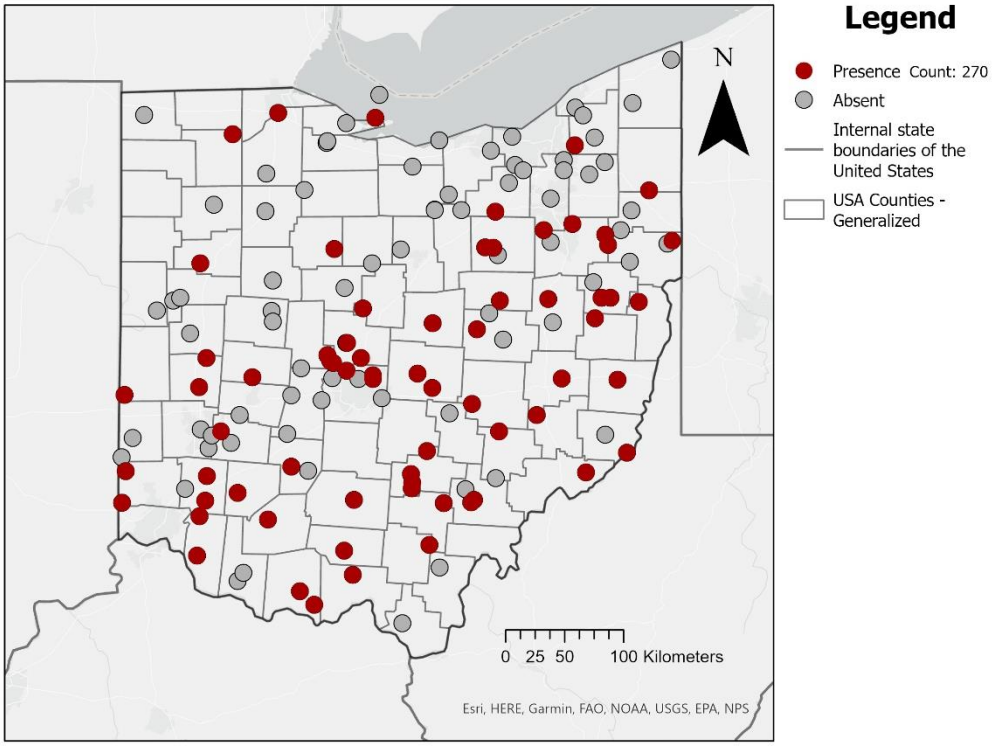
Lasioglossum ascheri is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice). *Lasioglossum ascheri* is a rare species that is a cleptoparasite of other species of *Lasioglossum*. This means that instead of foraging for its own pollen and nectar resources, it sneaks into the nests of other bees to lay eggs into their provisions. The parasite eggs hatch first and eat the nest provisions. The parasitic *Lasioglossum* species do not have pollen collecting hairs on their legs and typically have a very wide cheek. *Lasioglossum ascheri* lacks a tooth on the mandible and the mesepisternum is punctate instead of rugose.

Lasioglossum birkmanni



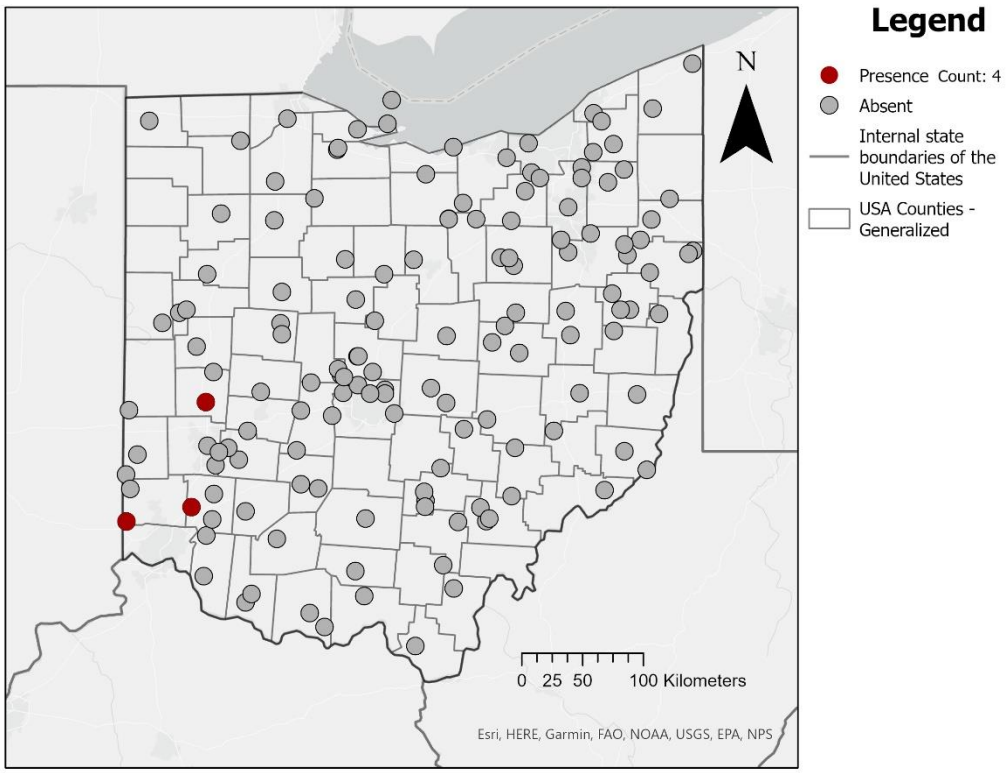
Lasioglossum birkmanni is in the family Halictidae. *Lasioglossum birkmanni* is one of the small *Lasioglossum* species that does not have any metallic reflections. They are black with minimal hair on the abdomen. They have a punctate mesepisternum, and a rounded pronotum. They are most similar to *Lasioglossum macoupinense*, but differ in having a wider head. Like other *Lasioglossum*, they nest in the ground.

Lasioglossum bruneri



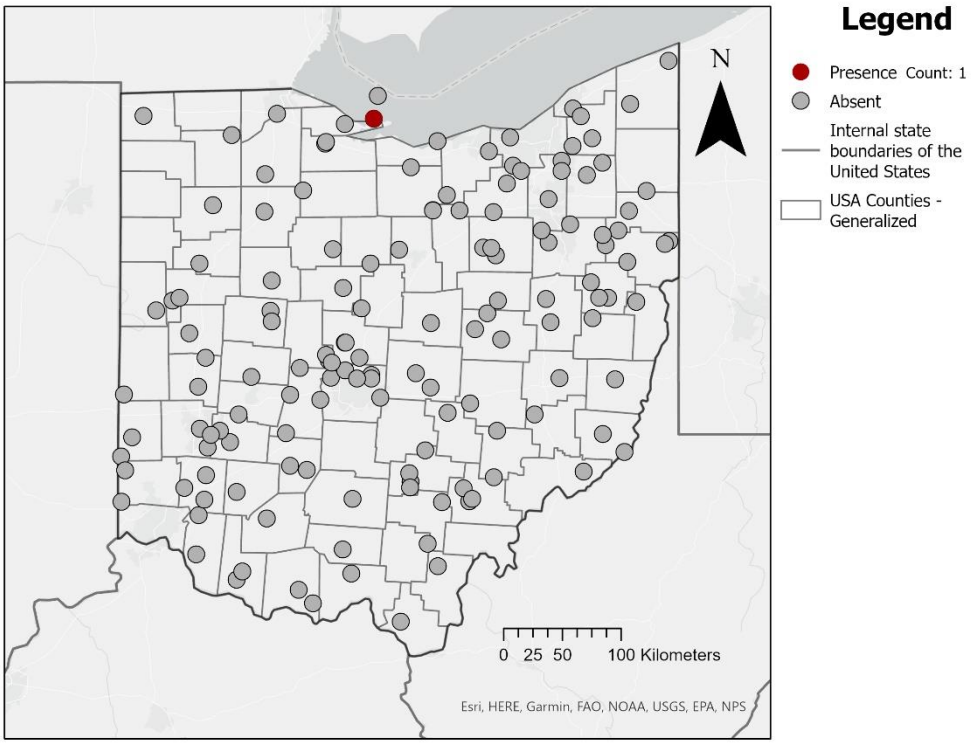
Lasioglossum bruneri is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum bruneri* is one of the nicer species in what we call the coarse propodeum group. These bees have a particularly rough propodeum that more easily separates them from other species of *Lasioglossum*. The hypostomal carina on the underside of the face is widely diverging, separating it from the other coarse propodeum species in our area.

Lasioglossum callidum



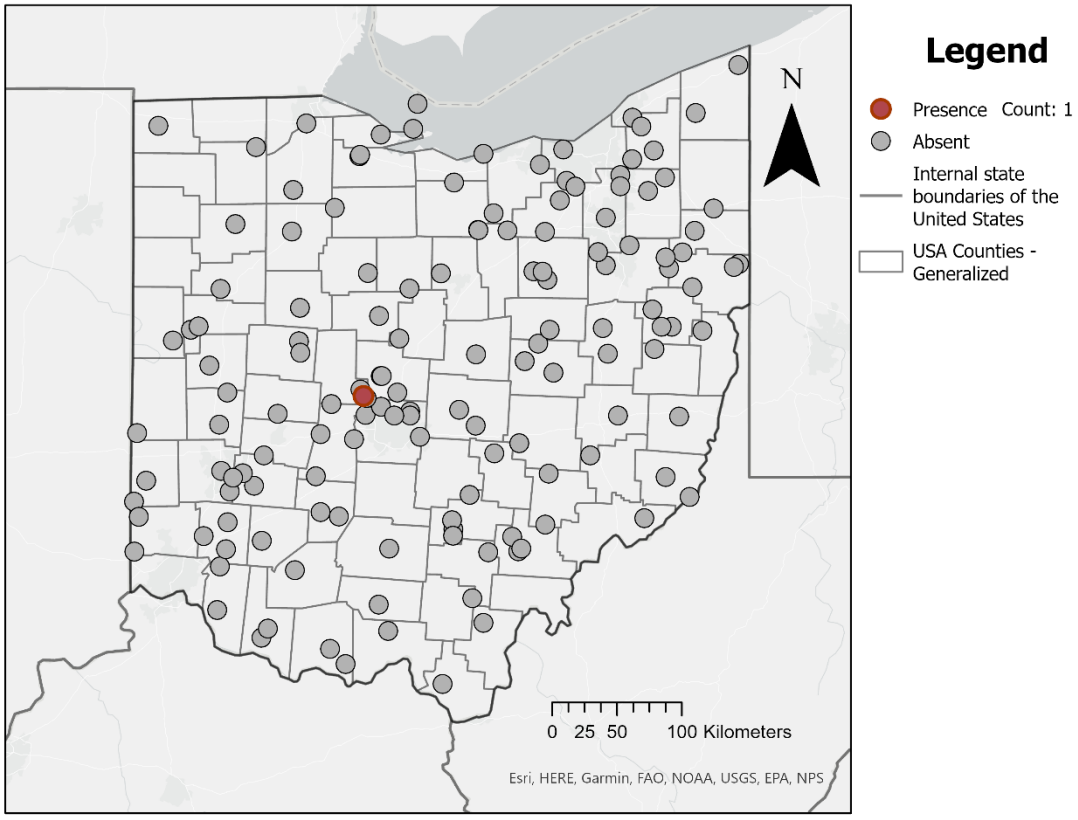
Lasioglossum callidum is in the family Halictidae. It is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. *Lasioglossum callidum* is a tricky species to identify. It is superficially most similar to *Lasioglossum versatum*, but has a broader protrocanter and mandible margin distinctly curved. Both characters need microscopic examination to confirm. Size range: 5.1-6.5 mm (female), 5.1 – 6.7 mm (male)

Lasioglossum cinctipes



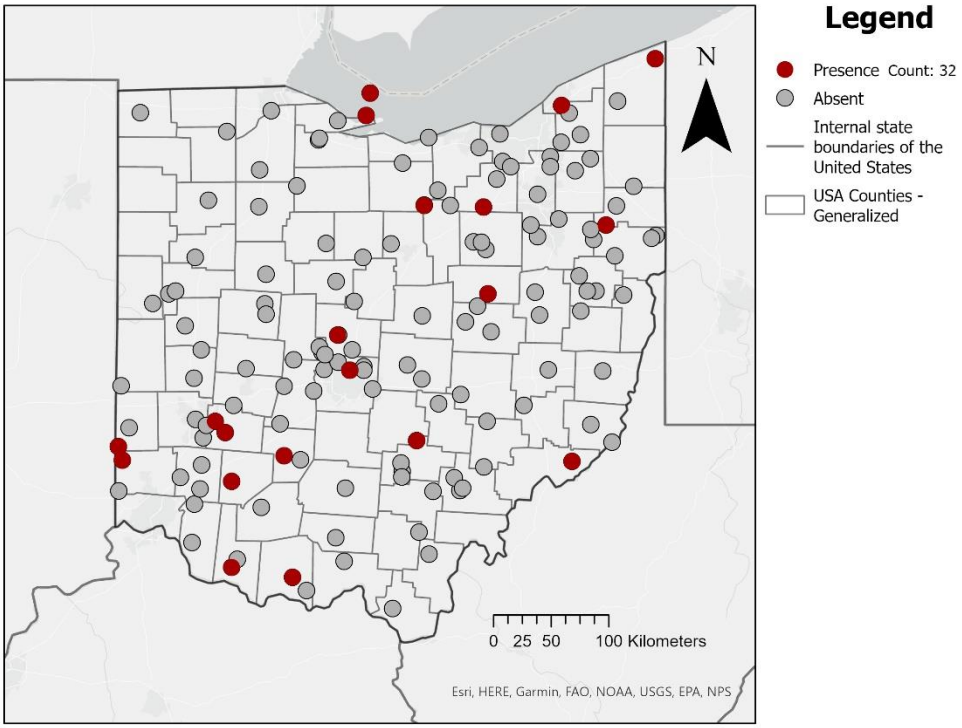
Lasioglossum cinctipes is in the family Halictidae. It is one of the black Lasioglossum that lacks metallic reflections. This species is broadly distributed in the USA east of the Rocky Mountains according to observations on GBIF accessed 28 July 2023. Like other *Lasioglossum*, it is a ground nesting species.

Lasioglossum coreopsis



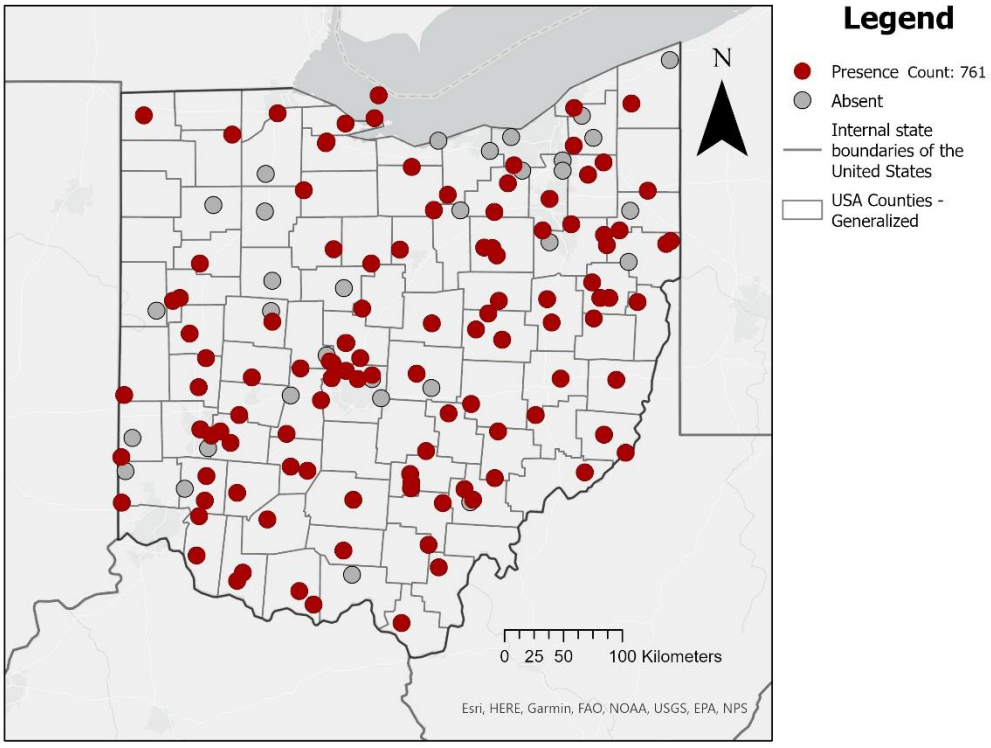
Lasioglossum coreopsis is in the family Halictidae. It is one of the small, dull green sweat bees. It is a rather distinct species when viewed under the scope, with an extremely narrow face and tesselate scutum. *Lasioglossum coreopsis* is broadly distributed in the USA east of the Rocky Mountains, but few records west of Kansas (GBIF and Discoverlife.org)

Lasioglossum coeruleum



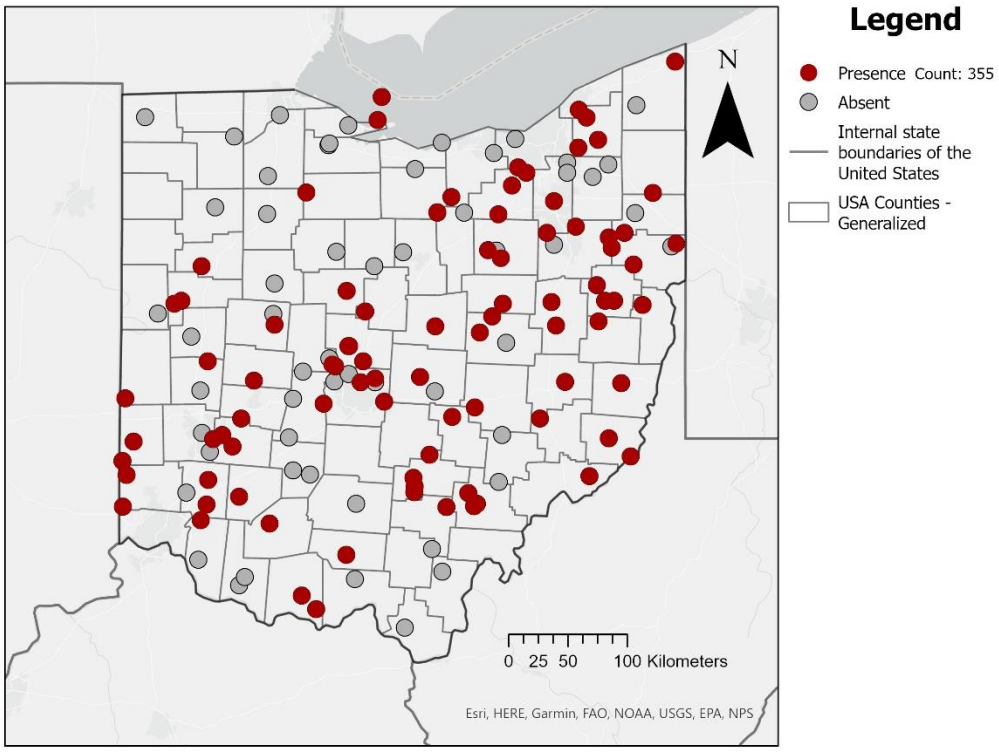
Lasioglossum coeruleum is in the family Halictidae. It is an unusual species of Lasioglossum in that instead of being dull metallic green, it is a dark blue! There are some other small *Lasioglossum* that have bluish thoraxes, but do not also have a blue abdomen. These are more medium sized *Lasioglossum* and have been found nesting in soil directly under rotten logs. This species is known to nest in insect burrows in rotting logs, preferring moist, soft wood (Stockhammer 1967).

Lasioglossum coriaceum



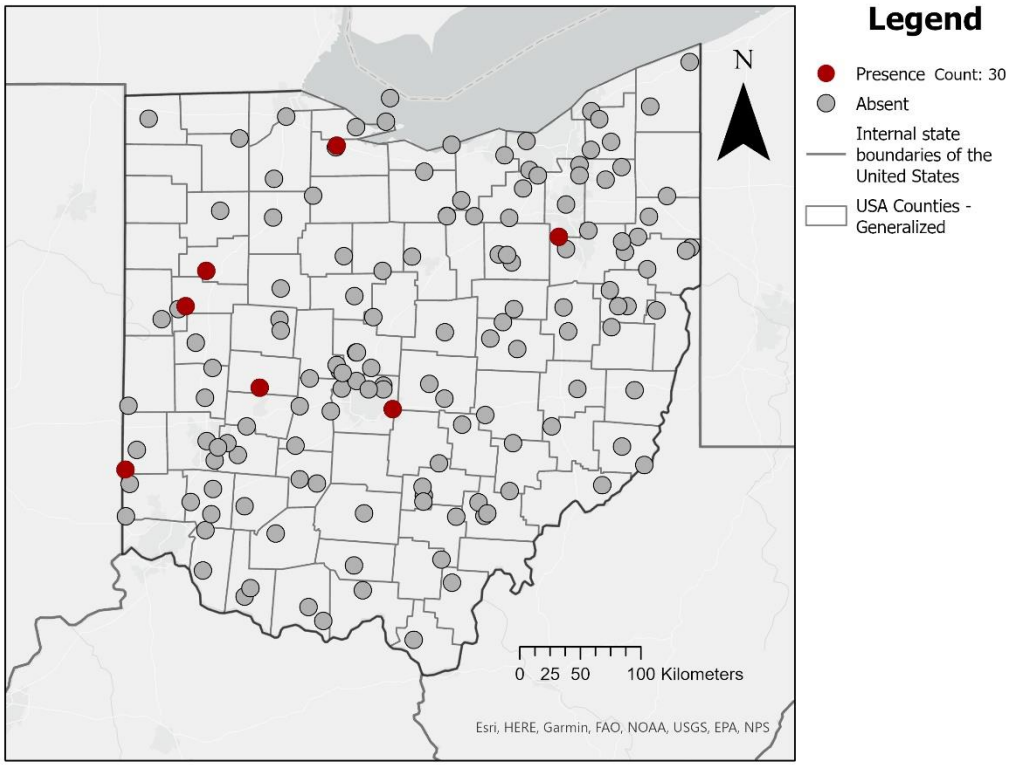
Lasioglossum coriaceum is in the family Halictidae. It is one of our biggest species of Lasioglossum in Ohio! They are also one of the few non-metallic *Lasioglossum*. Like other *Lasioglossum*, it is a ground nesting species and has a long flight season. It is in the *Lasioglossum* Sensu Strictu group, which has a very smooth propodeum and distinct basal hair bands. It is differentiated from other similar species by the round bare patch surrounded by hairs on the base of the first abdominal segment.

Lasioglossum cressonii



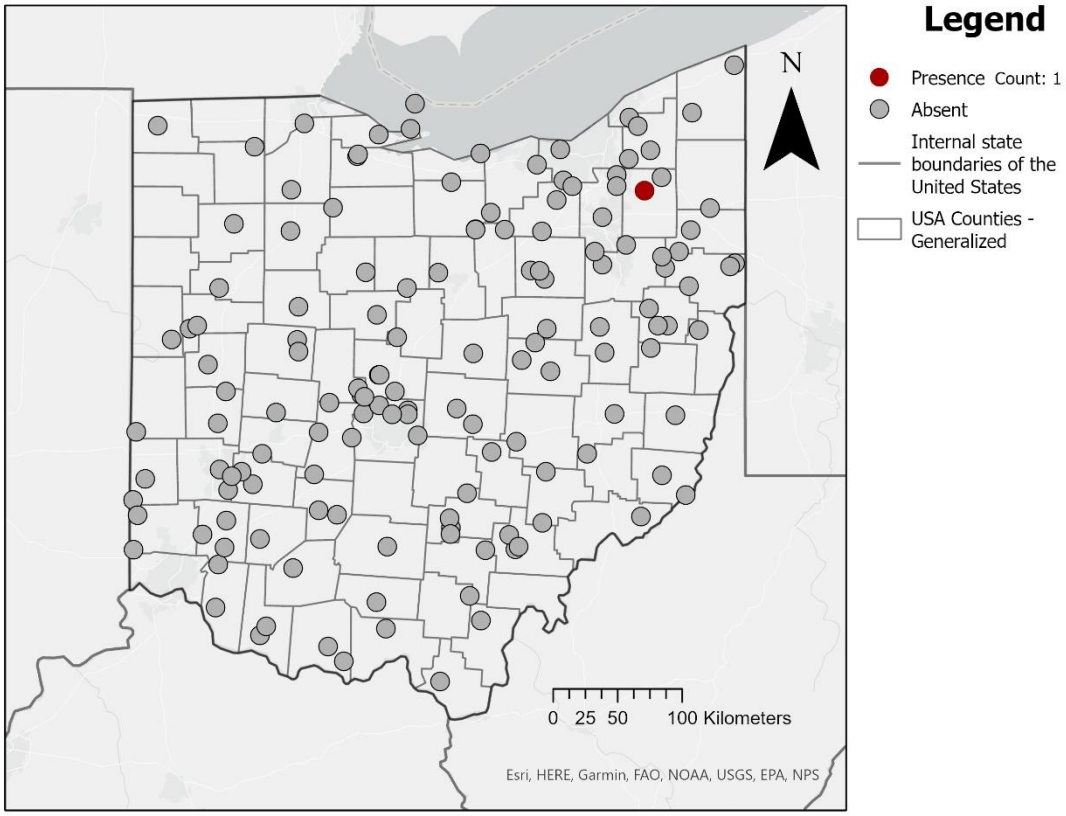
Lasioglossum cressonii is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum cressonii* is one of the nicer species in what we call the coarse propodeum group. These bees have a particularly rough propodeum that more easily separates them from other species of *Lasioglossum*. The scutum is punctate (not reticulate-rugose), the transverse propodeal carina is weakened in the center. Then separating from *albipenne* is based on integument color (*cressonii* is more green, whereas *albipenne* is more blue-ish), and wing vein color, with *albipenne* having almost milky white wing veins versus the normal tan wing vein color found in most other *Lasioglossum*.

Lasioglossum ellisiae



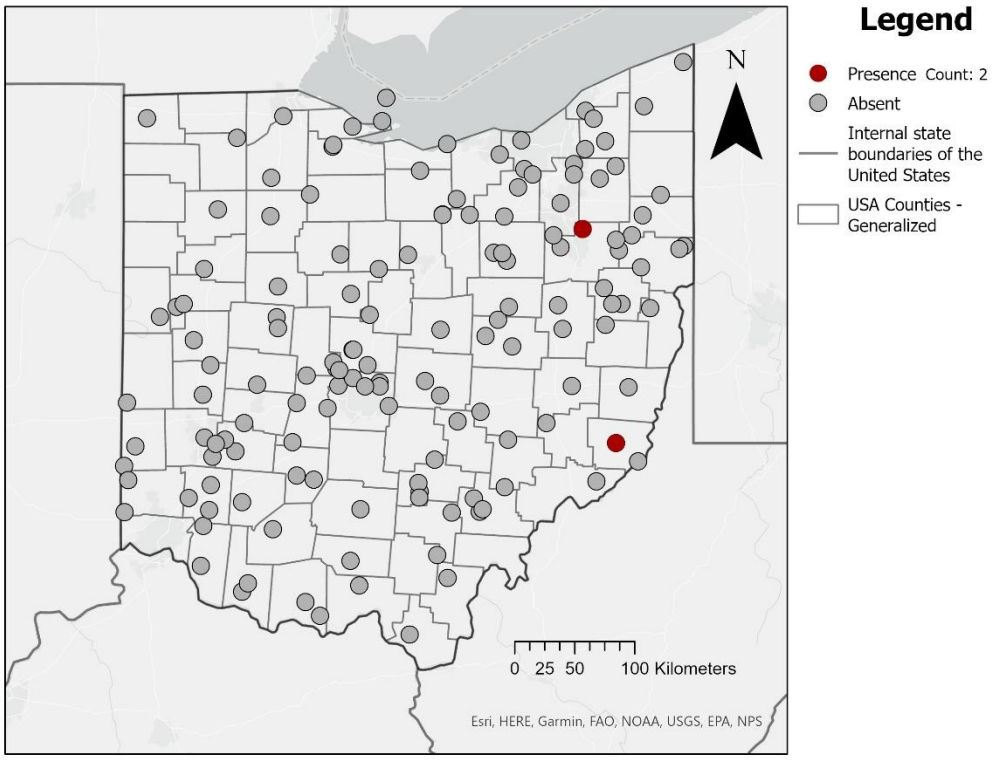
Lasioglossum ellisiae is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum ellisiae* is in the "bean tegula" group that has a distinctly shaped tegula that is more kidney bean shaped instead of oval. The tegula is the little structure that covers the top of the wing. At one point, *Lasioglossum ellisiae* was synonymized with *Lasioglossum tegulare* (Mitchell, 1960). This group was revised by Jason Gibbs in 2009 (Gibbs, 2009) who resurrected the *Lasioglossum ellisiae* species concept and the group revised again by Gardner and Gibbs in 2023 (Gardner and Gibbs, 2023). The mesepisternum on female *Lasioglossum ellisiae* is supposed to have widely separated pits (vs rugose and densely punctate in tegulare) and a shinier mesoscutum (Gardner and Gibbs, 2023).

Lasioglossum ephialtum



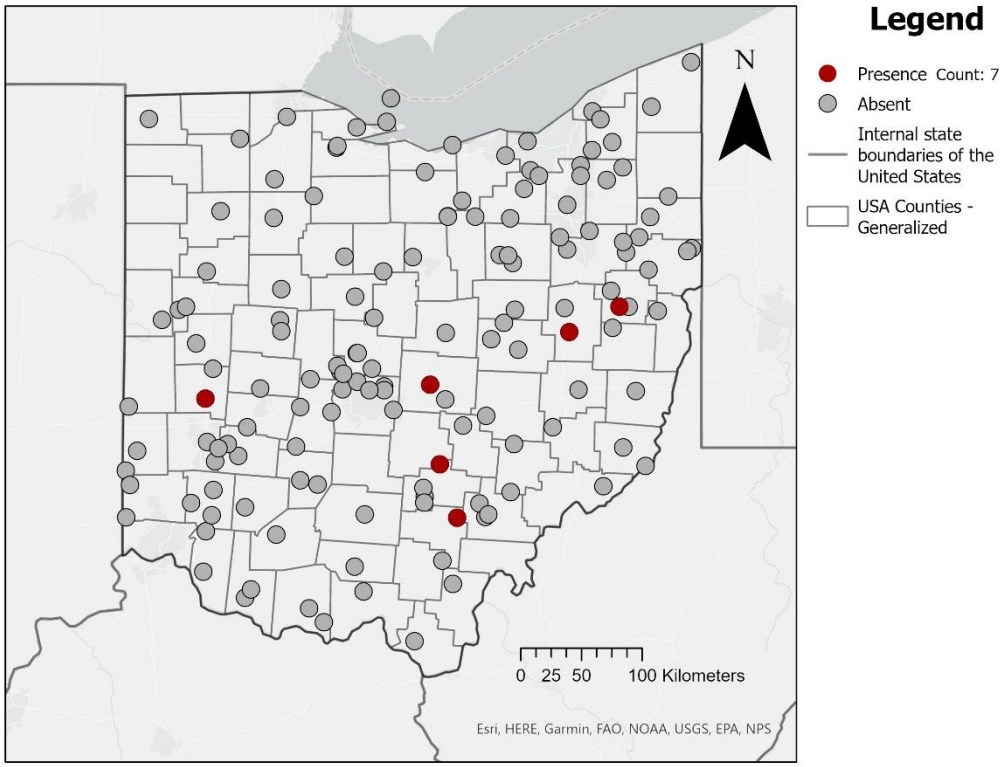
Lasioglossum ephialtum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum ephialtum* is especially challenging to identify. We likely have more specimens that we were unable to confirm.

Lasioglossum foxii



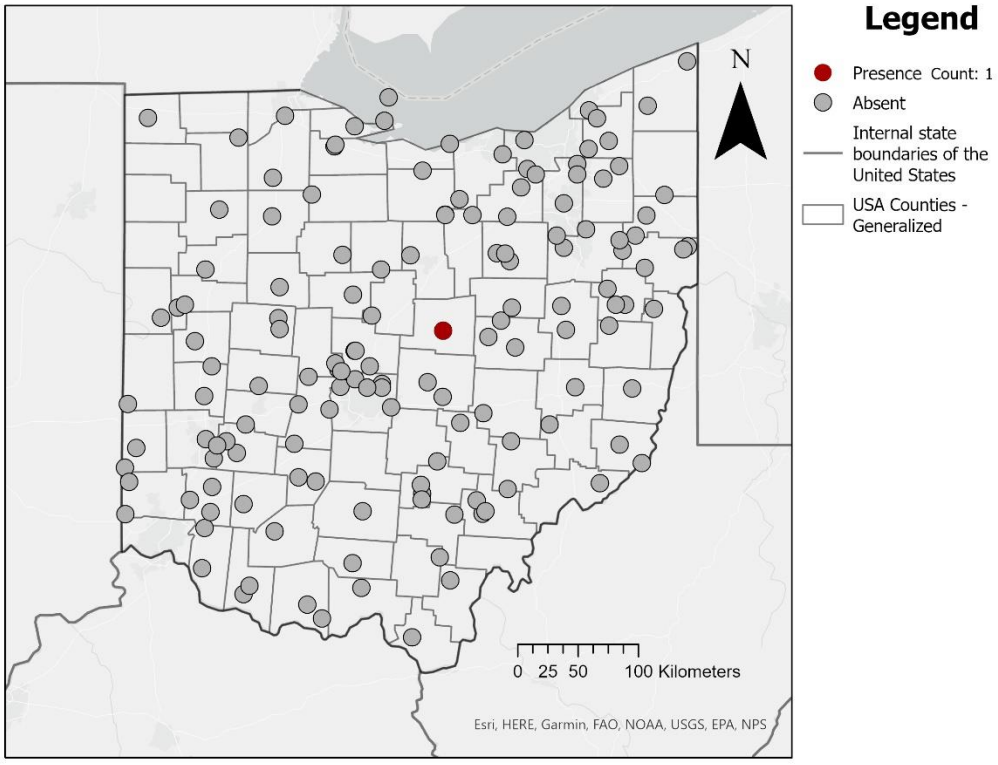
Lasioglossum foxii is in the family Halictidae. This species is broadly distributed across the eastern USA east of the Rocky Mountains. It is one of the few species of black *Lasioglossum* that lack metallic reflections. Although the black *Lasioglossum* comprise some of the easier *Lasioglossum* to identify, a microscope and care must be used when keying them out nevertheless. They nest in the ground and forage on a wide variety of plants.
Size range: 6-7 mm (female), 5-6 mm (male).

Lasioglossum fuscipenne



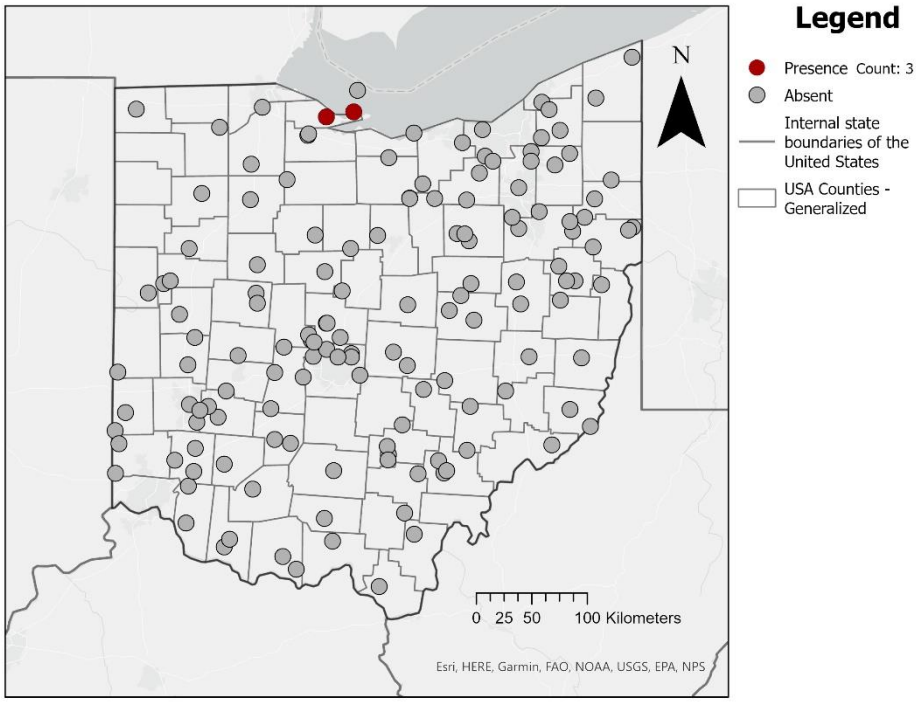
Lasioglossum fuscipenne is in the family Halictidae. It is one of our biggest species of *Lasioglossum* in Ohio! They are also one of the few non-metallic *Lasioglossum*. It is in the *Lasioglossum* Sensu Strictu group, which has a smooth propodeum and distinct basal hair bands. It is differentiated from other similar species by the slightly rougher propodeum and the only sparse hairs on the base of the first abdominal segment, with no obvious bare patches. It also has darker wings than most other species, which is why it is sometimes called the Dark-winged Sweat Bee.

Lasioglossum gotham



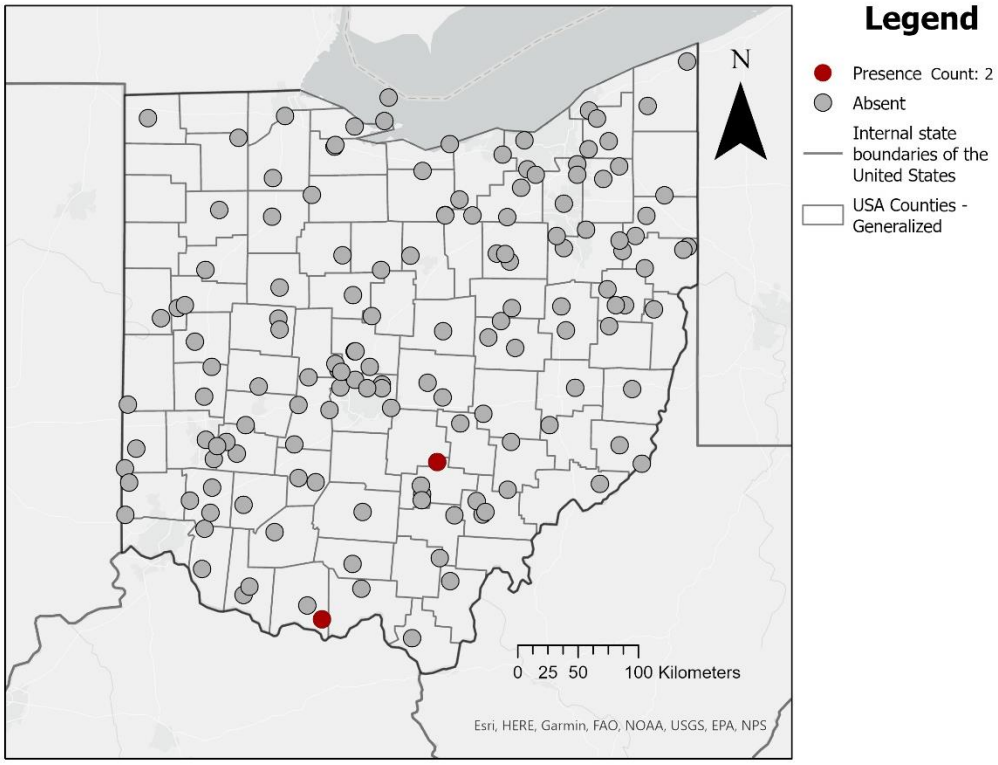
Lasioglossum gotham is in the family Halictidae. It is a somewhat newly described species of *Lasioglossum*. It was described in 2011 (Gibbs, 2011) and it is named after New York City, which is where some of the paratypes (one of the officially designated specimens that is meant to serve as a representative of the species in a museum) were collected. It has been called the Gotham Sweat Bee and made quite the buzz in the media when it was first announced. Like most other *Lasioglossum*, this species is challenging to identify, even under a microscope. These are ground nesting bees that use a variety of floral resources. They are distributed broadly across eastern USA but considered uncommon (Discoverlife.org).

Lasioglossum hartii

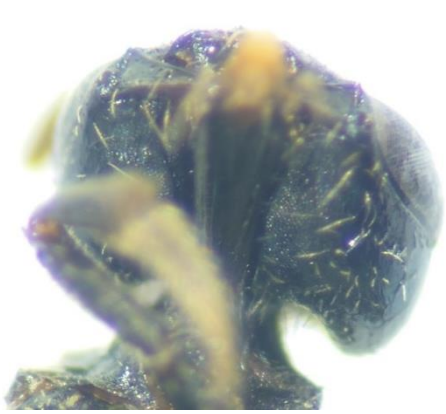


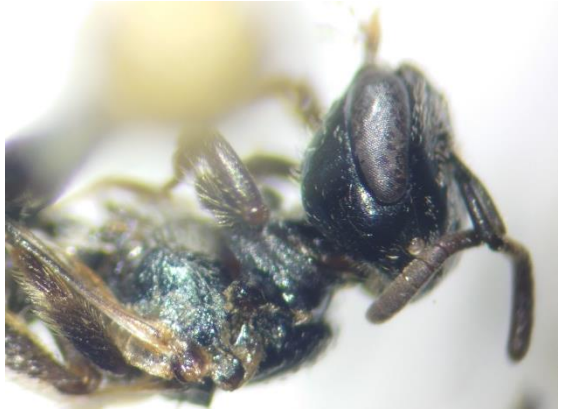
Lasioglossum hartii is in the family Halictidae. It is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. *Lasioglossum hartii* is thought to be associated with wetlands, which is in line with the locations where we collected it. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum hartii* is one of the easier to identify species and falls within what we call the coarse propodeum group. These bees have a particularly rough propodeum that more easily separates them from other species of *Lasioglossum*. The hypostomal carina on the underside of the face is parallel, not widely diverging as in bruneri. The scutum is punctate and becomes rugose towards the edges, which separates it from the other coarse propodeum species that have parallel hypostomal carina. Size range: 7 mm (female), 6.5 mm (male)

Lasioglossum heterognathum

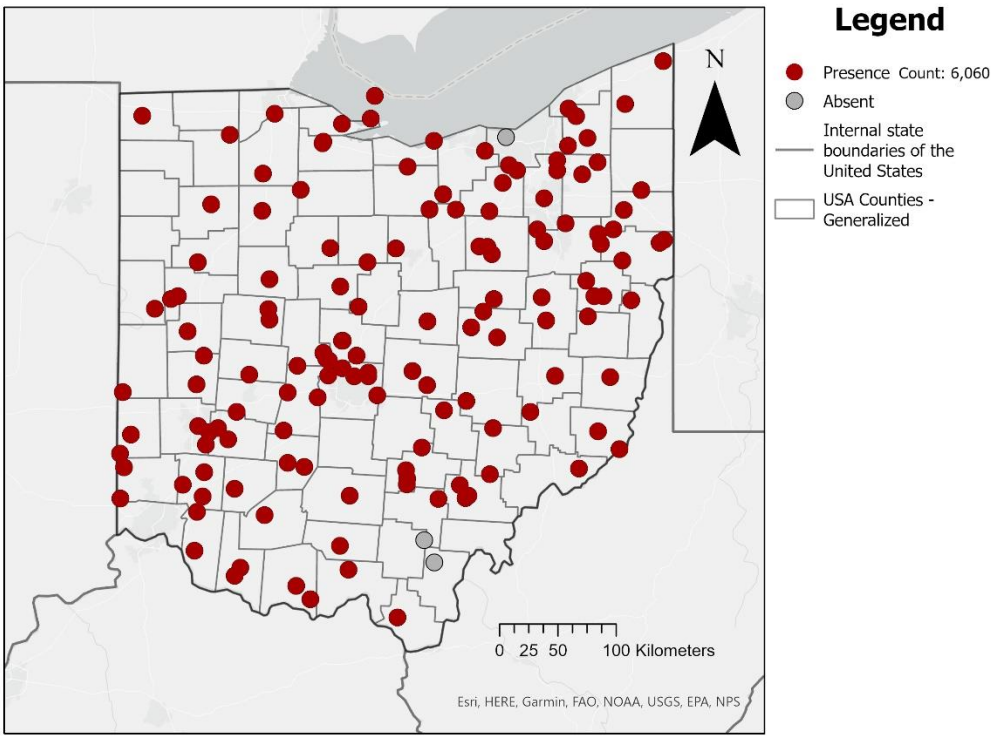


Lasioglossum heterognatum is in the family Halictidae. It is one of the dull green sweat bees in the subgenus *Dialictus*. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum heterognathum* is a rare species that is otherwise poorly documented. Not much is known about the biology of this species, but it is thought to be a ground nesting species that uses a variety of floral resources. It is unclear why it is so rarely collected. Similar to *Lasioglossum bruneri*, it has a strongly diverging carina on the underside of the face but lacks the coarse propodeum. It is also superficially similar to *Lasioglossum apocyni* in that it has a particularly wide cheek (gena). Size range



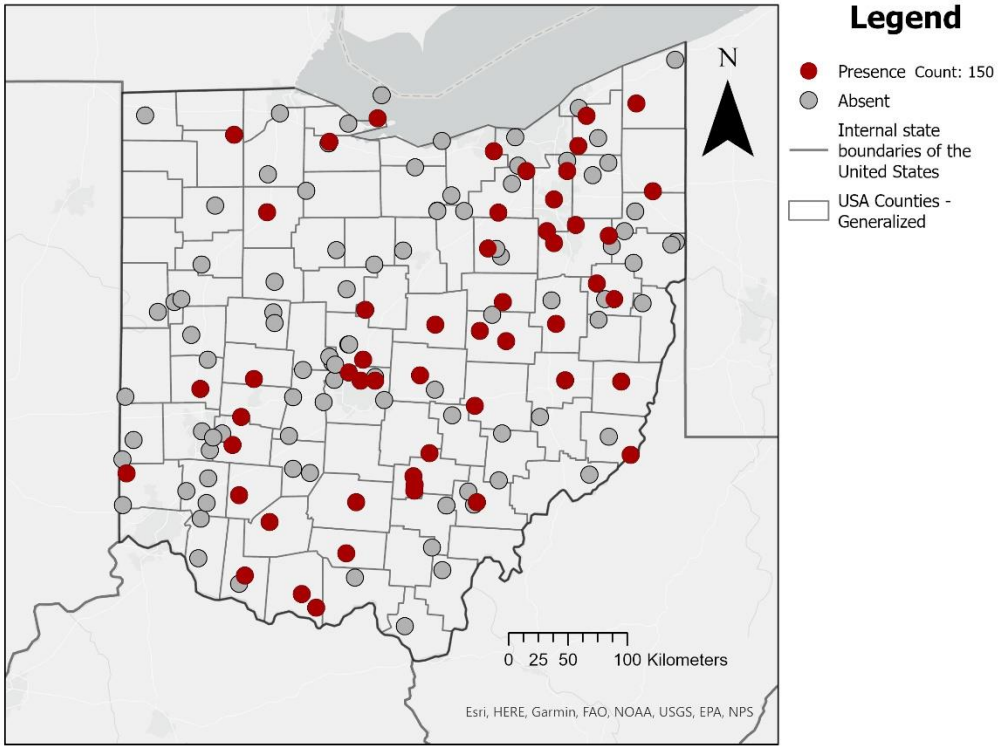


Lasioglossum hitchensi



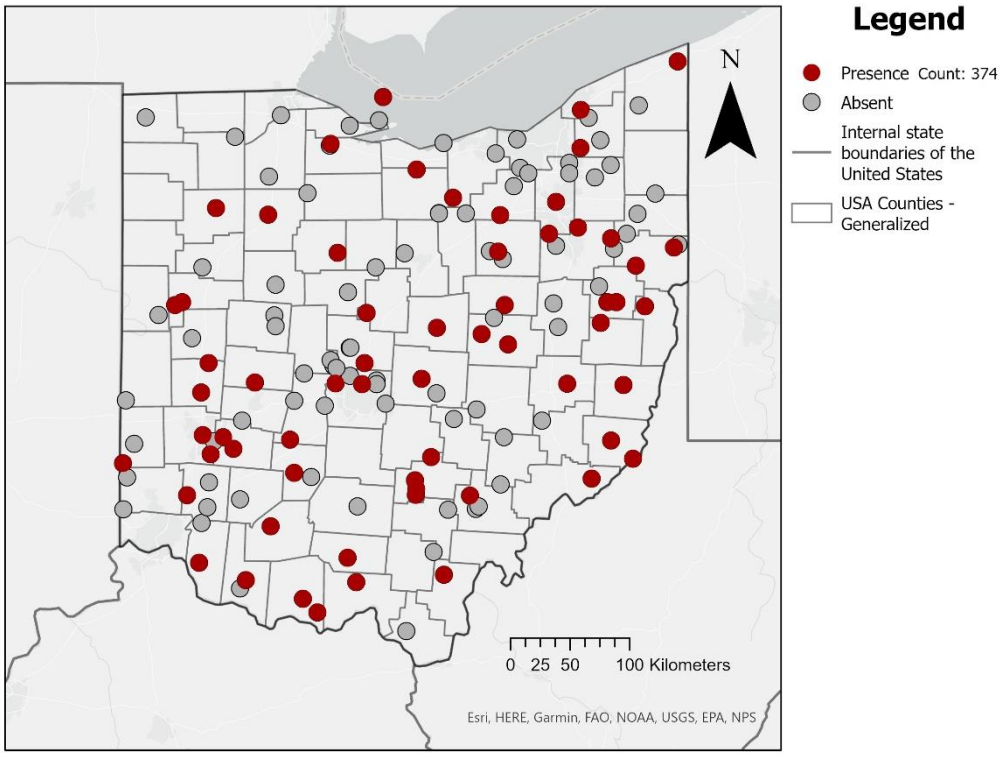
Lasioglossum hitchensi is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum hitchensi* is our second most common species of *Lasioglossum* that was caught in the bowl traps, behind *Lasioglossum versatum*. This is a small species with microsculpture on the first abdominal segment and a particularly rectangular (instead of trapezoidal) lower clypeus.

Lasioglossum illinoense



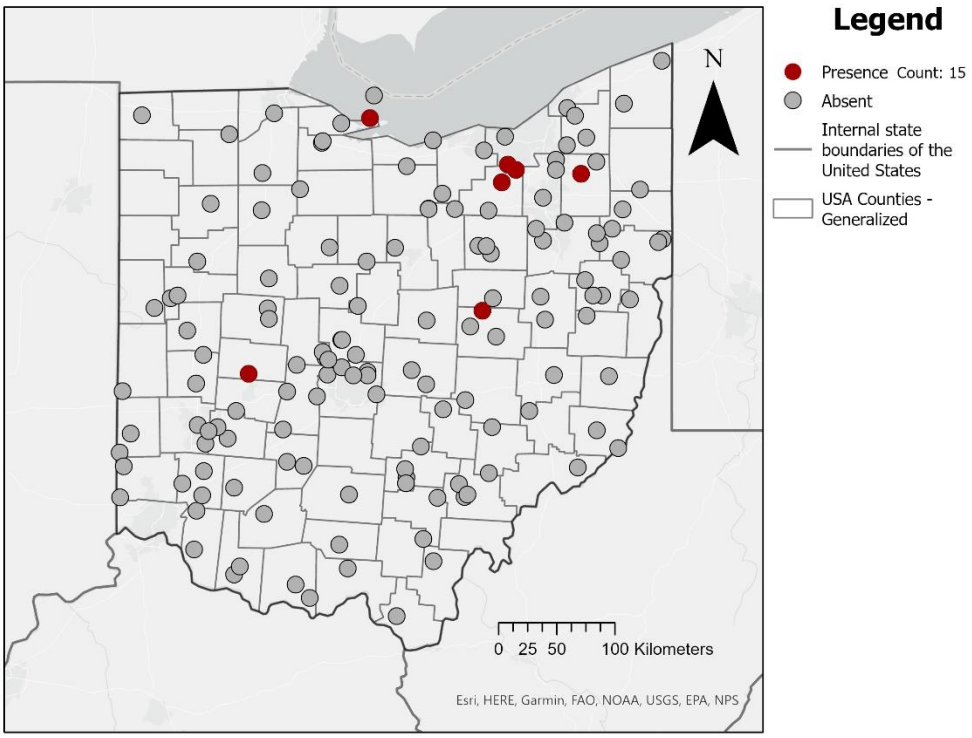
Lasioglossum illinoense is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. Thankfully, *Lasioglossum illinoense* is one of the easier Dialictus to identify with close examination. The females have a modified procoxa that has mounded projection compared to the normal flat procoxa of other species (Gibbs, 2011). There is also a unique lateral carina on the edge of the propodeum. While never abundant at any one site, this species popped up sporadically across the state.

