

MINNESOTA STATEWIDE BEE SURVEY 2014 - 2023





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Abstract

Native bees are vital components of Minnesota ecosystems and are thought to be in decline. The goal of this project was to document the bee diversity in the state to inform conservation decisions. The bee diversity in Minnesota was largely undescribed prior to Environment and Natural Resources Trust Fund investments in this project. This project has contributed to the establishment of a state list of native bee species of approximately 500 species. Bee surveys conducted by the Minnesota Biological Survey from 2014-2022 have expanded upon our understanding of the distributions of many bee species, contributed new species to the state list, and provided a baseline for conservation actions involving bees in Minnesota.

Introduction

Native bees provide important pollination services to sustain diverse plant communities and maintain or improve ecosystem resilience in Minnesota. Recent research suggests that some bee species are declining (Bartomeus et al. 2013). However, without survey efforts, a state list of bee species, and ongoing monitoring, it is difficult to know which species might be declining and thus in need of specific conservation action. Minnesotans are eager to support bees, as evidenced by the designation of a state bee, the rusty patched bumble bee (*Bombus affinis*) in 2019, an executive order ([16-07](#)) by former Governor Mark Dayton in 2016 to take steps to reverse pollinator declines, and an executive order ([19-28](#)) by Governor Tim Walz in 2019 to recognize continued support for pollinator protection. One of the first steps towards understanding how to protect bees is knowing which species reside in Minnesota and their distribution within the state. The goal of this statewide survey was to document wild bee diversity and distribution in Minnesota including contributing to drafting a state list of bees.

Various groups in Minnesota are working towards better understanding bee ecology and taxonomy. The Cariveau Native Bee Lab at the University of Minnesota has ongoing research projects devoted to native bees. The Minnesota Bee Atlas is directed at promoting citizen science, extension education, and monitoring bumble bees. The United States Fish and Wildlife Service coordinates information on the federally listed *B. affinis* and other bumble bee species. The Xerces Society has developed guidance on bee monitoring. Other partner organizations and communities are actively engaged in pollinator conservation in Minnesota. The Minnesota DNR (MNDNR), and specifically the Minnesota Biological Survey (MBS) is committed to documenting the diversity of native bees in Minnesota through survey and monitoring.

Previous efforts to survey Minnesota bees have been haphazard. The first attempt at listing the bees of Minnesota was a summary written by Frederic Washburn from the work of the state entomologist, Otto Luggler following his death (Washburn 1918). The list of 66 species was only a starting point as the author suggested that “manifestly many times more species occur in this state than are indicated in this publication” (Washburn 1918). The original list is now over 100 years old and has not been updated or expanded. Museum specimens are invaluable to the efforts of producing a state list. Without insect collections, there would be little to no historical documentation of bee species in Minnesota. Likewise, new statewide surveys are important to documenting the bees of Minnesota.

This lack of information has resulted in an inability to list species for conservation protection in Minnesota. At the time of writing this report, no bee species are listed on the state list of threatened and endangered species in Minnesota. The rusty patched bumble bee is regularly detected in Minnesota

and is protected through its federal endangered status but lacks state listing currently. The most recent version of the state list of Species of Greatest Conservation Need (SGCN) in the Wildlife Action Plan (Minnesota Department of Natural Resources 2016) lists five species of bumble bees (*Bombus*) as non-listed SGCNs, due to a lack of information about the status of these and all other bees in Minnesota. The Minnesota Wildlife Action Plan identifies bee survey needs as a high priority.

Two nearby states and one province have recently published state lists of bee species including Wisconsin (Wolf and Ascher 2008), Michigan (Gibbs et al. 2017), and Manitoba (Gibbs et al. 2023). The authors of these lists included records from insect collections and recent survey efforts by research groups. Results from these state bee lists indicate a total of 388 species in Wisconsin, 465 species in Michigan, and 392 species in Manitoba. Each list is preliminary, given the fluid nature of losses, new taxonomy, non-native species introductions, and detections of rare or cryptic species. Because of the efforts presented in this report along with those of other groups working on bees in Minnesota, there is now a Minnesota state list of bees, with over 500 species documented (Portman et al. 2023).

Plant diversity is likely a major driver of bee diversity. Minnesota is rich in ecosystem diversity, and because these ecosystems differ in plant community diversity we suspect similar patterns in bee diversity. The four ecological provinces of Minnesota define major zones of native vegetation: Tallgrass Aspen Parklands, Prairie Parkland, Eastern Broadleaf Forest, and the Laurentian Mixed Forest (Fig. 1). These ecological units are each unique in climate and native plant communities suggesting that the bee community is likely to shift with the ecological provinces as well. The Tallgrass Aspen Parkland (TAP) is the smallest ecological province and is characterized by cold and dry climate dominated by prairie landscapes that were shaped by glaciation. The Prairie Parkland (PP) is the tallgrass prairie portion of the state that experienced the most recent glaciation and is characterized by dry, westerly winds. Impacts of conversion of prairie to agriculture and the dramatic loss and fragmentation of prairies has been explored by researchers at the University of Minnesota (Lane et al. 2020, 2022, Ritchie et al. 2020). The Eastern Broadleaf Forest (EBF) is a transition zone between prairie and mixed conifer-deciduous forest, where climatically the amount of precipitation is approximately equal to evapotranspiration. Woody encroachment of the prairies and loss of spring ephemerals are likely threats that impact the bee community in the EBF. The Laurentian Mixed Forest (LMF) covers nearly half of the state with conifer and mixed hardwood forests and bogs. Threats such as peatland and timber harvest could negatively impact the bee community in the LMF through removal of important hostplants like *Vaccinium*.

The objectives of this project were to 1) database the various historical collections for Minnesota-collected bee specimens, 2) establish baseline survey-level data across the various ecological provinces, and 3) support a state checklist (Portman et al. 2023). To this end, the Minnesota Biological Survey documented the bee specimens at the University of Minnesota Insect Collection, visited and databased Minnesota-collected bee specimens at other collections, accepted and identified bees collected by partner organizations, and surveyed many sites throughout Minnesota. The results of those efforts to date are presented here. This report highlights the efforts by the Minnesota DNR, and the Minnesota Biological Survey for projects primarily funded by the Environment and Natural Resources Trust Fund from 2014-2022.

Methods

Museum Records

Minnesota Biological Survey staff visited and/or requested loans of Minnesota-collected bees from various insect collections including: American Museum of Natural History, Illinois Natural History Survey, Iowa State Insect Collection, Severin-McDaniel Insect Research Collection at South Dakota State University, University of Minnesota Duluth, University of Minnesota St Paul, North Dakota State Insect Reference Collection, and Wisconsin Insect Reference Collection. Specimens from the University of Minnesota St. Paul were confirmed by Crystal Boyd (MNDNR), Dr. Elaine Evans (University of Minnesota), Dr. Joel Gardner (University of Minnesota), and Dr. Zach Portman (University of Minnesota). Specimens from the American Museum of Natural History were confirmed by Dr. John Ascher (American Museum of Natural History). Specimens from the remainder of the collections were confirmed by Crystal Boyd.

Bee Surveys

Most bee surveys were conducted by DNR-MBS staff from May to October from 2014-2022 (Fig. 1). Sites consisted of primarily state-managed land (e.g. Scientific and Natural Areas, Wildlife Management Areas, State Forests, State Parks), USFWS National Forests, USFWS Waterfowl Production Areas, National Wildlife Refuges, and The Nature Conservancy Preserves ([Appendix A](#)). Bees were collected using both active and passive sampling methods: hand nets and elevated bowl traps, respectively. The primary means of surveying early in the project timeline was through bowl trapping, with hand netting being more opportunistic. Bowl trapping has a propensity for non-target catch (Tepedino et al. 2015) and bias towards some species (Geroff et al. 2014). Because bowl trapping in 2020 and 2021 suggested that bowls caught very few bees, we only surveyed bees by hand-netting from flowers during meandering walks in 2022.

A total of 163 sites were surveyed using bowl traps (bee bowls) ([Appendix A](#)). Survey sites for bowl trapping were established late April or early May each spring, with a goal of one site per county. Typically, five to eight rounds of sampling occurred at each site throughout a season. Surveys at each site consisted of one, 115-meter transect of 24 – 3.25-ounce bowls, eight bowls of each of three colors: UV yellow, UV blue, and white. Bowls were set in rings that were attached at the top of one-meter-tall PVC stakes, and stakes were placed 5 meters apart (Droege et al. 2010). Every three weeks each bowl was filled with soapy water (1 teaspoon Dawn dish soap: 1 gallon water) and left out for 24 hours. Bees and any bycatch were strained from the bowls and combined into a single whirl-pak for the site visit with 70% ethanol. Surveys were done on days when the temperature was 60 °F (15.5 °C) or above with wind speeds of 10 mph (16.1 km/h) or less. Attempts were made to avoid setting out bowls overnight if there were predictions for rain. Weather conditions at the beginning and ending of the trap setting were recorded as well as the number of bowls that were set and picked up. Opportunistic hand netting consisted of meandering walks at a total of 565 sites ([Appendix A](#)). This typically resulted in very few if any repeat visits to a site. Observers walked around through patches of blooming forbs, netting bees from flowers. Location information was documented for each specimen collected. Plant species were recorded when bees were collected from a flower. All specimens were frozen for several days before being processed, pinned, and identified.

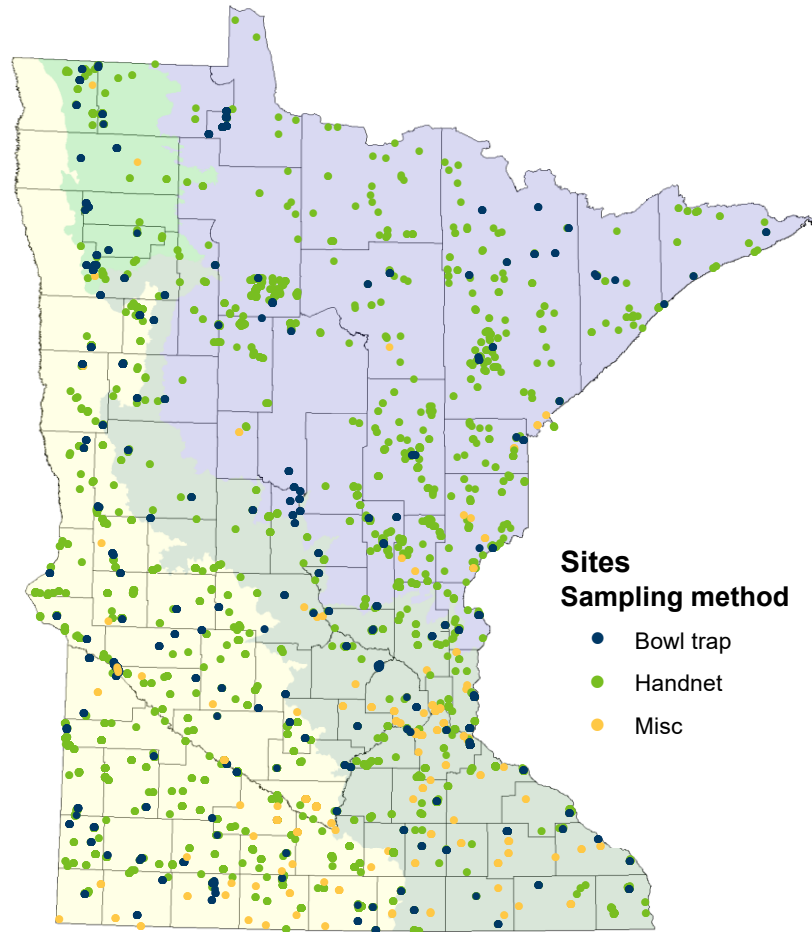


Figure 1. Map of Sampling Sites.

Sites surveyed using bowl traps (dark blue points), meandering walks using aerial hand nets (green points), and other miscellaneous methods (yellow points) from 2014-2022 for bees across the Tallgrass Aspen Parklands (light green polygon), Prairie Parkland (yellow polygon), Eastern Broadleaf Forest (dark green polygon), and Laurentian Mixed Forest (purple polygon) Provinces.

We also accepted bee specimens from other projects that did not have the resources to identify specimens. The Minnesota Department of Agriculture monitors insects using a variety of destructive sampling methods (e.g., Japanese beetle traps, cross vane) and has submitted their bee bycatch to be included in the Minnesota Bee Survey. The Minnesota Department of Natural Resources Division of Fish and Wildlife contracted Erin Maxson to survey Lake of the Woods County, in particular the area in and around Red Lake Wildlife Management Area. All specimens were identified to species where possible, and these data are included in this report.

Bee Identification

Bee identifications of specimens were preliminarily made by MBS staff using [Discover Life](#) keys, Mike Arduser's *Key to the genera and species of the Midwestern United States with an emphasis on the Tallgrass Prairie region*, and other published keys (Mitchell 1962, Colla et al. 2011, Gibbs 2011, Sheffield

et al. 2011, Koch 2012, Gonzalez and Griswold 2013, Williams et al. 2014, Gardner 2019). Specimens were then sent to a trained bee taxonomist (Dr. Zach Portman, University of Minnesota) for confirmation.

Once confirmed, the specimens and associated data were accessioned into the University of Minnesota Insect Collection (UMSP). Series of four females of *Agapostemon virescens* were accessioned due to their high abundance in the samples. Similarly, *Apis mellifera* specimens were discarded following identification and database entry. A synoptic reference collection is retained at the Minnesota Department of Natural Resources in St. Paul.

Several taxonomic groups are challenging to identify for a variety of reasons. Bowl traps can collect many specimens of *Lasioglossum*. This group is particularly challenging to identify, with only a few trained taxonomists that can accurately determine species. Combined with the large volume of specimens, this poses problems for anyone trying to survey bees. Many *Lasioglossum* specimens were identified and confirmed by a trained taxonomist, but we continue to process many specimens of this genus. Other taxonomic groups are difficult to identify due to a need for systematic revision (e.g. *Melissodes* and *Nomada*). Some specimens of *Melissodes* remain unidentified to species, pending taxonomic revisions. Some specimens of *Hylaeus* can only be identified to a group of several potential species, or undescribed taxa. Only specimens that have been confirmed and accessioned into the UMSP are reported here.

Data Processing and Analysis

All bee specimens were pinned and labelled in the lab using proper specimen curation techniques. Each collecting event and every observation is entered into a MNDNR database and are entered into the Natural Heritage Information System (NHIS) database. Because bees are often impossible to identify to species in the field, typically each observation is associated with an individual specimen. Occasionally, there are only photos of individuals that were captured and released as is the case for several records of rusty patched bumble bee (*Bombus affinis*) given its federal status of threatened.

We summarized data using R (R Core Team 2022) and the ‘vegan’ package (Oksanen et al. 2022) to assess species accumulation curve differences between the two primary collection methods, hand netting and bowl trapping.

We calculated subnational, or S-ranks for all species detected during this survey using the NatureServe calculator, excluding threats and trends as these are generally unknown (Master et al. 2012). The NatureServe conservation ranks are a standardized way for natural heritage programs such as MBS to assess the rarity, threats, and trends for species at the state-level. Ranks range from S1 – S5, with S1 being critically imperiled, and S5 being secure. Species were ranked as SNR (species not ranked) if there were less than five detections. Non-native species were ranked as SNA (species not applicable).

Results and Discussion

Museum Records

The total list of species that MBS documented in insect collections was 427. This list of species includes nearly all of those that Washburn recorded (1918). Washburn listed *Macropis ciliata* as residing in Minnesota, but no specimens of this species have been found in collections. *Macropis ciliata* has been reported from Wisconsin (Wolf and Ascher 2008), and may occur in Minnesota. Surveys would need to specifically target the host plant, *Lysimachia*.

The effort to document existing collections was a worthwhile endeavor towards establishing a state list of bees given the diversity of specimens that existed prior to commencing present day surveys. County maps presented in [Appendix B](#) indicate records of specimens represented in insect collections. States wishing to establish a baseline survey could consider first assessing existing collections, compiling a preliminary list, and then targeting surveys towards specific species that may be vulnerable to decline either from lists from nearby states or provinces or from the life history of the taxa.

Native Bee Surveys

Bee surveys conducted by MBS under the time frame of this report (2014-2022) include a total of 359 species (see [Appendix B](#) for species distributions). From the total specimens collected, pinned, and processed (53,975) the identifications of 42,675 have been confirmed to date, nearly 80% of the total bees collected. The identity of these confirmed specimens is what we report on here as it would be premature to discuss unconfirmed specimens.

Although the total bee species surveyed to date is less than the number of species on the state list, it should not be interpreted that the missing species are extirpated from Minnesota. In fact, a total of 359 could be considered a relatively large number of species when compared with other surveys of similar intensity that have documented far fewer species (~100 species as reviewed by Geroff et al. 2014). Many of the species on the state list are known from less than five specimens across all insect collections (145 species) and may be inherently rare, cryptic, or difficult to survey with broad sampling methodologies. We expect that with continued surveys including some targeted searches for the species that we have not yet surveyed and expanding surveys into the forested region of the state, the list of species will continue to grow.

Of the 66 bee species that Washburn listed as residents of Minnesota, five species have not been documented by this survey effort (*Andrena fragilis*, *Andrena robertsonii*, *Melissodes denticulatus*, *Trachusa zebrata*, and *Triepeolus distinctus*). Two of the five have been recently documented by other researchers (*Andrena fragilis* and *Melissodes denticulatus*). Most of these species are from the genus *Andrena*, a large and difficult-to-identify genus of Andrenidae, with many species that are specialists on early-blooming flowers. We expect that these species are likely present in the state and will be discovered with additional targeted surveys. *Andrena fragilis* for example, a specialist on *Cornus*, has only two known detections, from 1969 and 2014.

Various methods can be used to survey bees (e.g. bowl traps, hand netting, blue vane traps, Malaise traps, etc.). Different methods catch a different complement of bees (Geroff et al. 2014). Most specimens collected through this project were from bowl trapping (38,761), with far fewer specimens surveyed by hand netting (12,165). From these specimens, 100 species (28%) have been exclusively collected by hand netting and 41 species (11%) have been exclusively collected from bowl trapping reinforcing that different methods sample different species. Species accumulation curves suggest that hand netting accumulates species faster (i.e., with fewer specimens) compared with bowl trapping (Figure 2). The Chao1 estimate for bowl trapping is 345 (\pm 29) species and the estimate for hand netting is 402 (\pm 31) species. These results suggest that with continued sampling, more species would be detected with hand netting compared with bowl trapping, but the species richness estimate for neither method alone approaches the total known from Minnesota of 508. These results differ from others that have found bowl trap sampling to estimate a greater number of species compared with hand netting

(Grundel et al. 2011). Fewer specimens were collected by hand netting, but those efforts resulted in a far greater number of unique species suggesting that greater reliance on hand netting may be more efficient for inventories.

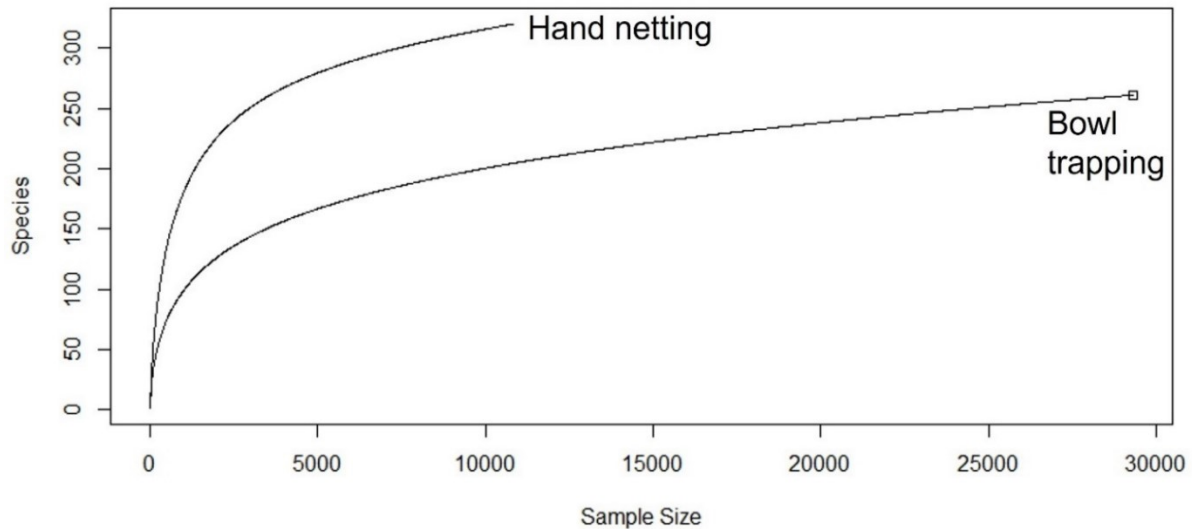


Figure 2. Species Accumulation Curves by Collection Method.

Species accumulation curves for the two primary sampling methodologies: hand netting and bowl trapping.

On average, this survey documented 53 species per county, ranging from 16 in Wadena County to 111 in Mille Lacs County (Figure 3). Counties were not surveyed with equal attention, ranging from 75 specimens from Watonwan County to 5432 specimens from Chippewa County (Figure 4). In general, those counties that have received less survey attention, with fewer specimens collected, also have fewer species surveyed. For example, the 16 species recorded from Wadena County, are only derived from 150 specimens as compared with Washington County that has 109 species recorded from 1487 specimens. Generally greater survey efforts, using multiple methods, and spanning the entire season resulted in greater sampled species richness. We expect that with additional surveys, the average number of species per county is likely to be at least 100, similar to what has been estimated for Michigan (Gibbs et al. 2017).

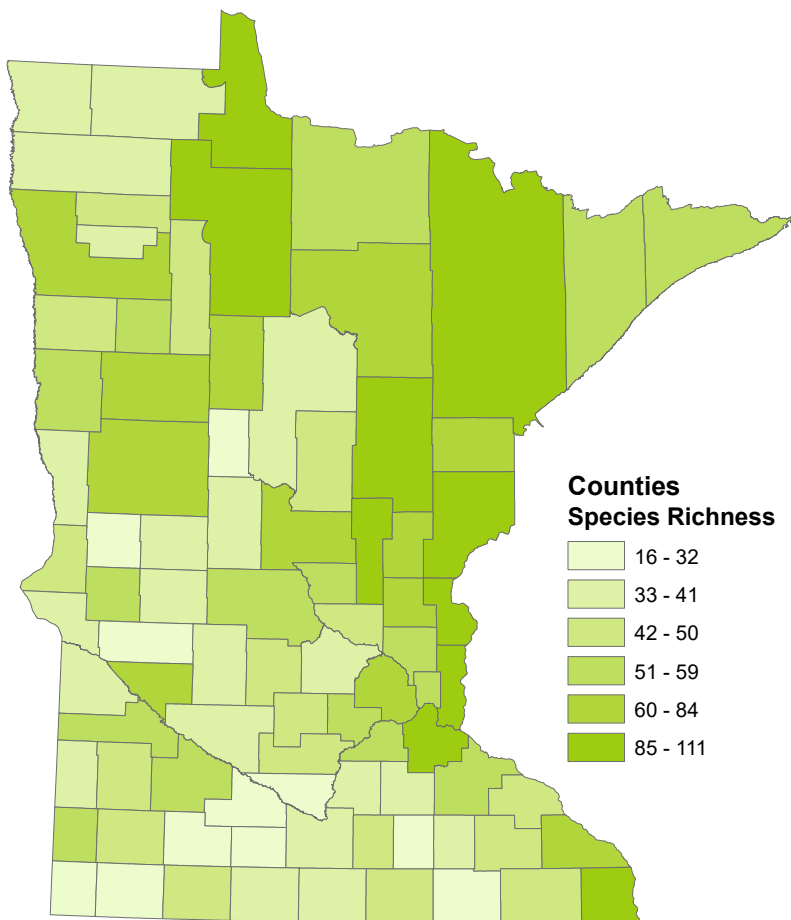


Figure 3. County Map of Species Richness.

County-level species richness (number of species) collected from 2014-2022 for bees across Minnesota, with a gradient from light green (lower species richness) to dark green (high species richness).

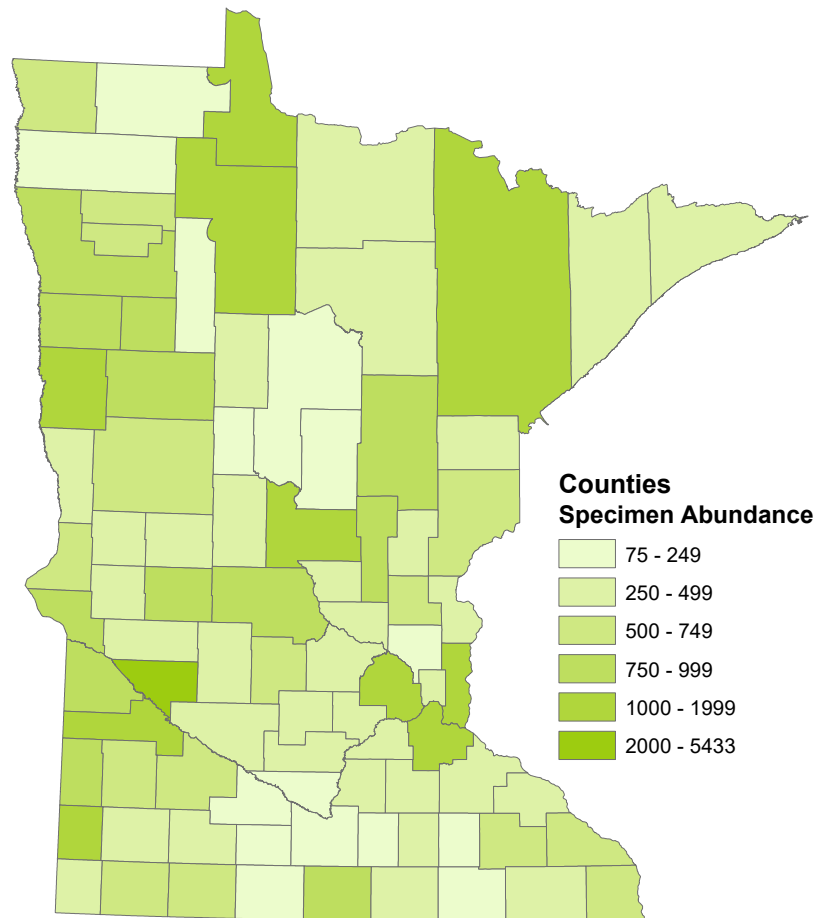


Figure 4. County Map of Specimen Abundance.

County-level specimen abundance (number of specimens) collected from 2014-2022 for bees across Minnesota, with a gradient from light green (lower number of specimens) to dark green (high number of specimens).

The ecological provinces were not surveyed with equal attention or with the same distribution of methods. Similarly, historical collecting effort varied between provinces. For example, much was previously known about the bee diversity in the prairie region, as evidenced by the large number of total specimens collected from the prairie (>60,000, Table 1). Although most specimens in this study were collected in the prairie, this resulted in the lowest species richness for any region. This is perhaps due to the reliance on bowl trapping in prairies, where more than 85% of specimens were collected using bowls (Table 1). In contrast to the prairie, very little was known about the bees of the forested regions of Minnesota. More than 50 species we collected from the Laurentian Mixed Forest had not previously known from that region. Clearly all regions of Minnesota harbor a great diversity of bees, but the Eastern Broadleaf Forest boasts the most species richness, perhaps due to the convergence of prairies and forests. Average specimens collected from bowl traps across the provinces varied: Tallgrass Aspen

Parkland (30), Prairie Parkland (40), Eastern Broadleaf Forest (28), and Laurentian Mixed Forest (12), similar to what others have found (Grundel et al. 2011).

Table 1. Species Richness and Specimen Abundance by Ecoregion.

Species richness and number of confirmed specimens from each of the four ecological provinces: Prairie Parkland (PP), Tallgrass Aspen Parkland (TAP), Eastern Broadleaf Forest (EBF), and Laurentian Mixed Forest (LMF). Data are separated into surveys conducted during the timeline of this project (MBS) compared with a dataset of all known bee specimens collected in Minnesota (Total) (Portman et al. 2023). The number of confirmed specimens collected during this project is further subdivided into those that were sampled by hand netting and bowl trapping to demonstrate the differences in collecting specimens across the ecological provinces.

| | Species Richness | | | |
|-------------------------|------------------|-----|-----|-----|
| | PP | TAP | EBF | LMF |
| MBS Specimens | 178 | 92 | 261 | 256 |
| Total Species | 279 | 102 | 377 | 308 |
| Percent of total | 64% | 90% | 69% | 83% |

| | Specimens | | | |
|-------------------------|-----------|-------|--------|--------|
| | PP | TAP | EBF | LMF |
| MBS Specimens | 17,985 | 2,076 | 13,066 | 9,289 |
| Hand net | 2,241 | 159 | 2,498 | 6,146 |
| Bowl traps | 15,546 | 1,934 | 9,272 | 3,066 |
| Total Specimens | 61,524 | 2,845 | 38,289 | 13,672 |
| Percent of total | 29% | 73% | 34% | 68% |

Not all sites were surveyed at the same effort or using the same methodologies, so comparisons between sites is inappropriate with these data. However, some interesting trends can be highlighted. Many sites that were surveyed using bowl traps and hand netting have around 50-60 species surveyed ([Appendix A](#)). Greater number of specimens does not necessarily result in greater species richness because some species are very abundant in bowl traps. For example, Chengwatana State Forest was surveyed using a variety of methods and has 54 species surveyed from only 137 specimens, whereas Freeman Wildlife Management Area has 27 species listed, collected using bowl traps and hand nets from about 111 specimens. Greater diversity of surveying methodologies seems to result in greater observed species richness.

Bee surveys to date have greatly increased our understanding of the state-wide distribution of many species ([Appendix B](#)). For example, one prairie specialist mining bee, *Andrena rudbeckiae*, was previously only known from one county and has now been surveyed from 14 additional counties. From species county-level distributions maps, and the data in [Appendix C](#) we can begin to see some trends in species that may be associated with certain ecological provinces. For example, we have only detected, *Dufourea novaeangliae*, a specialist on pickerelweed in the Laurentian Mixed Forest. As is typical for Minnesota fauna, some species of bees occur only in the western part of the state where they represent the far eastern extent of the species range in North America. One example is *Lasioglossum*

semicaeruleum in which the current survey included 111 specimens, across 31 counties thus expanding the statewide distributional understanding of this species and informing the eastern extent of the range.

This survey project contributed specimens and data to various partner efforts. Data and specimens have supported taxonomic revision efforts at the University of Minnesota – Bee Lab by Zach Portman.

Specimens collected during this survey supported a paper on *Andrena zizae*, reinstating a cryptic species *Andrena vernalis* (Portman et al. 2020). Similarly, a taxonomic revision and splitting of some *Agapostemon* species is forthcoming. Data collected here contributed to a paper on rare prairie bees (Lane et al. 2023). *Bombus* data has been submitted to the United States Fish and Wildlife Service for various listing decisions including *B. affinis*, *B. pensylvanicus*, and *B. terricola*.

In 2021 and 2022, with more emphasis placed on hand netting, we also began collecting bees from plants that are known to be hosts for some oligolectic, or specialist bees. Because work was occurring in the forests during this time, this included plants like spring beauty (*Claytonia*), trout lily (*Erythronium*), willow (*Salix*), pickerelweed (*Pontederia*), dogwood (*Cornus*), blueberry and others in the genus *Vaccinium*, and Jacob’s ladder (*Polemonium*). These efforts enabled rapid detection of species that are more likely to be of conservation concern due to their intimate relationship with a plant. This resulted in new state records, and re-detection of species that had not been surveyed in many years. About 30% of bees surveyed are oligolectic ([Appendix C](#)).



(left to right) *Colletes andrewsi* specializes on alumroot (*Heuchera*), *Eucera albata* and *Colletes aberrans* specialize on prairie clover (*Dalea*).

These survey efforts have contributed greatly to the statewide understanding of contemporary species occurrence in Minnesota. Several species had not been documented in over 50 years, due to a lack of attention paid to sampling bees. For example, in 2021 we documented *Andrena erigeniae*, a specialist bee on spring beauty at several sites. Prior to these surveys, it was last documented in 1973. Another spring ephemeral specialist on trout lily, *Andrena erythronii* was detected in 2021 and had not been recorded since 1951. *Dufourea novaeangliae*, a specialist on pickerelweed, was found at six sites in 2022 and had not been detected since 1934. Other species with similar stories include: *Hylaeus sparsus*, *Osmia nigriventris*, *Osmia felti*, *Macropis steironematis*, *Sphecodes pecosensis*, and *Triepeolus rhododontus*.



Female *Dufourea novaeangliae* foraging on pickerelweed (*Pontederia cordata*)

Conservation Status

Some species that appear to be in decline were detected during this survey. The rusty patched bumble bee (*Bombus affinis*), is a federally listed species. Surveys have discovered populations at three sites: Mound Prairie (2017), Seminary Fen (2018 and 2019), and Grey Cloud Dunes (2019 and 2022). Yellow banded bumble bee (*Bombus terricola*) is thought to be declining and was recorded at 34 sites during surveys. American bumble bee (*Bombus pensylvanicus*) was previously documented from 12 counties, but surveys conducted since 2014 expanded the known distribution to 35 total counties. All three species are considered in decline in Minnesota.



Male *Bombus terricola* on yarrow (*Achillea millefolium*)

There are some species that have perhaps been extirpated and therefore were not documented with this survey. The Ashton's cuckoo bumble bee (*Bombus ashtoni*) has not been recorded from Minnesota, for some time. *Bombus variabilis* may be extirpated across its range. A list of 38 species was highlighted in Portman et al. 2023 (Appendix 1) as not having been documented in Minnesota for more than 50 years.

Calculated S-ranks for all species detected during this survey are summarized in [Appendix C](#). Around 100 species were ranked as S2, Imperiled. These generally included species we detected with few occurrences. Without trends data available, it is difficult to discern the difference between species that normally occur at low abundance or perhaps are difficult to detect, with those that are in decline. Another 100 species are ranked as S3, Vulnerable. About 50 species are ranked as S4 or S5, Apparently Secure, or Secure respectively. Over 100 species could not be ranked because of too few detections in the database. These species should be targeted in future surveys, especially the 36 oligolectic species that weren't ranked.

New State Records

Through the efforts of this survey, 23 new species have been discovered in Minnesota that were not previously documented on the state species list either as specimens already in collections, or contemporarily collected by colleagues (Table 2). These are not likely newly colonized species, but rather species that have resided in Minnesota and have not previously been detected due to their low abundance in our samples, and the proximity of detections in nearby states and provinces. The new state records discovered through the course of this survey work underscore the necessity to continue to improve our collective understanding of species distributions in undersampled regions (Jamieson et al. 2019), in order to make more informed predictions about responses to environmental change.

Table 2. New Native State Records.

New Minnesota state records collected over the duration of this statewide survey.

| Species | Year | Site(s) |
|--|------------|--|
| <i>Andrena accepta</i> | 2015 | Sioux Nation WMA |
| <i>Andrena uvulariae</i> | 2022 | Hampton Woods WMA |
| <i>Anthidiellum boreale</i> *New genus to MN | 2022 | Stony Run NPB 10-1 |
| <i>Ceratina strenua</i> | 2019, 2021 | Mound Prairie SNA, King's and Queen's Bluffs SNA |
| <i>Dianthidium pudicum</i> | 2018 | Seven Sisters Prairie TNC |
| <i>Dufourea harveyi</i> | 2018 | Red Lake WMA |
| <i>Epeolus americanus</i> | 2021 | Finland SF |
| <i>Eucera aragalli</i> | 2019 | Prairie Coteau SNA |
| <i>Lasioglossum achilleae</i> | 2017 | Mound Prairie SNA |
| <i>Lasioglossum gotham</i> | 2013 | St. Croix Savanna SNA |
| <i>Lasioglossum rozeni</i> | 2017 | Lake Maria SP |
| <i>Megachile circumcincta</i> | 2018 | Red Lake WMA |
| <i>Megachile petulans</i> | 2017 | Iron Horse Prairie SNA |
| <i>Melissodes apicatus</i> | 2022 | Savanna Portage SP & Big Lake |
| <i>Nomada fuscicincta</i> | 2019 | Oak Glen WMA, Maple River WMA, Carney NPB |
| <i>Osmia inermis</i> | 2018 | Red Lake WMA |
| <i>Osmia inspergens</i> | 2021 | Scenic SP |
| <i>Osmia laticeps</i> | 2020, 2021 | Rice Lake NWR, Superior NF |
| <i>Osmia nearctica</i> *New US record | 2021 | Scenic SP |
| <i>Protandrena renimaculata</i> | 2015 | Antelope Valley SNA |
| <i>Sphecodes hydrangeae</i> | 2018 | Hubbel Pond |
| <i>Svastra atripes</i> | 2019 | Weaver Dunes TNC/SNA |
| <i>Triepeolus subalpinus</i> | 2017 | Pembina WMA |



Anthidiellum boreale is a new genus to Minnesota



Osmia nearctica is a new US record

Non-native Species

Several species found in surveys are considered non-native. Knowing what species are non-native and their relative abundance and distribution can help understand the potential conservation impacts they may have on native species in terms of disease transfer or competition. The most well-known is the European honey bee (*Apis mellifera*), found in nearly every county surveyed. *Andrena wilkella* is thought

to have been introduced into North America through ship ballast, a common route for introduced species (Giles and Ascher 2006, Gardner 2019). One species associated with city gardens, *Anthidium oblongatum*, was only recently introduced in 2013 and has been found across the Twin Cities Metro at 10 sites across four counties. This species was not on the state list prior to surveys conducted through this project. Another species in the same genus, *Anthidium manicatum* is also associated with gardens and was found in surveys at two sites in the Metro. This species has spread rapidly across North America and may exclude native bees (Miller et al. 2002). Two species of non-native *Lasioglossum* (*L. zonulum* and *L. leucozonium*) were found at 39 and 55 sites respectively. These species inhabit prairies throughout the state and can be locally abundant (e.g., 65 specimens of *L. leucozonium* from one site). *Megachile rotundata* has been established in Minnesota since 1951, but these surveys only detected 26 individuals at eight sites.

Conclusions

This project accomplished the goals of establishing a baseline survey for the bees of Minnesota and contributing to a statewide checklist (Portman et al. 2023). Along with data from other projects in the state, this survey will help to inform conservation through the draft subnational ranking (S-ranks) using the Conservation Rank Calculator developed by NatureServe (Master et al. 2012). There remains a list of 38 species that have not been detected in Minnesota in the last 50 years, neither by this survey or partners (Portman et al. 2023, Appendix 1), many of which are of survey priority. Around 30% of species were ranked as potentially imperiled and warrant continued surveys or monitoring and consideration for state listing.

Future efforts in conservation ranking in Minnesota will include evaluating trends for those bee species where we have sufficient data to evaluate historical area of occupancy. Next steps will be to share the draft S-ranks with experts to assess how to translate the ranks to state listed status and evaluate the accuracy of the calculator in capturing the conservation status of bee species.

