

# Habitat Management for Bumble Bees in Nebraska

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# Acknowledgments



This guide was made possible with support from the University of Nebraska–Lincoln and the Nebraska Environmental Trust. Additional support was provided by Annie’s, the Carroll Petrie Foundation, Cascadian Farm, Ceres Trust, Cheerios, CS Fund, The Dudley Foundation, General Mills, Häagen-Dazs, Justin’s, Muir Glen, Nature Valley, Turner Foundation, White Pine Fund, and Whole Foods Market.

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We thank the following for their careful review and input on this publication: Leif Richardson and Emily May of the Xerces Society, Chris Helzer of The Nature Conservancy, Scott Luedtke of the Nebraska Game and Parks Commission, Allyson Frank, Daniel Frank, Kayla Mollet, Mike Klosterman of Pheasants Forever, Elaine Evans of the University of Minnesota, Shaun Dunn of the Nebraska Game and Parks Commission, Scott Wessel of the Nebraska Game and Parks Commission.

Editing and layout: Sara Morris, The Xerces Society.

## Photographs & Artwork

We are grateful to the many photographers and designers for allowing us to use their wonderful photographs and illustrations. The copyright for all photographs and illustrations is retained by the creators. None of the photographs or illustrations may be reproduced without permission from the creator. Cover photos—FRONT (clockwise from left to right): Yellow bumble bee (*Bombus fervidus*) female flying to lupine (*Lupinus* sp.); half-black bumble bee (*B. vagans*) sleeping on rough blazing star (*Liatis aspera*); brown-belted bumble bee (*B. griseocollis*) on leadplant (*Amorpha canescens*). (Photos Xerces Society / Katie Lamke [left, bottom right]; Justin Meissen / Flickr [top right].) BACK: Female American bumble bee (*B. pensylvanicus*) collected, recorded, and released during the Nebraska Bumble Bee Atlas (left); bumble bees collected during a survey sit on a person’s hands to warm up after being chilled and recorded. (Photos Xerces Society / Katie Lamke.)

## Citation

Powers, R., K. Lamke, J. Hopwood, and R. Hatfield. 2022. *Habitat Management for Bumble Bees in Nebraska*. 20 pp. Portland, OR: The Xerces Society for Invertebrate Conservation.

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## Introduction to Bumble Bees

Bumble bees (*Bombus* spp.) are charismatic and easily recognizable pollinators, thanks to their loud buzz, large size, and distinct color patterns. In Nebraska there are up to 20 different species of bumble bees that play an incredibly important role in sustaining the health of our environment; their pollination services contribute to the successful harvest of many crops and help to maintain healthy plant communities. The bumble bee's unique physiology enables them to fly in adverse weather conditions and their long tongues allow them to access a diversity of flower types. Paired with their large colony sizes and long flight seasons, bumble bees are a significant group of pollinators.

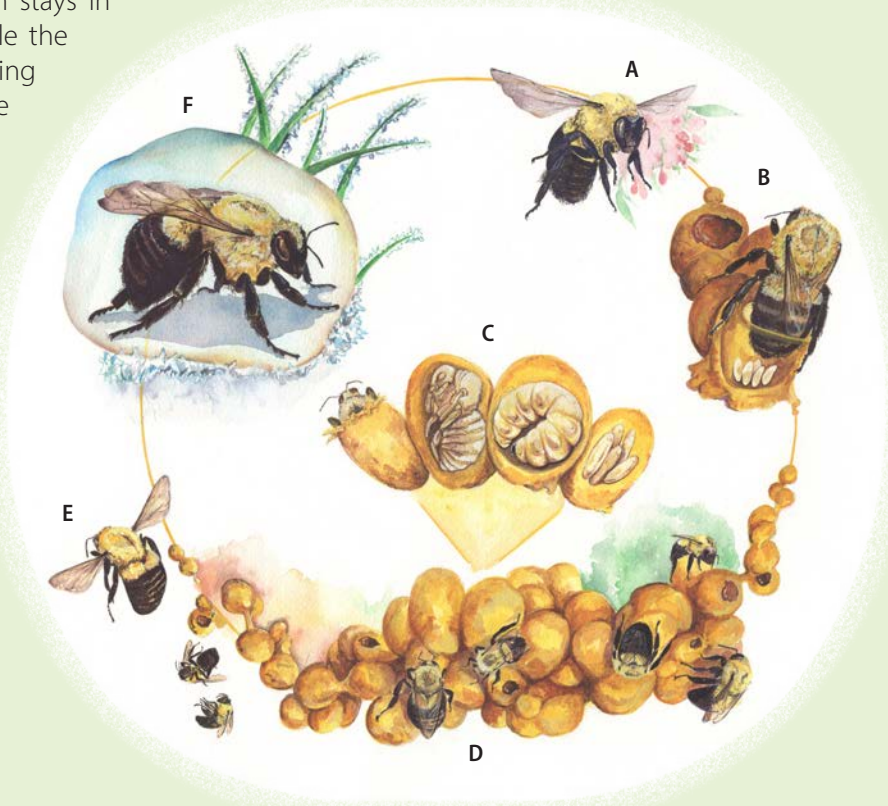
Unfortunately, many of our bumble bees face an uncertain future. A 2014 status assessment of bumble bees found that at least one quarter of North America's ~50 species may be facing the threat of extinction. In the past twenty years, only 15 species of bumble bees have been observed in Nebraska, five fewer species than historically recorded between 1800–2001. Nebraska lists four bumble bee species as Species of Greatest Conservation Need (SGCN) in the Nebraska Natural Legacy Plan, including the Southern Plains bumble bee (*Bombus fraternus*), Suckley cuckoo bumble bee (*B. suckleyi*), western bumble bee (*B. occidentalis*), and variable cuckoo bumble bee (*B. variabilis*). While these declines are not fully understood, contributing factors include habitat loss, pesticide exposure, climate change, low genetic diversity, and the amplification and distribution of pathogens through commercial pollinators. The most immediate and productive steps that we can take to conserve these imperiled pollinators is to intentionally manage and restore existing habitat and/ or create additional habitat.