Lasioglossum imitatum



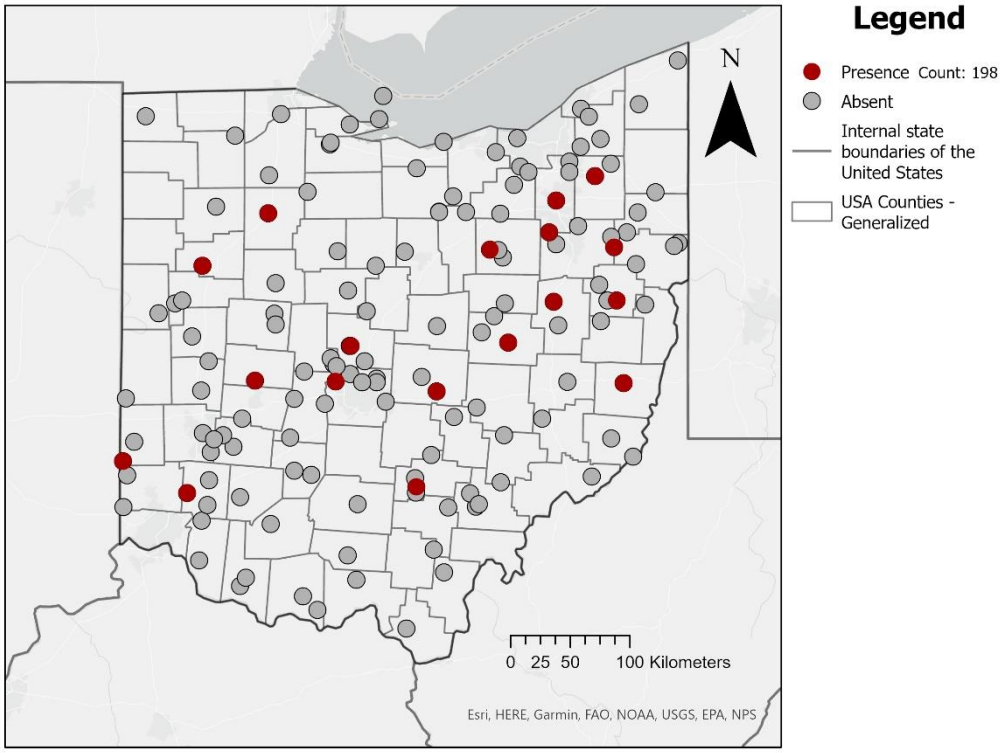
Lasioglossum imitatum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. Thankfully, *Lasioglossum imitatum* is one of the easier Dialictus to identify, sometimes even with just photography! The most important character are the thick, white hairs that are sparsely present on the last two abdominal segments. Because of these distinct bristles, this species is sometimes called the Bristle Sweat Bee. They are thought to be parasitized by *Lasioglossum lionatum* (Wcislo, 1997).

Lasioglossum laevissimum



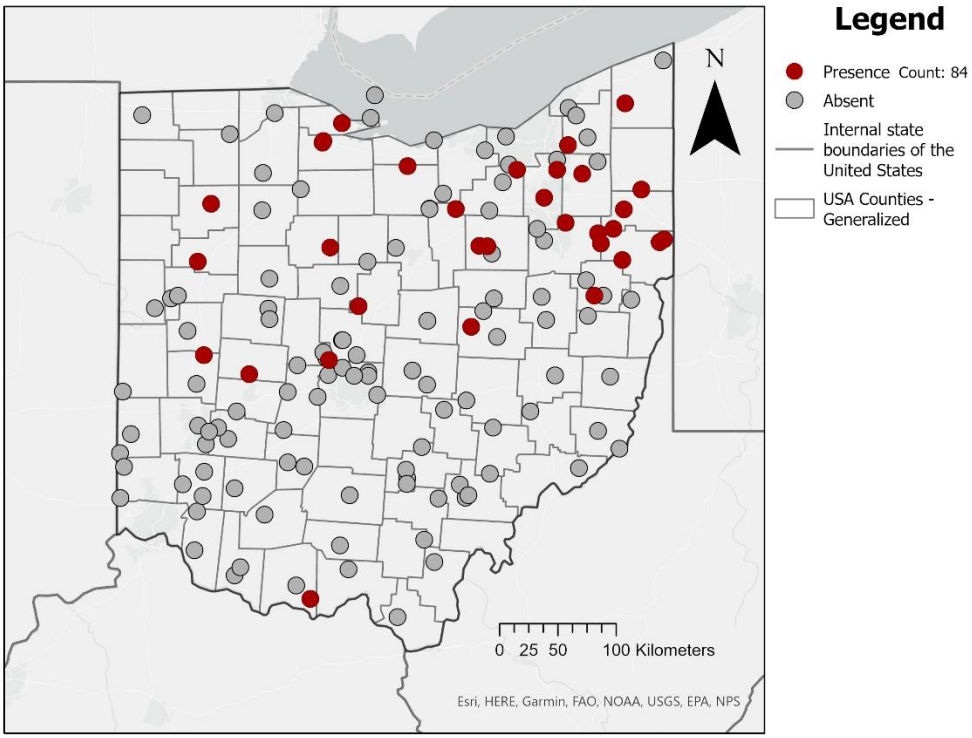
Lasioglossum laevissimum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. Female *Lasioglossum laevissimum* have microsculpture on the first abdominal segment, only a narrowly open fan, and the apical part of the second abdominal segment does not have punctures.

Lasioglossum leucocomum

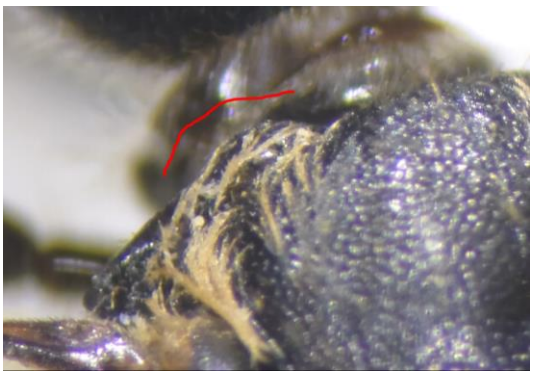


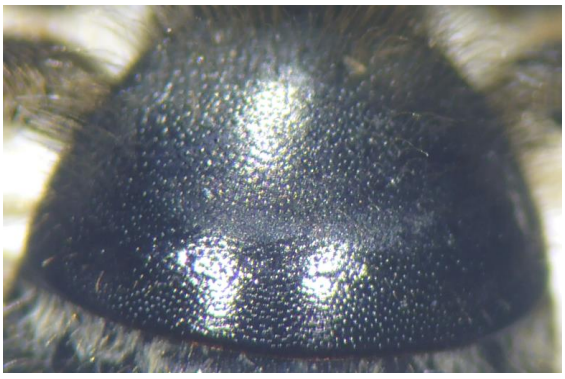
Lasioglossum leucocomum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum leucocomum* is one of the hairier sweat bees and is hardest to differentiate from *Lasioglossum pilosum* and *succinipenne*. This hairy bee group also has very elongate heads and very dense scutal punctures. *Lasioglossum leucocomum* and *succinipenne* have a more narrowed apical part of the clypeus, whereas *pilosum* is supposed to have a straighter clypeus. *Lasioglossum succinipenne* is supposed to only have bright white hairs and a longer supraclypeal area compared to *leucocomum*.

Lasioglossum leucozonium

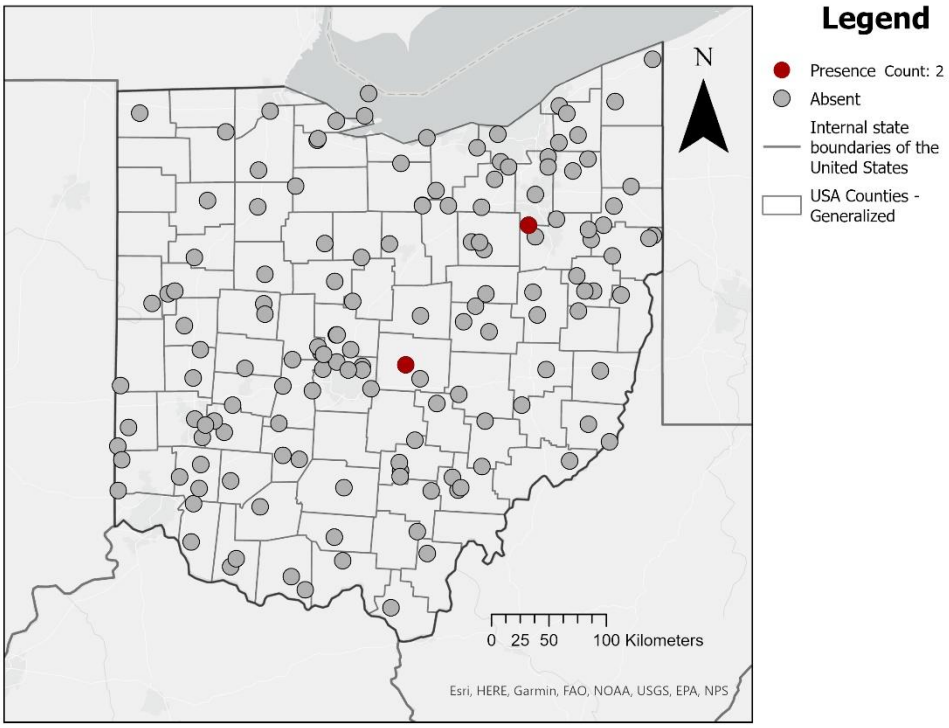


Lasioglossum leucozonium is in the family Halictidae. It is unusual in that it is one of the few non-native species of *Lasioglossum* that occur in our area. They are well established and expected to occur across most of the eastern United States. This is one of the black species that lacks metallic reflections. They nest in the soil. *Lasioglossum leucozonium* is in the subgenus Leuchalictus and is most similar to *Lasioglossum zonulum*. *Lasioglossum leucozonium* has the antero-lateral angle of the pronotum obtuse and the basal segment of the abdomen evenly punctate and slightly duller in comparison to *Lasioglossum zonulum*.



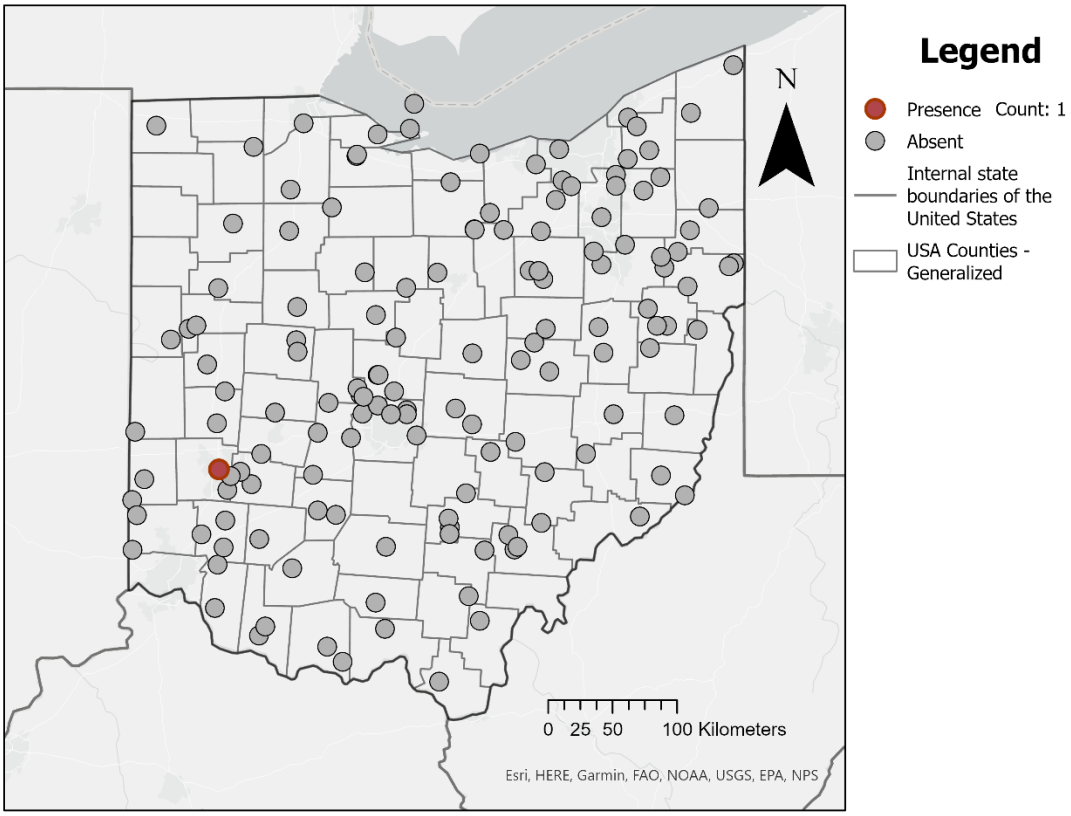


Lasioglossum lineatulum



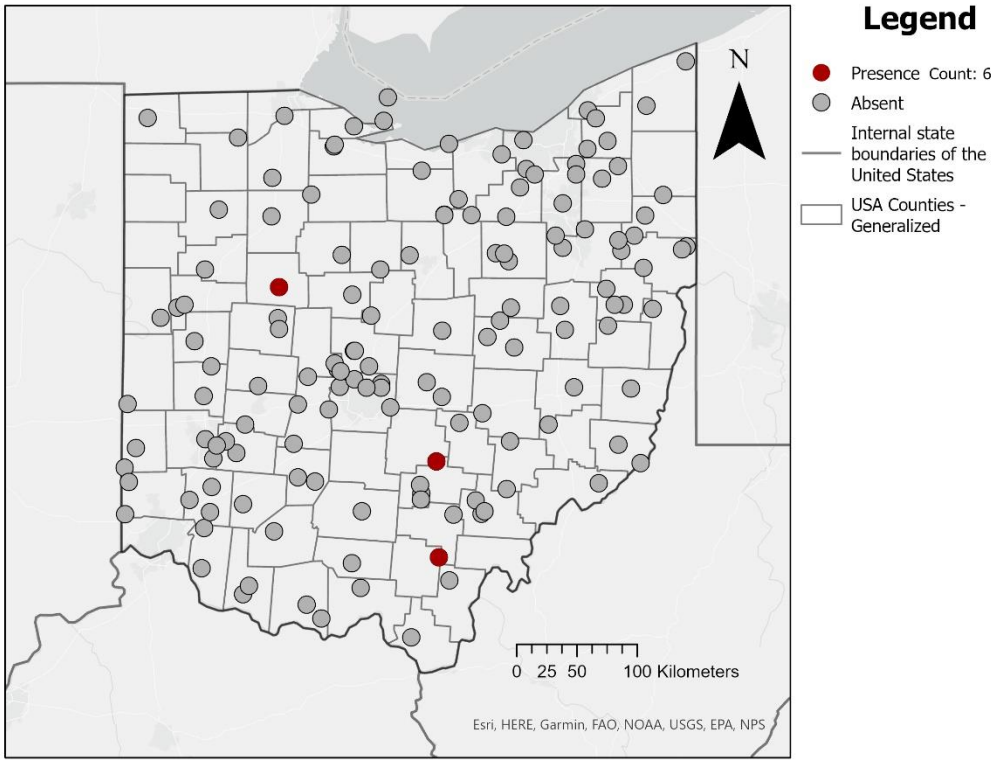
Lasioglossum lineatulum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum lineatulum* is one of the "easier" to identify *Lasioglossum* species as it has a very sparsely pitted scutum, even along the edges, the mesepisternum lacks punctures, and a normal width face. Despite the ease to identify this species, it was rarely documented in the state.

Lasioglossum lionotum



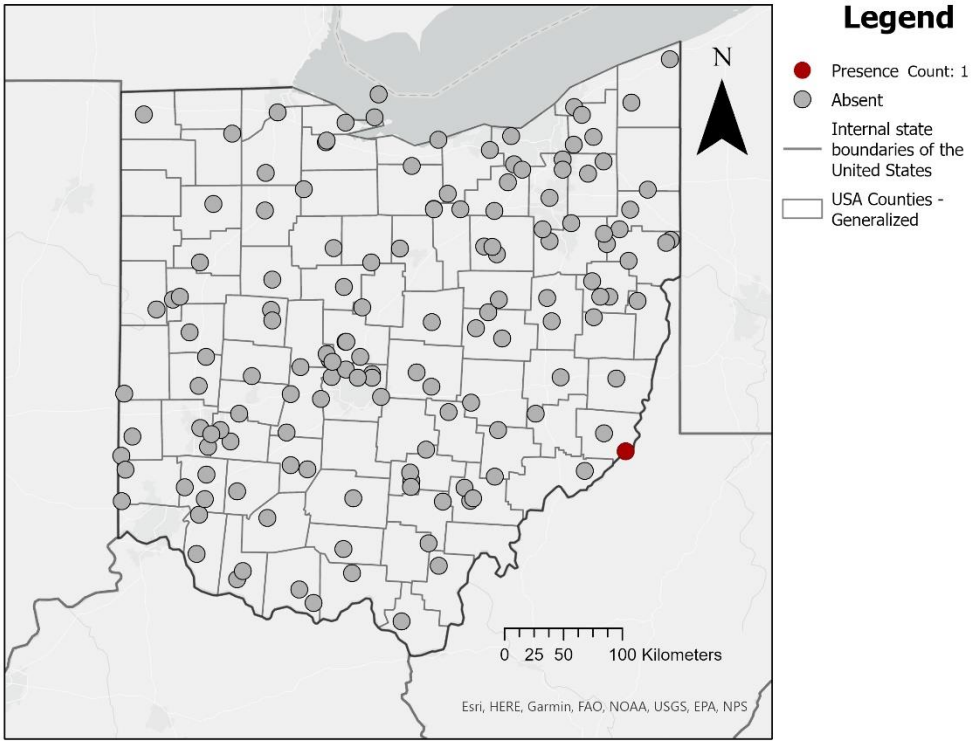
Lasioglossum lionotum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice). *Lasioglossum lionotum* is a rare species that is a cleptoparasite of *Lasioglossum imitatum* (Wcislo, 1997). This means that instead of foraging for its own pollen and nectar resources, it sneaks into the nests of other bees to lay eggs into their provisions. The parasite eggs hatch first and eat the nest provisions. The parasitic *Lasioglossum* species do not have pollen collecting hairs on their legs and typically have a very wide cheek. *Lasioglossum lionotum* has a smooth propodeum. *Lasioglossum lionotum* has been reported from Cleveland area research projects, which also had a large population of the host bee, *Lasioglossum imitatum* (Pham et al., *In Press*; Turo et al., 2021).

Lasioglossum macoupinense



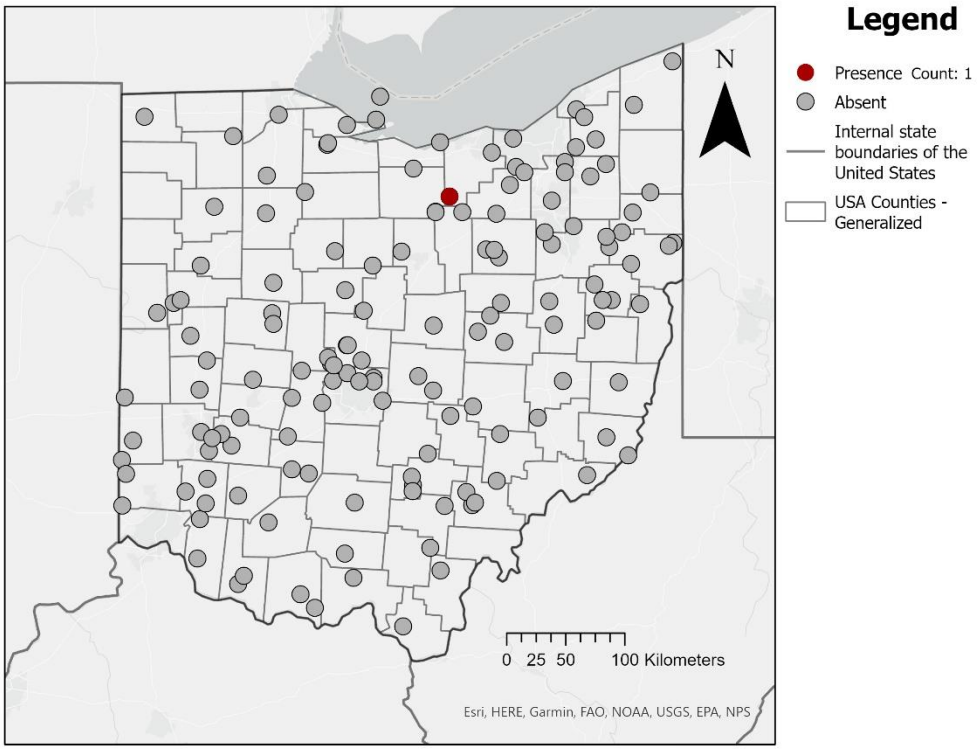
Lasioglossum macoupinense is in the family Halictidae. It is one of the small *Lasioglossum* species that does not have any metallic reflections. They are black with minimal hair on the abdomen. They have a punctate mesepisternum, and a rounded pronotum. They are most similar to *Lasioglossum birkmanni,* but differ in having a narrower head. Like other *Lasioglossum*, they nest in the ground.

Lasioglossum michiganense



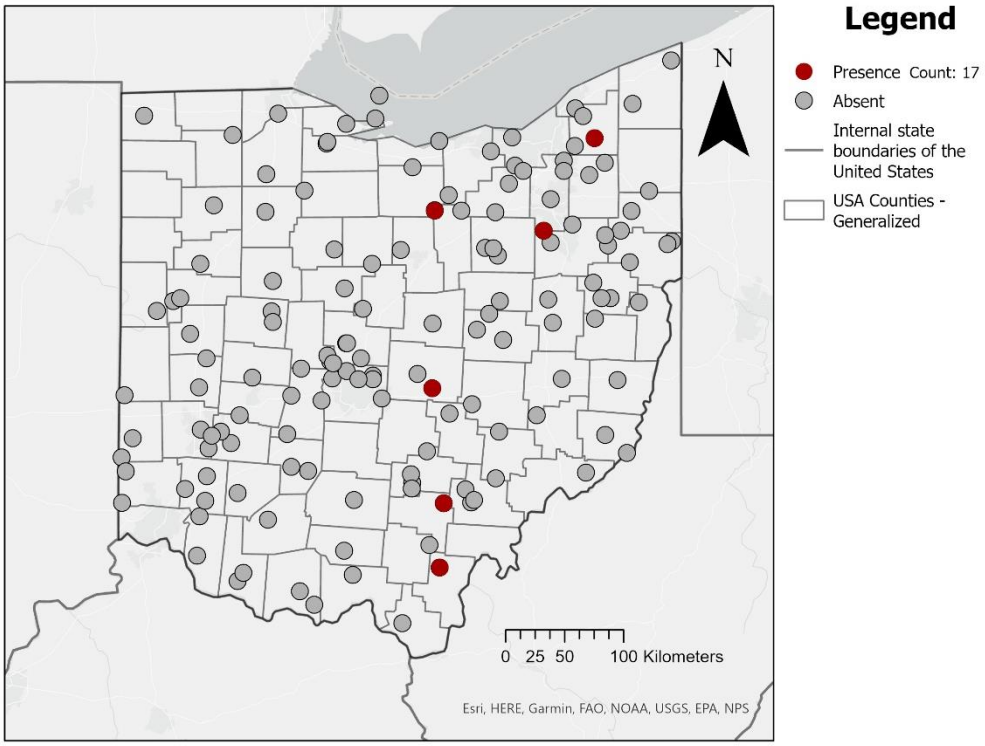
Lasioglossum michiganense is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice*). Lasioglossum michiganense* is a rare species that is a cleptoparasite of other species of *Lasioglossum*. This means that instead of foraging for its own pollen and nectar resources, it sneaks into the nests of other bees to lay eggs into their provisions. The parasite eggs hatch first and eat the nest provisions. The parasitic *Lasioglossum* species do not have pollen collecting hairs on their legs and typically have a very wide cheek. *Lasioglossum michiganense* has a gena (cheek) only slightly wider than the eye. The propodeum is rugose and the mandible tooth is very large.

Lasioglossum NEAR-michiganense

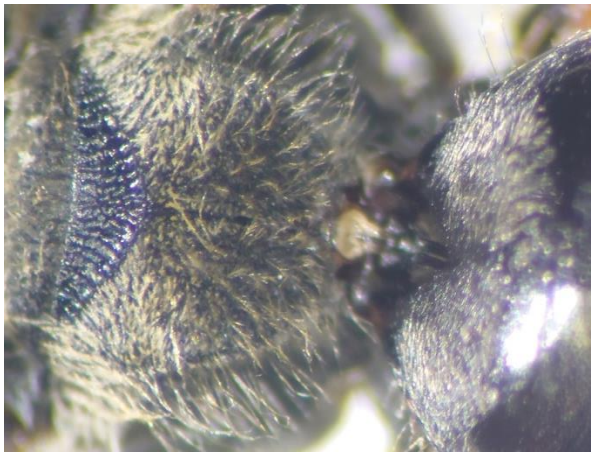


This is one of the parasitic *Lasioglossum* specimens in the family Halictidae. It keys out very close to *michiganense*, but does not quite match. It has a blue thorax, very wide gena, rugose propodeum, very large tooth on mandible, mesepisternum impunctate, and the 1st recurrent vein joins the second submarginal cell near the end of the cell. It has been given the temporary ID of NEAR-*michiganense* as it does not currently key out properly.

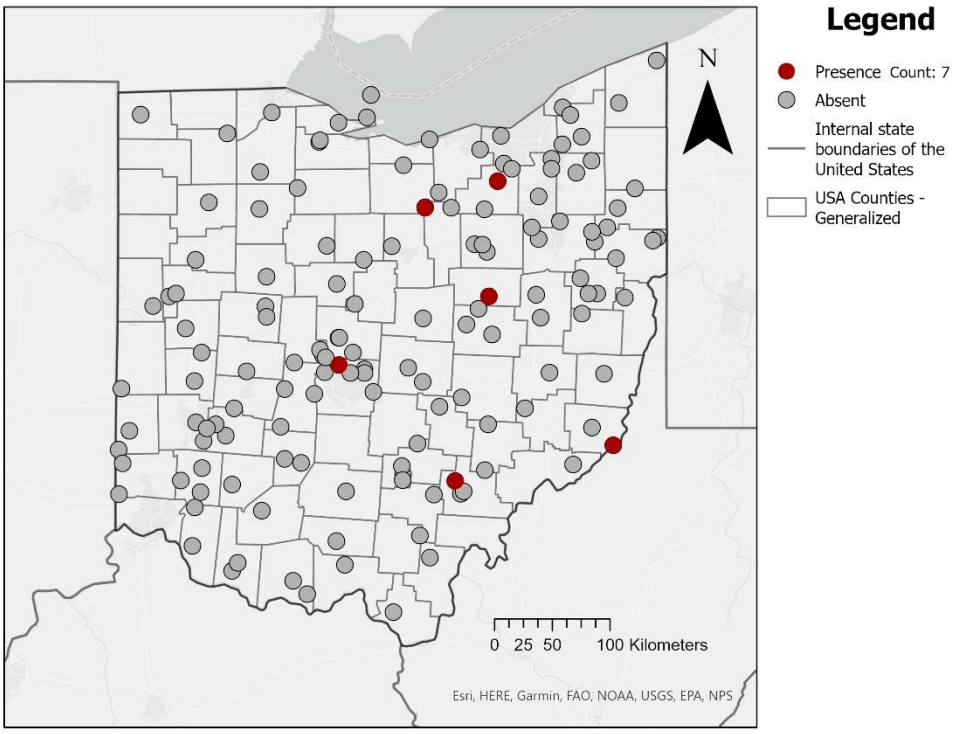
Lasioglossum nelumbonis



Lasioglossum nelumbonis is in the family Halictidae. It is a cool species! It is one of the larger black *Lasioglossum* with distinct hair patches on the thorax. It is a ground nesting species that is thought to be associated with wetlands. It is found regularly visiting water lily flowers in the genus *Nuphar* (Lippok et al., 2000). As such, it is sometimes called the Lotus Sweat Bee or Water Lily Sweat Bee. However, it has also been collected from many other wetland plants, so does not count as a specialist bee (Fowler, 2016).

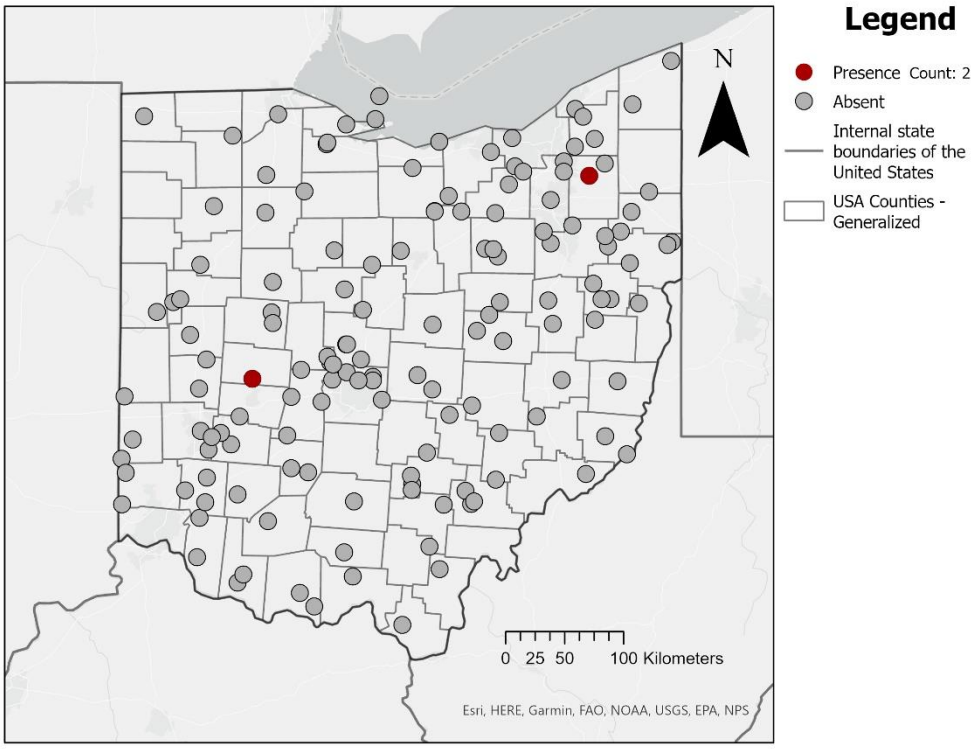


Lasioglossum nigroviride



Lasioglossum nigroviride is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum nigroviride* is one of the "easier" to identify *Lasioglossum* species as it has very widely spaced pitting on all of the scutum, the mesepisternum is smooth and pitted, the head is wide, and the abdomen is dark with minimal hairs.

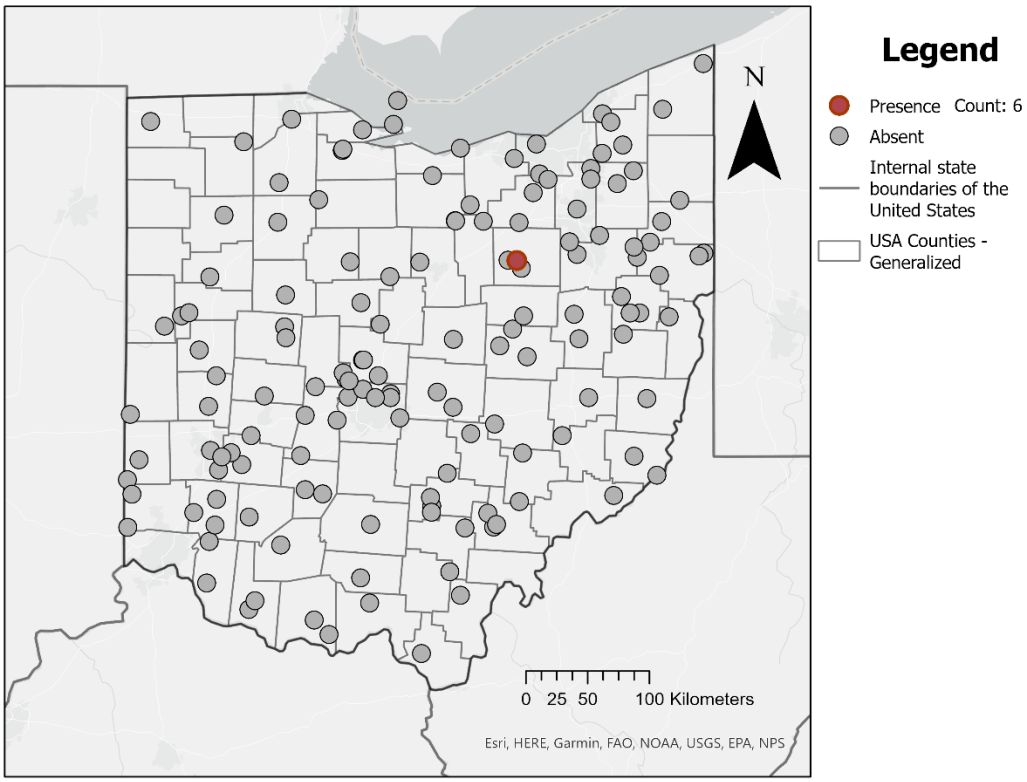
Lasioglossum oblongum



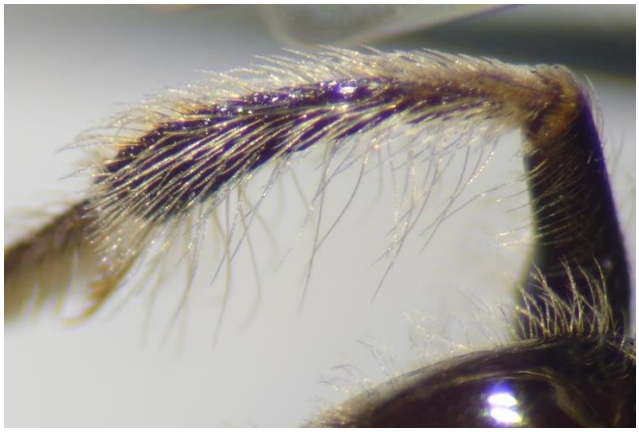
Lasioglossum oblongum is in the family Halictidae. It is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum oblongum* is particularly challenging to identify. They are on the smaller side for *Lasioglossum* and tend to have slightly blue thoracic reflections.

Size range 5.5 – 6 mm (females), 5 mm (males).

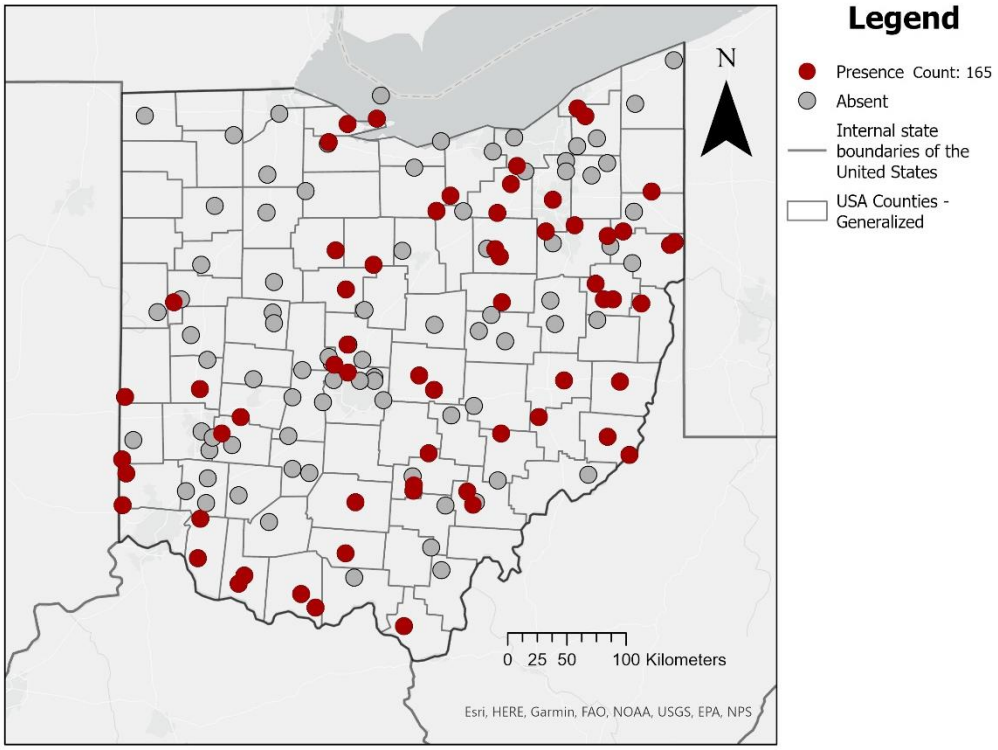
Lasioglossum oenotherae



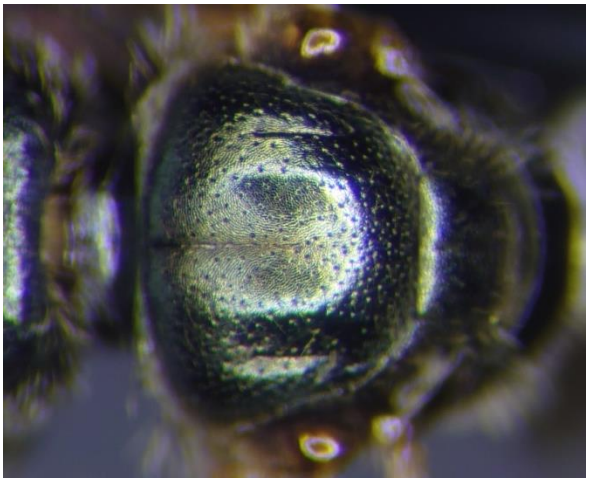
Lasioglossum oenotherae is in the family Halictidae. It is a new record for the state! We only found it at a single site. It is a specialist on *Oenothera* (Fowler and Droege, 2020), which is a weedy plant that is common across Ohio. The most common *Oenothera* plants often grow 5 or more feet tall, which might explain the general rarity of the bee in our bowl traps, which were placed on the ground. This is one of the all black *Lasioglossum* species that lacks any metallic reflections. *Lasioglossum oenotherae* has a very rough propodeum and distinct leg hairs that separate it from other species.



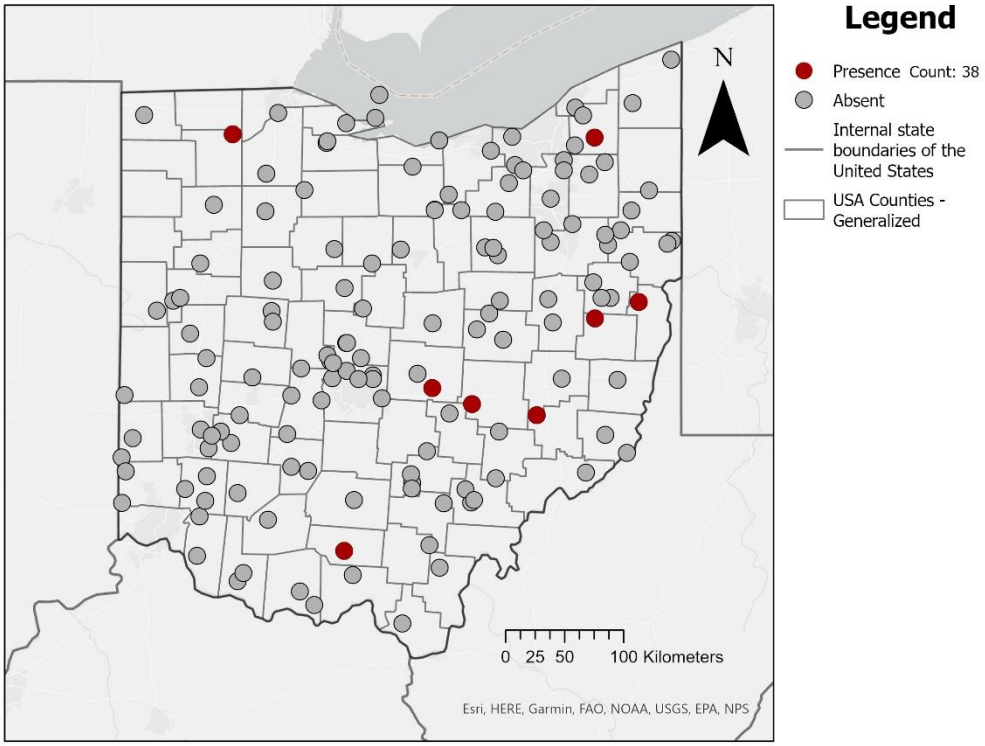
Lasioglossum obscurum



Lasioglossum obscurum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum obscurum* is one of the easier species to identify in direct comparison. The females have a very sparsely pitted scutum, but distinct pitting on the mesepisternum. They are smaller than the *Lasioglossum nigroviride* specimens and have only fine sculpting on the propodeum.

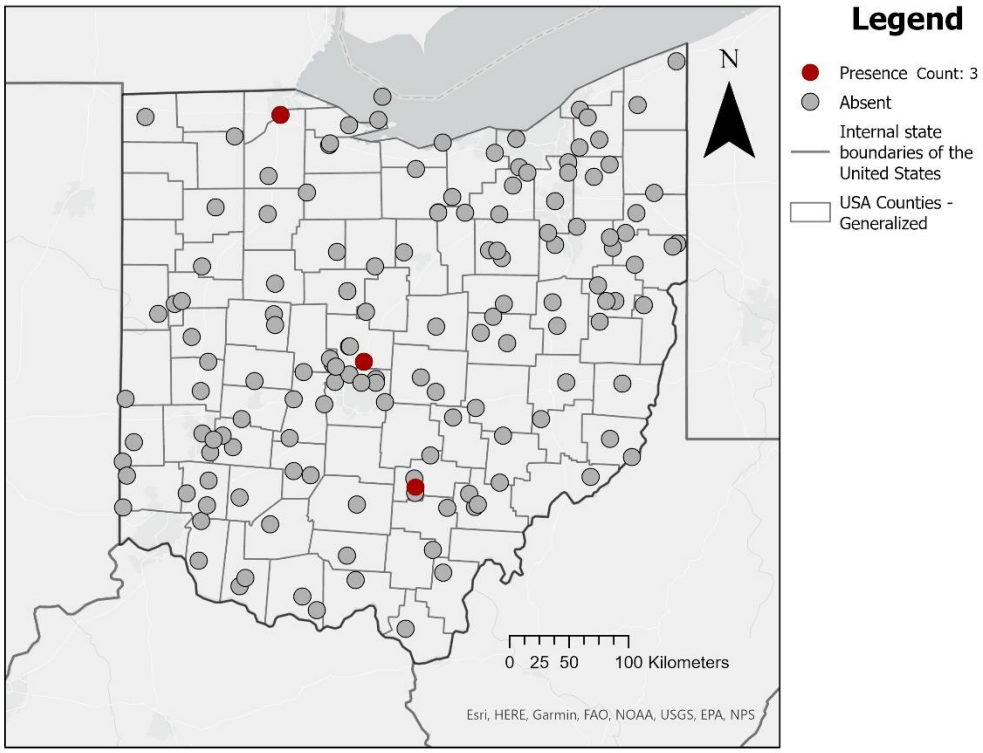


Lasioglossum oceanicum



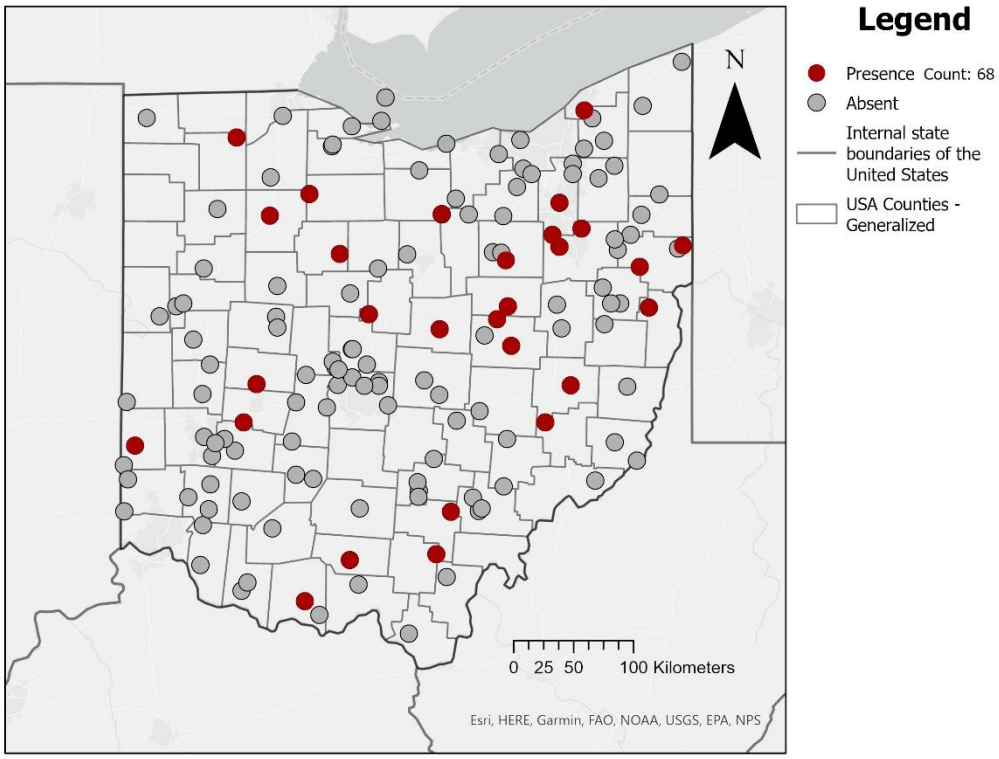
Lasioglossum oceanicum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are small bees that nest in the ground and forage on a wide variety of plants. *Lasioglossum oceanicum* is one of the nicer species in what we call the coarse propodeum group. These bees have a particularly rough propodeum that more easily separates them from other species of *Lasioglossum*. The scutum is punctate (not reticulate-rugose), the transverse propodeal carina is NOT weakened in the center, remaining a strong carina across the ridge.

Lasioglossum paradmirandum



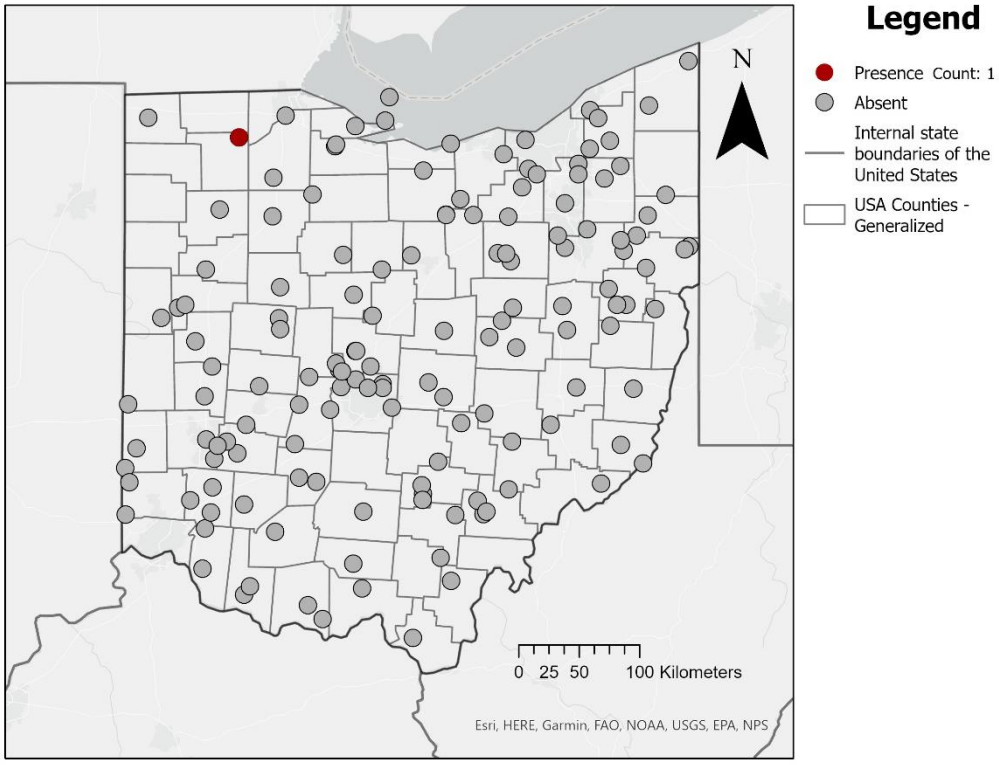
Lasioglossum paradmirandum is in the family Halictidae. It is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum paradmirandum* is a difficult species to identify with the surface of the first abdominal segment dulled by microsculpture. The acarinal fan is widely open, with cheek narrower than the eyes. Size range: 5-6 mm (female and male)

Lasioglossum pectorale



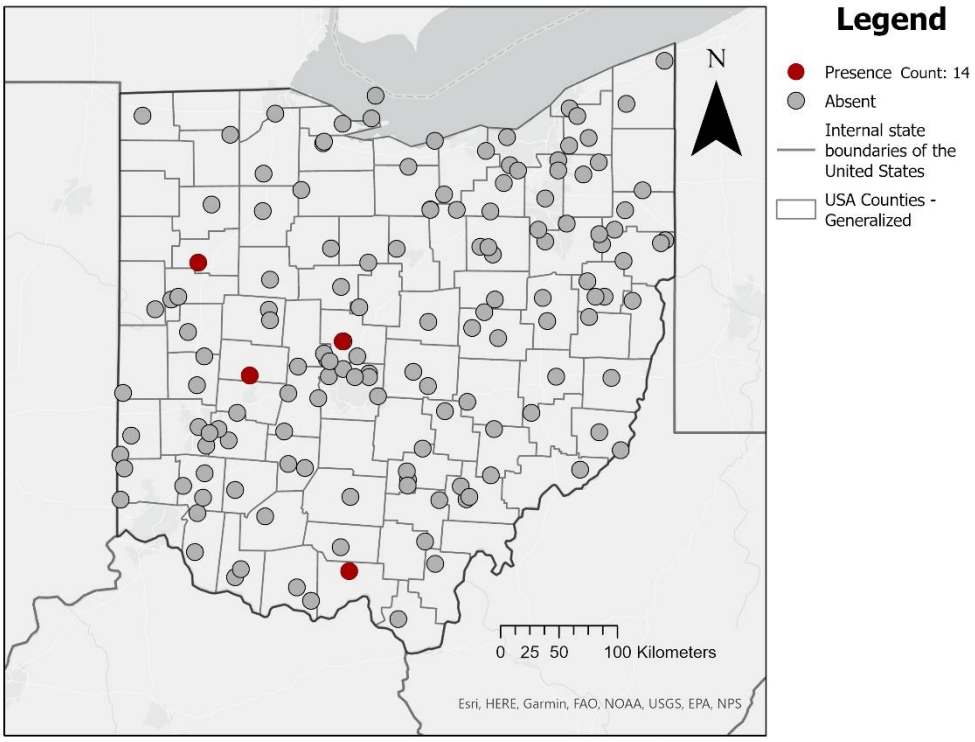
Lasioglossum pectorale is in the family Halictidae. It is a medium sized bee. It is one of the few black *Lasioglossum* that lacks any metallic reflections. It is unique in that it has an extremely rugose (wrinkled like a raisin, or choppy like miniature waves) mesepisternum, including on the underside of the thorax near the coxa.

Lasioglossum pictum



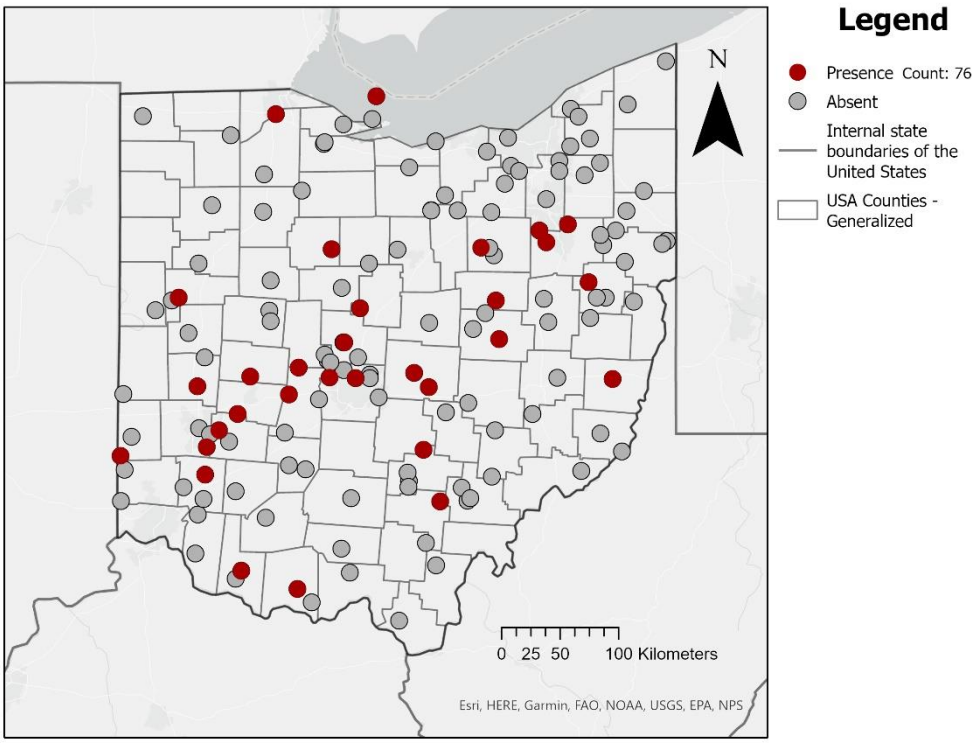
Lasioglossum pictum is in the family Halictidae. This is one of the sand associated species of *Lasioglossum* that is unique in that it has an orange instead of brown abdomen. This species is separated from the other species of *Lasioglossum* with orange abdomens by the lack of abundant hair on the top of the thorax, presence of punctures on the mesepisternum, the propodeum is rugose and clypeus is dark.

Lasioglossum pilosum



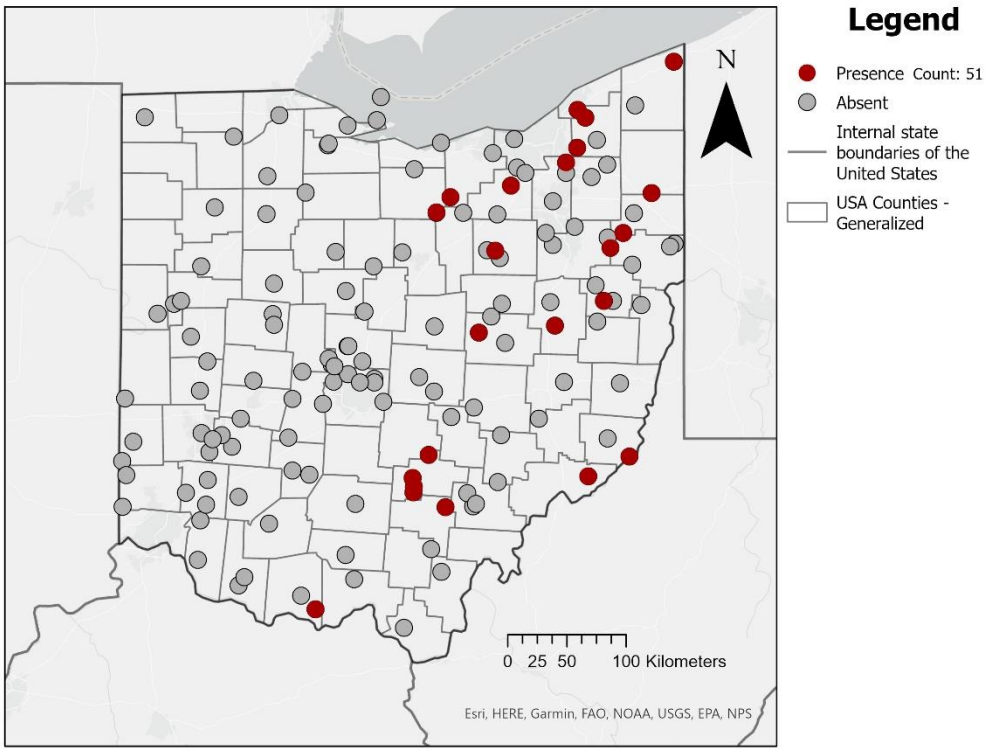
Lasioglossum pilosum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum pilosum* is one of the hairier sweat bees and is hardest to differentiate from *Lasioglossum leucocomum*. This hairy bee group also has very elongate heads and very dense scutal punctures. *Lasioglossum leucocomum* has a more narrowed apical part of the clypeus, whereas *pilosum* is supposed to have a straighter clypeus.