Recommendations for those interested in creating a baseline survey:

- Start with museum specimens and data. The work shown here suggests that there was a great deal of bee diversity already accessioned in collections.
- Hire a highly qualified bee taxonomist to confirm identifications. This relationship was invaluable to the high quality of data we desired. Likewise, the partnership was a two-way street as the specimens we collected provided material for taxonomic work.
- Use a variety of methodologies to sample bees, but if your goal is an inventory, hand netting should be emphasized. The associated plant data are invaluable. The volume of specimens is far less, and the species richness is greater than using passive interception traps. Hand netting may require additional expertise to detect small sized bees, but the payout in terms of species richness when the goal is an inventory outweighs this potential hurdle.
- Sampling a variety of habitat types, throughout the entire season (spring through fall) is likely to prove beneficial in efficiently capturing diversity (Grundel et al. 2011).

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All bee specimens were collected under appropriate collecting permits including the Minnesota Department of Natural Resources Scientific and Natural Areas, and State Parks, The Nature Conservancy, USFWS Waterfowl Production Areas, USFWS Recovery Permit #: ES40247C-1.

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Appendix A. Site List

Site name abbreviations: State Recreation Area (SRA), State Park (SP), National Wildlife Refuge (NWR), Wildlife Management Area (WMA), Scientific Natural Area (SNA), Waterfowl Production Area (WPA), State Forest (SF), National Forest (NF), Native Prairie Bank (NPB), Three Rivers Park District (TRPD), and Private property (PP). Technique refers to the type of sampling, handnet = sampling bees using an aerial hand net from flowers, bowls = passive interception bowl traps.

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---------------------------------------|------------------------|----------------------|------------------|-----------------|------------------|-----------------|-----------------------|
| Afton SP | 8 | 9 | handnet | 44.8459 | -92.7780 | Washington | 2017 |
| Agassiz Dunes SNA | 341 | 28 | bowls | 47.5121 | -96.2899 | Norman | 2015 |
| Aitkin WMA | 44 | 16 | handnet | 46.5718 | -93.6086 | Aitkin | 2020, 2021 |
| Alberta WMA | 1 | 1 | handnet | 45.5006 | -96.0666 | Stevens | 2015 |
| Almora WMA | 96 | 26 | handnet, bowls | 46.2475 | -95.3761 | Otter Tail | 2018 |
| Altona WMA | 90 | 28 | handnet, bowls | 44.1950 | -96.3209 | Pipestone | 2015, 2019 |
| Amiret WMA | 3 | 3 | handnet | 44.3613 | -95.6773 | Lyon | 2015 |
| Amor WMA | 15 | 4 | handnet | 46.4507 | -95.7691 | Otter Tail | 2018 |
| Anchor Lake WMA | 5 | 5 | handnet | 47.3196 | -92.4734 | St. Louis | 2022 |
| Andrea WMA | 2 | 2 | handnet | 46.3193 | -96.4017 | Wilkin | 2015 |
| Ann Lake WMA | 61 | 25 | handnet | 45.9135 | -93.3943 | Kanabec | 2020, 2022 |
| Antelope Valley SNA | 19 | 10 | handnet | 44.6766 | -96.1144 | Yellow Medicine | 2015 |
| Armbrust WMA | 9 | 6 | handnet | 43.7852 | -94.4710 | Martin | 2016 |
| Atherton WMA | 4 | 4 | handnet | 46.5447 | -96.4262 | Wilkin | 2015 |
| Aurzada Prairie WMA | 9 | 5 | handnet | 45.8191 | -95.1048 | Todd | 2015 |
| Avon Hills Forest SNA | 180 | 38 | handnet, bowls | 45.6360 | -94.5026 | Stearns | 2018 |
| Badger WMA | 6 | 5 | handnet, bowls | 43.9250 | -95.7368 | Murray | 2015 |
| Badoura Jack Pine Woodland SNA | 8 | 7 | handnet | 46.8625 | -94.6998 | Hubbard | 2020 |
| Bail Out WMA | 252 | 25 | bowls | 44.8481 | -96.2823 | Lac qui Parle | 2015 |
| Banning SP | 8 | 4 | handnet | 46.1234 | -92.8458 | Pine | 2022 |
| Barber Lake WPA | 91 | 15 | handnet, bowls | 44.8279 | -94.4358 | McLeod | 2016, 2017 |
| Barnesville WMA | 1 | 1 | handnet | 46.7077 | -96.2864 | Clay | 2018 |
| Bashaw WMA | 6 | 5 | handnet | 44.1487 | -94.9405 | Brown | 2015 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-----------------------------------|------------------------|----------------------|-----------------------------|-----------------|------------------|-----------------|-----------------------|
| Battle Creek Reg Park | 61 | 24 | handnet | 44.9364 | -93.0130 | Ramsey | 2020, 2021, 2022 |
| Bayport WMA | 9 | 8 | handnet | 45.0235 | -92.8081 | Washington | 2018, 2020 |
| Beaches Lake WMA | 209 | 28 | handnet, bowls, UV traps | 48.8759 | -96.5774 | Kittson | 2015, 2016, 2017 |
| Bean Dam WMA | 45 | 22 | handnet | 46.1022 | -93.1860 | Kanabec | 2020, 2021 |
| Beaulieu WMA | 85 | 22 | handnet, bowls | 47.3670 | -95.7787 | Mahnomen | 2018 |
| Beaver Creek Valley SP | 87 | 30 | handnet | 43.6426 | -91.5816 | Houston | 2021, 2022 |
| Beaver Falls WMA | 33 | 16 | handnet, pitfalls | 44.5761 | -95.0144 | Renville | 2015 |
| Bee Lake WMA | 2 | 2 | handnet | 47.6519 | -96.0423 | Polk | 2018 |
| Bejou WMA | 4 | 4 | handnet | 47.4543 | -95.9985 | Mahnomen | 2018 |
| Beltrami County Forest | 219 | 53 | handnet | 47.5412 | -94.9029 | Beltrami | 2020 |
| Ben Lacs WMA | 37 | 14 | handnet | 45.6204 | -93.7664 | Benton | 2018, 2020 |
| Bennett WMA | 12 | 5 | handnet | 43.8784 | -94.9916 | Cottonwood | 2015 |
| Bethel WMA | 25 | 14 | handnet | 45.3998 | -93.3089 | Anoka | 2018, 2019 |
| Big Kandiyohi Lake WPA | 2 | 2 | handnet | 44.9651 | -94.9266 | Kandiyohi | 2015 |
| Big Lake | 11 | 4 | handnet | 46.7097 | -92.6406 | Carlton | 2022 |
| Big Stone WMA | 7 | 4 | handnet | 45.3753 | -96.4839 | Big Stone | 2015 |
| Bill Freeman WMA | 12 | 11 | handnet | 45.4586 | -95.9699 | Stevens | 2015 |
| Birchdale WMA | 3 | 3 | handnet | 46.7395 | -93.8425 | Crow Wing | 2021 |
| Bjornson WMA | 16 | 9 | handnet | 46.7704 | -96.3625 | Clay | 2018 |
| Black Lake Bog SNA | 76 | 21 | handnet | 46.3703 | -92.3136 | Pine | 2019 |
| Blackduck SF | 10 | 8 | handnet | 47.6316 | -94.6719 | Beltrami | 2020 |
| Blackhoof River WMA | 56 | 20 | handnet | 46.5311 | -92.4153 | Carlton | 2020, 2021 |
| Blaine Preserve SNA | 3 | 3 | handnet | 45.1396 | -93.1770 | Anoka | 2018 |
| Blanket Flower Prairie SNA | 232 | 37 | handnet, bowls | 46.6894 | -96.2151 | Clay | 2018 |
| Blue Mounds SP | 147 | 27 | handnet, bowls | 43.7008 | -96.2010 | Rock | 2016, 2019 |
| Bluestem Prairie SNA | 11 | 5 | handnet | 46.8497 | -96.4738 | Clay | 2018 |
| Bob Gehlen WMA | 13 | 8 | handnet | 44.7150 | -94.2468 | Sibley | 2015 |
| Bohemian WMA | 13 | 8 | handnet | 44.6349 | -96.4062 | Yellow Medicine | 2015 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-------------------------------------|----------------|--------------|-------------------|----------|-----------|------------|----------------|
| Boike WMA | 5 | 1 | handnet | 44.9864 | -95.5135 | Chippewa | 2015 |
| Bois de Sioux WMA | 2 | 2 | handnet | 45.9054 | -96.5634 | Traverse | 2015 |
| Bonanza SNA | 4 | 4 | handnet | 45.4519 | -96.7135 | Big Stone | 2015 |
| Boot Lake WPA | 71 | 14 | bowls | 43.6789 | -95.0939 | Jackson | 2015 |
| Bowstring Deer Yard WMA | 3 | 3 | handnet | 47.4753 | -93.8908 | Itasca | 2022 |
| Bowstring SF | 35 | 19 | handnet | 47.4688 | -93.8491 | Cass | 2020, 2022 |
| Bradshaw Lake WMA | 4 | 3 | handnet | 44.6128 | -93.4841 | Scott | 2018 |
| Brakke WMA | 2 | 2 | handnet | 44.3624 | -95.6398 | Lyon | 2015 |
| Bremen WMA | 6 | 5 | handnet | 46.2809 | -92.9875 | Pine | 2021 |
| Brenner Lake WPA | 271 | 22 | bowls | 45.3997 | -95.2461 | Kandiyohi | 2016 |
| Browns Creek Park | 1 | 1 | Cross Vane | 45.0707 | -92.8459 | Washington | 2017 |
| Brownsville Bluff SNA | 16 | 10 | handnet | 43.6750 | -91.2825 | Houston | 2021 |
| Buena Vista SF | 287 | 54 | handnet, bowls | 47.6089 | -94.7927 | Beltrami | 2020 |
| Burbank WMA | 11 | 9 | handnet | 45.3552 | -94.9931 | Kandiyohi | 2015 |
| Burgen Lake Prairie WMA | 14 | 7 | handnet | 46.7053 | -94.8881 | Wadena | 2020 |
| Burke WMA | 20 | 9 | handnet | 43.9522 | -96.1308 | Pipestone | 2015 |
| Butternut Valley Prairie SNA | 21 | 8 | handnet, pitfalls | 44.1260 | -94.3506 | Blue Earth | 2010 |
| Butterwort Cliffs SNA | 17 | 9 | handnet | 47.7171 | -90.4864 | Cook | 2021 |
| C.P. Adams Park | 3 | 3 | Funnel Trap | 44.7311 | -92.8340 | Dakota | 2017 |
| Callaway WMA | 14 | 10 | handnet | 46.9974 | -95.8366 | Becker | 2018 |
| Cambria WMA | 29 | 12 | handnet | 44.2297 | -94.3053 | Blue Earth | 2019 |
| Camp Ripley - Yalu Rd. | 210 | 32 | bowls | 46.3240 | -94.4355 | Morrison | 2019 |
| Camp Ripley Casino | 188 | 20 | bowls | 46.2498 | -94.3823 | Morrison | 2020 |
| Camp Ripley Crow Wing River | 64 | 20 | bowls | 46.3019 | -94.3772 | Morrison | 2018 |
| Camp Ripley Kodiak | 62 | 17 | bowls | 46.2401 | -94.4677 | Morrison | 2020 |
| Camp Ripley Military #1 | 165 | 28 | bowls | 46.1746 | -94.3742 | Morrison | 2017, 2018 |
| Camp Ripley Military #2 | 86 | 27 | bowls | 46.0996 | -94.4214 | Morrison | 2017 |
| Camp Ripley- Manila Rd. | 72 | 22 | bowls | 46.1465 | -94.4424 | Morrison | 2019 |
| Cannon River Trout Lily WMA | 1 | 1 | handnet | 44.3226 | -93.2496 | Rice | 2021 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---|------------------------|----------------------|-----------------------------|-----------------|------------------|----------------------|---------------------------|
| Canosia WMA | 27 | 12 | handnet | 46.9033 | -92.2352 | St. Louis | 2021 |
| Caribou Falls WMA | 30 | 11 | handnet | 47.4630 | -91.0373 | Lake | 2021 |
| Caribou WMA | 57 | 21 | handnet, bowls | 48.9123 | -96.5565 | Kittson | 2015 |
| Carlos Avery WMA | 151 | 44 | handnet, bowls | 45.3879 | -92.9771 | Anoka | 2018, 2019, 2020, 2022 |
| Carney NPB | 69 | 25 | handnet | 43.9379 | -96.0319 | Murray | 2019 |
| Carp Swamp WMA | 4 | 3 | handnet | 48.5740 | -94.6477 | Lake of the Woods | 2022 |
| Carter WMA | 4 | 4 | handnet | 47.6180 | -95.5450 | Clearwater | 2018 |
| Carver Lake Park | 4 | 3 | handnet | 44.9042 | -92.9788 | Washington | 2020 |
| Carver Rd NE, Bemidji | 172 | 48 | handnet | 47.5932 | -94.8183 | Beltrami | 2020 |
| Cascade River SP | 5 | 4 | handnet | 47.7080 | -90.5138 | Cook | 2021 |
| Cecil's Walking Trail | 111 | 38 | handnet, bowls | 48.7116 | -95.1515 | Lake of the Woods | 2018, 2019 |
| Cedar Mountain SNA | 336 | 40 | handnet, bowls | 44.5037 | -94.8986 | Redwood | 2015, 2016 |
| Cedar Mountain WMA | 14 | 12 | handnet | 44.5075 | -94.8944 | Redwood | 2015 |
| Chengwatana SF | 137 | 54 | handnet, Malaise trap | 45.8107 | -92.7932 | Pine | 2020, 2021, 2022 |
| Chicog WMA | 3 | 3 | handnet | 47.6201 | -96.4127 | Polk | 2018 |
| Chippewa NF | 466 | 71 | handnet, bowls | 47.4772 | -94.5569 | Beltrami | 2020 |
| Chippewa Prairie | 2676 | 45 | bowls, pitfalls, UV trap | 45.1387 | -95.9984 | Chippewa | 2011, 2013 |
| Christopher Kurilla WMA | 5 | 5 | handnet | 45.6494 | -94.7531 | Stearns | 2018 |
| Chub Lake WMA | 6 | 5 | handnet | 44.5444 | -93.2212 | Dakota | 2017 |
| Cin WMA | 15 | 13 | handnet | 45.6184 | -96.1130 | Stevens | 2015 |
| Clair Rollings WMA | 189 | 24 | bowls | 45.2897 | -95.6253 | Swift | 2015 |
| Clark Lake WMA | 3 | 2 | handnet | 44.5819 | -93.8338 | Scott | 2017 |
| Cleanwater WMA | 1 | 1 | handnet | 43.8564 | -95.8054 | Murray | 2015 |
| Clear Lake SNA | 1 | 1 | handnet | 45.4298 | -94.0433 | Sherburne | 2018 |
| Clinton Falls Dwarf Trout Lily SNA | 10 | 7 | handnet | 44.1484 | -93.2456 | Steele | 2021 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|--|------------------------|----------------------|------------------|-----------------|------------------|---------------|-----------------------|
| Clinton Prairie SNA | 264 | 25 | handnet, bowls | 45.4578 | -96.5635 | Big Stone | 2015, 2016 |
| Cloquet Valley SF | 42 | 18 | handnet | 46.9927 | -92.2712 | St. Louis | 2021, 2022 |
| Colinoso WMA | 5 | 5 | handnet | 44.6159 | -96.3571 | Lincoln | 2015 |
| Compass Prairie SNA | 292 | 22 | bowls | 43.5732 | -95.7439 | Nobles | 2014, 2016 |
| Conservation Officer Eugene H. Wynn Jr. Memorial WMA | 4 | 3 | handnet | 45.8040 | -93.0503 | Pine | 2022 |
| Copeland WMA | 4 | 1 | handnet | 46.1219 | -96.2351 | Otter Tail | 2018 |
| Cottonwood River Prairie SNA | 84 | 20 | handnet, bowls | 44.2050 | -95.0983 | Brown | 2014, 2015 |
| Cranberry WMA | 35 | 14 | handnet | 45.7222 | -93.3476 | Isanti | 2020 |
| Crane Meadows WMA | 71 | 17 | handnet, bowls | 45.9113 | -94.2015 | Morrison | 2018 |
| Crane WMA | 3 | 3 | handnet | 47.8967 | -95.7301 | Red Lake | 2015 |
| Croixwood Park | 2 | 2 | Funnel Trap | 45.0472 | -92.8516 | Washington | 2017 |
| Crooked Road WMA | 24 | 16 | handnet | 45.4875 | -93.4667 | Isanti | 2018 |
| Crow River WMA | 2 | 2 | handnet | 45.4291 | -94.9585 | Stearns | 2018 |
| Crow-Hassan TRPD | 970 | 34 | bowls | 45.1948 | -93.6388 | Hennepin | 2015, 2016 |
| Cuba WMA | 2 | 2 | handnet | 46.9197 | -96.1012 | Becker | 2018 |
| Dablow WMA | 4 | 2 | handnet | 45.4593 | -96.0579 | Stevens | 2015 |
| Dalbo WMA | 38 | 15 | handnet | 45.7117 | -93.4615 | Isanti | 2018, 2020 |
| Dalton Johnson WMA | 6 | 3 | handnet | 44.9312 | -94.8190 | Kandiyohi | 2015 |
| Darwin S. Myers WMA | 29 | 13 | handnet | 47.6332 | -92.2242 | St. Louis | 2021 |
| Daubs Lake WMA | 3 | 2 | handnet | 44.4538 | -95.2984 | Redwood | 2015 |
| Delft WMA | 10 | 5 | handnet | 44.1183 | -95.1907 | Cottonwood | 2015 |
| Des Moines River SNA | 303 | 41 | handnet, bowls | 43.7943 | -95.0833 | Jackson | 2014, 2015, 2016 |
| Dietrich WMA | 3 | 3 | handnet | 45.2582 | -94.8481 | Kandiyohi | 2015 |
| Dishpan WMA | 4 | 3 | handnet | 47.7694 | -94.0975 | Itasca | 2022 |
| Dittmer WMA | 2 | 2 | handnet | 47.4121 | -96.0445 | Mahnomen | 2018 |
| Dolven WMA | 12 | 6 | handnet | 45.6202 | -95.8800 | Stevens | 2015 |
| Doran WMA | 10 | 6 | handnet | 46.1476 | -96.2427 | Otter Tail | 2018 |
| Dorr WMA | 40 | 18 | handnet, bowls | 47.6298 | -96.0689 | Polk | 2018 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---------------------------------|-------------|-----------|----------------|----------|-----------|------------|------------------------------|
| Dove Lake WMA | 4 | 3 | handnet | 44.2254 | -93.7066 | Le Sueur | 2017 |
| Duck Lake WMA | 3 | 2 | handnet | 46.7524 | -93.9018 | Crow Wing | 2021 |
| Duckhaven WMA | 12 | 10 | handnet | 44.0390 | -93.8901 | Blue Earth | 2015 |
| Dydsand WMA | 6 | 4 | handnet | 44.7622 | -95.2968 | Renville | 2015 |
| Dye WMA | 4 | 4 | handnet | 46.4621 | -92.5797 | Carlton | 2019 |
| Earl Swain WMA | 1 | 1 | handnet | 44.2320 | -93.6914 | Le Sueur | 2017 |
| East Colvill WMA | 27 | 15 | handnet | 47.8058 | -90.1003 | Cook | 2021, 2022 |
| Eden WMA | 3 | 3 | handnet | 43.8883 | -96.3223 | Pipestone | 2015 |
| Eleanor Graham Community Garden | 31 | 13 | Heliothis trap | 44.9442 | -93.1563 | Ramsey | 2014 |
| Elmo WMA | 1 | 1 | handnet | 45.2584 | -95.3637 | Otter Tail | 2018 |
| Emerson WMA | 6 | 4 | handnet | 44.1090 | -94.4037 | Brown | 2015 |
| Engelbrecht WMA | 1 | 1 | handnet | 45.7817 | -95.2554 | Douglas | 2018 |
| Ereaux WMA | 5 | 5 | handnet | 46.0121 | -94.3074 | Morrison | 2018 |
| Erhards Grove WMA | 9 | 8 | handnet | 46.4654 | -96.0324 | Otter Tail | 2018 |
| Erickson-Lindstrom Family WMA | 6 | 3 | handnet | 45.8839 | -93.1850 | Kanabec | 2019 |
| Essex Park | 4 | 4 | Cross Vane | 44.0765 | -92.4791 | Olmsted | 2017 |
| Ewy Lake WMA | 12 | 8 | handnet | 44.0116 | -94.7458 | Watonwan | 2015 |
| Expandere WMA | 186 | 25 | handnet, bowls | 43.9200 | -95.3481 | Cottonwood | 2015, 2016 |
| Faribault WMA | 4 | 4 | handnet | 44.2507 | -93.2531 | Rice | 2017 |
| Father Hennepin SP | 98 | 24 | handnet, bowls | 46.1440 | -93.4898 | Mille Lacs | 2020, 2021 |
| Felton County Game Refuge | 753 | 38 | handnet, bowls | 47.0680 | -96.4298 | Clay | 2015, 2016, 2017, 2020, 2022 |
| Fenmont WMA | 1 | 1 | handnet | 43.8381 | -95.8267 | Nobles | 2015 |
| Fergus Falls WMA | 3 | 3 | handnet | 46.3097 | -96.0944 | Otter Tail | 2018 |
| Fermoy WMA | 1 | 1 | handnet | 47.2117 | -92.6136 | St. Louis | 2021 |
| Finland SF | 78 | 24 | handnet | 47.4117 | -91.3131 | Lake | 2021, 2022 |
| Firebird WMA | 7 | 4 | handnet | 46.5289 | -92.9327 | Carlton | 2022 |
| Fireweed WMA | 3 | 2 | handnet | 48.2303 | -95.3572 | Beltrami | 2015 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-------------------------------------|------------------------|----------------------|------------------|-----------------|------------------|---------------|-----------------------|
| Floodwood WMA | 18 | 12 | handnet | 46.9190 | -92.9660 | St. Louis | 2021 |
| Foley WMA | 5 | 3 | handnet | 44.8960 | -96.2950 | Traverse | 2015 |
| Follies WMA | 5 | 5 | handnet | 45.4105 | -94.9272 | Kandiyohi | 2015 |
| Fond Du Lac SF | 110 | 35 | handnet | 46.6588 | -92.8031 | Carlton | 2021, 2022 |
| Forada WMA | 13 | 5 | handnet | 45.7966 | -95.3225 | Douglas | 2015, 2018 |
| Four Brooks WMA | 10 | 8 | handnet | 45.9327 | -93.7014 | Mille Lacs | 2019, 2021 |
| Fox and Fawn Farm CSA | 9 | 3 | Heliothis trap | 44.9357 | -93.9620 | Carver | 2014 |
| Foxhome Prairie Preserve TNC | 22 | 15 | handnet | 46.3246 | -96.2814 | Wilkin | 2018 |
| Franconia Bluffs SNA | 11 | 9 | handnet | 45.3724 | -92.7030 | Chisago | 2018 |
| Frank WMA | 4 | 3 | handnet | 46.8565 | -95.8346 | Becker | 2018 |
| Freeland 27-1 NPB | 38 | 14 | handnet | 44.8310 | -96.2626 | Lac qui Parle | 2022 |
| Freeland 27-2 NPB | 2 | 1 | handnet | 44.8260 | -96.2643 | Lac qui Parle | 2022 |
| Freeman WMA | 111 | 27 | handnet, bowls | 45.4576 | -95.9705 | Stevens | 2015 |
| Freemont WMA | 14 | 6 | handnet | 45.4303 | -93.6099 | Sherburne | 2018 |
| French Lake WMA | 18 | 11 | handnet | 46.6202 | -93.5683 | Aitkin | 2019 |
| Frontenac SP | 306 | 41 | handnet, bowls | 44.5263 | -92.3430 | Goodhue | 2017, 2021 |
| Furgamme WMA | 5 | 3 | handnet | 44.4255 | -96.0382 | Lyon | 2015 |
| Gale Woods Farm CSA | 76 | 18 | Heliothis trap | 44.9319 | -93.7042 | Hennepin | 2014 |
| Gales WMA | 2 | 2 | handnet | 44.3666 | -95.4727 | Redwood | 2015 |
| Garvin WMA | 1 | 1 | handnet | 44.2343 | -95.7952 | Lyon | 2015 |
| General C.C. Andrews SF | 13 | 11 | handnet | 46.3256 | -92.7849 | Pine | 2022 |
| George Washington SF | 79 | 33 | handnet | 47.4042 | -93.5371 | Itasca | 2022 |
| Gilfillan Lake WMA | 3 | 3 | handnet | 44.2109 | -93.8494 | Blue Earth | 2016 |
| Glacial Lakes SP | 524 | 28 | handnet, bowls | 45.5293 | -95.4799 | Pope | 2015, 2016 |
| Glacial Ridge NWR | 13 | 6 | handnet | 47.6967 | -96.3012 | Polk | 2018 |
| Glacial Ridge TNC | 270 | 27 | bowls | 47.7661 | -96.3379 | Red Lake | 2016 |
| Glendorado WMA | 45 | 20 | handnet | 45.5784 | -93.7767 | Benton | 2018, 2020 |
| Glynn Prairie SNA | 101 | 23 | handnet, bowls | 44.2638 | -95.6956 | Lyon | 2014, 2015, 2016 |
| Golden Anniversary SF | 1 | 1 | handnet | 47.1297 | -93.4671 | Itasca | 2022 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-------------------------------|-------------|-----------|-----------------------------------|----------|-----------|------------|---------------------------|
| Golden Valley: 1310 Castle Ct | 6 | 7 | handnet, bowls | 44.9931 | -93.3868 | Hennepin | 2017 |
| Grace WMA | 12 | 5 | handnet | 45.0980 | -95.5482 | Chippewa | 2015 |
| Grand Portage SF | 7 | 5 | handnet | 47.9889 | -90.0146 | Cook | 2022 |
| Grayling Marsh WMA | 19 | 12 | handnet | 46.6426 | -93.1910 | Aitkin | 2019, 2022 |
| Great River Bluffs SP | 266 | 41 | handnet, bowls | 43.9396 | -91.4109 | Winona | 2017, 2021 |
| Great Scott WMA | 25 | 13 | handnet | 47.4675 | -92.7589 | St. Louis | 2021 |
| Green Valley WMA | 4 | 4 | handnet | 44.5210 | -95.7078 | Lyon | 2015 |
| Greenleaf Lake SRA | 387 | 35 | handnet, bowls | 45.0056 | -94.4784 | Meeker | 2017 |
| Greenwater Lake SNA | 16 | 7 | handnet | 46.9908 | -95.4929 | Becker | 2018 |
| Gregory WMA | 15 | 11 | handnet | 47.4331 | -95.8911 | Mahnomen | 2015, 2018 |
| Grey Cloud Dunes SNA | 84 | 35 | handnet | 44.7916 | -92.9589 | Washington | 2018, 2020, 2021, 2022 |
| Grundmeyer WMA | 27 | 15 | handnet | 44.5334 | -94.5443 | Sibley | 2015, 2017 |
| Haberman WMA | 3 | 3 | handnet | 43.9002 | -95.5656 | Murray | 2015 |
| Halls Lake WMA | 3 | 2 | handnet | 43.6945 | -93.5006 | Freeborn | 2015 |
| Hampton Woods WMA | 26 | 12 | handnet | 44.6253 | -93.0327 | Dakota | 2022 |
| Happyland - Seitz Sandstone | 5 | 3 | Japanese Beetle Traps | 46.1426 | -92.8223 | Pine | 2017 |
| Hardwood Creek WMA | 5 | 2 | handnet | 45.2371 | -92.9178 | Washington | 2018, 2019 |
| Harold & Marie Deutsch WMA | 44 | 18 | handnet | 46.2183 | -93.8247 | Crow Wing | 2020 |
| Hastings Sand Coulee SNA | 437 | 53 | Blue vane trap, handnet, bowls | 44.6956 | -92.8224 | Dakota | 2013, 2017, 2018 |
| Hastings SNA | 5 | 1 | handnet | 44.7300 | -92.8325 | Dakota | 2021 |
| Hay Point WMA | 9 | 6 | handnet | 46.8731 | -93.6246 | Aitkin | 2022 |
| Hegg Lake WMA | 9 | 4 | handnet | 45.7885 | -95.6658 | Douglas | 2018 |
| Helen Allison Savanna SNA | 75 | 26 | handnet, bowls | 45.3838 | -93.1638 | Anoka | 2017, 2022 |
| Hellicksen Prairie WPA | 335 | 32 | handnet, bowls | 47.0813 | -96.0525 | Becker | 2015, 2016, 2017 |
| Helsene WMA | 217 | 27 | bowls | 45.8686 | -96.0764 | Grant | 2015, 2016 |
| Herberger WMA | 3 | 2 | handnet | 45.7987 | -95.1546 | Douglas | 2015 |
| Hesitation WMA | 39 | 18 | handnet | 46.3391 | -93.8863 | Crow Wing | 2020 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|--|------------------------|----------------------|------------------|-----------------|------------------|---------------|-----------------------|
| Hill River SF | 4 | 4 | handnet | 46.8164 | -93.6680 | Aitkin | 2021 |
| Hoff WMA | 3 | 3 | handnet | 45.4390 | -95.6301 | Pope | 2015 |
| Hole-in-the-Mountain Preserve | 250 | 28 | handnet, bowls | 44.2379 | -96.3014 | Lincoln | 2015, 2016, 2019 |
| Holthe Prairie SNA | 18 | 8 | bowls | 43.7538 | -95.0705 | Jackson | 2014 |
| Holz Farm Park Community Garden | 68 | 20 | Heliothis trap | 44.7874 | -93.1159 | Dakota | 2014 |
| Hovland WMA | 8 | 7 | handnet | 47.5226 | -95.7410 | Polk | 2018 |
| Hovland Woods SNA | 13 | 7 | handnet, bowls | 47.9253 | -90.0018 | Cook | 2021 |
| Hubbard County Forest | 54 | 28 | handnet | 47.3466 | -94.9325 | Hubbard | 2020 |
| Hubbel Pond WMA | 81 | 33 | handnet, bowls | 46.8655 | -95.6495 | Becker | 2018 |
| Hunter's Paradise WMA | 2 | 2 | handnet | 45.9361 | -96.5405 | Traverse | 2015 |
| Huntly WMA | 53 | 20 | handnet, bowls | 48.4546 | -96.1919 | Marshall | 2016 |
| Hythecker Prairie SNA | 133 | 25 | handnet | 44.0233 | -93.0316 | Dodge | 2017 |
| Indian Lake WMA | 14 | 9 | handnet | 44.5738 | -94.3339 | Sibley | 2015 |
| International Outreach Community Garden | 68 | 23 | Heliothis trap | 44.7704 | -93.3024 | Dakota | 2014 |
| Inver Hills/Metro State Interdisciplinary Community Garden and CSA | 35 | 12 | Heliothis trap | 44.8275 | -93.0563 | Dakota | 2014 |
| Iona WMA | 7 | 3 | handnet | 46.0484 | -94.9653 | Todd | 2018 |
| Iron Horse Prairie SNA | 25 | 15 | handnet | 43.8775 | -92.8497 | Dodge | 2017 |
| Itasca SP | 34 | 18 | handnet | 47.2407 | -95.1725 | Clearwater | 2020 |
| Ivan Jindra Memorial WMA | 9 | 5 | handnet | 46.0350 | -93.6830 | Mille Lacs | 2020 |
| Ivanhoe WMA | 15 | 9 | handnet | 44.4689 | -96.3040 | Lincoln | 2015 |
| Janet Johnson Memorial WMA | 33 | 17 | handnet | 45.4854 | -92.9558 | Chisago | 2020, 2022 |
| Jasper WMA | 1 | 1 | handnet | 43.8702 | -96.3717 | Pipestone | 2015 |
| Jay Cooke SP | 184 | 58 | handnet, bowls | 46.6437 | -92.3361 | Carlton | 2020, 2022 |
| Jenkins WPA | 75 | 26 | handnet, bowls | 47.5317 | -95.6835 | Polk | 2018 |
| Jensen WMA | 9 | 7 | handnet | 46.1603 | -95.7276 | Otter Tail | 2018 |
| Johnsonville WMA | 2 | 2 | handnet | 44.3685 | -95.3750 | Redwood | 2015 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|--|------------------------|----------------------|-----------------------------------|-----------------|------------------|---------------|---------------------------|
| Joseph A. Tauer Prairie SNA | 42 | 10 | handnet, pitfalls | 44.1984 | -94.5275 | Brown | 2015 |
| Kabetogama SF | 77 | 33 | handnet | 48.0874 | -92.8763 | St. Louis | 2021, 2022 |
| Kasota Prairie SNA | 242 | 34 | handnet, bowls | 44.2654 | -94.0033 | Le Sueur | 2017 |
| Kelly-Meyer WMA | 2 | 2 | handnet | 45.3150 | -93.8810 | Wright | 2018 |
| Kensington WMA | 15 | 6 | handnet | 45.7766 | -95.7089 | Douglas | 2015 |
| Kimberly Marsh WMA | 35 | 19 | handnet | 46.5529 | -93.4186 | Aitkin | 2020, 2022 |
| Kinbrae WMA | 1 | 1 | handnet | 43.8204 | -95.4812 | Nobles | 2017 |
| King's and Queen's Bluffs SNA | 31 | 16 | handnet | 43.9508 | -91.4103 | Winona | 2021 |
| Klason WMA | 17 | 11 | handnet | 45.6440 | -95.8746 | Stevens | 2015 |
| Koochiching SF | 143 | 45 | handnet | 48.0668 | -93.5835 | Koochiching | 2021, 2022 |
| Krahmer WMA | 3 | 2 | handnet | 43.6835 | -94.6062 | Martin | 2015 |
| Krantz Lake WPA | 30 | 12 | handnet | 45.6627 | -95.1680 | Pope | 2018 |
| Kroschel WMA | 48 | 15 | handnet | 46.0863 | -93.1457 | Kanabec | 2020 |
| Kube-Swift WMA | 5 | 3 | handnet | 46.0871 | -96.1862 | Grant | 2015 |
| Kujas Lake WMA | 6 | 4 | handnet | 44.6456 | -94.3959 | McLeod | 2015 |
| Kulenkamp Park | 2 | 2 | Funnel Trap | 45.2847 | -92.9405 | Washington | 2017 |
| Kunkel WMA | 216 | 46 | Blue vane trap, handnet, bowls | 45.5732 | -93.6636 | Mille Lacs | 2018, 2020 |
| La Salle Lake SNA | 20 | 12 | handnet, bowls | 47.3516 | -95.1731 | Hubbard | 2013 |
| La Salle Lake SRA | 36 | 14 | handnet | 47.3460 | -95.1625 | Hubbard | 2020 |
| Lac Qui Parle WMA | 1486 | 44 | handnet, bowls | 45.1629 | -96.0228 | Chippewa | 2013, 2015, 2016, 2022 |
| Lake Alexander Woods SNA | 5 | 3 | handnet | 46.1565 | -94.5852 | Morrison | 2017 |
| Lake Bemidji SP | 25 | 14 | handnet | 47.5356 | -94.8259 | Beltrami | 2020 |
| Lake Bronson SP | 59 | 16 | handnet, bowls | 48.7176 | -96.5977 | Kittson | 2015 |
| Lake Maria SP | 214 | 31 | handnet, bowls | 45.3181 | -93.9349 | Wright | 2017 |
| Lake Vermilion-Soudan Underground Mine SP | 46 | 16 | handnet, bowls | 47.8218 | -92.1983 | St. Louis | 2021 |
| Lamberton WMA | 16 | 12 | handnet | 44.2509 | -95.2180 | Redwood | 2015 |
| Lamprey Pass WMA | 22 | 8 | handnet | 45.2574 | -93.0234 | Anoka | 2022 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|--------------------------------------|----------------|--------------|-----------------------------------|----------|-----------|-------------|---------------------------|
| Lawrence WPA | 1 | 1 | handnet | 45.6146 | -96.5529 | Traverse | 2015 |
| Lembke WMA | 1 | 1 | handnet | 43.8797 | -93.7861 | Blue Earth | 2016 |
| Lester Lake SNA | 38 | 13 | handnet | 47.1524 | -94.7680 | Hubbard | 2020 |
| Leudtke WMA | 26 | 16 | handnet | 43.6443 | -94.3067 | Martin | 2015, 2016 |
| Lilydale Food Patch Community Garden | 35 | 12 | Heliothis trap | 44.9068 | -93.1299 | Dakota | 2014 |
| Lind WMA | 6 | 6 | handnet | 48.6363 | -96.3287 | Roseau | 2015 |
| Lines WMA | 397 | 20 | handnet, bowls | 44.5861 | -95.6433 | Lyon | 2015 |
| Little Elk WMA | 7 | 6 | handnet | 46.0361 | -94.6474 | Morrison | 2017 |
| Little Hanging Horn Lake | 4 | 1 | handnet | 46.4874 | -92.6722 | Carlton | 2022 |
| Little Too Much Lake SNA | 20 | 10 | handnet, bowls | 47.6261 | -93.7751 | Itasca | 2021 |
| Little Willow River WMA | 6 | 6 | handnet | 46.7115 | -93.6945 | Aitkin | 2021 |
| Littlefork River WMA | 11 | 8 | handnet | 48.3198 | -93.4667 | Koochiching | 2022 |
| Loen WPA | 171 | 23 | bowls | 45.3725 | -95.4913 | Swift | 2015 |
| Loncrace WMA | 9 | 7 | handnet | 47.4417 | -95.9406 | Mahnomen | 2018 |
| Long lost lake South WMA | 6 | 6 | handnet | 47.7325 | -95.2179 | Clearwater | 2018 |
| Long Prairie River WMA | 226 | 23 | handnet, bowls | 46.1752 | -94.8094 | Todd | 2017, 2018 |
| Lost Marsh WMA | 7 | 5 | handnet | 43.9361 | -93.7964 | Blue Earth | 2015 |
| Lost Valley Prairie SNA | 519 | 59 | Blue vane trap, handnet, bowls | 44.7988 | -92.8222 | Washington | 2013, 2017, 2018, 2020 |
| Lower Akron 2-1 NPB | 28 | 11 | handnet | 45.2276 | -96.1245 | Big Stone | 2022 |
| Luescher-Barnum WMA | 10 | 6 | handnet | 44.4441 | -95.1834 | Redwood | 2015 |
| Lundblad Prairie SNA | 229 | 28 | handnet, bowls | 43.9345 | -95.7211 | Murray | 2014, 2015, 2016 |
| Lunde WMA | 6 | 3 | handnet | 46.8710 | -96.1320 | Becker | 2018 |
| Lutsen SNA | 32 | 11 | handnet, bowls | 47.6570 | -90.7008 | Cook | 2021 |
| Macsville WMA | 5 | 2 | handnet | 45.7831 | -96.0477 | Grant | 2015 |
| Madelia WMA | 1 | 1 | handnet | 43.9754 | -94.4739 | Watonwan | 2015 |
| Magnusson WMA | 5 | 4 | handnet | 46.7859 | -96.4196 | Clay | 2018 |
| Mahoney's Marsh WMA | 3 | 3 | handnet | 44.5647 | -93.7676 | Scott | 2017 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|----------------------------------|----------------|--------------|-----------------------------------|----------|-----------|------------------------------------|------------------|
| Manchester WMA | 95 | 28 | handnet, bowls | 43.7599 | -93.4299 | Freeborn | 2015, 2016 |
| Manston WMA | 15 | 5 | handnet | 46.4890 | -96.5098 | Wilkin | 2015 |
| Maple Meadows WMA | 1 | 1 | handnet | 47.6181 | -96.2486 | Polk | 2018 |
| Maple River WMA | 55 | 18 | handnet | 43.9431 | -94.0378 | Blue Earth | 2015, 2016, 2019 |
| Maplewood SP | 89 | 28 | handnet, bowls | 46.5322 | -95.9709 | Otter Tail | 2018 |
| Marcoux WMA | 53 | 22 | handnet, bowls | 47.8029 | -96.2294 | Red Lake | 2015, 2017 |
| Marget Lake WMA | 11 | 6 | handnet | 45.4612 | -93.3065 | Isanti | 2021, 2022 |
| Mark & Ursel Smith WMA | 41 | 15 | handnet | 44.8294 | -94.3655 | McLeod | 2015 |
| Marple WMA | 10 | 5 | handnet | 46.0630 | -96.1665 | Grant | 2015 |
| Marsh WMA | 6 | 5 | handnet | 44.5872 | -93.6414 | Scott | 2017 |
| McCarthy Beach SP | 13 | 9 | handnet | 47.6832 | -93.0121 | St. Louis | 2021 |
| McDougall WMA | 8 | 6 | handnet | 45.8442 | -94.3371 | Morrison | 2018 |
| McGregor Marsh SNA | 86 | 25 | handnet | 46.5882 | -93.2789 | Aitkin | 2019, 2020, 2022 |
| McNally Landing | 3 | 2 | bowls | 44.0815 | -91.6876 | Winona | 2017 |
| Meeker County - Private Property | 129 | 14 | bowls | 44.9113 | -94.7182 | Meeker | 2016 |
| Metz WMA | 12 | 7 | handnet | 45.6021 | -96.7605 | Traverse | 2015 |
| Michaelson Farm WMA | 6 | 4 | handnet | 45.7381 | -94.2269 | Benton | 2018 |
| Miesville Ravine Park Reserve | 13 | 5 | handnet | 44.5444 | -92.8042 | Dakota | 2021 |
| Milan WMA | 12 | 7 | handnet | 45.1097 | -95.9062 | Chippewa | 2015 |
| Mille Lacs Kathio SP | 174 | 43 | handnet, bowls | 46.1331 | -93.7509 | Mille Lacs | 2020, 2021, 2022 |
| Mille Lacs Moraine SNA | 116 | 28 | handnet | 46.2830 | -93.8522 | Crow Wing | 2019, 2020, 2022 |
| Mille Lacs WMA | 374 | 71 | Blue vane trap, handnet, bowls | 45.9928 | -93.5174 | Kanabec | 2020, 2021, 2022 |
| Miller Richter WMA | 4 | 2 | handnet | 44.7902 | -96.0923 | Yellow Medicine | 2015 |
| Miltona WMA | 7 | 5 | handnet | 46.1075 | -95.3233 | Douglas | 2018 |
| Minnesota Point Pine Forest SNA | 20 | 15 | handnet | 46.7178 | -92.0367 | St. Louis | 2021 |
| Minnesota Valley NWR | 116 | 36 | handnet | 44.7757 | -93.4480 | Carver, Dakota, Hennepin, Scott | 2013, 2017, 2018 |
| Minnetonka Community Garden | 190 | 33 | Heliothis trap | 44.9086 | -93.5014 | Hennepin | 2014 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-----------------------------------|------------------------|----------------------|------------------|-----------------|------------------|----------------------|---------------------------|
| Minnewawa Lake | 2 | 1 | handnet | 46.6971 | -93.2488 | Aitkin | 2022 |
| Minowa WMA | 3 | 3 | handnet | 43.5056 | -94.4353 | Martin | 2015 |
| Mississippi Headwaters SF | 10 | 7 | handnet | 47.4608 | -95.0167 | Beltrami | 2020 |
| Moose Mountain SNA | 68 | 29 | handnet | 46.8811 | -91.9807 | St. Louis | 2021, 2022 |
| Moose Willow WMA | 5 | 5 | handnet | 46.9409 | -93.5198 | Aitkin | 2021 |
| Morton Outcrops SNA | 268 | 32 | handnet | 44.5506 | -94.9910 | Renville | 2015, 2016 |
| Mosquito Creek WMA | 4 | 4 | handnet | 47.4374 | -95.4052 | Clearwater | 2018 |
| Mound Prairie SNA | 318 | 65 | handnet | 43.7647 | -91.4260 | Houston | 2017, 2019 |
| Mound Prairie WMA | 11 | 7 | handnet | 43.7799 | -91.4159 | Houston | 2021 |
| Mound Spring Prairie SNA | 675 | 25 | bowls | 44.7430 | -96.4295 | Yellow Medicine | 2015, 2016 |
| Mound Springs WMA | 17 | 9 | handnet | 44.7766 | -96.4424 | Yellow Medicine | 2015, 2022 |
| Movil Maze Rec Area | 37 | 22 | handnet | 47.5777 | -94.8322 | Beltrami | 2020 |
| Moylan WMA | 2 | 2 | handnet | 48.2671 | -95.7058 | Marshall | 2015 |
| Mud Creek WMA | 1 | 1 | handnet | 44.4861 | -93.2546 | Dakota | 2017 |
| Mud Goose WMA | 13 | 8 | handnet | 47.2514 | -93.9434 | Cass | 2022 |
| Murphy WPA | 1 | 1 | handnet | 45.6002 | -96.6496 | Traverse | 2015 |
| Myre-Big Island SP | 118 | 17 | handnet, bowls | 43.6350 | -93.3127 | Freeborn | 2017 |
| Neil Park Community Garden | 63 | 23 | Heliothis trap | 44.7577 | -93.3074 | Dakota | 2014 |
| Nelson Prairie WPA | 11 | 7 | handnet | 47.4696 | -95.9751 | Mahnomen | 2018 |
| Nemadji SF | 27 | 17 | handnet | 46.4015 | -92.4660 | Pine | 2020, 2021, 2022 |
| Nerstrand Big Woods SP | 228 | 34 | handnet, bowls | 44.3322 | -93.1156 | Rice | 2017, 2022 |
| Nessel WMA | 6 | 4 | handnet | 45.7064 | -93.1146 | Chisago | 2019 |
| Ney WMA | 180 | 37 | handnet, bowls | 44.5440 | -93.8829 | Scott | 2017, 2018 |
| Nielson Spearhead Center | 52 | 20 | handnet | 47.3726 | -94.9561 | Hubbard | 2020 |
| Norris Camp | 339 | 59 | handnet, bowls | 48.6114 | -95.1850 | Lake of the Woods | 2014, 2015, 2018, 2019 |
| Norwegian WMA | 18 | 9 | handnet | 46.5572 | -96.2081 | Otter Tail | 2015 |
| Numo WMA | 2 | 2 | handnet | 45.0554 | -95.6847 | Chippewa | 2015 |
| O. A. Vee Memorial WMA | 1 | 1 | handnet | 44.1325 | -94.1315 | Blue Earth | 2016 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|----------------------------|-------------|-----------|-----------------------------------|----------|-----------|-----------------|------------------|
| Oak Glen WMA | 11 | 5 | handnet | 43.9358 | -93.0956 | Steele | 2019 |
| O'Brien WMA | 4 | 3 | handnet | 44.5859 | -93.7007 | Scott | 2017 |
| Ogema Springs WMA | 15 | 12 | handnet | 47.0586 | -95.9164 | Becker | 2018 |
| Old Red Lake Trail WMA | 23 | 12 | handnet | 47.6236 | -95.3106 | Clearwater | 2018 |
| Oleander WMA | 3 | 2 | handnet | 45.3751 | -95.2033 | Kandiyohi | 2015 |
| Oriniak WMA | 1 | 1 | handnet | 47.9857 | -95.9465 | Pennington | 2015 |
| Oronoco Prairie SNA | 484 | 44 | Blue vane trap, handnet, bowls | 44.1388 | -92.4905 | Olmsted | 2013, 2017 |
| Oshkosh WMA | 8 | 4 | handnet | 45.3255 | -96.3447 | Yellow Medicine | 2015 |
| Osmundson Prairie SNA | 164 | 20 | handnet, bowls | 43.5103 | -93.6501 | Faribault | 2016 |
| Otter Tail Prairie SNA | 153 | 25 | handnet, bowls | 46.1654 | -96.2263 | Otter Tail | 2014, 2016, 2018 |
| Owens WMA | 14 | 7 | handnet | 47.8449 | -92.6906 | St. Louis | 2021, 2022 |
| Oxcart Crossing WMA | 4 | 1 | handnet | 45.5204 | -95.0040 | Stearns | 2018 |
| Padua WMA | 13 | 8 | handnet | 45.6292 | -95.0188 | Stearns | 2018 |
| Panicum Prairie WMA | 19 | 14 | handnet | 43.5563 | -93.2933 | Freeborn | 2015, 2016 |
| Paul Bunyan SF | 59 | 22 | handnet | 47.2083 | -94.8559 | Hubbard | 2020 |
| Paul Hugo Farm WMA | 11 | 9 | handnet | 45.1624 | -92.8670 | Washington | 2018 |
| Pawek WMA | 172 | 28 | handnet, bowls | 44.1483 | -93.4090 | Waseca | 2017 |
| Peat Bog WMA | 4 | 3 | handnet | 44.4859 | -93.2760 | Rice | 2017 |
| Pebbles WMA | 6 | 2 | handnet | 44.7501 | -94.4547 | McLeod | 2015 |
| Pelican Creek WMA | 7 | 3 | handnet | 46.0859 | -95.9177 | Grant | 2015 |
| Pelican Lake WMA | 6 | 4 | handnet | 45.2373 | -93.7996 | Wright | 2018 |
| Pembina Trail Preserve SNA | 390 | 38 | handnet, bowls | 47.6911 | -96.3552 | Polk | 2015, 2016, 2017 |
| Pembina WMA | 531 | 48 | handnet, bowls | 48.0702 | -96.4535 | Pennington | 2015, 2016, 2017 |
| Perch Creek WMA | 89 | 27 | handnet, bowls | 43.8328 | -94.4757 | Martin | 2015, 2016 |
| Percy WMA | 2 | 2 | handnet | 48.8183 | -96.5934 | Kittson | 2015 |
| Pheasants Forever #3 WMA | 2 | 2 | handnet | 44.5744 | -93.7223 | Scott | 2017 |
| Pheasants Forever WMA | 5 | 5 | handnet | 44.0549 | -92.8071 | Dodge | 2017 |
| Pick WMA | 11 | 6 | handnet | 43.9054 | -93.8405 | Blue Earth | 2015 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---------------------------------------|-------------|-----------|----------------|----------|-----------|---------------|------------------------|
| Pickereel WMA | 7 | 5 | handnet | 46.8546 | -95.7164 | Becker | 2018 |
| Pillsbury SF | 81 | 31 | bowls | 46.4302 | -94.4841 | Cass | 2020 |
| Pin Oak SNA | 96 | 31 | handnet, bowls | 43.7922 | -92.2187 | Fillmore | 2017 |
| Pine Bend Bluffs SNA | 78 | 18 | handnet, bowls | 44.7887 | -93.0697 | Dakota | 2013, 2017, 2018 |
| Pine County V+S 3 WMA | 3 | 2 | handnet | 45.9458 | -93.0109 | Pine | 2020 |
| Pine Island SF | 41 | 21 | handnet | 48.0928 | -94.0904 | Koochiching | 2020, 2022 |
| Pine Point SF | 6 | 3 | handnet | 47.4271 | -95.0684 | Beltrami | 2020 |
| Pioneer Park Gardens Community Garden | 40 | 15 | Heliothis trap | 44.8412 | -93.4823 | Hennepin | 2014 |
| Pipestone WMA | 3 | 3 | handnet | 44.0222 | -96.3267 | Pipestone | 2015 |
| Pliny WMA | 22 | 16 | handnet | 46.3312 | -93.2038 | Aitkin | 2019, 2020, 2022 |
| Plover Prairie TNC | 316 | 21 | handnet, bowls | 45.1976 | -96.2504 | Lac qui Parle | 2015, 2016 |
| Plymouth: 10050 6th Ave N | 2 | 2 | handnet | 44.9849 | -93.4078 | Hennepin | 2017 |
| Polk WMA | 1 | 1 | handnet | 47.7289 | -95.9871 | Polk | 2018 |
| Pomroy Pastures WMA | 33 | 20 | handnet | 46.0400 | -93.0891 | Kanabec | 2019, 2020, 2021 |
| Poor Farm WMA | 3 | 2 | handnet | 46.3382 | -94.1448 | Crow Wing | 2020 |
| Poplar Creek WMA | 3 | 2 | handnet | 43.8813 | -96.2076 | Pipestone | 2015 |
| Prairie Bush Clover SNA | 44 | 8 | bowls | 43.7257 | -95.0637 | Jackson | 2014 |
| Prairie Coteau SNA | 536 | 35 | handnet, bowls | 44.1239 | -96.1538 | Pipestone | 2014, 2015, 2016, 2019 |
| Prairie Ridge WMA | 116 | 14 | handnet, bowls | 46.1657 | -96.2184 | Otter Tail | 2015, 2018 |
| Prairie WMA | 22 | 7 | handnet | 45.3361 | -96.3848 | Big Stone | 2022 |
| Private Property (Anne's) | 123 | 40 | handnet | 43.6049 | -91.5582 | Houston | 2021 |
| Private Property (Jason's) | 89 | 26 | handnet, bowls | 47.7324 | -95.2184 | Clearwater | 2018 |
| Purvis Lake-Ober Foundation SNA | 4 | 3 | bowls | 47.8258 | -92.0052 | St. Louis | 2021 |
| Quarry Park SNA | 28 | 13 | handnet, bowls | 45.5288 | -94.2396 | Stearns | 2014, 2018 |
| Quistorff WMA | 1 | 1 | handnet | 45.8284 | -95.0866 | Todd | 2018 |
| R J D Memorial Hardwood SF | 13 | 4 | handnet | 43.7602 | -91.8640 | Fillmore | 2021 |
| Raguet WMA | 14 | 10 | handnet | 44.8078 | -93.5573 | Carver | 2017 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---|-------------|-----------|----------------|----------|-----------|-------------------|----------------|
| Ras-Lynn WMA | 16 | 12 | handnet | 44.8023 | -94.4568 | McLeod | 2015 |
| Raven WMA | 3 | 3 | handnet | 44.5544 | -93.7439 | Scott | 2017 |
| Red Lake Peatland | 1 | 1 | handnet | 48.3424 | -94.5516 | Beltrami | 0 |
| Red Lake SF | 25 | 13 | handnet | 48.1239 | -94.5283 | Beltrami | 2022 |
| Red Lake WMA | 1 | 1 | handnet | 48.1941 | -94.8166 | Beltrami | 2015 |
| Regal Flats WMA | 1 | 1 | handnet | 45.3874 | -94.8136 | Kandiyohi | 2015 |
| Reno Forest SRA | 1 | 1 | handnet | 43.6051 | -91.2810 | Houston | 2021 |
| Reservation Dam WMA | 9 | 5 | handnet | 45.7694 | -96.6375 | Traverse | 2015 |
| Rice Area Sportsmens Club WMA | 14 | 7 | handnet | 45.8699 | -94.1490 | Morrison | 2018 |
| Rice Creek WMA | 18 | 11 | handnet | 45.7379 | -93.2045 | Kanabec | 2019, 2020 |
| Rice Lake NWR | 226 | 49 | handnet, bowls | 46.5376 | -93.3397 | Aitkin | 2020 |
| Rice Lake WMA | 7 | 6 | handnet | 44.8023 | -94.4559 | Faribault | 2015, 2020 |
| Richard M. and Mathilde Rice Elliot SNA / TNC | 135 | 22 | bowls | 46.5866 | -96.3643 | Wilkin | 2016 |
| Richardson WMA | 23 | 13 | handnet | 46.1162 | -93.9178 | Morrison | 2019, 2020 |
| Ringneck WMA | 3 | 3 | handnet | 43.9009 | -96.3910 | Pipestone | 2015 |
| Ripple River WMA | 28 | 13 | handnet | 46.4036 | -93.6594 | Aitkin | 2020 |
| River Terrace Pr SNA | 17 | 13 | handnet | 44.5417 | -92.7998 | Goodhue | 2017 |
| River Valley WMA | 6 | 4 | handnet | 44.3625 | -94.5370 | Brown | 2015 |
| Riverlands SF | 7 | 3 | handnet | 47.3192 | -92.5378 | St. Louis | 2022 |
| Robert and Marylin Burman WMA | 35 | 20 | handnet | 45.3269 | -93.2904 | Anoka | 2018, 2019 |
| Roberts Bird Sanctuary | 140 | 25 | bowls | 44.9331 | -93.3002 | Hennepin | 2017 |
| Roberts-Wickstrom WMA | 16 | 10 | handnet | 46.7470 | -93.4699 | Aitkin | 2021 |
| Rock Ridge Prairie SNA | 36 | 15 | handnet, bowls | 44.0980 | -95.0734 | Cottonwood | 2014, 2015 |
| Rodewald WMA | 6 | 6 | handnet | 45.0295 | -94.7526 | Meeker | 2015 |
| Roosevelt Rd, Y intersection | 95 | 41 | bowls | 48.6211 | -95.1475 | Lake of the Woods | 2018, 2019 |
| Rosaasen Slough WMA | 7 | 6 | handnet | 44.8364 | -95.3499 | Renville | 2015 |
| Roscoe Prairie SNA | 8 | 6 | bowls | 45.4183 | -94.6804 | Stearns | 2014 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---------------------------|-------------|-----------|----------------|----------|-----------|------------|---------------------------|
| Roseau River WMA | 69 | 23 | handnet, bowls | 48.9668 | -96.3905 | Roseau | 2015 |
| Rosenau-Lambrecht WMA | 3 | 2 | handnet | 44.3319 | -94.5828 | Brown | 2015 |
| Rothi WPA | 285 | 21 | bowls | 45.3181 | -96.2829 | Big Stone | 2015 |
| Rothsay WMA | 72 | 12 | handnet, bowls | 46.5336 | -96.3850 | Wilkin | 2015 |
| Round-Rice Bed WMA | 15 | 10 | handnet | 46.3335 | -93.8448 | Crow Wing | 2022 |
| Ruff-Nik WMA | 11 | 6 | handnet | 46.1363 | -94.6609 | Todd | 2017 |
| Rum River SF | 43 | 23 | handnet | 45.9905 | -93.6234 | Mille Lacs | 2020, 2021, 2022 |
| Rush Lake WMA | 5 | 4 | handnet | 45.6588 | -93.0230 | Chisago | 2020 |
| Rush WMA | 8 | 5 | handnet | 47.3550 | -95.8819 | Mahnomen | 2018 |
| Rushford Sand Barrens SNA | 5 | 4 | handnet | 43.7892 | -91.8049 | Fillmore | 2021 |
| Ruthton WMA | 9 | 4 | handnet | 44.1729 | -96.0463 | Murray | 2015 |
| Rutledge WMA | 24 | 15 | handnet | 46.2486 | -92.8105 | Pine | 2019, 2020, 2021 |
| Salt and Pepper WMA | 51 | 11 | bowls | 43.9502 | -96.0249 | Murray | 2015 |
| Sand Prairie WMA | 280 | 20 | handnet, bowls | 45.5400 | -94.1007 | Sherburne | 2018 |
| Sandpiper Prairie SNA | 4 | 3 | handnet | 47.2523 | -96.4009 | Norman | 2018 |
| Sandstone WMA | 106 | 34 | handnet | 46.0797 | -92.8281 | Pine | 2019, 2020, 2022 |
| Santee Prairie SNA | 542 | 35 | handnet, bowls | 47.3937 | -95.9128 | Mahnomen | 2015, 2016, 2017, 2018 |
| Santwire WMA | 18 | 13 | handnet | 47.2300 | -95.8983 | Mahnomen | 2018 |
| Sartell WMA | 237 | 35 | handnet, bowls | 45.7798 | -94.1959 | Benton | 2018 |
| Savage Fen SNA | 33 | 19 | handnet, bowls | 44.7726 | -93.3520 | Scott | 2013, 2018 |
| Savanna Portage SP | 36 | 14 | handnet | 46.8371 | -93.1732 | Aitkin | 2022 |
| Savanna SF | 26 | 15 | handnet | 46.8684 | -93.2539 | Aitkin | 2021, 2022 |
| Save the Wetlands WMA | 16 | 10 | handnet, bowls | 43.6548 | -93.6762 | Faribault | 2015, 2016 |
| Sawyer WMA | 26 | 13 | handnet | 46.6403 | -92.6352 | Carlton | 2020, 2022 |
| Sax WMA | 2 | 2 | handnet | 47.1969 | -92.6051 | St. Louis | 2021 |
| Sax-Zim Bog | 336 | 67 | handnet, bowls | 47.1754 | -92.7037 | St. Louis | 2014, 2021, 2022 |
| Scenic SP | 101 | 38 | handnet, bowls | 47.7059 | -93.5685 | Itasca | 2021 |
| Schaefer Prairie TNC | 73 | 21 | handnet, bowls | 44.7247 | -94.2962 | McLeod | 2017 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-------------------------------------|-------------|-----------|----------------|----------|-----------|-------------------|------------------|
| Scheuring WMA | 1 | 1 | handnet | 43.8492 | -95.8053 | Murray | 2015 |
| Schneewind WMA | 206 | 34 | handnet, bowls | 44.8096 | -93.8273 | Carver | 2018 |
| Sedan Brook Prairie SNA | 286 | 22 | bowls | 45.5498 | -95.0971 | Stearns | 2014, 2016 |
| Sedan WMA | 5 | 3 | handnet | 45.5894 | -95.2731 | Pope | 2015 |
| Seminary Fen SNA | 53 | 25 | handnet | 44.8089 | -93.5564 | Carver | 2017, 2018, 2021 |
| Sena WMA | 99 | 15 | handnet, bowls | 45.0936 | -95.2869 | Chippewa | 2015, 2016 |
| Senn-Rich WMA | 30 | 17 | handnet | 44.0034 | -93.4985 | Waseca | 2015, 2016 |
| Seven Sisters Prairie TNC | 256 | 27 | handnet, bowls | 46.1069 | -95.7457 | Douglas | 2018 |
| Seymour Lake WMA | 2 | 2 | handnet | 43.7039 | -94.7102 | Martin | 2015 |
| Sham Lake WMA | 1 | 1 | handnet | 44.6107 | -95.6500 | Lyon | 2015 |
| Shaokatan WMA | 1 | 1 | handnet | 44.4447 | -96.3909 | Lincoln | 2015 |
| Shooks Slough WMA | 3 | 1 | handnet | 47.9104 | -94.4436 | Beltrami | 2022 |
| Shooting Range | 421 | 58 | bowls | 48.5630 | -95.3166 | Lake of the Woods | 2018, 2019 |
| Shooting Star Prairie SNA | 41 | 23 | handnet, bowls | 43.5444 | -92.5787 | Mower | 2017 |
| Shuck WMA | 2 | 1 | handnet | 46.0644 | -96.1491 | Grant | 2015 |
| Sibley SP | 3 | 2 | handnet | 45.3079 | -95.0156 | Kandiyohi | 2020 |
| Silver Creek WMA | 7 | 5 | handnet | 48.6699 | -94.4846 | Lake of the Woods | 2022 |
| Sioux Nation WMA | 30 | 12 | handnet | 44.6829 | -96.4343 | Yellow Medicine | 2015 |
| Sioux Prairie WMA | 29 | 13 | handnet | 44.4428 | -96.0689 | Lyon | 2015 |
| Sisters of Charity Community Garden | 51 | 13 | Heliothis trap | 44.7492 | -92.8765 | Dakota | 2014 |
| Sixteen WMA | 5 | 2 | handnet | 46.2446 | -95.4717 | Otter Tail | 2018 |
| Snake River SF | 116 | 38 | handnet | 46.1229 | -93.2095 | Kanabec | 2020, 2021, 2022 |
| Solana SF | 48 | 16 | handnet | 46.3233 | -93.1703 | Aitkin | 2022 |
| Somerset WMA | 233 | 18 | handnet, bowls | 44.0437 | -93.2505 | Steele | 2017 |
| Somsen WMA | 8 | 5 | handnet | 44.3293 | -94.5221 | Brown | 2015 |
| Spectacle WMA | 10 | 6 | handnet | 45.5589 | -93.3877 | Isanti | 2022 |
| Spencer Brook WMA | 29 | 15 | handnet | 45.5172 | -93.4490 | Isanti | 2022 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|---------------------------------|----------------|--------------|-----------------------------------|----------|-----------|-------------------|---------------------------|
| Spooner WMA | 2 | 2 | handnet | 48.6853 | -94.6503 | Lake of the Woods | 2022 |
| Spring Creek Prairie SNA | 19 | 11 | handnet | 44.5549 | -92.5942 | Goodhue | 2017, 2021 |
| St. Croix Savanna SNA | 503 | 61 | Blue vane trap, handnet, bowls | 45.0016 | -92.7825 | Washington | 2013, 2018, 2020, 2022 |
| St. Croix SF | 31 | 15 | handnet | 46.0850 | -92.4962 | Pine | 2021, 2022 |
| St. Croix SP | 155 | 52 | handnet, bowls | 45.9509 | -92.6023 | Pine | 2020, 2022 |
| Stanchfield WMA | 29 | 18 | handnet | 45.7185 | -93.3062 | Isanti | 2018, 2019 |
| Staples WMA | 21 | 13 | handnet | 46.2998 | -94.7819 | Todd | 2018 |
| Stearns Prairie Heritage WMA | 13 | 8 | handnet | 45.4274 | -94.9014 | Stearns | 2018 |
| Stearns Prairie WMA | 1 | 1 | handnet | 45.4252 | -94.9015 | Stearns | 2015 |
| Stone's Throw Wrenshall Farm | 3 | 3 | Bucket Trap | 46.5846 | -92.4061 | Carlton | 2017 |
| Stony Run 10-1 NPB | 58 | 18 | handnet | 44.8746 | -95.6465 | Yellow Medicine | 2022 |
| String Lake WPA | 1 | 1 | handnet | 43.8454 | -95.1937 | Jackson | 2019 |
| Stryker Avenue Community Garden | 202 | 29 | Heliothis trap | 44.9273 | -93.0883 | Ramsey | 2014 |
| Sturgeon Lake WMA | 7 | 5 | handnet | 46.3893 | -92.8684 | Pine | 2020 |
| Sturgeon River SF | 48 | 19 | handnet | 47.7449 | -92.9690 | St. Louis | 2021, 2022 |
| Succonnix WMA | 15 | 7 | handnet | 45.3189 | -94.0663 | Wright | 2018 |
| Sugarloaf Point SNA | 5 | 5 | bowls | 47.4868 | -90.9844 | Cook | 2021 |
| Sulem Lake WMA | 1 | 1 | handnet | 43.9253 | -94.8300 | Watonwan | 2016 |
| Superior NF | 415 | 67 | handnet, bowls | 47.7703 | -91.9017 | Cook | 2021, 2022 |
| Swan Lake WMA | 173 | 23 | handnet, pitfalls | 44.3201 | -94.2547 | Nicollet | 2015 |
| Swedes Forest SNA | 5 | 4 | handnet | 44.6892 | -95.3637 | Redwood | 2015 |
| Sween WMA | 3 | 3 | handnet | 44.8884 | -95.5789 | Chippewa | 2015 |
| Talcot Lake WMA | 3 | 2 | handnet | 43.9015 | -95.4494 | Cottonwood | 2015 |
| Talcot Lake WPA | 3 | 3 | handnet | 43.9036 | -95.4487 | Murray | 2015 |
| Talley WMA | 1 | 1 | handnet | 44.6437 | -96.4316 | Yellow Medicine | 2015 |
| Tangential WMA | 2 | 1 | handnet | 44.5263 | -92.8169 | Goodhue | 2021 |
| Terrace WMA | 191 | 26 | handnet, bowls | 44.0300 | -96.1708 | Pipestone | 2015 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|--|-------------|-----------|--------------------------------|----------|-----------|-------------------|------------------|
| Tessman WPA | 239 | 23 | handnet, bowls | 46.8634 | -95.9078 | Becker | 2018 |
| Tettegouche SP | 12 | 8 | handnet | 47.3450 | -91.2308 | Lake | 2022 |
| Thorn Crest Farm CSA | 6 | 4 | Heliothis trap | 44.4167 | -93.2415 | Rice | 2014 |
| Three Island Lake Cty Park | 72 | 29 | handnet | 47.6157 | -94.7808 | Beltrami | 2020 |
| Tierney WMA | 30 | 18 | handnet, bowls | 43.9927 | -94.4475 | Watonwan | 2015, 2016 |
| Tiger Lake WMA | 1 | 1 | handnet | 44.5483 | -95.0397 | Redwood | 2015 |
| Tillemans WMA | 22 | 10 | handnet | 44.5029 | -96.0733 | Lyon | 2015 |
| Timber doodle WMA | 6 | 6 | handnet | 47.7474 | -95.9675 | Polk | 2018 |
| Townsend Woods SNA | 10 | 5 | handnet | 44.2460 | -93.5185 | Rice | 2021 |
| Transgrud Landing Public Access | 6 | 5 | handnet | 48.9201 | -96.0724 | Roseau | 2015 |
| Trapper Pete's Trail | 239 | 48 | handnet, bowls | 48.6742 | -95.1534 | Lake of the Woods | 2018, 2019 |
| Traverse County - PP | 425 | 30 | bowls | | | Traverse | 2016 |
| Tribute WMA | 5 | 3 | handnet | 45.4377 | -94.9089 | Stearns | 2018 |
| Trinity Evangelical Free Church Community Garden | 2 | 2 | Heliothis trap | 44.6419 | -93.2821 | Dakota | 2014 |
| Trongard WMA | 1 | 1 | handnet | 44.7547 | -95.3474 | Renville | 2015 |
| Tunsberg WMA | 2 | 1 | handnet | 45.0546 | -95.7531 | Chippewa | 2015 |
| Twin Lakes SNA | 300 | 30 | handnet, bowls | 45.4550 | -93.0426 | Isanti | 2017, 2018 |
| Twin Lakes WMA | 3 | 2 | handnet | 48.5922 | -96.4335 | Kittson | 2015 |
| Twin Valley Prairie SNA | 334 | 30 | handnet, bowls | 47.1811 | -96.3544 | Norman | 2015, 2016, 2018 |
| Two Rivers Aspen Parkland SNA | 60 | 17 | handnet, bowls | 48.6678 | -96.3465 | Roseau | 2015, 2016 |
| Two Rivers WMA | 15 | 10 | handnet | 44.2746 | -95.3759 | Redwood | 2015 |
| Tympanuchus WMA | 174 | 19 | handnet, bowls | 47.7011 | -96.4312 | Polk | 2015, 2018 |
| Tyrone Flats WPA | 4 | 4 | handnet | 45.2879 | -94.5217 | Meeker | 2015 |
| Uncas Dunes SNA | 75 | 30 | Blue vane trap, handnet, bowls | 45.4220 | -93.7001 | Sherburne | 2013 |
| unnamed gated road | 7 | 5 | handnet, bowls | 48.6705 | -95.1488 | Lake of the Woods | 2018, 2019 |
| Vale WMA | 188 | 36 | handnet, bowls | 44.5571 | -93.9392 | Sibley | 2017 |