### The Bumble Bee Life Cycle

Bumble bees are social insects with colonies that last one year. The annual life cycle begins in spring when a mated queen emerges from her overwintering burrow (A). This queen, the colony foundress, spends time locating a suitable nest location. Once found, she begins to construct waxen pots to store nectar. She'll then make a brood clump, an additional wax surface provisioned with balls of pollen, moistened with nectar. She will lay her first clutch of eggs on the brood clump and cover it with wax (B). The queen will then alternate her time between incubating the eggs and foraging. After the eggs hatch into worm-like larvae, they spend several weeks eating and growing before they pupate, and finally emerge as winged adults (total time from egg to adult is 4–6 weeks) (C).

Once the first brood of workers emerge, the queen stays in the nest to lay eggs and tend to her offspring, while the workers carry out other tasks, such as foraging, caring for developing brood, and defending the nest (D). The colony will reach peak size by mid-summer, which can range from 25–1,000 individuals depending on the species and habitat quality.

As summer fades, the colony will produce male bees (who leave the natal nest in search of a mate) and new queens—though not all colonies will successfully reach this stage. The foundress queen, worker bees, and males die at the end of the annual colony cycle (in late summer or fall), while newly mated queens (gynes) receive support in the nest from any remaining workers and spend time foraging to build up fat reserves (E). Each queen will then locate a safe place to overwinter and enter a hibernation-like state until the following spring when they will begin the cycle anew (F).



Artwork: Trenton Jung

# Recommended Management Practices for Bumble Bee Conservation

Here we include recommended practices for managing lands specifically for the conservation of bumble bees in Nebraska (Note: New habitat creation is not detailed in this document; for more information on that topic, see [Resources on page 13.](#)).

These recommendations combine the latest understanding of bumble bee habitat needs with lessons learned from the Nebraska Bumble Bee Atlas (NEBBA). NEBBA is a collaborative effort between the University of Nebraska-Lincoln and the Xerces Society with support from the Nebraska Environmental Trust. NEBBA data informed this document and will continue to contribute to ongoing research, all of which is possible because of the time and effort from the many community scientists who traversed the state to conduct bumble bee and landscape surveys.

## Habitat Needs

To support bumble bees throughout their life cycle, landscapes need to include three habitat components: foraging, nesting, and overwintering resources. These may not all be in the same location but will likely be in close proximity. While ideal bumble bee habitat varies by species, there is significant overlap in timing and utilization of resources.

Creating or maintaining some version of foraging, nesting, and overwintering resources (as described below) in the landscape will support bumble bees. There is a large body of knowledge regarding foraging habitat, allowing for more specific, evidence-based management recommendations. Currently, less is known about nesting and overwintering habitat, therefore these are more general recommendations.

## Foraging Habitat

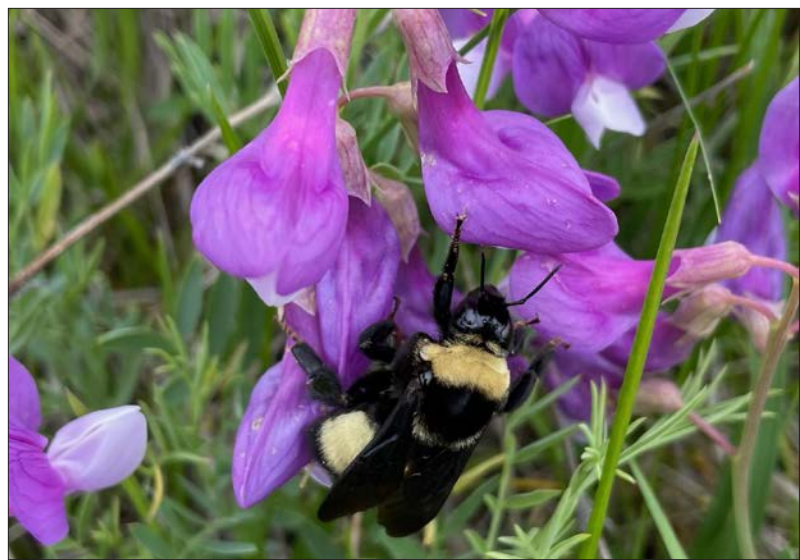
To successfully reproduce, bumble bee colonies need a diversity and abundance of flowering plants throughout their active season, April–October in Nebraska. Providing flowering plants at either end of the active season can be a challenge, but it is key to supporting queen bumble bees. Early blooming trees, shrubs, and flowering ground covers are great spring food sources while asters (*Symphyotrichum* spp.), sunflowers (*Helianthus* spp.), and native thistles (*Cirsium* spp.) are excellent late season resources (see [Appendix B: Plant Lists on page 17.](#)).

**The term ‘native’ in this guide refers to species that were indigenous to all or part of Nebraska pre-European settlement.**

### What Does High-Quality Bumble Bee Habitat Look Like?

You should be able to stand at various locations around your property and see:

- Blooming flowers throughout the spring, summer, and fall
- Several different species of native flowers in bloom—and pesticide-free—at any time
- Different heights of vegetation, including bunchgrasses and small patches of bare ground that will remain undisturbed from April–October
- Brush or rock piles
- Transition zones between grassland to native woody or shrubby habitats where appropriate



Black-and-gold bumble bee (*B. auricomus*) on manystem pea (*Lathyrus polymorphus*). (Photo: Sarah Bailey / Prairie Plains Resource Institute.)



