



Eagle Project

Joseph Hawkins

Project Objective

- ◆ Clearing area of weeds for a picnic area
- ◆ Spreading pea gravel to make a path
- ◆ Installing educational signs
- ◆ Installing a Bee Hotel
- ◆ Adding split rail fencing around the Bee Hotel as funds allow



Create a Pathway w/ border:



Clean up weeds:
• Within area outlined in purple



Install Signs: _____

Project Outline



Red – Parking Area

Blue – Bathrooms

Purple – Project Area

Highlighted – Weeding

Orange - Sign

Green – Bee Hotel

INITIAL PROJECT IDEAS

Bee Hotel

- ◆ I am planning to install a bee hotel
- ◆ Look into getting bees for my project.
- ◆ I want it to look similar model it to the Galena Creek Regional Park Bee Hotel.



Sign Design Idea



Pollinator Sign In Progress

Common Native Nevada Pollinating Plants, Which Ones Can You Spot In Our Pollinator Garden?

Catmint
(Nepeta)



Western Aster
(Symphyotrichum
Ascendens)



Worm Seed Mustard
(Erysimum)



Indian Rice Grass
(Achnatherum
Hymenoides)



Lilac
(Syringa)



Desert Globemallow
(Sphaeralcea Ambigua)



Golden Current
(Ribes Aureum)



Rabbitbrush, green
(Chrysothamnus
Nauseosus)



Nine Bark
(Physocarpus
Alternans)



Purple Sage
(Salvia Dorrii)



Showy Milkweed
(Asclepias
Speciosa)



Common Yarrow
(Achillea Millefolium)



Sulphur-Flower
(Erigonum-
Umbellatum)



Firecracker Flower
(Penstemon Eatonii)



Signs for Bees

Photographs of Nevada Bees by Joseph C. Miller

- I found a lot of good information on Bees and a very good comprehensive sign with the organization: Nevada Bugs and Butterflies
- I was able to track down one of the leading members of this organization through some web sleuthing and emailing various emails asking for permission to use their sign.



Bees4vets

- ◆ My partner for this project is bees4vets and they are an organization dedicated to helping vets with PTSD and/or TBI by setting up a bee keeping area for them.
- ◆ Bees for vets provided an artificial bee hive for my project and I appreciate what they do for people and the bees.



Plant Showy Milkweed Seeds



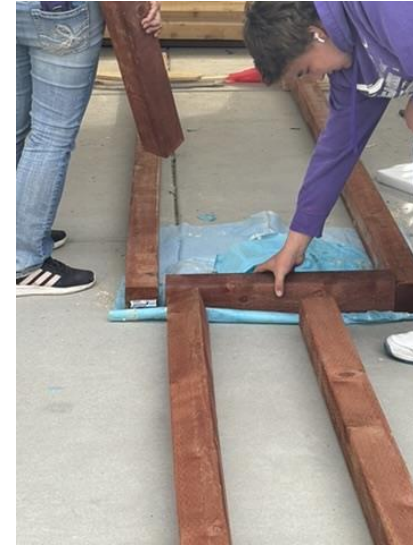
PROPOSAL APPROVED

- ◆ Next Steps:
 - ◆ Finalize sign ideas
 - ◆ Permissions to use/reproduce signs made by other organizations
 - ◆ Finalize sign holder plans/bee hotel
 - ◆ Finalize layout of area
 - ◆ Put out emails for help
 - ◆ Food for volunteers
 - ◆ Get hive from Bees 4 Vets

Making The Bee Hotel



Making The Sign Holders



Creating the Signs

Aster Prairie (Symphyotrichum turbinellum): A shrub perennial that sprouts flowers in shades of lavender, yellow, or blue. These flowers attract hummingbirds, bees, and other pollinators. Bloom in late summer early fall.



<https://www.washoecounty.gov/parks/files/Seed-Mix-Identifying-Guide.pdf>; Page 6

Buckwheat, sulfur (Eriogonum umbrellatum): A flower that blooms in fall with golden yellow flowers. It loves the sun and requires little water. It attracts butterflies, moths, bees, and some birds.



Ants pollinate by eating nectar from flowers. They pollinate as they walk and climb through flowers. Ants are not the fastest or strongest pollinators, but they do their part in helping ecosystems.



Beetles pollinate flowers by eating through flowers and defecating in them. They pollinate as they move about their day and play a huge part in ecosystems.



Butterflies play a key role in pollinating plants in Northern Nevada. They do this by feeding on the nectar from plants/flowers, while they are feeding the pollen from the plants get stuck to them and they spread it to other plants/flowers. This helps the plants/flowers to make produce flowers, fruit, or vegetable, and make seeds.