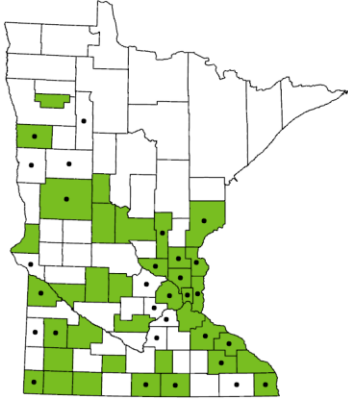
| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|--|-------------|-----------|----------------------------|----------|-----------|-------------|---------------------------|
| Vallers WMA | 13 | 8 | handnet | 44.5622 | -95.8403 | Lyon | 2015 |
| Valley Natural Food Coop Community Garden | 7 | 6 | Heliothis trap | 44.7549 | -93.2480 | Dakota | 2014 |
| Verlyn Marth Memorial Prairie SNA | 189 | 25 | handnet, bowls | 45.7456 | -96.0007 | Stevens | 2015, 2016 |
| Vermillion River WMA | 1 | 1 | handnet | 44.6692 | -93.0547 | Dakota | 2017 |
| Victory WMA | 2 | 2 | handnet | 45.3400 | -96.3693 | Big Stone | 2022 |
| Waldbilling WMA | 16 | 12 | handnet | 48.4462 | -93.7372 | Koochiching | 2022 |
| Walnut Lake WMA | 93 | 22 | handnet, bowls | 43.6635 | -93.7983 | Faribault | 2015, 2016 |
| Wambach WMA | 10 | 6 | handnet | 47.3976 | -95.9538 | Mahnomen | 2018 |
| Warsaw WMA | 5 | 4 | handnet | 44.4304 | -93.0173 | Goodhue | 2017 |
| Watline WMA | 20 | 9 | handnet | 43.9220 | -94.6757 | Watonwan | 2015, 2016, 2019 |
| Waukenabo SF | 4 | 2 | handnet | 46.6822 | -93.6777 | Aitkin | 2021 |
| Weaver Dunes TNC/SNA | 311 | 40 | handnet, bowls | 44.2548 | -91.9365 | Wabasha | 2017, 2019, 2021 |
| West Graham WMA | 257 | 21 | bowls | 43.8014 | -95.5326 | Nobles | 2015 |
| Whited WMA | 1 | 1 | handnet | 45.9714 | -93.2483 | Kanabec | 2022 |
| Whitefield WMA | 10 | 7 | handnet, bowls | 45.0355 | -95.0521 | Kandiyohi | 2015 |
| Whitewater WMA | 287 | 53 | handnet, bowls | 44.1515 | -92.0028 | Wabasha | 2017, 2019, 2021, 2022 |
| Wieker WMA | 2 | 2 | handnet | 45.0519 | -94.7319 | Meeker | 2015 |
| Wild Indigo SNA | 46 | 9 | handnet, bowls | 43.7275 | -92.7687 | Mower | 2017 |
| Wild River SP | 253 | 78 | handnet, bowls | 45.5237 | -92.7364 | Chisago | 2020, 2021, 2022 |
| Wild Rose WMA | 18 | 11 | handnet | 45.6273 | -92.9640 | Chisago | 2018, 2019, 2020 |
| William M. Rath WMA | 32 | 22 | handnet | 46.3023 | -92.5216 | Pine | 2020, 2022 |
| Wilts WMA | 4 | 3 | handnet | 45.8324 | -96.0687 | Grant | 2015 |
| Wincrest Park | 2 | 2 | Cross Vane, Funnel Trap | 44.0374 | -91.6691 | Winona | 2017 |
| Winfield WMA | 2 | 2 | handnet, bowls | 44.8526 | -95.0896 | Renville | 2015 |
| Winter WMA | 365 | 20 | bowls | 44.1347 | -96.3697 | Pipestone | 2015 |
| Wire Tree WMA | 14 | 8 | handnet | 45.7809 | -93.2237 | Kanabec | 2020 |

| Site Name | # Specimens | # Species | Technique | Latitude | Longitude | County | Sampling Years |
|-----------------------------------|------------------------|----------------------|------------------|-----------------|------------------|---------------|-----------------------|
| Wolf Trail WMA | 1 | 1 | handnet | 48.2520 | -95.5077 | Beltrami | 2015 |
| Wolk Park Community Garden | 22 | 8 | Heliothis trap | 44.7565 | -93.2615 | Dakota | 2014 |
| Wood Lake WMA | 3 | 2 | handnet | 44.1254 | -94.8110 | Brown | 2015 |
| Wood-Rill SNA | 21 | 11 | handnet | 44.9831 | -93.5441 | Hennepin | 2020 |
| Woross WMA | 61 | 26 | handnet | 46.4608 | -93.2959 | Aitkin | 2019, 2020 |
| Wrenshall WMA | 10 | 9 | handnet | 46.5676 | -92.4080 | Carlton | 2020 |
| Wright WMA | 95 | 25 | bowls | 48.3775 | -96.5310 | Marshall | 2015 |
| Zim WMA | 35 | 11 | handnet, bowls | 47.2261 | -92.5988 | St. Louis | 2021 |

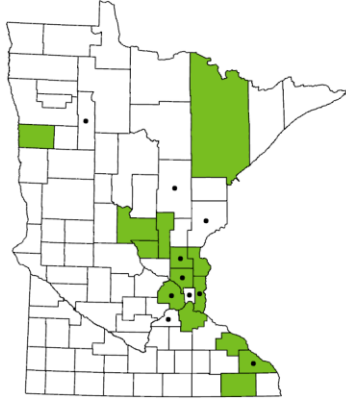
Appendix B. County-Level Species Maps

These county-level species distributions represent MBS surveys conducted from 2014-2022 (green) (see [Figure 1](#) for survey distribution) and records from existing museum collections (black dot).