Bumble bees can be found in a variety of landscapes. Native plants on roadsides provide food and shelter for wildlife and can help connect isolated patches of habitat. Flowering cover crops or blooming field weeds can serve as a temporary source of pollen and nectar. (Photo credits [left to right]: Xerces Society / Jennifer Hopwood; Xerces Society / Kathryn Prince; Dustie Lohmeyer / Wikimedia Commons.)

Bumble bees are considered generalist foragers, meaning they will utilize many different types of flowering plants, but visit native species when they are available. Data from the NEBBA showed that 80% of bumble bee visits were to native plants. It is best to manage for a variety of flowering plants; consider flower shape, size, color, bloom period, growth habit (forbs/herbs, shrubs, trees, and vines), as well as duration (annual, perennial, biennial) when evaluating site conditions and making management decisions. Monocultures of sod forming grasses are poor bumble bee foraging habitat, as are areas invaded by eastern red cedar (*Juniperus virginiana*). Areas with a diversity and abundance of native wildflowers that are free from pesticide contamination is ideal foraging habitat for bumble bees. When selecting native plants, ensure they are adapted to your region and be careful not to select horticultural varieties that may look nice but do not offer nectar or pollen.

## Nesting Habitat

Most bumble bees nest on or beneath the ground in a pre-existing insulated cavity, though nest site selection varies by species. They will often utilize abandoned rodent burrows but have also been observed nesting in “messy” areas—rock piles, under logs, in dense brush or brambles, hay bales, or within bunchgrasses. Some species will nest aboveground in tree cavities, bird nests, or exposed housing insulation. Bumble bee nests have been observed in open areas, as well as in woodland areas; the edges between these two plant communities also seem to be important. It is uncommon for bumble bees to reuse a nest site the following year. Due to the uncertainty associated with bumble bee nest site selection, providing a diversity of habitat types across the landscape with the features described above is recommended. Nesting habitat should remain largely untouched through the growing season.



Common eastern bumble bees (near the entrance of their subterranean nest. This species will often form their nest 1–3' underground in abandoned rodent burrows. Tunnel length leading from the surface to the nest varies from ~18" up to 9'. (Photo: Sarah Bailey / Prairie Plains.)

Nesting and foraging habitats are not necessarily found in the same location; individual bees can travel up to two miles from the colony in search of food. Generally, foraging near the nest is the most efficient choice as opposed to expending energy on a long flight. However, staying close to home is not always possible or preferable. Higher quantities and qualities of pollen and nectar may be accessible at a greater distance or the workers may have exhausted the flowers nearest the nest (depending on the density of workers or if it's later in the season). Foraging away from the nest site might also help to protect the nest site from potential predators.

## Overwintering Habitat

Newly mated bumble bee queens—the reproductive females responsible for starting next year’s colonies—overwinter (or hibernate) alone, outside their natal nest. This is an important and vulnerable phase of the colony cycle where the overwintering queen must survive a solitary period of inactivity for at least six months in order for the colony to reproduce. Yet, because it is difficult to find and study hibernating queens, many knowledge gaps exist for this phase of the colony cycle.



American bumble bee (left) and two-spotted bumble bee (right) queens preparing to overwinter. (Photos: Sarah Bailey / Prairie Plains Resource Institute [left]; Michael Pecha [right].)

What we do know indicates that overwintering queens are typically found approximately 1–6" (2–15cm) underground or nestled into plant litter; requiring sites with adequate organic material, mossy ground cover, or loose soils. They have been found in shaded areas near tree bases without dense vegetation, as well as on sheltered north-facing slopes (though this might reflect the difficulty of conducting searches in dense vegetation as much as habitat preference). Bumble bee queens don’t usually overwinter within their natal nest, though some species have been observed overwintering nearby. Landscapes with compacted soils, very little plant litter, and frequent ground disturbance (e.g., tilling or thatch/litter removal by haying, mowing, or burning) are poor overwintering sites for bumble bees.

## Supporting Bumble Bees in Towns and Cities

In addition to natural areas, bumble bees are often found within towns and cities. Providing overwintering, nesting, and foraging habitat in yards, parks, gardens, and other public spaces will attract bumble bees.

### Recommended Practices for Yards, Parks, and Public Spaces:

- Native plants with overlapping bloom periods from spring through fall are the best source of food for bumble bee colonies and fit well in many landscapes.
- Avoid pesticide use, especially for aesthetic or cosmetic purposes.
- If pesticides are used, take steps to mitigate their risk: choose products that are less harmful to bumble bees, target applications to avoid drift or overspray onto flowering plants, avoid use when plants are flowering, and use during periods when bumble bees are less active (after dusk).
- Avoid the use of systemic insecticides, which are absorbed and can be transported through the plant’s tissues and expressed in pollen and nectar.
- Ask your nursery for plants grown without systemic insecticides.
- Work with your community to develop sustainable mosquito management practices that avoid harming bumble bees and other beneficial insects. See Resources for more information.
- Leave “messy” areas in your space, such as rock piles, uncut bunchgrasses, downed branches or logs, and areas with leaf litter.
- Keep patches of land that are unmown and untilled.
- To protect overwintering queens, avoid raking and mowing early in the season. If possible, delay mowing and raking until daytime temperatures are above 65°F for 14 consecutive days, especially in north-facing areas.
- Display a pollinator habitat sign to help others understand that your space is actively managed for a particular purpose.

American bumble bee (*B. pensylvanicus*) on white clover (*Trifolium repens*). (Photo: Kellie Hayden.)



See the [Resources on page 13](#), for native plant/seed providers and resources for additional nesting and overwintering information.

# Bumble Bee Habitat in Nebraska

Nebraska is home to many ecosystems that support a diversity of bumble bees. From oak woodland and tallgrass prairie in the east to shortgrass prairie in the west, there is a rich assortment of landscapes that provide fertile ground for bumble bee populations.