Moths function the same way as butterflies. They are equally important because they feed on different plants/flowers. Specifically, by feeding on flowers that are nocturnal.



Hummingbirds have a mutualistic relationship with flowers, where the flowers provide nectar to attract the hummingbirds, and the hummingbirds pollinate the flowers as they move from flower to flower. When hummingbirds dip their long bills into red, tubular-shaped flowers to drink the nectar, pollen gets on their faces and beaks, this is spread as they move between flowers.



Use the QR code below to help you identify native plants in our Pollinator Garden:



1. <https://www.provenwinners.com/learn/how-to/catmint>
2. <https://www.carsonnow.org/story/10/08/2023/northern-nevada-backyards-and-gardens-alleles-aside-rabbitbrush-native-autumn-go!#:~:text=In%20late%20summer,%20rabbitbrush,%20a%20gorgeous%20plant%20despite%20its%20unflattering>
3. [https://www.nevadaaandubon.org/native-gardening/bird-friendly-annuals-perennials-of-northern-nevada#:~:text=Hummingbird-Trumpet%20\(Epilobium%20canum\)%20Also%20known%20as%20California%20Fuchsia%20and%20Zauschneria](https://www.nevadaaandubon.org/native-gardening/bird-friendly-annuals-perennials-of-northern-nevada#:~:text=Hummingbird-Trumpet%20(Epilobium%20canum)%20Also%20known%20as%20California%20Fuchsia%20and%20Zauschneria)

4. https://xerces.org/sites/default/files/2018-05/12-022_04_XercesSoc_NativeMilkweeds_Nevada_web.pdf

5. <https://desertgarden.com/desert-purple/>



Showy Milkweed (Asclepias Speciosa): is perennial that blooms a pinkish white flower in May-August and can grow up to 4ft tall. It loves moist soil and lots of sun. It attracts butterflies, bees, and hummingbirds.



Purple Sage (Salvia Dorrii): a sturdy, woody perennial that blooms purple flowers in late spring. It thrives in full sun and little water. It attracts, bees, and butterflies.



Common Yarrow (Achillea Millefolium): a perennial that grow to 3+ft tall and produce flat flowers at the top. It blooms in late summer/fall, it prefers full sun/partial shade, and some water. It attracts birds, bees, and other pollinators.



Great Plants To Use To Start Your Own Pollinator Garden:

Catmint (Nepeta): a shrub perennial that sprouts flowers in shades of lavender, pink, or white. It thrives in any environment that it is planted. These flowers attract hummingbirds, bees, and other pollinators.



Rubber Rabbitbrush (Chrysothamnus Nauseosus): a shrub that blooms in late summer with golden yellow flowers. It loves the sun and requires little water. It attracts butterflies, moths, bees, and some birds.






Hummingbird Trumpet (Epilobium Canum): it is a vine that produces beautiful, bright cupping flowers late in the summer/early fall. It can grow in full sun or partial shade with little water. It attracts hummingbirds, bee, and butterflies.




Nevada Bee Identification Guide

Devon Picklum¹, Cynthia Schopf, and Kevin Burbi²
¹ Ecology, Evolution, and Conservation Biology, University of Nevada, Reno, NV
² Nevada Bees and Butterflies
 In cooperation with Pollinator Partnership
 Photographs of Nevada bees by Joseph S. Wilson

Why bees are important: Bees provide essential ecosystem services in natural and agricultural landscapes as pollinators of three-quarters of flowering plants. For people, this means every third bite of food is the result of pollination. Plants rely on pollinators to reproduce and set seed. Honey bees pollinate crops, but native bees also have a role in agriculture and they are essential for pollination in natural landscapes. There are 3,000 native species of ground-nesting, twig-nesting and parasitic bees found within Nevada. This guide gives information for identifying 10 major groups of bees commonly observed in Nevada including key characteristics, sizes (in mm), nesting habits, floral preferences, and distinctive behaviors.

Bee Identification: Bees have three body segments: a head, thorax, and abdomen. The head has compound eyes, a pair of segmented antennae, and mouthparts including mandibles for biting, and the tongue for drinking nectar. The abdomen bears the legs and four wings. The abdomen contains digestive organs and the sting in females.



Female bees have special pollen-carrying hairs (scopa), usually on the legs, or in the case of leafcutters, under the abdomen. Honey bees and bumble bees carry pollen packed tightly into a ball on pollen baskets (corbiculae), concave areas on their hind legs.

Bumble bees (*Bombus* spp.)
 Family: Apidae - 10-23 mm
 Robust, black body, extensively covered with bands of black, yellow, orange, or whitish hairs, long face, pollen basket on hind legs.