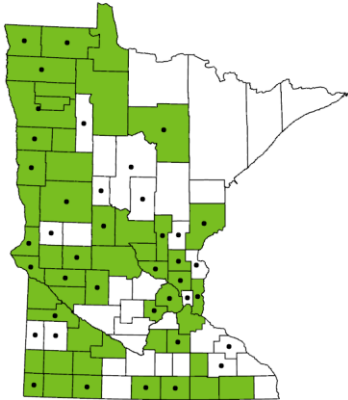
Agapostemon sericeus



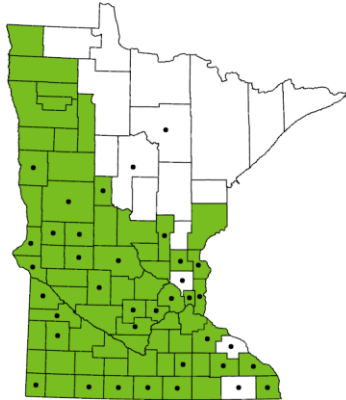
Agapostemon splendens



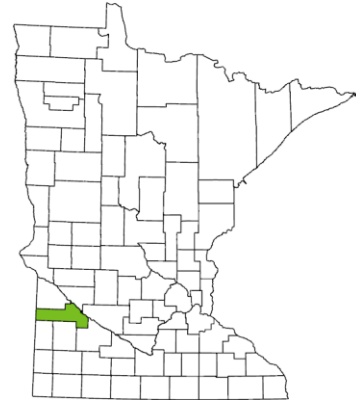
Agapostemon texanus



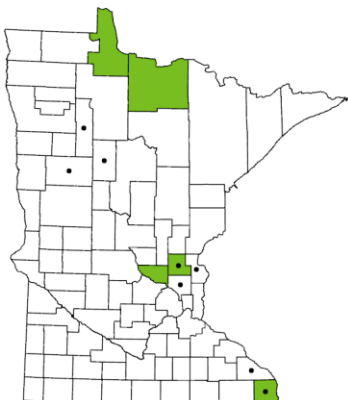
Agapostemon virescens



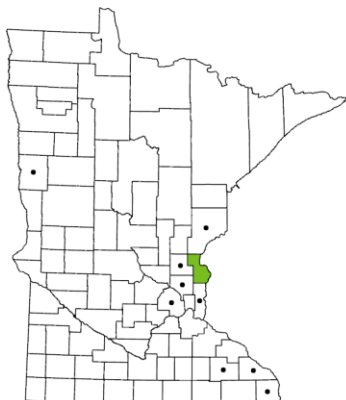
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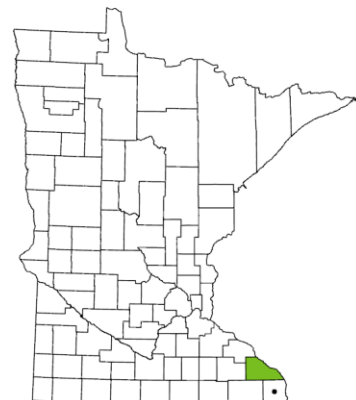
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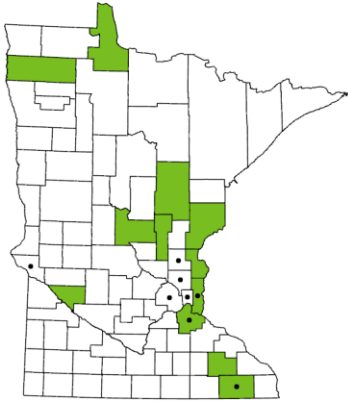
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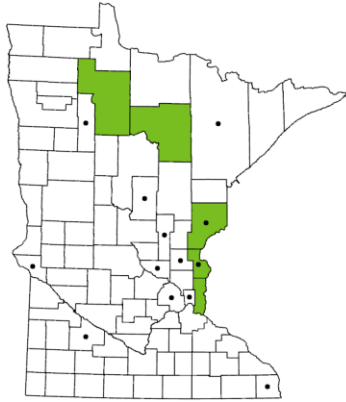
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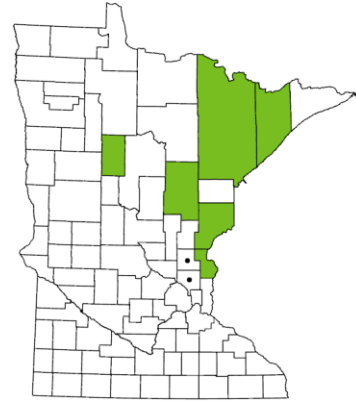
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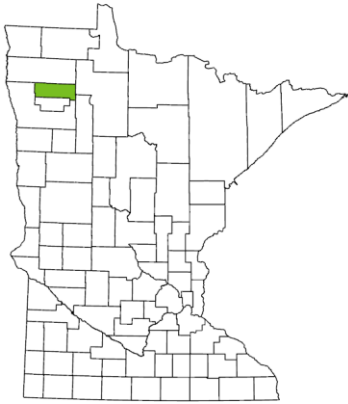
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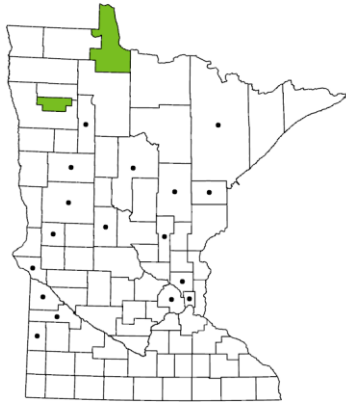
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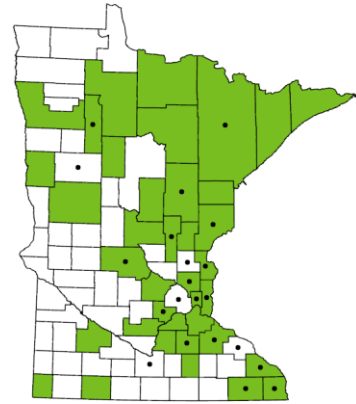
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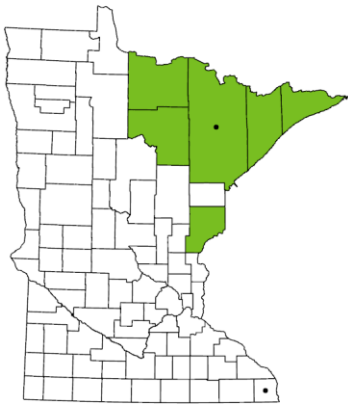
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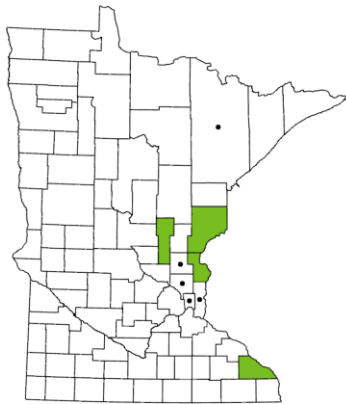
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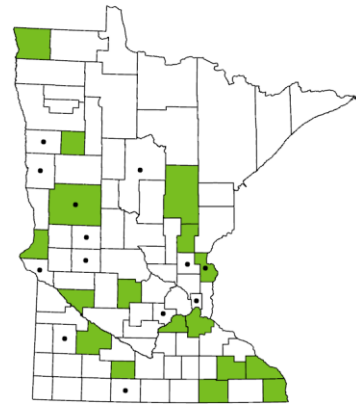
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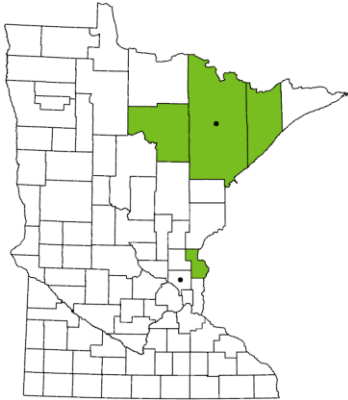
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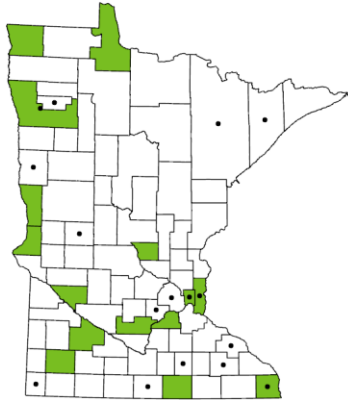
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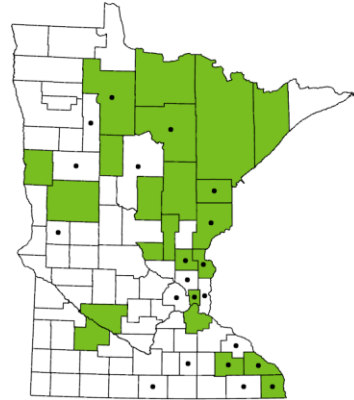
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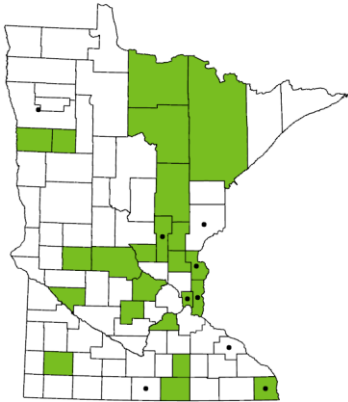
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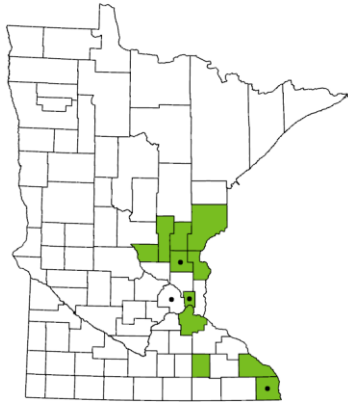
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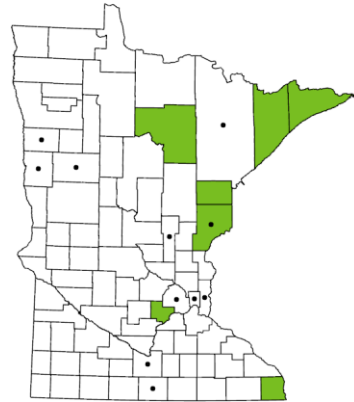
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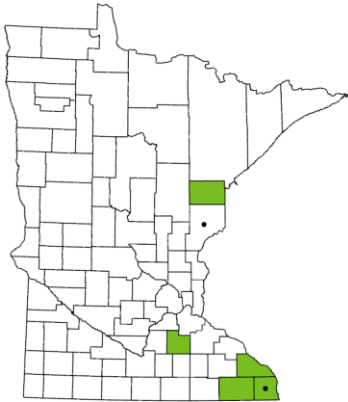
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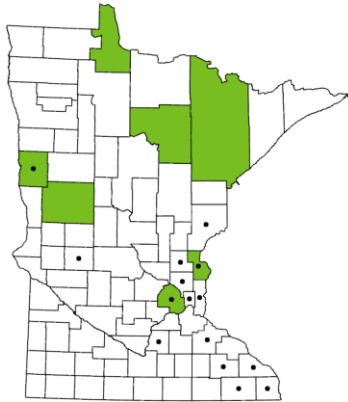
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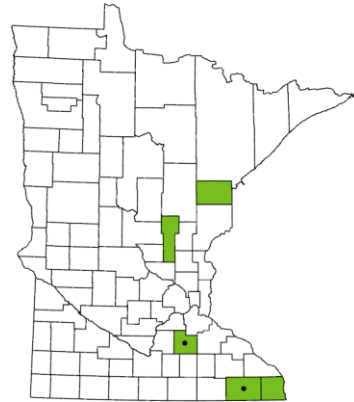
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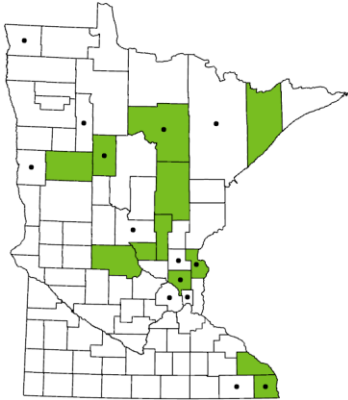
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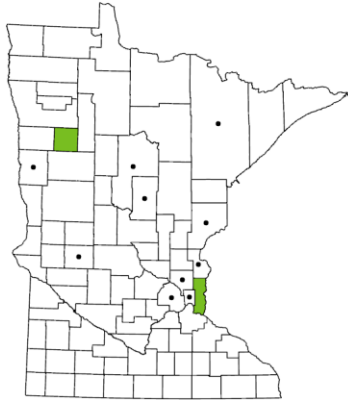
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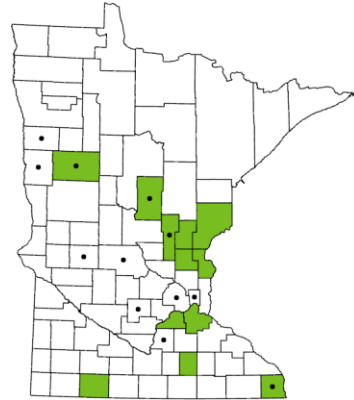
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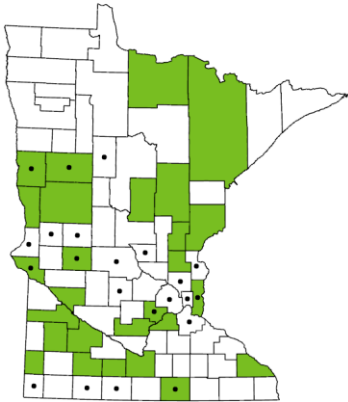
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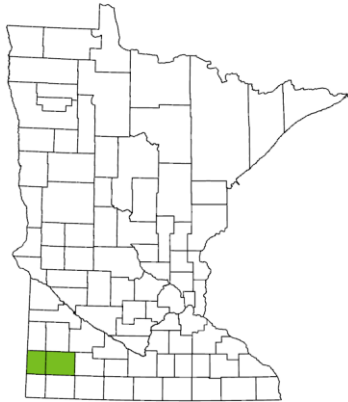
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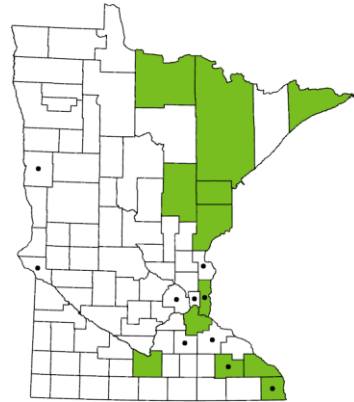
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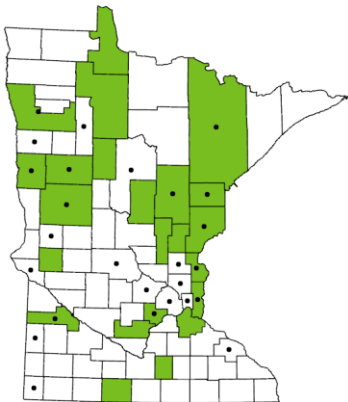
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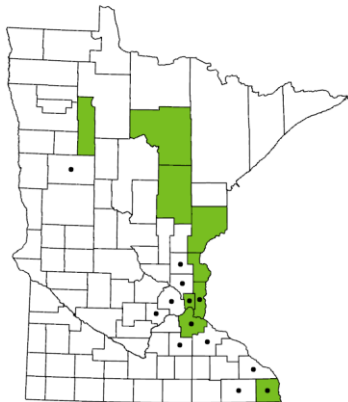
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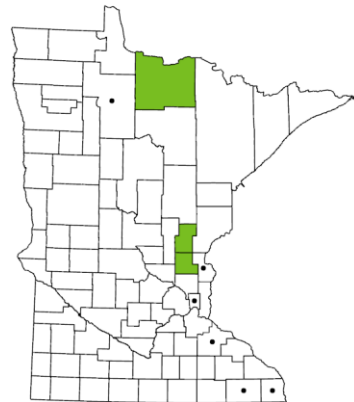
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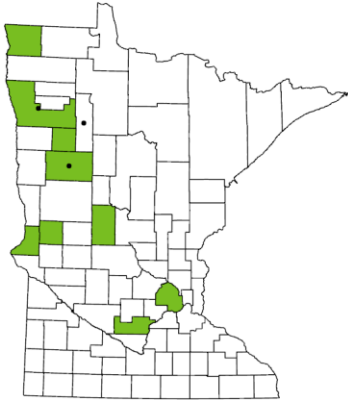
Andrena imitatrix



Andrena integra



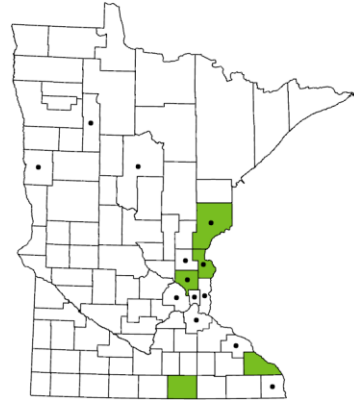
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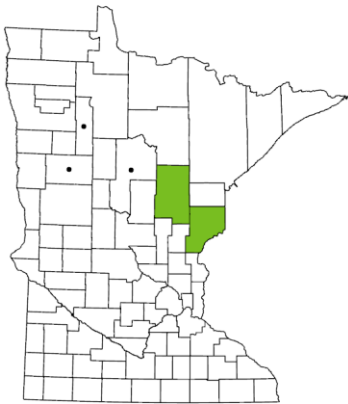
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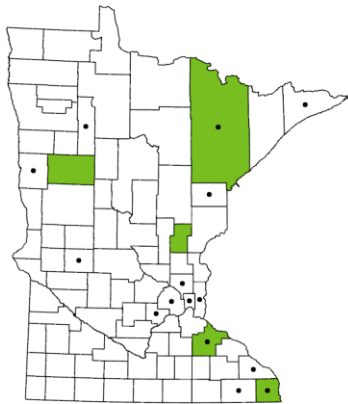
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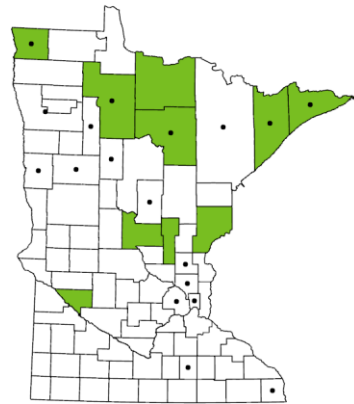
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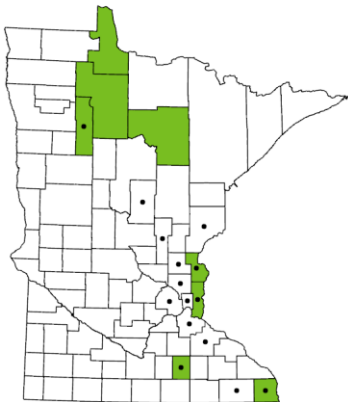
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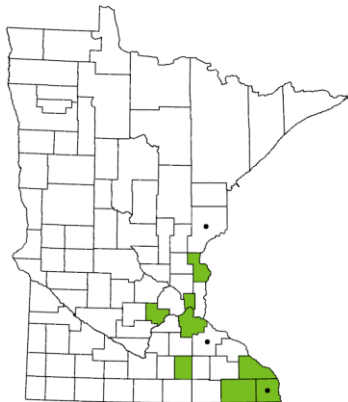
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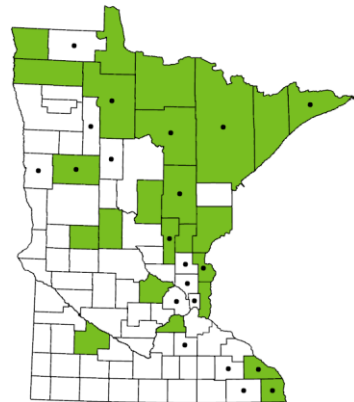
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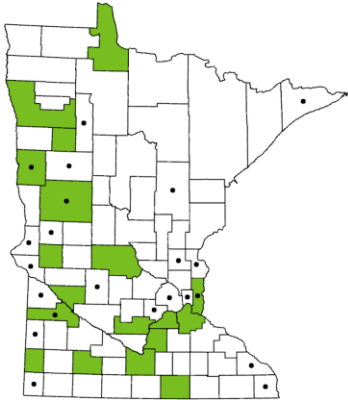
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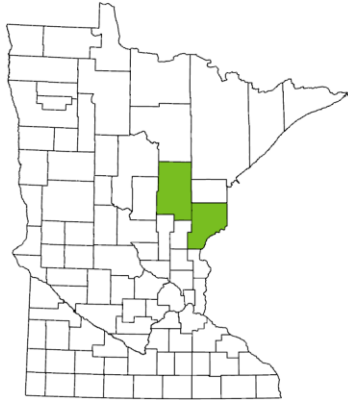
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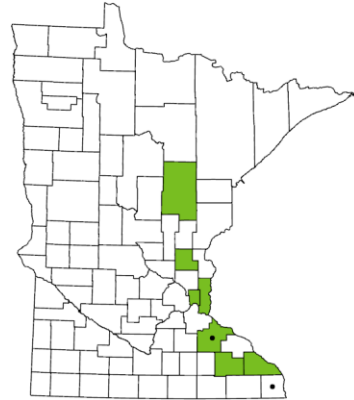
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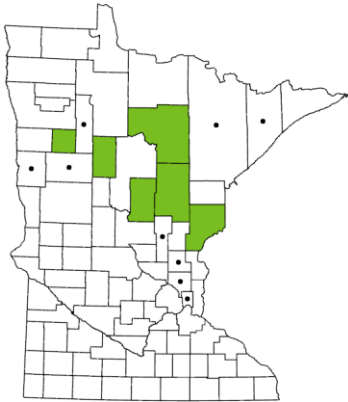
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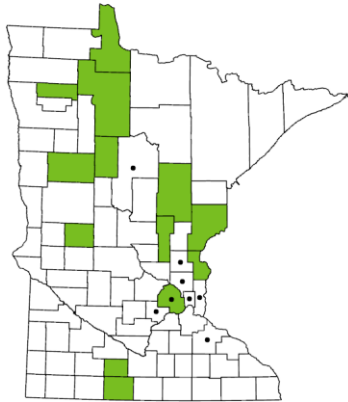
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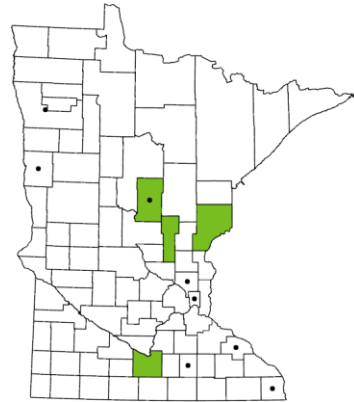
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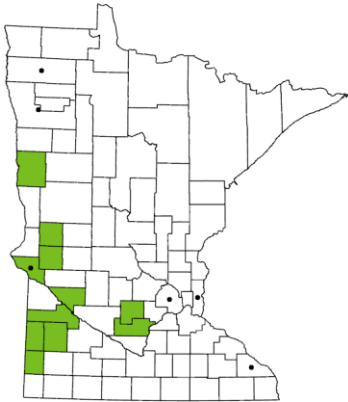
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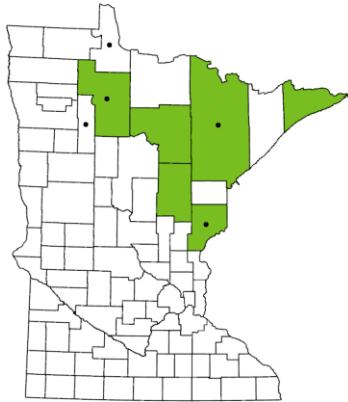
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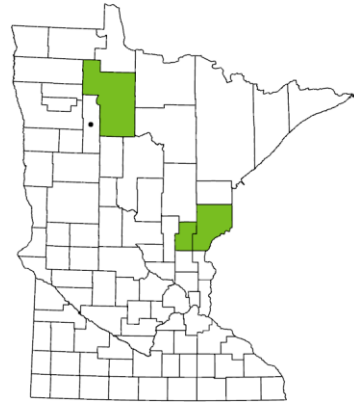
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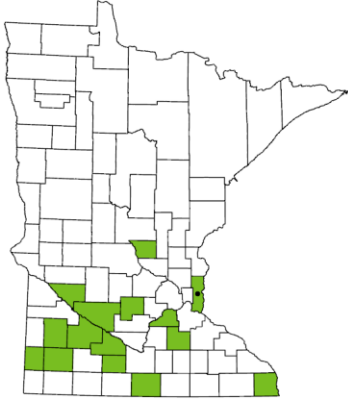
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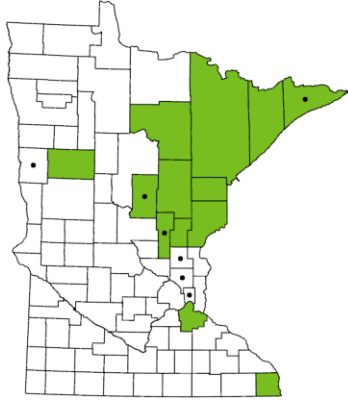
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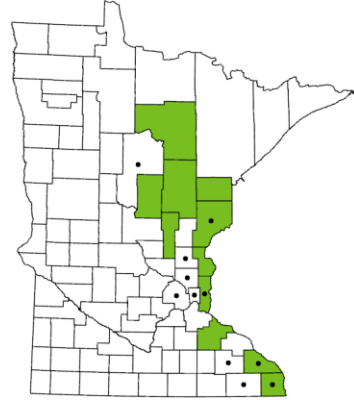
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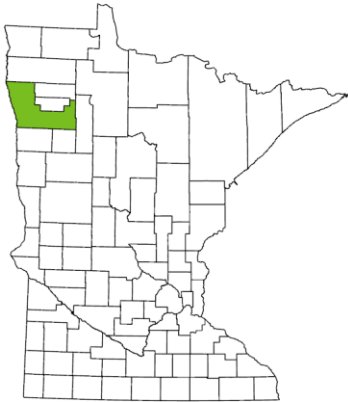
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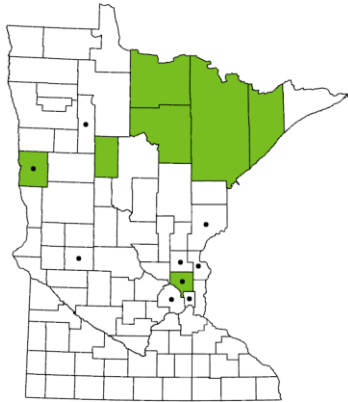
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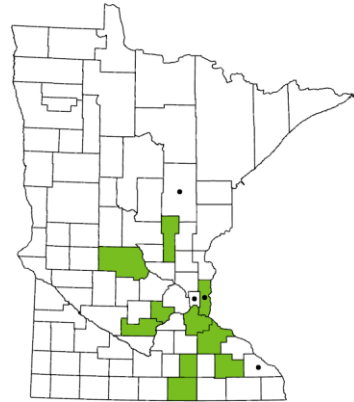
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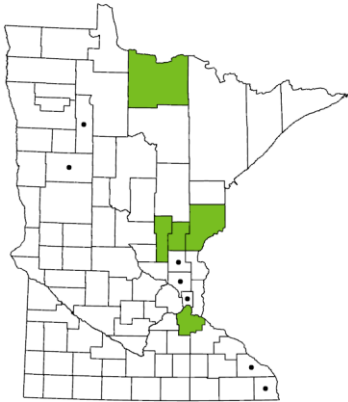
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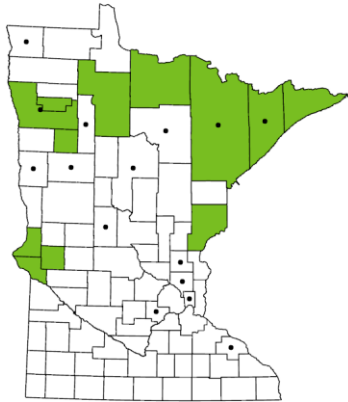
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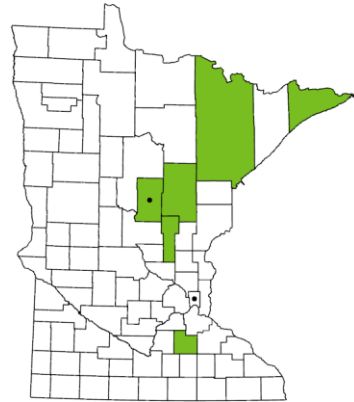
Andrena spiraeana



Andrena thaspiae



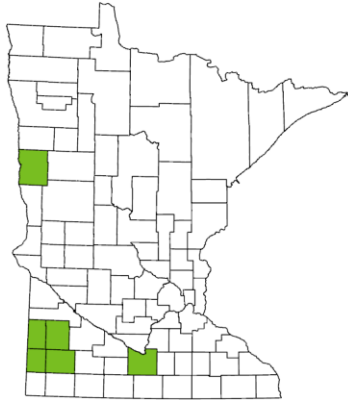
Andrena tridens



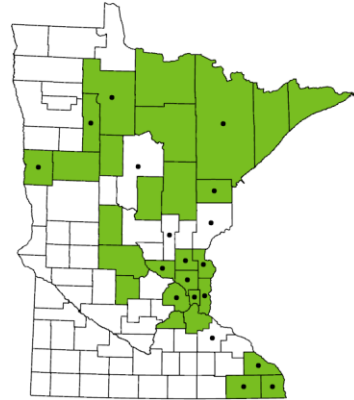
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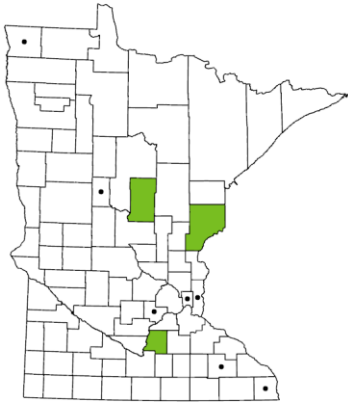
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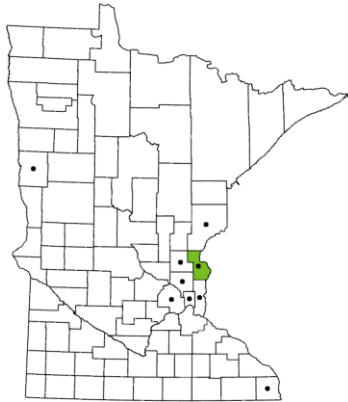
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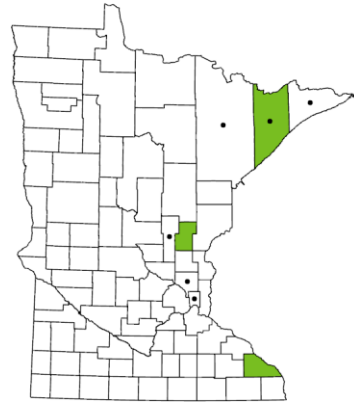
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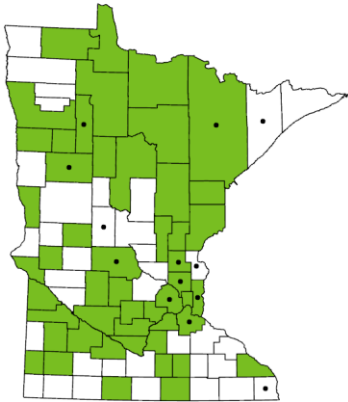
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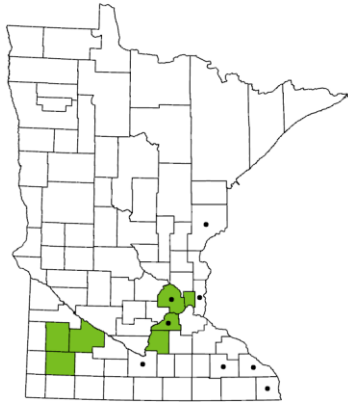
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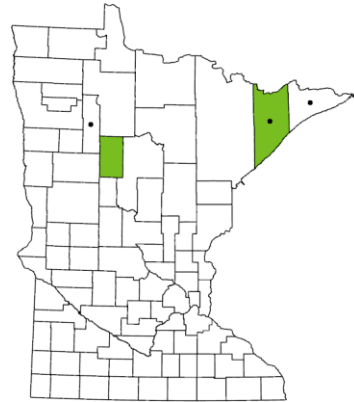
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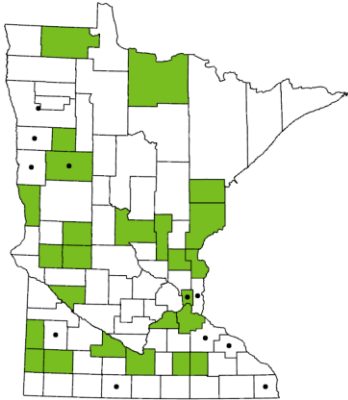
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Andrena w-scripta



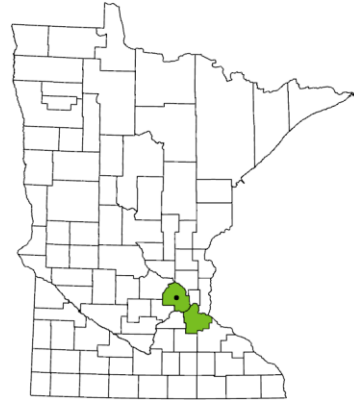
Andrena ziziae



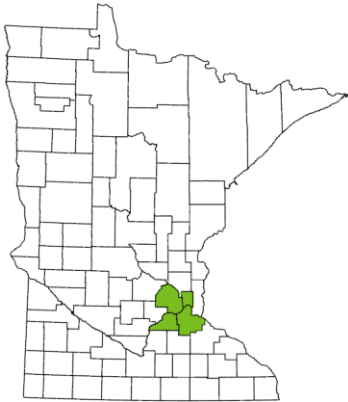
Anthidiellum boreale



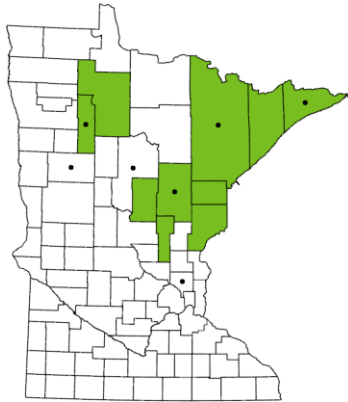
Anthidium manicatum



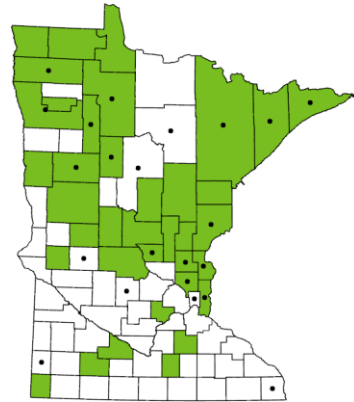
Anthidium oblongatum



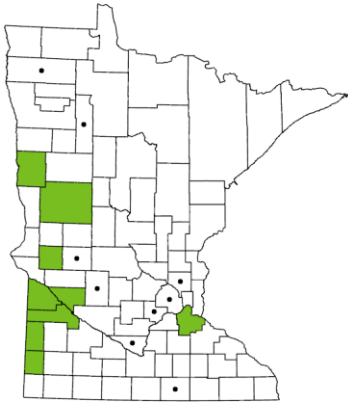
Anthophora bomboides



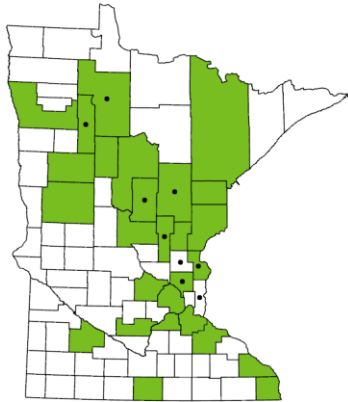
Anthophora terminalis



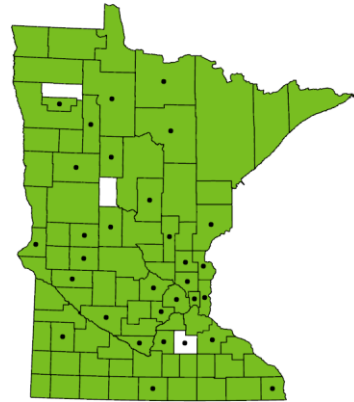
Anthophora walshii



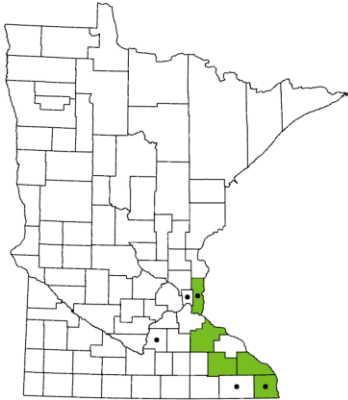
Augochlora pura



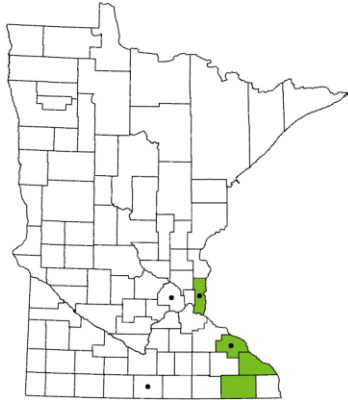
Augochlorella aurata



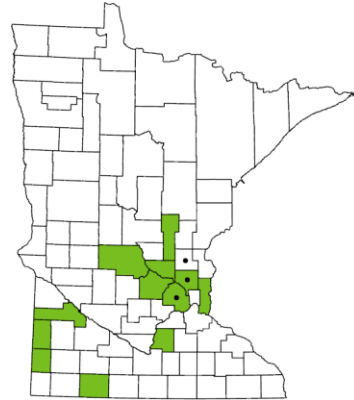
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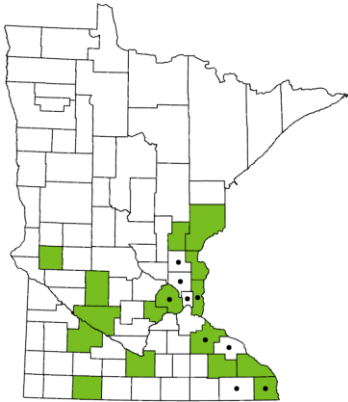
Augochloropsis humeralis



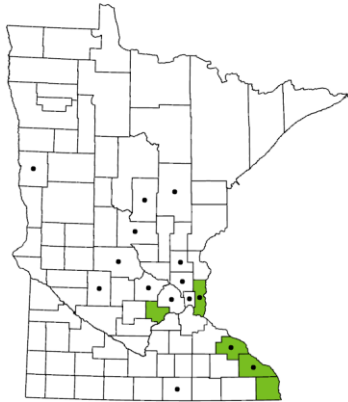
Augochloropsis metallica



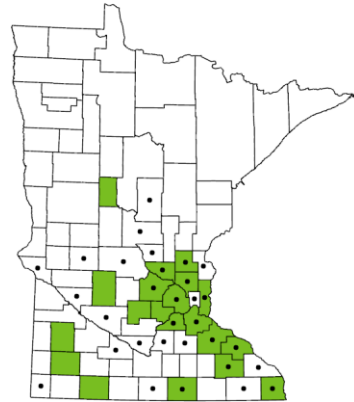
Augochloropsis viridula



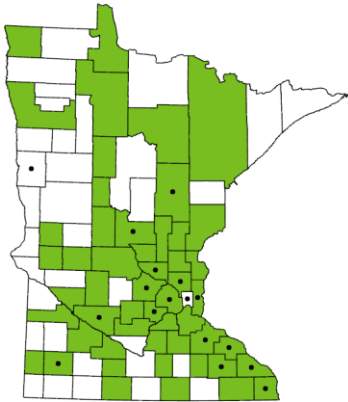
Bombus affinis



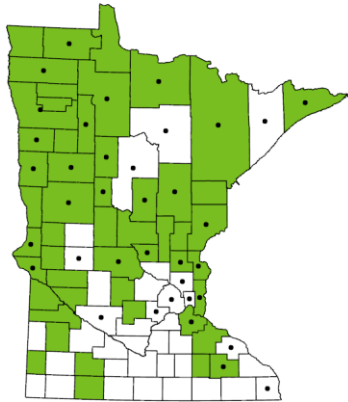
Bombus auricomus



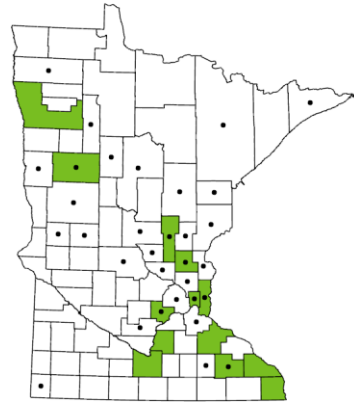
Bombus bimaculatus



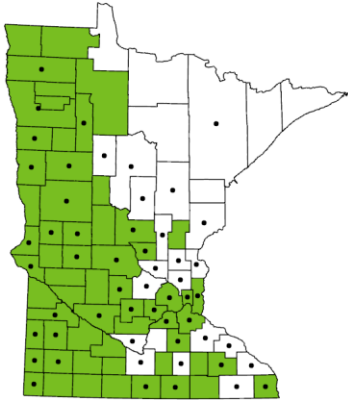
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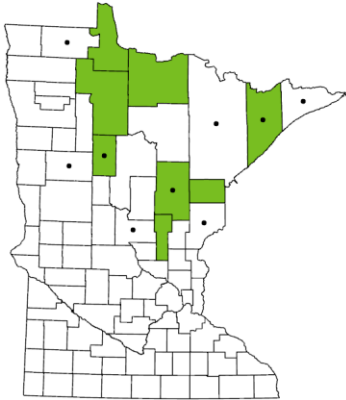
Bombus citrinus