As generalist species, bumble bees will utilize a variety of ecological communities—riparian areas, woodlands, grasslands, wetlands, working lands, developed lands, etc. In Nebraska, nearly all species have been found to utilize grasslands. However, some species are associated with particular habitats, such as the half-black bumble bee (*B. vagans*) which is more likely to occur in forested areas of the state but may also be found in grasslands. Depending on the species' range, it may occur in many types of prairies across the state like the American bumble bee (*B. pensylvanicus*), while others like Hunt's bumble bee (*B. huntii*) rely on shortgrass prairies in western Nebraska. Some species will happily thrive in our towns, cities, and roadsides, like the common eastern bumble bee (*B. impatiens*), while others are more abundant in our natural areas like the yellow bumble bee (*B. fervidus*). Farmscapes or other working lands that foster suitable habitat (e.g., flowering field borders, windbreaks, shelterbelts) can support populations if managed appropriately, but row crops do not provide nesting or overwintering areas and are generally poor forage for bumble bees. Maintaining the incredible diversity of bumble bee habitat in Nebraska is vital to the future of bumble bees in the Great Plains and depends on active management by landowners and managers.

## Management Recommendations

Historically, Nebraska's ecosystems were shaped both by natural disturbances—such as herds of grazing bison and browsing mammals, flooding, and drought—and the active management of prairie by native people, primarily through the use of fire. Many of these managed and natural disturbances have disappeared entirely or changed over time. In order to continue the careful management of our predecessors in the native prairies of the Great Plains and shepherd these valuable ecosystems into the future, active management is required. Thoughtfully planned grazing, prescribed fire, and haying/mowing can maintain healthy ecosystems for wildlife, including bumble bees. In the short term, some management activities may temporarily reduce bumble bee populations or habitat quality; but, if done carefully, managed disturbances can increase both over the long term.

### General Recommended Practices\*:

*\*Implement with all management strategies*

- Use adaptive management strategies that monitor effects of management on vegetation, adjusting practices as necessary to achieve goals and account for contingencies.
- Maintain or restore a mosaic of foraging, nesting, and overwintering habitats.
- When implementing a disturbance treatment of any type, do not treat more than 1/3 of a managed area at a time. Do not disturb an entire site in a single year.

Providing within site refuge is critically important in all habitats. In fragmented landscapes like the prairie surrounded by agriculture (left), disturbance-free refuge areas may help maintain the bumble bee populations on the site. In large, intact landscapes, like the rangeland shown on the right, neighboring habitat can contribute to bumble bee populations on site. (Photos: Ethan Freese/Platte Basin Timelapse [left]; Jennifer Hopwood [right].)



## Grazing

Bumble bees are an essential component of healthy rangelands, pollinating a wide array of wildflowers that provide and improve nutritional forage for livestock. As one of the dominant land-use types in Nebraska, rangelands are also essential for bumble bees, providing acres of contiguous grasslands with diverse floral communities, and ample spaces for nesting and overwintering. Well-managed grazing can increase plant diversity, including wildflowers, creating high-quality habitat for bumble bees and other wildlife.

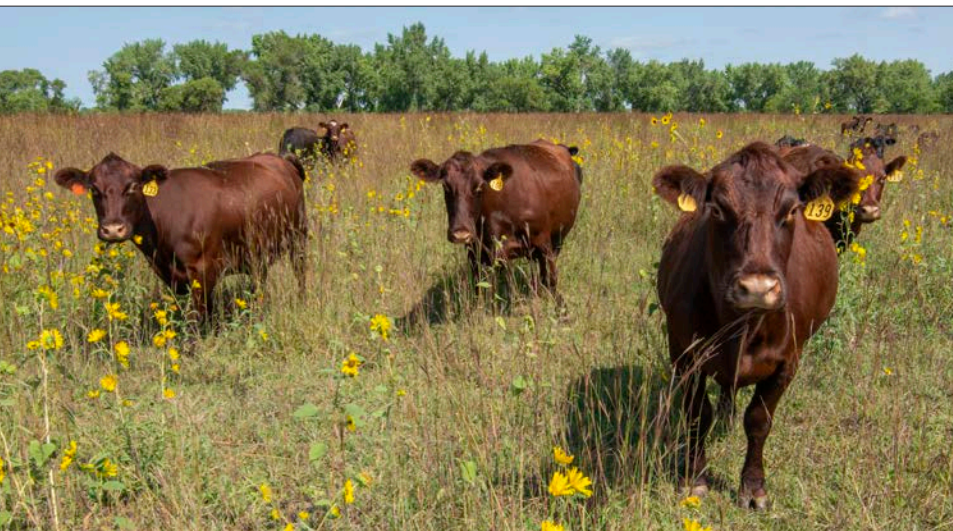
Grazing can also pose risks to bumble bees. Chronic overgrazing and broadcast-spraying herbicides for broadleaf plants can lead to the long-term depletion of native prairie plants and degrade rangeland health. Grazing that encourages a high abundance and variety of native wildflowers throughout the growing season is ideal for bumble bees. Grazing events or regimes that decimate or suppress wildflowers in a local area or across the landscape are harmful to bumble bees, particularly if blooming species are not present during critical life stages (early spring and fall when solitary queens lack the support of a colony). Bumble bee colonies and overwintering queens can also be trampled by livestock; this may be more of a risk when stocking rates are high. These potential impacts vary by grazing practice and by livestock species. For example, sheep eat more wildflowers and less grass than cattle, horse, and bison; as a result, sheep-grazed pastures may support fewer bumble bees.

Well-managed rangelands are incredibly important habitats for bumble bees in Nebraska. There are several considerations for bumble bees when designing grazing practices that are compatible with livestock production and bumble bee diversity.

