

2nd Annual Eugene Bee Survey

Hosted by
Walama Restoration Project
Beyond Toxics
&
Oregon Bee Project



Community members arrive at the Community Involvement & Long-term Ownership Strategy (CILOS) site for the 2018 Bee Survey and learn how to safely catch bees.

What is the importance of this report? As pollinating wild bee species decline, it's increasingly important to implement regular monitoring of wild bee species in our communities. Factors impacting bee abundance and diversity range from deforestation and insecticide applications to climate change and environmental policy.

Background

Have you ever wondered what's going on over there next to I-5 along Pre's Trail in East Alton Baker Park, just north of the Knickerbocker Bike Bridge?

This 3.5-acre site in the Whilamut Natural Area is a community-based environmental education and restoration project to rehabilitate native prairie and wetland habitat. The project involves a partnership between the Walama Restoration Project, City of Eugene, Oregon Department of Transportation, and schools in the Eugene-Springfield area.



Since 2014, Walama Restoration Project has organized local communities to rehabilitate this area, which has gone from a toxic landfill and staging area for the I-5 River Bridge construction work (pictured left, in 2011) to restored upland prairie, wetland prairie, and seasonal wetland habitats that host numerous native birds, pollinators, reptiles, amphibians, and over 70 species of native plants!

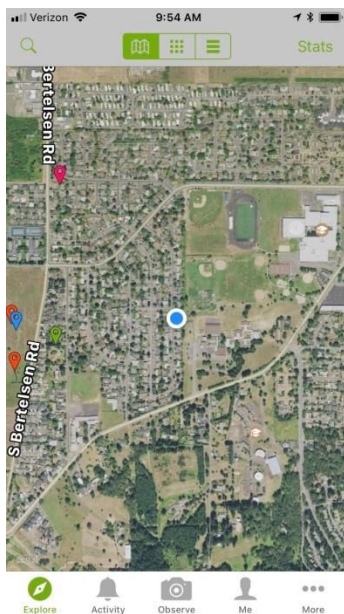
In 2017, Beyond Toxics and WRP spearheaded the first Eugene Bee Survey to determine if native bees were using the wildflowers that were planted and seeded on the site during the course of 3 years of restoration efforts. The survey was organized with the intent to expand our understanding of the native pollinator species present in urban parks and their foraging patterns. In 2018, citizen scientists and local experts from WRP, Beyond Toxics, Oregon Bee Project, and Mount Pisgah Arboretum made 16 distinct observations of different bee tribes, genera, and species at this site in the Whilamut Natural Area. The results of the 2nd Annual Eugene Bee Survey are presented here, along with some fun facts about our local pollinators.

Methods

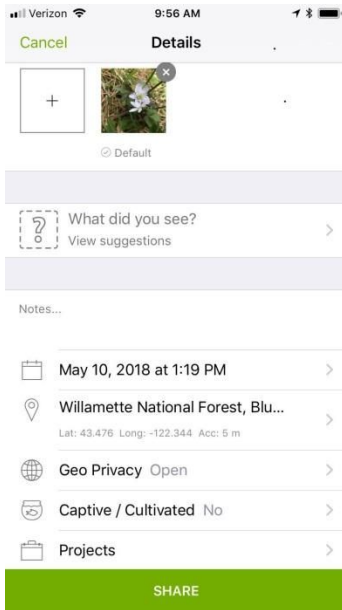
The Eugene Bee Survey is an annual citizen science event that happens in the spring or early summer. The identification of bees to species, and often genera is a difficult task that takes years, if not a lifetime of practice. We rely on local experts to assist with identifying each bee collected and photographed during the survey to the lowest taxonomic level possible. Bug nets were used to trap bees, which were then transferred into insect-collecting jars and placed into a cooler with ice for 1-2 minutes in order to slow down bee activity to allow for photography and close-up examination and identification of the bee without harming it. The results of our survey will contribute to the Oregon Bee Atlas, an effort to develop a stronger base of knowledge about the bees of Oregon. The project's success rests on the shoulders of committed volunteers and its' four year mission (2018-2021) is to train volunteers to seek out new native bee records across the state of Oregon.

We utilized the free application for smartphones, iNaturalist, to record our observations and contribute to the Oregon Bee Atlas. Below are directions for using iNaturalist and participating in the project at your own leisure.

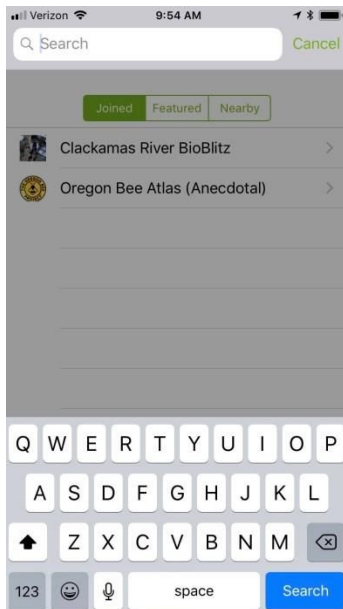
Download iNaturalist for smart phones and/or desktop computers and create a new account: <https://www.inaturalist.org/home>



1. To join a project, select "More" in the bottom task bar.



2. Search for the "Oregon Bee Atlas (Anecdotal)" and join the project.



3. To make an observation, return to the home screen and click on the camera icon in the bottom task bar (see step 1). Upload the image. the date and location may be automatically imported for some devices, but otherwise use the aerial image to search for our restoration site in east Alton Baker Park. Select "Projects" to add your observation to the Oregon Bee Atlas before you share the observation.