Lasioglossum platyparium



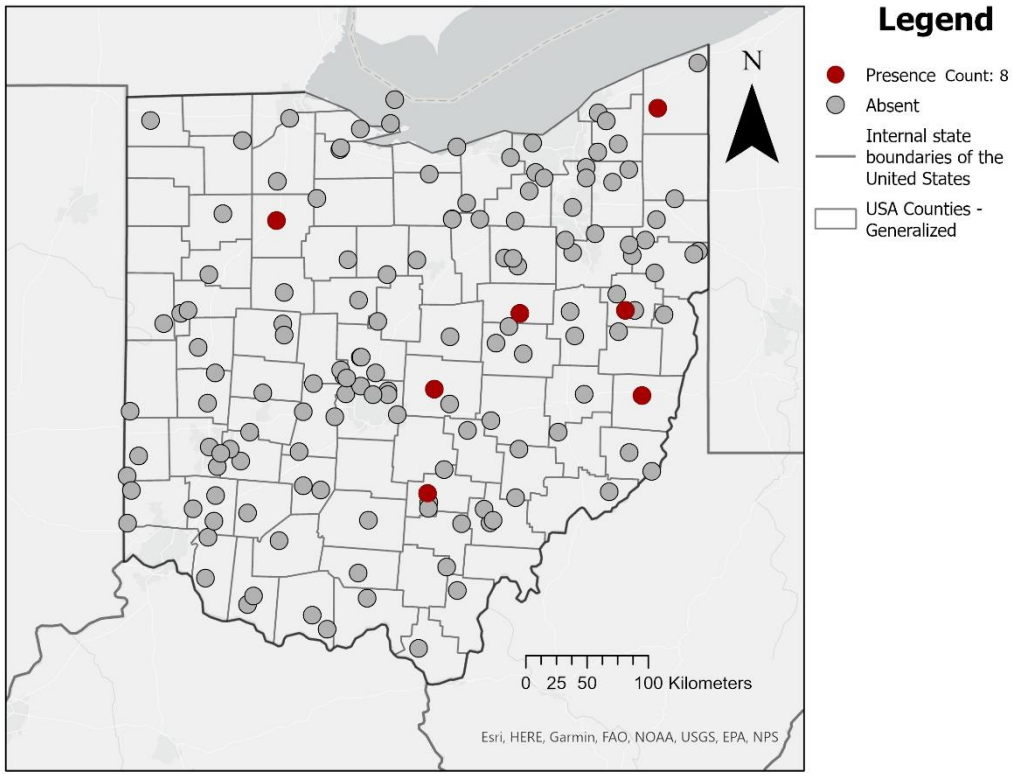
Lasioglossum platyparium is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice). *Lasioglossum platyparium* is a rare species that is a cleptoparasite of other species of *Lasioglossum*. This means that instead of foraging for its own pollen and nectar resources, it sneaks into the nests of other bees to lay eggs into their provisions. The parasite eggs hatch first and eat the nest provisions. The parasitic *Lasioglossum* species do not have pollen collecting hairs on their legs and typically have a very wide cheek. *Lasioglossum platyparium* can be with or without a tooth on the mandible, has an overall wide mandible, and the labrum has a large basal tubercle.

Lasioglossum quebecense



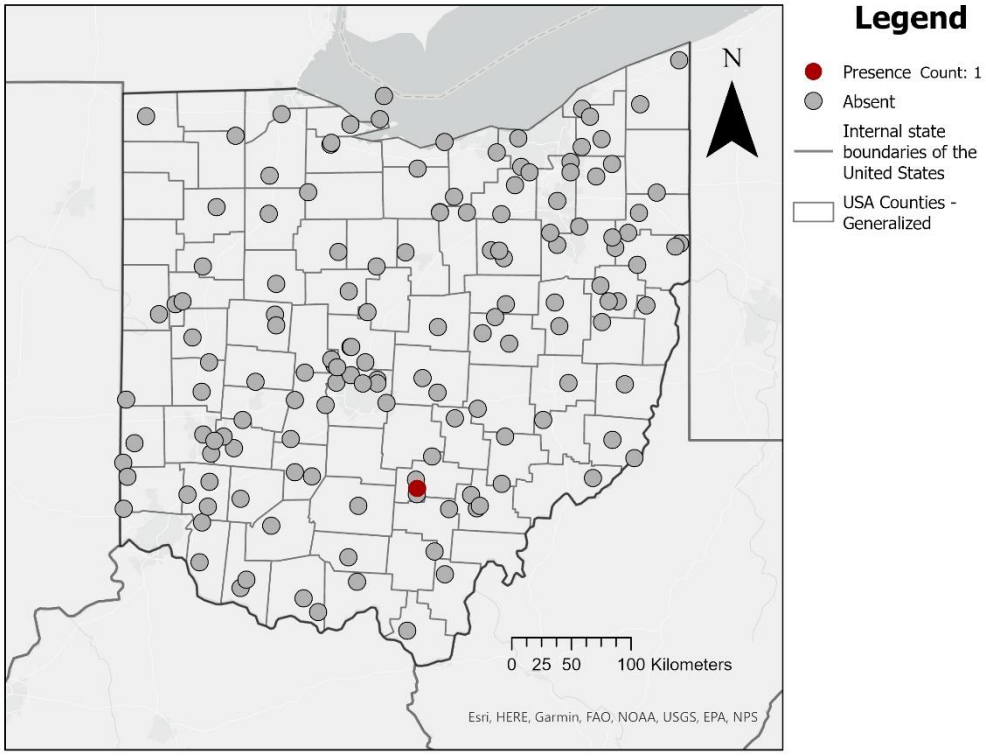
Lasioglossum quebecense is in the family Halictidae. Itis one of the few black *Lasioglossum* that lacks any metallic reflections. It is interesting that it seems to be recorded more from the eastern half of the state. It is likely associated with forests. Most *Lasioglossum* have only basal hair bands, but *quebecense* is one of the few species that has very weak apical hair bands, at least laterally.

Lasioglossum rozeni



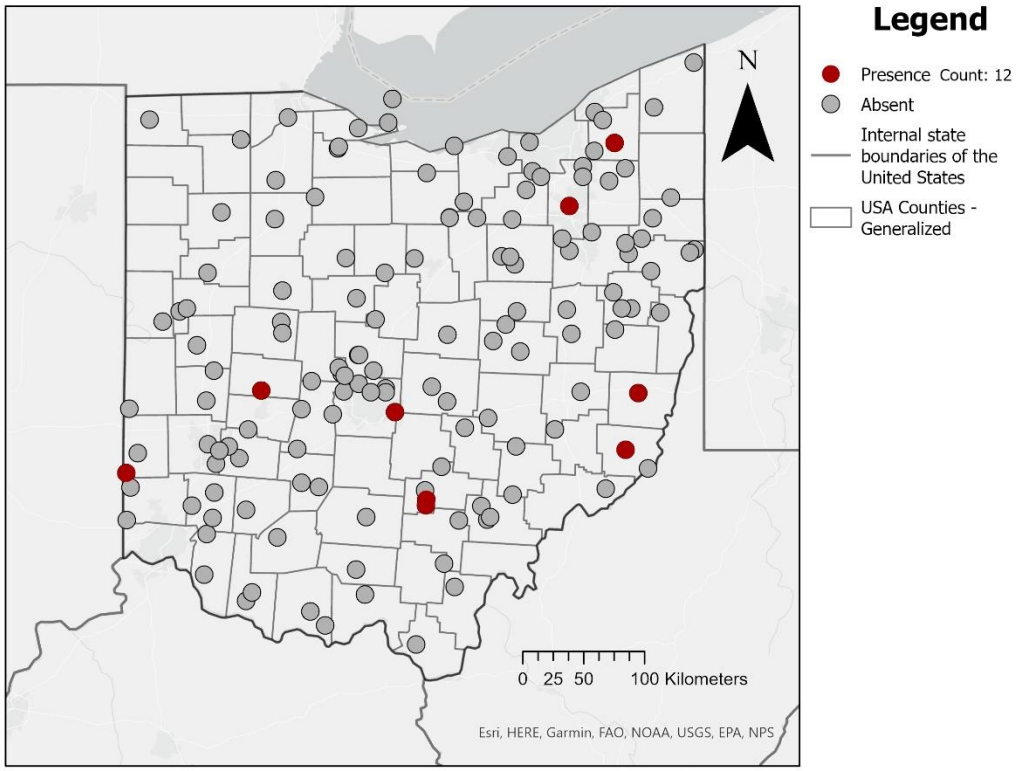
Lasioglossum rozeni is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice*). Lasioglossum rozeni* is a rare species that is a cleptoparasite of other species of *Lasioglossum*. This means that instead of foraging for its own pollen and nectar resources, it sneaks into the nests of other bees to lay eggs into their provisions. The parasite eggs hatch first and eat the nest provisions. The parasitic *Lasioglossum* species do not have pollen collecting hairs on their legs and typically have a very wide cheek. *Lasioglossum rozeni* lacks a tooth on the mandible, is otherwise narrow, and the mesepisternum is rugulose, not punctate.

Lasioglossum smilacinae?



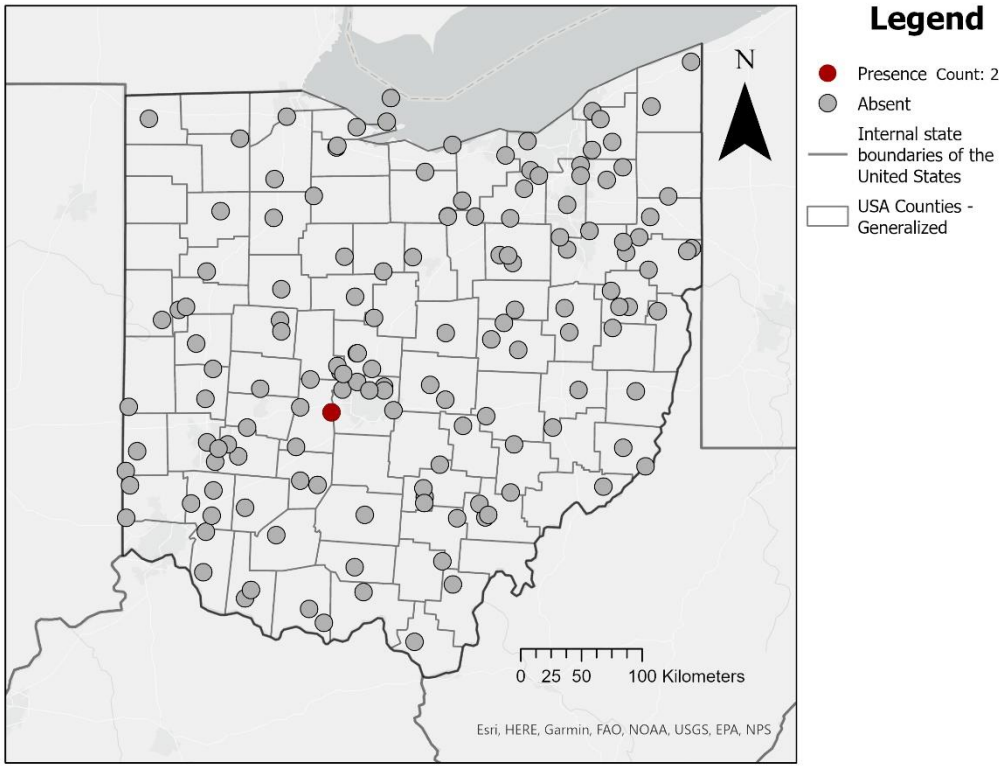
Lasioglossum smilacinae is in the family Halictidae. It is represented in our dataset by a specimen has a strepsiptera parasite in the abdomem (Sam Droege, USGS, pers. comm.). DNA analysis would be one way to confirm the identification given that strepsiptera are known to consume the host's reproductive organs, which in turn impacts development and leads to ambiguous-looking bees that have secondary sex characters of both males and females. Because taxonomic keys are are developed based on sex, a stresiptera infection makes it difficult to positively identify a specimen.

Lasioglossum subviridatum



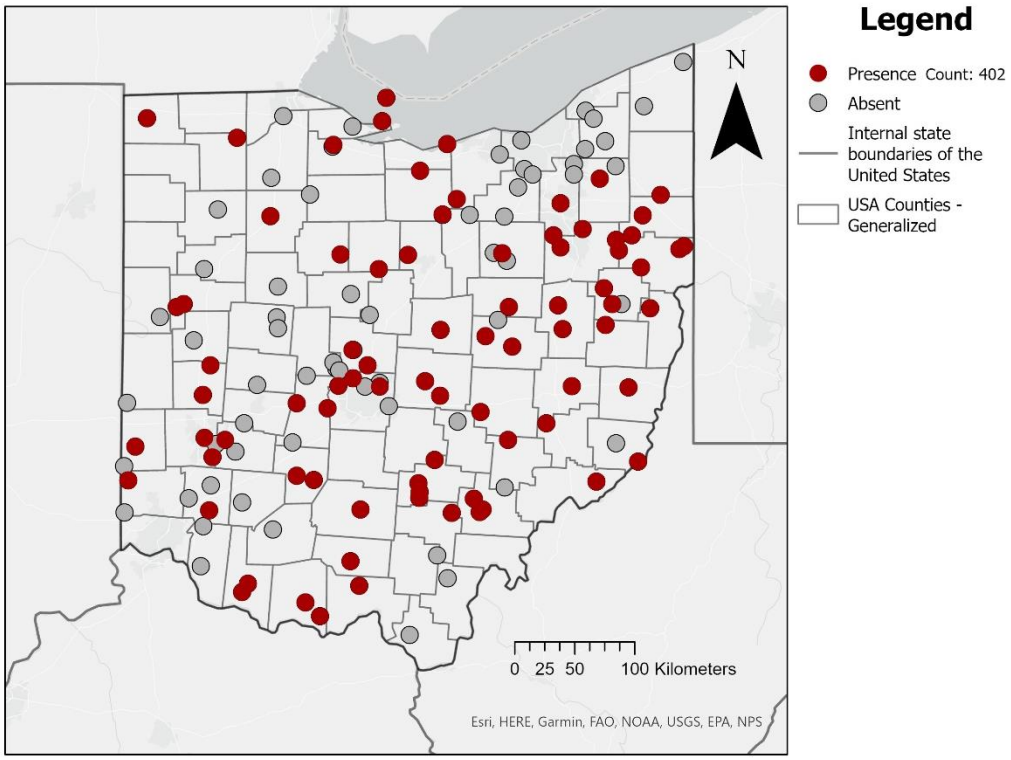
Lasioglossum subviridatum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum subviridatum* is one of the more challenging species and often confused with *abanci*. These two species both have a polished scutum, and minimal hair on the abdomen. Anything we call subviridatum has more punctation in the apical area of the second abdominal segment.

Lasioglossum succinipenne



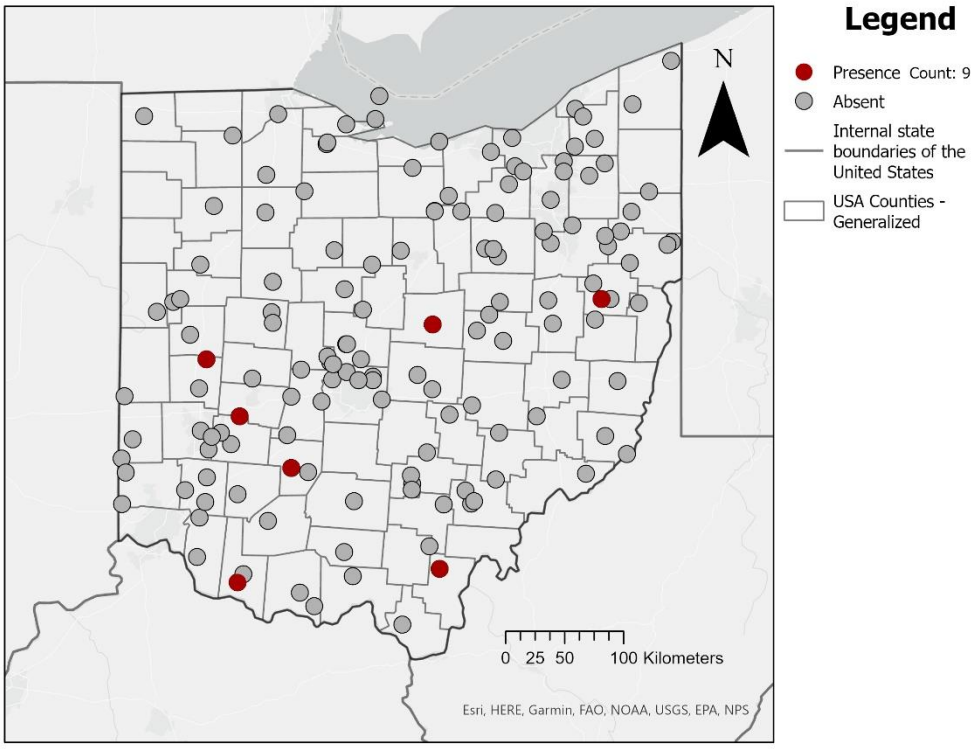
Lasioglossum succinipenne is in the family Halictidae. It is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum succinipenne* is one of the hairier sweat bees and is hardest to differentiate from *Lasioglossum pilosum* and *leucocomum*. This hairy bee group also has very elongate heads and very dense scutal punctures. *Lasioglossum leucocomum* and *succinipenne* have a more narrowed apical part of the clypeus, whereas pilosum is supposed to have a straighter clypeus. *Lasioglossum succinipenne* is supposed to only have bright white hairs and a longer supraclypeal area compared to *leucocomum*.
Size range: 4.7 – 6.1 mm(female), 5.9-6.1 mm (male)

Lasioglossum tegulare



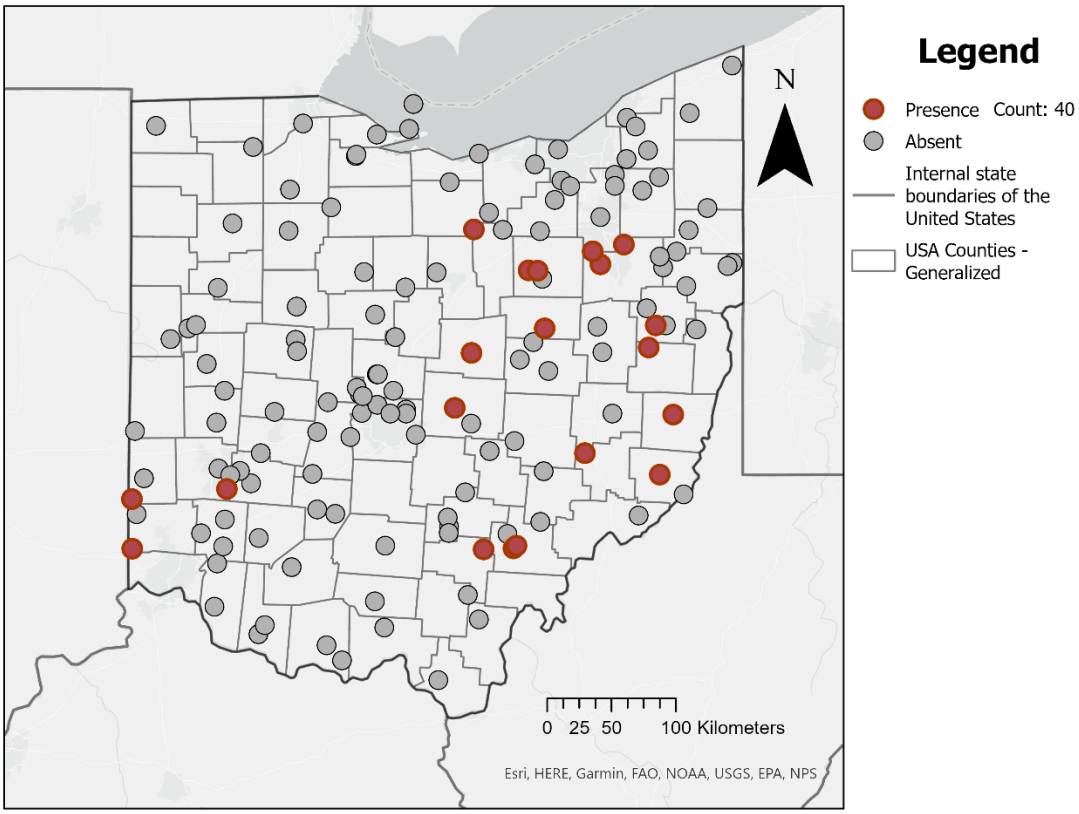
Lasioglossum tegulare is in the family Halictidae. This is a dull green sweat bee in the subgenus *Dialictus*. They are small bees that nest in the ground and forage on a wide variety of plants. *Lasioglossum tegulare* is in the "bean tegula" group that has a distinctly shaped tegula that is more kidney bean shaped instead of oval. The tegula is the little structure at the top of the wing. At one point, *Lasioglossum ellisiae* was synonymized with *Lasioglossum tegulare* (Mitchell, 1960). This group was revised by Jason Gibbs in 2009 (Gibbs, 2009) who resurrected the *Lasioglossum ellisiae* species concept and the group revised again by Gardner and Gibbs in 2023 (Gardner and Gibbs, 2023). The mesepisternum on female *Lasioglossum tegulare* is supposed to have extremely dense pits (vs sparser pits in ellisiae) and a duller mesoscutum (Gardner and Gibbs, 2023).

Lasioglossum trigeminum



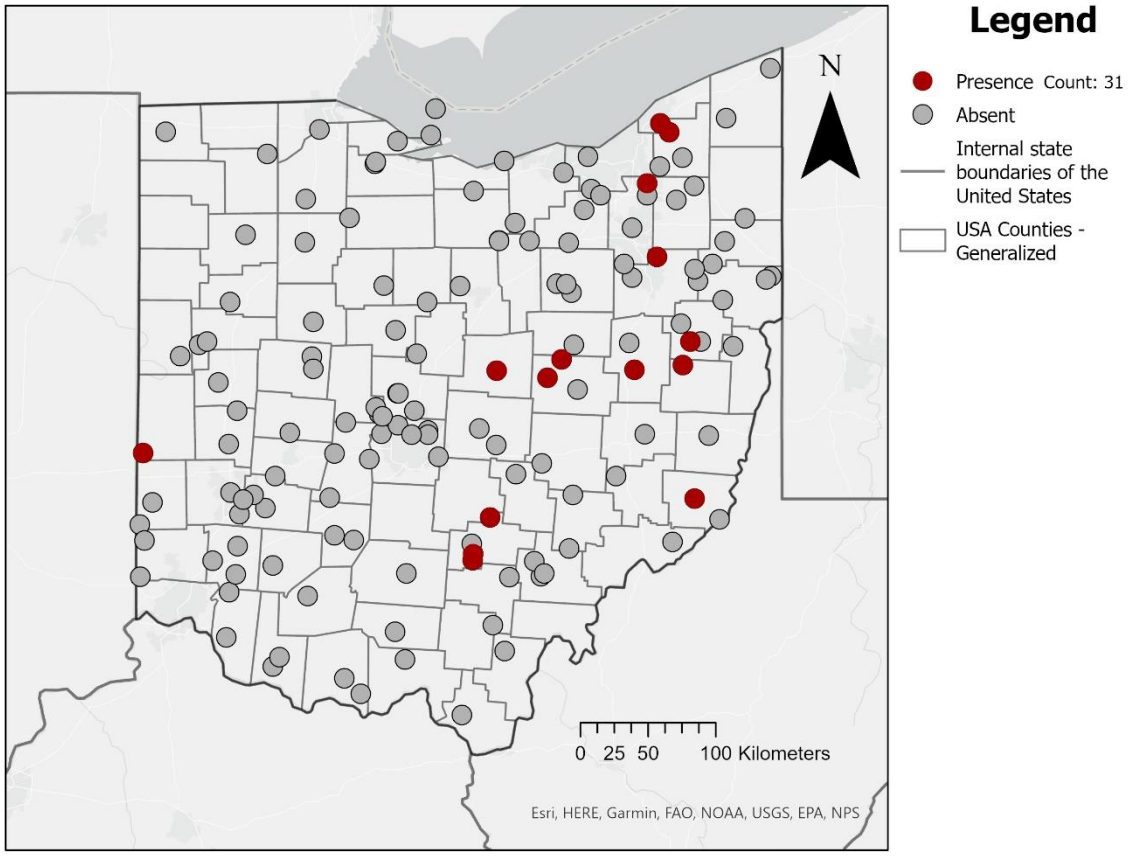
Lasioglossum trigeminum is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum trigeminum* is similar to the much more common *Lasioglossum versatum*, but the clypeus does not protrude as far beneath the suborbital line, the scutum is shinier, and the tegula is paler.

Lasioglossum truncatum



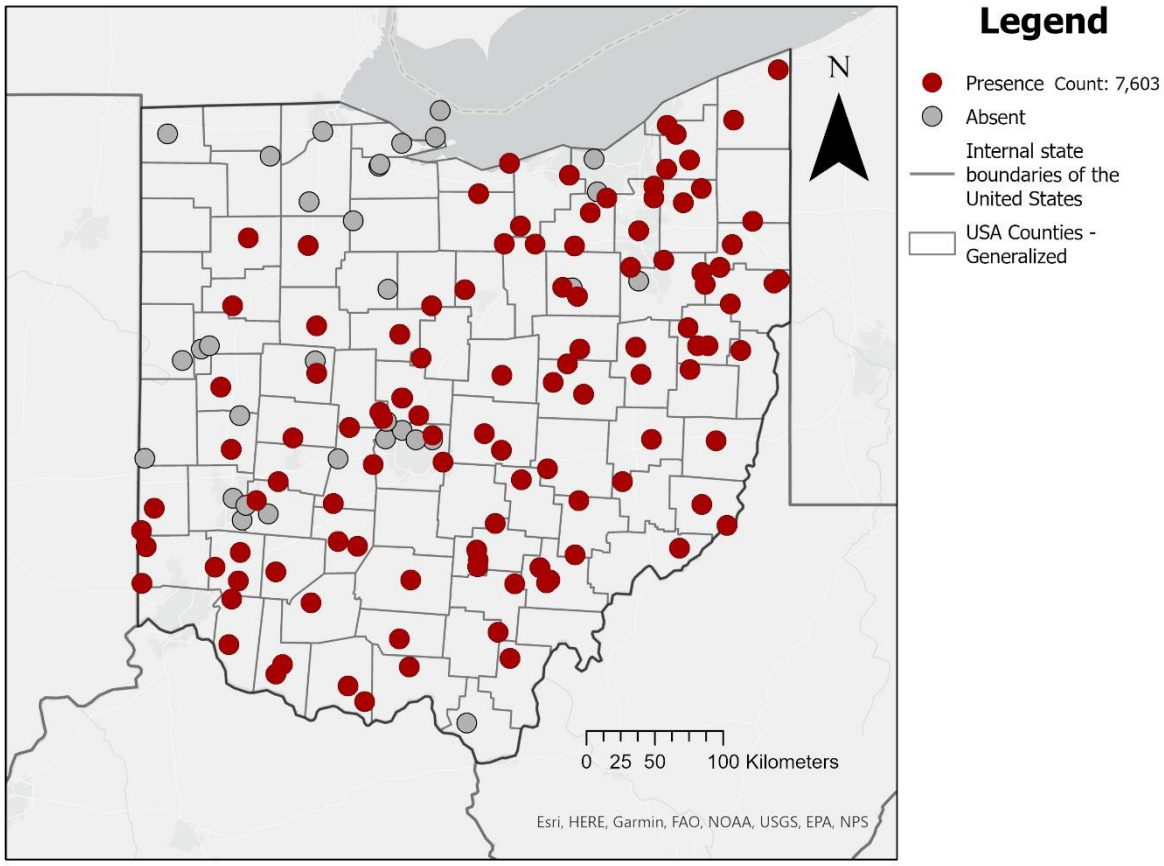
Lasioglossum truncatum is in the family Halictidae. It is another of the less common black *Lasioglossum* that lacks any metallic reflections. They have a 90-degree humeral angle (compared to more obtuse in other species). They forage on a variety of floral resources and like most other Lasioglossum are thought to be ground nesting species.

Lasioglossum versans



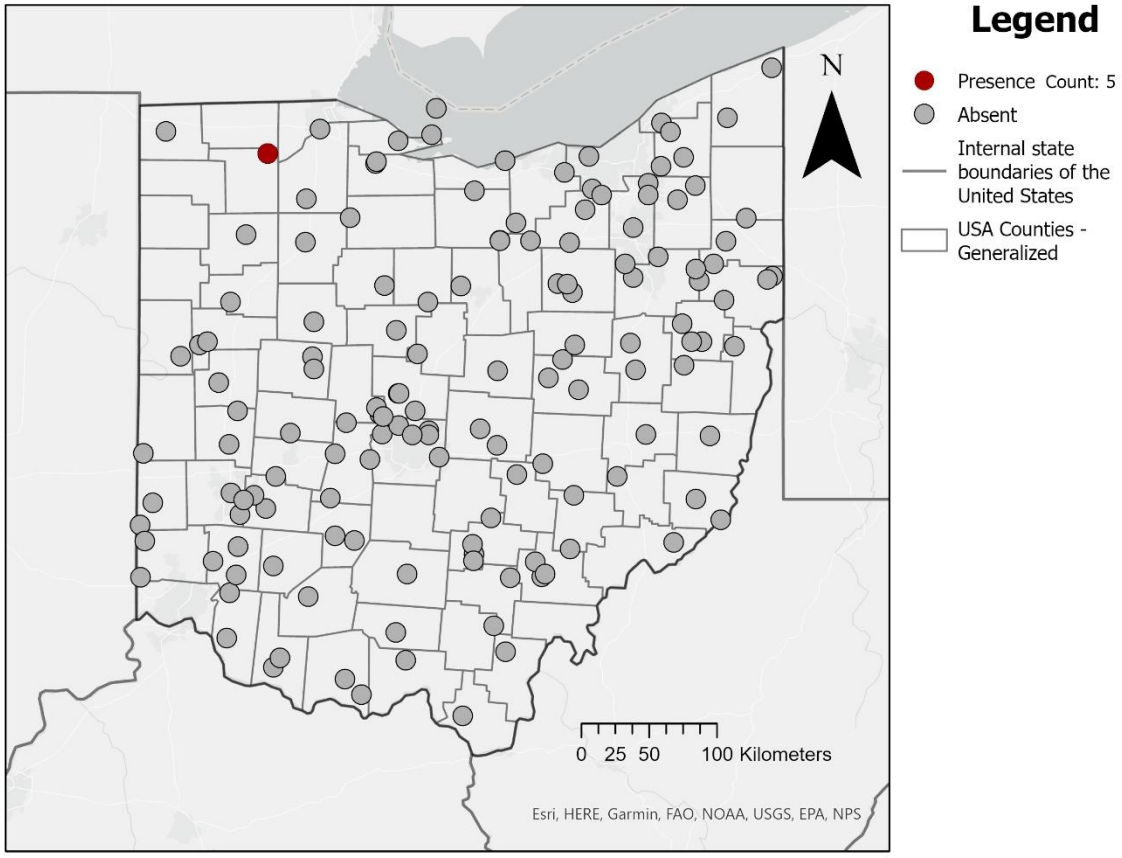
Lasioglossum versans is in the family Halictidae. It is an uncommon species of *Lasioglossum* that is thought to be associated with forests. That also explains the mostly eastern distribution of occurrence in our dataset, which corresponds with the more forested part of the state. *Lasioglossum versans* is distinct in the dull green sweat bees in that, instead of having flattened appressed hairs on the first abdominal segment, the hairs stand upright. This is not something easily seen from a photo, so they still require collection to confirm any identifications. These are ground nesting bees that forage on a wide variety of floral resources.

Lasioglossum versatum



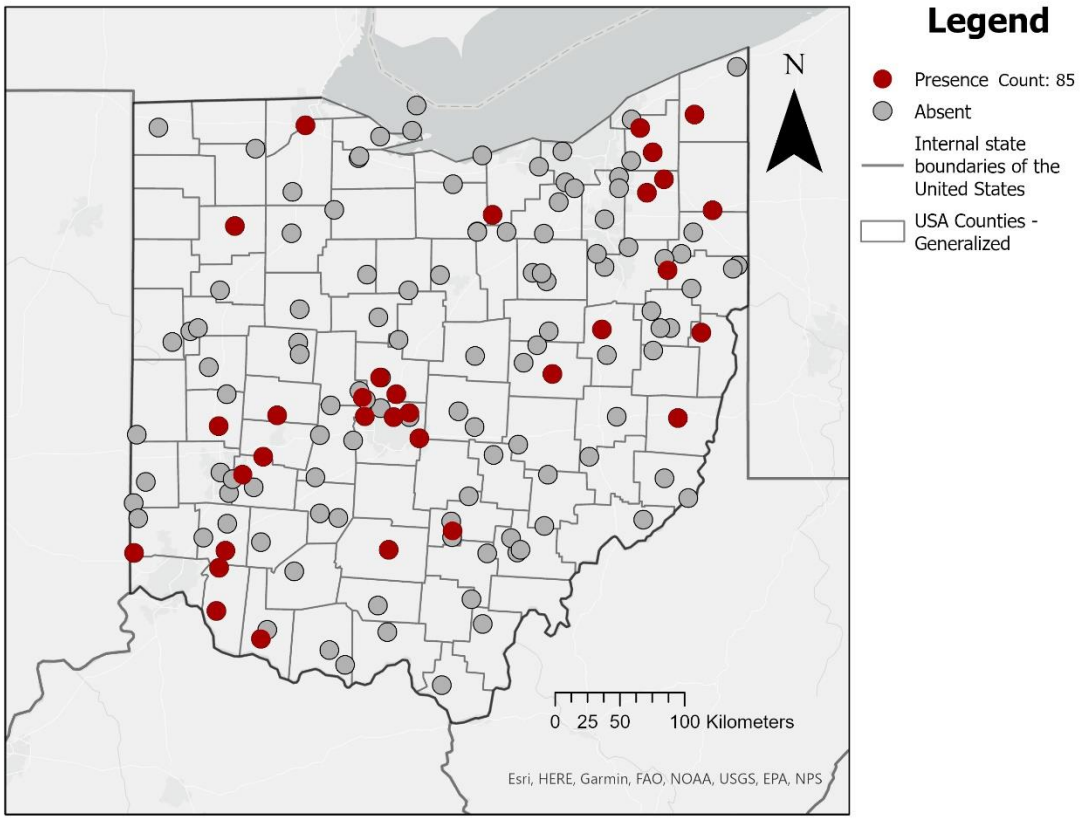
Lasioglossum versatum is in the family Halictidae. It is our most abundant species of bee caught in the bowl survey by a wide margin, followed shortly behind by Lasioglossum hitchensi. Both are small dull green bees the size of a grain of rice and easily overlooked. They require microscopic examination to confirm, which is why so few are documented on community science platforms like iNaturalist despite being so common in our samples. *Lasioglossum versatum* lacks microsculpture on the first abdominal segment, making it shiny even on the highest magnification. It is similar to *Lasioglossum trigeminum*. As with most other *Lasioglossum*, it is a ground nesting species that uses a wide variety of floral resources.

Lasioglossum vierecki



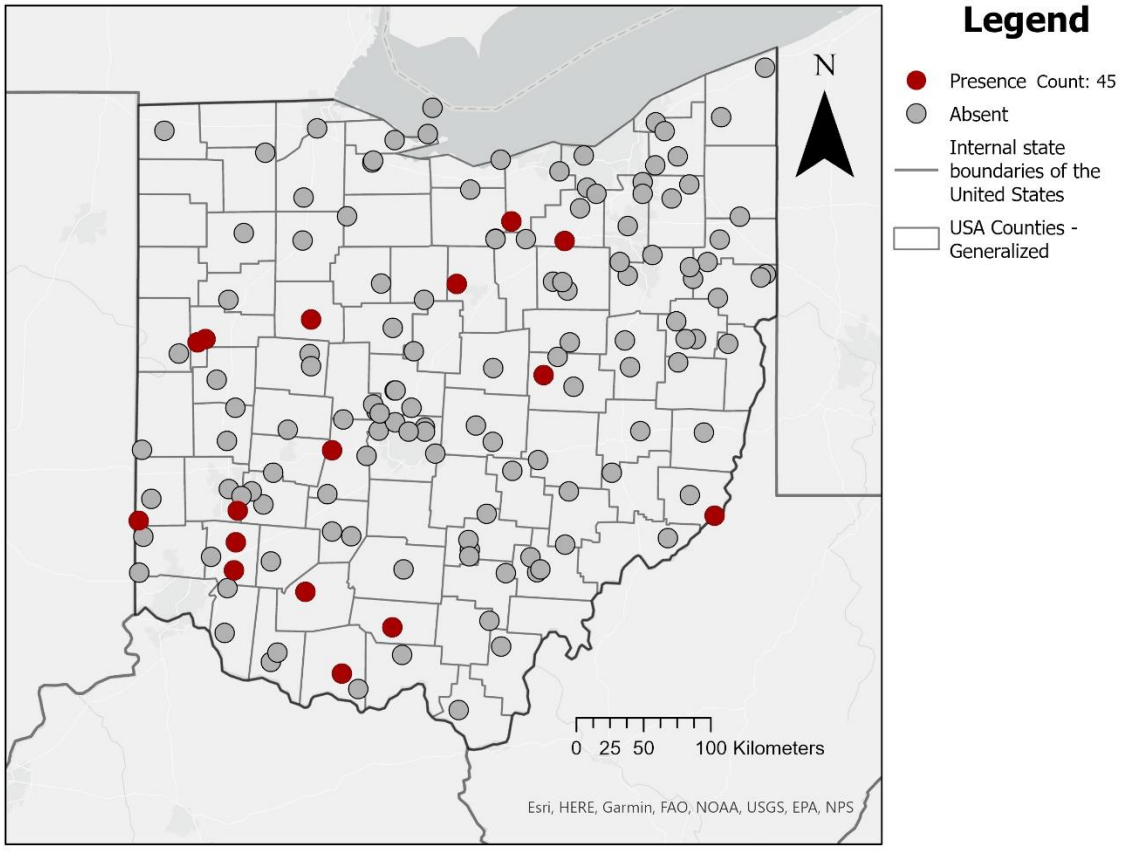
Lasioglossum vierecki is in the family Halictidae. It is a sandy habitat- associated species of *Lasioglossum* that is unique in its orange (instead of brown) abdomen. *Lasioglossum vierecki* has a clypeus with an apical yellow rim and orange legs. Given the preference for nesting in sand, it is possible this species occurs in small, localized populations across Ohio, and its distribution is limited by the availability of nesting substrates. Most of the sample sites lacked sandy habitat, so a more thorough review of sandy areas will help us better understand the status of this species. Several were collected as part of the 2010 publication of the bees at Kitty Todd in the Oak Openings (Arduser, 2010).
Size range: 4 mm (female and male)

Lasioglossum weemsi



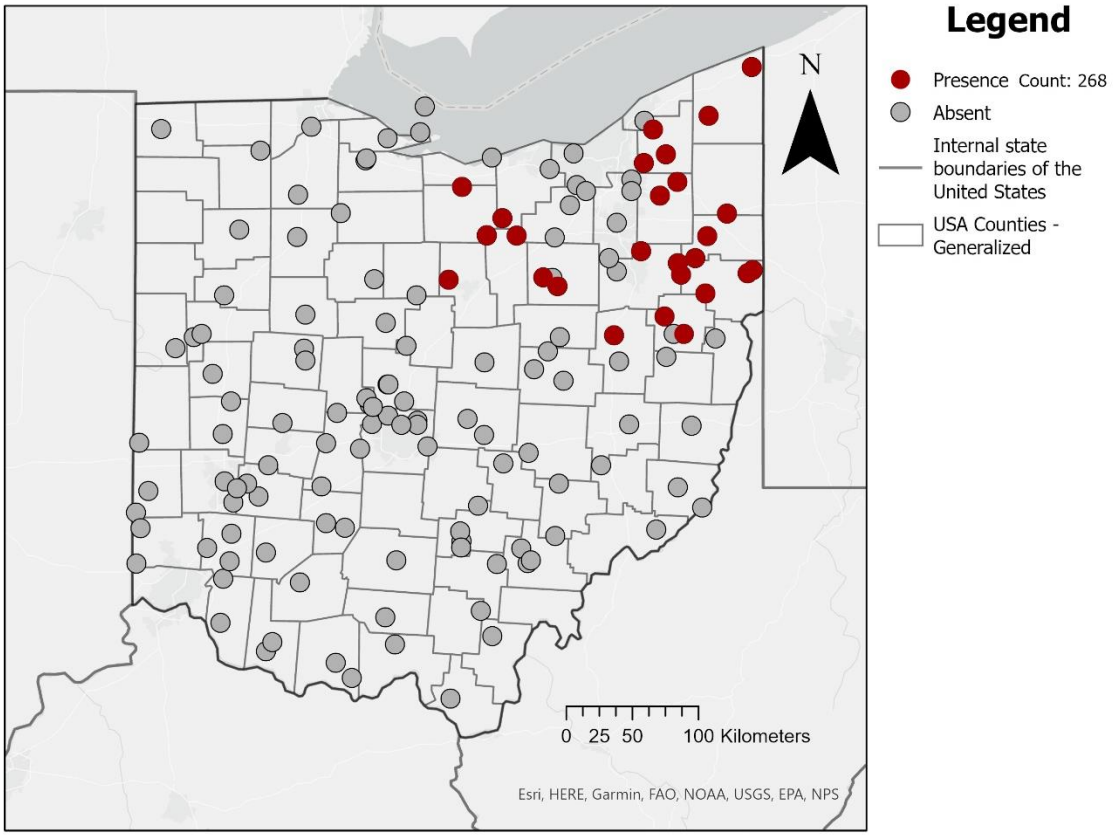
Lasioglossum weemsi is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum weemsi* is a tricky species. It is most similar to *Lasioglossum hitchensi*, but with a wider opening on the fan on the abdomen.

Lasioglossum zephyrus



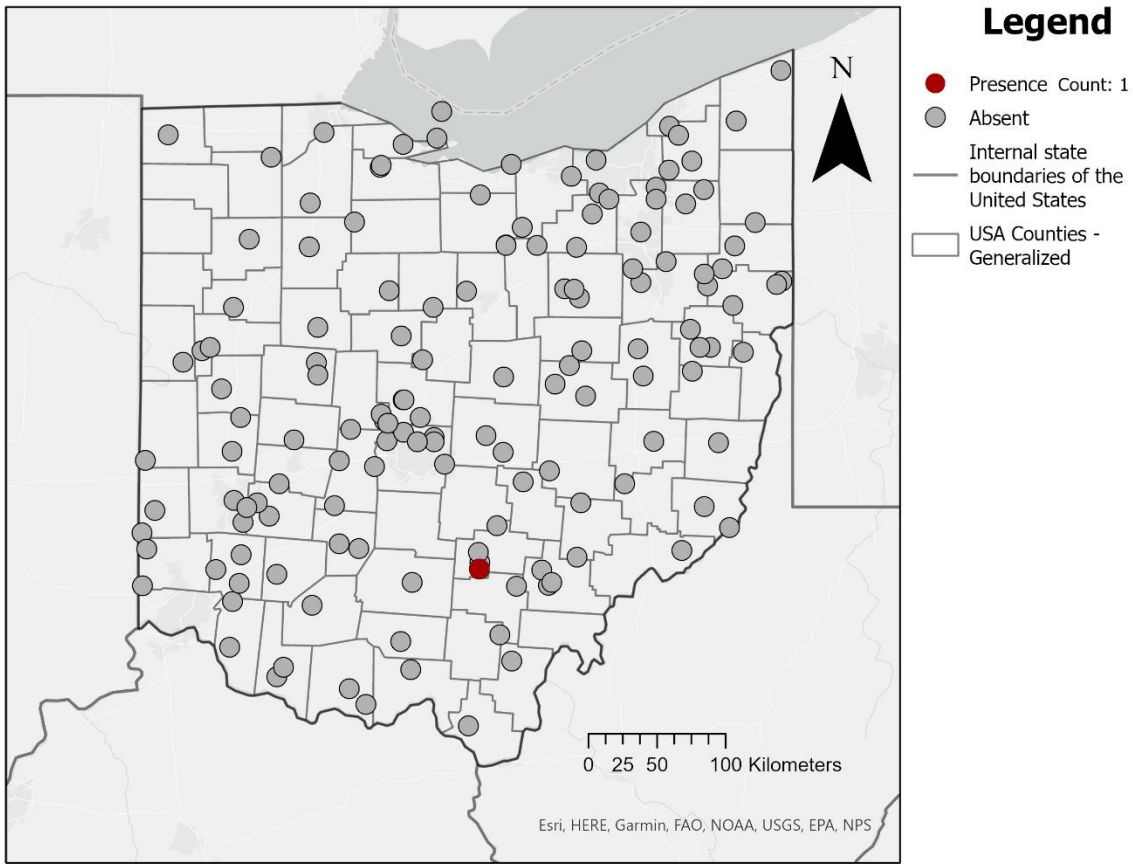
Lasioglossum zephyrus is in the family Halictidae. This is one of the dull green sweat bees in the subgenus *Dialictus*. They are generally small bees (less than a grain of rice) that nest in the ground and forage on a wide variety of plants. Most *Lasioglossum* bees are challenging to identify, even with a specimen under a microscope. *Lasioglossum zephyrus* is unusual in that the striations on the propodeum only reach about halfway or less and the abdomen has metallic reflections in addition to the thorax.

Lasioglossum zonulum



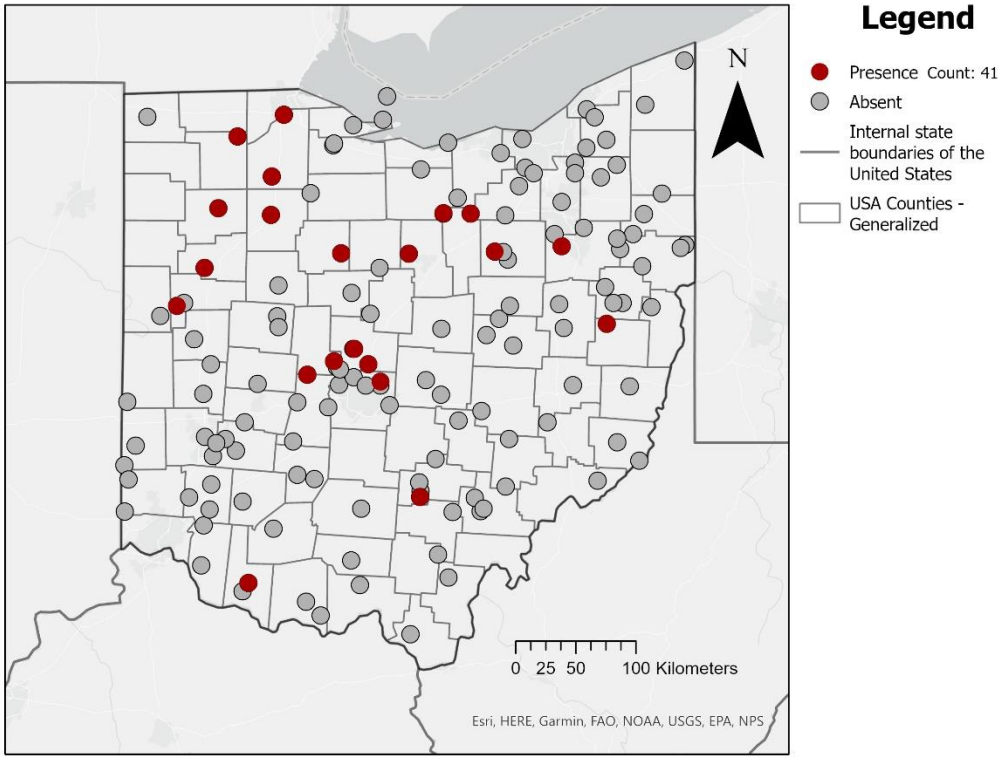
Lasioglossum zonulum is in the family Halictidae. It is unusual in that it is one of the few non-native species of *Lasioglossum* that occur in our area. They are well established and seem to occur in mostly the northeastern reaches of the United States. This is one of the black species that lacks metallic reflections. They nest in the soil. *Lasioglossum zonulum* in the subgenus Leuchalictus and is most similar to *Lasioglossum leucozonium*. *Lasioglossum zonulum* has the antero-lateral angle of the pronotum sharply angled and the basal segment of the abdomen sparsely punctate in the center and slightly shinier in comparison to *Lasioglossum leucozonium*.

Megachile addenda



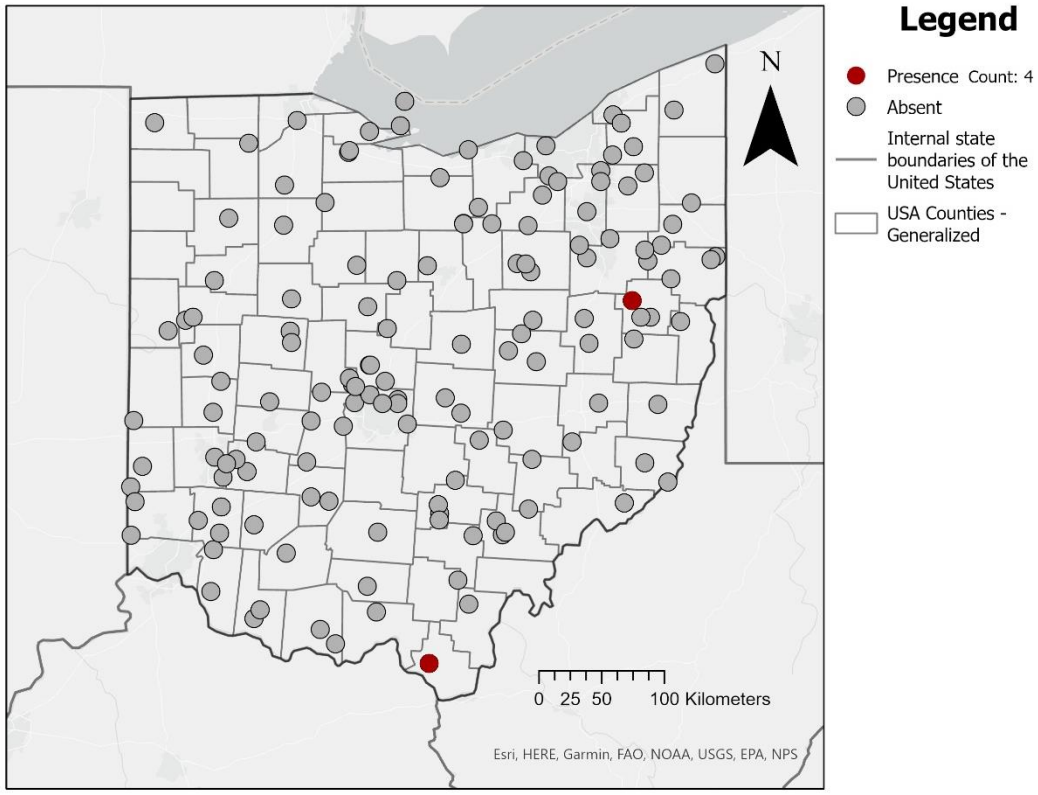
Megachile addenda is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. The males have a very distinct shape on the end of the abdomen.

Megachile brevis



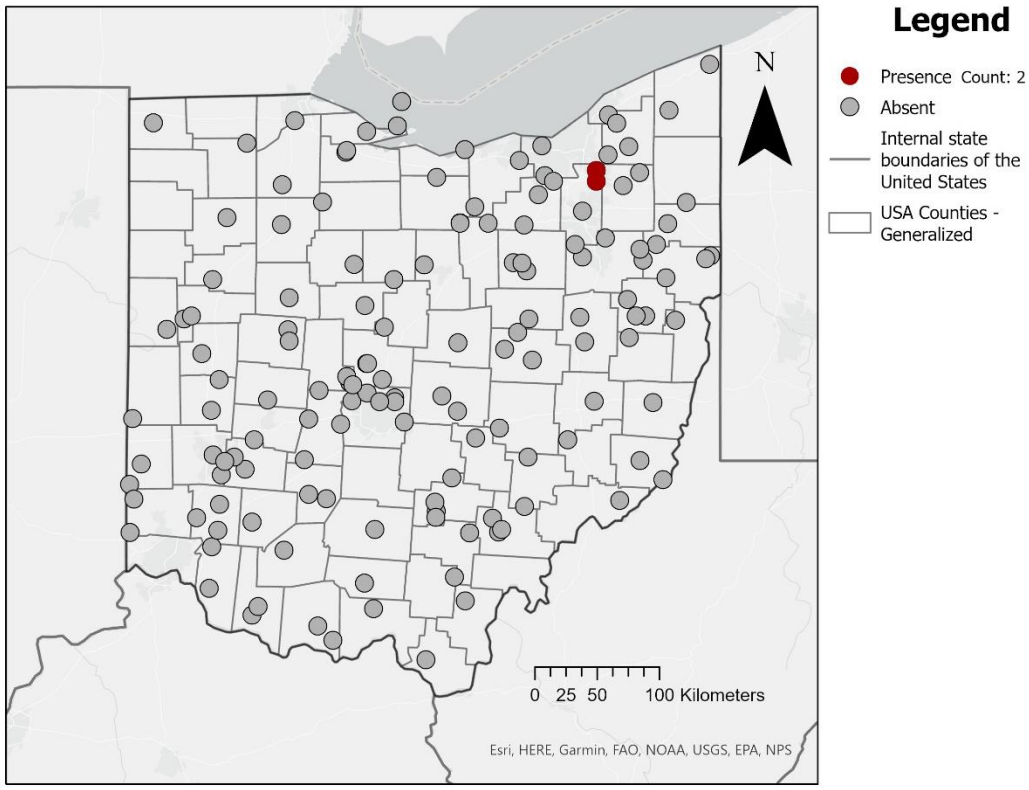
Megachile brevis is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. This is one of our more common species. Below is an example leaf damage characteristic of *Megachile*.