### Recommended Grazing Practices:

- Implement a grazing system that:
  - ⇒ Supports native wildflower abundance and diversity.
  - ⇒ Avoids chronic overutilization.
  - ⇒ Changes season of use from year to year to ensure no unit is grazed during the same time every year.
  - ⇒ Provides proper rest and recovery of vegetation, allowing wildflowers periodic opportunities to bloom and set seed.
- If a unit is grazed continuously or season-long for multiple years, keep stocking rates low or moderate.
- Plan carefully to maintain native wildflower abundance and diversity in sheep-grazed landscapes. If possible, limit sheep grazing on public lands or in areas with records of SGCN bumble bee species, use sheep grazing primarily for noxious broadleaf weed control.
- Integrating prescribed fire into grazing systems can direct grazing pressure and maintain a variety of plant communities and vegetation heights. **If** prescribed fire is integrated into grazing systems, follow recommended management practices for **both** disturbance management techniques.

Left: Well-managed rangelands in Nebraska are critically important for bumble bees. Right: An American bumble bee visits a prairie larkspur (*Delphinium carolinianum*) on rangeland in south central Nebraska. (Photos: Chris Helzer / The Nature Conservancy.)







Left: Prescribed fire is a valuable tool to prevent eastern red cedar encroachment into grasslands. Right: the season following a burn is a good time to monitor wildflower diversity as their regrowth is not concealed by grass or plant litter. (Photos: Chris Helzer / The Nature Conservancy.)

## Prescribed Fire

Prescribed fire is a management tool used on rangelands and other landscapes in Nebraska. Well-planned use of controlled burns can limit woody plant encroachment, help control invasive species, and maintain healthy plant communities. The interactions between prescribed fire and bumble bees are not well understood yet but bumble bees are likely affected in different ways depending on the season and intensity of the burn. While adult bumble bees may be able to seek refuge, the colony will not survive if their nest is destroyed in the burn area. Additionally, burning can temporarily remove floral resources for bumble bees. Varying the timing and intensity of burns across years and maintaining unburned areas while also achieving land management goals will help sustain high-quality habitat for bumble bees.

Balancing the risks of fire to bumble bees and land management goals is complicated. Carefully planned prescribed burns that encourage a diverse native plant community in the long term are recommended. However, it is imperative to leave unburned areas each season that can serve as refuge for bumble bees and other wildlife. Low intensity, patchy burns on cool, humid days are ideal for bumble bee short term survival but may not achieve land management objectives that support bumble bee habitat and long-term health. For example, high-intensity burns help control eastern red cedar, a critical threat to much of Nebraska's grasslands, but will negatively affect bumble bees in the short term (e.g., nest incineration). However, both the grassland and bumble bees will benefit from using such tools to halt cedar invasion in the long term.

The timing of prescribed burns impacts bumble bees. Dormant-season burns can be a crucial part of maintaining or restoring bumble bee habitat because they encourage early blooming wildflowers and help control invasive species that threaten bumble bees. Cool season invasive species like smooth brome (*Bromus inermis*) outcompete many native wildflowers, removing bumble bee forage (see the invasive species section below for additional guidance). However, dormant-season burns can potentially harm or kill overwintering queens resting on or just centimeters below the surface. Late spring (April–May) and early fall (September–October) burns may be particularly harmful as these are sensitive times of year. Bumble bee queens need energy from high-quality floral resources in spring to begin nesting and again in the fall to prepare for overwintering. Recognizing that these sensitive periods overlap with critical control times, it is best to develop a thoughtful prescribed fire regime that meets the intended management goal and works to improve grassland plant diversity over the long term.

### Prescribed Fire Recommended Practices:

- When it is compatible with other prescribed fire goals, avoid high-intensity fire (work to minimize peak soil temperatures).
- Rotate burns, maintaining some unburned areas within the landscape each year.
- If small patches fail to burn within the burn unit, leave them unburned.
- Dormant season burns are recommended for bumble bees (November–March), but high-intensity burns may impact overwintering queens.



Hay meadows can be important sites for plant diversity and bumble bees. (Photo: Chris Helzer / The Nature Conservancy.)

### Native Thistles Are Not Weeds

Nebraska has six native thistle species that provide valuable resources for wildlife, particularly bumble bees. To distinguish native thistles (A) from non-native thistles (B), examine the underside of the leaf. All of our native thistles have dense hairs on the underside of the leaf, giving it a whitish or silvery color (C). Non-native thistles are green on both sides of the leaf, although Canada thistle (*Cirsium arvense*) may have a pale whitish film (D).

(Photos: Justin Meissen / Flickr [A]; Xerces Society / Sarah Foltz Jordan [B, C]; Bruce Ackley, The Ohio State University / Bugwood.org [D].)



## Haying and Mowing

Haying and mowing—the cutting of hayfields, roadsides, field borders, and other spaces that include wildflowers—helps prevent woody encroachment and maintain diverse plant communities. The removal of plant material through haying is more beneficial for plant diversity than mowing. However, both haying and mowing pose similar risks to bumble bees as other disturbances since they remove floral resources and can destroy nesting and overwintering sites. Varying the timing of haying each year will promote plant diversity. If possible, however, try to avoid cutting during sensitive life stages for bumble bees in late spring and early fall.

### Haying and Mowing Recommended Practices:

- One haying per year is recommended, if possible.
- Provide refuge areas by haying or mowing in strips or patches instead of cutting an entire site (e.g., leave  $\frac{1}{3}$  uncut in any given year).
- Vary the month of haying and mowing from year to year to encourage plant and pollinator diversity.
- Hay during daylight hours at reduced speeds (less than 8 mph) so adult bumble bees have time to disperse.
- Using a flushing bar on the windrower may help reduce risk to adult bumble bees.
- Avoid cutting in late spring (April–May) and early fall (September–October).
- If haying an entire site is unavoidable, cut at a high height or offset the timing of haying, cutting  $\frac{1}{2}$  the site early in the season and  $\frac{1}{2}$  the site late in the season.