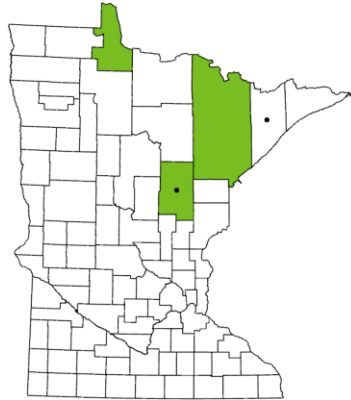
*Bombus
fervidus*



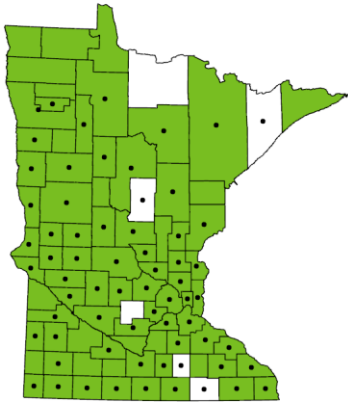
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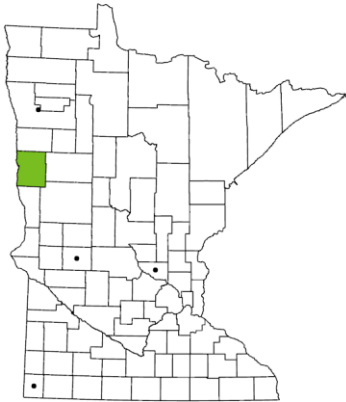
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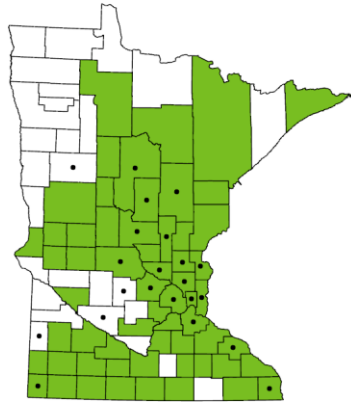
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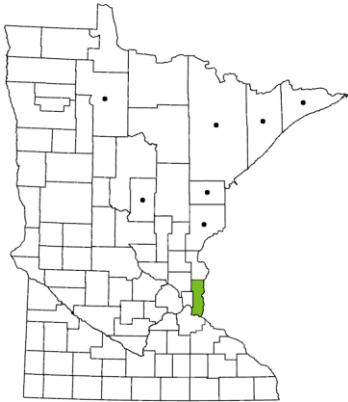
*Bombus
huntii*



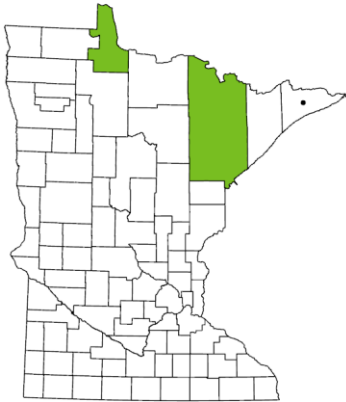
*Bombus
impatiens*



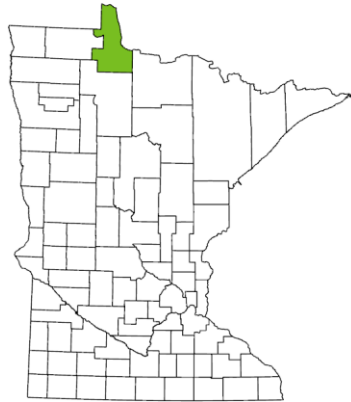
*Bombus
insularis*



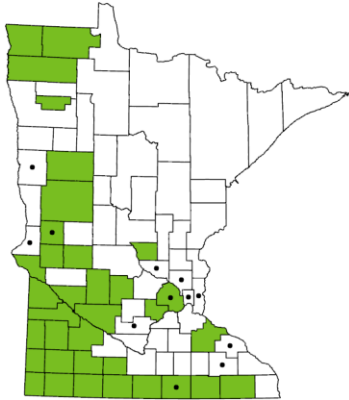
*Bombus
melanopygus*



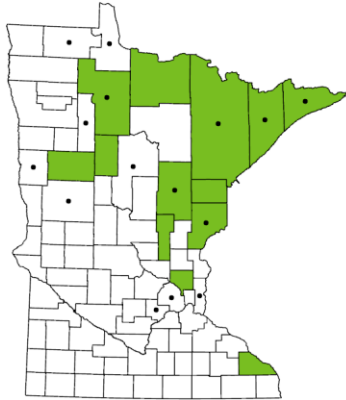
*Bombus
nevadensis*



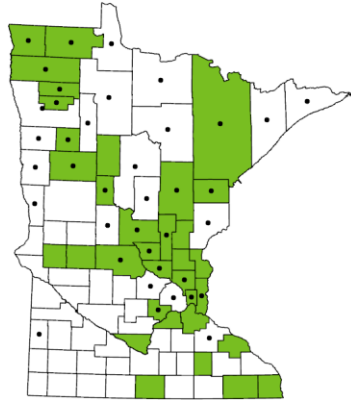
Bombus pennsylvanicus



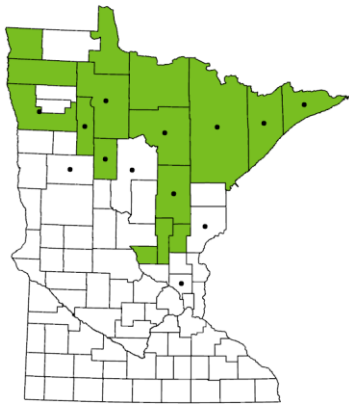
Bombus perplexus



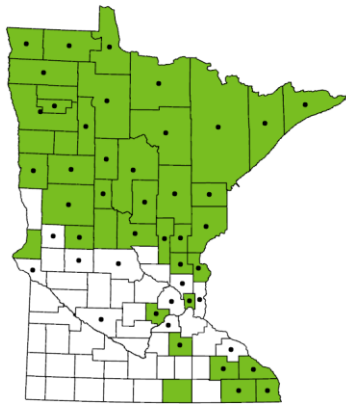
Bombus rufocinctus



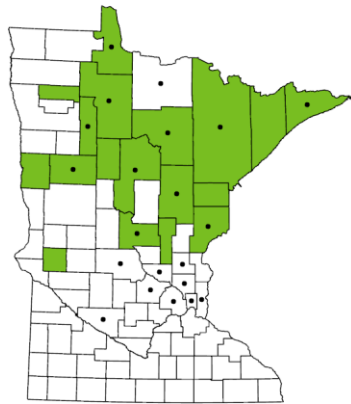
Bombus sandersoni



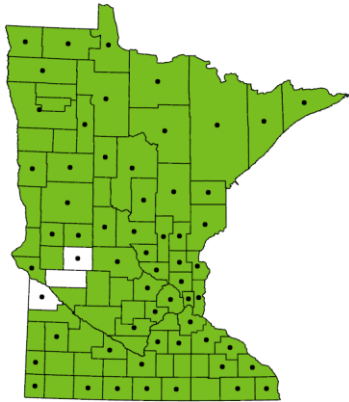
Bombus ternarius



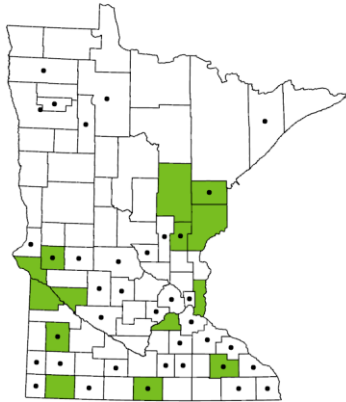
Bombus terricola



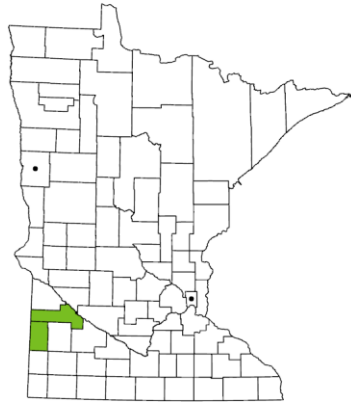
Bombus vagans



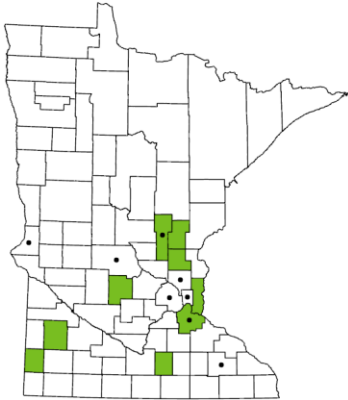
Calliopsis andreniformis



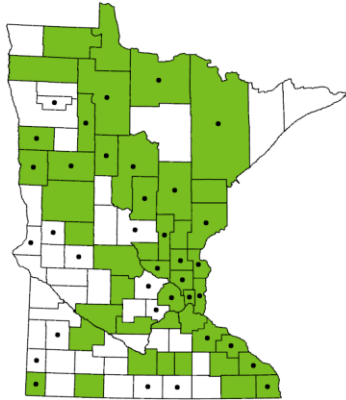
Calliopsis coloradensis



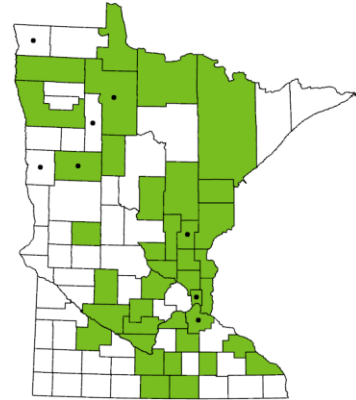
Calliopsis nebraskensis



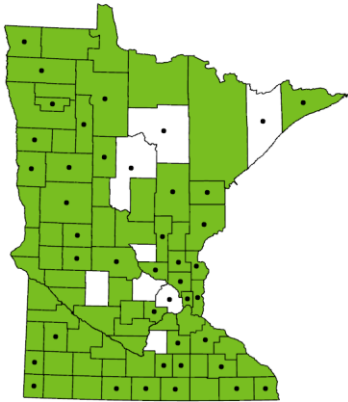
Ceratina calcarata



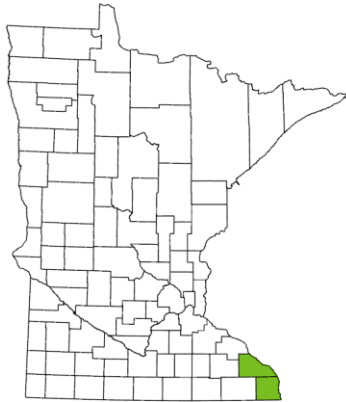
Ceratina dupla



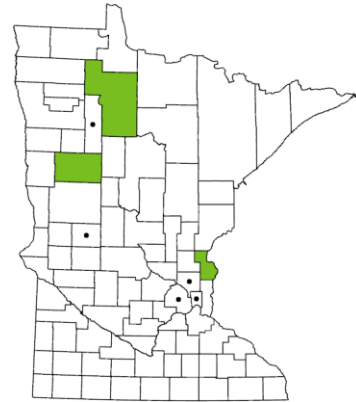
Ceratina mikmaqi



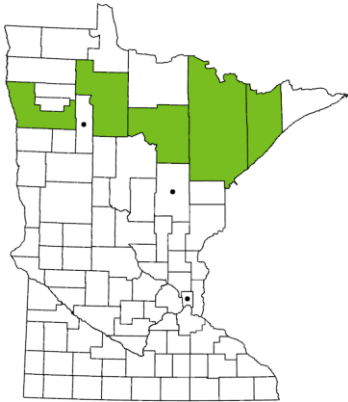
Ceratina strenua



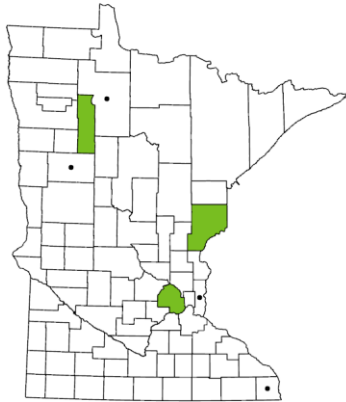
Coelioxys alternatus



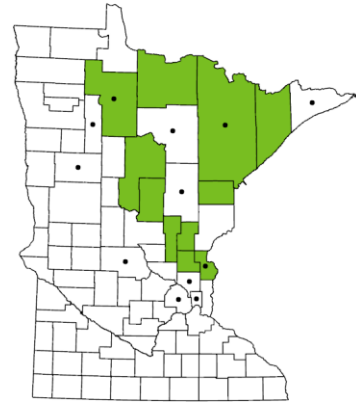
Coelioxys funerarius



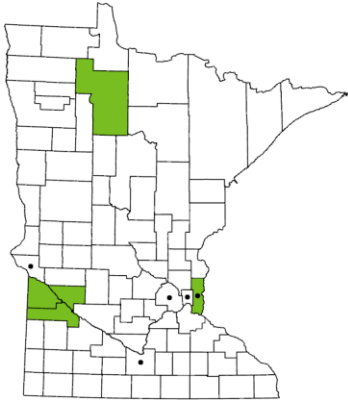
Coelioxys modestus



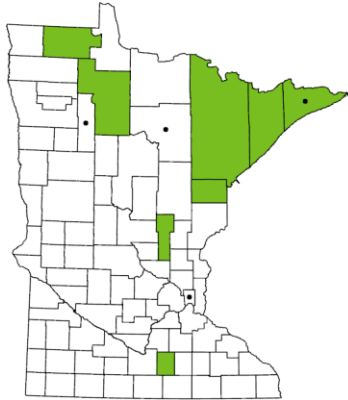
Coelioxys moestus



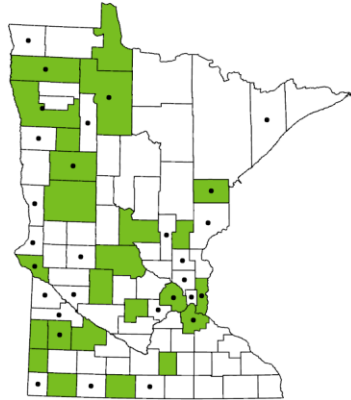
Coelioxys octodentatus



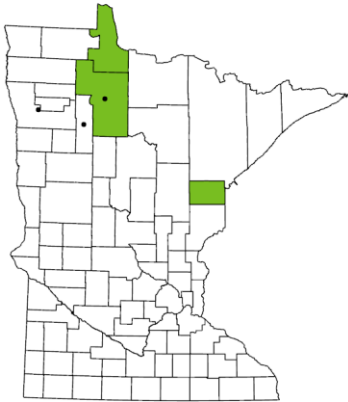
Coelioxys porterae



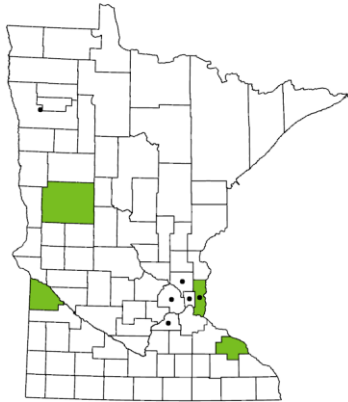
Coelioxys rufitarsis



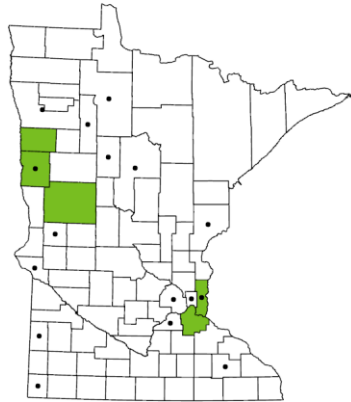
Coelioxys sodalis



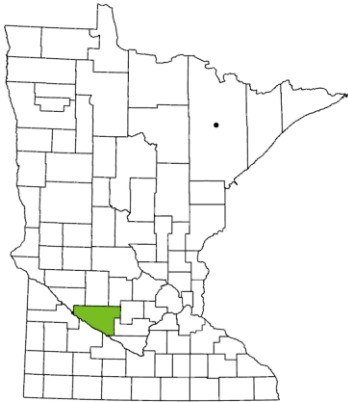
Colletes aberrans



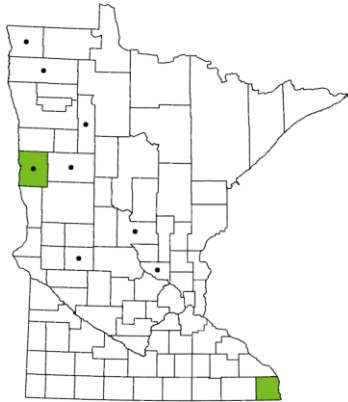
Colletes americanus



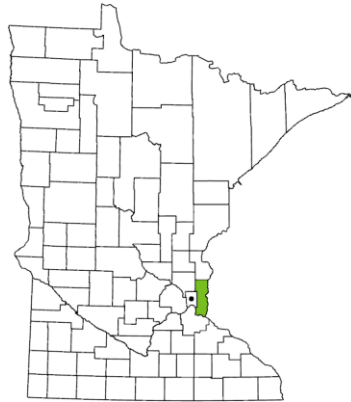
Colletes andrewsi



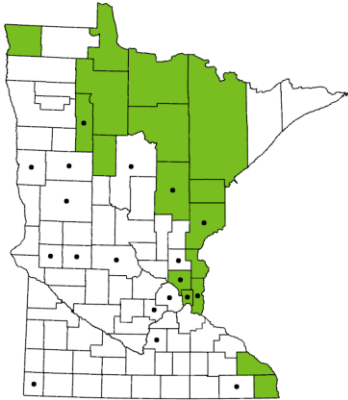
Colletes brevicornis



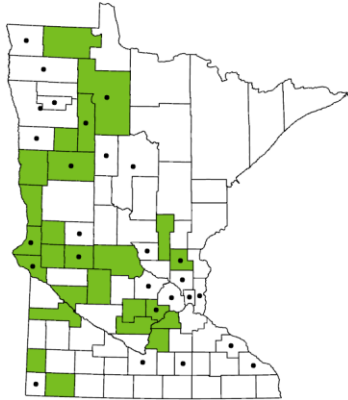
Colletes compactus



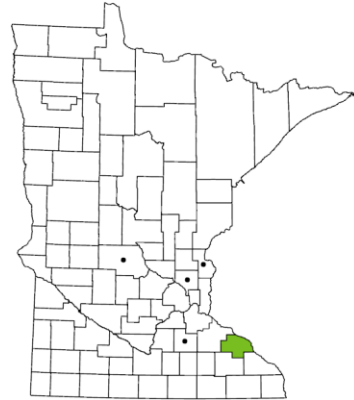
Colletes inaequalis



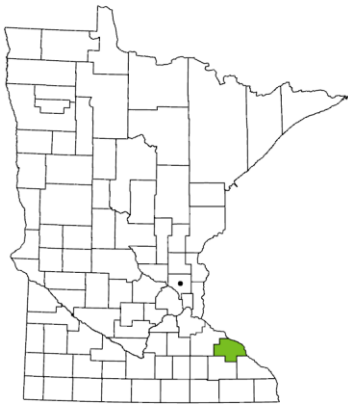
Colletes kincaidii



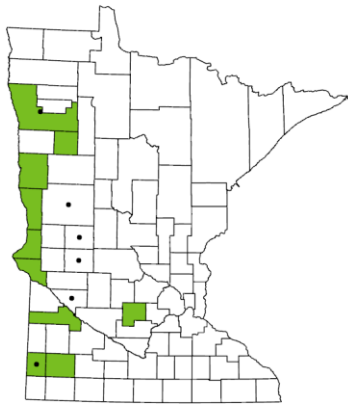
Colletes latitarsis



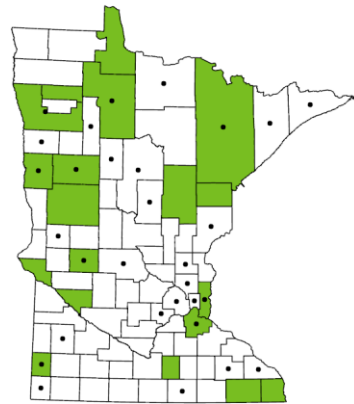
Colletes mandibularis



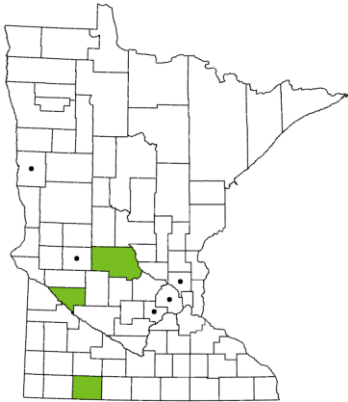
Colletes robertsonii



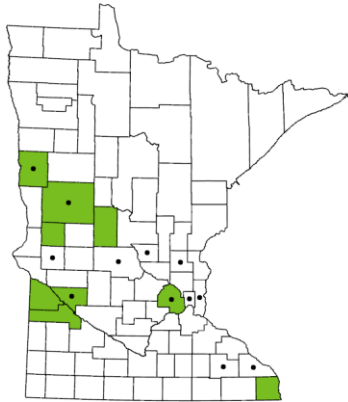
Colletes simulans



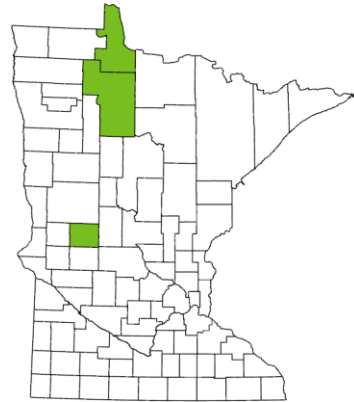
Colletes solidaginis



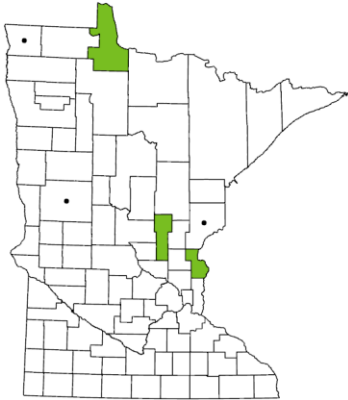
Colletes susannae



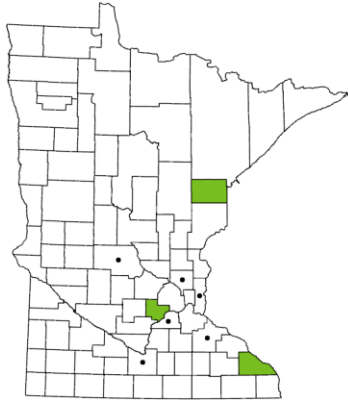
Dianthidium pudicum



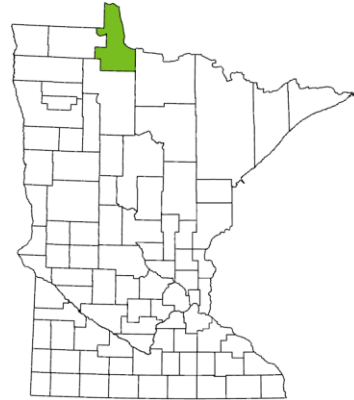
Dianthidium simile



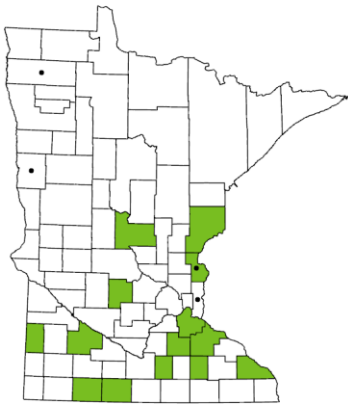
Dieunomia heteropoda



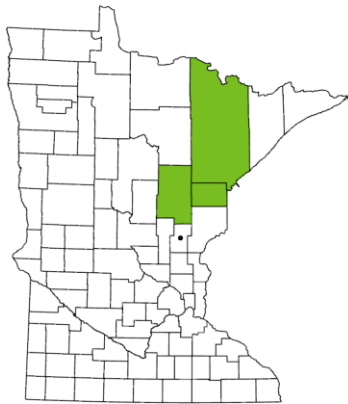
Dufourea harveyi



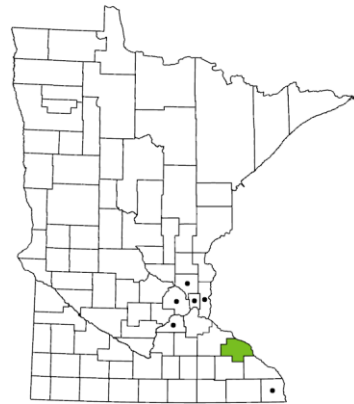
Dufourea monardae



Dufourea novaeangliae



Epeolus ainsliei



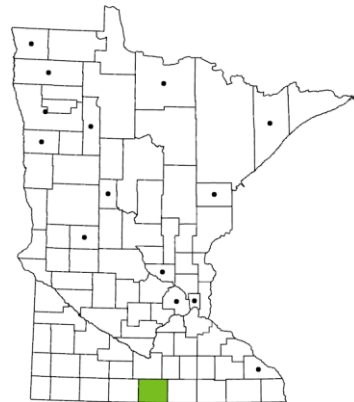
Epeolus americanus



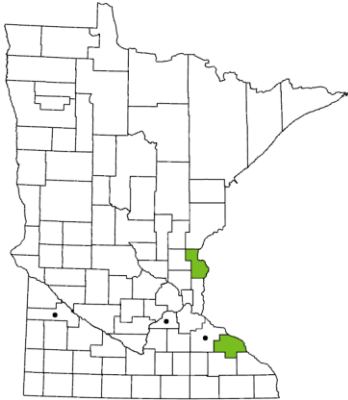
Epeolus lectoides



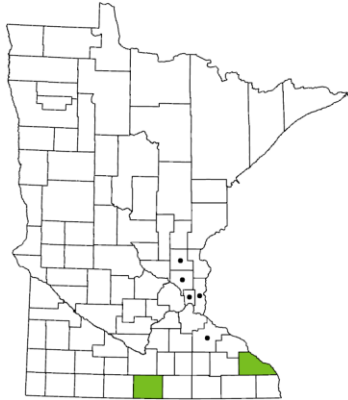
Epeolus minimus



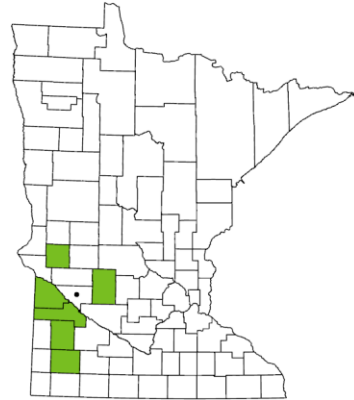
Epeolus pusillus



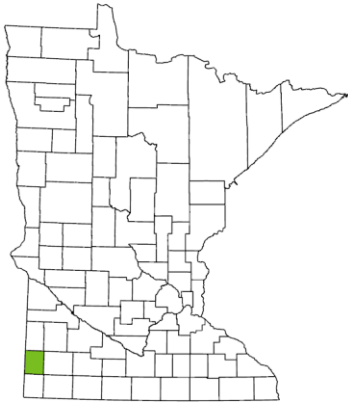
Epeolus scutellaris



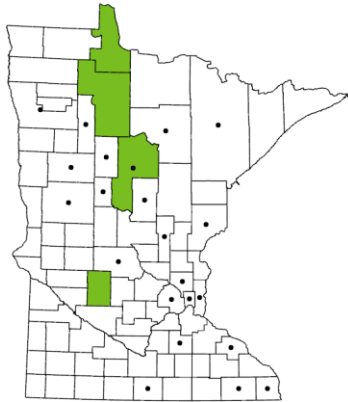
Eucera albata



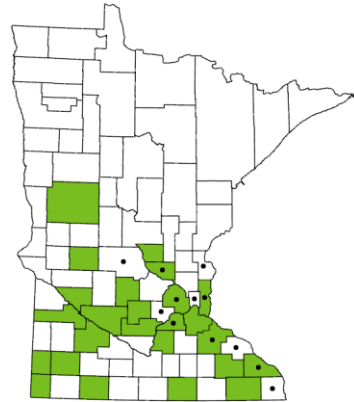
Eucera aragalli



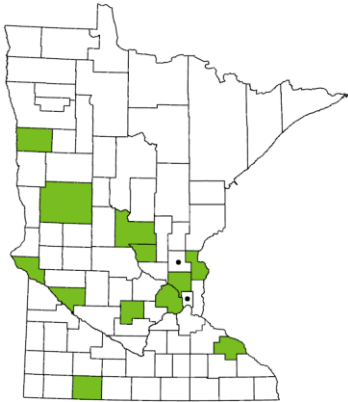
Eucera atriventris



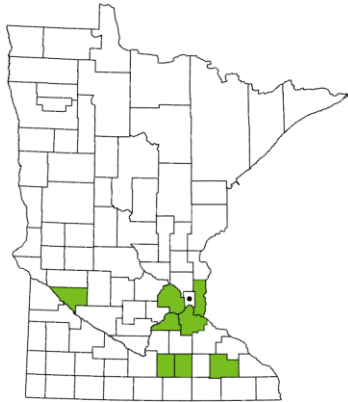
Eucera hamata



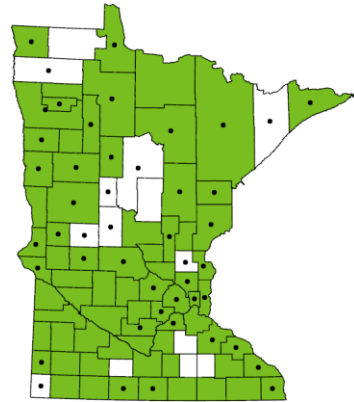
Eucera kansensis



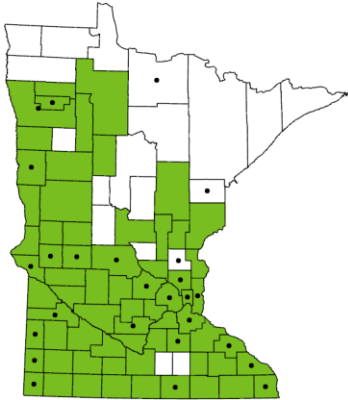
Eucera pruinosa



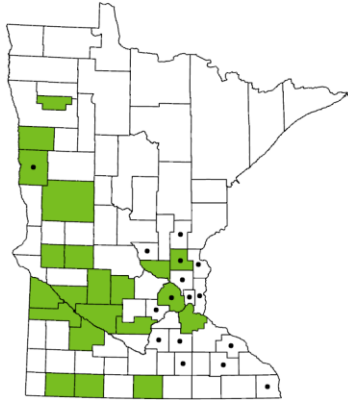
Halictus confusus



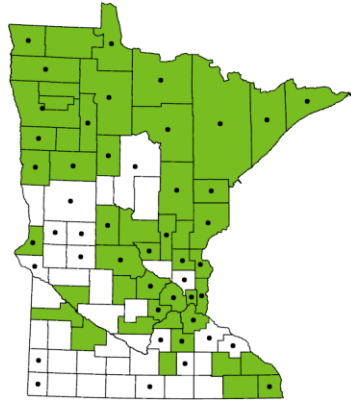
*Halictus
ligatus*



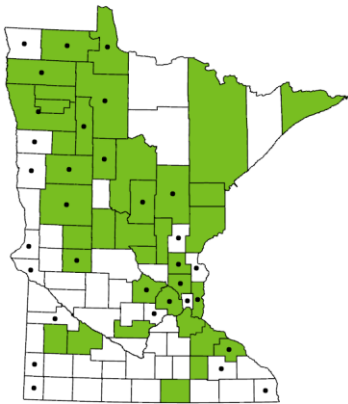
*Halictus
parallelus*



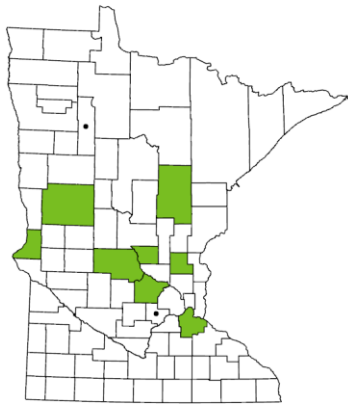
*Halictus
rubicundus*



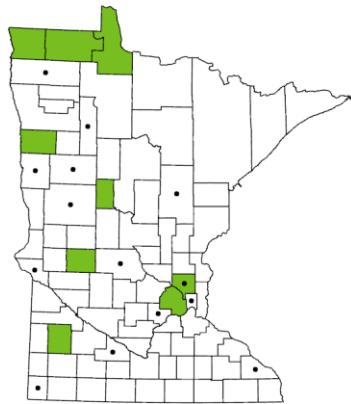
*Heriades
carinata*



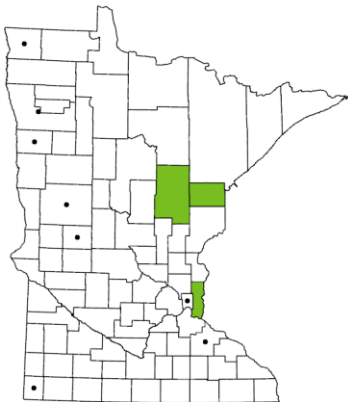
*Heriades
leavitti*



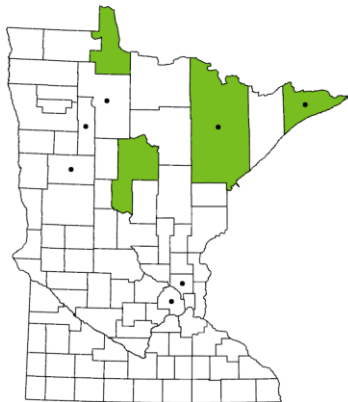
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variolosa*



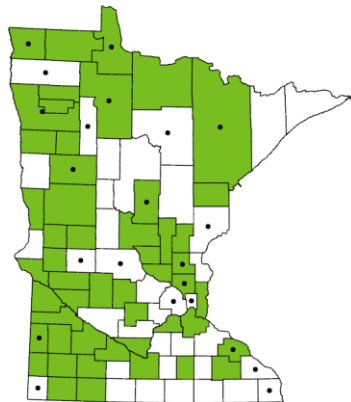
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calliopsidis*



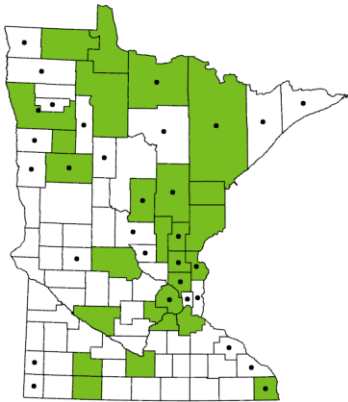
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albifrons*



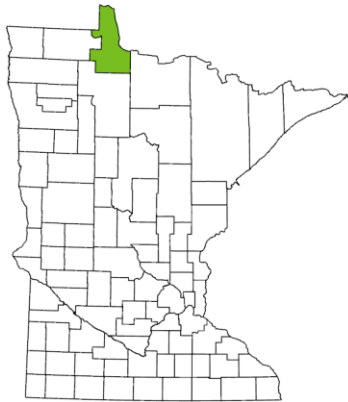
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pilosifrons*