Megachile campanulae



Megachile campanulae is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. *Megachile campanulae* can be most often found foraging on bellflower. That plant grows best in shaded and forested habitats, and thus, shaded and forested habitats are also the best spots to find this species of *Megachile*.

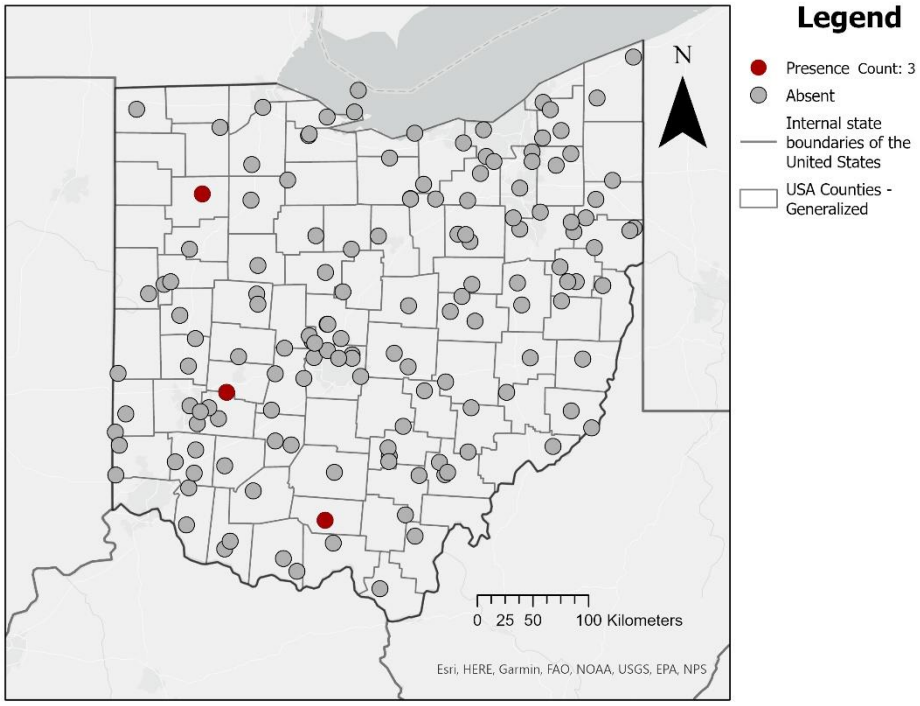
Megachile centuncularis



Megachile centuncularis is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests.

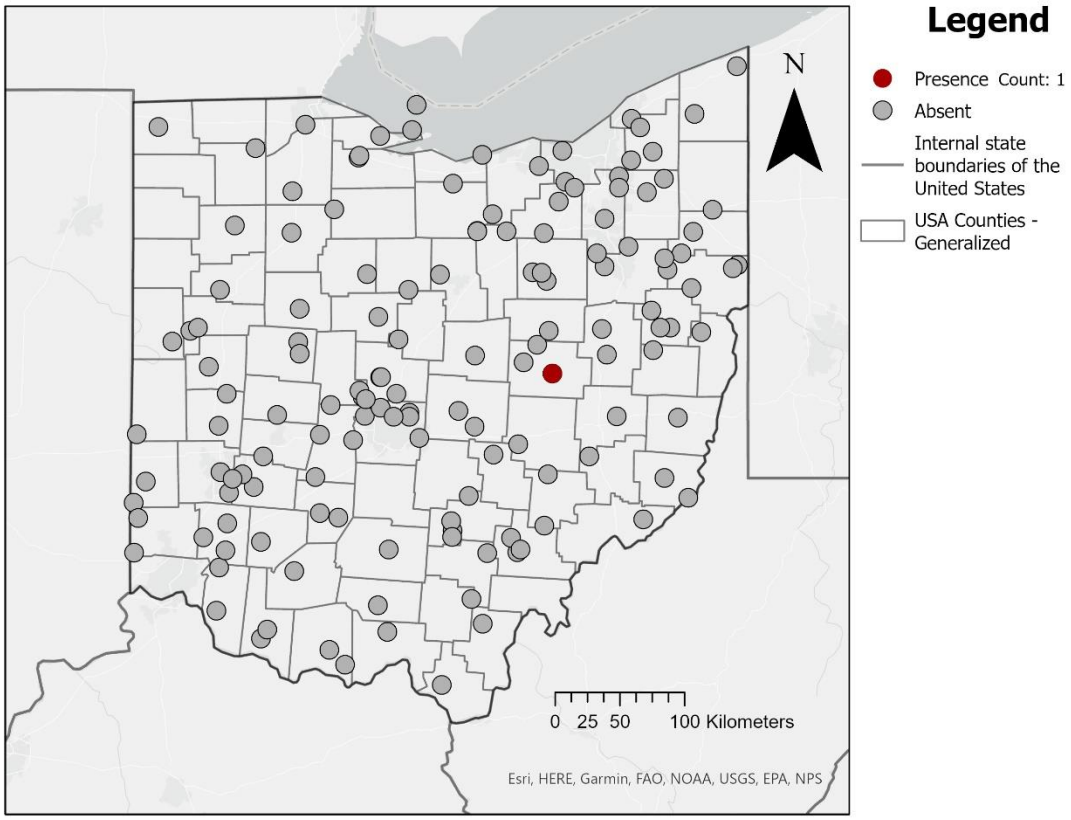
Size range: 10-11 mm (female), 8 – 9 mm (male).

Megachile inimica



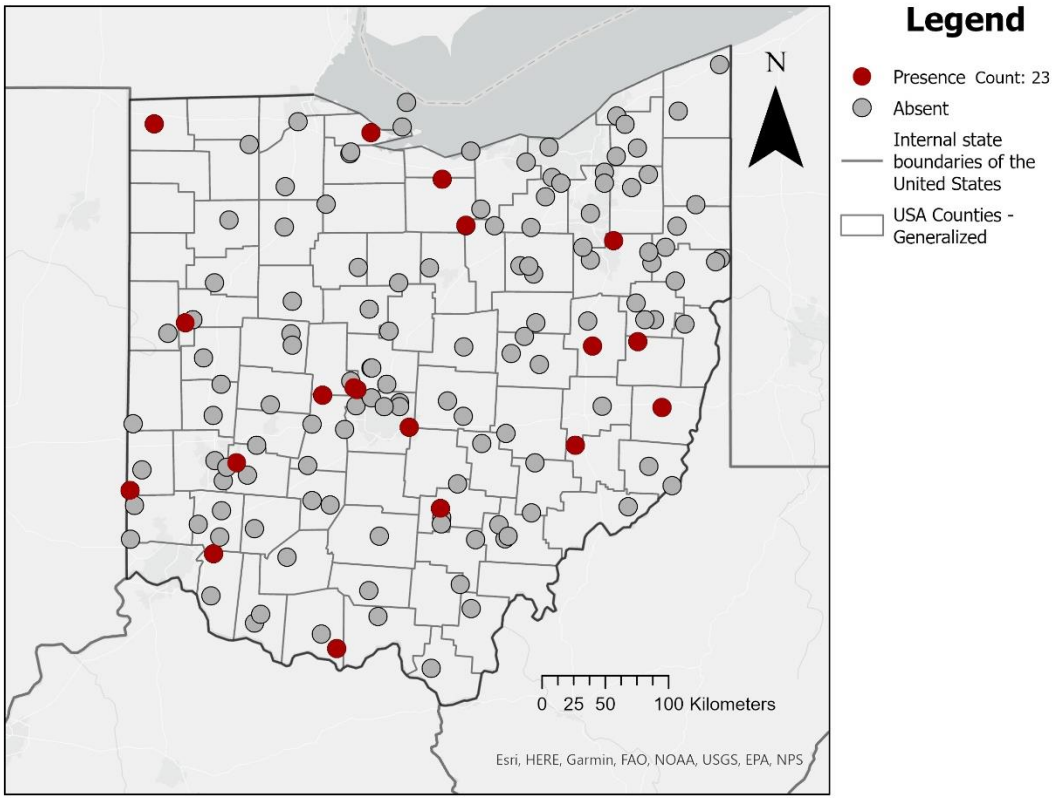
Megachile inimica is in the family Megachilidae. It is a solitary cavity nesting bee that cuts pieces of leaves or sometimes flower petals to line their nests. *Megachile inimica* is a specialist of Asteraceae including *Baccharis, Chrysopsis, Cirsium, Coreopsis, Erigeron, Grindelia, Helianthus, Rudbeckia, Silphium, Solidago, Verbesina*, and *Vernonia* (Fowler and Droege, 2020).
Size range: 13-16 mm (female), 11-14 mm (male).

Megachile melanophaea



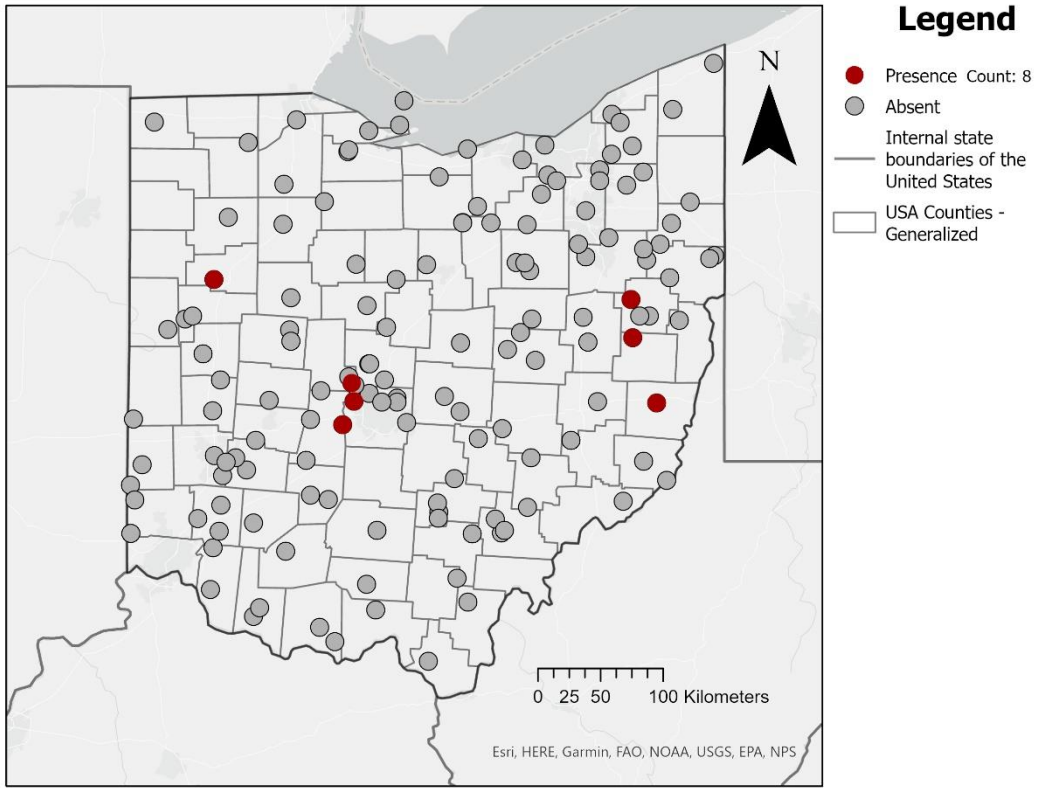
Megachile melanophaea is one of the leafcutter bees in the family Megachilidae. These are solitary nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. This is also an unusual species of *Megachile* in that it nests in the ground and actively digs a nest in the well-drained soil (Ivanochko, 1979)! They have also shown territoriality, with males defending areas (Ivanochko, 1979). M*egachile melanophaea* is a specialist of Fabaceae, including *Astragalus*, *Hedysarum*, *Lotus*, and *Lupinus* (Fowler and Droege, 2020). This is a widely distributed species that can be found across most of North America (Ivanochko, 1979). This is also a somewhat unusual looking *Megachile* that is a bit stouter than the other species, with more yellow and black hairs, so a very cursory glance might confuse it with its Apidae cousins. The pollen collecting hairs on the abdomen separate the Megachilids from the Apids. Otherwise, it is most similar to *Megachile mucida.*

Megachile mendica



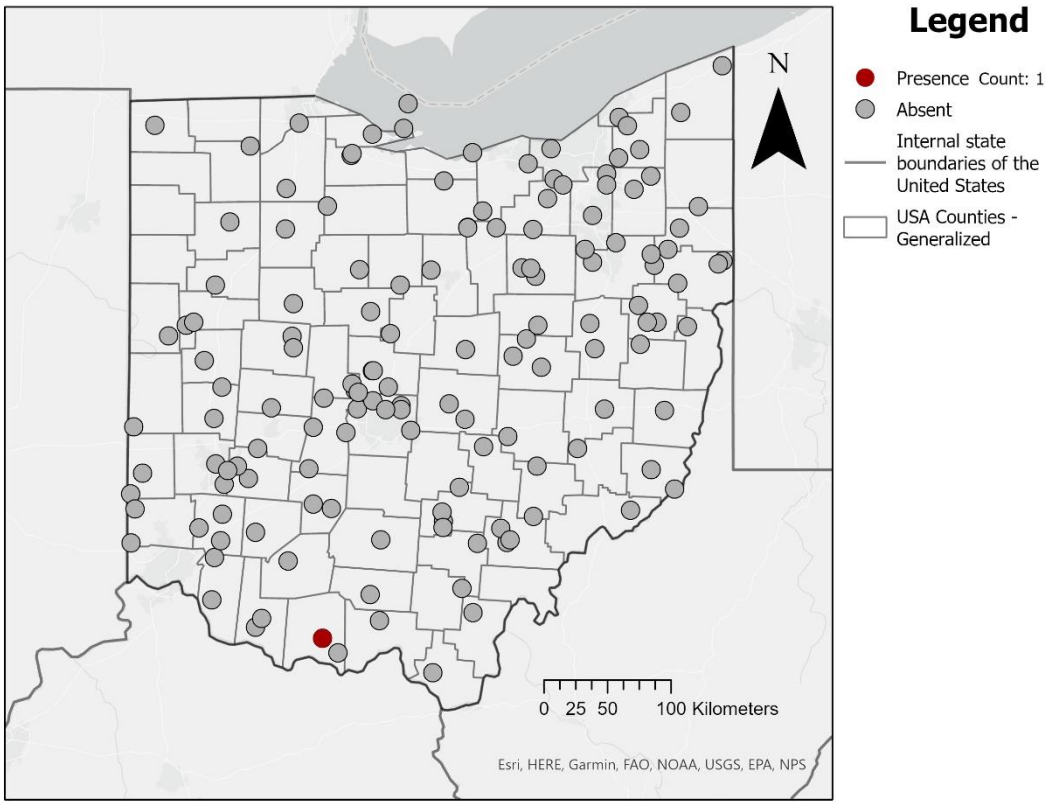
Megachile mendica is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. They are willing to nest in trap nests with diameters of between 5 and 8 mm (Ivanochko, 1979). They use a wide variety of floral hosts and at one point were considered for commercialization to increase yield of alfalfa production. *Megachile mendica* was one of the most common species of *Megachile* in a survey of bees in minelands of southeastern Ohio, where it was found visiting 20 different species of plants (Novotny and Goodell, 2020).

Megachile montivaga



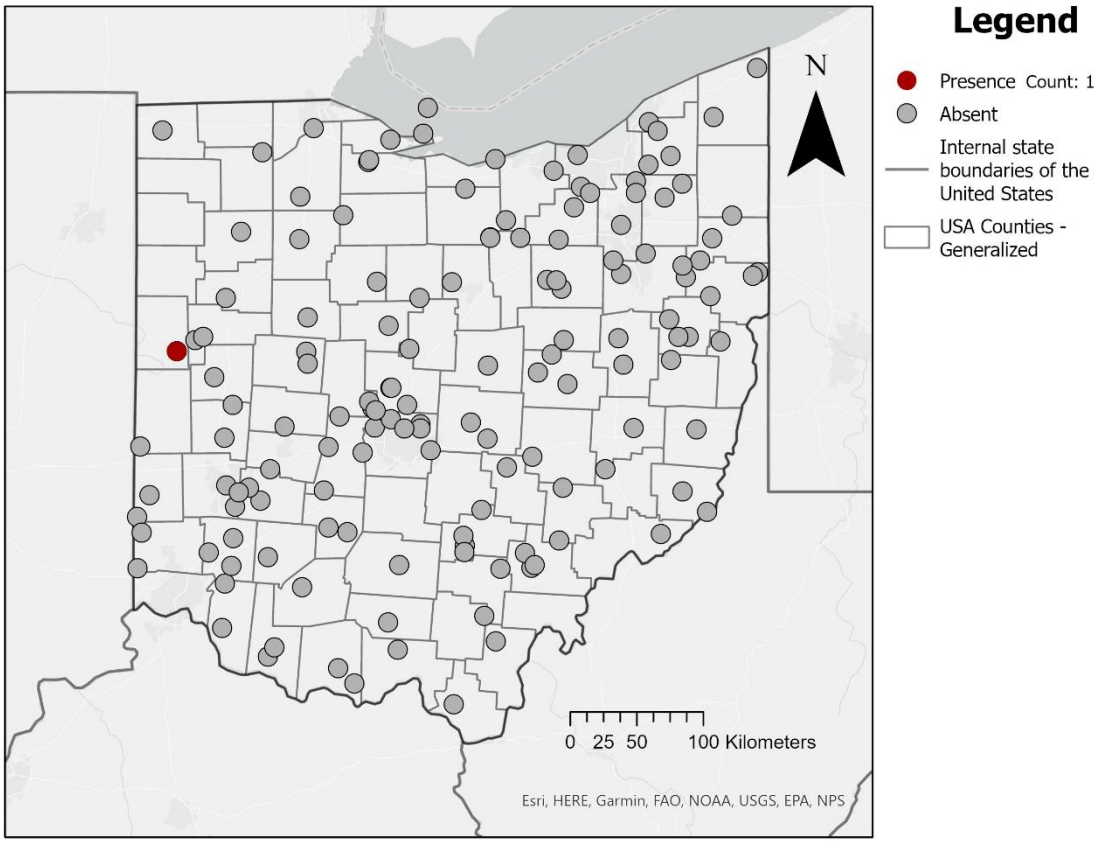
Megachile montivaga is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. They use a wide range of floral hosts to provision their nests.

Megachile mucida



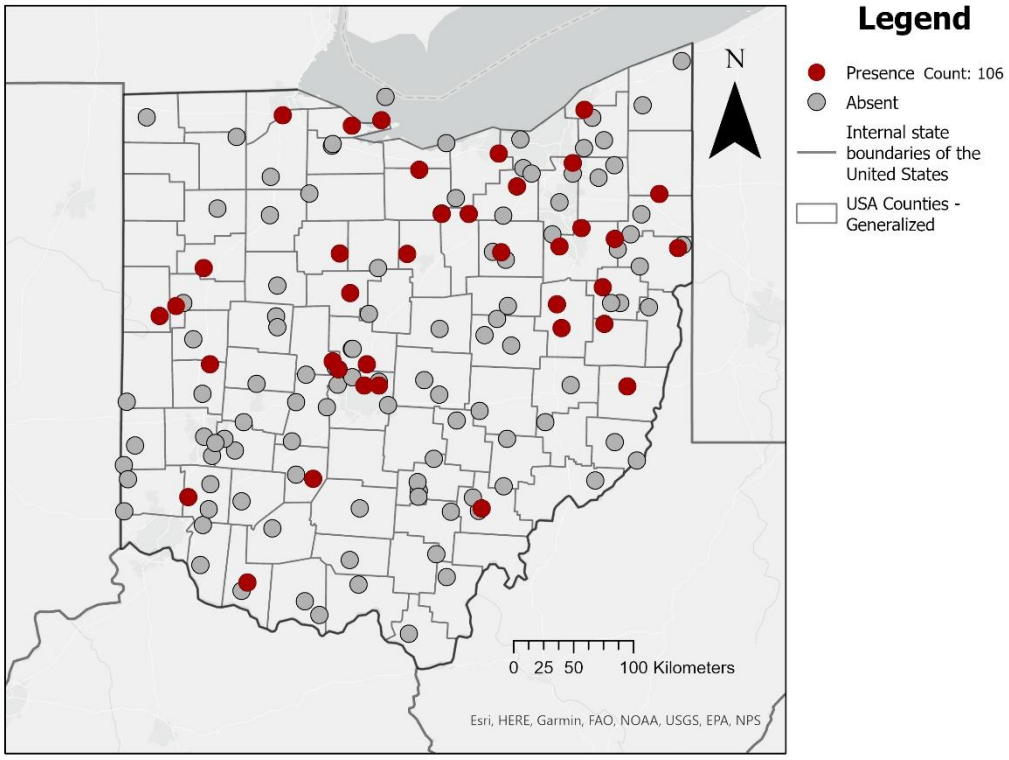
Megachile mucida is one of the leafcutter bees in the family Megachilidae. These are solitary nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. This is also an unusual species of *Megachile* in that it nests in the ground and actively digs a nest in soil (Gibbs, 2017). This is also a somewhat unusual looking *Megachile* that is a bit stouter than the other species, with more yellow and black hairs, so a very cursory glance might confuse it with its Apidae cousins. The pollen collecting hairs on the abdomen separate the Megachilids from the Apids. Of the other *Megachile*, it is most similar to *Megachile melanophaea*.

Megachile pugnata



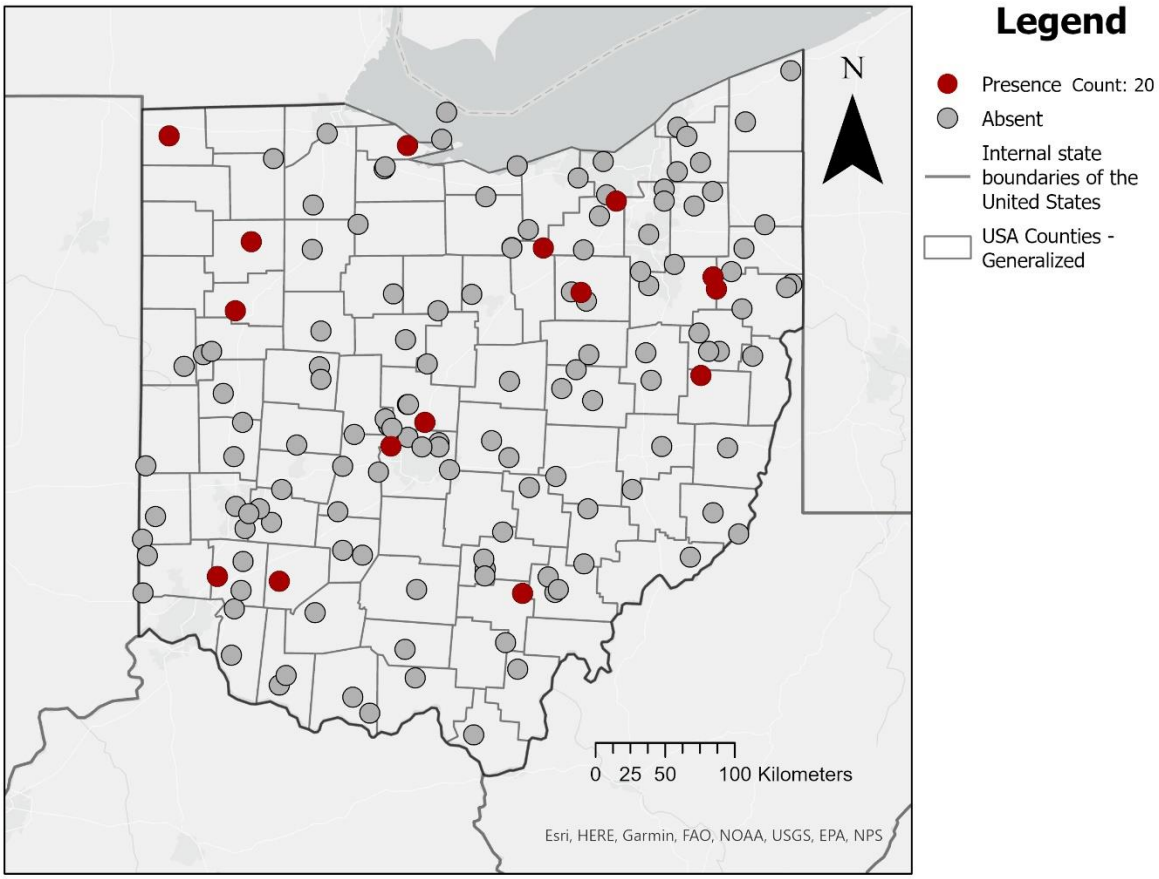
Megachile pugnata is one of the leafcutter bees in the family Megachilidae. These are solitary cavity nesting bees that cut pieces of leaves or sometimes flower petals, which they use to line their nests. *Megachile pugnata* is a specialist of Asteraceae, *including Cirsium, Coreopsis, Erigeron, Grindelia, Helianthus*, and *Rudbeckia* (Fowler and Droege, 2020). The females of *Megachile pugnata* are distinct in that they have a very large projection on the side of their cheek (gena), similar to the wide cheek of *Halictus ligatus*. *Megachile pugnata* is another species that is widely distributed across the United States. It is also worth noting that the large cheek projection makes it one of the easier species of *Megachile* to reliably identify from a photo.

Megachile rotundata



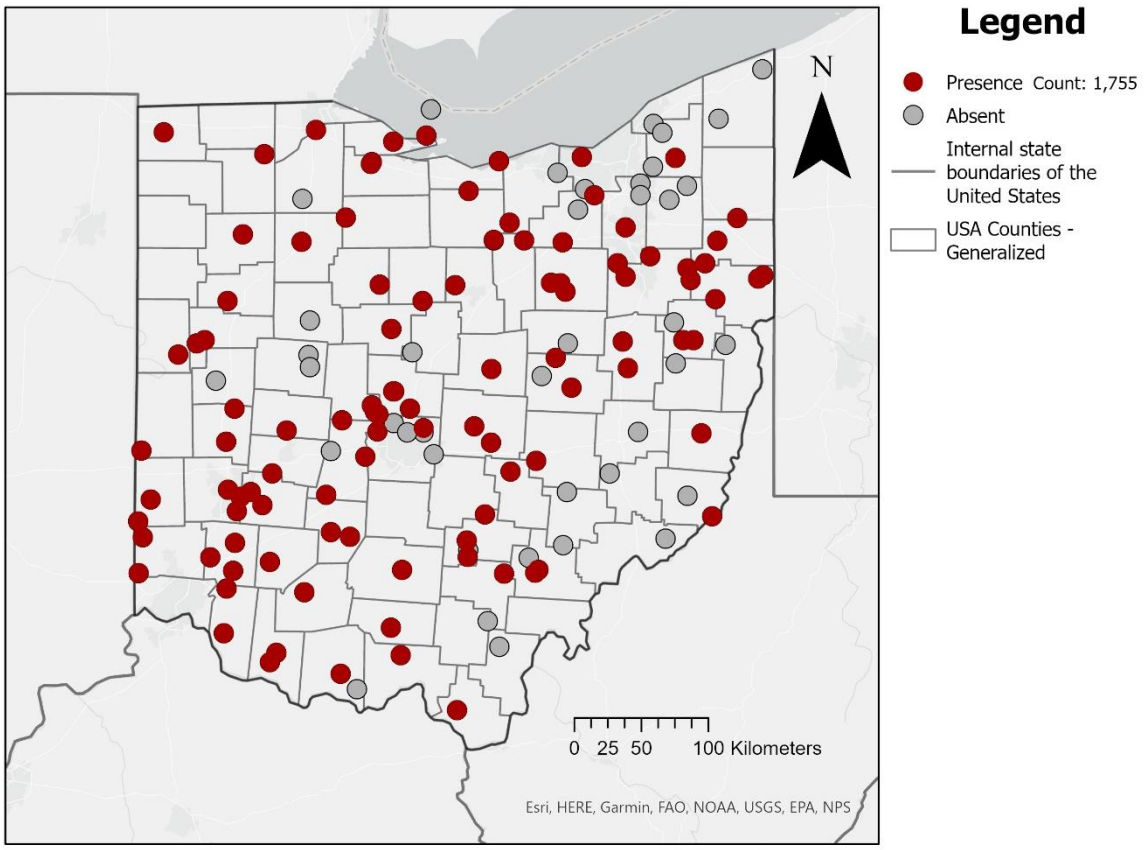
Megachile rotundata is in the family Megachilidae. It is sometimes called the alfalfa leafcutter bee. It is regularly used and reared to increase alfalfa seed production. This is a non-native species that is regularly raised by humans, but also does very well in the wild without human intervention. This is one of the smaller leafcutter bees, and tends to use the smaller stems in trap nests. *Megachile rotundata* was the most common leafcutter bee from the 2013 Marietta College survey, with most specimens caught on the college campus (Spring et al., 2017).

Melissodes agilis/trinodis



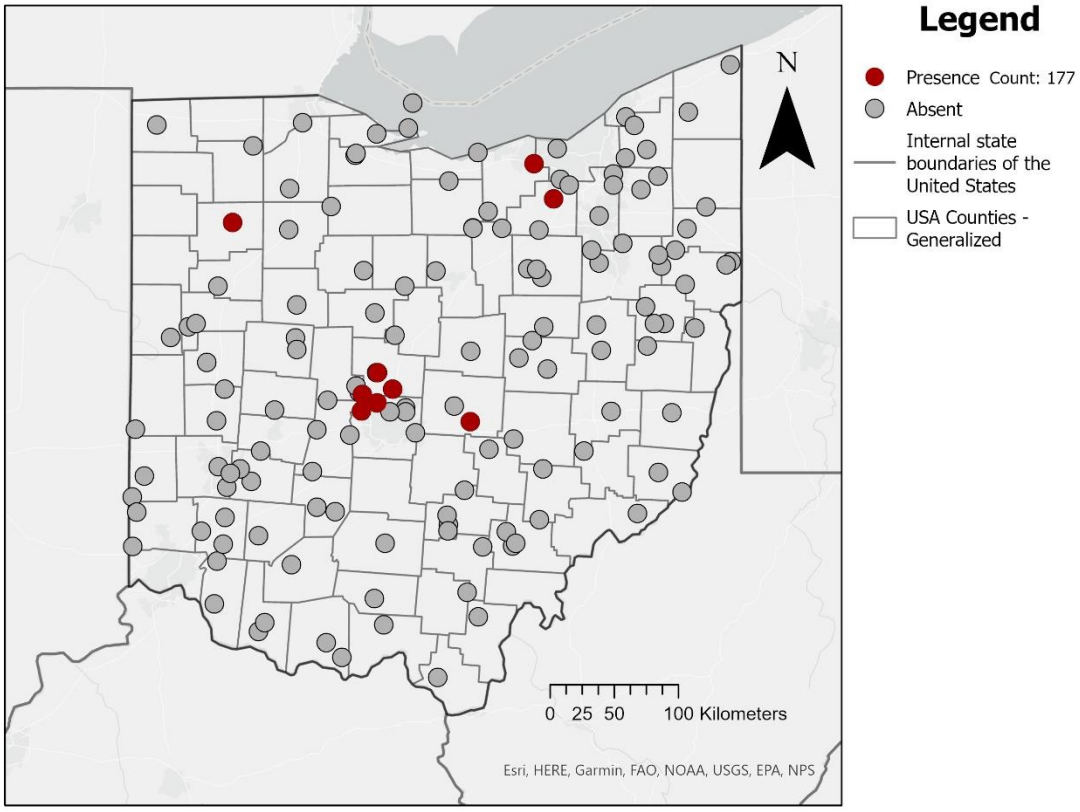
Melissodes are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. Anything identified as *Melissodes agilis/trinodis* is either *Melissodes agilis* or *Melissodes trinodis* and we were unable to say with certainty as to which.

Melissodes bimaculatus



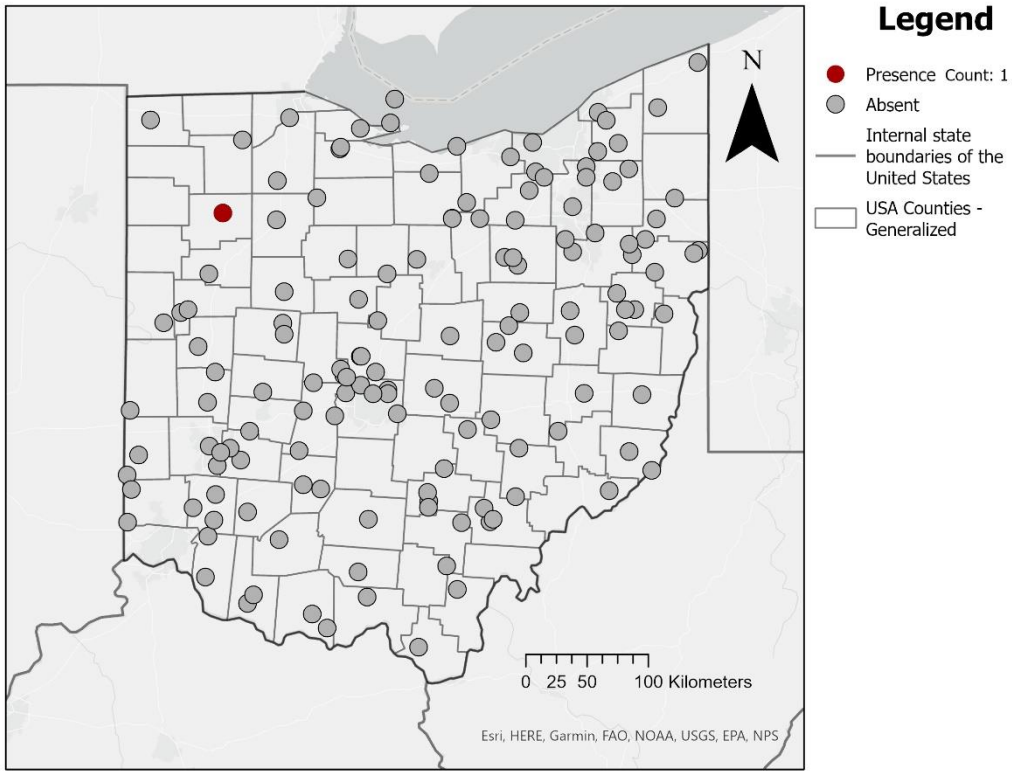
Melissodes bimaculatus is in the family Apidae. *Melissodes* are referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees that forage on a wide variety of plant species. *Melissodes bimaculatus* is our most common species of *Melissodes* by a long shot. These are distinct, fuzzy black bees, with the females having two yellow spots on the end of their abdomen. That is also how they got their common name, the Two-spotted Longhorn Bee. Being so distinct, this is one of the few species of *Melissodes* that is identifiable from a photo, and thus is well represented in community science platforms like iNaturalist. Males can sometimes be found clinging to plant stems by their mandibles at night to sleep. They will return to the same spot each night. Below is an example image of a female perched and a male sleeping.

Melissodes boltoniae/fumosus/elegans



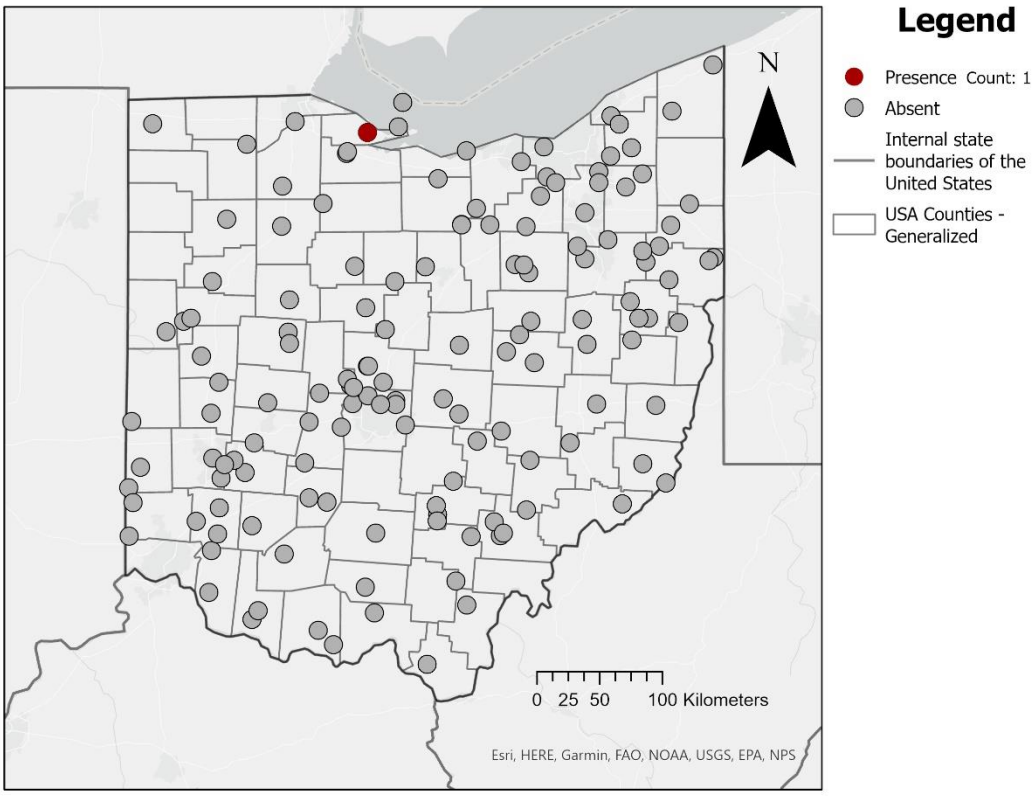
Melissodes are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. Anything identified as *Melissodes boltoniae/fumosus/elegans* is either *Melissodes boltoniae, Melissodes fumosus*, or *Melissodes elegans* and we were unable to say with certainty as to which.

Melissodes communis



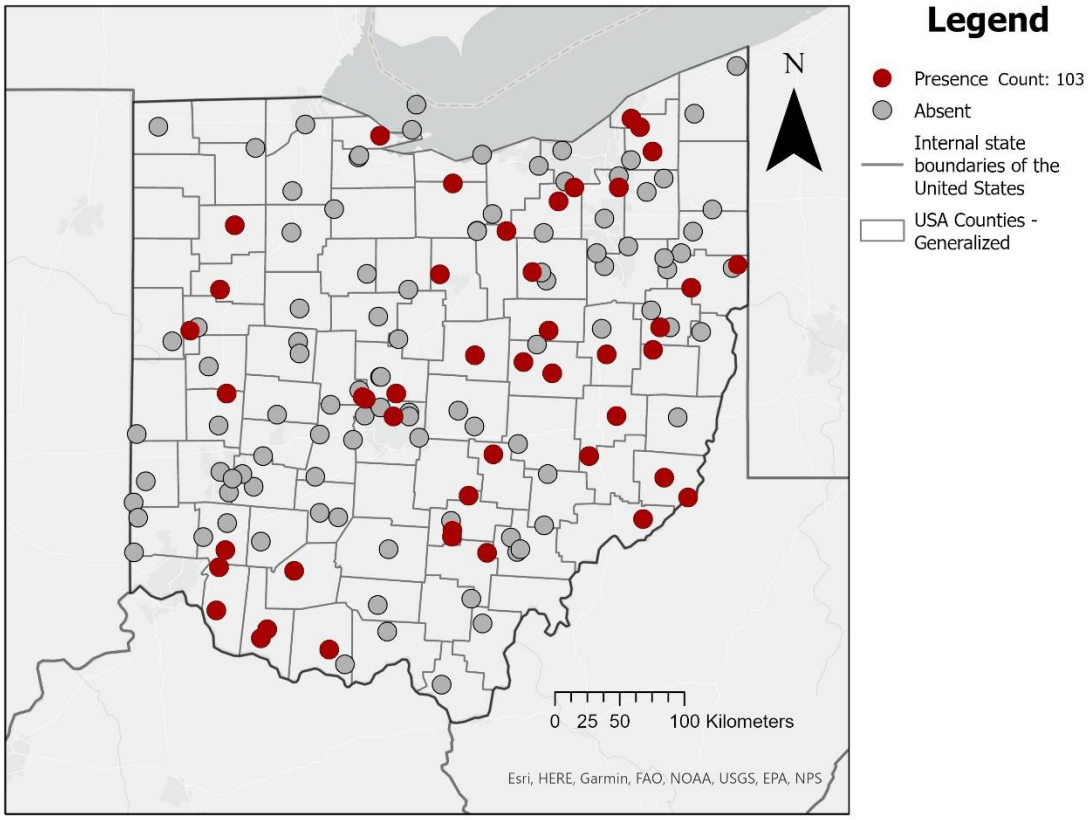
Melissodes communis is in the family Apidae. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees that use a wide variety of floral resources. *Melissodes communis* can be tricky to confidently confirm with a specimen.

Melissodes comptoides



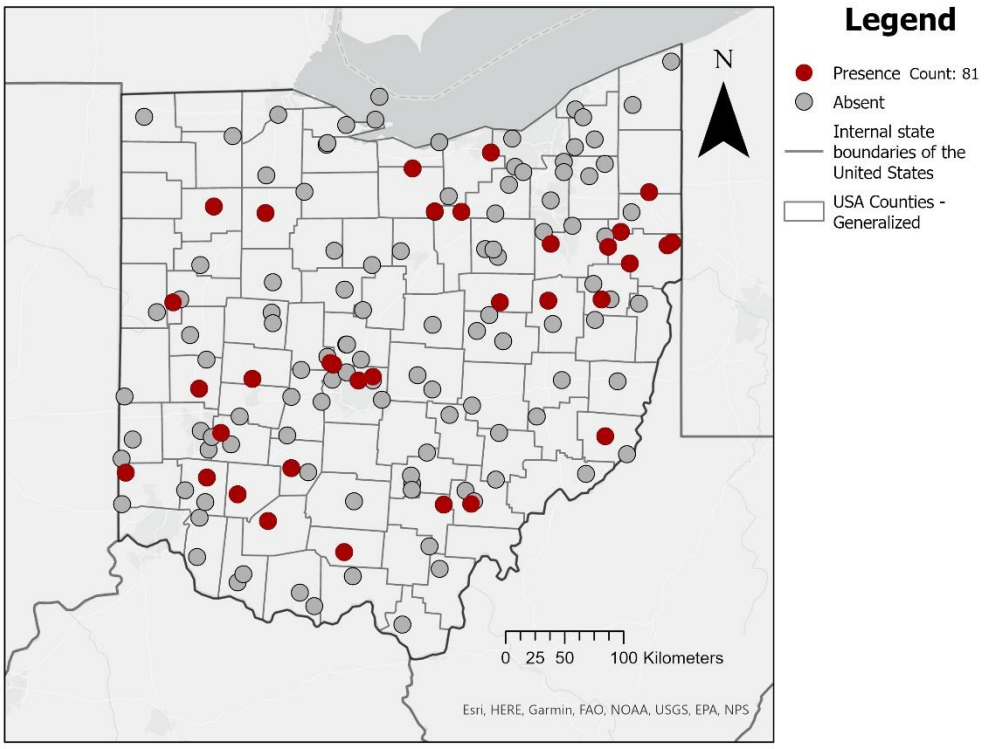
Melissodes comptoides is in the family Apidae. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees that use a wide variety of floral resources. *Melissodes comptoides* can be tricky to confidently confirm with a specimen.

Melissodes denticulatus



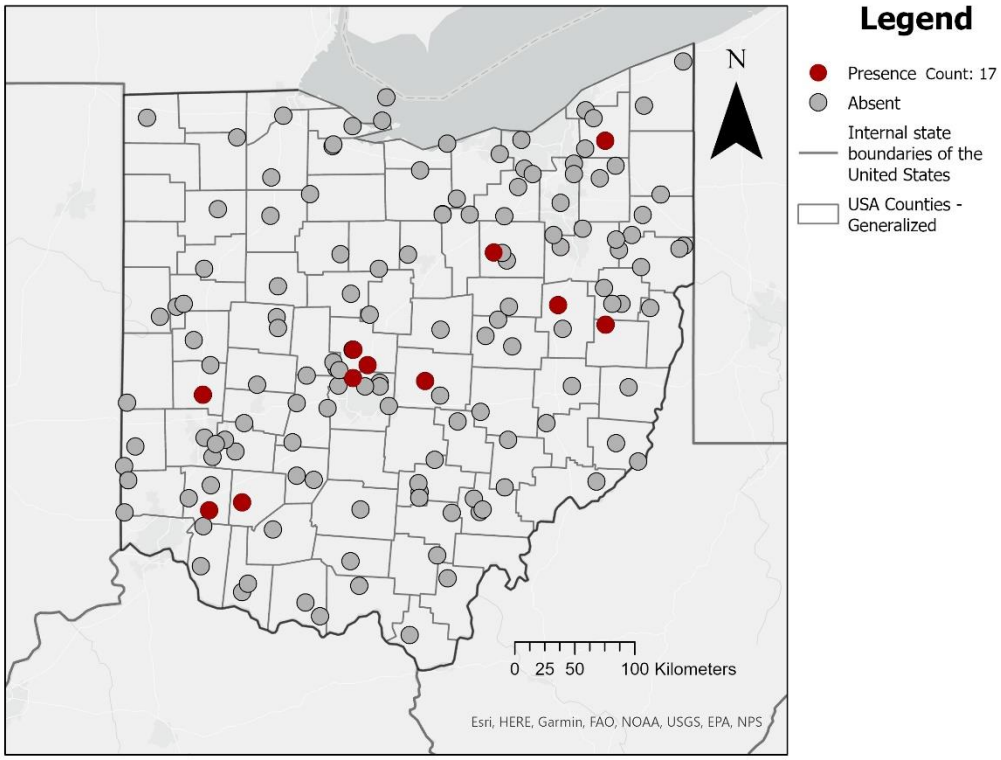
Melissodes denticulatus is in the family Apidae. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. *Melissodes denticulatus* is a specialist of Asteraceae, including *Helianthus,* and *Vernonia* (Fowler and Droege, 2020). It is most reliably found foraging on *Vernonia*.

Melissodes desponsus



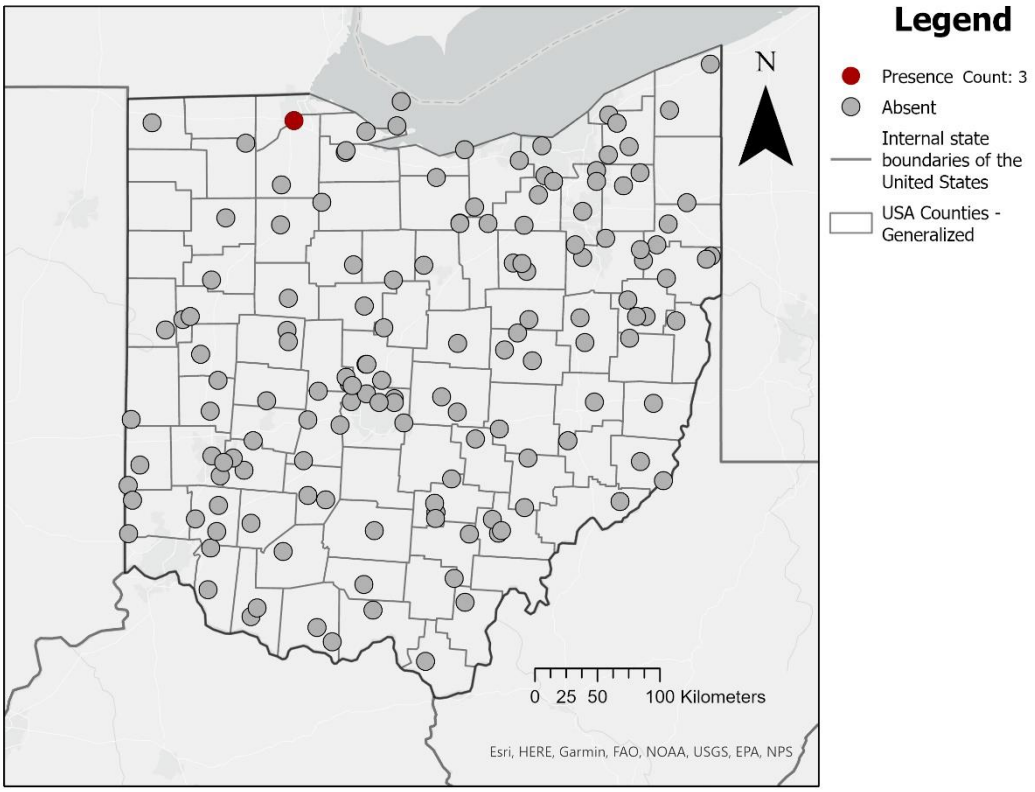
Melissodes desponsus is in the family Apidae. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. *Melissodes desponsus* is a specialist of *Cirsium* (Fowler and Droege, 2020). As such, it is sometimes called the Eastern Thistle Longhorn Bee. Note that *Melissodes desponsus* is most often found on our native thistles, and less likely to use the non-native noxious weed Creeping Thistle, *Cirsium arvense.*

Melissodes druriellus



Melissodes druriellus is in the family Apidae. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. *Melissodes druriellus* is a specialist of Asteraceae, including *Eurybia, Euthamia, Helianthus, Rudbeckia, Solidago, Symphyotrichum, Verbesina,* and *Vernonia* (Fowler and Droege, 2020).

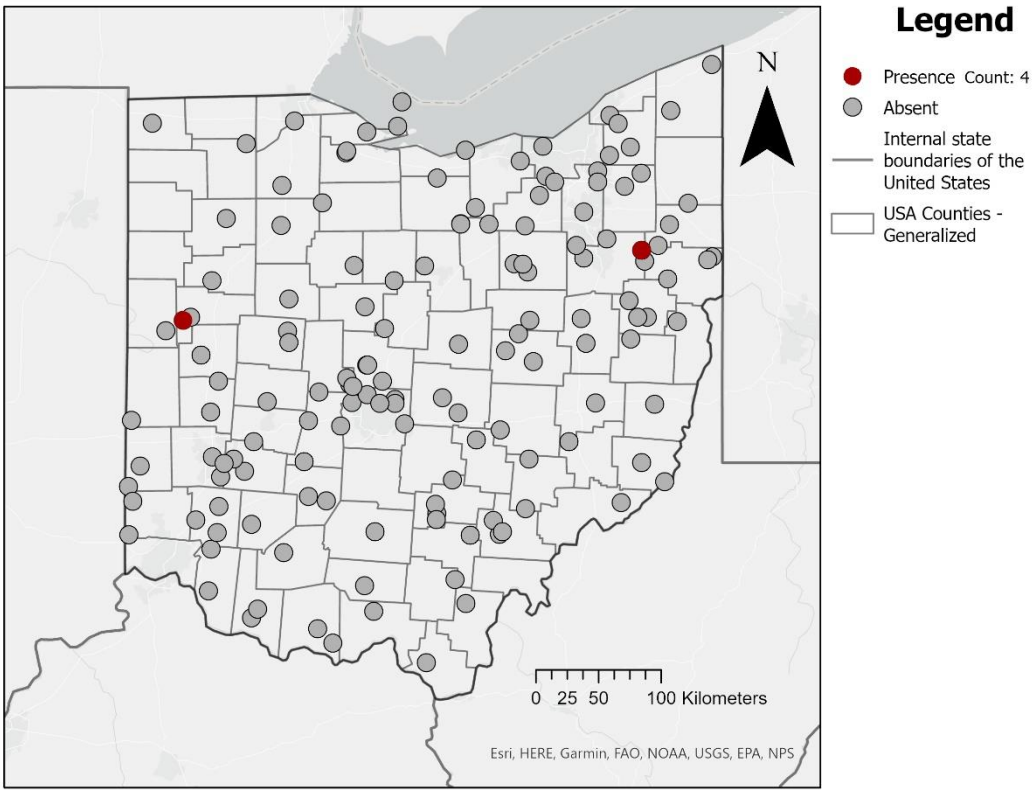
Melissodes illatus



Melissodes illatus is in the family Apidae. It is a specialist of Asteraceae, including *Helianthus, Rudbeckia, Solidago,* and *Symphyotrichum* (Fowler and Droege, 2020). *Melissodes* is a genus of bee that is sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees.