## Invasive Plant Species Control

Invasive plant species can overwhelm native plant communities, leading to degraded floral diversity and impacting bumble bees. Treating invasive species infestations will improve bumble bee habitat but some treatments can be detrimental to bumble bee populations in the short term.

There are many methods to control invasive plant species, including mechanical control through mowing, cultural control strategies such as targeted grazing or prescribed burning, and chemical control using herbicides. In general, following the recommended practices for the management activities outlined in this document—grazing, prescribed fire, haying and mowing, and pesticide use (below)—will protect bumble bees. In some cases, bumble bees may be accustomed to floral resources of certain invasive plants. If so, it may be useful to consider how to ensure other flowers will still



**It is critical to correctly identify noxious weeds or invasive species. Invasive and/or noxious plants are listed online by the Nebraska Invasive Species program at <https://neinvasives.com/ecoregions/all>.** Some native species, like this native tall thistle (*Cirsium altissimum*), are beneficial and do not need controlling but may look similar to invasive species. Additionally, many plants (native and non-native), like the native sunflowers (*Helianthus* sp.) above right, may increase in response to temporary opportunities (e.g., after intense grazing events or drought conditions) but then decrease in abundance on their own without continued disturbance, are not a threat to habitat, and treatment is not needed. (Photos: Xerces Society / Ray Moranz [left]; Xerces Society / Anne Stine [right].)

be available when those invasive plants have been suppressed or eradicated. In certain situations, adding native grass and wildflower seed following treatment can help restore diversity to the site.

### **Invasive Plant Control Recommended Practices:**

- Identify nearby potential off-site seed sources for noxious weeds such as shelterbelts, roadsides, travel lands, and fence lines. Rigorously monitor areas near noxious weed seed sources.
- Prevent new invasive weed seed sources; avoid moving soil, hay, or other sources of seed, and clean tires and equipment after visiting sites with weed issues.
- Use plant identification guides to distinguish noxious and invasive weeds from nontarget species. For example, native thistles are not weeds and should not be treated. See [Resources on page 13](#).
- Target invasive species control methods to patches of infestation to avoid damage to nontarget plants.

### **Pesticide Use**

Use of pesticides—insecticides, herbicides, and fungicides—can affect bumble bees directly and indirectly. Exposed bumble bees may experience a variety of lethal or sublethal effects, which may reduce their ability to forage and reproduce. Insecticides in particular can be highly toxic to bumble bees, but other types of pesticides that fall short of killing a bee can have other important impacts that could affect their ability to survive and reproduce over the long term. Fungicides have recently been found to weaken bees, making them more susceptible to disease, and can also increase the toxicity of other products when applied in combination. Some herbicides can also have direct impacts on bees, affecting their growth and reproduction or ability to navigate back to the nest. Targeted herbicide use is an important tool in invasive plant management; whereas, broadcast herbicide use can reduce the quantity and quality of flowering resources for bumble bees. Implementing cultural, mechanical, or other nonchemical pest management practices that prevent plant diseases, weeds, and problematic insects can be an effective way to reduce pesticide use.

Negative impacts of pesticide combinations can be synergistic, not just additive, so avoiding tank mixes when possible is recommended. Pesticide labels are legal instruments that must be followed, but do not contain information about how to reduce harm to bumble bees or other native bees. Toxicity information on honey bees may be included on pesticide labels but it is not a good approximation of the risk to bumble bees and other native bees. The scale and structure of a honey bee hive is different from a bumble bee colony and even pesticides with low toxicity to honey bees can have a disproportionate effect on bumble bee populations. With many products, following more conservative practices than the label instructions, as outlined below, will help minimize the risk to bumble bees.

## Pesticide Use Recommended Practices:

- Use Integrated Pest Management (IPM) to guide pesticide use decisions:
  - ⇒ Identify and monitor for pests. Pesticides should be considered after monitoring indicates that pest populations have reached predetermined thresholds.
  - ⇒ Avoid prophylactic use of pesticides (including neonicotinoid and other seed treatments); pesticides should only be used when there is a demonstrated need.
  - ⇒ See [Pesticide Resources](#) for more information on IPM including tools to identify the active ingredients in trade-named seed treatments.
- Choose the least toxic option. See the [Resources](#) section for toxicity guidance.
  - ⇒ Avoid dusts and microencapsulated products which may stick to a bumble bee's pollen-collecting hairs. Foraging bumble bees transport these pesticides back to the colony.
  - ⇒ Systemic insecticides are of particular concern.
- Apply the pesticide as directly and locally as possible. For example, when using herbicides to manage invasive species and restore plant communities, use targeted application methods such as cut-stem or basal bark treatments for woody plants or spot-spraying of herbaceous plants to avoid more widespread use and potential bumble bee exposure.
- If possible avoid applications to target plants when in bloom, spray when plants are most vulnerable and before seed set. If plants are most vulnerable while in bloom, avoid daytime applications.
- Avoid applying combinations of insecticides and fungicides that together may increase the risk to pollinators.
  - ⇒ Avoid tank-mixing pesticides and clean all equipment thoroughly between uses.
  - ⇒ Carefully consider the use of adjuvants—spray tank additives that improve the activity of pesticides—such as 'sticker-spreaders' or emulsifiers. Pesticide adjuvants can, in some cases, significantly increase the toxicity of pesticides to bees upon contact.
- Take all possible measures to limit off-site movement into field margins or flowering habitat. Reduce spray drift:
  - ⇒ Avoid aerial spraying and mist blowers.
  - ⇒ Do not spray on windy days (winds >15mph).
  - ⇒ Do not spray during temperature inversions, which can lead to damaging long-distance drift of volatile pesticides.
  - ⇒ Calibrate equipment regularly.

## Managed Bees

An additional consideration for bumble bees is the presence and abundance of managed bees, including non-native species like the western honey bee and alfalfa leafcutter bee (*Megachile rotundata*) along with North America-native bees brought in from distant locations (e.g., commercial common eastern bumble bee colonies and blue orchard mason bees [*Osmia lignaria*]). Managed bees can transmit diseases to wild bumble bees and may compete for pollen and nectar or nesting locations.