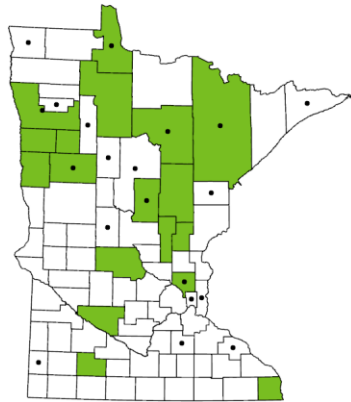
Hoplitis producta



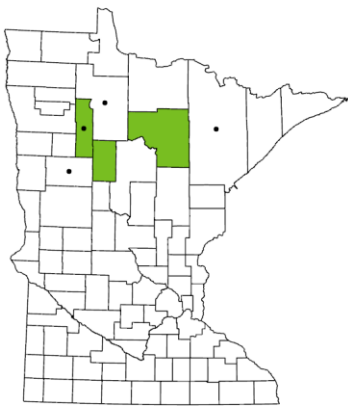
Hoplitis producta complex



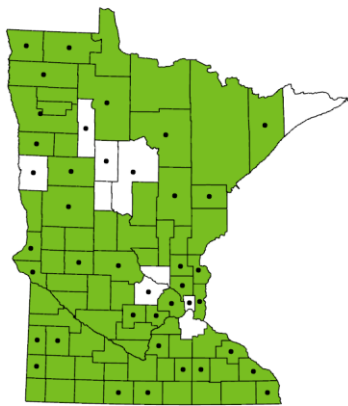
Hoplitis spoliata



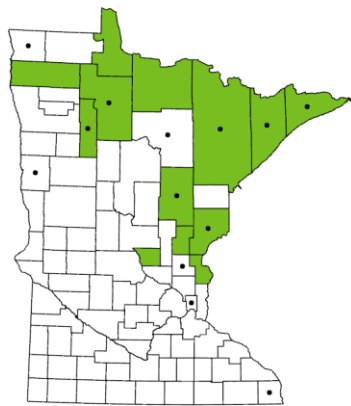
Hoplitis truncata



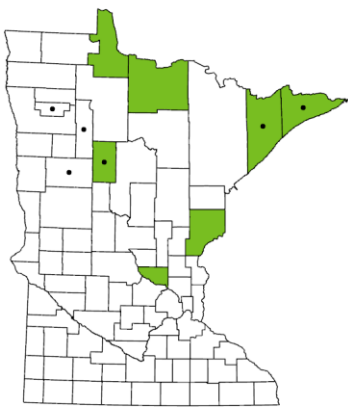
Hylaeus affinis



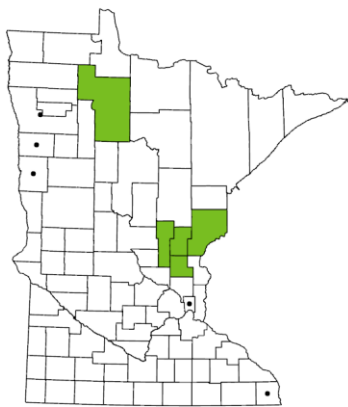
Hylaeus annulatus



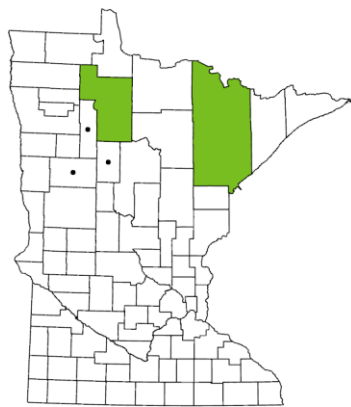
Hylaeus basalis



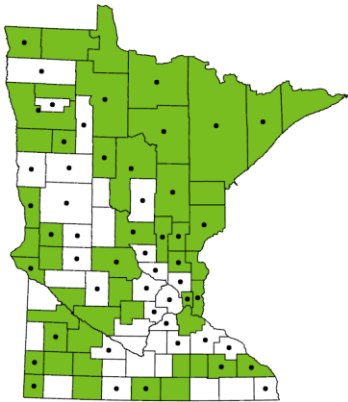
Hylaeus fedorica



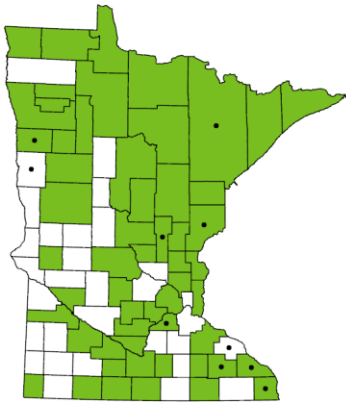
Hylaeus floridanus



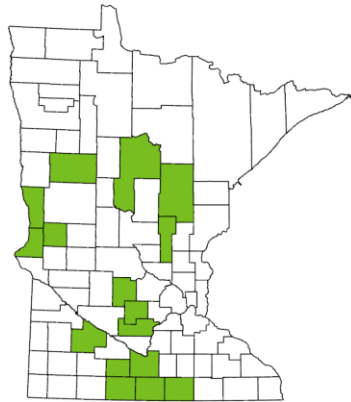
Hylaeus mesillae group



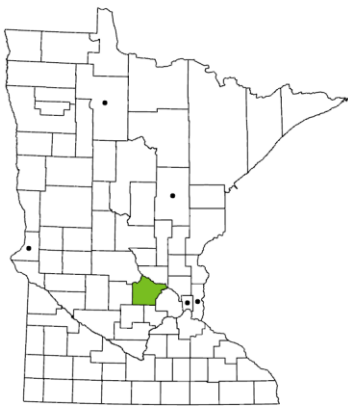
Hylaeus modestus group



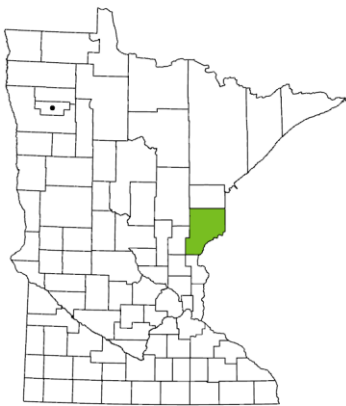
Hylaeus nelumbonis



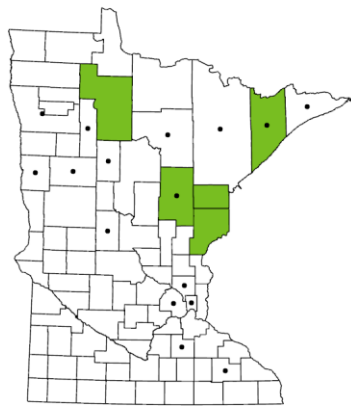
Hylaeus saniculae



Hylaeus sparsus



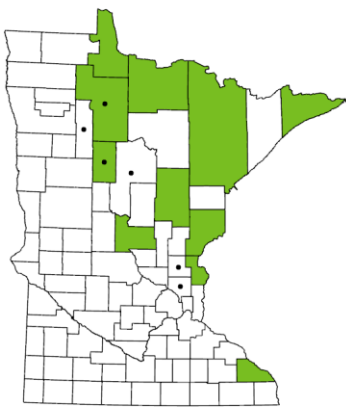
Hylaeus verticalis



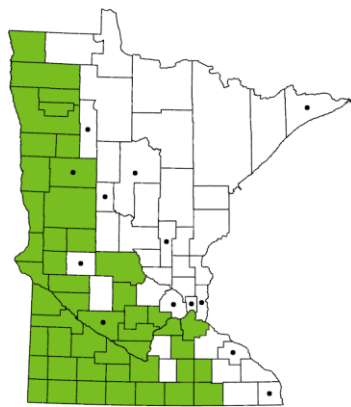
Lasioglossum achilleae



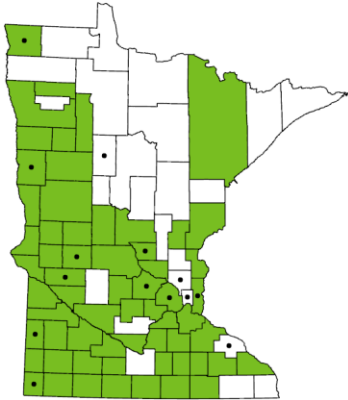
Lasioglossum acuminatum



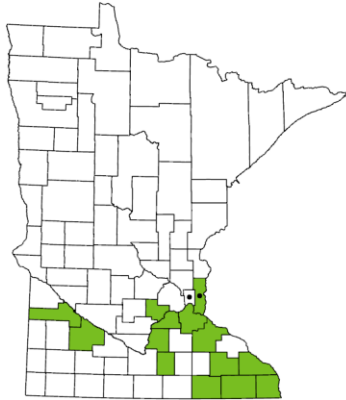
Lasioglossum admirandum



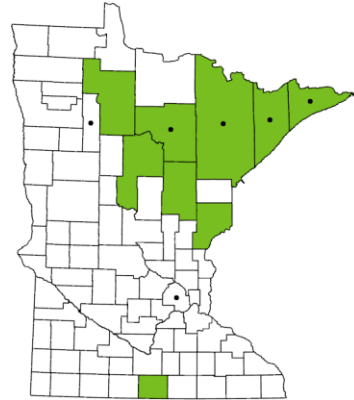
Lasioglossum albipenne



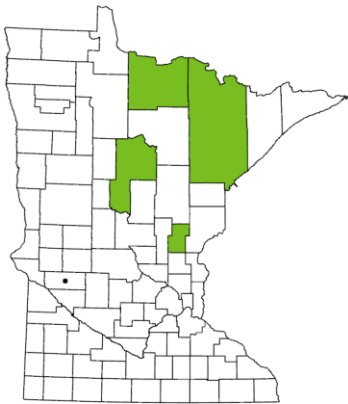
Lasioglossum anomalum



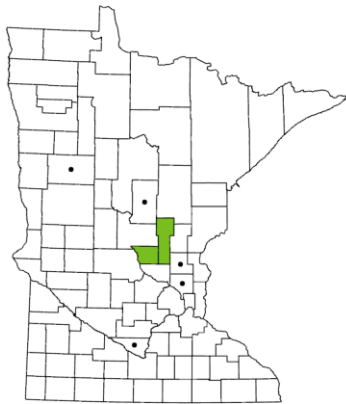
Lasioglossum athabascense



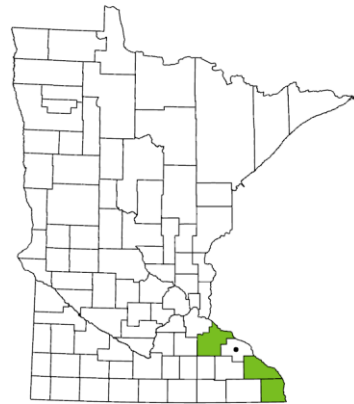
Lasioglossum atwoodi



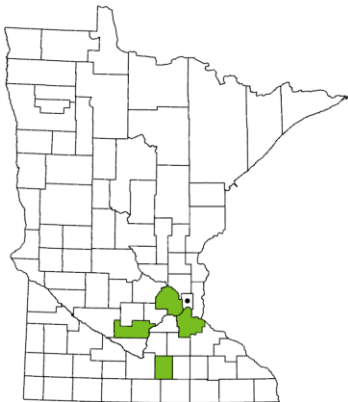
Lasioglossum birkmanni



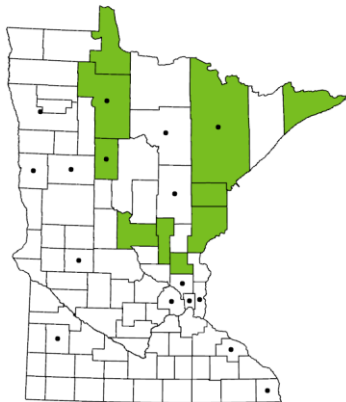
Lasioglossum bruneri



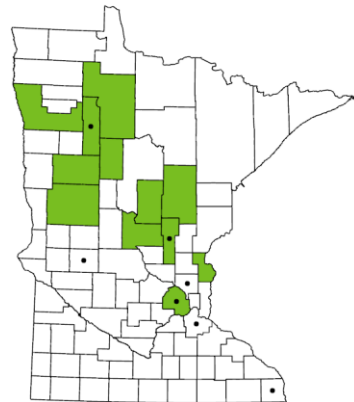
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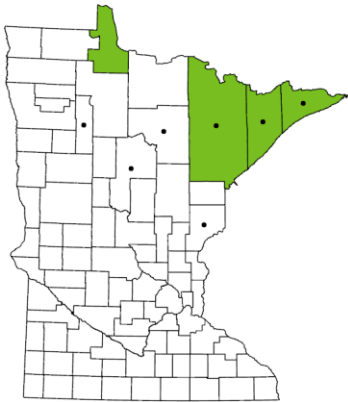
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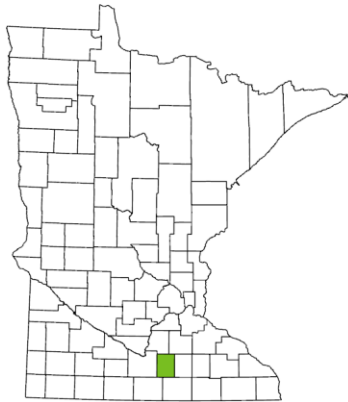
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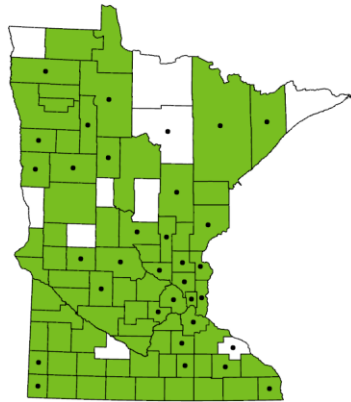
Lasioglossum comagenense



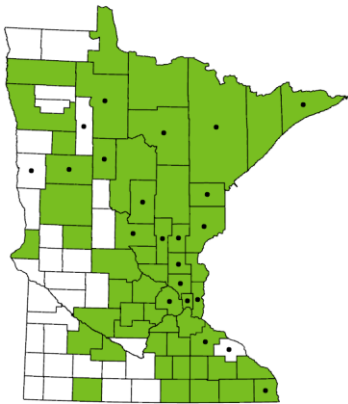
Lasioglossum coreopsis



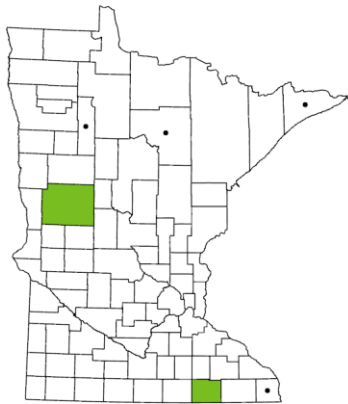
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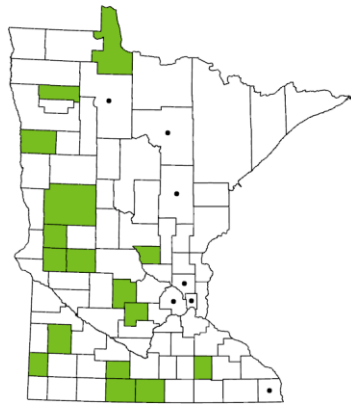
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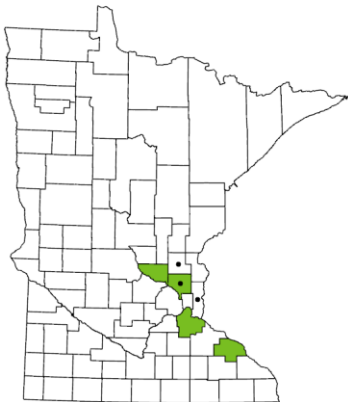
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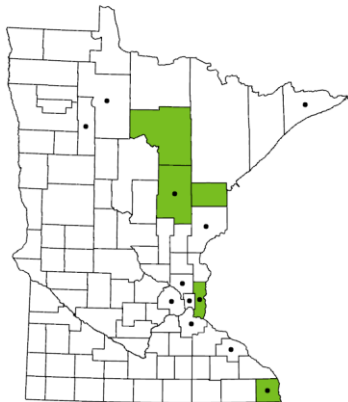
Lasioglossum ephialtum



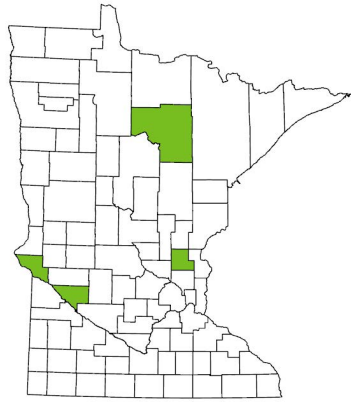
Lasioglossum floridanum



Lasioglossum foxii



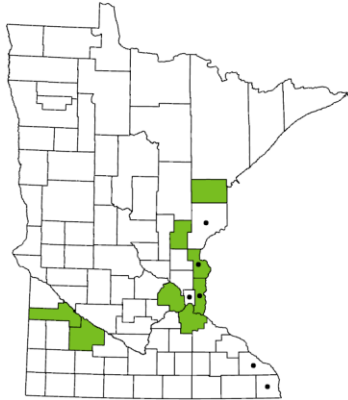
Lasioglossum n. sp. 1



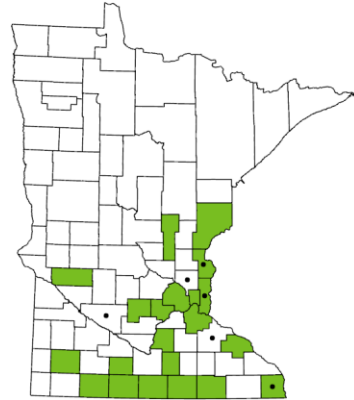
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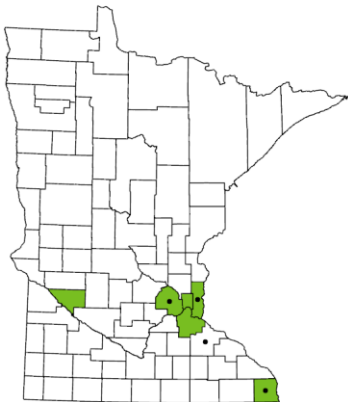
Lasioglossum heterognathus



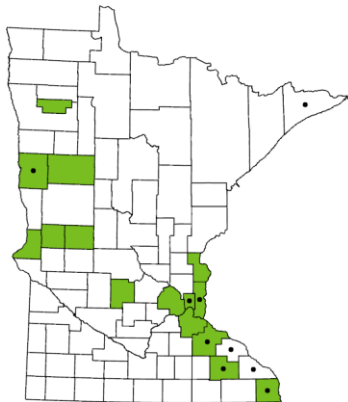
Lasioglossum hitchensi



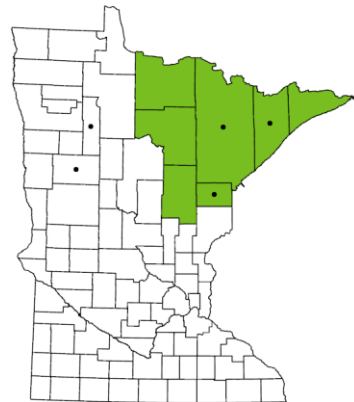
Lasioglossum illinoense



Lasioglossum imitatum



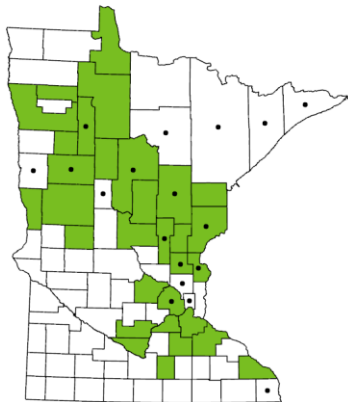
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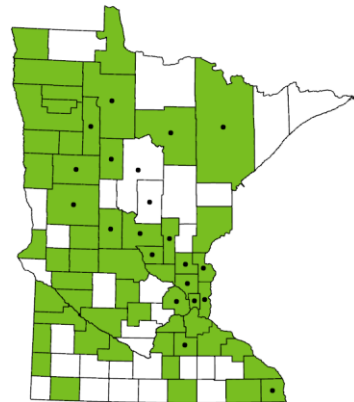
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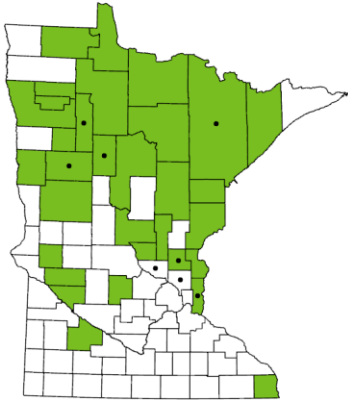
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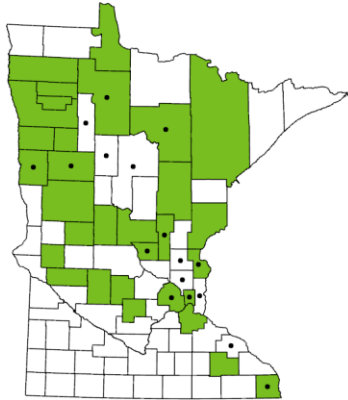
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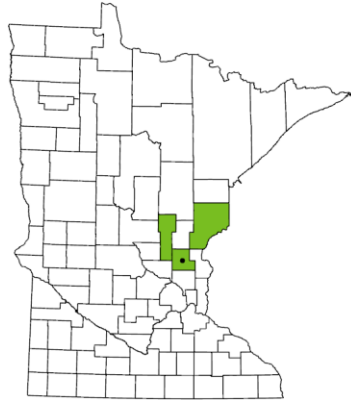
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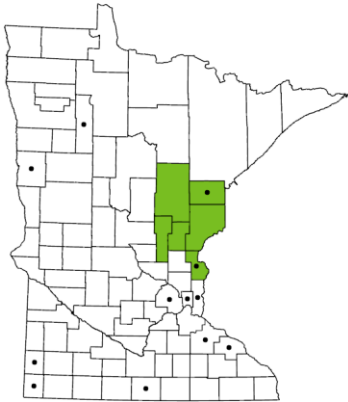
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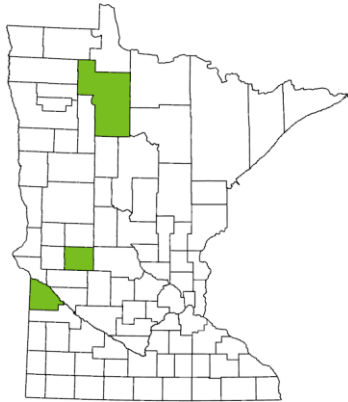
Lasioglossum lustrans



Lasioglossum macoupinense



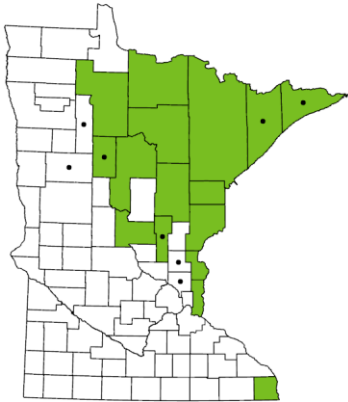
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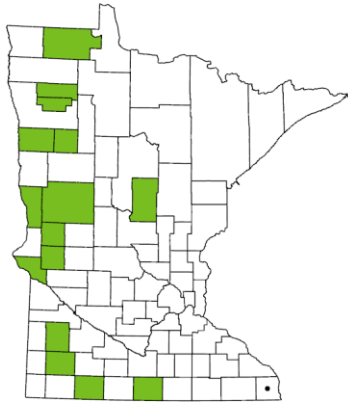
Lasioglossum nelumbonis



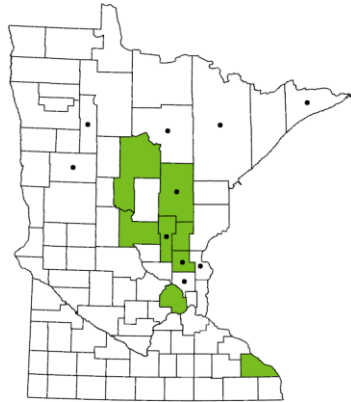
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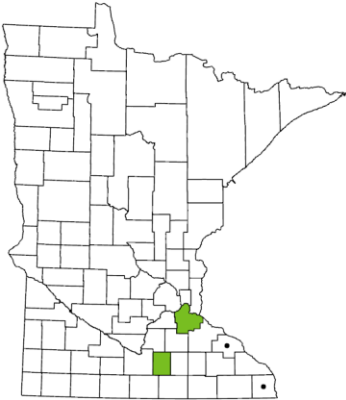
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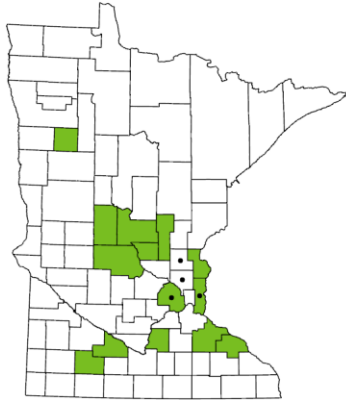
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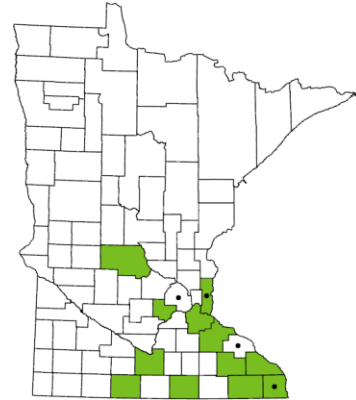
Lasioglossum
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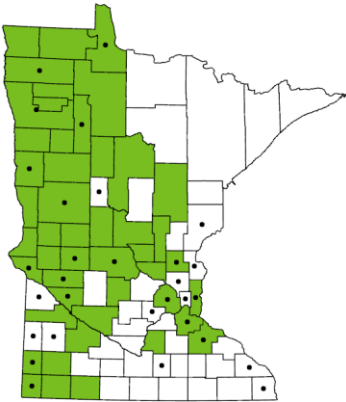
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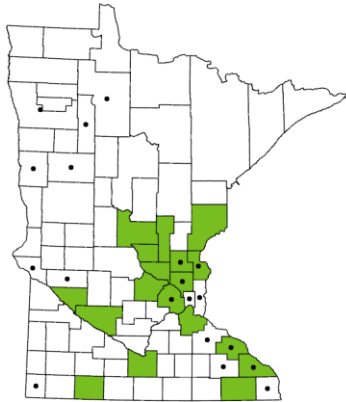
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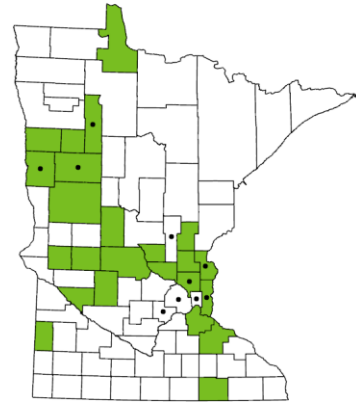
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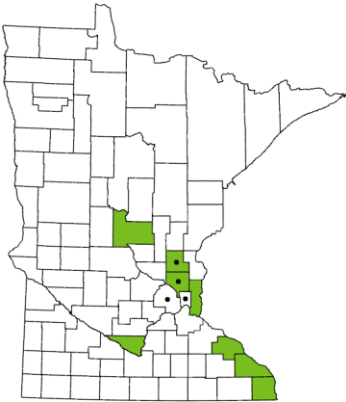
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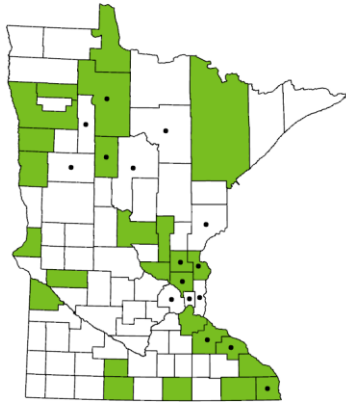
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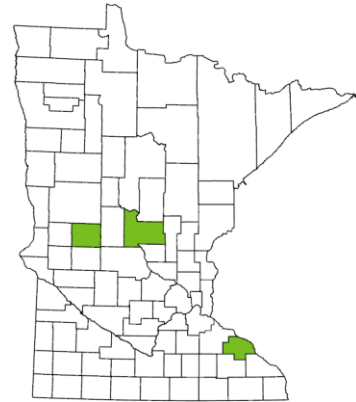
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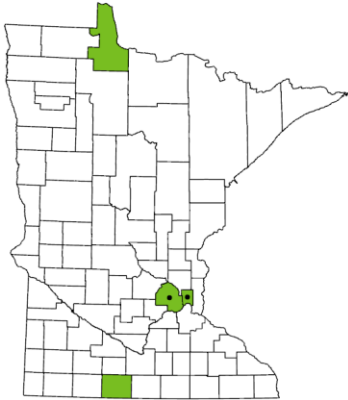
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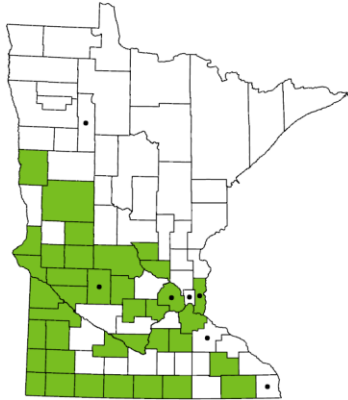
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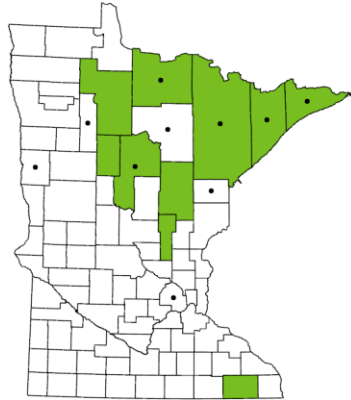
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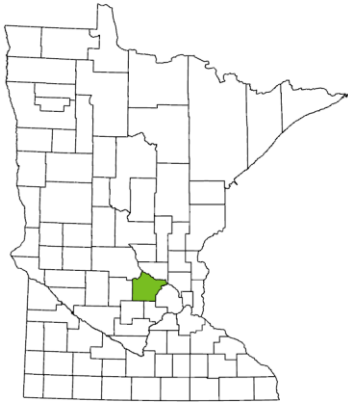
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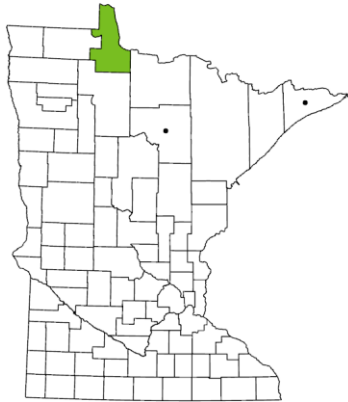
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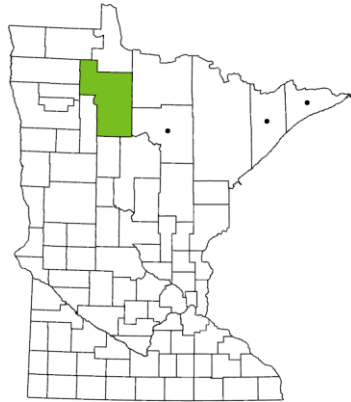
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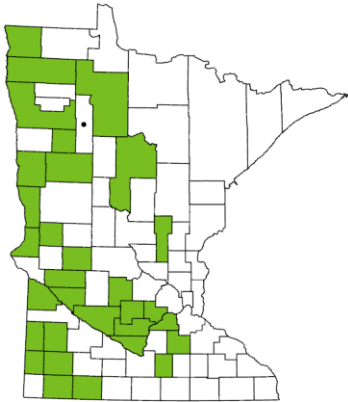
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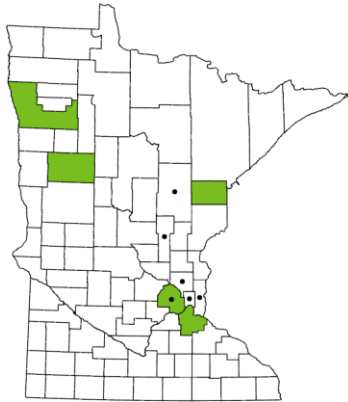
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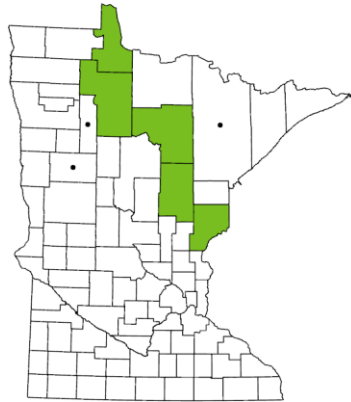
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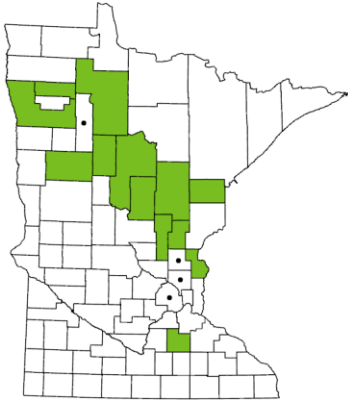
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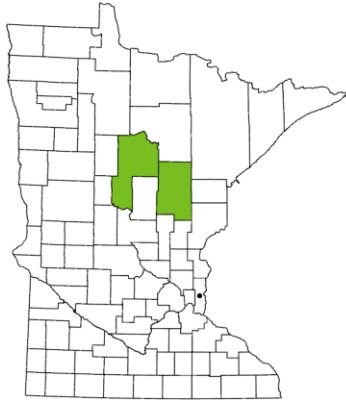
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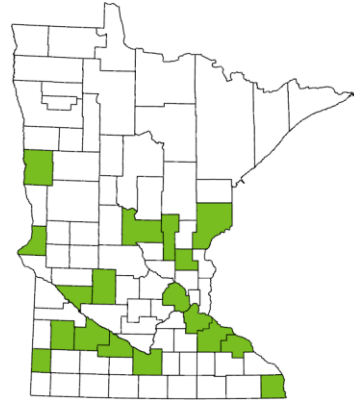
Lasioglossum subviridatum



Lasioglossum taylorae



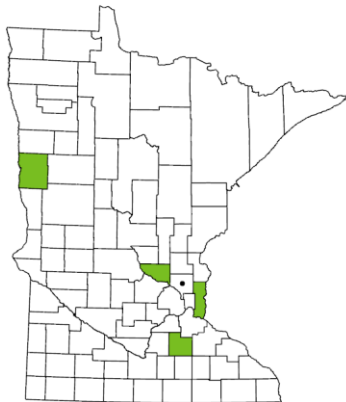
Lasioglossum tegulare group



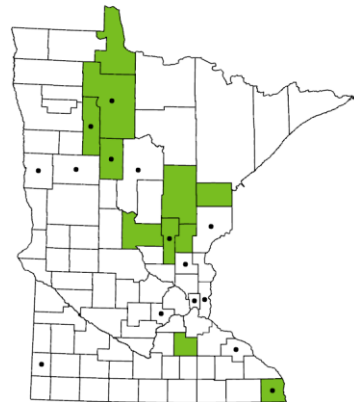
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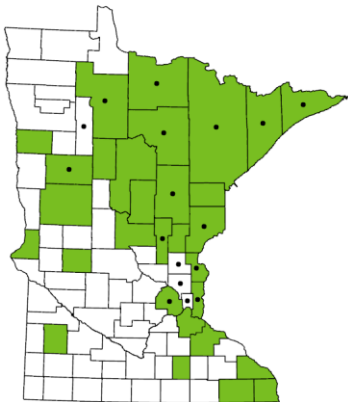
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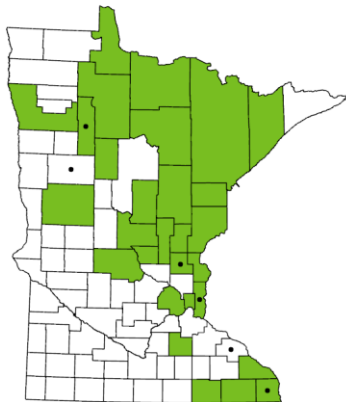
Lasioglossum truncatum



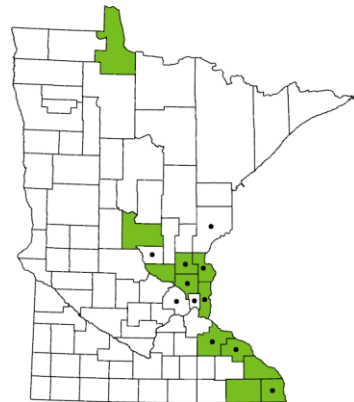
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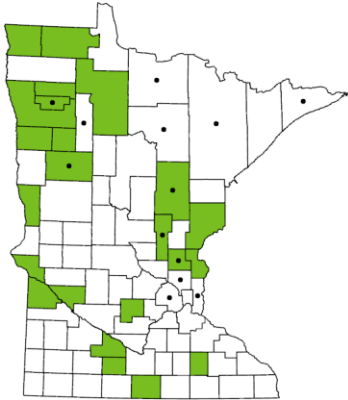
Lasioglossum versatum



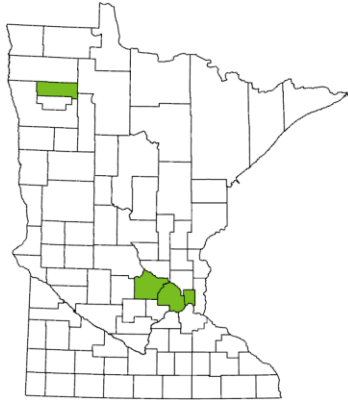
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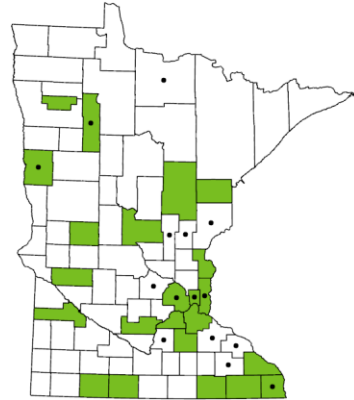
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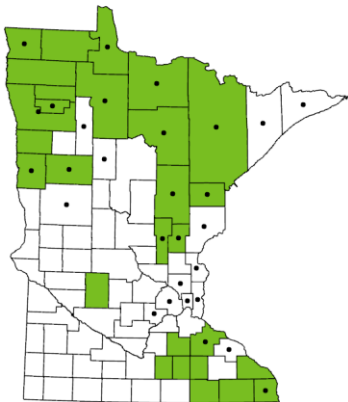
Lasioglossum weemsi



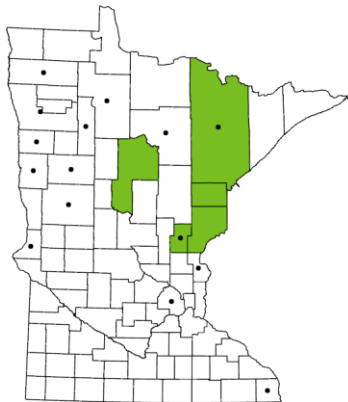
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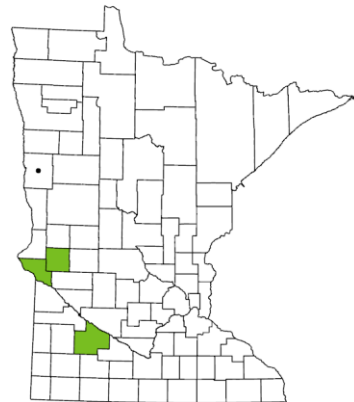
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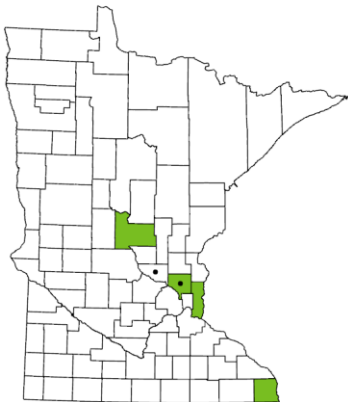
Macropis nuda



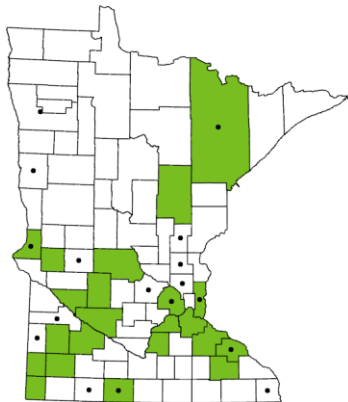
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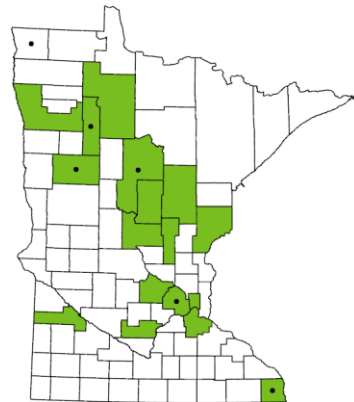
Megachile addenda



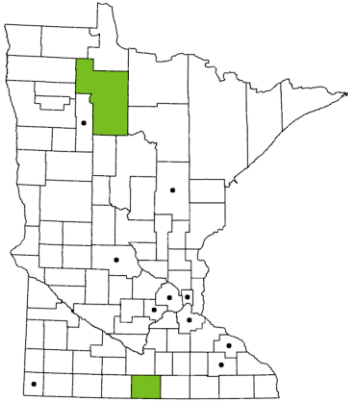
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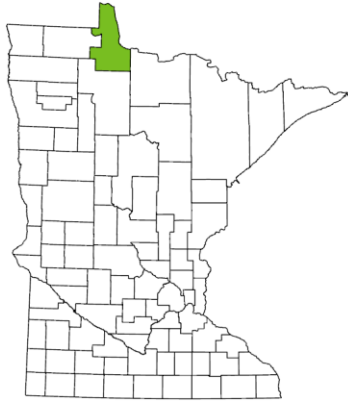
Megachile campanulae