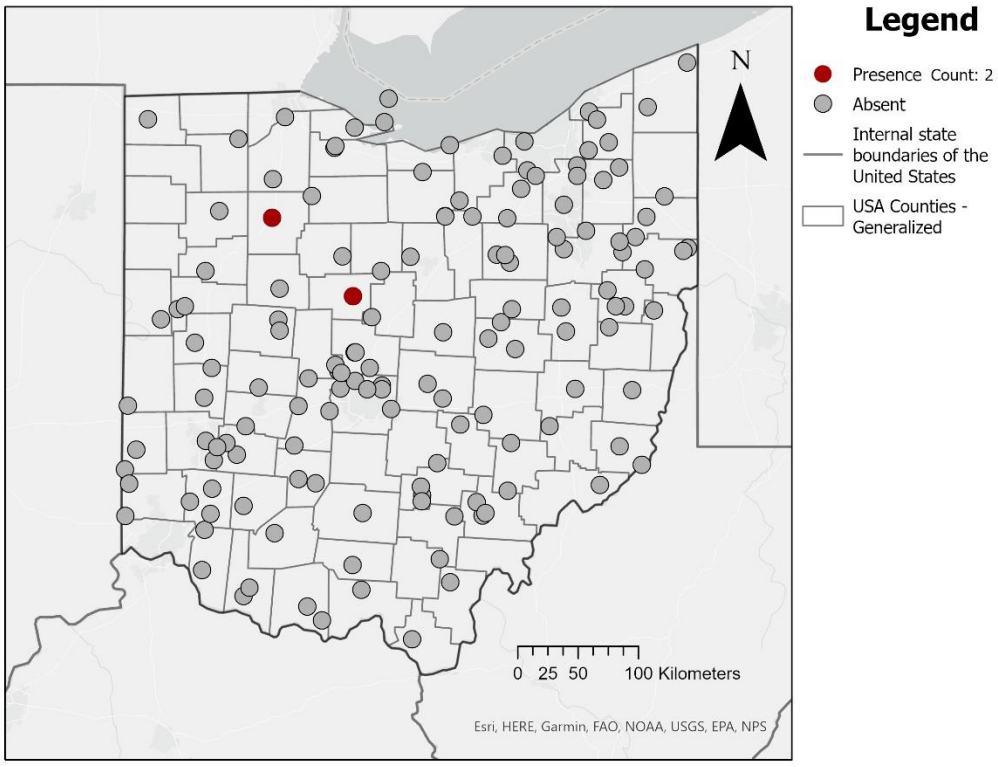
Size range: 9 – 12 mm (female), 8 – 9.5 mm (male)

Melissodes niveus



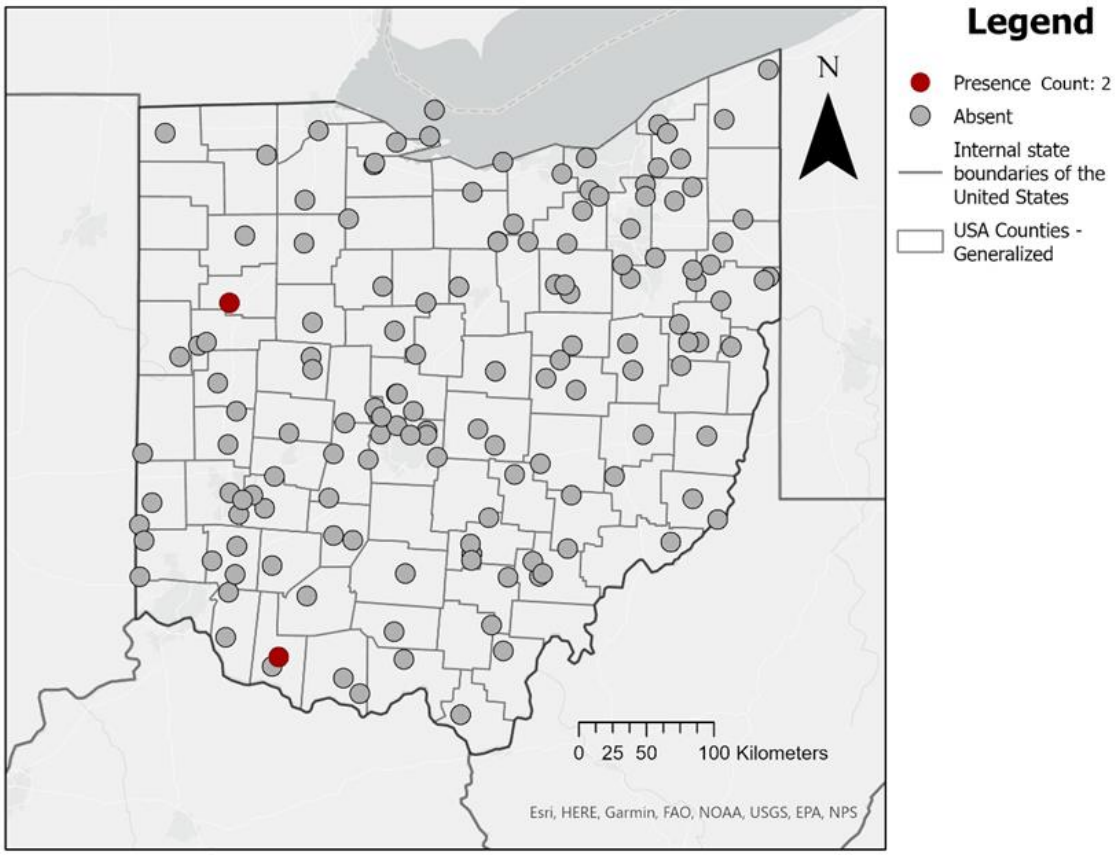
Melissodes niveus is in the family Apidae. Bees in the genus *Melissodes* are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. *Melissodes niveus* is a specialist of Asteraceae, including *Bidens, Chrysopsis, Helianthus, Solidago,* and *Symphyotrichum* (Fowler and Droege, 2020).
Size range: 9.5 – 11.5 mm (female), 9 mm (male).

Melissodes subillatus



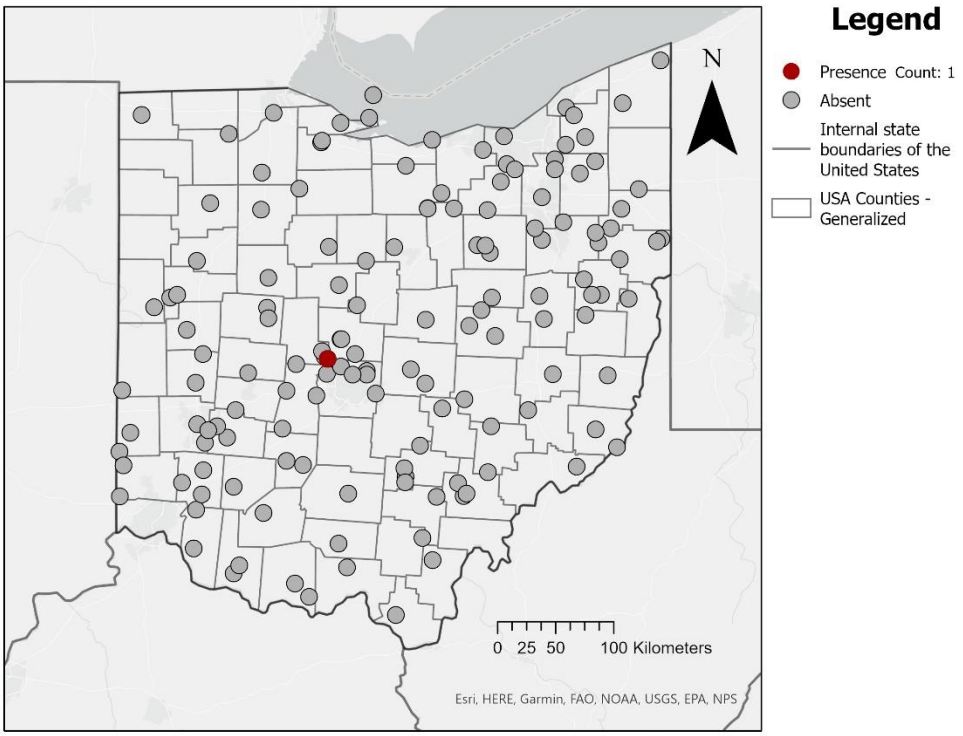
Melissodes subillatus is in the family Apidae. It is a specialist of Asteraceae, including *Coreopsis, Cirsium, Rudbeckia, Symphyotrichum,* and *Vernonia* (Fowler and Droege, 2020). *Melissodes* is a genus of bees that is sometimes referred to as the longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. Size range: 9.5 – 12 mm (female and male)

Melissodes tepaneca



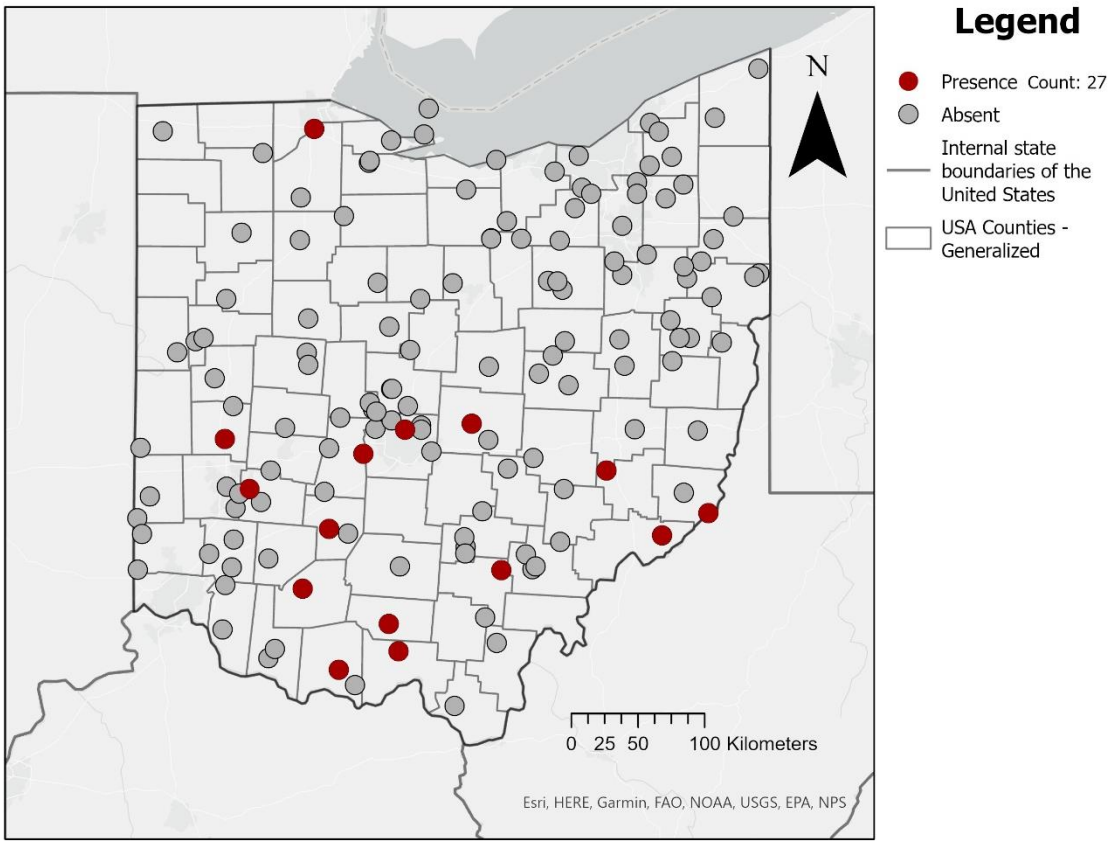
Melissodes tepaneca is in the family Apidae. It is a floral generalist ground-nesting bee. It is tricky to identify and is most similar to *Melissodes communis*. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose.
Size Range: 12-13 mm (female), 9.5 – 11 mm (male)

Melissodes tinctus



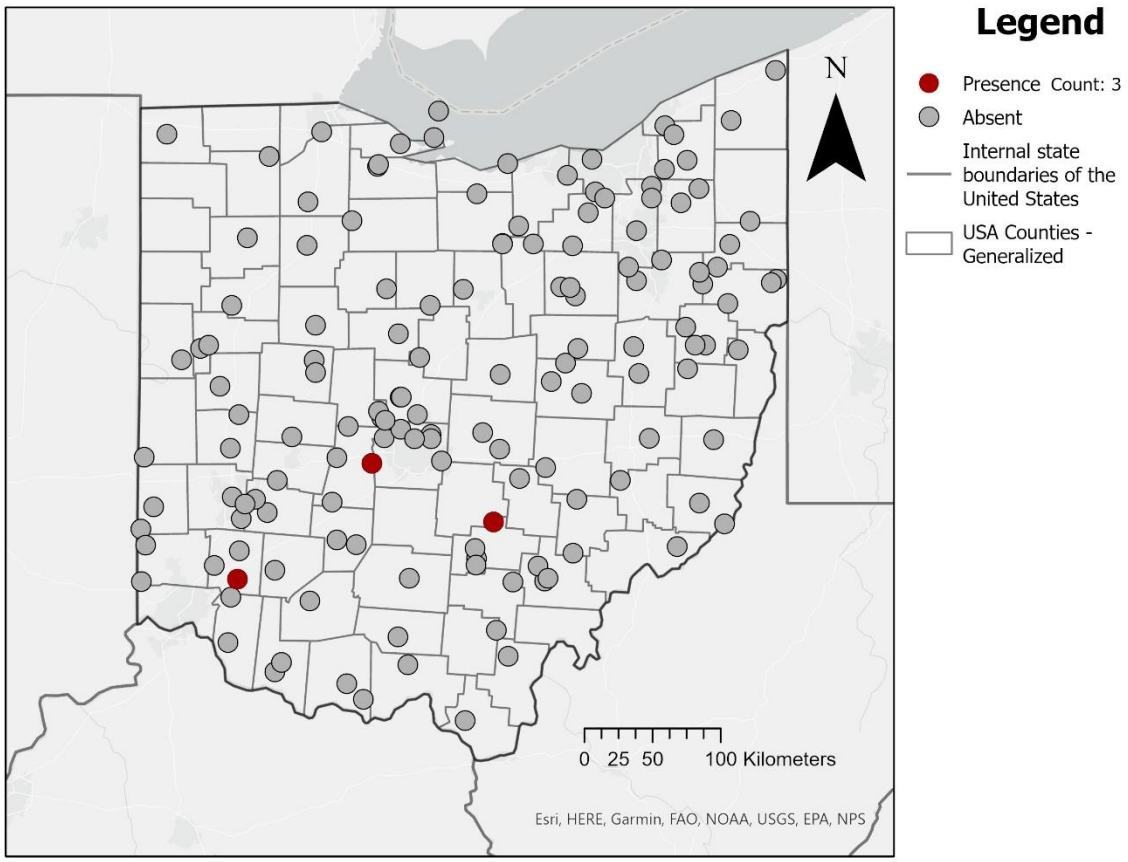
Melissodes tinctus is in the family Apidae. *Melissodes* are a genus of bees that are sometimes referred to as longhorn bees. The longhorn refers to the particularly long antennae in the males, which can reach beyond the thorax when in repose. These are ground nesting bees. *Melissodes tinctus* is a specialist of Asteraceae, including *Chrysopsis, Helianthus, Symphyotrichum*, and *Verbesina* (Fowler and Droege, 2020).

Melitoma taurea



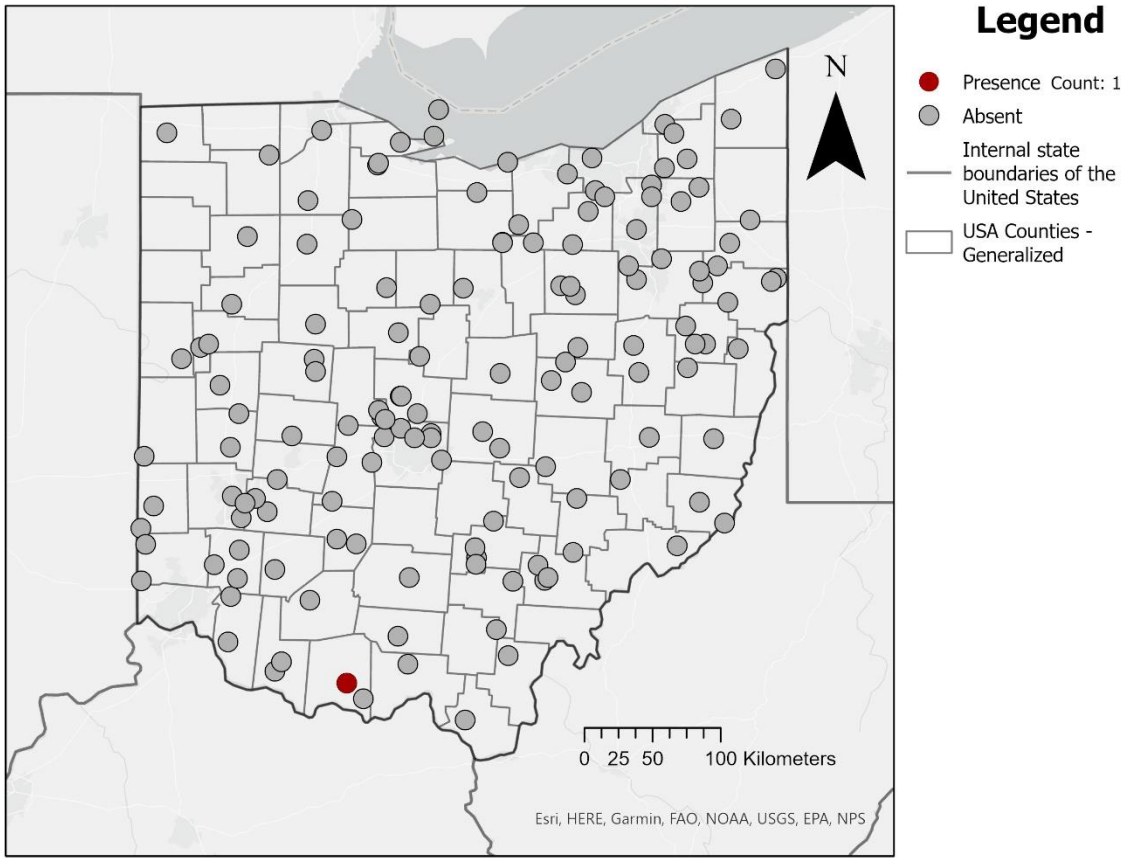
Melitoma taurea is in the family Apidae. It is a beautiful species of ground nesting bee that builds little turrets out of soil around the nest entrances. *Melitoma taurea* is a specialist of *Calystegia* and *Ipomoea* (Fowler and Droege, 2020) and is thus often referred to as the Morning Glory Turret Bee. They can sometimes be found just resting inside the flowers at midday. This is a charismatic grey bee with black patterns on the top of the thorax. Because they are specialist on such deep flowers, they also have very long tongues to be able to reach deep into the flower. The tongues are so long that even when at rest, the tip of the tongue extends to the end of the underside of their thorax.

Nomada affabilis



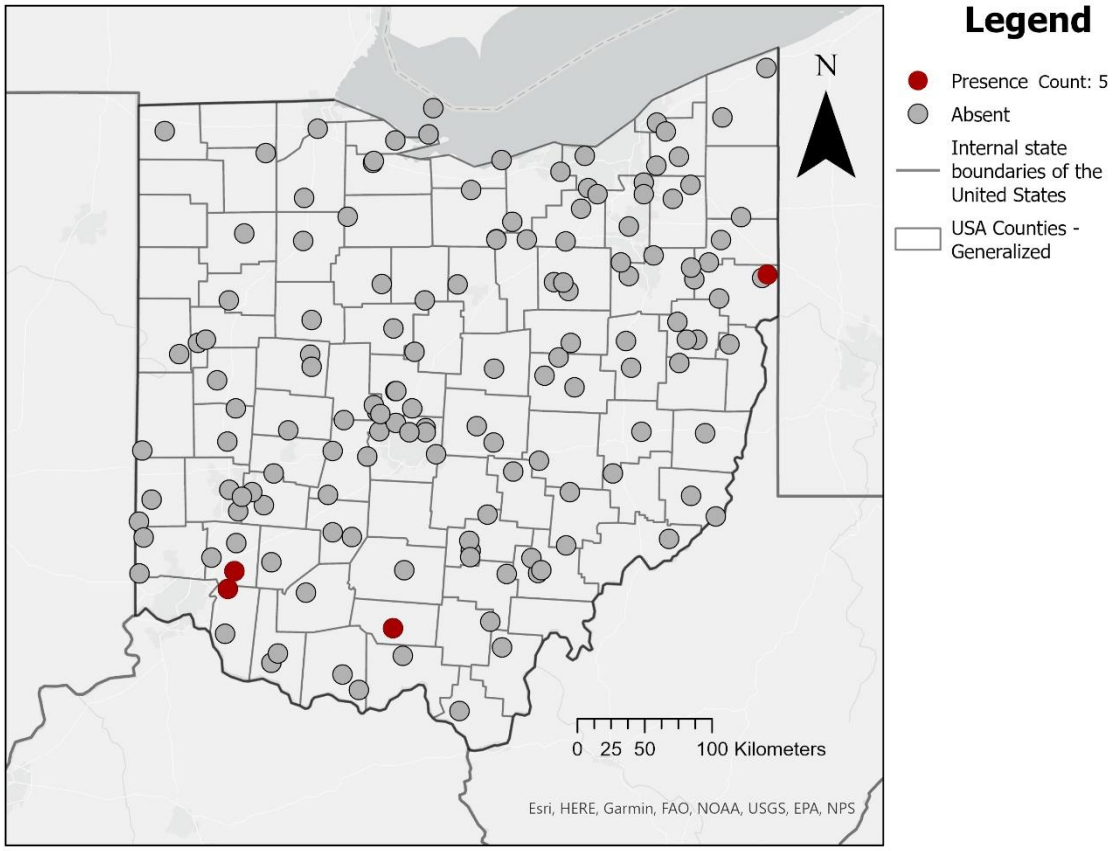
Nomada affabilis is a cleptoparasitic species of bee in the family Apidae. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada affabilis* is a late spring, early summer species with a simple mandible. The males have a yellow scutellum, abdominal bands completely yellow, and propodeum with yellow. The females have a yellow clypeus, abdominal bands completely yellow, propodeum yellow with some black, first antennal segment longer than the second, and hind leg femur with many short, thin, orangish spines. Overall, this genus is difficult to identify and in need of taxonomic revision.
Size range: 9 – 12 mm (female), 10 – 12 mm (male)

Nomada annulata



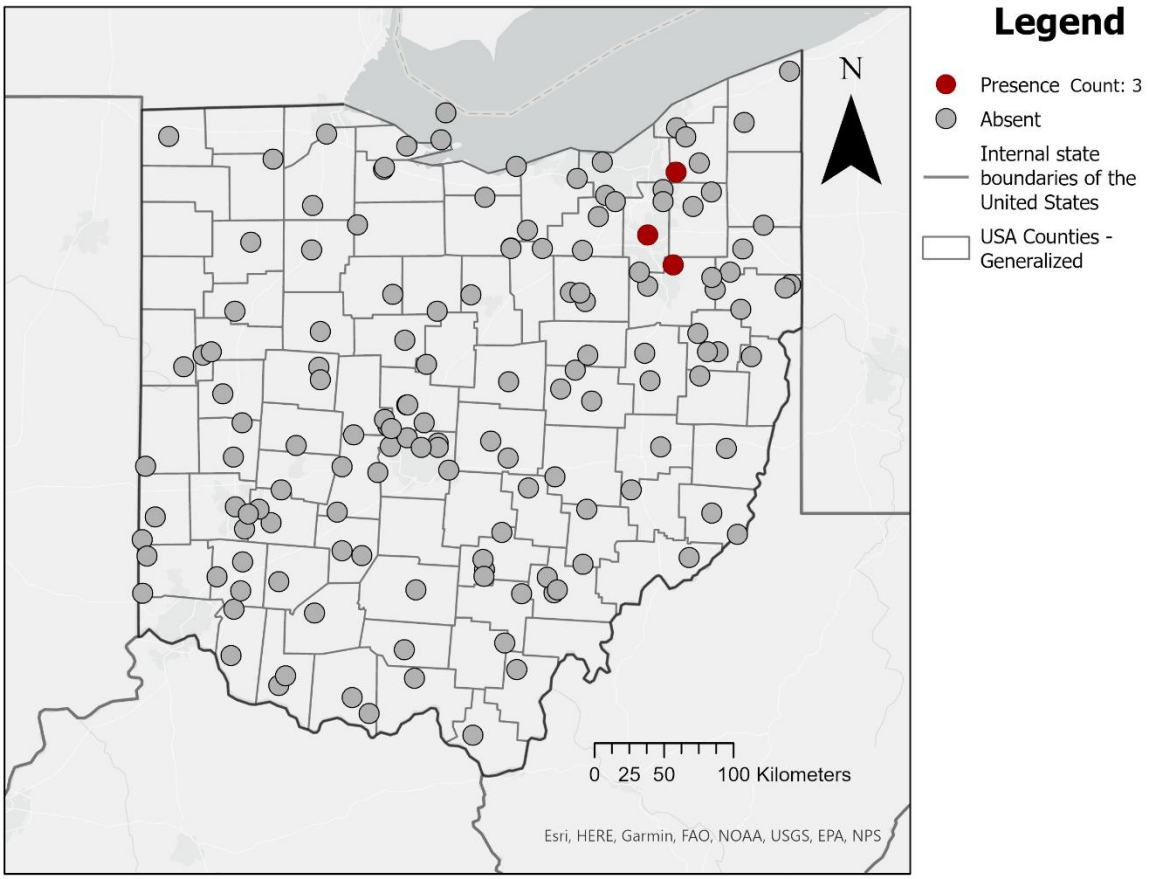
Nomada annulata is a cleptoparasitic species of bee in the family Apidae. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada annulata* is a spring species with a simple mandible. The males have a black scutum, yellow scutellum, propodeum and mesepisternum primarily black, yellow stripes on the abdomen, and first and second antennal segments equal.
Size range: 8 – 9 mm (female), 6.5 – 9.5 mm (male)

Nomada articulata



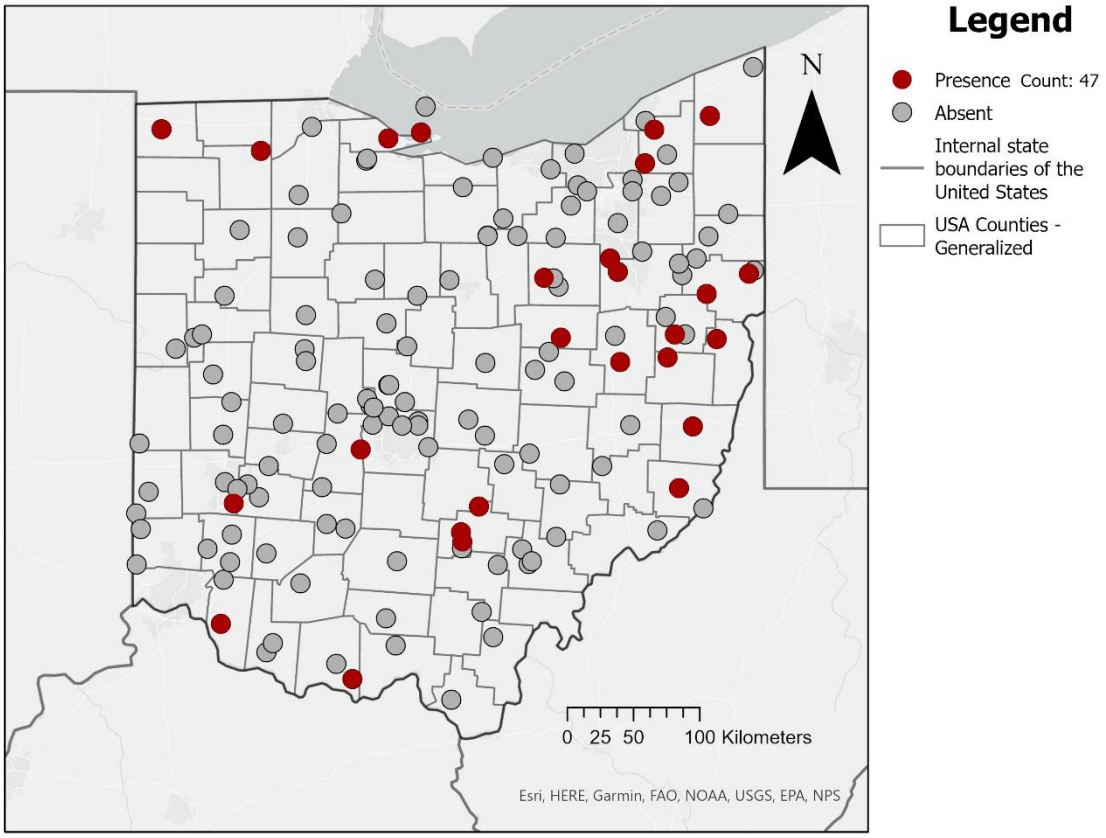
Nomada articulata is a cleptoparasitic species of bee in the family Apidae. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada articulata* is a late spring, early summer species with a simple mandible. The females have an entirely red abdomen without yellow and the hind tibia has several thick red hairs that are as long as the surrounding hairs. The male has a distinct spine on the underside of the antennae.
Size range: 8.5 mm (female), 8.5 – 9.5 mm (male)

Nomada australis



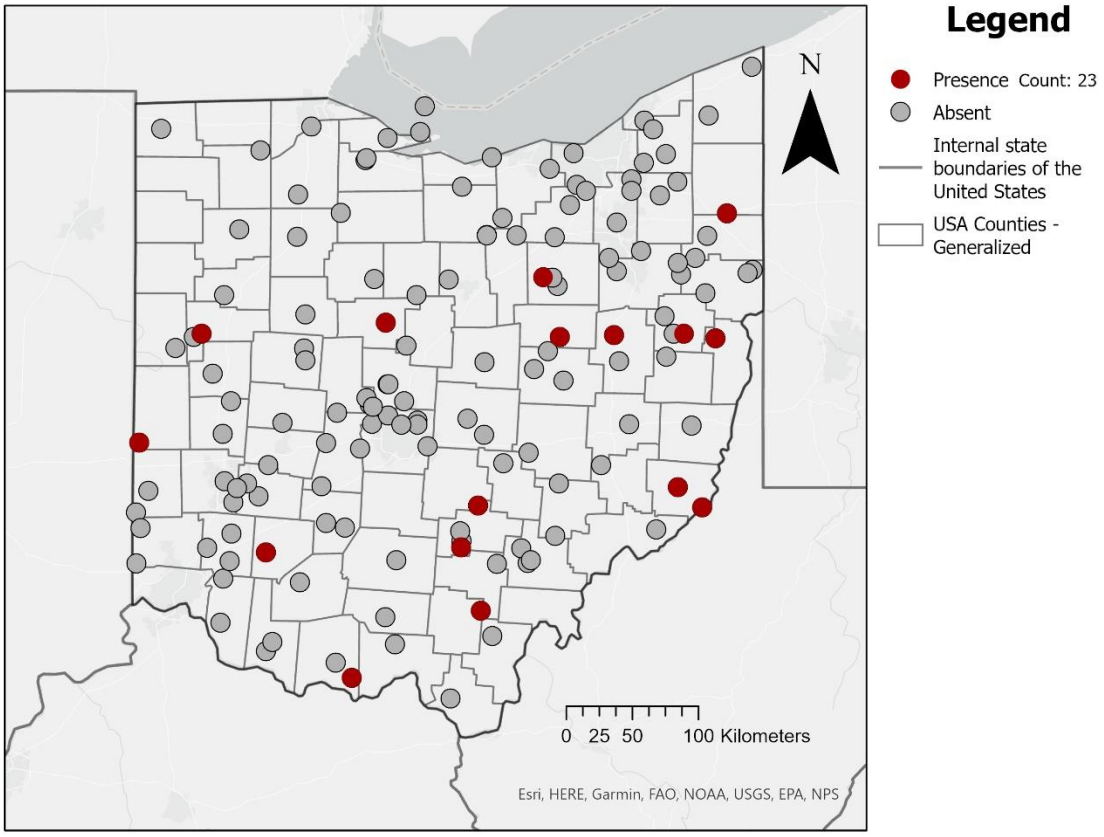
Nomada australis is a cleptoparasitic species of bees in the family Apidae. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada australis* is a late spring species with a simple mandible. The females have an entirely red body and long red spines on the hind tibia.
Size range: 7 – 8 mm (female), 7 – 9 mm (male)

Nomada Bidentate Group



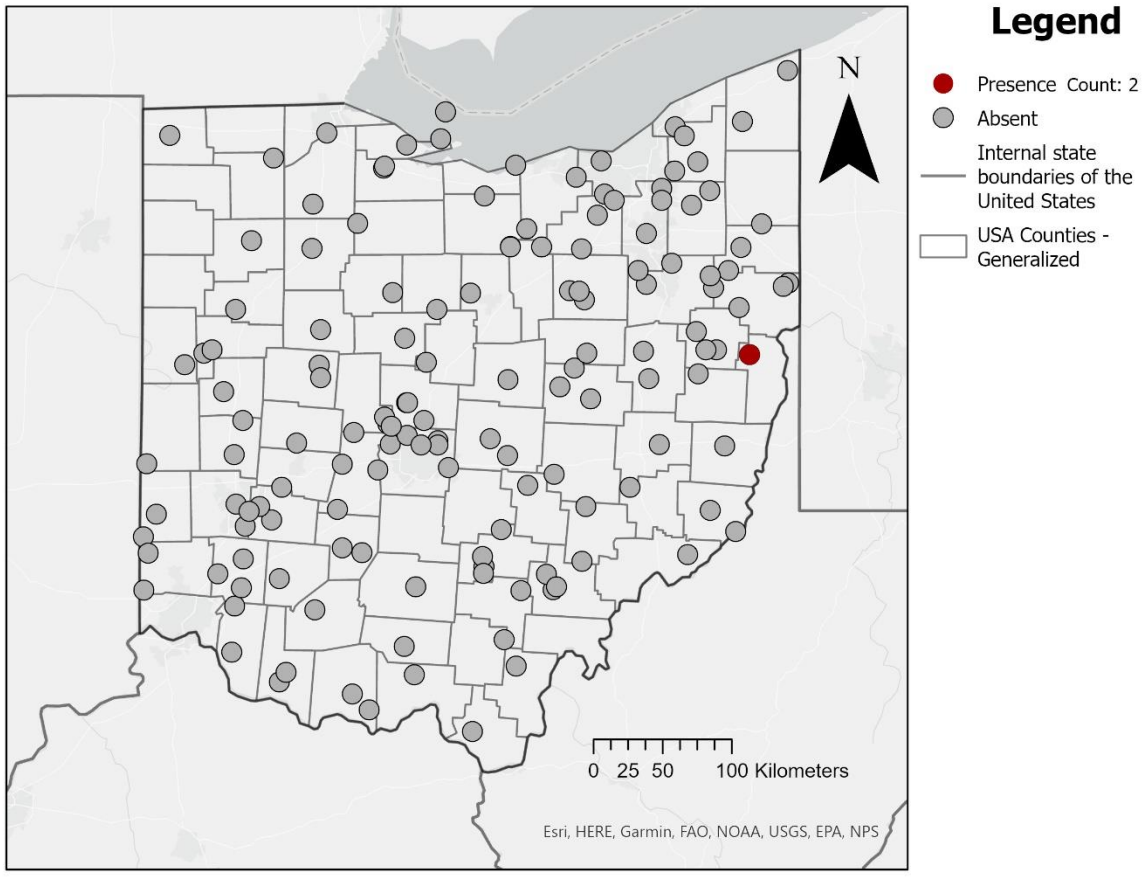
This is a cleptoparasitic group of bees that seek out nests of other bees to lay their eggs into. Anything identified as *Nomada* Bidentate Group is a group of Nomada with a bidentate (with a small tooth) mandible. This group of *Nomada* is in dire need of revision and thus everything with a tooth on the mandible was lumped into this group.

Nomada cressonii



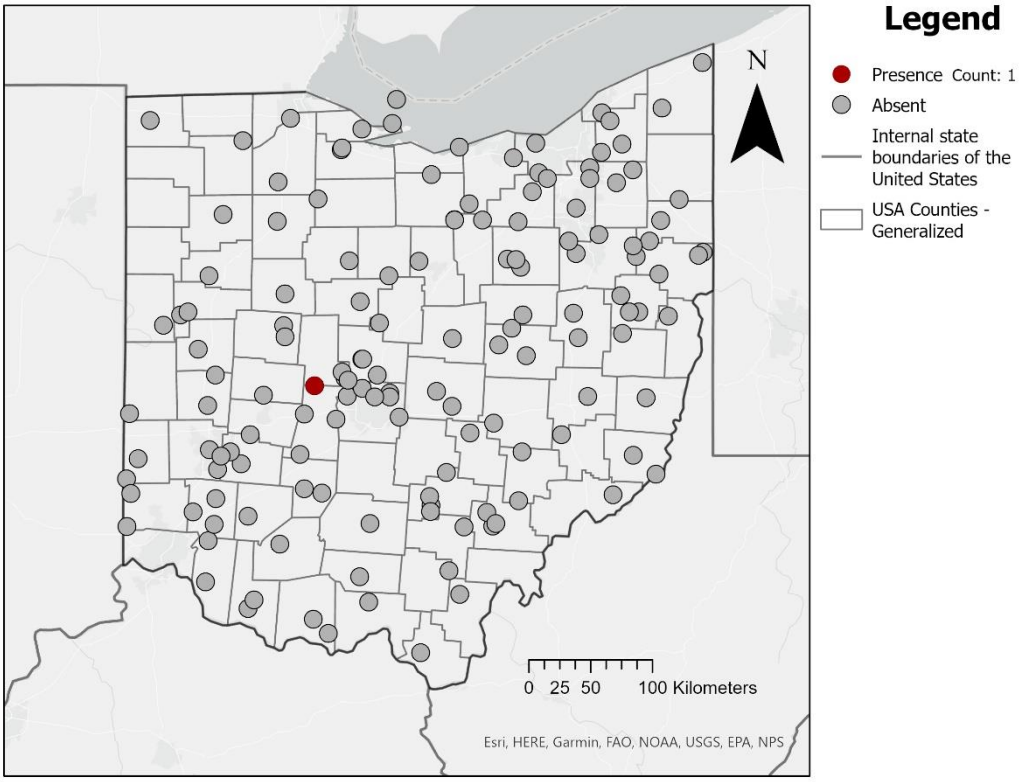
Nomada cressonii is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada cressonii* is a late spring, early summer species with a simple mandible. It is one of the very red species with a variable amount of yellow on the body. The hind tibial hairs are long and clear.

Nomada denticulata



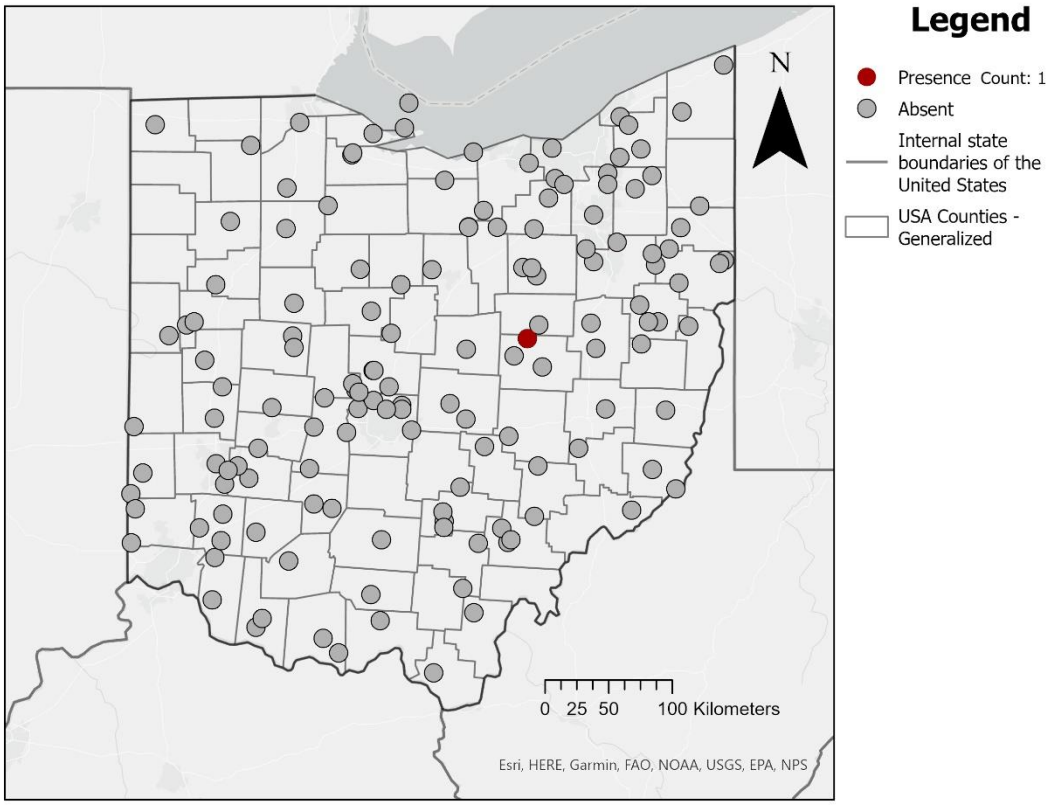
Nomada denticulata is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada denticulata* is an early summer species that can be tricky to identify. The female primarily red with some yellow. The male is black, red, and yellow. The key characters to separate them from other species can be tricky.

Nomada electa



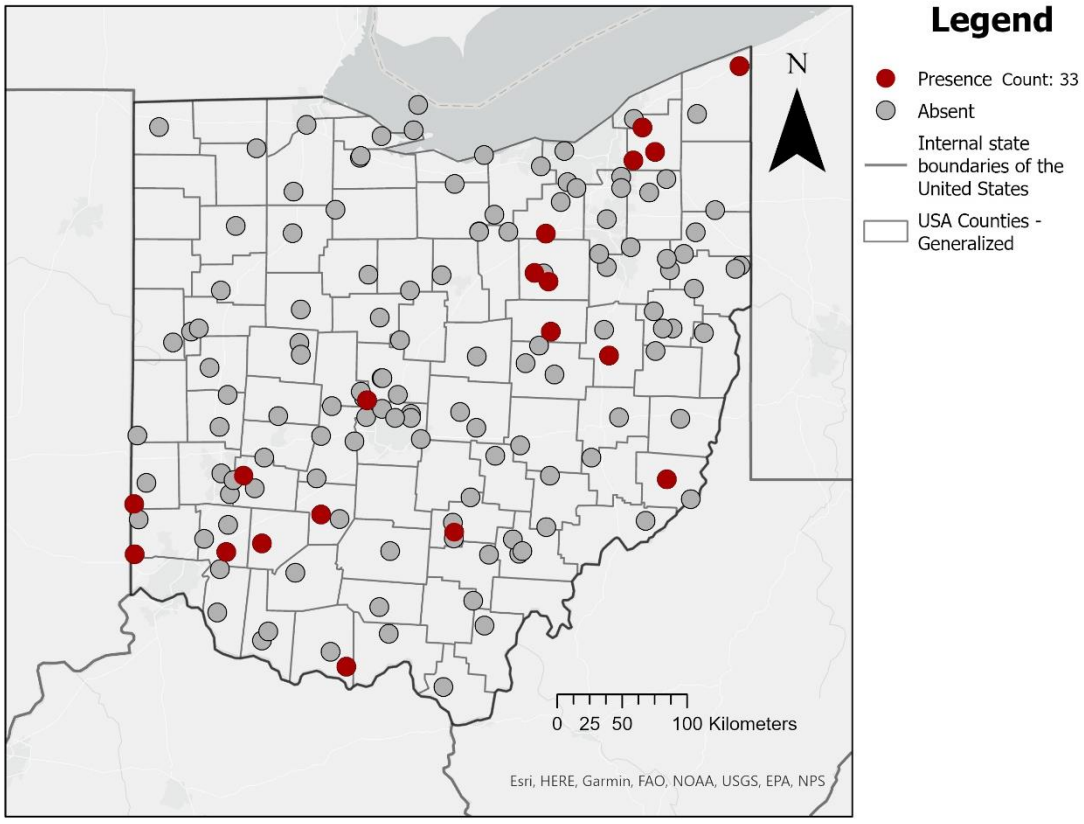
Nomada electa is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada electa* is a rare species of a fall flying *Nomada* with a simple mandible. It is a probable state record as it has not been previously reported for Ohio. Our single male specimen has yellow on the scutellum, t1-3 with narrowly separated yellow, segments t4-6 with completely yellow stripes, propodeum and supraclypeus black, clypeus yellow, and the hind tibia with short, thick hairs.

Nomada fragariae



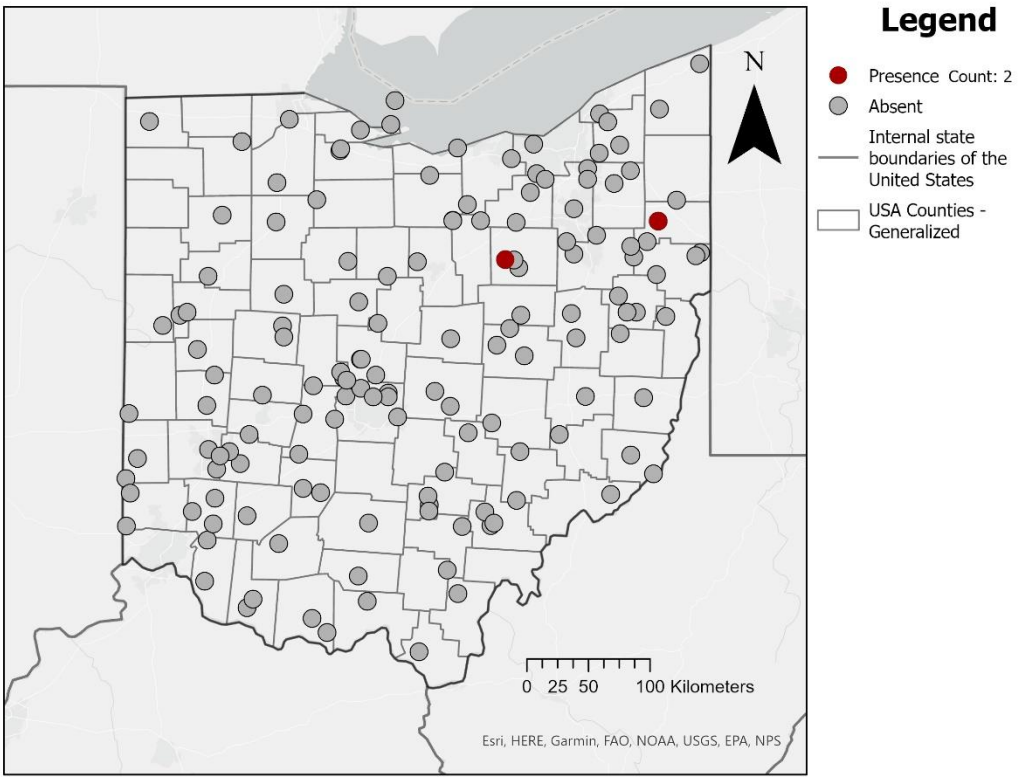
Nomada fragariae is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. We found a single female with the following characters: yellow clypeus, all abdominal segments with complete yellow stripes, propodeum with yellow, scutum mostly red with some yellow, scutellum yellow, hind tibia with 6 long, thin, reddish spines that extend beyond the length of other hairs, t2 and t3 pits extend all the way to the rim, and labral process about 1/3 from bottom of labrum.

Nomada imbricata



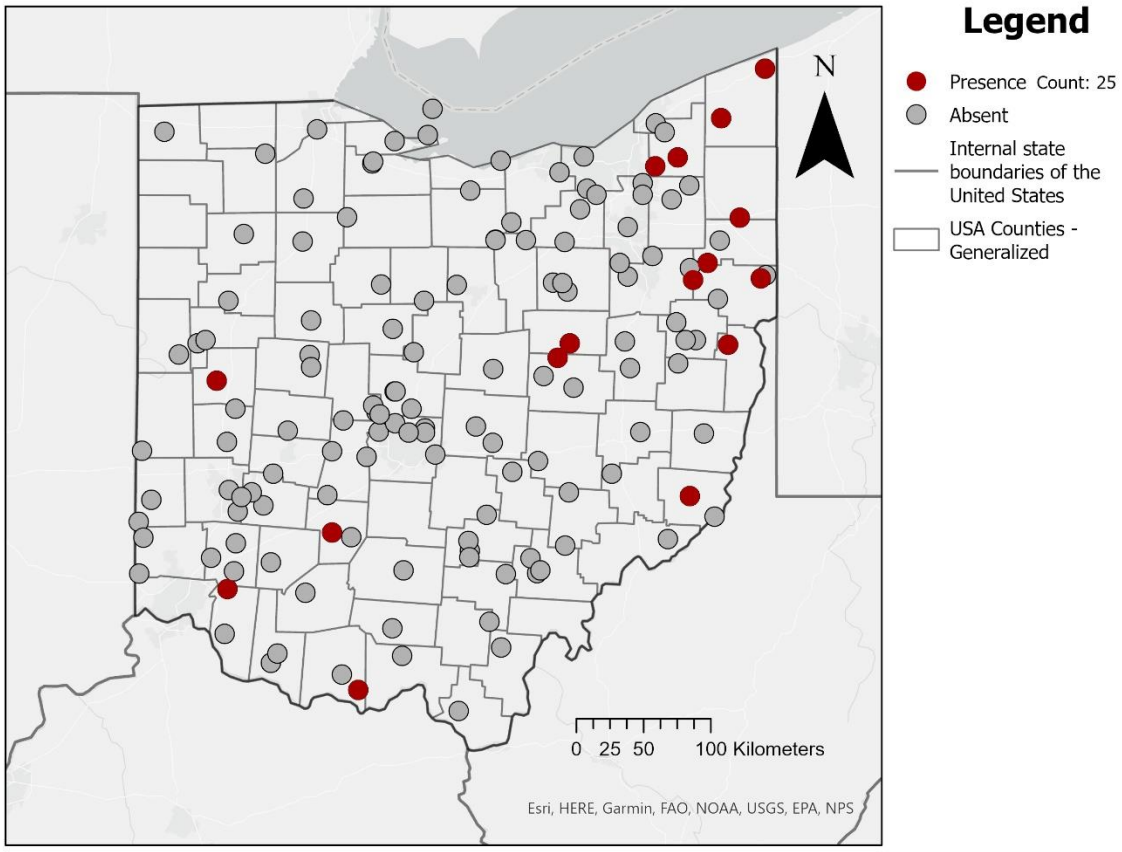
Nomada imbricata is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada imbricata* is a late spring, early summer species with a simple mandible. We were only able to confidently identify the females of the species. The females have a yellow clypeus, first abdominal segment with broken yellow, with the rest of the segments having full yellow stripes, propodeum yellow with some black and red, scutum mostly red with some yellow, scutellum yellow, hind tibia with 3 short, thick, red spines.

Nomada integerrima



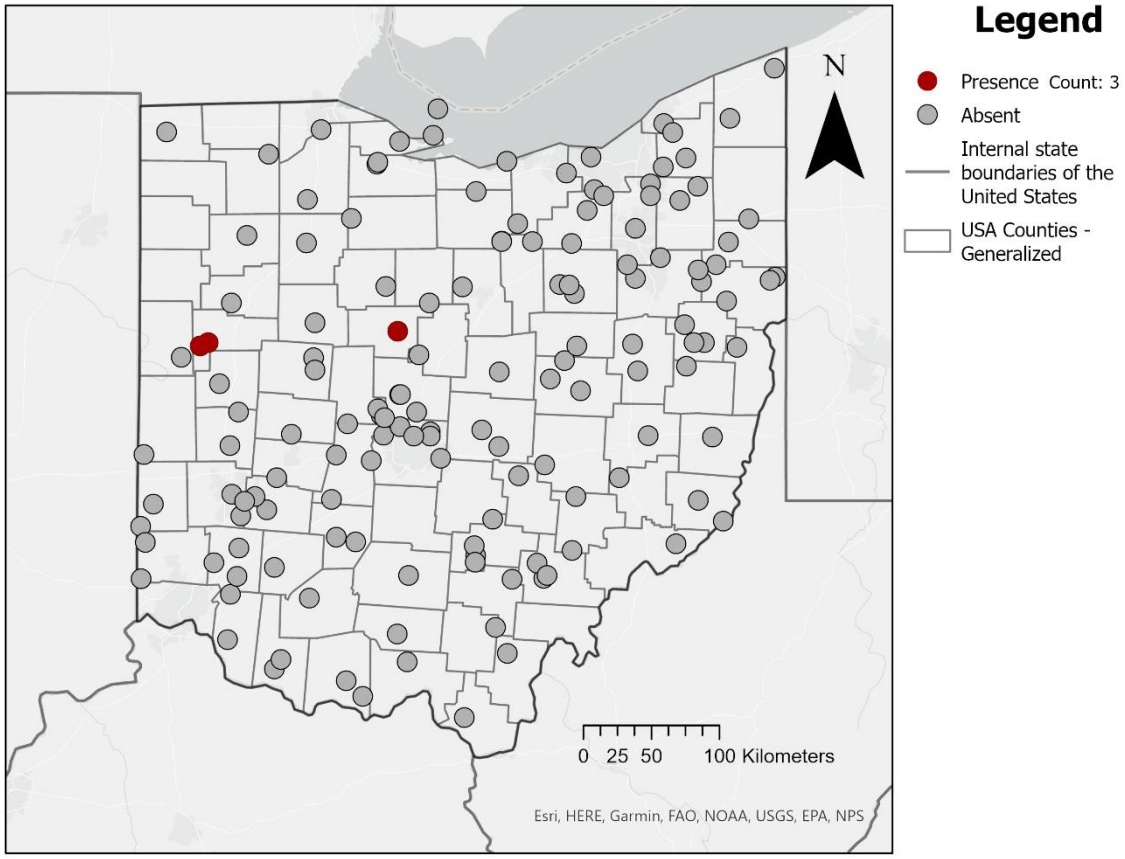
Nomada integerrima is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. We caught two specimens, both of which were males from late May and early June. The males were overall small, with a black scutellum, no markings on t1, t2-3 with widely separated markings, t6 yellow, clypeus yellow below and black above, and supraclypeal area black.