Under "What did you see", you can enter unknown, the family, genus, or species of the pollinator you are trying to identify. Experts will confirm or help identify your insect!

Results

In addition to the European honeybee (*Apis mellifera*), we observed 15 wild bee species during the 2nd Annual Eugene Bee Survey:

1. California bumblebee (*Bombus californicus*)
2. White shouldered bumblebee (*Bombus appositus*)
3. Yellow faced bumblebee (*Bombus vosnesinskii*)
4. Cuckoo bee (*Nomada* sp.)
5. Small carpenter bee (*Ceratina* sp.)
6. Long horned bee (*Eucerini* tribe)
7. European wool carder bee (*Anthidium manicatum*)
8. Mason bee (*Osmia* sp.)
9. Leaf cutter bee (*Megachile* sp.)
10. Alfalfa leaf cutter bee (*Megachile rotundata*)
11. Mining bee (*Andrena* sp.)
12. *Anthidiini* tribe, please note there are many possible genera and species with different common names
13. Sweat bee (*Halictus ligatus*)
14. Sweat bee (*Lasioglossum* sp.)
15. Masked bee (*Hylaeus* sp.), please note that there are many common names for this genus

Discussion

FAMILY APIDAE

Bumblebee (*Bombus* spp.)

Bumble bees are both ground- and cavity nesting and are often found in rodent burrows, bird houses, building insulation, and compost piles. They are robust and hairy bees with black, white, yellow, and orange banded patterns. They carry pollen in baskets on their legs called corbicula. Bumblebees are eusocial and live in colonies comprised of up to 100 individual workers and a single queen bee. The lifespan of a worker bee is approximately one month during which they collect nectar and pollen to feed subsequent generations. In the fall, the colony dies and a new queen is born. She hibernates over the winter and the following spring she searches for a new location for her colony and lays her eggs. Bumblebees do not cluster over the winter like honeybees, and by contrast, they do not make honey combs. They are some of the most important native pollinators of agricultural crops, and unlike honeybees, they perform well in greenhouses and can forage during cool temperatures and wet weather. Over 20 species live in Oregon. Female bumblebees can sting repeatedly, but are not aggressive and generally ignore humans.

California bumblebee (*Bombus californicus*)

The taxonomy of the California bumblebee is controversial, and some regard it as a subspecies or variety of the golden northern bumblebee (*Bombus fervidus*). It is an uncommon species in the western United States and is possibly in decline. Many workers were observed in the WNA visiting self heal (*Prunella vulgaris* var. *lancelolata*), which is a native mint that was planted as part of the upland prairie restoration at the site.



The California Bumblebee, *Bombus californicus*, in hand.

White shouldered bumblebee (*Bombus appositus*)

The white shouldered bumblebee is common in the western United States, and it is rumored that a mostly yellow form of this bee can be found around Corvallis, Oregon. Many workers and one queen were observed in the WNA visiting self heal.



White shouldered bumblebee, *Bombus appositus*, in collecting jar,

Yellow faced bumblebee (*Bombus vosnesinskii*)

The yellow faced bumblebee is common in the western United States and populations are possibly growing in size. It is an important pollinator for greenhouse tomatoes. Several workers were observed in the WNA visiting California poppy (*Eschscholzia californica*). California poppy was likely introduced to the WNA during staging for the I-5 river bridge construction. While it is native to western Oregon, this species was not used in restoration efforts on the site.

Cuckoo bee (*Nomada* sp.)

Cuckoo bees are solitary and are one of the largest genera in the family Apidae. They often have a wasp-like appearance. They are kleptoparasitic, stealing pollen masses made by other bees to lay their eggs upon. Once the egg hatches, the cuckoo bee larva destroys the egg or larva left by the host and then uses the pollen provision to grow on. Because cuckoo bees don't need to collect pollen for their young, they are often less hairy in appearance. The different species of cuckoo bees vary in their selection of hosts. They are intimately connected to their hosts, so that if host populations decline, cuckoo bees will likely also suffer. They were identified in the WNA, but could not be associated with a particular plant.

Small carpenter bee (*Ceratina* sp.)

Small carpenter bees are usually solitary. They nest in hollow plant stems, holes in the ground, and crevices in wood or rock. They are generally hairless and are dark metallic black, blue and green. Small carpenter bees have rudimentary or vestigial pollen carrying hairs, and instead transport pollen by swallowing it and regurgitating it back at the nest, a behavior observed in primitive bees. Several male and female small carpenter bees were observed in the WNA, but could not be associated with any particular plant species.