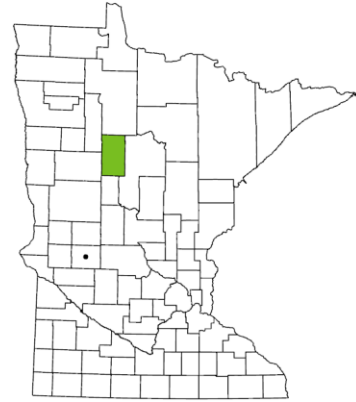
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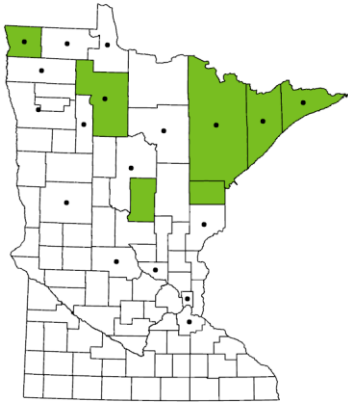
Megachile circumcincta



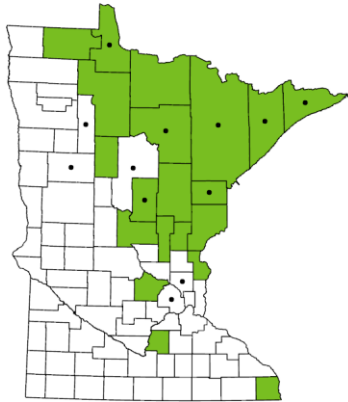
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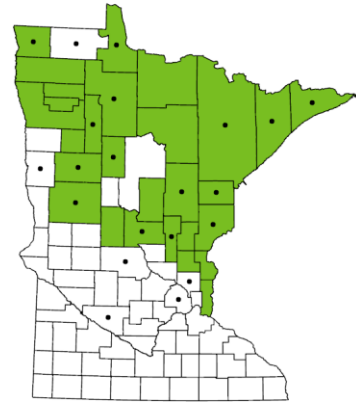
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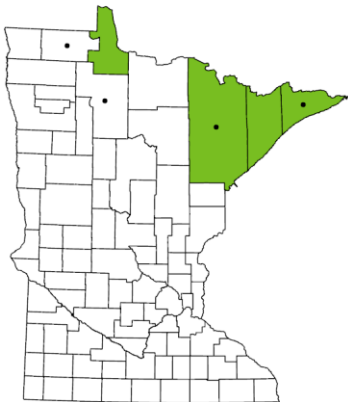
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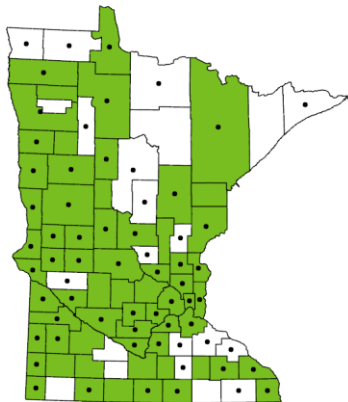
Megachile inermis



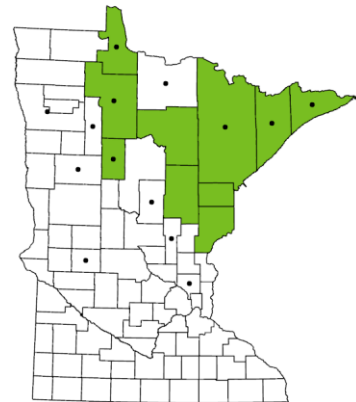
Megachile lapponica



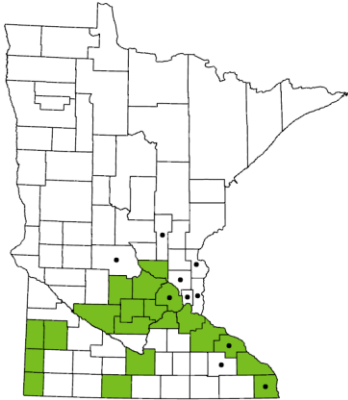
Megachile latimanus



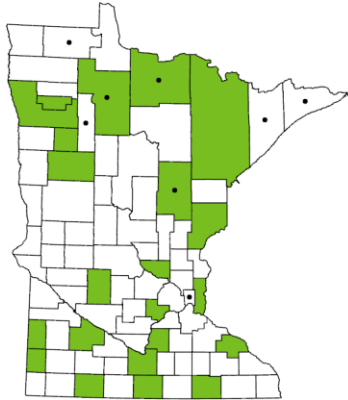
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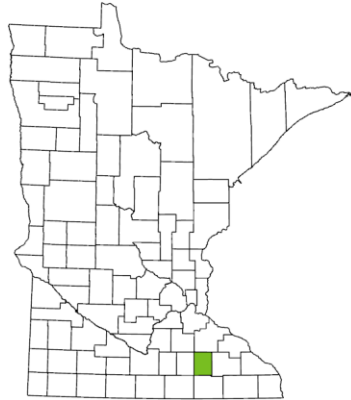
Megachile mendica



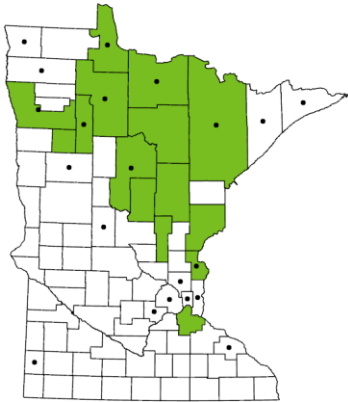
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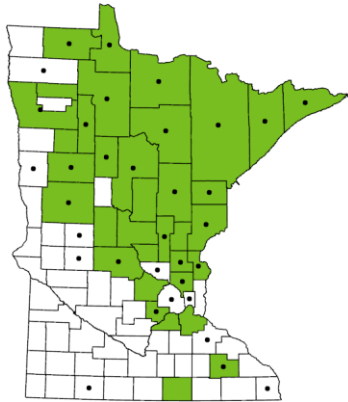
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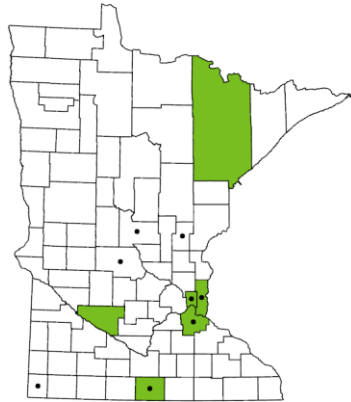
Megachile pugnata



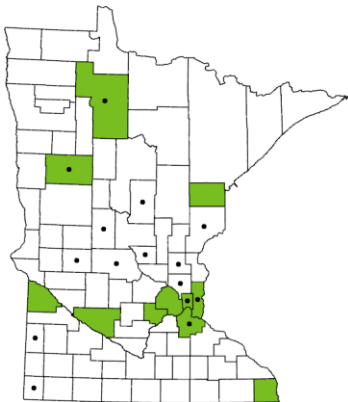
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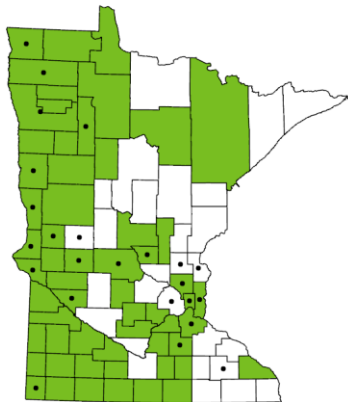
Megachile rotundata



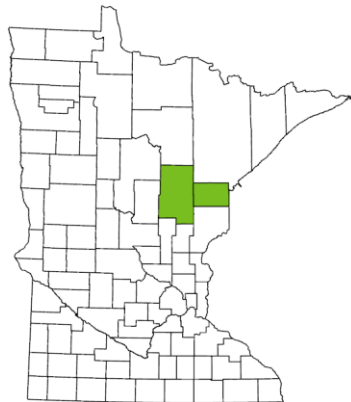
Megachile texana



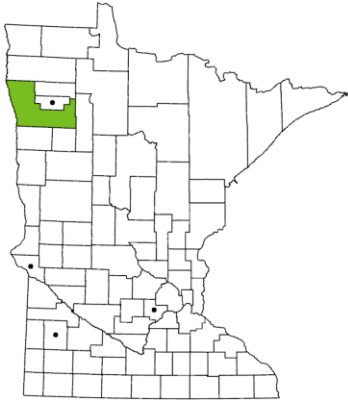
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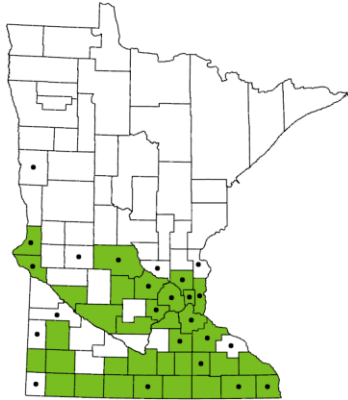
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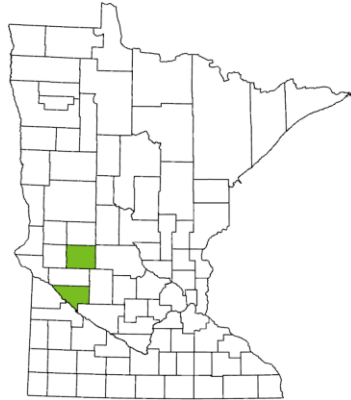
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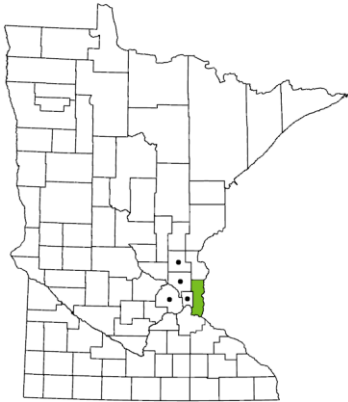
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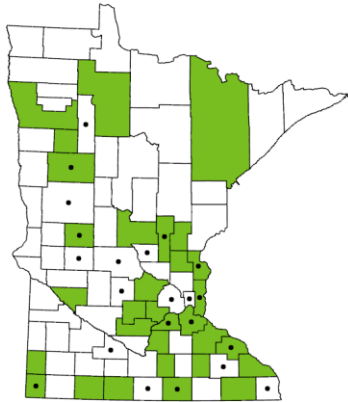
Melissodes communis



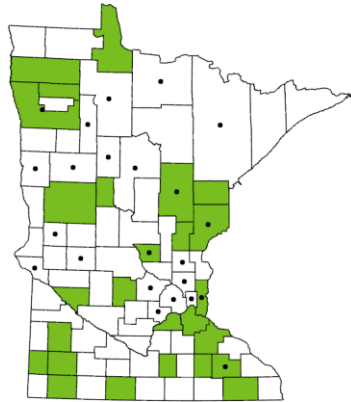
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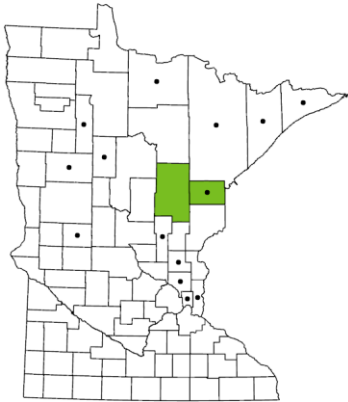
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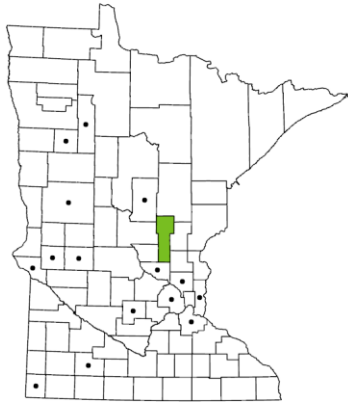
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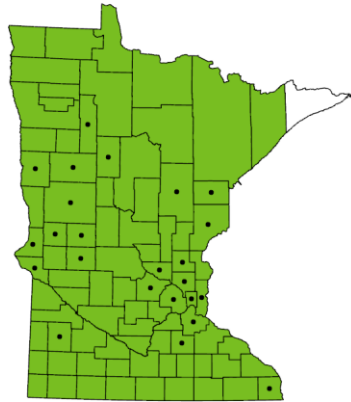
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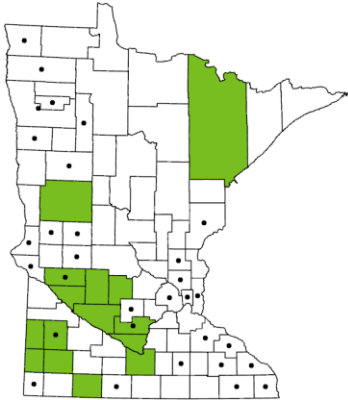
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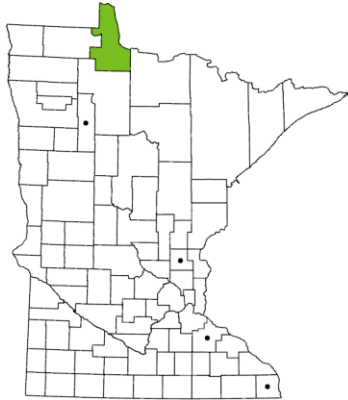
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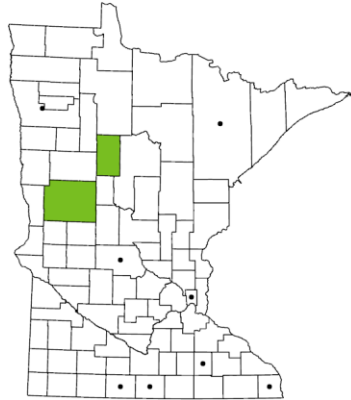
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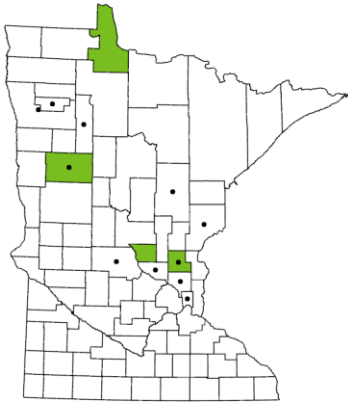
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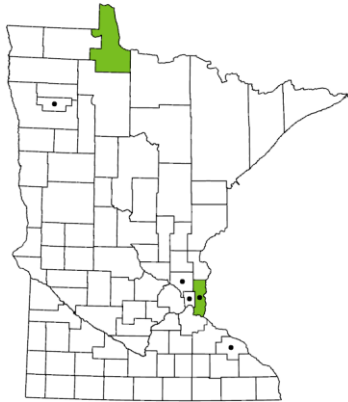
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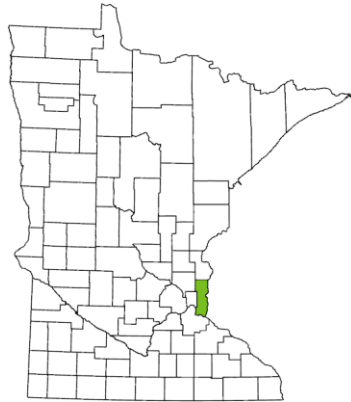
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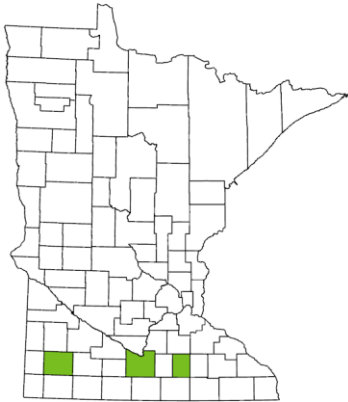
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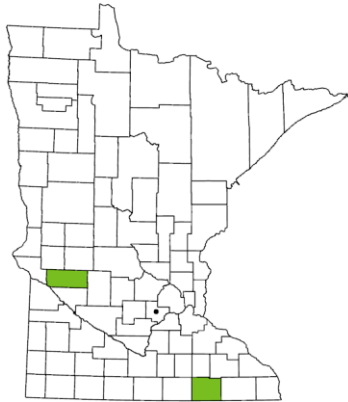
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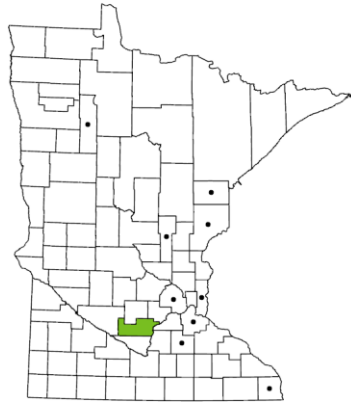
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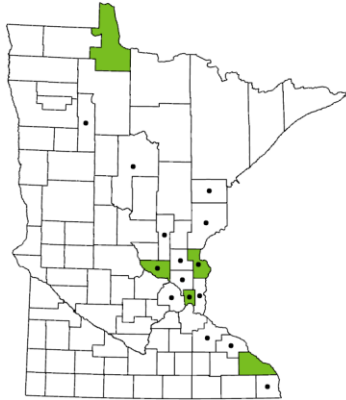
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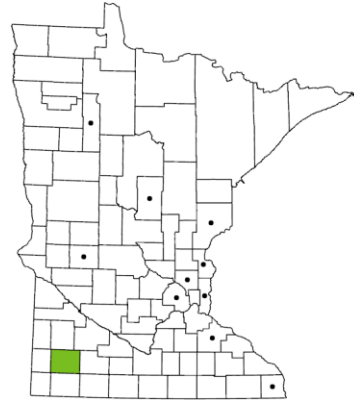
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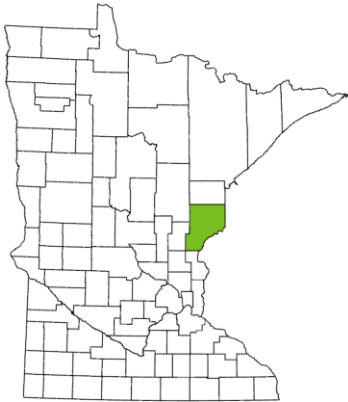
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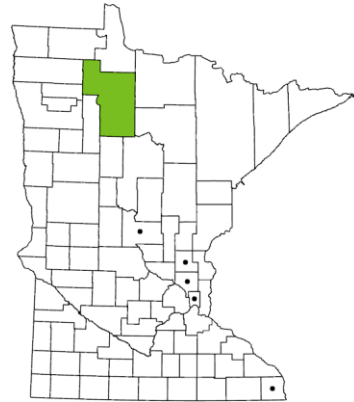
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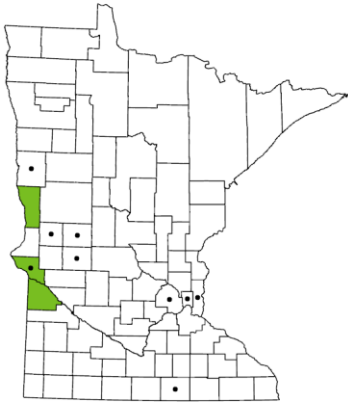
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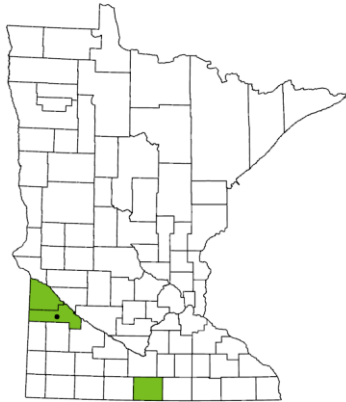
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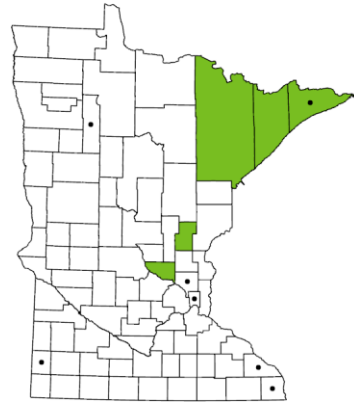
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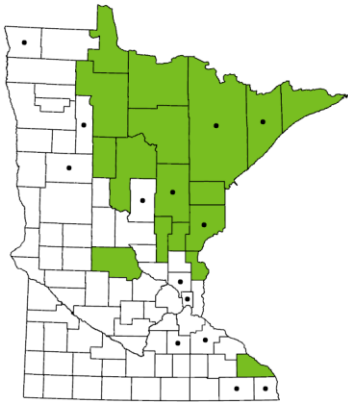
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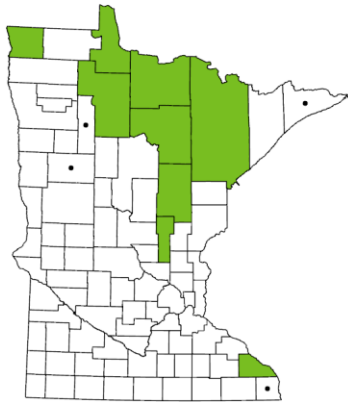
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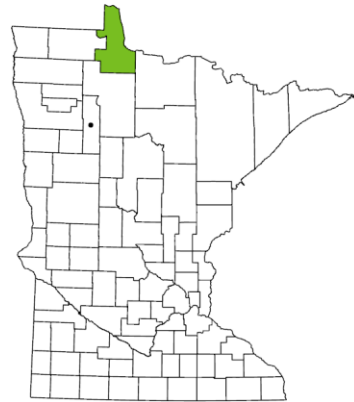
Osmia atriventris



Osmia bucephala



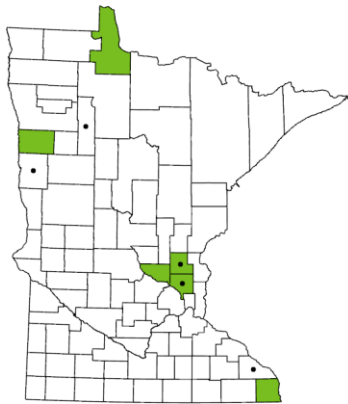
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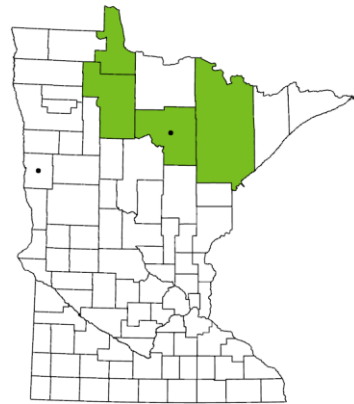
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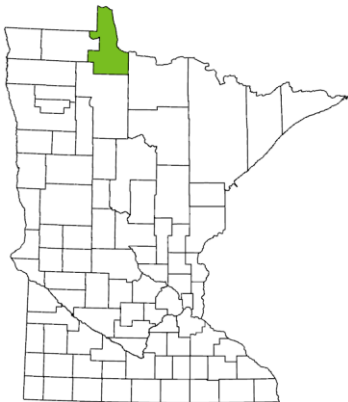
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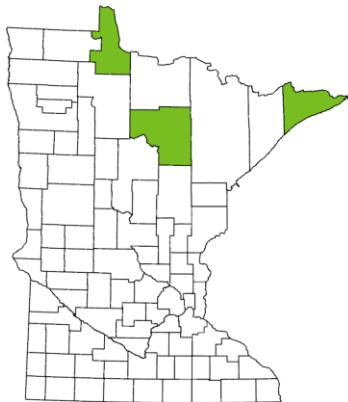
Osmia felti



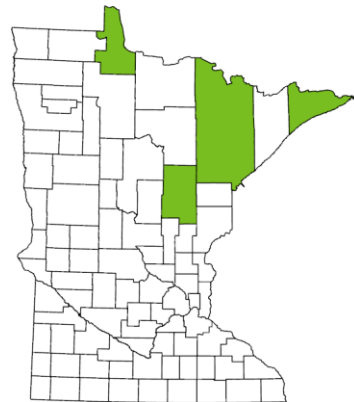
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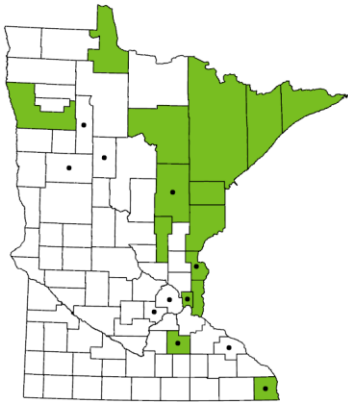
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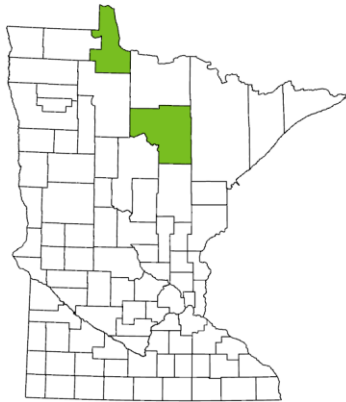
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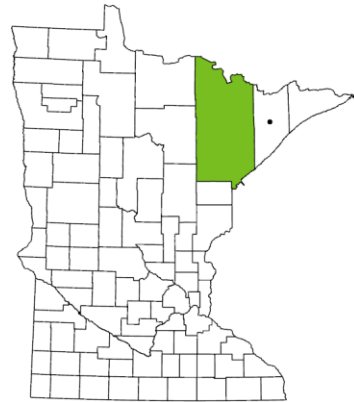
Osmia lignaria



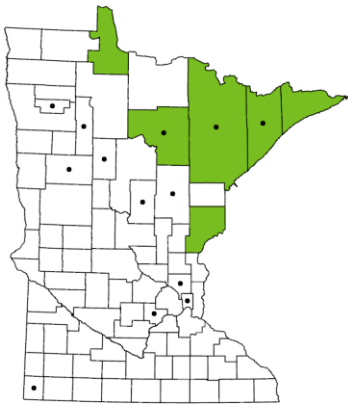
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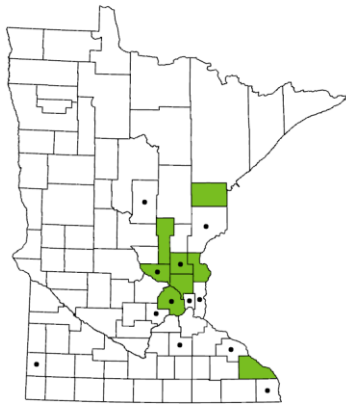
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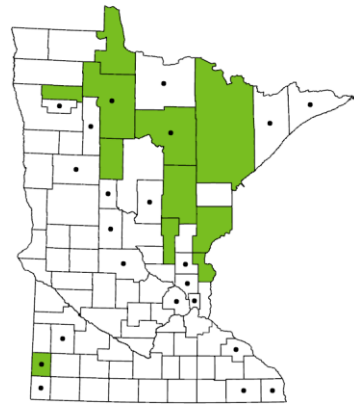
Osmia proxima



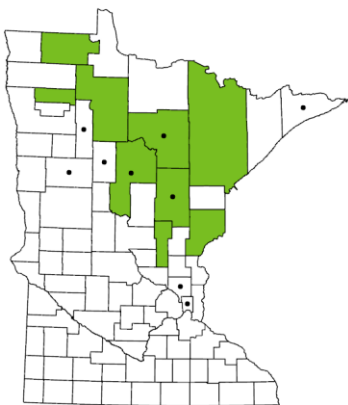
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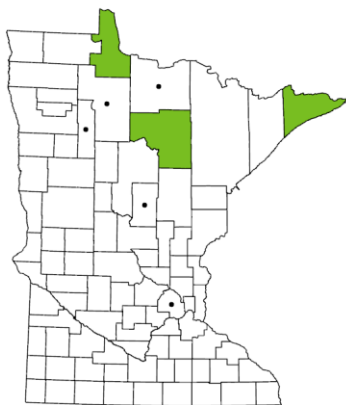
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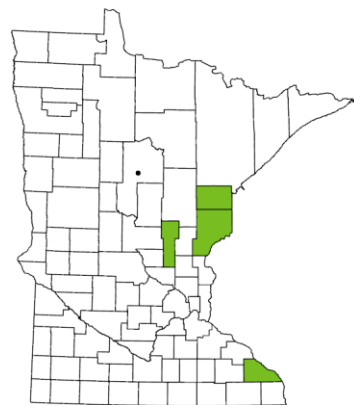
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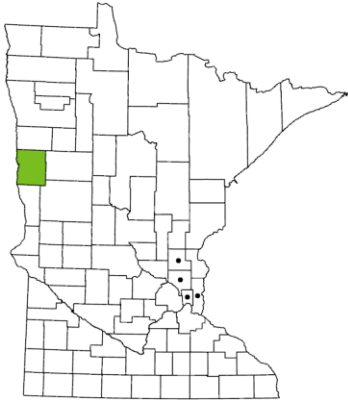
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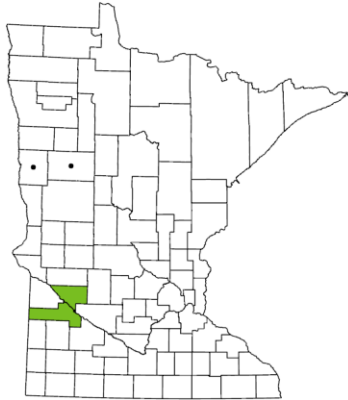
Paranthidium jugatorium



Perdita albipennis



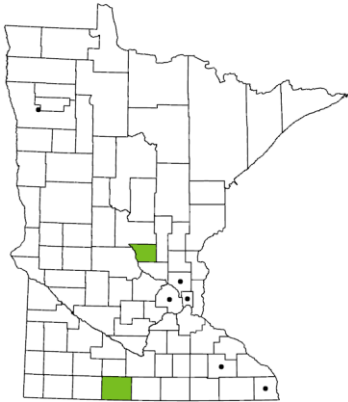
Perdita bruneri



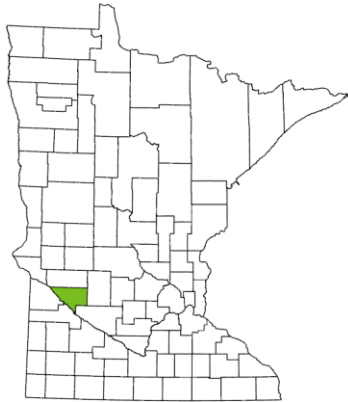
Perdita gerhardi



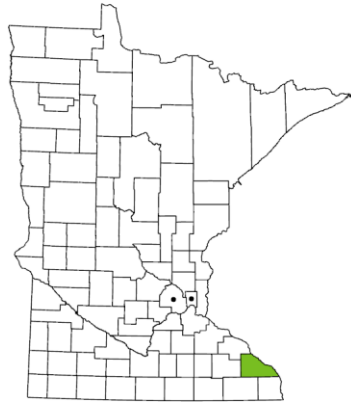
Perdita halictoides



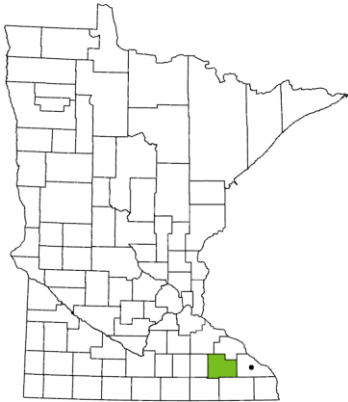
Perdita ignota



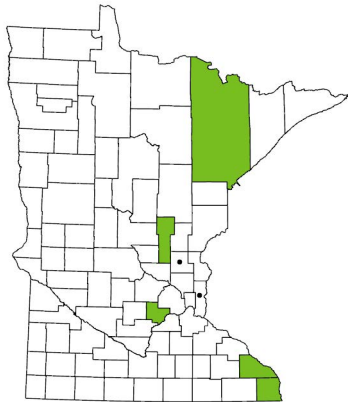
Perdita maculigera



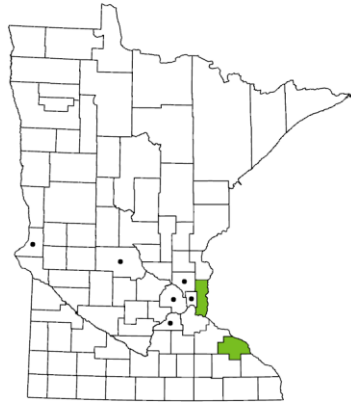
Perdita octomaculata



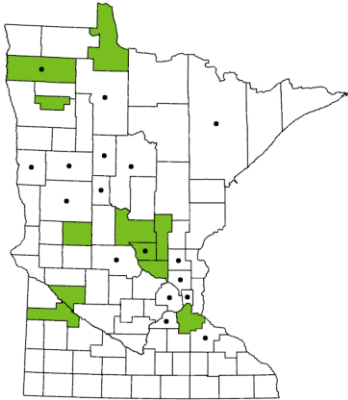
Perdita pallidipennis



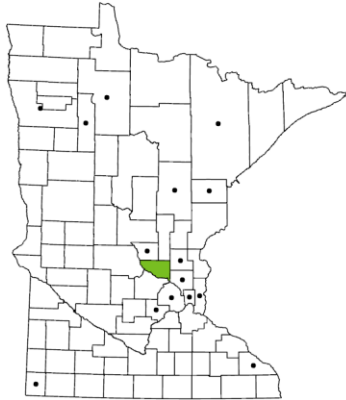
Perdita perpallida



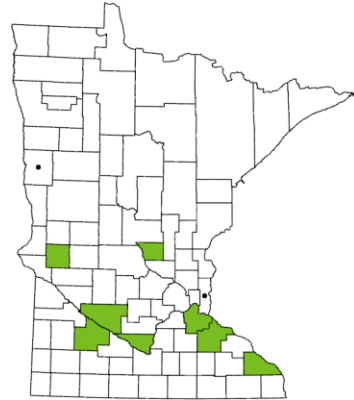
Perdita swenki



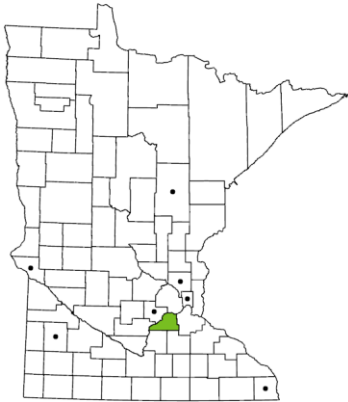
Protandrena aestivalis



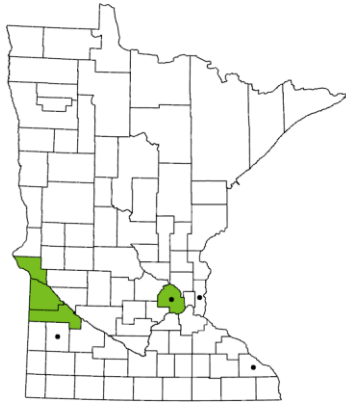
Protandrena albitarsis



Protandrena andrenoides



Protandrena bancrofti



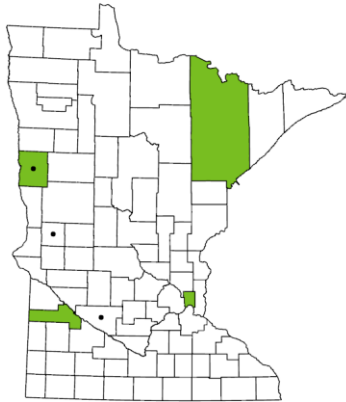
Protandrena labrosa



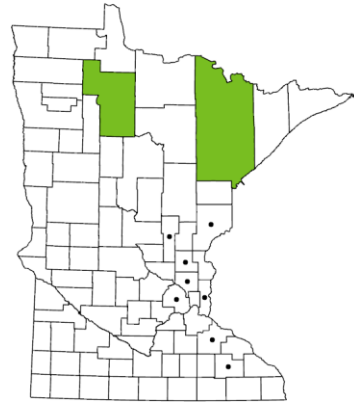
Protandrena renimaculata



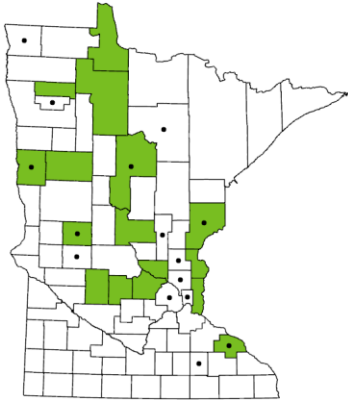
Protandrena simulans



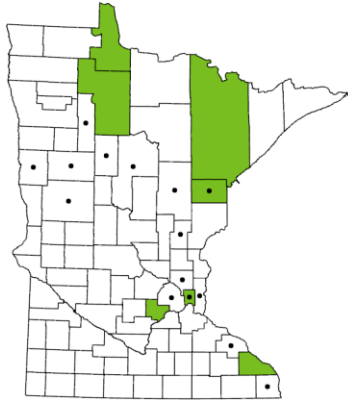
Sphecodes confertus



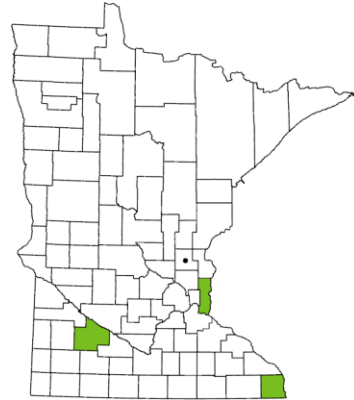
Sphecodes davisii



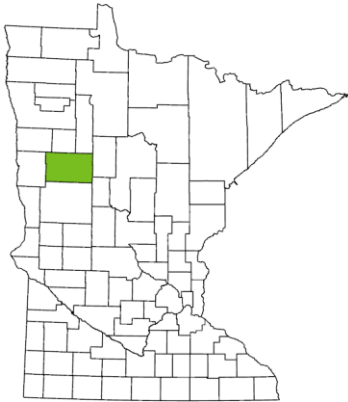
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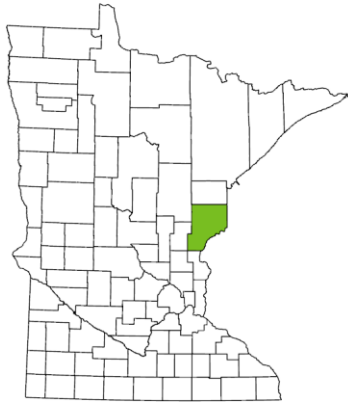
Sphecodes heraclei