Nomada luteoloides



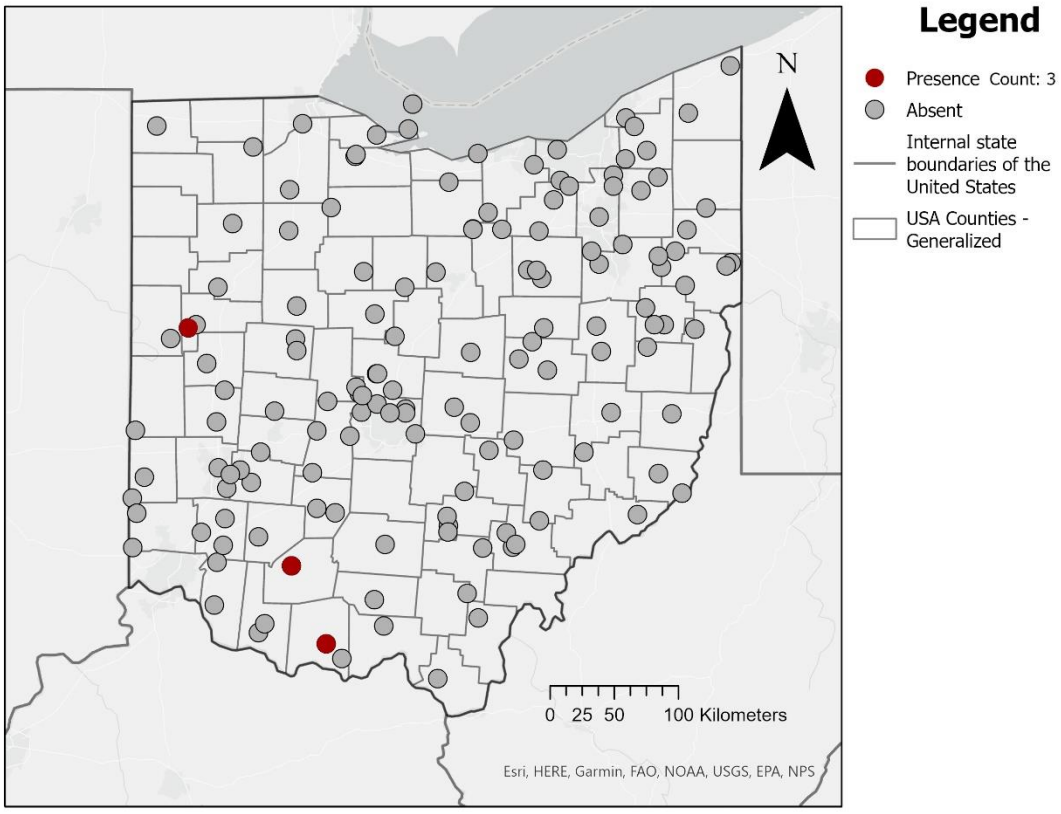
Nomada luteoloides is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada luteoloides* is a late spring, early summer species with a simple mandible. The males have an entirely black scutum, black scutellum with yellow spots, propodeum mostly black, and hairs on mid femur more than a quarter of the femur width. The females have a yellow clypeus, complete yellow stripes on all abdominal segments, propodeum yellow laterally with black in center, black scutum, and hind tibial with 2 short, thick, red and strongly curved setae.

Nomada obliterata



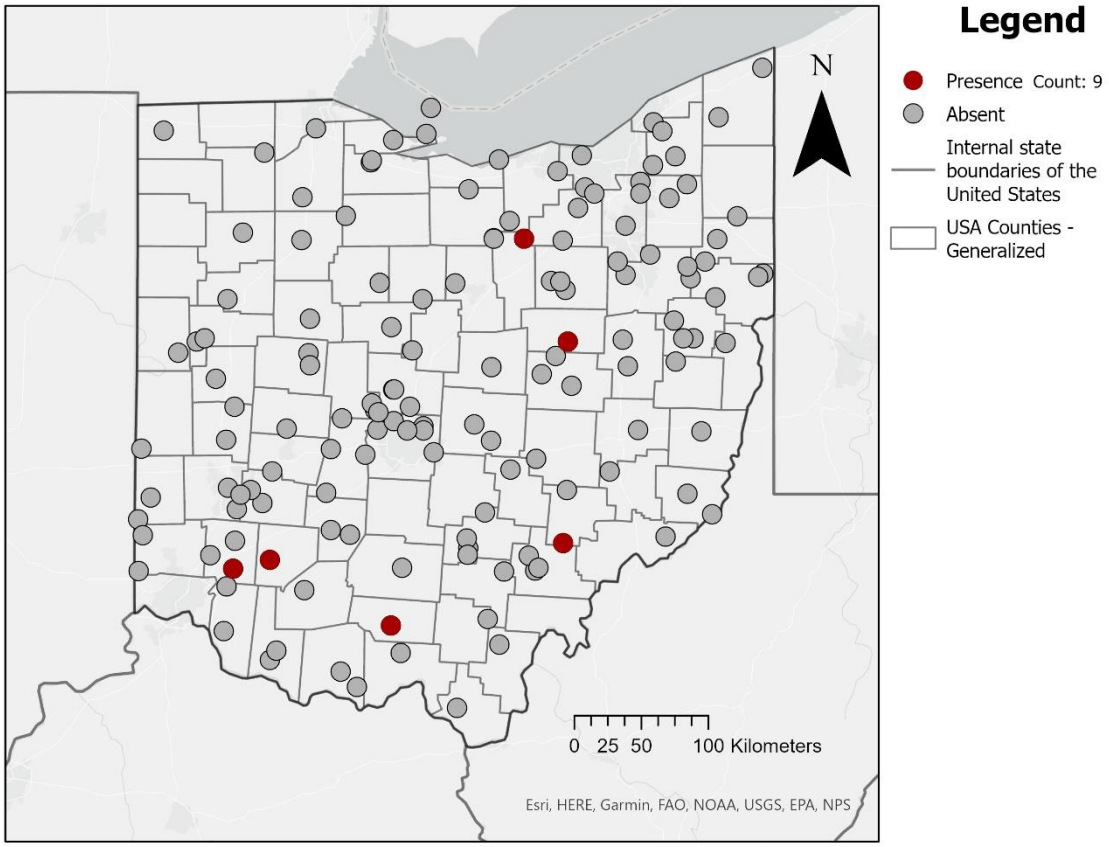
Nomada obliterata is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada obliterata* is a fun species of *Nomada* with an easy character that separates it from other *Nomada*. Most *Nomada* have 3 submarginal cells, but *Nomada obliterata* has only two! It is still important to check other characters as sometimes bees can improperly form wings that are missing veins, and thus look like they only have two cells. Most often, when that happens, it only occurs on one wing, so check both wings. This character applies to both males and females. We caught representatives of both sexes in late May and early June.

Nomada parva



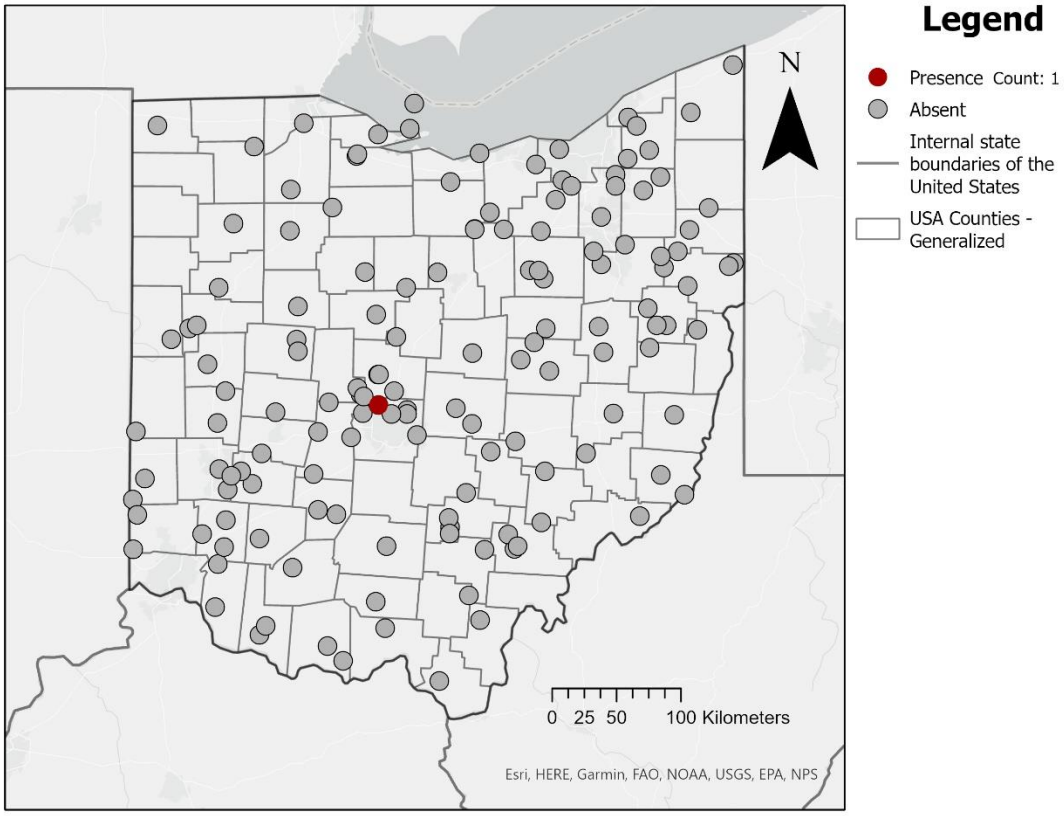
Nomada parva is in the family Apidae. It is a cleptoparasitic species of bee. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. We caught 3 males of *Nomada parva*, all in May. The males are very small, with black scutellum, t1 no yellow, t2-4 with dots of yellow only laterally, hind tibia with a yellow stripe, the first antennal segment shorter than the second, and the third antennal segment also shorter than the second. Size range: 5 – 5.5 mm (female), 4.5 – 5.6 mm (male)

Nomada placida



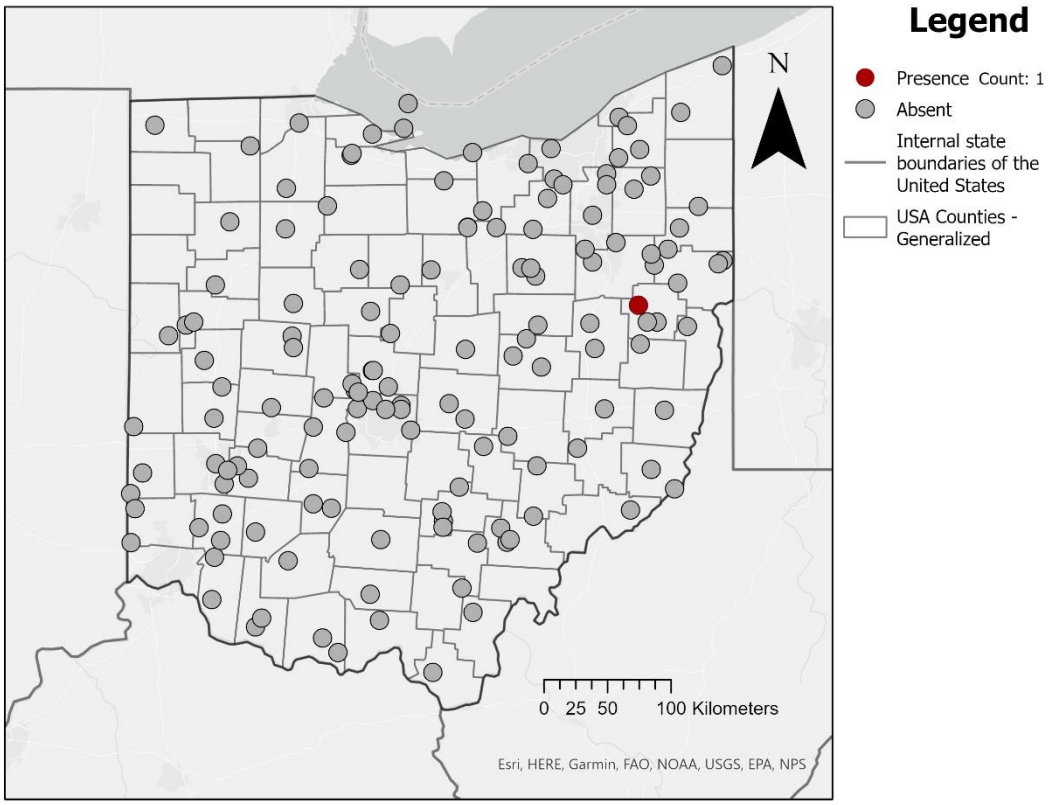
Nomada placida is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. Most species of *Nomada* emerge in the spring, matching their host bees. However, *Nomada placida* is one of the few fall emerging species! The males have a yellow scutellum, t1 with no yellow, t2-3 with yellow separated, and remaining segments with complete yellow stripes, The hind tibia has 3 reddish, thick hairs, the clypeus is yellow, propodeum and mesepisternum black, and the first antennal segment only slightly longer than the second. The female has a yellow clypeus, labrum with bump all the way on the edge, t1 without yellow, t2-3 with separated yellow, t4-5 with completely yellow stripes, and hind tibial hairs dark, thick and with 3-5 on each leg.

Nomada pygmaea



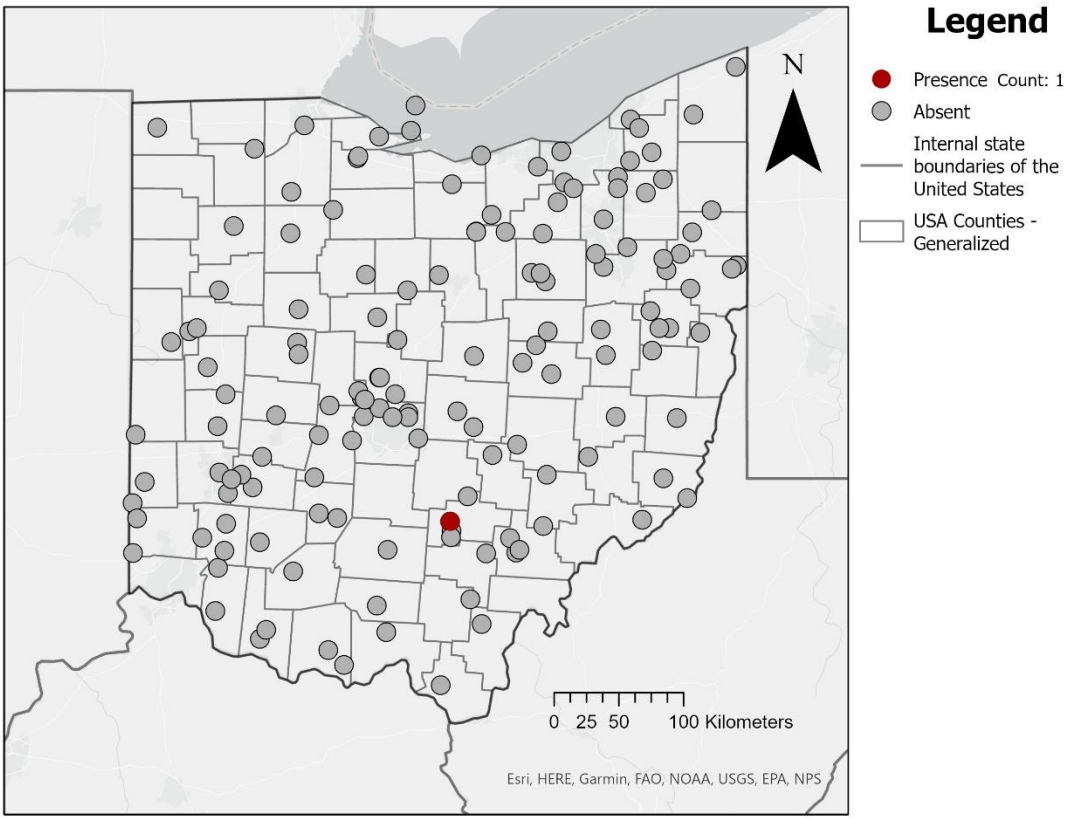
*Nomada pygmae*a is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada pygmae*a is another spring emerging species with a simple mandible. This is one of the smaller reddish species. We collected a single female that did not have any yellow on t4 or t5.

Nomada seneciophila



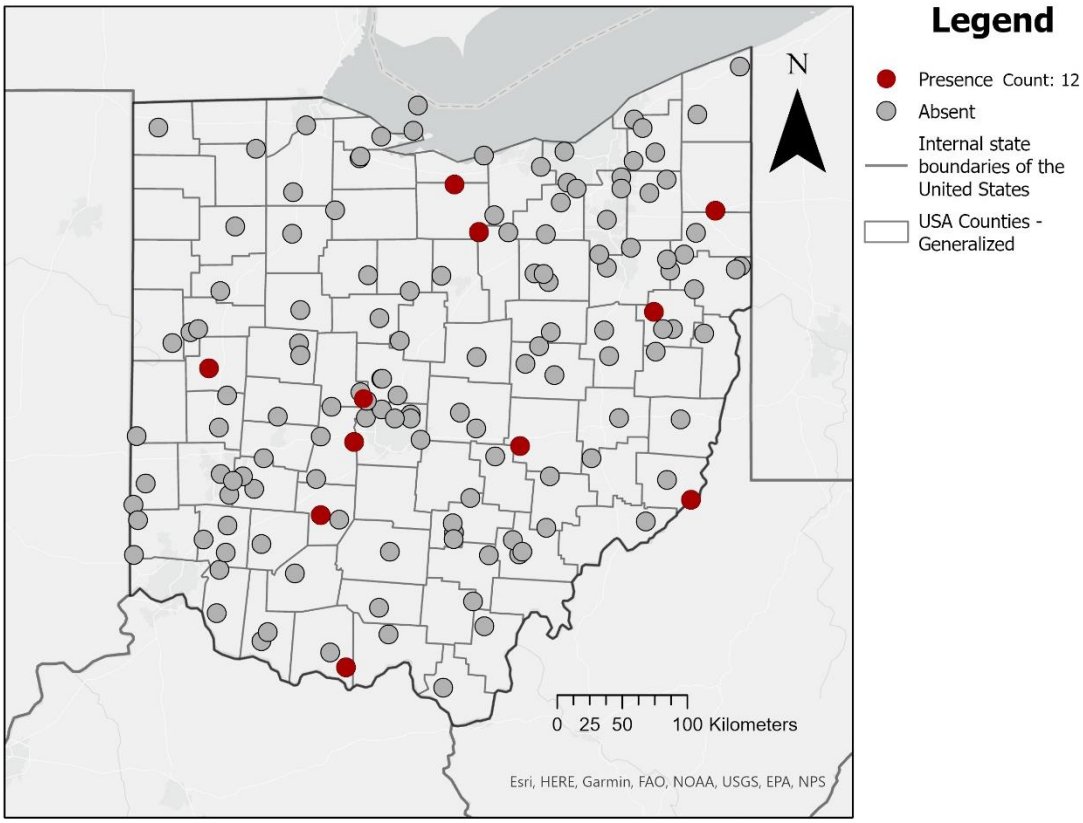
Nomada seneciophila is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada seneciophila* is a species with a simple mandible that emerges in the late spring. We caught a single female that has a red clypeus, red t1, t2-3 with widely separated yellow, t4-5 with yellow stripe not separated, propodeum black, left tibia with 2 spines, right with 3, all longer than surrounding hairs. This is a probable state record. The host bee is thought to be *Andrena gardineri.*

Nomada superba



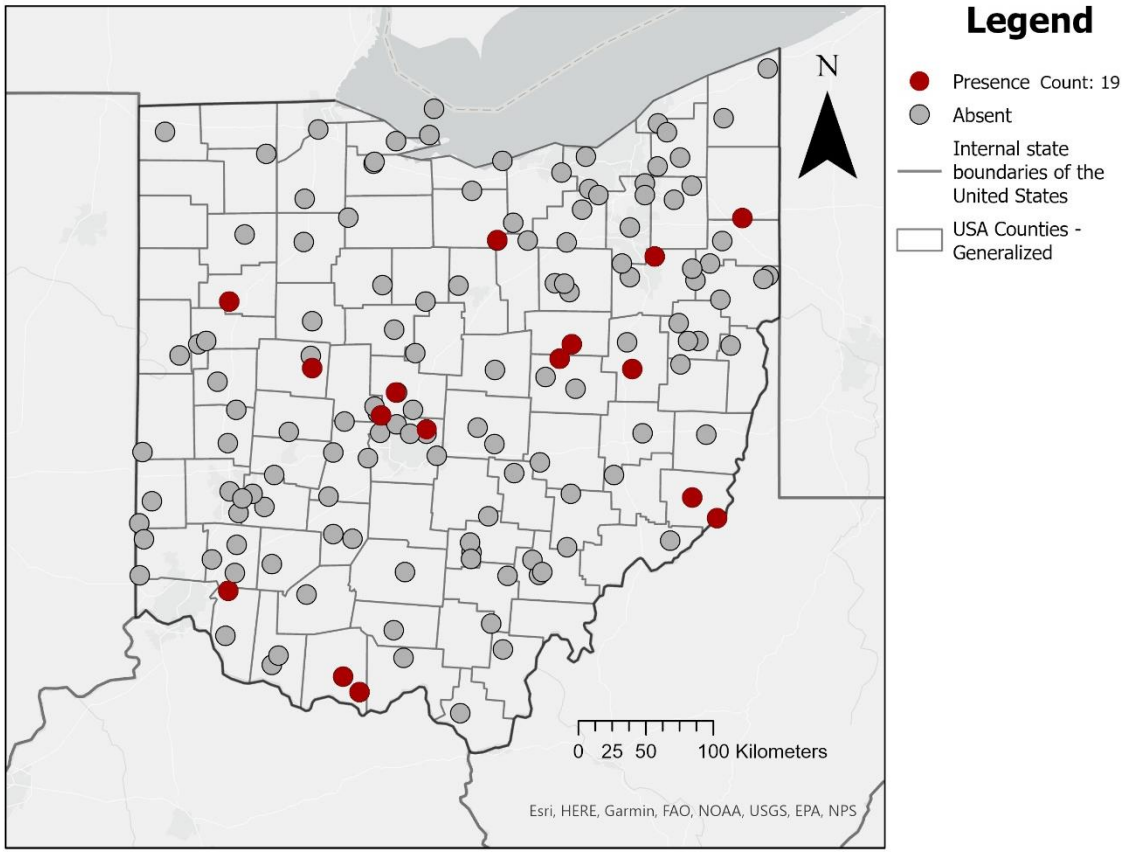
Nomada superba is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Nomada superba* is a spring emerging species with a simple mandible. We caught a single male, which has a black scutum, black scutellum with yellow dots, t1-6 with complete yellow stripes, yellow clypeus, black supraclypeus, many tiny hairs on the hind tibia, and propodeum entirely black.

Osmia albiventris



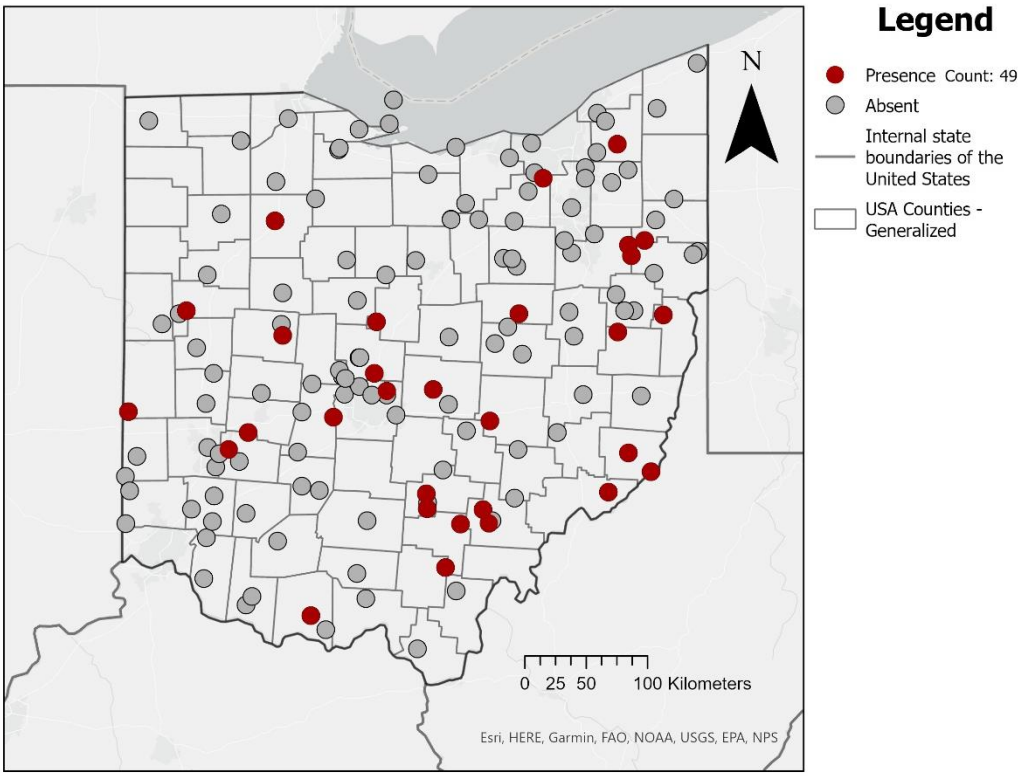
Osmia albiventris is in the family Megachilidae. Bees in the genus *Osmia* are called Mason bees because they often line their cavity nests with mud. However, several species of *Osmia* actually line their nests with finely mashed leaf matter, as is the case with *Osmia albiventris* (Medler, 1967). They seek out cavities and crevices in stems, trees, and even rocks! Several are willing to use bee trap nests made of cardboard straws of the appropriate width and depth. These are solitary bees. *Osmia albiventris* can be found in late spring and into the summer across Ohio. It is superficially similar to our much more common *Osmia pumila.*

Osmia atriventris



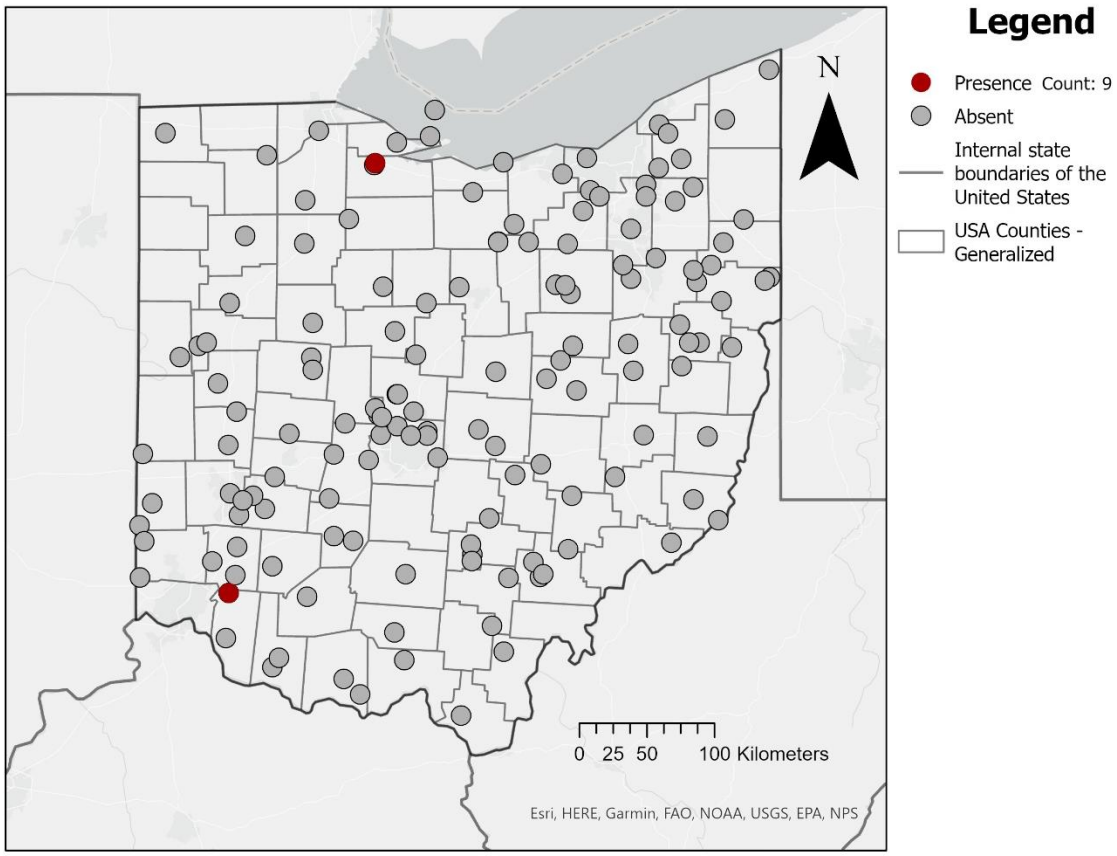
Osmia atriventris is in the family Megachilidae. Bees in the genus *Osmia* are called Mason bees because they often line their cavity nests with mud. They seek out cavities and crevices in stems, trees, and even rocks! Several are willing to use bee trap nests made of cardboard straws of the appropriate width and depth. These are solitary bees. *Osmia atriventris* can be found across Ohio from late spring into summer. This is one of the few species of *Osmia* that have black pollen collecting hairs on their stomach (scopa), whereas most other female *Osmia* have white or yellowish hairs. It is sometimes given the common name of the Blueberry Bee or the Black-bellied Mason bee, but neither name is particularly accurate as it visits many other species of plants and it is not the only mason bee with black scopal hairs.

Osmia bucephala



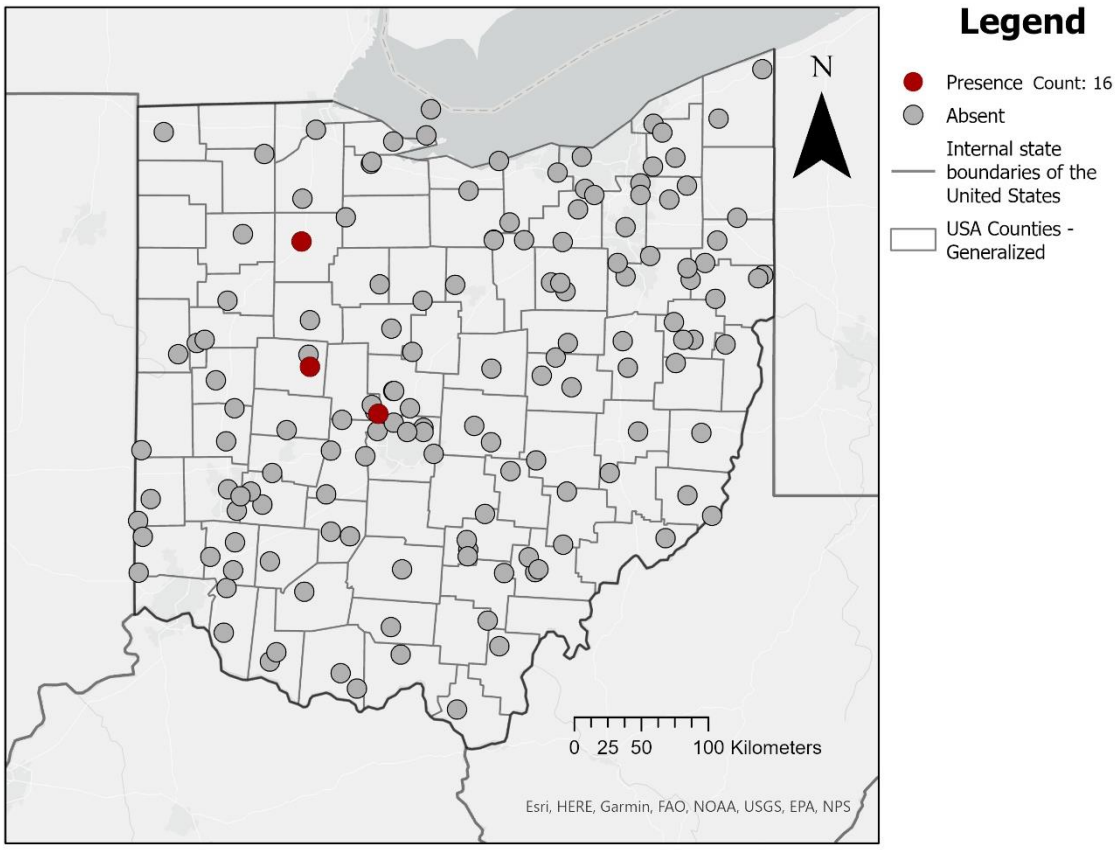
Osmia bucephala is in the family Megachilidae. It is common across Ohio between May and June. This species looks superficially similar to a bumble bee with a quick glance given how much yellow fuzz is on the thorax and the overall size, but the pollen collecting hairs on the underside of the abdomen are one of the key characters to separate the groups. *Osmia bucephala* is also one of the few *Osmia* in our area to have black scopal hairs compared to the normal pale white or yellowish hairs. This is a medium sized charismatic bee that is relatively easy to identify, and thus well represented on community science platforms like iNaturalist.

Osmia caerulescens



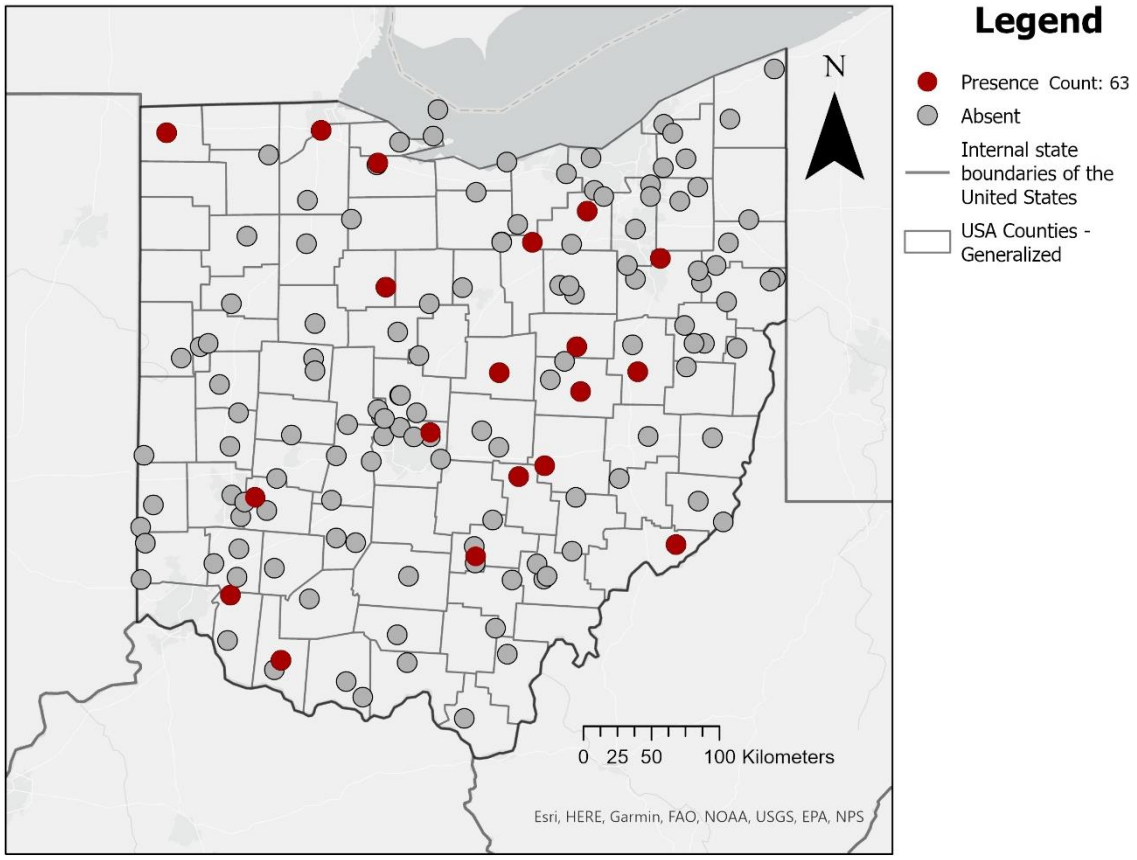
Osmia caerulescens is in the family Megachilidae. Bees in the genus *Osmia* are called Mason bees because they often line their cavity nests with mud. However, several species of *Osmia* actually line their nests with finely mashed leaf matter, as is the case with *Osmia caerulescens* (Medler, 1967). They seek out cavities and crevices in stems, trees, and even rocks! Several are willing to use bee trap nests made of cardboard straws of the appropriate width and depth. These are solitary bees. *Osmia caerulescens* can be found in late spring and into the summer in Ohio. This is one of the trickier species of the group to identify and microscopic examination of many characters is required.

Osmia conjuncta



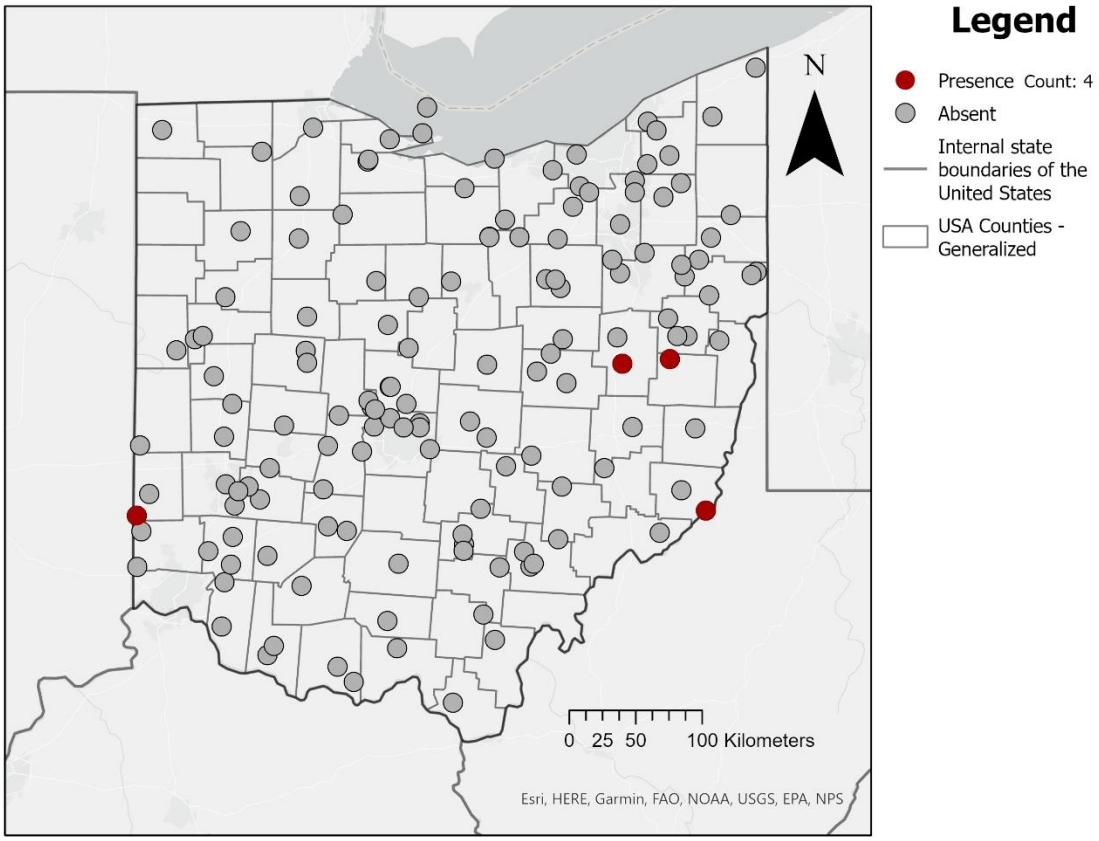
Osmia conjuncta is in the family Megachilidae. Bees in this genus typically nest in cavities such as the stems of lants or crevices in trees, however, *Osmia conjuncta* is one of the few species that actually uses empty snail shells as nests (Fanaki et al., 2023)! *Osmia conjuncta* was readily using non-native snail shells, with an occupancy rate of almost 10% (Fanaki et al., 2023). A typical snail shell held only a single cocoon, but some had several, with the highest being 6 cocoons in that study (Fanaki et al., 2023). Interestingly, all three sites we managed to collect this species had large ponds, which likely support snails and in turn provide nesting resources for *Osmia conjuncta*. This species will likely be found elsewhere with more targeted searches near wetland habitats where large snails thrive. Below is an image of one of the *Cepaea* snail shells they might use as a nest. *Osmia conjuncta* is active from late spring into summer.

Osmia cordata



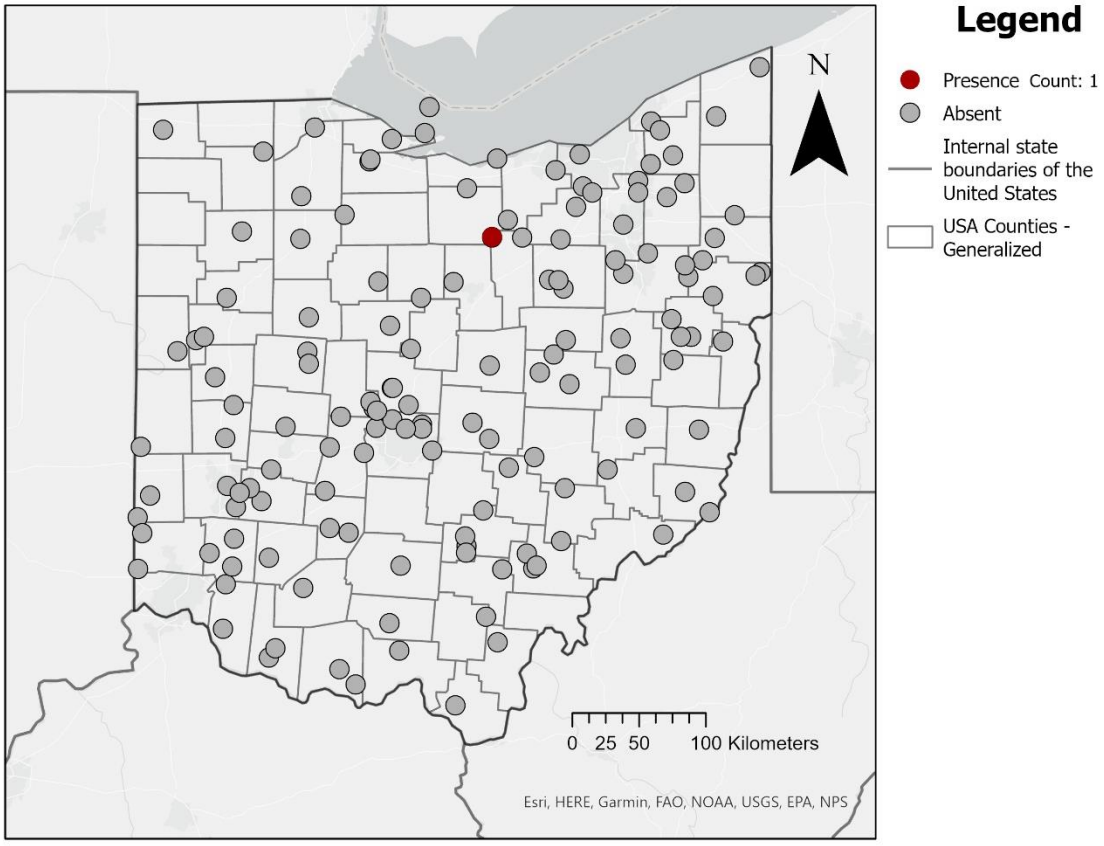
Osmia cordata is in the family Megachilidae. Bees in the genus *Osmia* seek out cavities and crevices in stems, trees, and even rocks! Several are willing to use bee trap nests made of cardboard straws of the appropriate width and depth. *Osmia cordata* is most often found nesting in old mud dauber nests, lining them with chewed leaf material (Chandler, 1958). They also have a high parasitism rate, with less than half of the bees emerging from the nests constructed (Chandler, 1958). These are solitary bees. *Osmia cordata* is active in late spring and early summer.

Osmia cornifrons



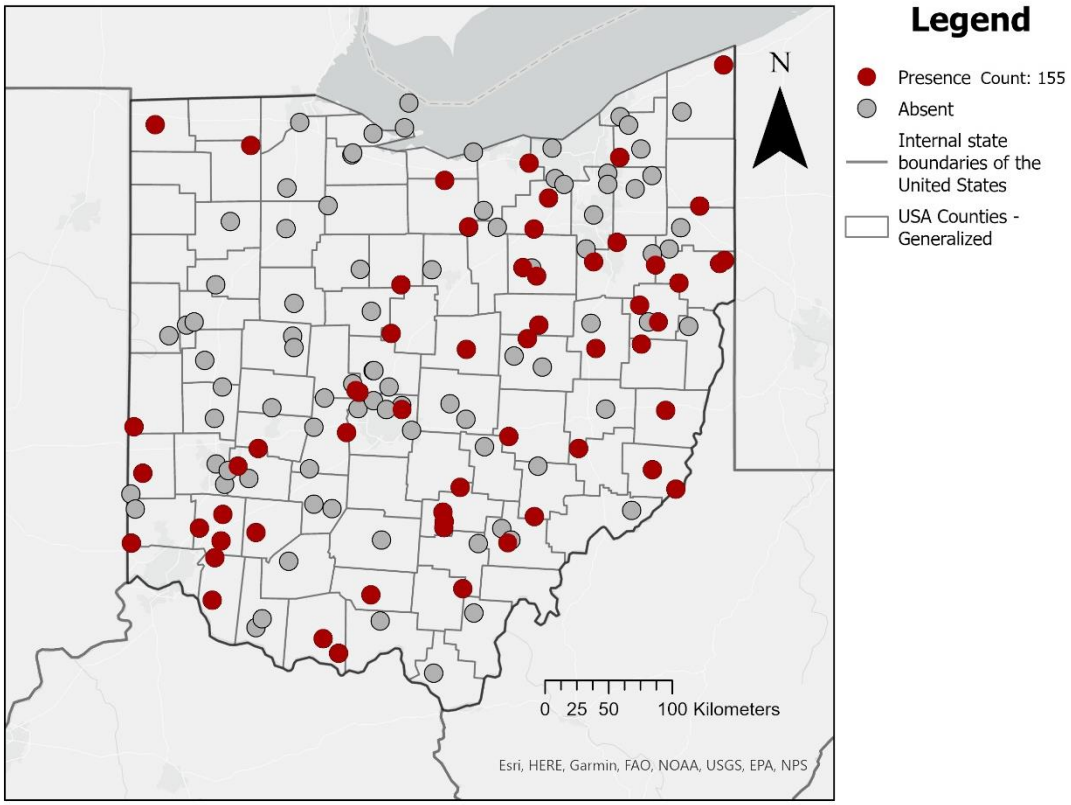
Osmia cornifrons is in the family Megachilidae. It is a non-native, cavity nesting species. It is an early season species, with few found after the end of May in Ohio. Our lack of abundance is likely tied to the fact that most sample kits were not mailed and received until mid-May due to logistical challenges of the pandemic. These are mostly brown *Osmia*, and not as metallic compared to their native relatives. Like *Osmia taurus*, females of *Osmia cornifrons* have two horn like projections on their clypeus. The horns are longer and more pointed in *cornifrons* compared to shorter and more rounded in *taurus*. Males need microscopic examination to confirm.

Osmia distincta



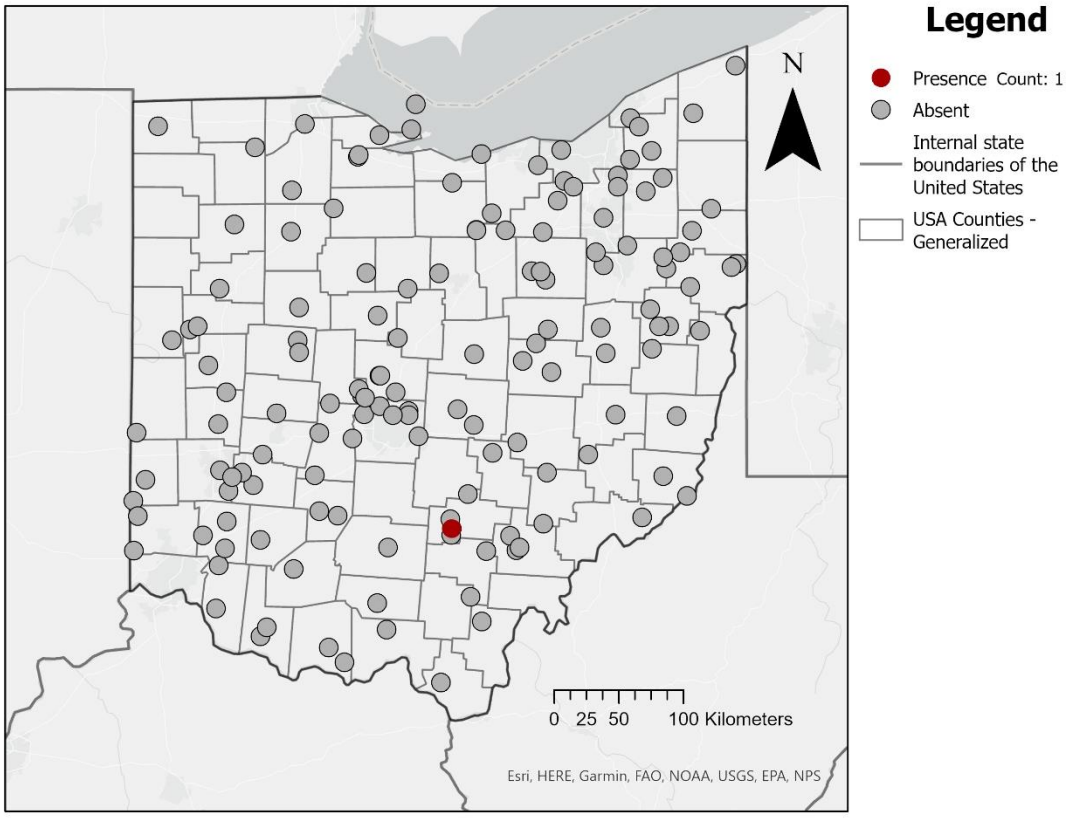
Osmia distincta is in the family Megachilidae. It is thought to be a specialist of *Penstemon* (Fowler and Droege, 2020). They can spend up to 2 minutes inside a flower, and bees in the genus *Osmia* have actually been found in pressed herbarium specimens of *Penstemon* (Crosswhite and Crosswhite, 1966)! However, *Osmia distincta* has been historically reported from other plant genera as well (Mitchell, 1962). Our single specimen was found in May. Like other *Osmia*, these are solitary, cavity nesting bees. The females are unique in that they have a small patch of forward pointing hairs on their forehead. Otherwise, they superficially resemble most of the other blue *Osmia* and require microscopic examination to identify with confidence.

Osmia georgica



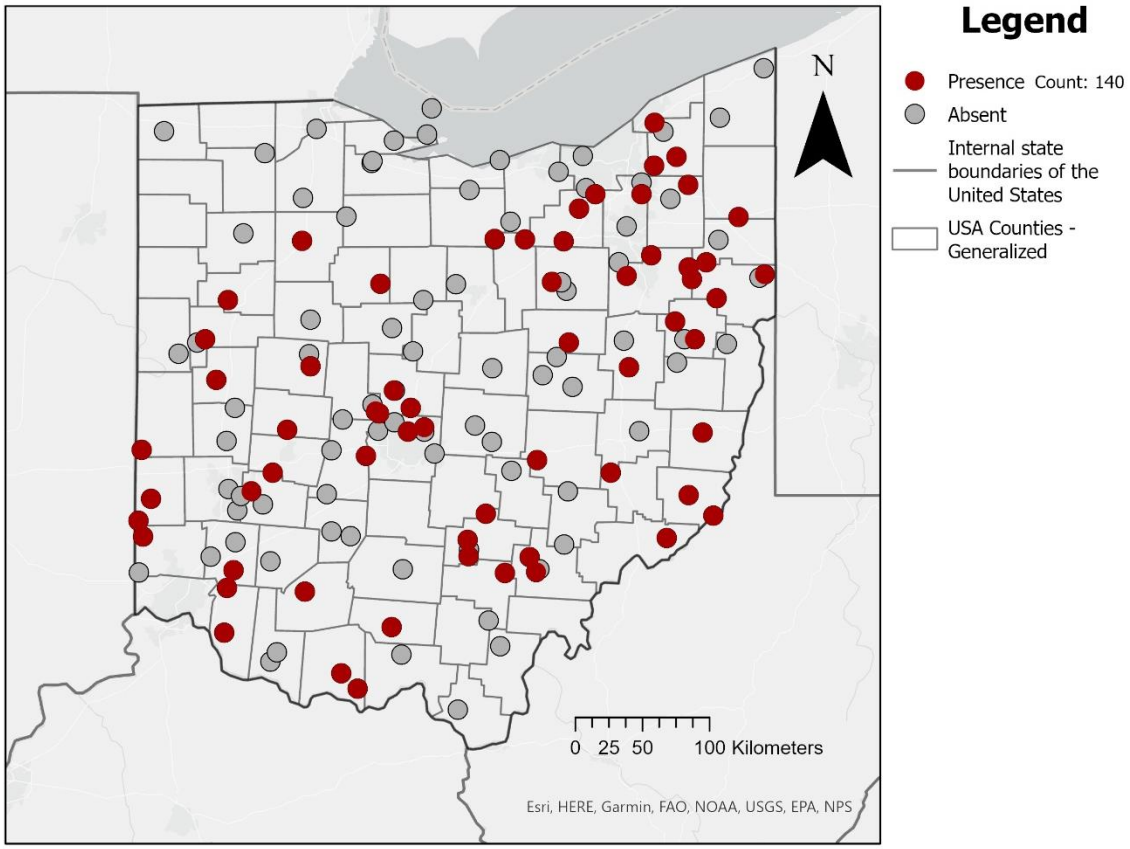
Osmia georgica is in the family Megachilidae. It is most abundant in May, with populations decreasing by June, and only a single individual observed in July and August. This is a solitary, cavity nesting species. They have been known to use trap nests, and separate the sections with small bits of mashed up leaf (Hawkins, 1975). Their most common net parasite was a cuckoo wasp in the family Chrysididae (Hawkins, 1975). Females of *Osmia georgica* are one of our more distinct species of *Osmia*, with large projections on their mandibles (not on the clypeus like *Osmia taurus* and *cornifrons*), and bright orange hairs on the underside of their abdomen. The orange hair is distinct for the species, but care must be taken to not confuse orange hair with orange pollen on pale hair.