- Social colonies nest underground, usually in abandoned rodent nests.
- Bumble bees pollinate in cool, cloudy weather when most bees are at home.
- Bumble bees can buzz-pollinate flowers, like tomatoes, that require vibration to release pollen.

Honey bees (*Apis mellifera*)
 Family: Apidae - 10-15 mm
 Light to dark brown body with pale and dark hairs in bands on abdomen. Abdomen some-shaped. Heart-shaped head; pollen baskets on hind legs.

- Large social colonies of 30,000 or more. Nest in man-made hives, tree hollows, or rock outcrops. Colonies swarm to locate new nests.
- Honey bees are not native to the U.S., but were brought over by Europeans in the 17th century.

Carpenter bees (*Xylocopa* & *Ceratina* spp.)
 Family: Apidae
Xylocopa - 13-30 mm
 Shiny dark black to metallic blue-green body, sparse hairs on abdomen, robust with massive jaws. Pollen-carrying hairs on rear legs.

- Solitary to communal, nests are burrowed into wood, often in roof eaves.
- *Ceratina* - 3-15 mm
 Shiny dark metallic blue-green body, sparsely haired, cylindrical abdomen. Pale yellow marks on face. Pollen-carrying hairs on hind legs.
- Solitary or subsocial, nest in twigs and stems.

Sweat bees (*Agapostemon*, *Augochlorella*, *Halictus* spp. & others)
 Family: Halictidae - 3-12 mm
 Two forms: 1) dull metallic blue or bright metallic green to copper or 2) black/brown with light bands of hair on the abdomen. Parasitic forms often have red abdomens. Slender body, pollen-carrying hairs on hind legs.

- Solitary to social, nest in the ground.
- Some are attracted to salt in your sweat.

Mining bees (*Andrena* & *Perdita* spp.)
 Family: Andrenidae - *Andrena* 7-18mm, *Perdita* 2-7 mm
 Black or dull, slender metallic body often with lacinia or reddish hairs. Pollen-carrying hairs on hind legs and side of thorax.

- Solitary or communal, nest in sand.
- *Andrena* are abundant in the spring as they are one of the first bees to emerge each season.
- *Perdita* is a diverse genus, bright yellow, black and whitish bees.

Cuckoo bees (*Nomada*, *Triepeolus* & *Sphecodes* spp.)
 Family: Apidae - 5-18 mm
 Slender and wasp-like, relatively thick antennae, often with few hairs. Red, black, or yellow body, banded abdomens. *Triepeolus* is black and white with red legs.

- Females do not collect pollen.
- Females are kleptoparasites, they lay their eggs in another bee's nest to steal the nectar and food.

Squash bees (*Peponapis* & *Xenoglossa* spp.)
 Family: Andrenidae - 10-18mm
 Brown body covered in dense light hair on the thorax and in bands on abdomen. Carry dense pollen-collecting hair on hind legs. May have light spot on face, males have long antennae. Appear to have protruding "nose".

- Solitary bees nest in the ground, often in or near pumpkin and squash fields.
- Only collect pollen from squash and pumpkins.

Leafcutter bees (*Megachile* spp.)
 Family: Megachilidae - 10-20 mm
 Black body with light or dark hairs. Pollen-carrying hairs beneath abdomen. Some have rather pointy abdomens. Head is as broad as the thorax with large mouthparts used to cut leaves.

- Females cut circular pieces from leaves to line their nests.
- Solitary, nest in beetle holes or wood nesting blocks, some in soil.

Mason bees (*Osmia* spp.)
 Family: Megachilidae - 5-20 mm
 Two forms: 1) black body covered in pale hairs or 2) dull metallic green blue and ochre. Carry pollen on hairs under abdomen. Head as broad as thorax, robust body, large mandibles.

- Collect mud to line their nests.
- Solitary, our nest in aggregations in natural or man-made holes such as beetle holes, nesting blocks, stems, or soil.

Long-horned bees (*Melissodes*, *Svastra* & *Eucera* spp.)
 Family: Apidae - 7-20 mm
 Robust and very hairy, dark body often with pale hair bands on abdomen. Dense pollen-carrying hairs on hind legs. Males have very long antennae.


- Solitary to communal, nest in sandy soil.
- Some species are especially attracted to asters, sunflowers, and mallows.

A Bee or Not a Bee? There are two kinds of insects that are often confused with bees: flies and wasps. Many flower-visiting flies (e.g. the Syrphidae) are bee and wasp mimics in color, form, and behavior. By mimicking bees and wasps so successfully, they gain protection from predators. So, how do you tell these pollinators apart?

Fly Identification: Flies have only one pair of wings, while bees have two pairs. Flies usually have short, stubby antennae with single hairs, or feathery antennae. They have piercing/sucking or sponging mouthparts. Many flies have huge eyes that meet at the top of their heads.