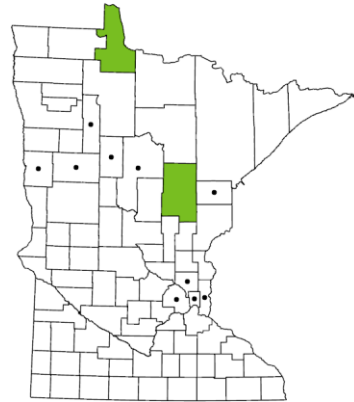
Sphecodes hydrangeae



Sphecodes pecosensis



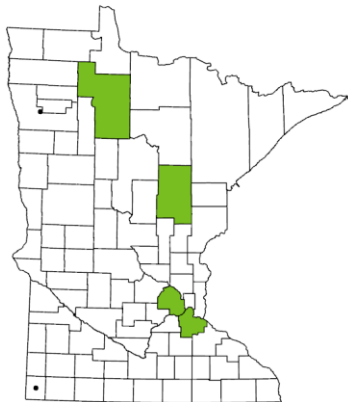
Sphecodes proshorus



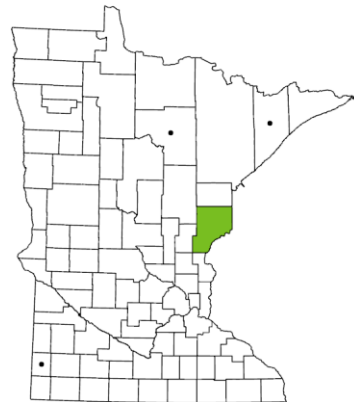
Sphecodes solonis



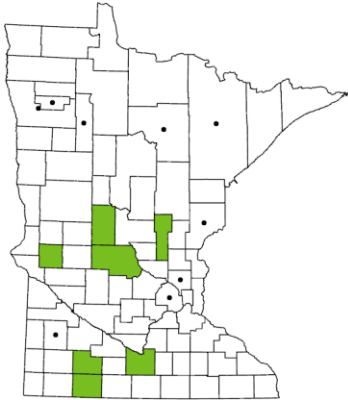
Stelis coarctatus



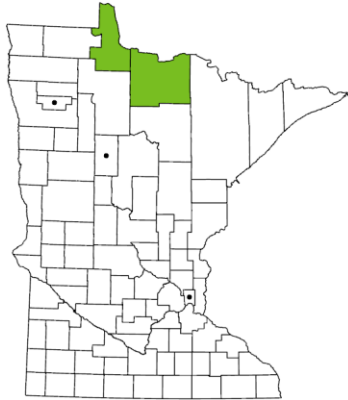
Stelis foederalis



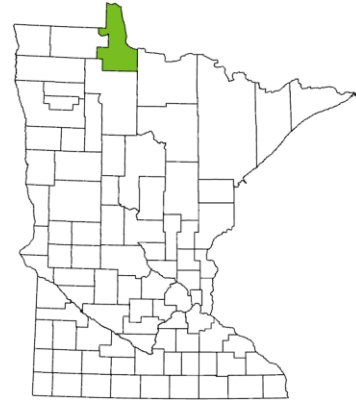
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lateralis*



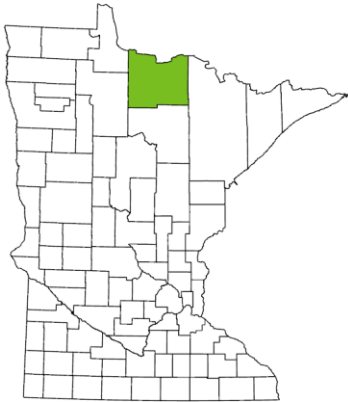
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*Stelis
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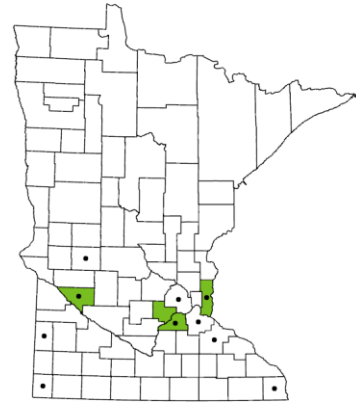
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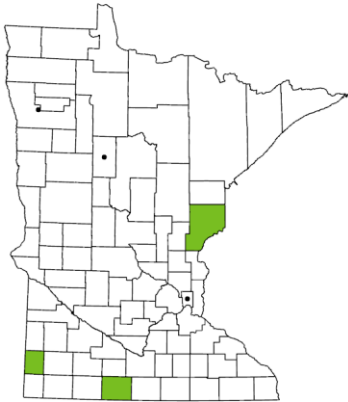
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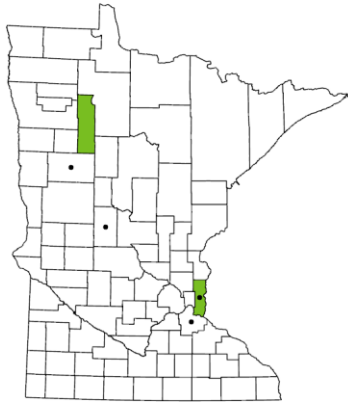
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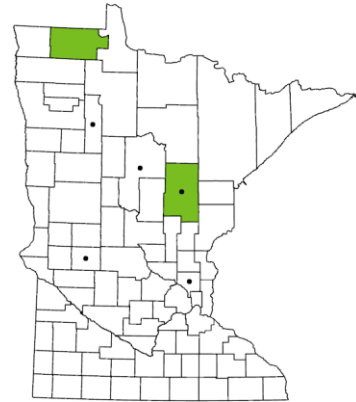
*Triepeolus
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*Triepeolus
donatus*



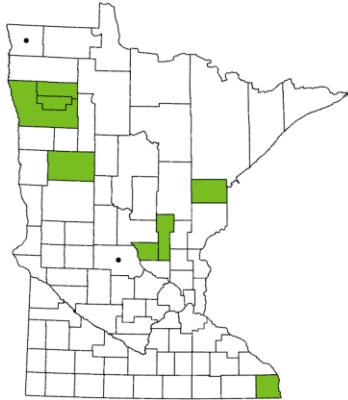
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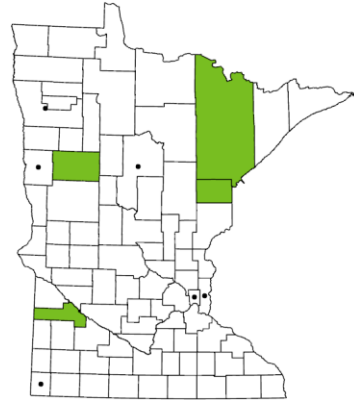
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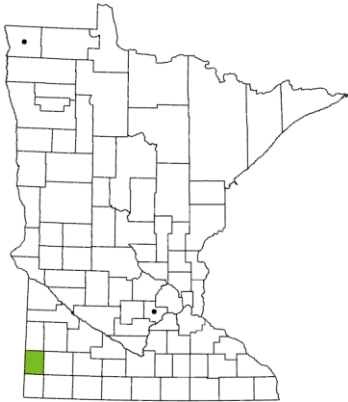
Triepeolus obliteratus



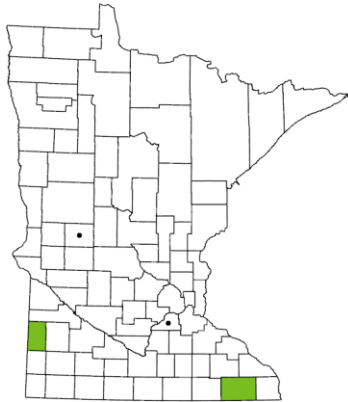
Triepeolus pectoralis



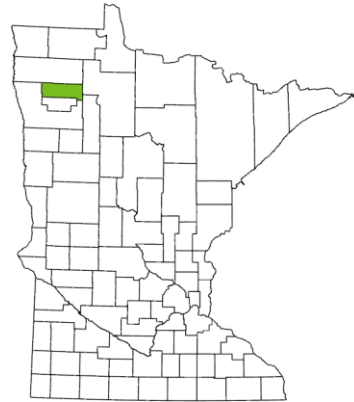
Triepeolus rhododontus



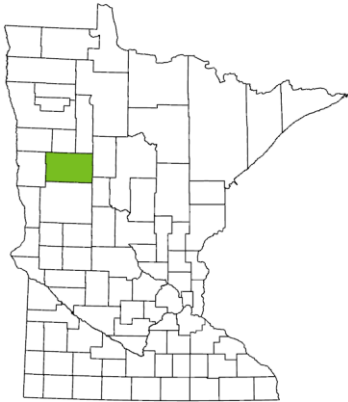
Triepeolus simplex



Triepeolus subalpinus



Xeromelecta interrupta



Appendix C. Species List and Conservation S-Ranks

All 359 bee species are listed along with their relative abundance in surveys in each of the ecological provinces. Each species was ranked using the Conservation Rank Calculator developed by NatureServe for the subnational or s-rank for Minnesota, (Master et al. 2012) to evaluate the conservation status of each species we observed. We did not include threats or trends in these rankings. SNR = Species Not Ranked, due to insufficient data. SNA = Species Not Applicable, here due to non-native status. Lecty refers to those species that are noted here as oligolectic, or specialist bees on either a species, genus, or sometimes family of plants. The data for each species included detections from this study and all other data compiled for the state species list (Portman et al. 2023).

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|--------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Agapostemon sericeus</i> | S4 | 1 | 29 | 118 | 9 | |
| <i>Agapostemon splendens</i> | S3 | | 1 | 25 | 11 | |
| <i>Agapostemon texanus</i> | S4 | 118 | 547 | 236 | 115 | |
| <i>Agapostemon virescens</i> | S4 | 36 | 4326 | 1170 | 30 | |
| <i>Andrena accepta</i> | SNR | | 1 | | | oligolectic |
| <i>Andrena alleghaniensis</i> | S2 | | | 3 | 7 | |
| <i>Andrena andrenoides</i> | SNR | | | 4 | | oligolectic |
| <i>Andrena arabis</i> | SNR | | | 4 | | oligolectic |
| <i>Andrena asteris</i> | S3 | 3 | 1 | 31 | 7 | oligolectic |
| <i>Andrena barbilabris</i> | S2 | | | 2 | 5 | |
| <i>Andrena bradleyi</i> | S2 | | | | 15 | oligolectic |
| <i>Andrena campanulae</i> | SNR | 2 | | | | oligolectic |
| <i>Andrena canadensis</i> | SNR | 1 | | | 1 | oligolectic |
| <i>Andrena carlini</i> | S4 | | 5 | 86 | 72 | |
| <i>Andrena carolina</i> | S2 | | | | 19 | oligolectic |
| <i>Andrena ceanothi</i> | S2 | | | 2 | 4 | |
| <i>Andrena chromotricha</i> | S3 | 1 | 8 | 9 | 9 | oligolectic |
| <i>Andrena clarkella</i> | S2 | | | 2 | 5 | oligolectic |
| <i>Andrena commoda</i> | S3 | 3 | 6 | 8 | 18 | |
| <i>Andrena crataegi</i> | S3 | | 9 | 27 | 52 | |
| <i>Andrena cressonii</i> | S3 | | 10 | 24 | 21 | |
| <i>Andrena distans</i> | S3 | | | 13 | 13 | oligolectic |
| <i>Andrena dunningi</i> | S3 | | | 3 | 11 | |
| <i>Andrena erigeniae</i> | S3 | | | 15 | 1 | oligolectic |
| <i>Andrena erythrogaster</i> | S2 | | 2 | 9 | 8 | oligolectic |
| <i>Andrena erythronii</i> | S2 | | | 25 | 15 | oligolectic |
| <i>Andrena forbesii</i> | S3 | | 1 | 12 | 12 | |
| <i>Andrena frigida</i> | S2 | | 1 | 2 | | oligolectic |
| <i>Andrena geranii</i> | S3 | | 1 | 17 | 30 | oligolectic |
| <i>Andrena helianthi</i> | S3 | | 30 | 6 | 10 | oligolectic |
| <i>Andrena helianthiformis</i> | S2 | | 3 | | | oligolectic |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|-------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Andrena hipposotes</i> | S3 | | | 16 | 15 | |
| <i>Andrena hirticineta</i> | S3 | 1 | 4 | 17 | 28 | oligolectic |
| <i>Andrena imitatrix</i> | S3 | | | 9 | 6 | |
| <i>Andrena integra</i> | S2 | | | | 3 | oligolectic |
| <i>Andrena lupinorum</i> | S2 | 2 | 5 | 2 | | oligolectic |
| <i>Andrena mandibularis</i> | SNR | | | 3 | | |
| <i>Andrena mariae</i> | S2 | | | 9 | 1 | oligolectic |
| <i>Andrena melanothroa</i> | SNR | | | | 2 | oligolectic |
| <i>Andrena milwaukeeensis</i> | S3 | | 2 | 6 | 5 | |
| <i>Andrena miranda</i> | S3 | 1 | 1 | 1 | 15 | |
| <i>Andrena miserabilis</i> | S3 | | | 6 | 26 | |
| <i>Andrena nasonii</i> | S3 | | | 50 | 4 | |
| <i>Andrena nivalis</i> | S3 | 2 | 5 | 9 | 76 | |
| <i>Andrena nubecula</i> | S3 | | 15 | 18 | 1 | oligolectic |
| <i>Andrena peckhami</i> | SNR | | | | 4 | oligolectic |
| <i>Andrena perplexa</i> | S3 | | | 6 | 1 | |
| <i>Andrena persimulata</i> | S2 | | 2 | | 5 | oligolectic |
| <i>Andrena placata</i> | S3 | 1 | 6 | 10 | 8 | oligolectic |
| <i>Andrena platyparia</i> | S2 | | 1 | | 7 | oligolectic |
| <i>Andrena quintilis</i> | S3 | | 38 | | | oligolectic |
| <i>Andrena regularis</i> | S2 | | | | 14 | |
| <i>Andrena robervalensis</i> | SNR | | | | 3 | oligolectic |
| <i>Andrena rudbeckiae</i> | S3 | | 21 | 10 | 1 | oligolectic |
| <i>Andrena rufosignata</i> | S3 | | | 3 | 35 | |
| <i>Andrena rugosa</i> | S3 | | | 26 | 22 | |
| <i>Andrena runcinatae</i> | SNR | 6 | | | | oligolectic |
| <i>Andrena sigmundi</i> | S2 | | 2 | 4 | 7 | oligolectic |
| <i>Andrena simplex</i> | S2 | | | 18 | 1 | oligolectic |
| <i>Andrena spiraeana</i> | S2 | | | 1 | 4 | |
| <i>Andrena thaspiae</i> | S3 | 3 | 14 | | 9 | |
| <i>Andrena tridens</i> | S2 | | | 1 | 13 | |
| <i>Andrena uvulariae</i> | SNR | | | 2 | | oligolectic |
| <i>Andrena vernalis</i> | S2 | | 13 | 1 | | oligolectic |
| <i>Andrena vicina</i> | S3 | | 1 | 77 | 35 | |
| <i>Andrena virginiana</i> | S2 | | | 1 | 7 | |
| <i>Andrena wellesleyana</i> | SNR | | | 6 | | oligolectic |
| <i>Andrena wheeleri</i> | S2 | | | 1 | 2 | |
| <i>Andrena wilkella</i> | SNA | 12 | 65 | 36 | 121 | oligolectic |
| <i>Andrena wilmattae</i> | S2 | | 4 | 6 | | |
| <i>Andrena w-scripta</i> | SNR | | | | 3 | |
| <i>Andrena ziziae</i> | S3 | 1 | 64 | 27 | 22 | oligolectic |
| <i>Anthidiellum boreale</i> | SNR | | 1 | | | |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|---------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Anthidium manicatum</i> | SNA | | | 2 | | |
| <i>Anthidium oblongatum</i> | SNA | | | 18 | | |
| <i>Anthophora bomboides</i> | S2 | | | | 20 | |
| <i>Anthophora terminalis</i> | S4 | 12 | 5 | 24 | 140 | |
| <i>Anthophora walshii</i> | S3 | | 15 | 1 | | |
| <i>Apis mellifera</i> | SNA | 189 | 624 | 332 | 22 | |
| <i>Augochlora pura</i> | S4 | | 2 | 63 | 332 | |
| <i>Augochlorella aurata</i> | S5 | 30 | 1582 | 477 | 321 | |
| <i>Augochlorella persimilis</i> | S2 | | | 25 | | |
| <i>Augochloropsis humeralis</i> | S2 | | | 60 | | |
| <i>Augochloropsis metallica</i> | S3 | | 11 | 10 | | |
| <i>Augochloropsis viridula</i> | S2 | | 26 | 11 | 5 | |
| <i>Bombus affinis</i> | S4 | | | 10 | | |
| <i>Bombus auricomus</i> | S4 | | 7 | 69 | 1 | |
| <i>Bombus bimaculatus</i> | S4 | 3 | 25 | 389 | 127 | |
| <i>Bombus borealis</i> | S4 | 47 | 63 | 34 | 79 | |
| <i>Bombus citrinus</i> | S3 | | 2 | 12 | 1 | |
| <i>Bombus fervidus</i> | S4 | 109 | 309 | 78 | 20 | |
| <i>Bombus flavidus</i> | S3 | | | | 26 | |
| <i>Bombus frigidus</i> | S2 | | | | 13 | |
| <i>Bombus griseocollis</i> | S4 | 25 | 327 | 133 | 117 | |
| <i>Bombus huntii</i> | SNR | | 1 | | | |
| <i>Bombus impatiens</i> | S4 | | 113 | 277 | 151 | |
| <i>Bombus insularis</i> | S2 | | | 1 | | |
| <i>Bombus melanopygus</i> | S2 | | | | 11 | |
| <i>Bombus nevadensis</i> | S2 | | | | 1 | |
| <i>Bombus pennsylvanicus</i> | S4 | 11 | 137 | 7 | | |
| <i>Bombus perplexus</i> | S4 | | | 2 | 51 | |
| <i>Bombus rufocinctus</i> | S4 | 59 | 11 | 39 | 30 | |
| <i>Bombus sandersoni</i> | S3 | 3 | | 2 | 89 | |
| <i>Bombus ternarius</i> | S4 | 55 | 11 | 45 | 428 | |
| <i>Bombus terricola</i> | S4 | 1 | 1 | 3 | 53 | |
| <i>Bombus vagans</i> | S4 | 71 | 150 | 247 | 401 | |
| <i>Calliopsis andreniformis</i> | S3 | | 8 | 69 | 32 | oligolectic |
| <i>Calliopsis coloradensis</i> | SNR | | 11 | | | oligolectic |
| <i>Calliopsis nebraskensis</i> | S2 | | 3 | 4 | 6 | oligolectic |
| <i>Ceratina calcarata</i> | S4 | 2 | 25 | 195 | 92 | |
| <i>Ceratina dupla</i> | S3 | 1 | 18 | 52 | 65 | |
| <i>Ceratina mikmaqi</i> | S4 | 40 | 440 | 470 | 224 | |
| <i>Ceratina strenua</i> | SNR | | | 3 | | |
| <i>Coelioxys alternatus</i> | SNR | | | 1 | 4 | |
| <i>Coelioxys funerarius</i> | S2 | | | 1 | 6 | |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|-------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Coelioxys modestus</i> | S2 | | | 2 | 1 | |
| <i>Coelioxys moestus</i> | S2 | | | 1 | 13 | |
| <i>Coelioxys octodentatus</i> | S2 | | 4 | 2 | 4 | |
| <i>Coelioxys porterae</i> | S2 | 1 | | 1 | 10 | |
| <i>Coelioxys rufitarsis</i> | S3 | 1 | 13 | 12 | 12 | |
| <i>Coelioxys sodalis</i> | SNR | | | | 4 | |
| <i>Colletes aberrans</i> | SNR | | 2 | 12 | | oligolectic |
| <i>Colletes americanus</i> | S2 | | 4 | 4 | | oligolectic |
| <i>Colletes andrewsi</i> | SNR | | 1 | | | oligolectic |
| <i>Colletes brevicornis</i> | SNR | | 1 | 1 | | oligolectic |
| <i>Colletes compactus</i> | SNR | | | 1 | | oligolectic |
| <i>Colletes inaequalis</i> | S3 | 3 | | 32 | 33 | |
| <i>Colletes kincaidii</i> | S3 | 1 | 60 | 9 | 6 | |
| <i>Colletes latitarsis</i> | SNR | | | 2 | | oligolectic |
| <i>Colletes mandibularis</i> | SNR | | | 2 | | |
| <i>Colletes robertsonii</i> | S3 | | 15 | 1 | | oligolectic |
| <i>Colletes simulans</i> | S3 | 3 | 8 | 10 | 11 | oligolectic |
| <i>Colletes solidaginis</i> | S2 | | 2 | 1 | | oligolectic |
| <i>Colletes susannae</i> | S2 | | 11 | 5 | | oligolectic |
| <i>Dianthidium pudicum</i> | SNR | | | 1 | 8 | oligolectic |
| <i>Dianthidium simile</i> | S2 | | | 1 | 8 | oligolectic |
| <i>Dieunomia heteropoda</i> | SNR | | | 6 | 1 | oligolectic |
| <i>Dufourea harveyi</i> | SNR | | | | 1 | oligolectic |
| <i>Dufourea monardae</i> | S3 | | 10 | 13 | 12 | oligolectic |
| <i>Dufourea novaeangliae</i> | S2 | | | | 25 | oligolectic |
| <i>Epeolus ainsliei</i> | SNR | | | 1 | | |
| <i>Epeolus americanus</i> | SNR | | | | 1 | |
| <i>Epeolus lectoides</i> | SNR | | | 1 | | |
| <i>Epeolus minimus</i> | SNR | | 1 | | | |
| <i>Epeolus pusillus</i> | SNR | | | 1 | 1 | |
| <i>Epeolus scutellaris</i> | S2 | | 1 | 3 | | |
| <i>Eucera albata</i> | S2 | | 13 | | | oligolectic |
| <i>Eucera aragalli</i> | SNR | | 1 | | | |
| <i>Eucera atriventris</i> | S2 | | 1 | | 8 | |
| <i>Eucera hamata</i> | S3 | | 27 | 148 | | |
| <i>Eucera kansensis</i> | S3 | | 7 | 15 | | oligolectic |
| <i>Eucera pruinosa</i> | S2 | | 1 | 38 | | oligolectic |
| <i>Halictus confusus</i> | S4 | 26 | 840 | 224 | 194 | |
| <i>Halictus ligatus</i> | S4 | 15 | 388 | 192 | 77 | |
| <i>Halictus parallelus</i> | S3 | 1 | 58 | 47 | | |
| <i>Halictus rubicundus</i> | S4 | 113 | 45 | 79 | 138 | |
| <i>Heriades carinata</i> | S4 | 6 | 5 | 45 | 104 | |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|----------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Heriades leavitti</i> | S2 | | 8 | 6 | 8 | oligolectic |
| <i>Heriades variolosa</i> | S3 | 6 | 3 | 2 | 15 | oligolectic |
| <i>Holcopasites calliopsidis</i> | S2 | | | 14 | 5 | |
| <i>Hoplitis albifrons</i> | S2 | | | | 21 | |
| <i>Hoplitis pilosifrons</i> | S4 | 18 | 85 | 30 | 39 | |
| <i>Hoplitis producta</i> | S3 | 3 | 5 | 16 | 32 | |
| <i>Hoplitis producta</i> complex | SNR | | | | 2 | |
| <i>Hoplitis spoliata</i> | S3 | 1 | 4 | 8 | 24 | |
| <i>Hoplitis truncata</i> | S2 | | | | 6 | |
| <i>Hylaeus affinis</i> | S4 | 35 | 329 | 187 | 106 | |
| <i>Hylaeus annulatus</i> | S3 | 1 | | | 41 | |
| <i>Hylaeus basalis</i> | S2 | | | 1 | 13 | |
| <i>Hylaeus fedorica</i> | S2 | | | | 17 | |
| <i>Hylaeus floridanus</i> | S2 | | | | 4 | |
| <i>Hylaeus mesillae</i> group | SNR | 11 | 41 | 35 | 112 | |
| <i>Hylaeus modestus</i> group | SNR | 6 | 39 | 48 | 235 | |
| <i>Hylaeus nelumbonis</i> | S3 | | 20 | 5 | 2 | |
| <i>Hylaeus saniculae</i> | SNR | | | 1 | | |
| <i>Hylaeus sparsus</i> | SNR | | | | 1 | oligolectic |
| <i>Hylaeus verticalis</i> | S2 | | | | 9 | |
| <i>Lasioglossum achilleae</i> | SNR | | | 1 | | |
| <i>Lasioglossum acuminatum</i> | S3 | | | 1 | 42 | oligolectic |
| <i>Lasioglossum admirandum</i> | S4 | 36 | 852 | 85 | | |
| <i>Lasioglossum albipenne</i> | S4 | 40 | 1234 | 1262 | 18 | |
| <i>Lasioglossum anomalum</i> | S3 | | 7 | 61 | | |
| <i>Lasioglossum athabascense</i> | S2 | | | | 63 | |
| <i>Lasioglossum atwoodi</i> | S2 | | | | 11 | |
| <i>Lasioglossum birkmanni</i> | SNR | | | | 3 | |
| <i>Lasioglossum bruneri</i> | SNR | | | 3 | | |
| <i>Lasioglossum cattellae</i> | S2 | | | 11 | | |
| <i>Lasioglossum cinctipes</i> | S3 | | | | 23 | |
| <i>Lasioglossum coeruleum</i> | S3 | | | 18 | 37 | |
| <i>Lasioglossum comagenense</i> | S2 | | | | 13 | |
| <i>Lasioglossum coreopsis</i> | SNR | | | 1 | | |
| <i>Lasioglossum coriaceum</i> | S4 | 37 | 815 | 772 | 179 | |
| <i>Lasioglossum cressonii</i> | S4 | 14 | 44 | 226 | 320 | |
| <i>Lasioglossum dreisbachi</i> | SNR | | | 2 | | |
| <i>Lasioglossum ephialtum</i> | S3 | 3 | 20 | 5 | 1 | |
| <i>Lasioglossum floridanum</i> | S2 | | | 54 | | |
| <i>Lasioglossum foxii</i> | S2 | | | 5 | 3 | |
| <i>Lasioglossum</i> n. sp. 1 | SNR | | 4 | 1 | 1 | |
| <i>Lasioglossum gotham</i> | SNR | | | 1 | | |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|---------------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Lasioglossum heterognathus</i> | S2 | | 2 | 32 | 6 | |
| <i>Lasioglossum hitchensi</i> | S3 | | 11 | 30 | 12 | |
| <i>Lasioglossum illinoense</i> | S2 | | 1 | 22 | | |
| <i>Lasioglossum imitatum</i> | S3 | 1 | 6 | 74 | 2 | |
| <i>Lasioglossum inconditum</i> | S2 | | | | 12 | |
| <i>Lasioglossum katherineae</i> | SNR | | | 2 | | |
| <i>Lasioglossum laevissimum</i> | S3 | 1 | 4 | 43 | 63 | |
| <i>Lasioglossum leucocomus</i> | S3 | 177 | 294 | 707 | 229 | |
| <i>Lasioglossum leucozonium</i> | SNA | 85 | 16 | 6 | 144 | |
| <i>Lasioglossum lineatulum</i> | S4 | 13 | 36 | 37 | 31 | |
| <i>Lasioglossum lustrans</i> | SNR | | | 5 | 2 | oligolectic |
| <i>Lasioglossum macoupinense</i> | S3 | | | | 13 | |
| <i>Lasioglossum michiganense</i> | S2 | | 2 | | 1 | |
| <i>Lasioglossum nelumbonis</i> | S2 | | | | 1 | oligolectic |
| <i>Lasioglossum nigroviride</i> | S3 | | | 2 | 72 | |
| <i>Lasioglossum novascotiae</i> | S3 | 14 | 38 | | 1 | |
| <i>Lasioglossum oblongum</i> | S2 | | | 11 | 9 | |
| <i>Lasioglossum obscurum</i> | S2 | | | 2 | | |
| <i>Lasioglossum oceanicum</i> | S3 | | 6 | 520 | 6 | |
| <i>Lasioglossum paradmirandum</i> | S3 | | 4 | 19 | | |
| <i>Lasioglossum paraforbesii</i> | S4 | 205 | 483 | 58 | 43 | |
| <i>Lasioglossum pectorale</i> | S3 | | 5 | 23 | 9 | |
| <i>Lasioglossum perpunctatum</i> | S3 | | 13 | 21 | 13 | |
| <i>Lasioglossum pictum</i> | S3 | | 1 | 85 | | |
| <i>Lasioglossum pilosum</i> | S3 | 6 | 50 | 295 | 276 | |
| <i>Lasioglossum pilosum</i> group | SNR | | | 2 | 2 | |
| <i>Lasioglossum platyparius</i> | S2 | | 1 | 2 | 1 | |
| <i>Lasioglossum pruinatum</i> | S4 | | 595 | 192 | | |
| <i>Lasioglossum quebecense</i> | S3 | | | 1 | 21 | |
| <i>Lasioglossum rozeni</i> | SNR | | | 1 | | |
| <i>Lasioglossum rufulipes</i> | SNR | | | | 5 | |
| <i>Lasioglossum seillean</i> | SNR | | | | 1 | |
| <i>Lasioglossum semicaeruleum</i> | S3 | 5 | 78 | 24 | 4 | |
| <i>Lasioglossum smilacinae</i> | S3 | | | 23 | 5 | |
| <i>Lasioglossum subversans</i> | S2 | | | | 6 | |
| <i>Lasioglossum subviridatum</i> | S3 | 2 | | 5 | 32 | |
| <i>Lasioglossum taylorae</i> | SNR | | | | 2 | |
| <i>Lasioglossum tegulare</i> group | SNR | | 16 | 14 | 5 | |
| <i>Lasioglossum texanum</i> | SNR | | 1 | | | oligolectic |
| <i>Lasioglossum timothyi</i> | S2 | | | 5 | | |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|--------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Lasioglossum truncatum</i> | S3 | | | 3 | 24 | |
| <i>Lasioglossum versans</i> | S4 | | 6 | 21 | 93 | |
| <i>Lasioglossum versatum</i> | S4 | | | 127 | 356 | |
| <i>Lasioglossum vierecki</i> | S3 | | | 165 | 11 | |
| <i>Lasioglossum viridatum</i> | S3 | 84 | 30 | 19 | 17 | |
| <i>Lasioglossum weemsi</i> | S3 | 1 | | 5 | | |
| <i>Lasioglossum zephyrus</i> | S3 | 1 | 5 | 90 | 8 | |
| <i>Lasioglossum zonulus</i> | S3 | 72 | 8 | 33 | 80 | |
| <i>Macropis nuda</i> | S2 | | | | 23 | oligolectic |
| <i>Macropis steironematis</i> | SNR | | 6 | | | oligolectic |
| <i>Megachile addenda</i> | S2 | | | 4 | 2 | oligolectic |
| <i>Megachile brevis</i> | S3 | | 18 | 27 | 4 | |
| <i>Megachile campanulae</i> | S3 | 1 | 1 | 11 | 28 | oligolectic |
| <i>Megachile centuncularis</i> | SNR | | 4 | | 2 | |
| <i>Megachile circumcincta</i> | SNR | | | | 6 | |
| <i>Megachile fortis</i> | SNR | | | | 1 | |
| <i>Megachile frigida</i> | S3 | 1 | | | 20 | |
| <i>Megachile gemula</i> | S3 | 1 | | 4 | 121 | |
| <i>Megachile inermis</i> | S4 | 13 | 3 | 19 | 1 | |
| <i>Megachile lapponica</i> | SNR | | | | 8 | |
| <i>Megachile latimanus</i> | S4 | 8 | 104 | 111 | 40 | |
| <i>Megachile melanophaea</i> | S3 | | | | 31 | |
| <i>Megachile mendica</i> | S3 | | 10 | 12 | | |
| <i>Megachile montivaga</i> | S3 | 1 | 12 | 8 | 14 | |
| <i>Megachile petulans</i> | SNR | | | 1 | | |
| <i>Megachile pugnata</i> | S3 | | | 4 | 29 | oligolectic |
| <i>Megachile relativa</i> | S4 | 11 | 10 | 26 | 380 | |
| <i>Megachile rotundata</i> | SNA | | 4 | 21 | 1 | |
| <i>Megachile texana</i> | S3 | | 2 | 17 | 6 | |
| <i>Melissodes agilis</i> | S4 | 71 | 416 | 92 | 57 | oligolectic |
| <i>Melissodes apicatus</i> | SNR | | | | 3 | oligolectic |
| <i>Melissodes bidentis</i> | SNR | | | 1 | | oligolectic |
| <i>Melissodes bimaculatus</i> | S4 | | 23 | 208 | | |
| <i>Melissodes communis</i> | S2 | | 31 | | | |
| <i>Melissodes dentiventris</i> | SNR | | | 1 | | oligolectic |
| <i>Melissodes desponsus</i> | S4 | 1 | 8 | 53 | 20 | oligolectic |
| <i>Melissodes druriellus</i> | S3 | 9 | 19 | 39 | 13 | oligolectic |
| <i>Melissodes illatus</i> | S2 | | | | 15 | oligolectic |
| <i>Melissodes subillatus</i> | S3 | | | 1 | | oligolectic |
| <i>Melissodes trinodis</i> | S4 | 37 | 992 | 300 | 171 | oligolectic |
| <i>Nomada articulata</i> | S3 | | 33 | 4 | 1 | |
| <i>Nomada australis</i> | SNR | | | | 1 | |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|--------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Nomada bethunei</i> | S2 | | | 1 | 1 | |
| <i>Nomada cuneata</i> | S2 | | | 3 | 1 | |
| <i>Nomada denticulata</i> | S2 | | | 1 | 1 | |
| <i>Nomada erigeronis</i> | SNR | | | 1 | | |
| <i>Nomada fuscicincta</i> | S2 | | 6 | 2 | | |
| <i>Nomada graenicheri</i> | SNR | | 1 | 1 | | |
| <i>Nomada imbricata</i> | SNR | | 1 | | | |
| <i>Nomada lepida</i> | SNR | | | 1 | 1 | |
| <i>Nomada maculata</i> | S2 | | | 7 | 6 | |
| <i>Nomada obliterated</i> | SNR | | 1 | | 1 | |
| <i>Nomada ovata</i> | SNR | | | | 1 | |
| <i>Nomada parva</i> | SNR | | 1 | | 1 | |
| <i>Nomada tiftonensis</i> | SNR | | | | 1 | |
| <i>Nomada vincta</i> | S2 | | 5 | | | |
| <i>Nomia universitatis</i> | S2 | | 8 | | | oligolectic |
| <i>Osmia albiventris</i> | S2 | | | 3 | 14 | |
| <i>Osmia atriventris</i> | S3 | | | 4 | 86 | |
| <i>Osmia bucephala</i> | S3 | 1 | | 3 | 68 | |
| <i>Osmia collinsiae</i> | SNR | | | | 1 | |
| <i>Osmia cyaneonitens</i> | SNR | | 1 | | | oligolectic |
| <i>Osmia distincta</i> | S2 | | 2 | 6 | 1 | oligolectic |
| <i>Osmia felti</i> | S2 | | | | 7 | |
| <i>Osmia inermis</i> | SNR | | | | 2 | oligolectic |
| <i>Osmia inspergens</i> | SNR | | | | 3 | |
| <i>Osmia laticeps</i> | SNR | | | | 6 | oligolectic |
| <i>Osmia lignaria</i> | S3 | | | 8 | 30 | |
| <i>Osmia nearctica</i> | SNR | | | | 5 | |
| <i>Osmia nigriventris</i> | SNR | | | | 1 | |
| <i>Osmia proxima</i> | S2 | | | | 13 | |
| <i>Osmia pumila</i> | S3 | | | 6 | 4 | |
| <i>Osmia simillima</i> | S3 | 1 | 1 | 1 | 12 | |
| <i>Osmia tersula</i> | S2 | 4 | | | 13 | |
| <i>Osmia virga</i> | SNR | | | | 11 | oligolectic |
| <i>Paranthidium jugatorium</i> | S3 | | | 2 | 3 | oligolectic |
| <i>Perdita albipennis</i> | SNR | | 1 | | | oligolectic |
| <i>Perdita bruneri</i> | SNR | | 11 | | | oligolectic |
| <i>Perdita gerhardi</i> | SNR | | | 4 | | oligolectic |
| <i>Perdita halictoides</i> | S2 | | 1 | 1 | | oligolectic |
| <i>Perdita ignota</i> | SNR | | 3 | | | oligolectic |
| <i>Perdita maculigera</i> | SNR | | | 1 | | oligolectic |
| <i>Perdita octomaculata</i> | SNR | | | 1 | | oligolectic |
| <i>Perdita pallidipennis</i> | S2 | | | 12 | 1 | oligolectic |

| Species | S-rank | Tallgrass Aspen Parkland | Prairie Parkland | Eastern Broadleaf Forest | Laurentian Mixed Forest | Lecty |
|---------------------------------|--------|--------------------------------|---------------------|--------------------------------|-------------------------------|-------------|
| <i>Perdita perpallida</i> | S3 | | | 19 | | oligolectic |
| <i>Perdita swenki</i> | S3 | 8 | 2 | 40 | 27 | oligolectic |
| <i>Protandrena aestivalis</i> | SNR | | | 1 | | oligolectic |
| <i>Protandrena albitarsis</i> | S3 | | 9 | 6 | | oligolectic |
| <i>Protandrena andrenoides</i> | S2 | | | 1 | | oligolectic |
| <i>Protandrena bancrofti</i> | S2 | | 11 | 2 | | |
| <i>Protandrena labrosa</i> | SNR | | | 2 | | oligolectic |
| <i>Protandrena renimaculata</i> | SNR | | 3 | | | oligolectic |
| <i>Protandrena simulans</i> | S2 | | 2 | 6 | 1 | oligolectic |
| <i>Sphecodes confertus</i> | SNR | | | | 4 | |
| <i>Sphecodes davisii</i> | S3 | 1 | 2 | 11 | 18 | |
| <i>Sphecodes dichrous</i> | S2 | | | 3 | 7 | |
| <i>Sphecodes heraclei</i> | SNR | | 1 | 2 | | |
| <i>Sphecodes hydrangeae</i> | SNR | | | 1 | 1 | |
| <i>Sphecodes pecosensis</i> | SNR | | | | 1 | |
| <i>Sphecodes prosphorus</i> | SNR | | | | 2 | |
| <i>Sphecodes solonis</i> | SNR | | | | 1 | |
| <i>Stelis coarctatus</i> | S2 | | | 5 | 4 | |
| <i>Stelis foederalis</i> | SNR | | | | 1 | |
| <i>Stelis lateralis</i> | S3 | | 5 | 1 | 2 | |
| <i>Stelis nitida</i> | SNR | | | | 2 | |
| <i>Stelis permaculata</i> | SNR | | | | 1 | |
| <i>Stelis submarginata</i> | SNR | | | | 1 | |
| <i>Svastra atripes</i> | SNR | | | 1 | | |
| <i>Svastra obliqua</i> | S3 | | 2 | 3 | | oligolectic |
| <i>Triepeolus cressonii</i> | SNR | | 2 | | 1 | |
| <i>Triepeolus donatus</i> | SNR | 1 | | 1 | | |
| <i>Triepeolus eliseae</i> | SNR | 1 | | | 1 | |
| <i>Triepeolus lunatus</i> | S2 | | | 1 | | |
| <i>Triepeolus obliteratedus</i> | S2 | 3 | | 4 | 3 | |
| <i>Triepeolus pectoralis</i> | S2 | | 2 | 1 | 2 | |
| <i>Triepeolus rhododontus</i> | SNR | | 1 | | | |
| <i>Triepeolus simplex</i> | SNR | | 1 | 1 | | |
| <i>Triepeolus subalpinus</i> | SNR | 1 | | | | |
| <i>Xeromelecta interrupta</i> | SNR | | 1 | | | |



500 Lafayette Road
St. Paul, MN 55155-4040
888-646-6367 or 651-296-6157
mndnr.gov

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