Osmia inspergens



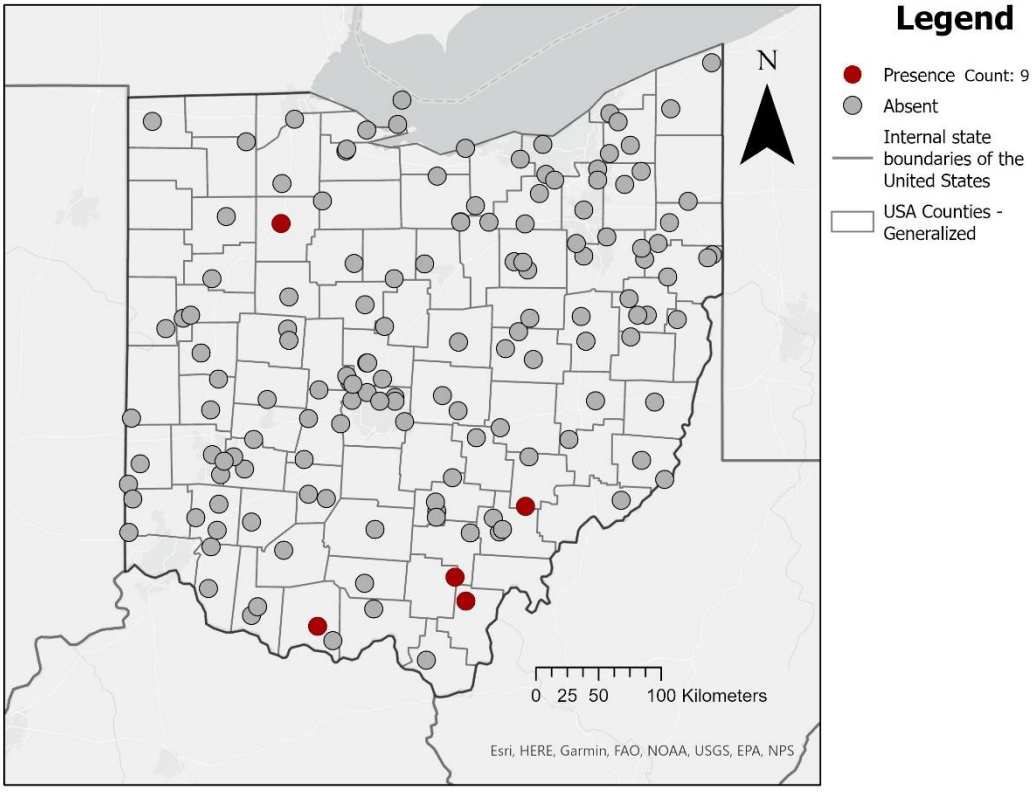
Osmia inspergens is in the family Megachilidae. The genus *Osmia* are cavity nesting bees that typically nest in twigs, stems, or other hollow structures. Our single specimen of *Osmia inspergens* was collected in May, and is otherwise rare in Ohio. A single specimen was also found in 2013 in Marietta, Ohio (Spring et al., 2017). This species has been documented on several different plants, but detailed natural history data is lacking.

Osmia pumila



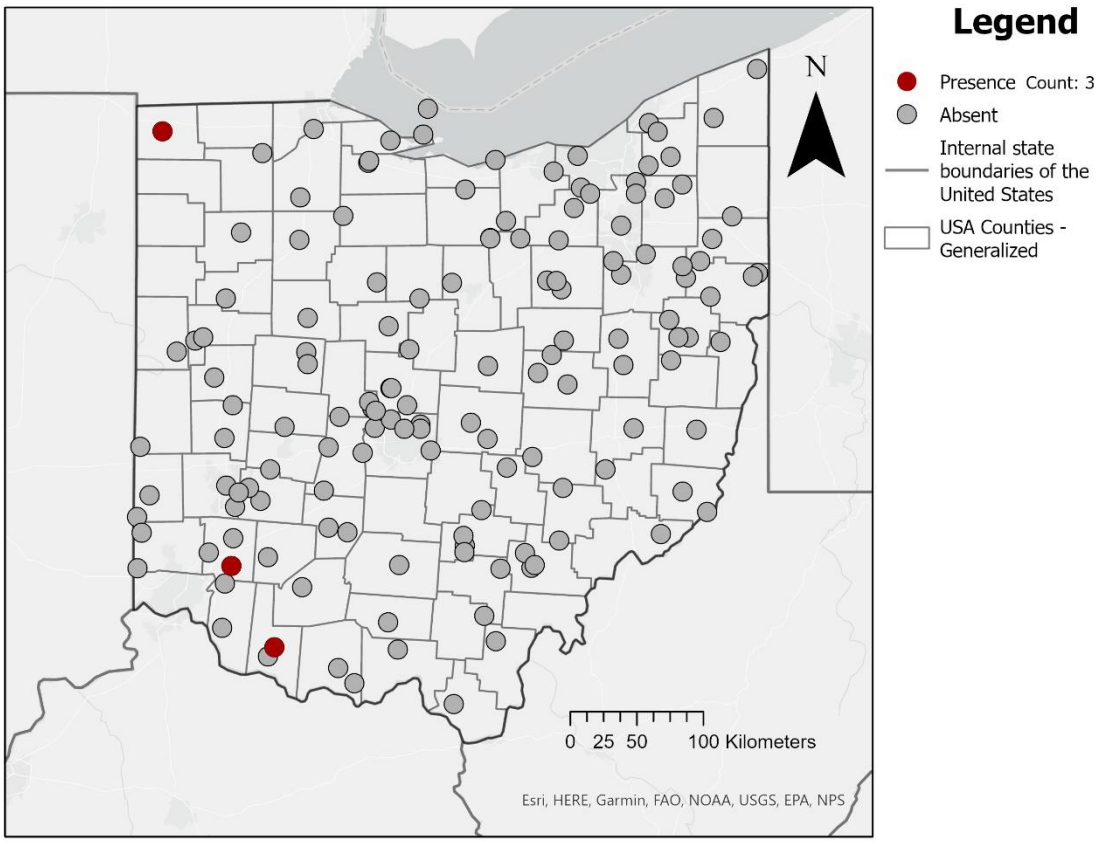
Osmia pumila is in the family Megachilidae. Bees in the genus *Osmia* are called Mason bees because they often line their cavity nests with mud. However, several species of *Osmia* actually line their nests with finely mashed leaf matter, as is the case with *Osmia pumila* (Medler, 1967). They seek out cavities and crevices in stems, trees, and even rocks! Several are willing to use bee trap nests made of cardboard straws of the appropriate width and depth. These are solitary bees. *Osmia pumila* can be found in late spring and into the summer across Ohio. Our highest abundance of *Osmia pumila* was in May. It is superficially similar to our much less common *Osmia albiventris*. *Osmia pumila* is one of our most common species of *Osmia* in Ohio, though not easily documented with just photography, hence the lack of observations on community science platforms like iNaturalist. *Osmia pumila* has been documented to be parasitized by the cuckoo bee *Stelis lateralis* (Johnson, 1986).

Osmia similima



Osmia simillima is in the family Megachilidae. The genus *Osmia* are cavity nesting bees that typically nest in twigs, stems, or other hollow structures. *Osmia simillima* line their nests with a chewed leaf pulp (Scott, 1993). Our specimens of *Osmia simillima* were collected in May and June.

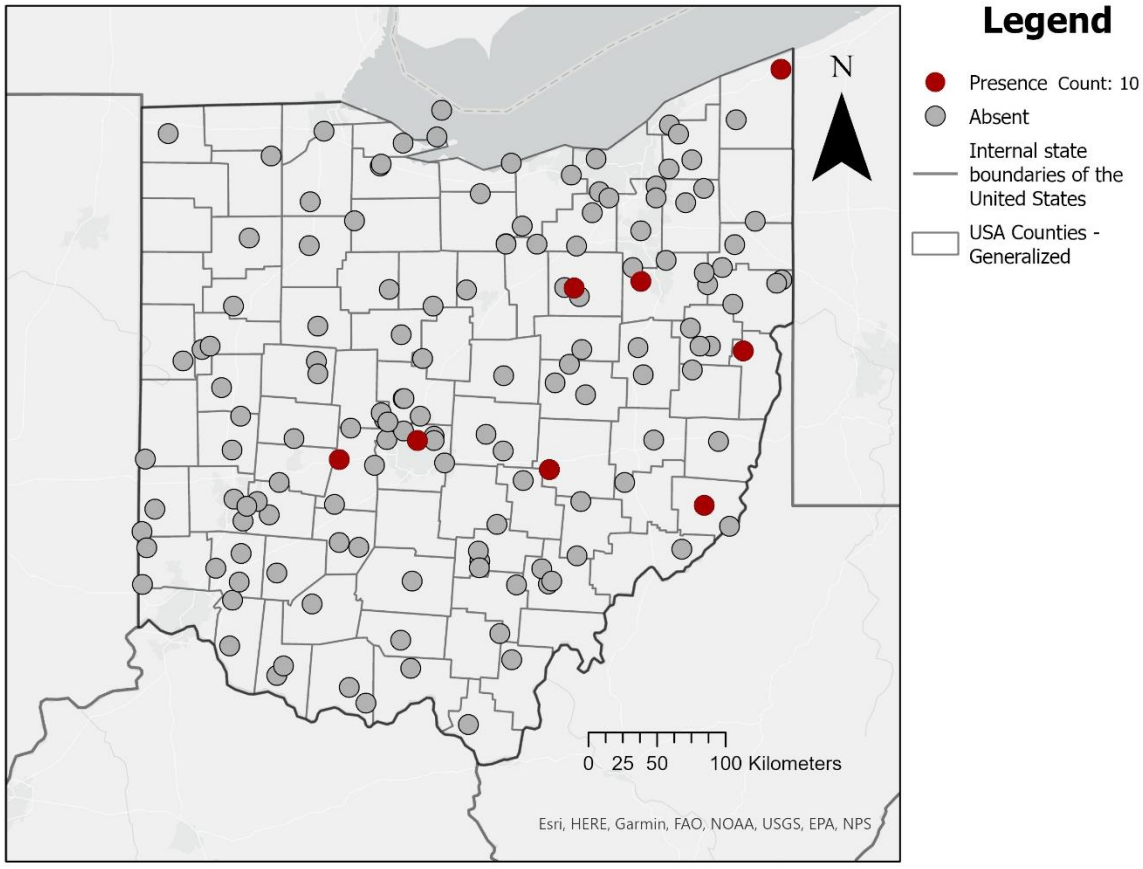
Osmia subfasciata



Osmia subfaciata is in the family Megachilidae. It is a bee that nests in pre-existing holes in twigs, stems, or other hollow structures. They have been reported nesting in the burrows of longhorn beetles in houses (Mitchell, 1962). Our specimens of *Osmia subfasciata* were collected in May and July.

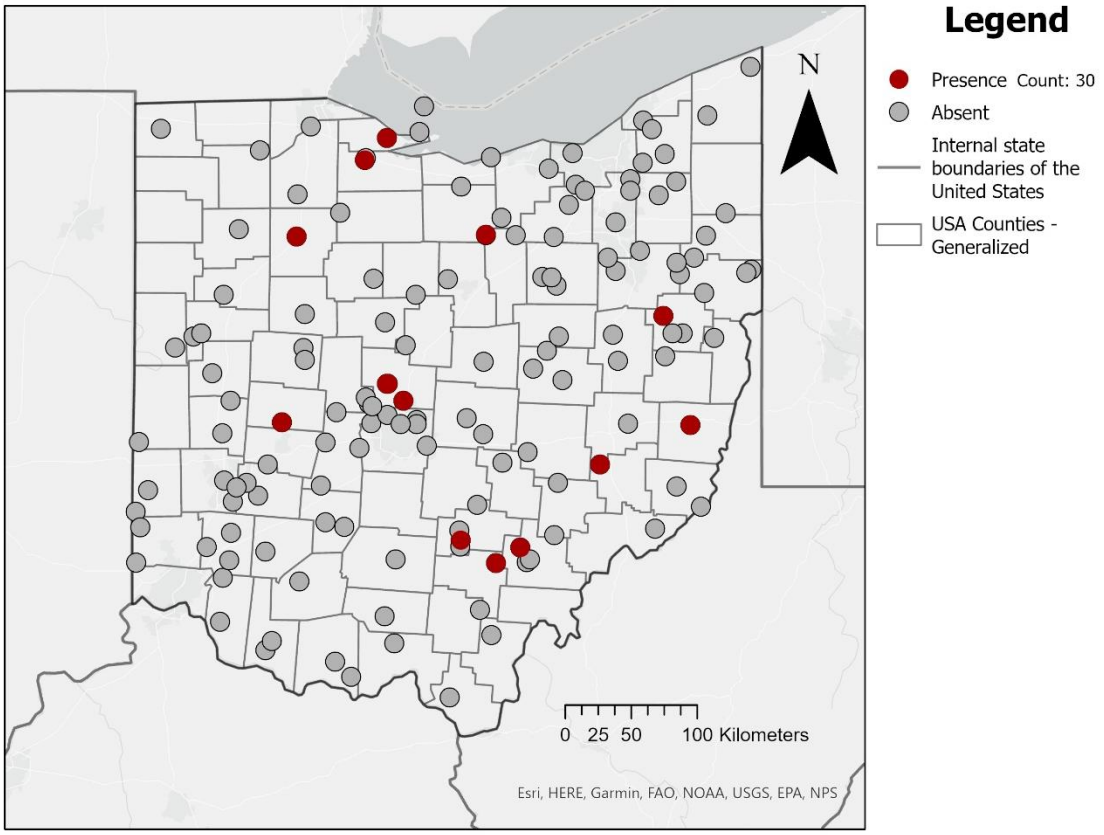
Size range: 8 mm (female), 7 mm (male)

Osmia taurus

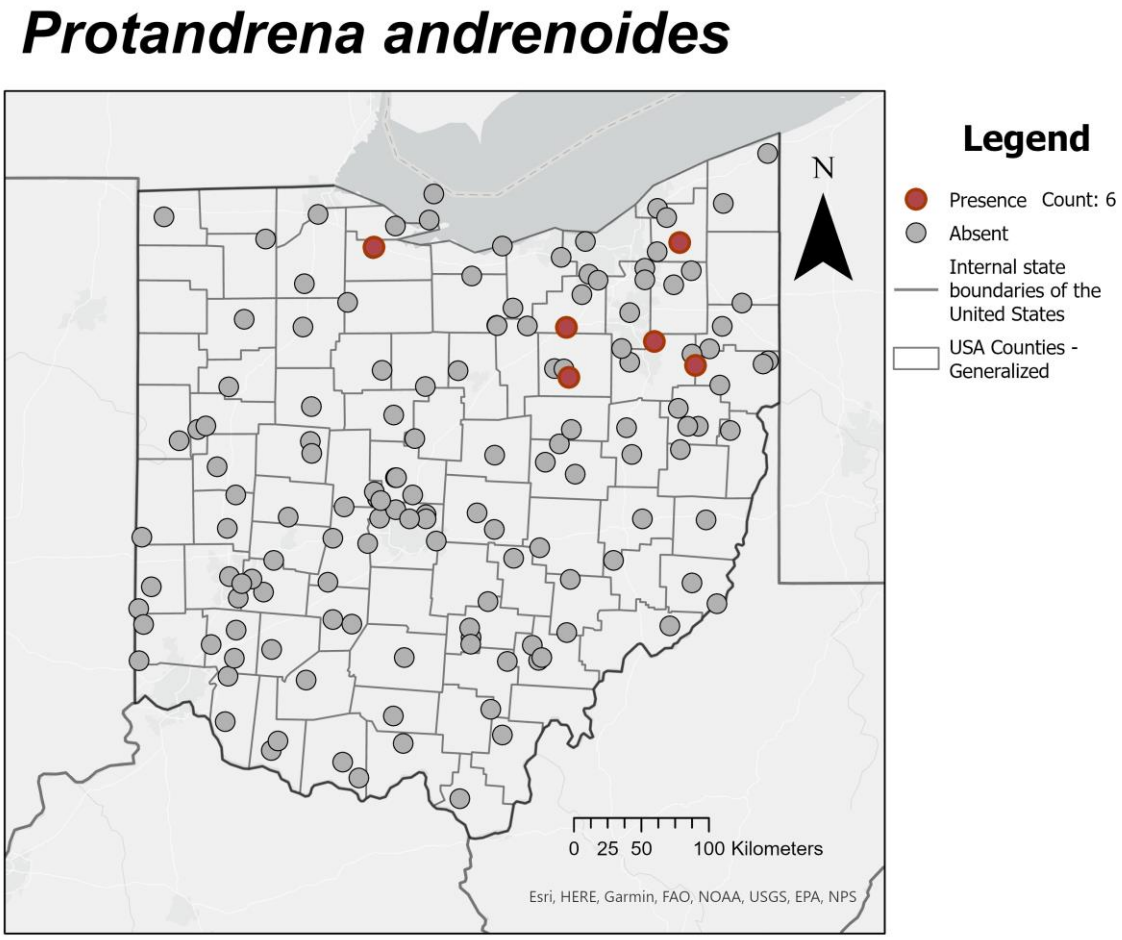


Osmia taurus is in the family Megachilidae. It is a non-native species of *Osmia* that has recently spread across Ohio. As with *Osmia cornifrons,* we likely missed the main sampling window for Osmia taurus, which is known to fly much earlier than we were able to distribute our traps to collectors. These are mostly brown *Osmia*, and not as metallic compared to their native relatives. Like *Osmia cornifrons*, females of *Osmia taurus* have two horn like projections on their clypeus (see below). The horns are longer and more pointed in *cornifrons* compared to shorter and more rounded in *taurus*. Female taurus also have less hair on their clypeus. Males need microscopic examination to confirm. These are cavity nesting bees.

Osmia texana

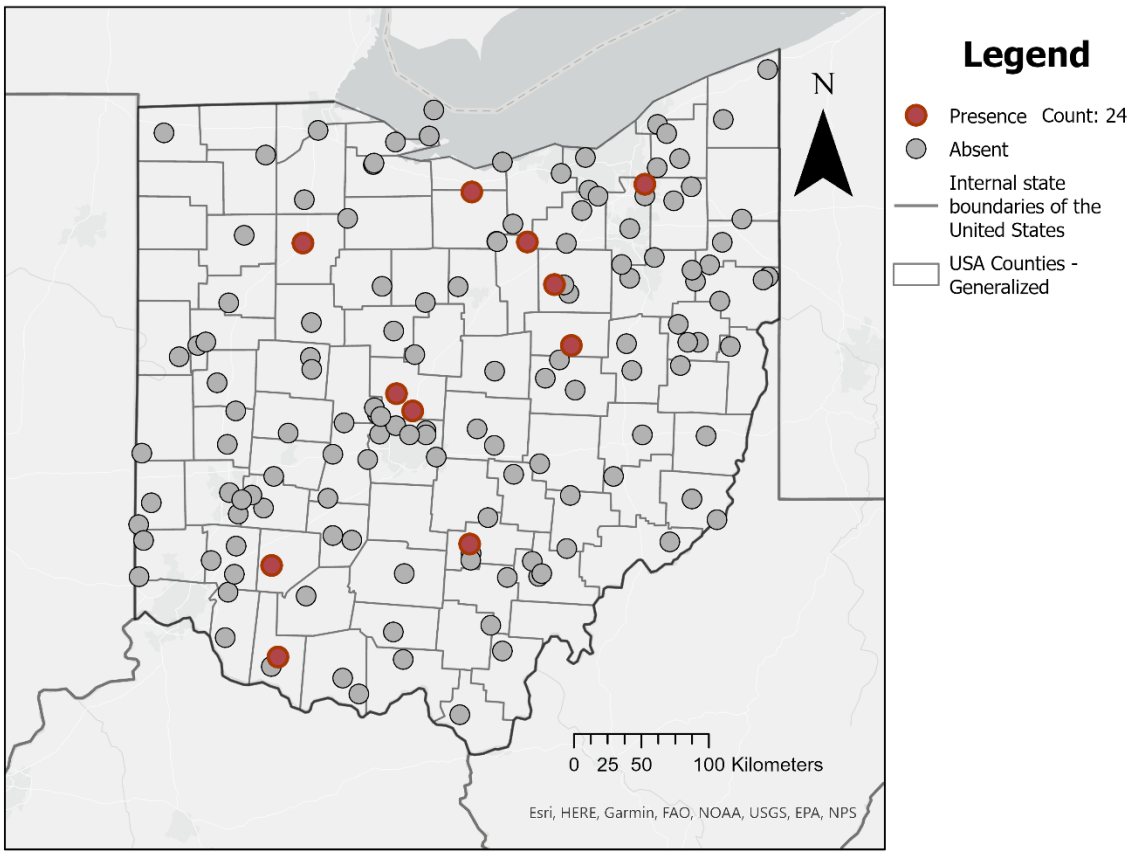


Osmia texana is in the family Megachilidae. It is a specialist of *Cirsium* (Fowler and Droege, 2020). Unlike most other *Osmia* species in Ohio that emerge in the spring and fly into the summer, *Osmia texana* is one of the few species that emerges mid-summer and flies into the fall. This is also one of the few species of *Osmia* that has black scopal hairs (hairs on the underside of the abdomen) and a unique shaped clypeus and mandibles.



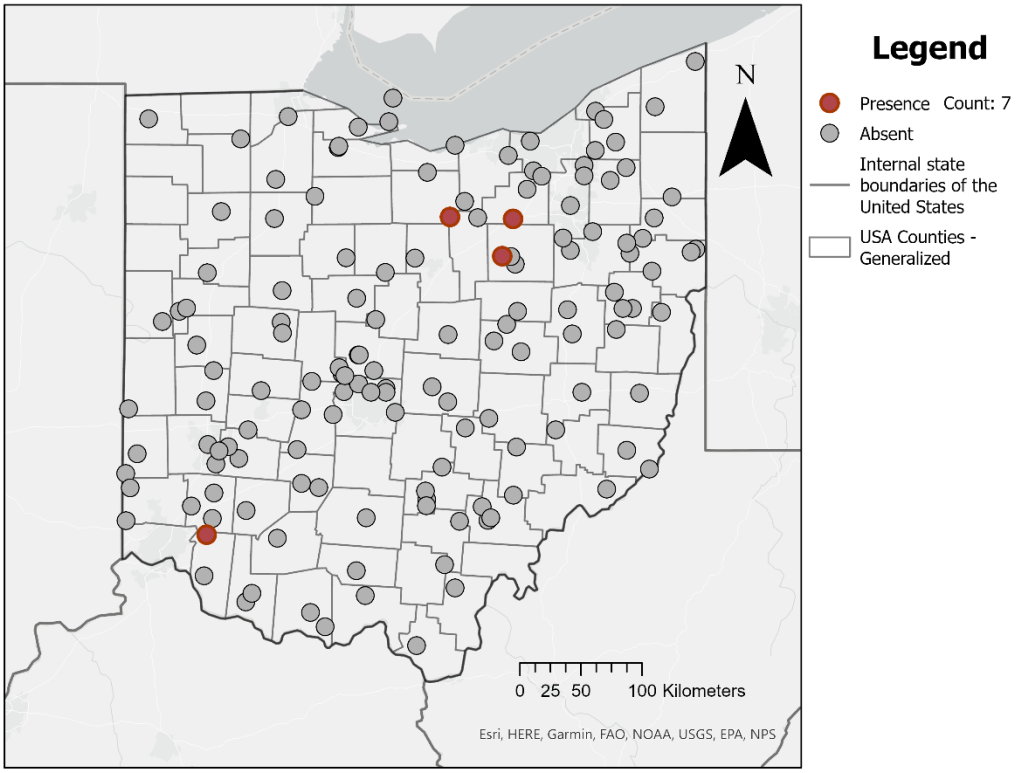
Protandrena andrenoides is in the family Andrenidae. It is one of the small black mining bees. These bees are easily overlooked and often do not emerge until September and into October. Since they emerge so late, they are also under-reported as many survey projects stop once the academic school year begins. These specimens were loaned for a taxonomic revision as part of a thesis, so more information about this interesting group can be found there (Robinson, 2023). That revision changed the genus from *Pseudopanurugus* back to *Protandrena*. *Protandrena andrenoides* is a specialist of *Eurybia*, *Rudbeckia*, *Solidago*, and *Symphyotrichum* (Fowler and Droege, 2020).

Protandrena compositarum



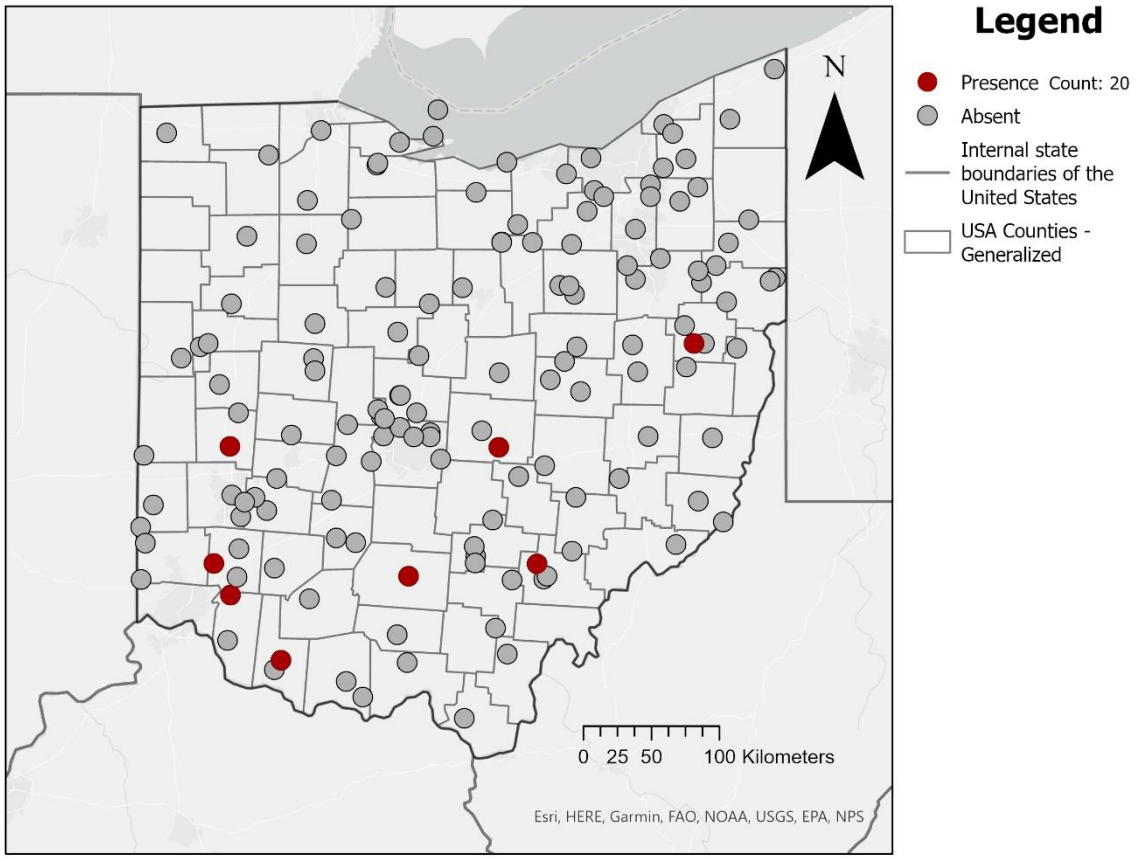
Protandrena compositarum is in the family Andrenidae. It is one of the small black mining bees. These bees are easily overlooked and often do not emerge until September and into October. Since they emerge so late, they are also under-reported as many survey projects stop once the academic school year begins. These specimens were loaned for a taxonomic revision as part of a thesis, so more information about this interesting group can be found there (Robinson, 2023). That revision changed the genus from *Pseudopanurugus* back to *Protandrena*. *Protandrena compositarum* is a specialist of *Bidens*, *Eurybia*, *Rudbeckia*, *Solidago,* and *Symphyotrichum* (Fowler and Droege, 2020).

Protandrena labrosa



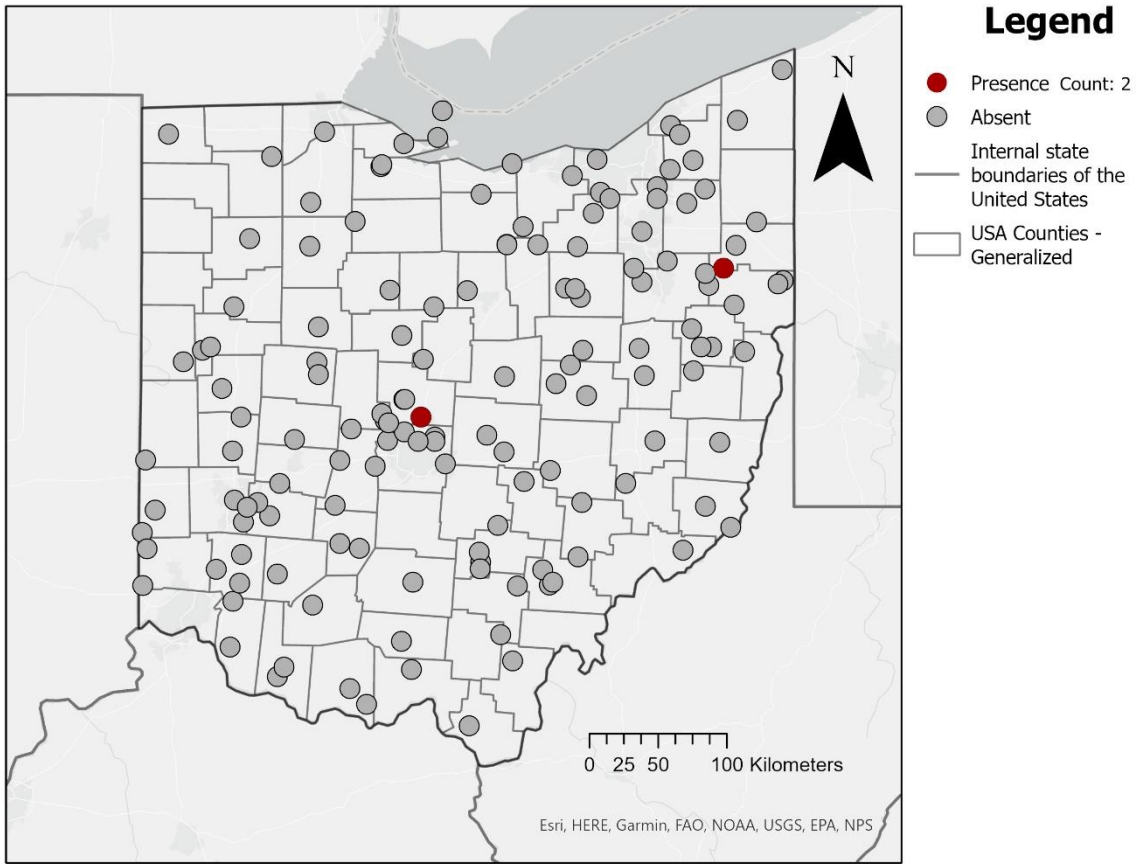
Protandrena labrosa is in the family Andrenidae. It is one of the small black mining bees. These bees are easily overlooked and often do not emerge until late August into September. Since they emerge so late, they are also under-reported as many survey projects stop once the academic school year begins. These specimens were loaned for a taxonomic revision as part of a thesis, so more information about this interesting group can be found there (Robinson, 2023). That revision changed the genus from *Pseudopanurugus* back to *Protandrena*. Our specimens have since been returned, with the exception of one female that was retained for the University of Manitoba collection since they did not have any of the species!

Ptilothrix bombiformis



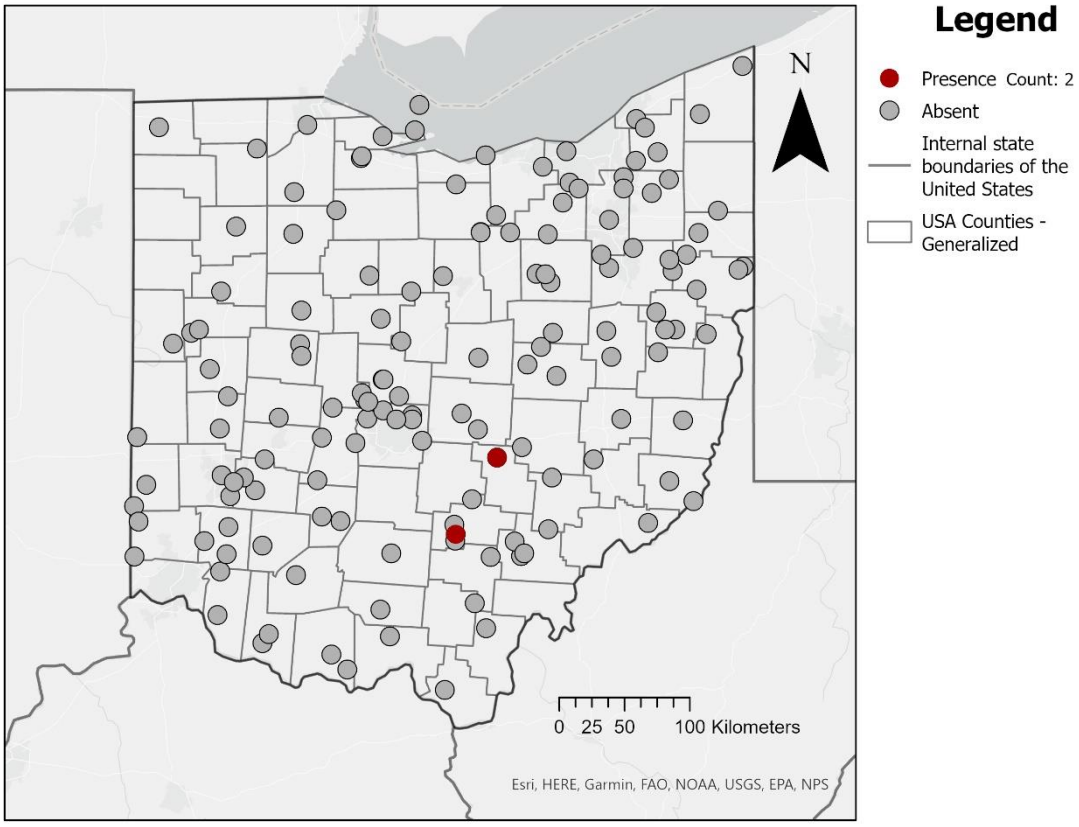
Ptilothrix bombiformis is in the family Apidae. It is a specialist of our large flowered native *Hibiscus* (Fowler and Droege, 2020). They have also been documented on buttonbush (*Cephalanthus occidentalis*) and purple coneflower (*Echinacea purpurea*), but seem to still need *Hibiscus* in the area to survive. They have the common name Hibiscus Turret Bee because they primarily use *Hibiscus* and build turrets around their nest entrances on the ground. This is a charismatic species that is easily mistaken for a leggy bumble bee. They are large and photogenic, and served as our token specialist bee for the cover of our Guide to the Specialist Bees of Ohio.

Sphecodes aroniae



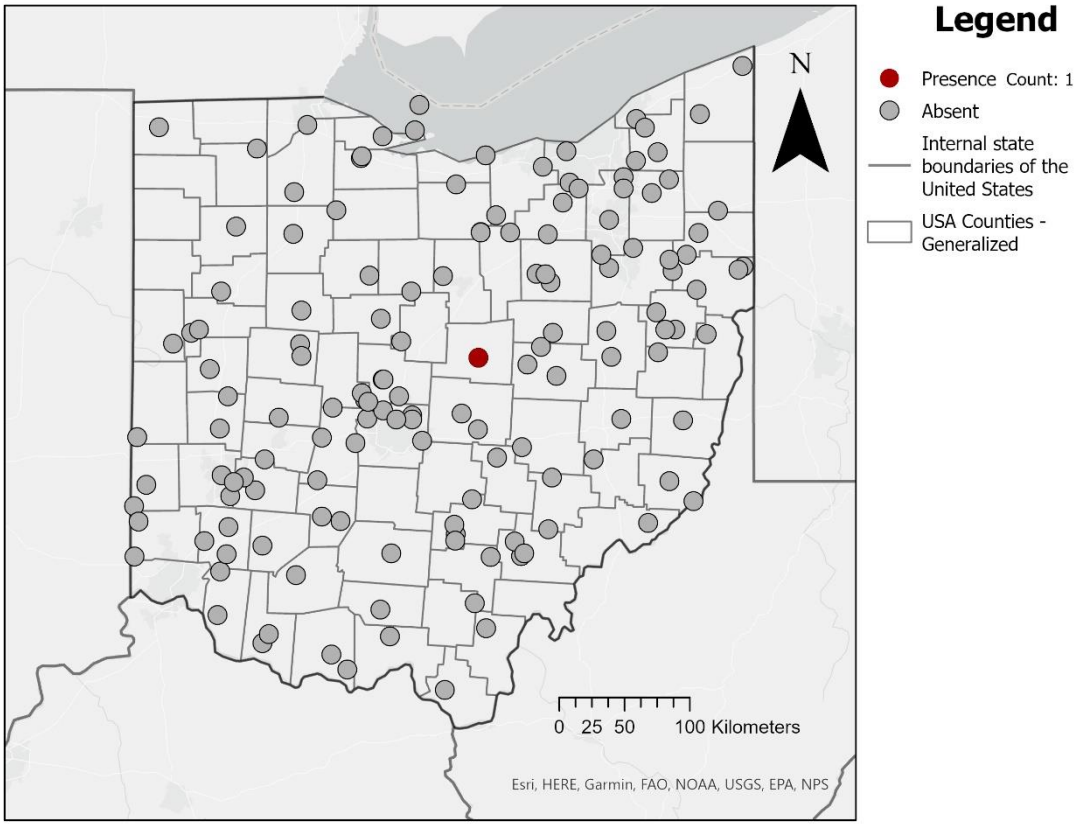
Sphecodes aroniae is a cleptoparasitic species of bee in the Halictidae. Instead of foraging for their own pollen and nectar resources, females of this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a difficult group to identify even with a specimen viewed under a microscope. The entire genus needs taxonomic revision, so many of our specimens were left at Sphecodes sp or morphospecies. The females have a black thorax and a red abdomen.
Size range: 9-10 mm (female), 9 mm (male)

Sphecodes atlantis/cressonii



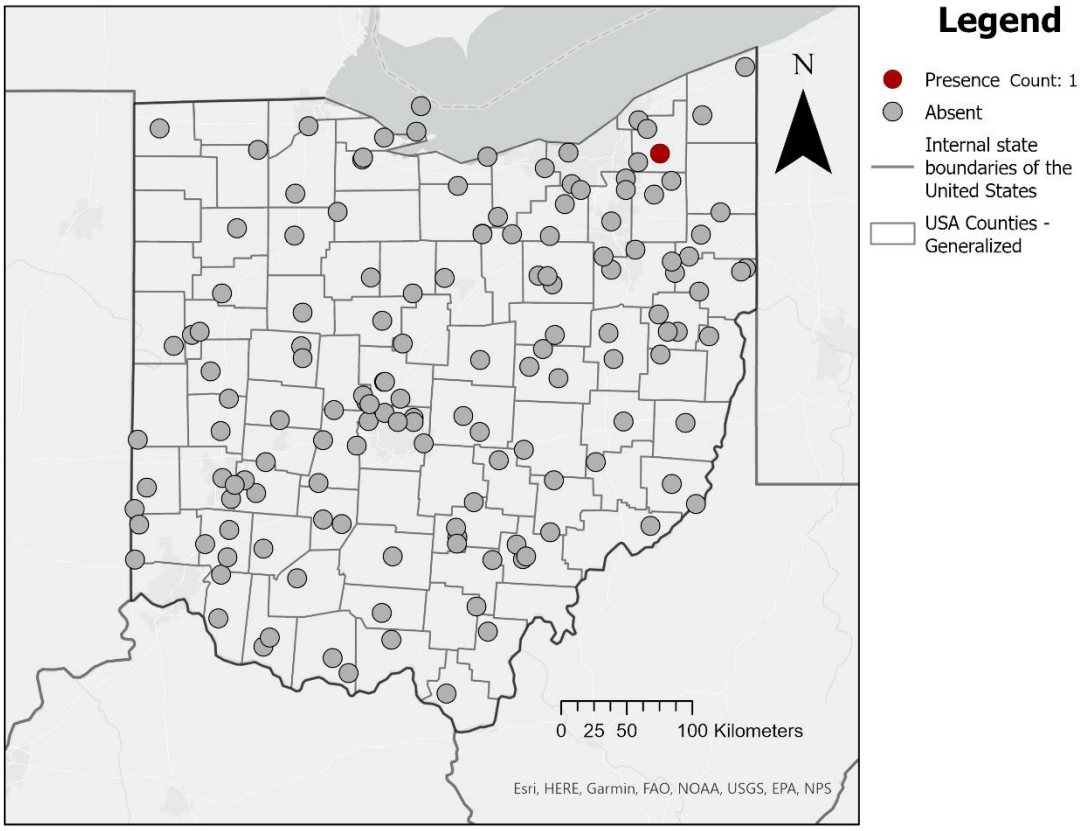
This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at Sphecodes sp or morphospecies. The females have a black thorax and a red abdomen. In the case of *Sphecodes atlantis/cressonii,* we are relatively confident that it is either *Sphecodes atlantis* or *Sphecodes cressonii*, but were unable to confidently differentiate the two.

Sphecodes brachycephalus



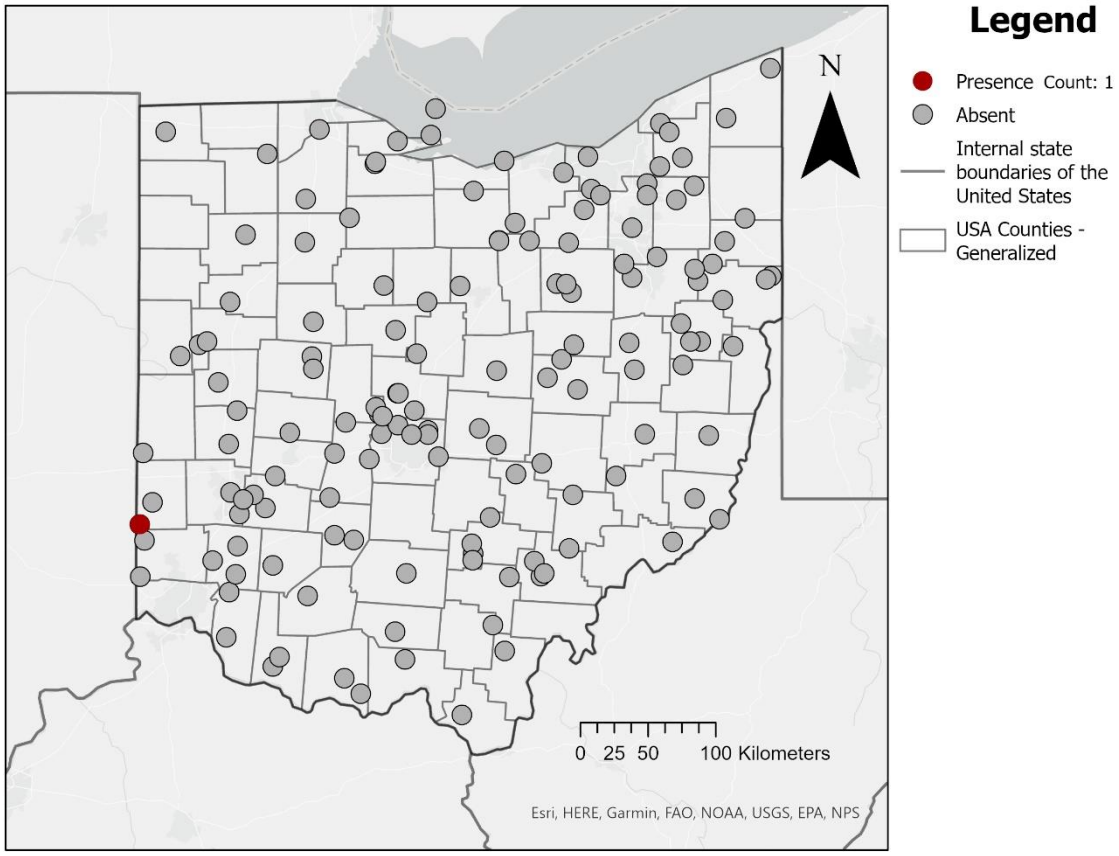
Sphecodes brachycephalus is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. *Sphecodes brachycephalus* is a particularly odd species, with a strangely wide face, only two submarginal cells, and an orange abdomen. This is also a rather small species, at under 6 mm.

Sphecodes confertus



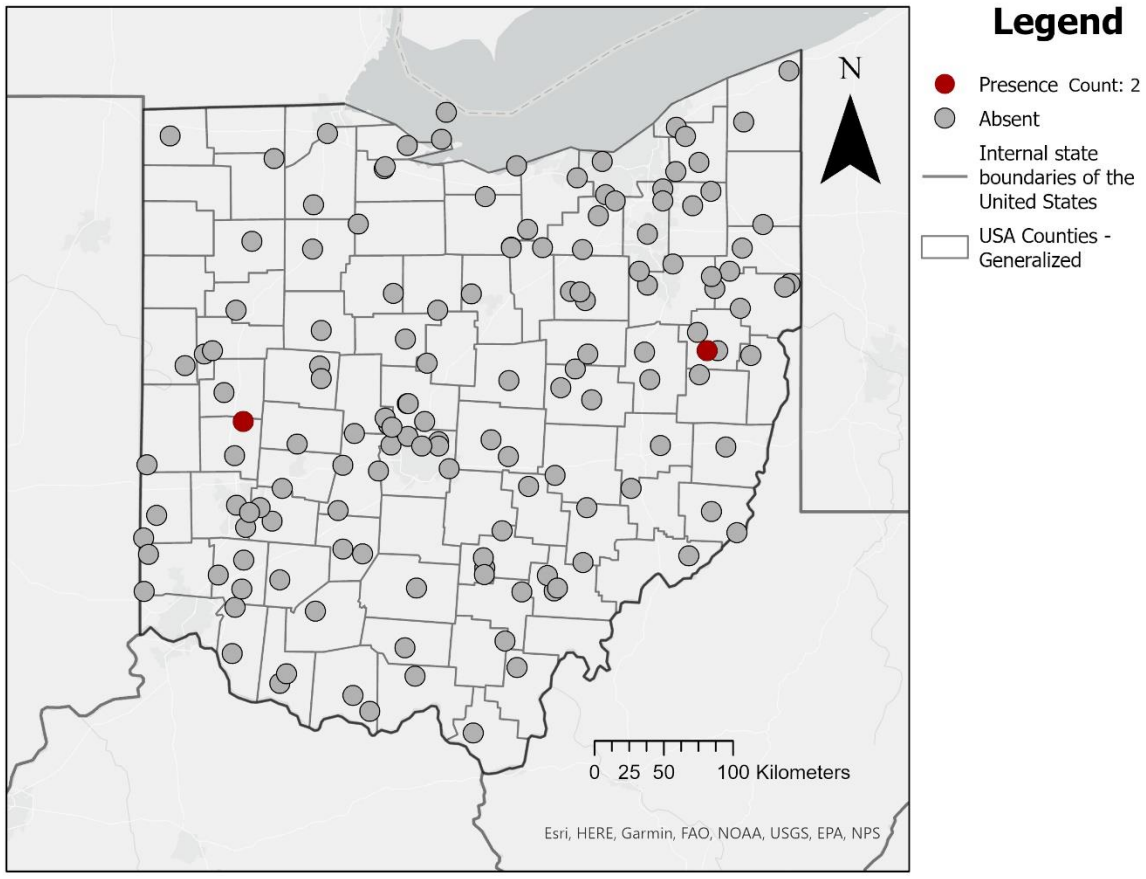
Sphecodes confertus is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen.

Sphecodes davisii



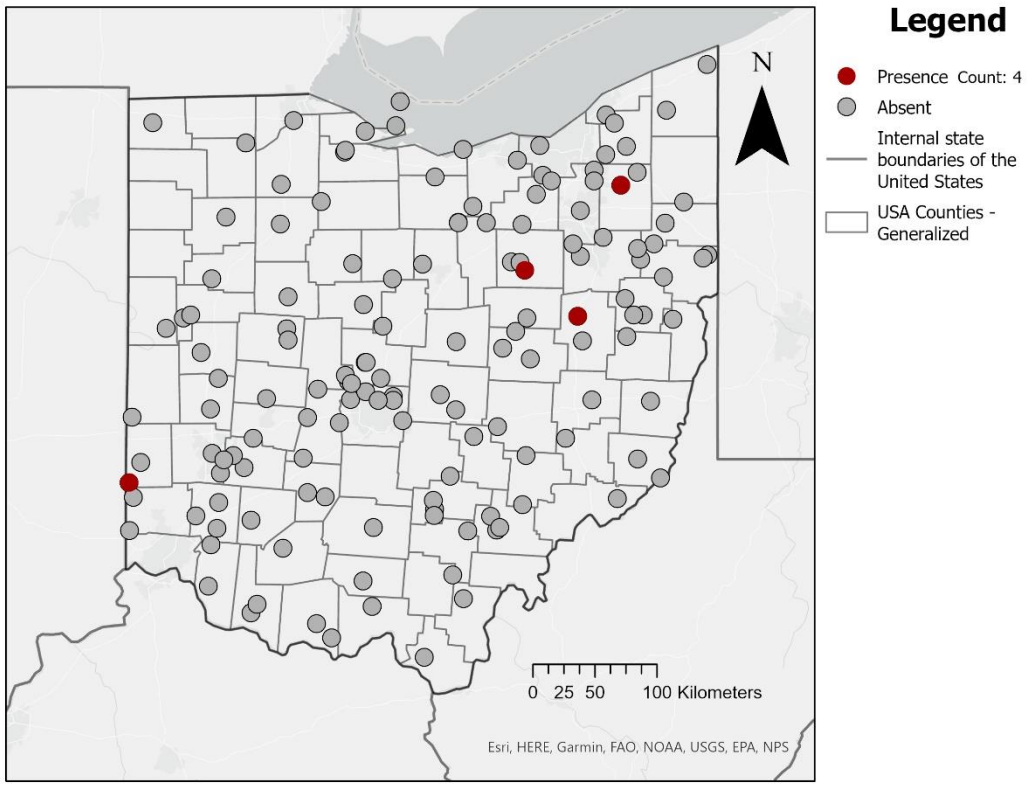
Sphecodes davisii is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen.

Sphecodes dichrous



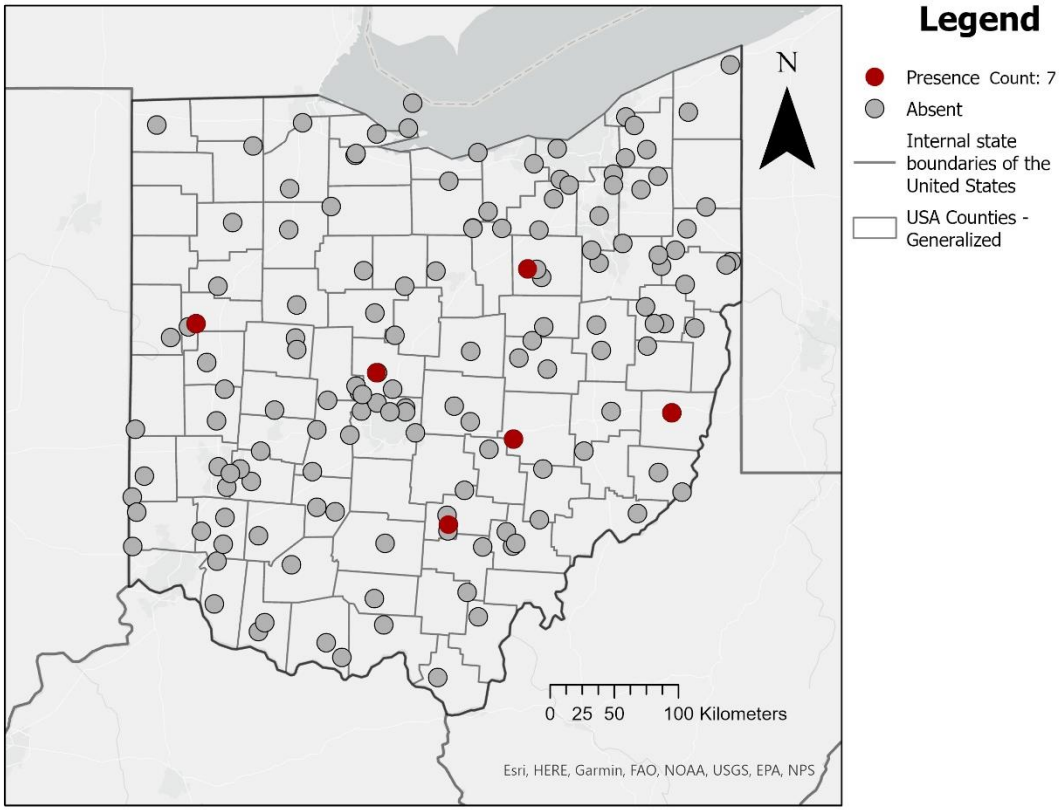
Sphecodes dichrous is a cleptoparasitic species of bees in the Halictidae. Instead of foraging for their own pollen and nectar resources, bees of this species seek out nests of other bees to lay their eggs into. *Sphecodes* is a tricky genus to identify to species even with a specimen. The entire genus is in need of taxonomic revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. *Sphecodes dichrous* is one of the larger species of *Sphecodes*. The females have a black thorax and a red abdomen. Size: 9-10 mm (female), 9 mm (male)

Sphecodes galerus

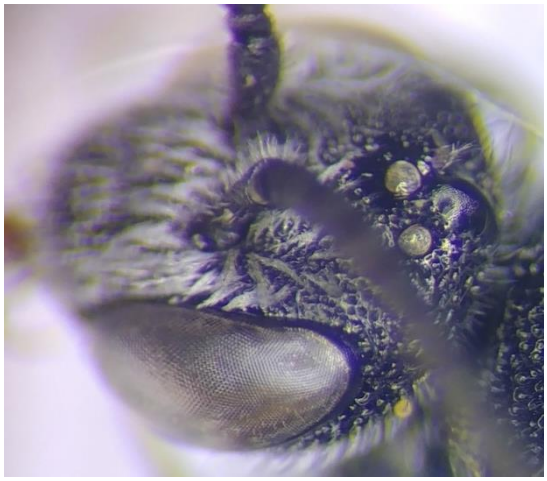


Sphecodes galerus is in the family Halictidae. It is a cleptoparasitic species of bee. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in need of taxonomic revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen. *Sphecodes galerus* is one of the species that has a tooth on the mandible.
Size range: 6 mm (female), 6 – 8 mm (male)

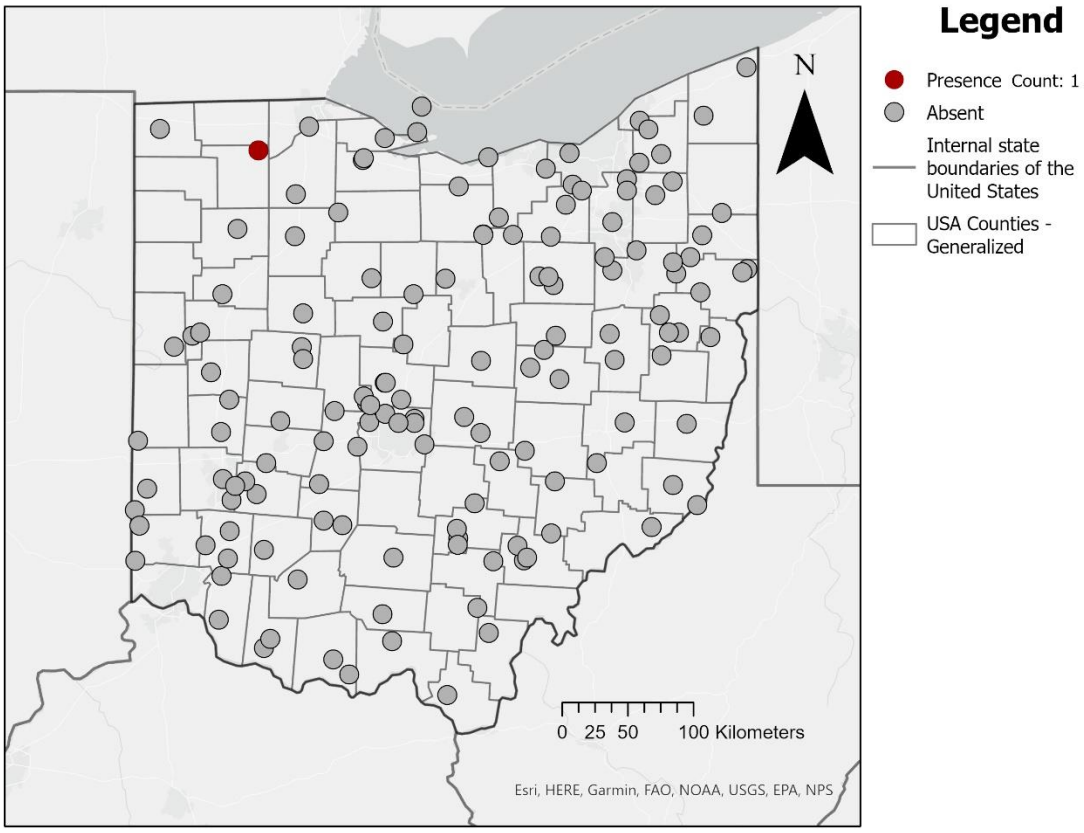
Sphecodes heraclei



Sphecodes heraclei is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The females have a black thorax and a red abdomen. *Sphecodes heraclei* is one of the few easily identifiable species in the genus, with a strange large mound on the center of the head between the three simple eyes (example images below).