Wasp Identification: Wasps have two pairs of wings, chewing mouthparts, a sting in females, and long antennae. While bee hairs are branched (plumose), wasp hairs are simple and straight. Bees are also usually hairier and more robust than wasps. Many wasps have a distinctive constricted "waist" between the abdomen and thorax. While most wasps are carnivorous predators or parasites, some feed on pollen and nectar.

Now that you know how to tell the difference between bees, wasps and flies, try identifying the insects in the photos below. Answers are at the bottom.



Bees4Vets

is a local Nevada 501C3 whose mission is to assist military veterans and first responders living with PTSD or TBI. Beekeeping experiences in the local community combine outdoor activity, education, and community outreach. These activities create an environment of support and training where veterans and first responders can develop the interest and skills necessary to participate in beekeeping as a vocation or hobby.

Honey bees play a critical role in America's food production. One out of every three bites of food can be attributed to the efforts of these tiny pollinators.



Signs Provided by Partners



Day 1- Installing Signs



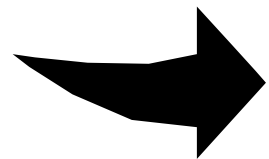
Day 1- Installing the Walkway

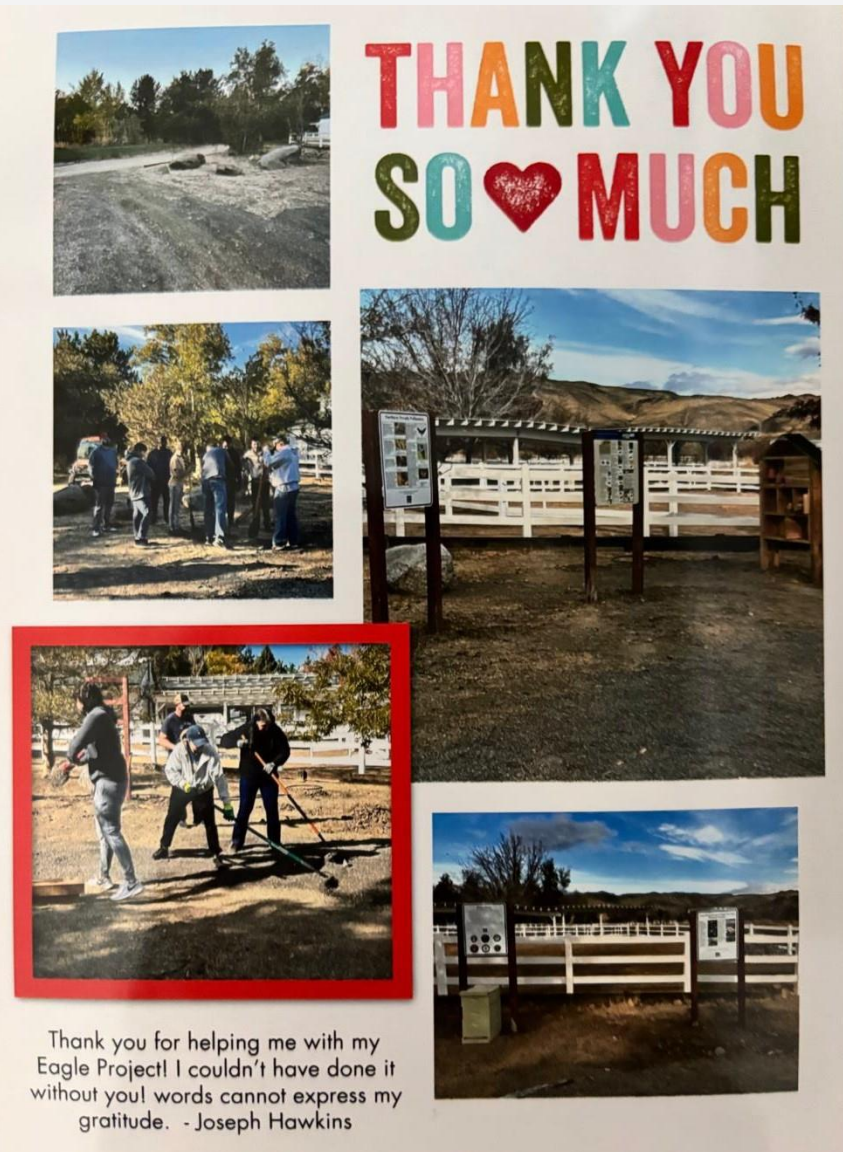


Day 2- Installing the Bee Hotel



Before and After





- ◆ Thank you all for your help and support!!!
 - ◆ -Joseph Hawkins