## Managed Bees Recommended Practices:

- Do not place managed bee hives, colonies, or artificial nest blocks in or near areas that are of special value for biodiversity (e.g., remnant prairies, state parks, national grasslands, and forests) or that have records of declining bumble bees. Ideally, no hives would be placed within four miles of these areas.
- In areas that are appropriate to support managed bees, when adding hives to the site, consider increasing the area and density of flowering habitat to help support native and managed bees. A single hive may use up to 130 lbs/year of pollen and 900 lbs/year of nectar.
- Avoid using commercial bumble bee colonies in open field settings.

## Resources

### Management Resources

- *Rangeland Management and Pollinators: A Guide for Producers in the Great Plains*  
<https://xerces.org/publications/fact-sheets/rangeland-management-and-pollinators>
- *Nebraska Bumble Bee Identification Guide*  
<https://xerces.org/publications/identification-and-monitoring-guides/guide-to-bumble-bees-of-nebraska>
- *Conserving Bumble Bees: Guidelines for Creating and Managing Habitat for America's Declining Pollinators*  
<https://xerces.org/publications/guidelines/conserving-bumble-bees>
- *Nesting and Overwintering Habitat: For Pollinators and Other Beneficial Insects*  
<https://xerces.org/publications/fact-sheets/nesting-overwintering-habitat>
- *Maintaining Diverse Stands of Wildflowers Planted for Pollinators*  
<https://xerces.org/publications/guidelines/maintaining-diverse-stands-of-wildflowers-planted-pollinators>
- *Pollinator-Friendly Parks: Enhancing Our Communities by Supporting Native Pollinators in Our Parks and Other Public Places*  
<https://xerces.org/publications/guidelines/pollinator-friendly-parks>
- *Roadside Best Management Practices that Benefit Pollinators: Handbook for Supporting Pollinators through Roadside Maintenance and Landscape Design*  
<https://xerces.org/publications/guidelines/roadside-best-management-practices-that-benefit-pollinators>
- *An Overview of the Potential Impacts of Honey Bees to Native Bees, Plant Communities, and Ecosystems in Wild Landscapes: Recommendations for Land Managers*  
<https://xerces.org/publications/guidelines/overview-of-potential-impacts-of-honey-bees-to-native-bees-plant>
- Nebraska Native Seed and Plant Producers Association  
<https://nnspp.weebly.com/>
- Nebraska Invasive Species Program  
<https://neinvasives.com/>
- Center for Grassland Studies Plant Identification  
<https://grassland.unl.edu/plant-identification>

### Pesticide Resources

- *Making Decisions About Neonicotinoid Seed Treatment Use in Iowa: Scouting and Field History Reports for Early Season Corn and Soybean IPM*  
<https://xerces.org/publications/guidelines/making-decisions-about-neonicotinoid-seed-treatment-use-in-iowa>
- *The Effectiveness of Neonicotinoid Seed Treatments in Soybean*  
<https://extension.entm.purdue.edu/publications/E-268/E-268-W.pdf>
- *The UC-IPM Bee Precaution Pesticide Rating Tool*  
<https://www2.ipm.ucanr.edu/beeprecaution/>
- *Protecting Pollinators from Insecticides: Fungicide Impacts on Pollinators*  
<https://xerces.org/publications/fact-sheets/protecting-pollinators-from-pesticides-fungicide-impacts-on-pollinators>
- *Habitat Planning for Beneficial Insects: Guidelines for Conservation Biological Control*  
<https://xerces.org/publications/guidelines/habitat-planning-for-beneficial-insects>
- *What's on your seed?*  
[https://ipcm.wisc.edu/download/pubsPM/Whats\\_on\\_your\\_seed\\_web.pdf](https://ipcm.wisc.edu/download/pubsPM/Whats_on_your_seed_web.pdf)
- *Searchable Systemic Insecticides List*  
<https://xerces.org/systemic-insecticides/list>

## Resources for Towns and Cities - Yards, Parks, Open Spaces

- **Bee City USA and Bee Campus**  
<https://beecityusa.org/>
- **Buying Bee-safe Plants**  
<https://xerces.org/publications/fact-sheets/buying-bee-safe-plants>
- **How to Help Your Community Create an Effective Mosquito Management Plan**  
<https://xerces.org/publications/guidelines/how-to-help-your-community-create-effective-mosquito-management-plan>
- **Establishing Pollinator Meadows from Seed**  
<https://xerces.org/publications/guidelines/establishing-pollinator-meadows-from-seed>
- **Nebraska Native Seed and Plant Producers Association**  
<https://nnspp.weebly.com/>
- **Pollinator-Friendly Parks: Enhancing Our Communities by Supporting Native Pollinators in Our Parks and Other Public Places**  
<https://xerces.org/publications/guidelines/pollinator-friendly-parks>

## Restoration Resources

- **Interseeding Wildflowers to Diversify Grasslands for Pollinators: Guidance for the Great Plains and Midwest Regions**  
<https://xerces.org/publications/guidelines/interseeding-wildflowers-to-diversify-grasslands-for-pollinators>
- **Habitat Installation Guide: Upper Midwest Pollinator Meadow**  
<https://xerces.org/publications/higs/upper-midwest-pollinator-meadow>
- **Prairie Restoration Technical Guide Series**  
<https://tallgrassprairiecenter.org/technical-guides>
- **Organic Site Preparation for Wildflower Establishment**  
<https://xerces.org/publications/guidelines/organic-site-preparation-for-wildflower-establishment>
- **Pollinator Plants: Northern Plains**  
<https://xerces.org/publications/plant-lists/pollinator-plants-northern-plains>

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# Appendix A: Top 10 Bumble Bees in Nebraska

**HOME PRINT SCALE CHECK**  
The bar above should be **25.4 mm / 1" long** at 100% scale.  
If it is not, check your printer's scale settings.