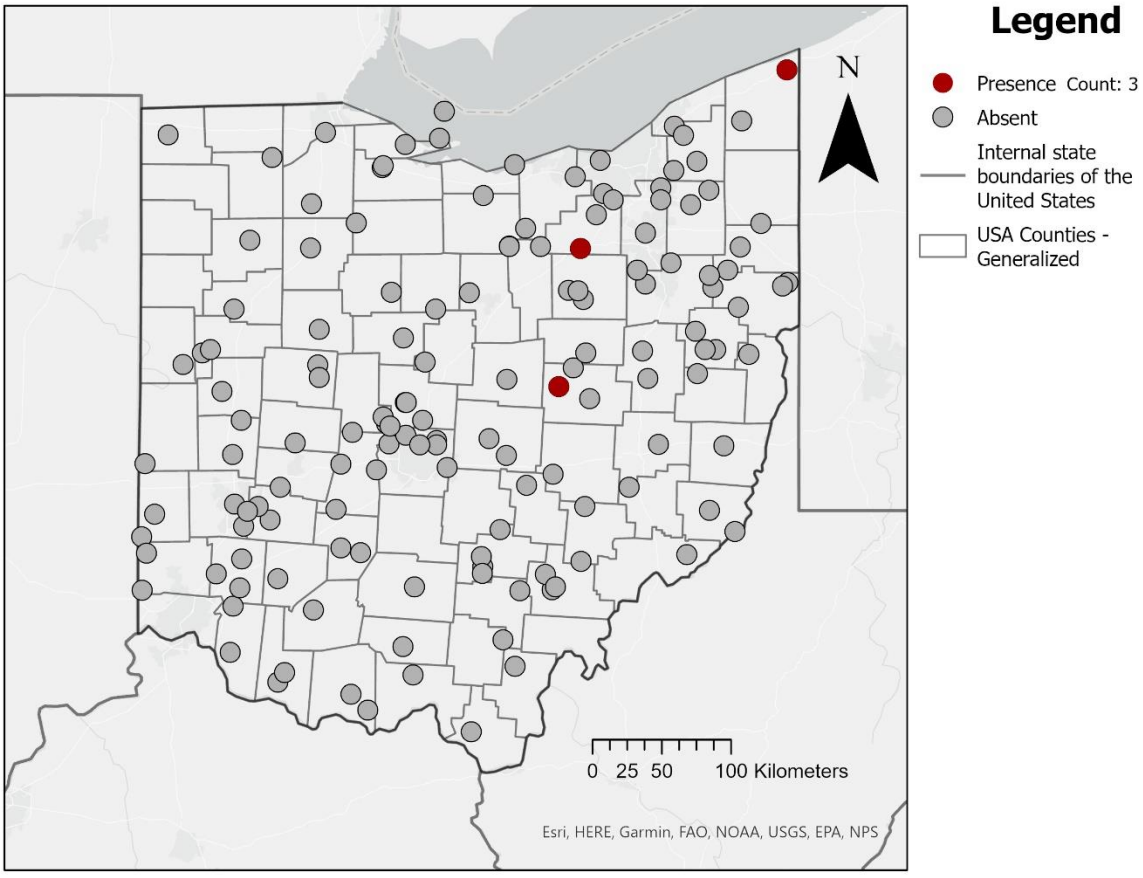


Sphecodes illinoensis



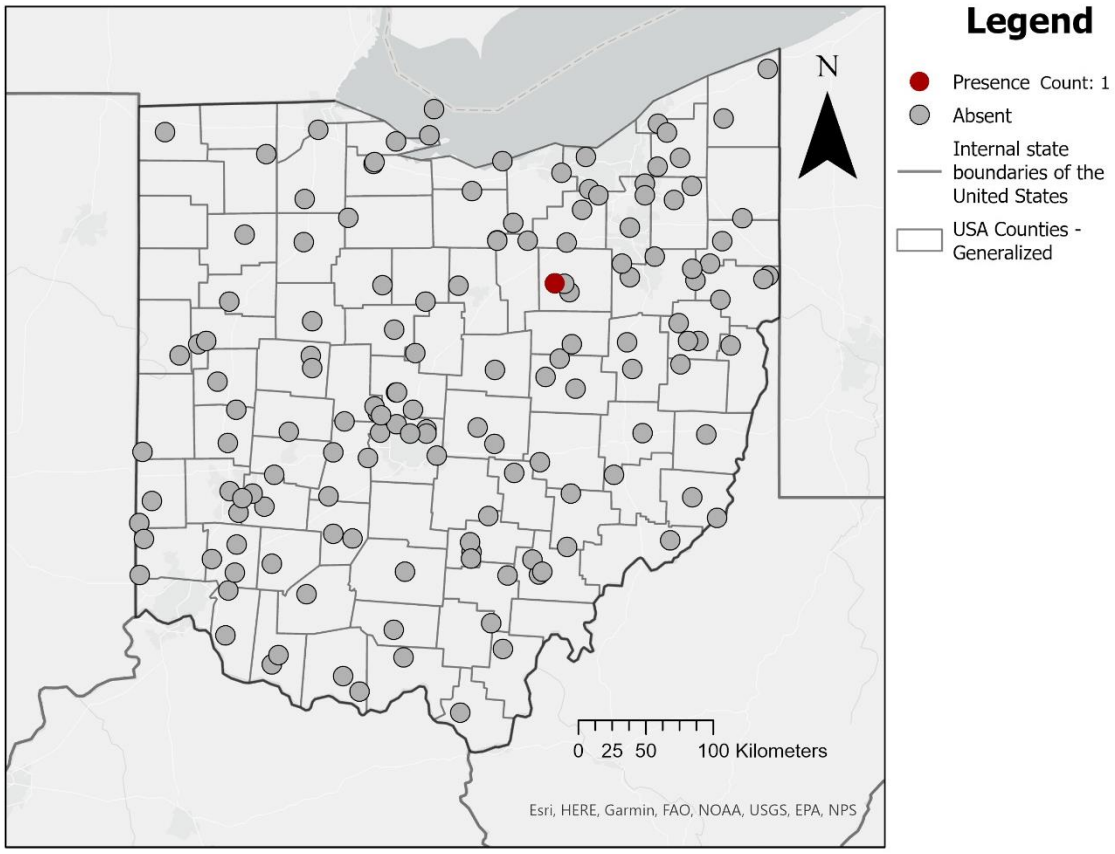
Sphecodes illinoensis is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen. *Sphecodes illinoensis* is one of the species that has a simple mandible without a tooth.

Sphecodes levis



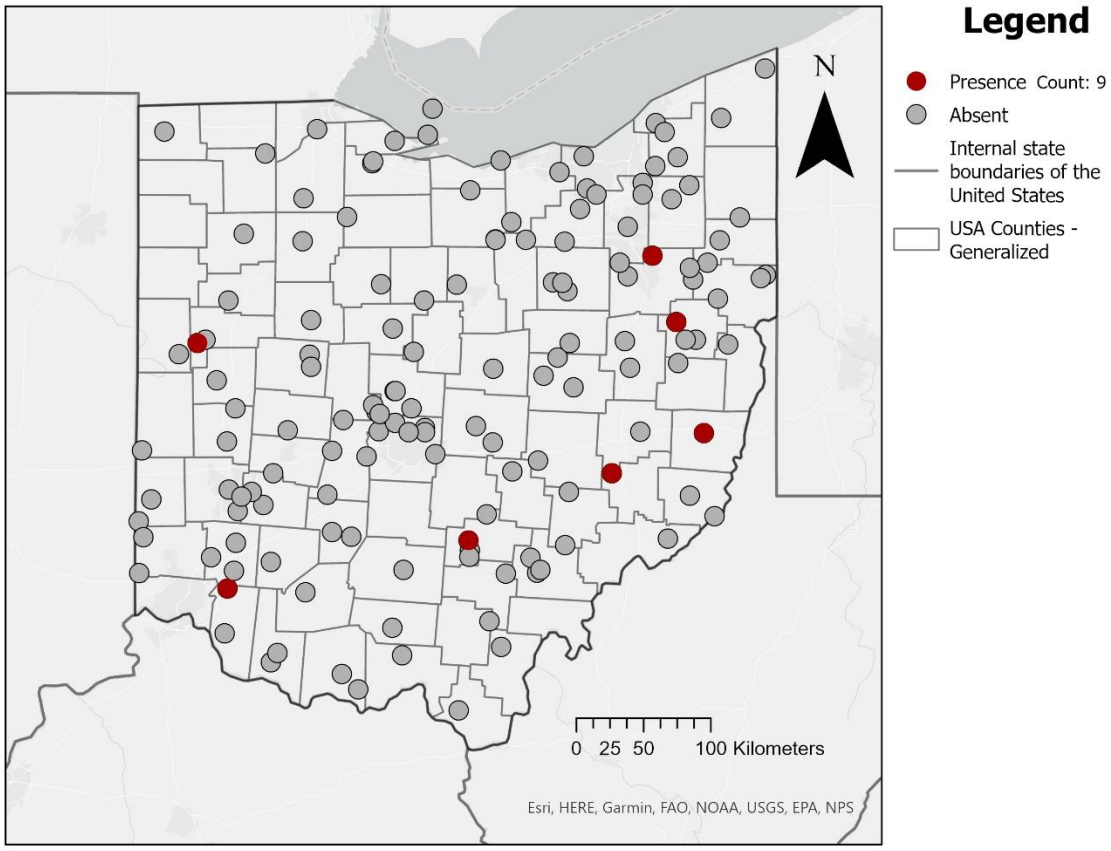
Sphecodes levis is a cleptoparasitic species of bee in the family Halictidae. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen.
Size range: 6 mm (female), 5 mm (male)

Sphecodes near-stygius



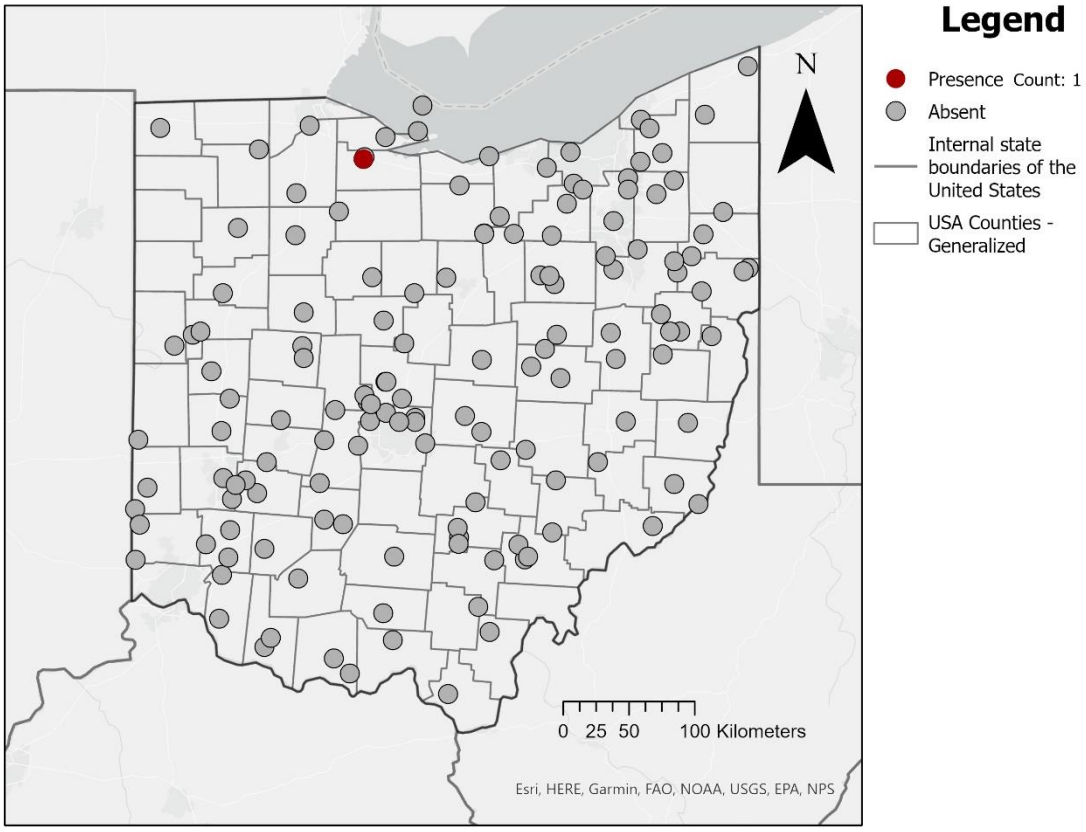
Sphecodes near-*stygius* is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. This particular specimen matched most of the characters with *Sphecodes stygius*, but the abdomen is mostly black in the female, so we labelled it near-*stygius* instead.

Sphecodes pimpinellae



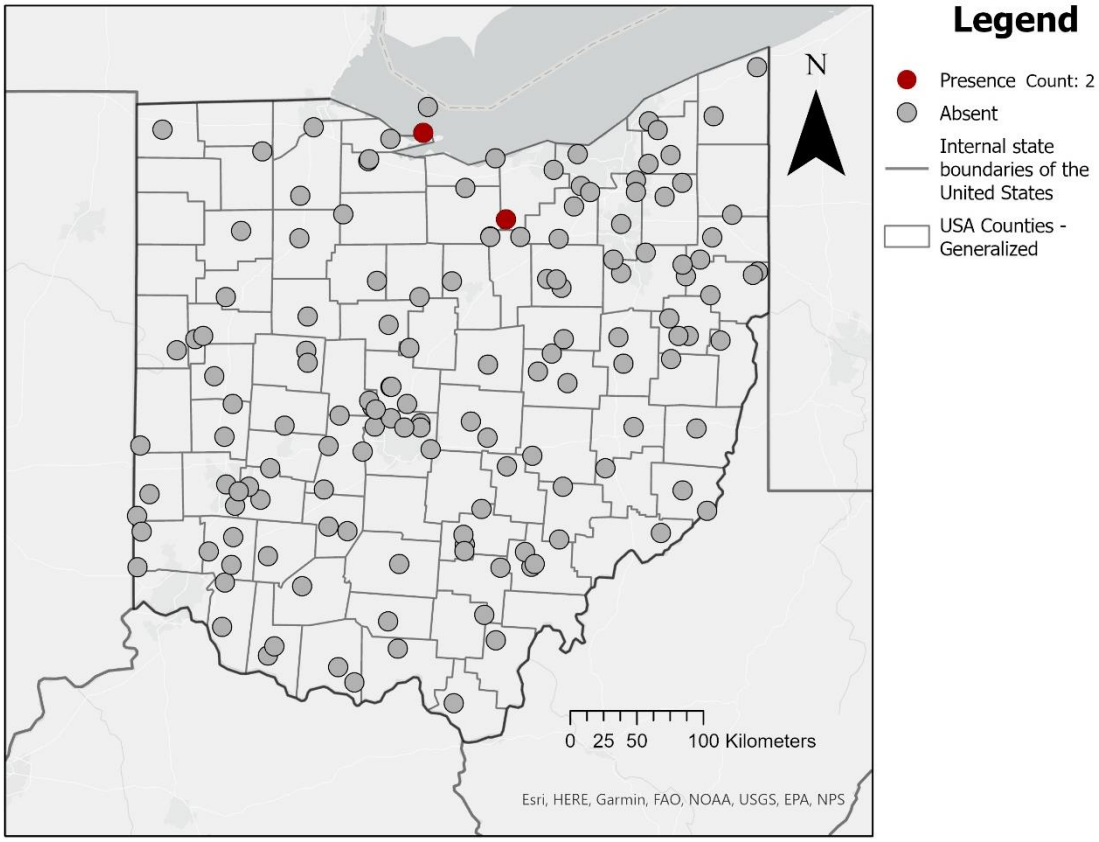
Sphecodes pimpinellae is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen. *Sphecodes pimpinellae* is one of the few in the genus with only two submarginal cells and has a simple mandible with no teeth.

Sphecodes stygius



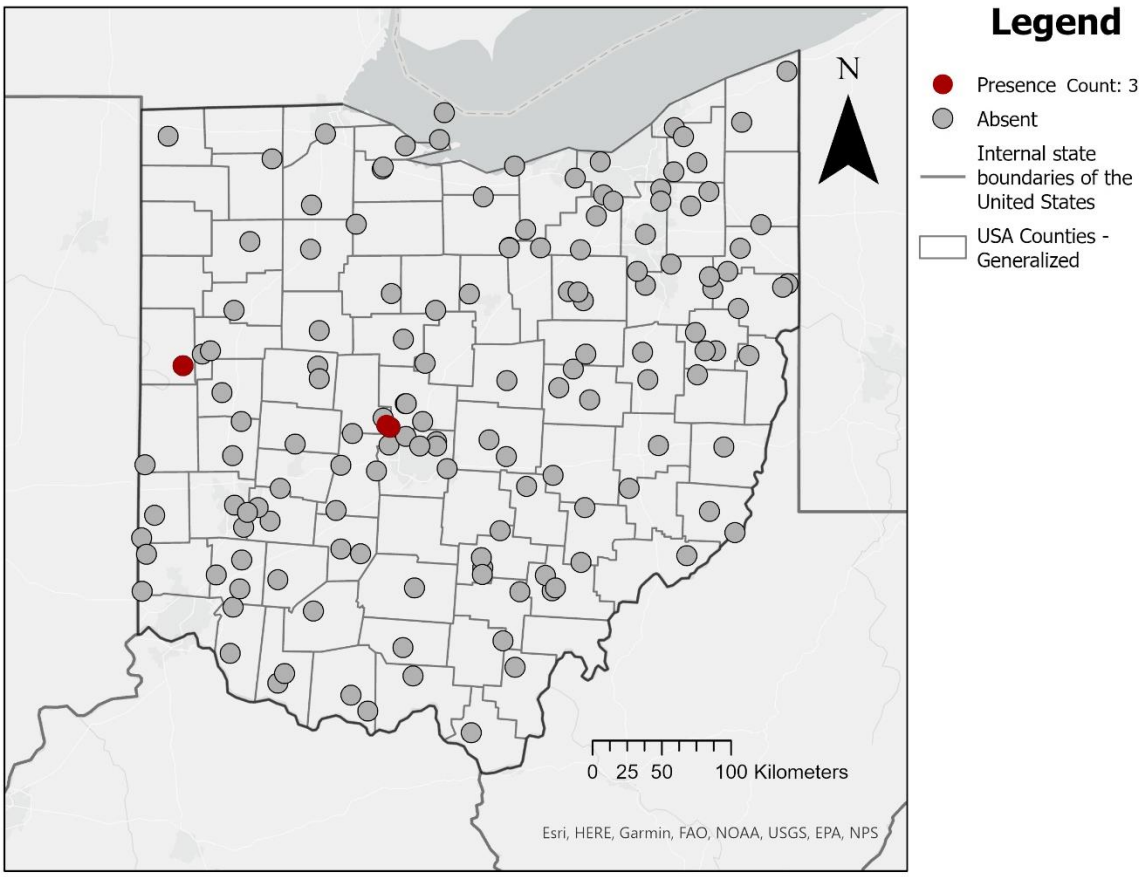
Sphecodes stygius is in the family Halictidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Sphecodes* are a tricky group to identify even with a specimen. The entire genus is in dire need of revision, so many of our specimens were left at *Sphecodes* sp or morphospecies. The females have a black thorax and a red abdomen. *Sphecodes stygius* has a simple mandible with no teeth.

Stelis coarctatus



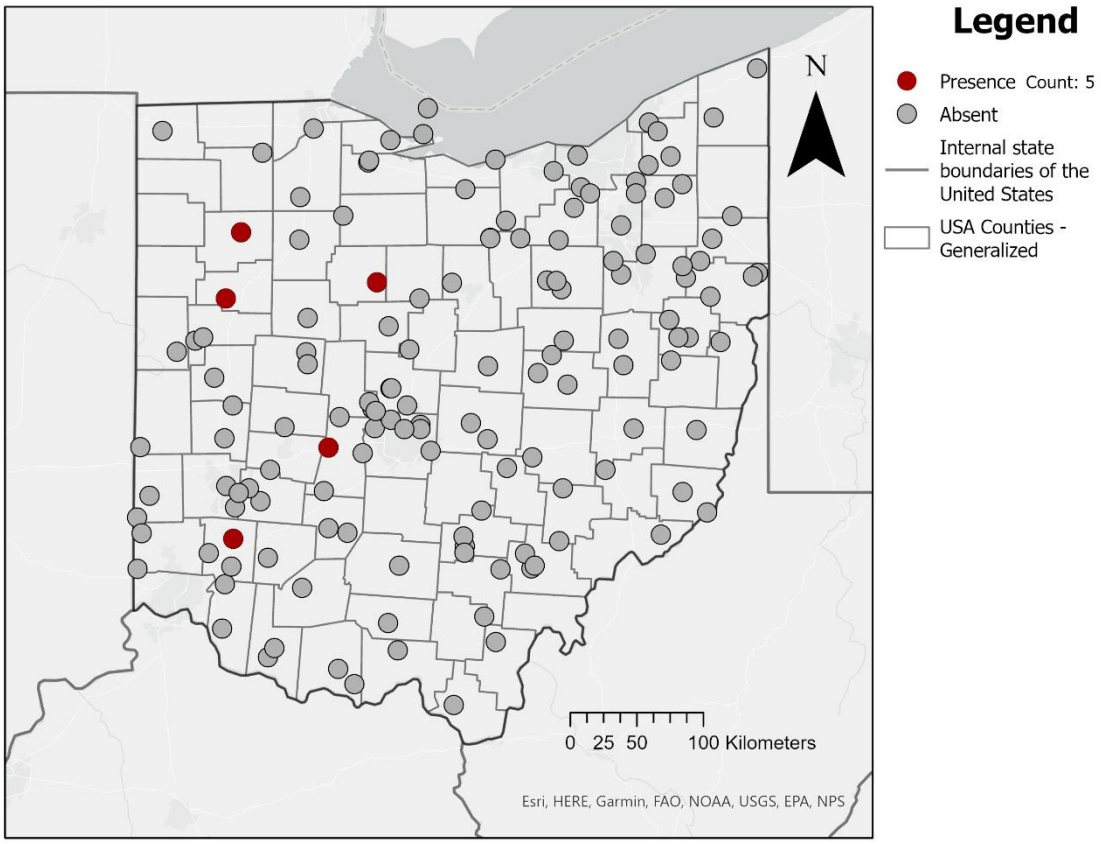
Stelis coarctatus is in the family Megachilidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Stelis coarctatus* is known to parasitize *Heriades carinata*, but likely parasitizes other species as well (Sheffield et al., 2008). It is a rather small bee with reduced markings to only the lateral edges of the abdominal segments.
Size range: ~6 mm

Stelis labiata



Stelis labiata is in the family Megachilidae. This is a cleptoparasitic species of bee. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. It is known to parasitize *Hoplitis spoliata* and *Hoplitis producta* (J. T. Medler, 1967; Medler, 1961).
Size range: 8 mm (female and male)

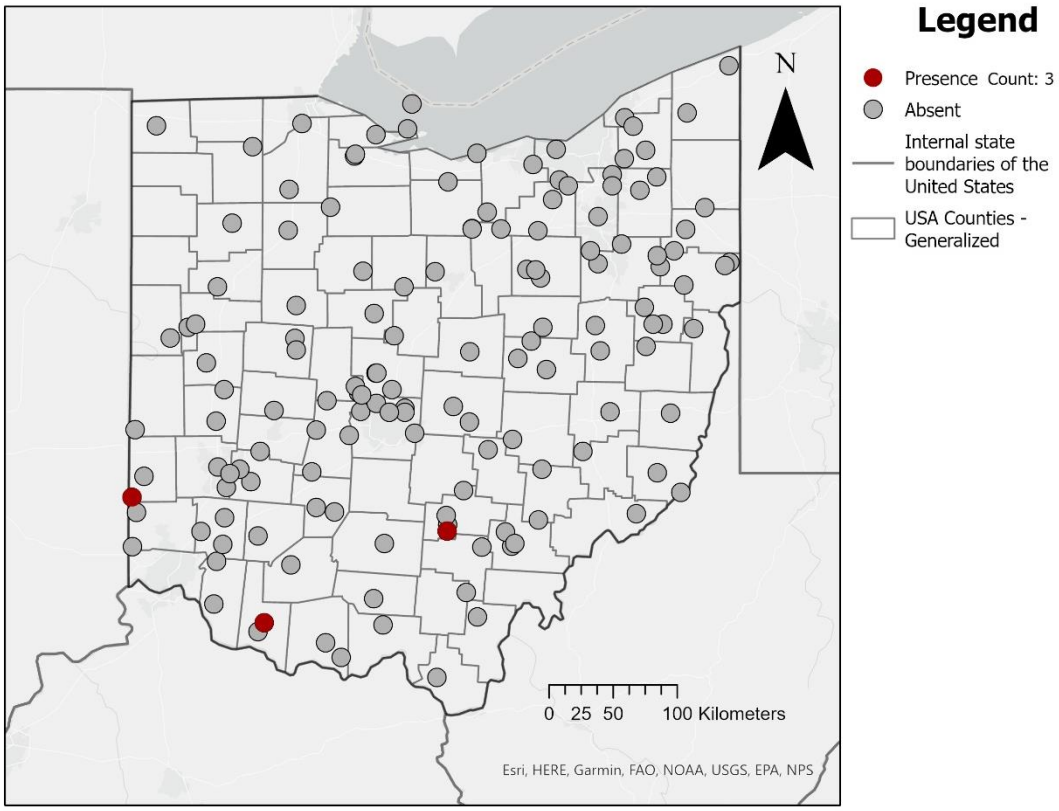
Stelis lateralis



Stelis lateralis is in the family Megachilidae. This is a cleptoparasitic species of bee. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Stelis lateralis* is known to parasitize *Osmia pumila, Hoplitis pilosifrons, Hoplitis producta*, and *Hoplitis spoliata* (J. T. Medler, 1967; Johnson, 1986; Medler, 1961; Michener, 1955).

Size range: 5 – 6 mm (female) – 7 mm (male)

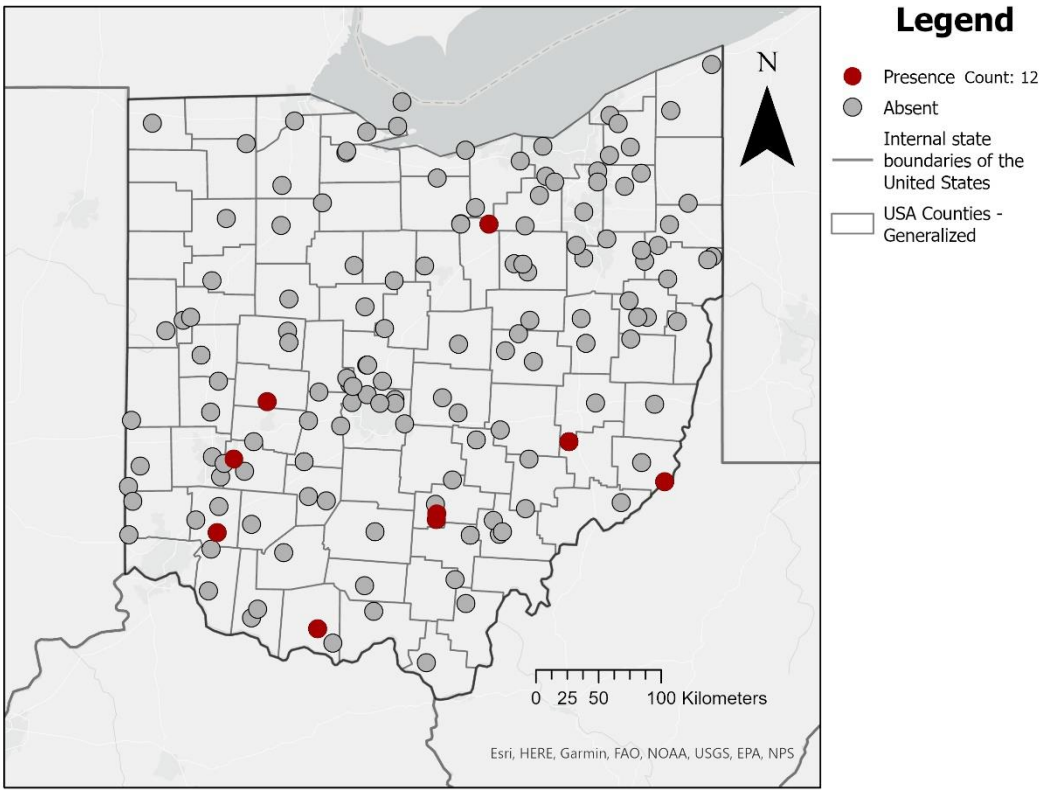
Stelis permaculata



Stelis permaculata is a cleptoparasitic species of bee in the family Megachilidae. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Stelis permaculata* is a cleptoparasite of *Heriades carinata* and potentially *Heriades variolosa* as well (Satyshur et al., n.d.). This is a rarely documented species, and these specimens represent the first known records for Ohio.

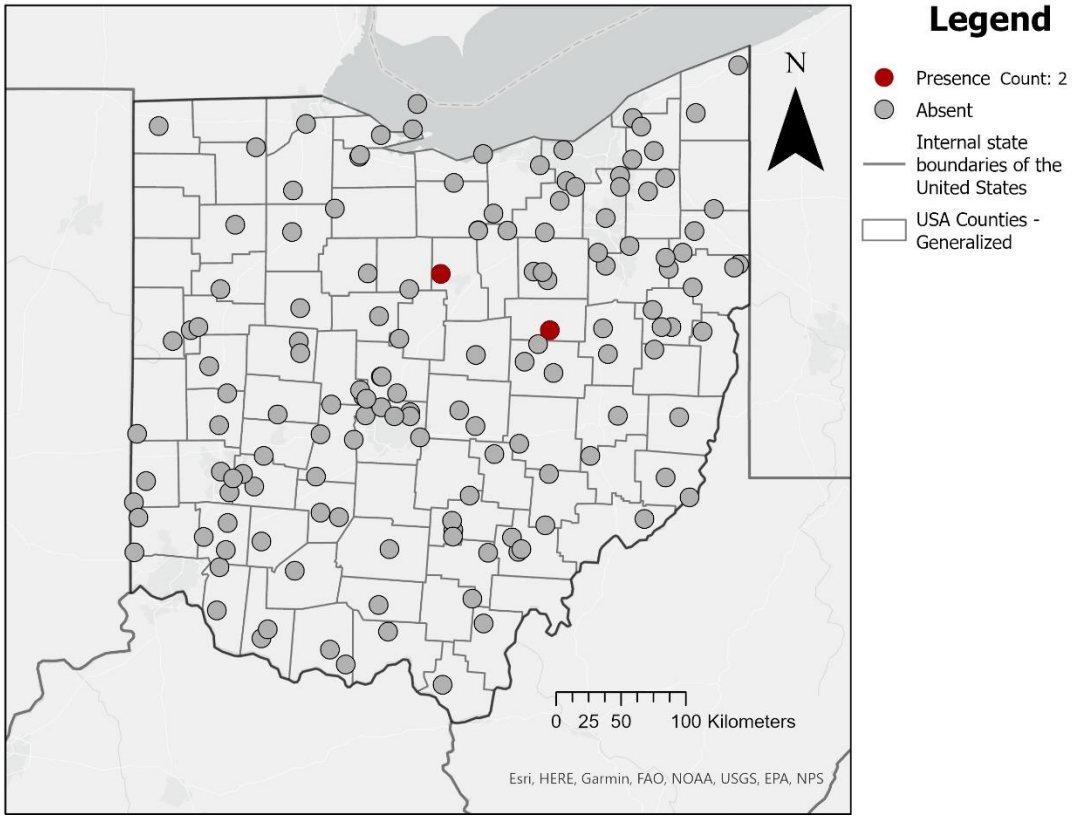
Size range: 5 mm (female)

Triepeolus cressonii



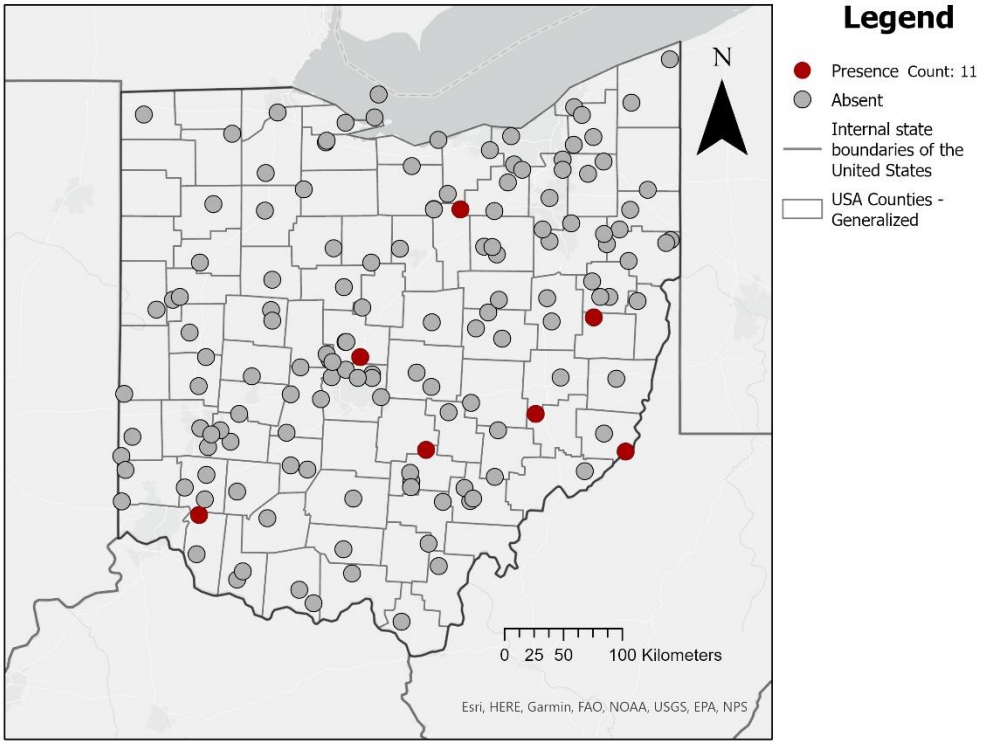
Triepeolus cressonii is in the family Apidae. It is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Triepeolus cressonii* is a large black bee, with short, flat white hairs that look like white bands. The hair bands on the first abdominal segment are parallel.

Triepeolus donatus



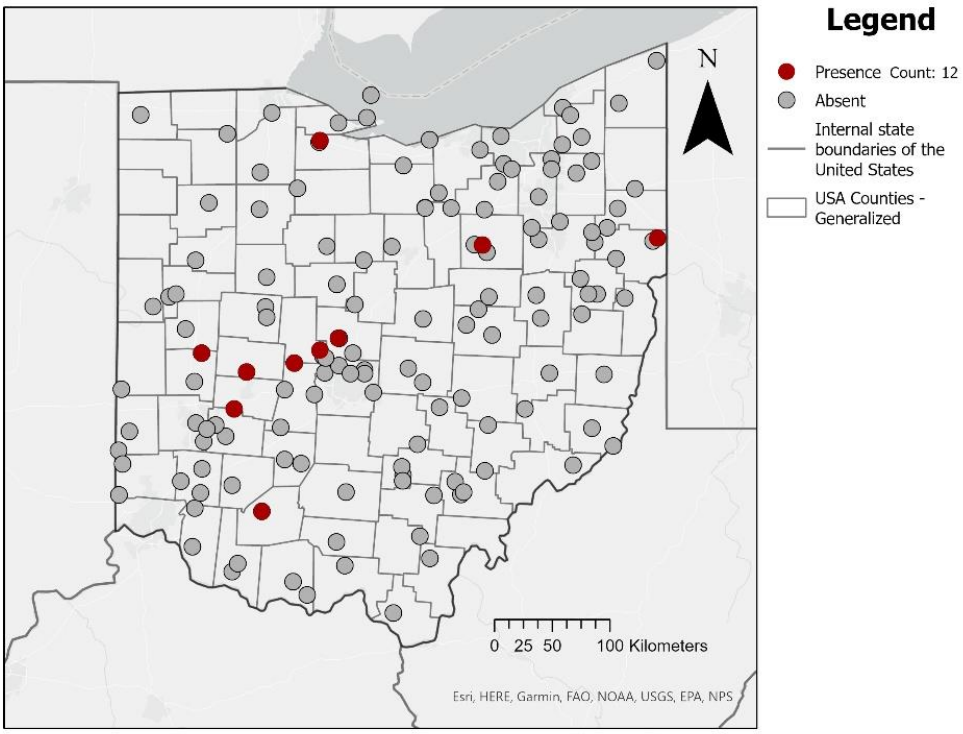
Triepeolus donatus is in the family Apidae. It is a cleptoparasitic species of bee. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Triepeolus donatus* is a large black bee, with short, flat white hairs that look like white bands. The hair bands on the first abdominal segment are parallel.
Size range: 11-13 mm (female), 9 – 11 mm (male)

Triepeolus helianthi



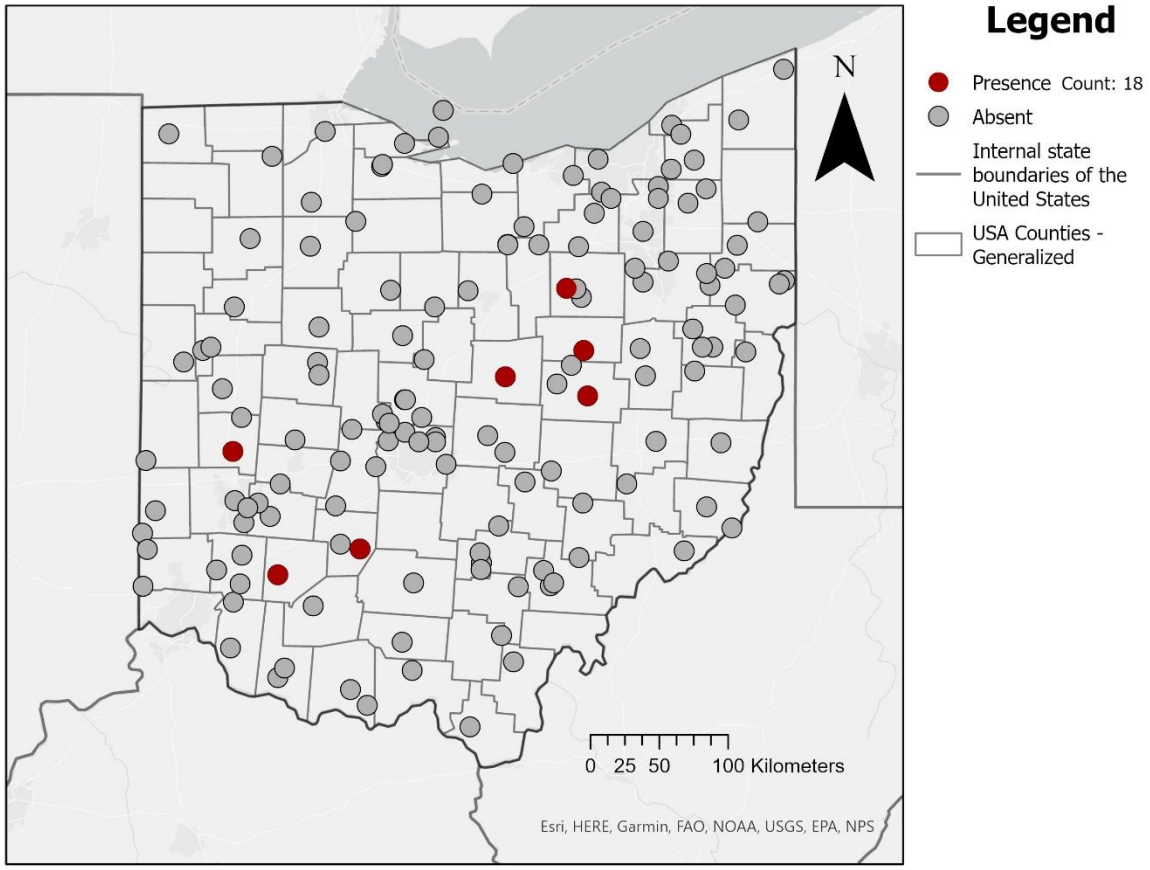
Triepeolus helianthi is in the family Apidae. It is a cleptoparasitic species of bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Triepeolus helianthi* has been reported in the nests of bees in the genus *Melissodes* (Parker et al., 1981). Triepeolus helianthi is a large black bee, with short, flat white hairs that look like white bands. The hair bands on the first abdominal segment are parallel.

Triepeolus lunatus



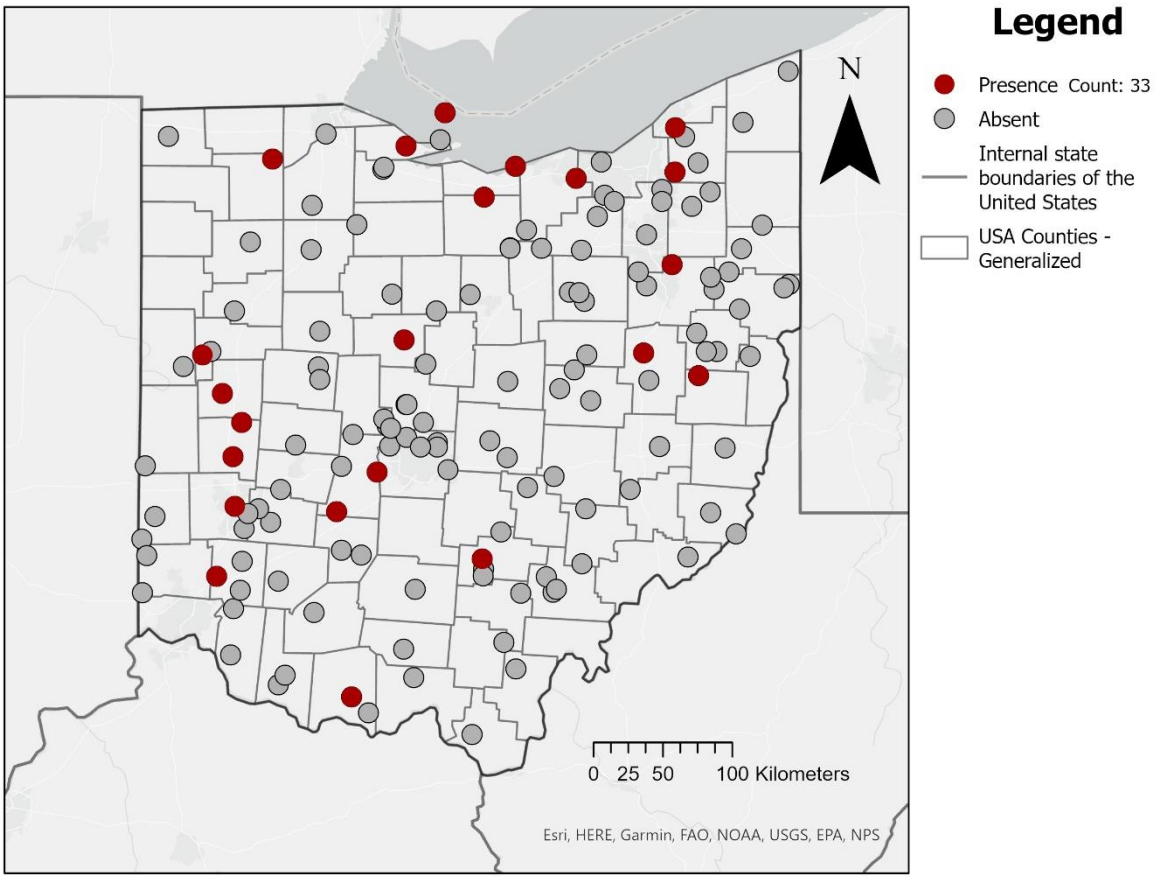
Triepeolus lunatus is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Triepeolus lunatus* has been reported parasitizing nests of bees in the genus *Melissodes* (Rightmyer, 2008). *Triepeolus lunatus* is a large black bee, with short, flat white hairs that look like white bands. The hair bands on the first abdominal segment are not parallel, instead are angled such that the black hairless region appears triangular.

Triepeolus pectoralis



Triepeolus pectoralis is in the family Apidae. This is a cleptoparasitic species of other bees. Instead of foraging for their own pollen and nectar resources, bees in this species seek out nests of other bees to lay their eggs into. *Triepeolus pectoralis* is known to parasitize bees in the genus *Melissodes* (Hurd et al., 1980). *Triepeolus pectoralis* is a large black bee, with short, flat white hairs that look like white bands.

Xylocopa virginica



Xylocopa virginica is in the family Apidae. It is known as the Eastern Carpenter Bee. This is a large, charismatic bee that is common across Ohio. It likely was poorly documented in our survey because it was large enough to climb out of our bowl traps. The large carpenter bee is most likely to be confused with bumble bees, but is on average larger and without dense hair on most of the abdominal segments, thus giving it that "shiny hiney" that naturalists like to point out. Many building managers run into issues with this bee drilling and nesting in wooden structures like fences, benches, and buildings. The male carpenter bees have a yellow face, no stinger, and are prone to hovering directly in front of people at eye view. More recently, the non-native *Megachile sculpturalis* has been documented evicting carpenter bees and taking over their nests (Laport and Minckley, 2012).

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Acknowledgements:

This project was funded through the Ohio Division of Wildlife, Ohio Biodiversity Conservation Partnership along with the Manitou Fund. We also thank the many individual donors who supported this project. This project would not have been possible without the many volunteers who were willing to set traps in the height of the pandemic, along with the parks and preserves that were able to get us survey permits. Many additional thanks go to the many helpers in the lab, without whom, we would still be processing these specimens. Special thanks go to Denise Ellsworth and Lisa

Lebovitz for helping get this project off the ground. We also appreciate the time that Rob Jean and Sam Droege took to look at a small subset of our specimens.

Collectors Who Made This Project Possible:

Al Blyth, Amy Mackey, Amy Miller, Amy Schnebelin, Andrea Ballinger, Ann Lighthiser, Ashley Kuflewski, Barbara Dewey, Barbara Lodermeier, Beth Robb, Beth Scheckelhoff, Bob Heath, Bonnie L. Marx, Bonnie M Twaddle, Brooks Bolyard, Cali Granger, Cameron Svoboda, Caren Diltz, Carl Gleditsch, Carol Blake, Carol Cottrill, Catherine Gunn, Chad Carroll, Charlene Margetiak, Chelsea Gottfried, Chris Frontz, Chris Kimmel, Cindy Beveridge, Clara E Glade, Clarissa Thompson, Craig Biegler, Danielle Thompson, Dave & Vickie Echternacht, Dean R Babcock, Denise Ellsworth, Denny Reiser, Dianne Kadonaga, Dick Baker, Dixie Bowen, Don Winstel, Douglas Drum, Drema Hiestand, Elaine Robinson, Elizabeth Heiser, Gail L Piper, Hannah Scott, Heath White, Helen M. Hollis, Jackie Driscoll, James Estep, Jandi Adams, Jane M Kutzley, Jane O'Brien, Janet Nelson, Jeanne C Poremski, Jeff Stachler, Jenny Richards, Joan Bugner, Jodie Lynn Cordell, Joe Lansing, John Howard, Joseph Moosbrugger, Judy Hinterlong, Judy Page, Karen Feltham, Karen Orosz, Karen Salvagno, Karen Veve, Kari Thompson, Kathy Bowers, Kelly A Love, Kelly Capuzzi, Kimber Caito, Kris Hunter, Laura J. Weber, Laurie Lowe, Linda Gilbert, Lisa Lebovitz, Livia Raulinaitis, Loretta Graham, LuAnn Dillon, Lynda Andrews, MaLisa Spring, Marcia Carsten, Marianne O'Donnell, Marsha Freeland, Mary Brennan, Mary Schilling, Michelle Manzo, Miriam Forquer, Nancy Helm, Natalie Fraser, Nora Sullivan, Pam Knudson, Patricia Dutton, Patricia Siebert, Peter Boyer, Rebecca Thomas, Richard Duval, Robert Stanton, Rosemary Fromer, Ruth Bowell, Samantha Hearn, Scott Lewis, Sharon A. Devine, Shena Weade, Steve Upperman, Susan Kishman, Suzanne Nelson, Tammy Oneil, Teresa Staats, Thomas Miller, Timothy D Myshrall, Vickie Eichof, William Stitt, Yvonne Cecil, Roxanne Luff, Jennifer Smith, Karen E Elliott, Laura Hughes, Cheryl Corney, Rachel Goodpaster, Robert Klips, Margaret Zeleznik, Leslie Moore, Marianne Cooper, Christina P Bobek, Rachel Cochran, Bruce H Smith, Bruce Rahn, Shana Angel, Judie Gaerke, Lewis T. Price, Bailey Grenert, Barbara Wilson/Kim E McCoy, Becky Donaldson, David Kerns II, Dona Rhea, Jacqueline Kralovic, James Noah Ganson, Jamie L Walters, Jena Copley, Jeri Wenger, Katie VanDyne, Kristi DeFalco, Linda Mautz, Miyauna Incarnato, Peg Ryan, Shayne E. Marhofer, Stephanie Honeck, Tara Poling.

Parks and Preserves:

Barkcamp State Park, Batelle Darby Metro Park, Bigelow Cemetery State Nature Preserve, Blacklick Metropark, Blendon Woods Metro Park, Bowyer Farm, Brown County Soil & Water Office, Burton Wetlands Nature Preserve, Camp Akita, Camp Myeerah, Camp Oty'okwa, Cedar Bog, Clary Gardens, Cowan Lake State Park, Crane Hollow Preserve, Creek Bend Farm: Wilson Nature Center, Cricket Frog Cove, Dutch Fork Wetland: Dawes Arboretum, Glacier Ridge Metro Park, Hannon's Camp America, Hiram College Field Station, Homestead Metro Park, Ironton Ranger Station, Longbranch Farm, McCammon Creek Park, Morgan Park, Morgan Swamp Preserve, Mustill Store Museum, Norma J Johnson Nature Preserve, Oakwoods Nature Preserve, OSU Marion Prairie, Penitentiary Glen Reservation, Research Reserve for Huston-Brumbaugh Nature Center, Saulisberry Park, SHARP Site, Stratford Ecological Center, The Ridges, USDA Science Center, W. W. Knight Nature Preserve, Wayne National Forest Headquarters, Wooster Memorial Park.

Volunteers and assistants in the lab: (in no particular order)
Rahma Dini, Cheyenne Helton, Amber Fredenburg, Conner Newsome, Vanessa Chilcoat, Caroline Mallory, Eleanor MacDonald, Dean Babcock, Jane Obrien, Roxanne Luff, Miriam Forquer, Joe Moosbrugger, Hope Saunders, Bob Heath, Loretta Graham, Elizabeth Heiser, Carl Gleditsch, Jim Estep, Pat Dutton, Elaine Robinson, Suzanne Nelson, Peter Boyer, Hellen Hollis, Kiersten McMahon, Cameron Svoboda, Bob Klips, Dianne Kadonaga, Teresa Staats, Katie and James VanDyne, Keri Bowyer, Brooks Platt, Matthew Semler.