Carpenter bee, *Ceratina* sp., on collecting jar lid.

Long horned bees (*Eucerini* tribe)

Many long horned bees belong to the genus *Melissodes* sp. and are called as such because males have unusually long antennae in comparison to females. They are solitary bees, although males will cluster together at night for warmth. Long horned bees nest in ground tunnels. They are robust and females have brushlike hairs called scopa on their legs to carry pollen. One male and one female were observed in the WNA near a yarrow (*Achillea millefolium*) patch, a native plant species that was planted on the site's upland prairie habitat.

FAMILY MEGACHILIDAE

European wool carder bee (*Anthidium manicatum*)

Wool carder bees are solitary. They are aptly named, as the females scrape fibrous material from plants to use for nests. They readily nest in hollow plant stems or wood cavities approximately 7-10 millimeters in diameter. Males have a reputation of aggressively guarding flower patches from other insects by darting and chasing. Neither males nor females have stingers, but rather, the males have spike-like projections on their abdomen that are used to defend their territories.

The European wool carder bee is not native to the United States and its long term impact is not yet known. However, it is important to note that this species is not responsible for the decline of the European honeybee. While male European wool carder bees will readily attack honeybees to defend their territory, both of these species were introduced to the United States from Europe where populations have coexisted for thousands of years. Male and female European wool carder bees were abundant in the WNA around patches of self heal.



European wool carder bee, *Anthidium manicatum*, inside collecting jar.

Mason bee (*Osmia* sp.)

Mason bees are solitary. They are named as such because they use mud to seal the entrances to nests and create partitions inside. They nest in hollow plant stems, holes in the ground, and crevices in wood or rock. Mason bees are metallic black, blue, and green in color and carry pollen on specialized hairs on the abdomen. They are especially efficient in pollinating fruit trees and several species are managed in orchards. Approximately 70 species can be found in Oregon. A few female mason bees were observed in the WNA, but could not be associated with any particular plant species.



Mason bee, *Osmia* sp., inside collecting container.

Leaf cutter bee (*Megachile* sp.) and Alfalfa leaf cutter bee (*M. rotundata*)

Leaf cutter bees are solitary. They are named as such because they use small pieces of leaves and flowers to line their nest cells. They nest in hollow plant stems, holes in the ground, and crevices in wood or rock. Leaf cutter bees carry pollen on specialized hairs on the abdomen. They are managed commercially for alfalfa production and approximately 40 species can be found in Oregon. One male alfalfa leaf cutter bee was observed in the WNA on yarrow and another male that could not be identified to species was seen on farewell to spring (*Clarkia amoena*), a native plant species that was seeded in upland prairie habitat in the WNA.

FAMILY ANDRENIDAE

Mining bee (*Andrena* sp.)

Mining bees are solitary. They nest in burrows made in loose or sandy substrates often near shrubs and protection from extreme heat and frost. Burrows are constructed of small cells containing a ball of pollen mixed with nectar, upon which an egg is laid before each cell is sealed. Mining bees vary greatly in appearance and carry pollen on their hind legs and on hairs between their abdomen and thorax. Approximately 100 species can be found in Oregon where they are often the first native bees to emerge in the spring. In the WNA, two male mining bees were seen visiting fragrant popcorn flower (*Plagiobothrys figuratus*) and elegant calico flower (*Downingia elegans*) in the site's seasonal wetlands. Both of these native plants were seeded as part of restoration efforts at the site.



Mining bee, *Andrena* sp., on finger.

FAMILY HALICTIDAE

Sweat bee (*Halictus ligatus*)

Sweat bees are aptly named due to their attraction to salts. They are ground nesting bees that generally use vertical tunnels with side passages leading to egg chambers. Nests are often made in loose or sandy substrates, often near the ground surface. Sweat bees are primitively eusocial with aggression being the primary means to establishing the hierarchy within a colony. They are smaller in size than many other native bees and thus, are well matched to pollinate the more diminutive native plant species that are too small for others. Sweat bees carry pollen on their hind legs and the underside of their body. Although there are only 4 species in Oregon, they are some of

the most commonly observed bees in croplands. Multiple female sweat bees were seen visiting yarrow in the WNA's upland prairie habitat.

Sweat bee (*Lasioglossum* sp.)

This genus is likely the most common of the sweat bees in Oregon. They are solitary and nest in ground tunnels. Nests are often made in loose or sandy substrates, often near the ground surface. They are broad generalists in terms of pollination preference and carry pollen on their hind legs and on hairs on the underside of the body. There are 15 species known to occur in Oregon. In the WNA, multiple females were seen around yarrow patches.



Sweat bee, *Halictus ligatus*, on collecting jar lid.

FAMILY COLLETIDAE

Masked bee (*Hylaeus* sp.)

There are several common names associated with this genus of bees, which consists of small, black and yellow species with a wasp-like appearance. Their face mask pattern is useful in identification. Masked bees are solitary and nest in wood or hollow plant stems. Similar to wasps, these bees lack scopa to parry pollen and females carry pollen internally, regurgitating a provision into cells within the nest where it will be used as larval food.

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