Nebraska is home to up to 20 species of bumble bees (*Bombus* spp.), each with their own defining color patterns, natural history, and habitat associations. Due to our central location in the United States, Nebraska contains a diversity of ecological communities, from oak woodland and tallgrass prairie in the east to shortgrass prairie in the west. As such, Nebraska provides suitable habitat for eastern U.S. species, like the black-and-gold bumble bee (*B. auricomus*), as well as western montane species, like Hunt's bumble bee (*B. huntii*). This list contains 10 of Nebraska's most commonly-observed bumble bees. For additional information on the species below, or on species not listed here, refer to *Bumble Bees of Nebraska: Recognizing These Important Pollinators*.

## Species Notes

**SIZE RANGE BY SEX**—Queen or foundress (♂); Worker (♀); Male (♂). Note: Size ranges are based off of national averages.





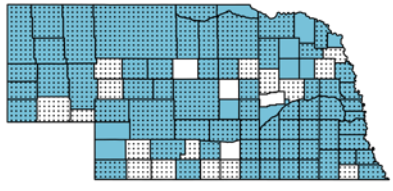




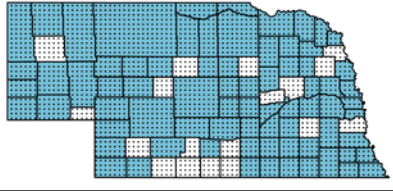




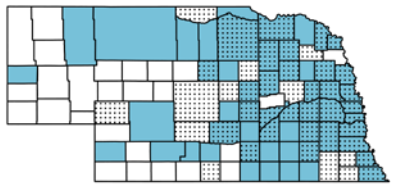




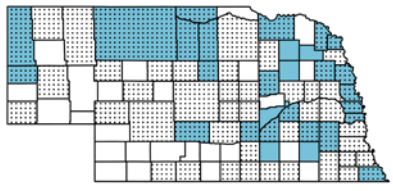
**INFORMATION** about species  
**NOTE** of concern regarding conservation or species status

**OBSERVED** population trends  
**NESTING** preferences/ habits

## Range Maps

**KEY** 1900–2018 2019–2021

**CREDITS**—**Maps:** Katie Lamke, Xerces Society (Feb 2022). **Data**—*Nebraska Bumble Bee Atlas* (2019–2021); Richardson (Oct 2021), *Bumble bees of North America* occurrence records database; Golick & Ellis (2006), *An Update on the Distribution and Diversity of Bombus in Nebraska*; LaBerge & Webb (1962), *Bumblebees of Nebraska*; Swenk (1907), *Bees of Nebraska III*. **Bumble bee illustrations**—Paul Williams (identification and color patterns); Elaine Evans, Rich Hatfield (bee body design). **Photos**—Xerces Society / Katie Lamke: 1, 2R, 3R, 4R, 5R, 6R, 7R, 8R, 9R, 10R; Ted Kyster: 2L; Xerces Society / Sarah Nizzi: 3L; Sarah Bailey Sarah Bailey / Prairie Plains: 4L; Kara Keating-Stuart: 5L; Mic Rhode: 6L; Julie Thornburg: 7L; Kellie Hayden: 8L; Xerces Society / Mace Vaughan: 9L; Xerces Society / Emily May: 10L.





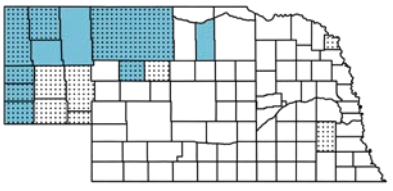
<b>1</b>	<b>Brown-belted bumble bee (<i>B. griseocollis</i>)</b>				
14 mm					
<b>Ef</b>	18-23 mm (♂); 10-16 mm (♀); 12-18 mm (♂)				
<b>h</b>	Nests underground, occasionally on the surface   <b>Q</b> Consistently the most common species observed statewide (1900–present)				
<b>2</b>	<b>American bumble bee (<i>B. pensylvanicus</i>)</b>				
17 mm					
<b>Ef</b>	22-26 mm (♂); 13-19 mm (♀); 15-21 mm (♂)				
<b>h</b>	Nests on the surface of the ground, sometimes underground; ability to produce large colonies   <b>Q</b> Frequently observed throughout the state   <b>▲</b> As of 2022, this species is under review by the U.S. Fish and Wildlife Service for protection under the Endangered Species Act because it is showing sharp decline throughout the northern part of its range in North America; local abundance in Nebraska is likely due to the state being centrally located within this species' range coupled with its ability to produce large colonies				
<b>3</b>	<b>Common eastern bumble bee (<i>B. impatiens</i>)</b>				
14 mm					
<b>Ef</b>	21-23 mm (♂); 9-14 mm (♀); 12-14 mm (♂)				
<b>h</b>	Nests underground; ability to produce large colonies   <b>i</b> Long active season (emerges early in spring, persists into fall)   <b>Q</b> One of the most common species found in eastern 1/2 of the state; modern records, while few, expand range into western Nebraska   <b>▲</b> This species is used to rear commercial bumble bee colonies for greenhouses, research, and educational purposes; lab-reared colonies may be detrimental to wild bumble bee populations and should only be kept in an enclosed area				
<b>4</b>	<b>Black-and-gold bumble bee (<i>B. auricomus</i>)</b>				
17 mm					
<b>Ef</b>	22-26 mm (♂); 16-19 mm (♀); 13-21 mm (♂)				
<b>h</b>	Nests on the surface of the ground; typically produces small colonies   <b>Q</b> Most commonly found in eastern 1/2 of state				

Continued on next page...

**5 Yellow bumble bee (*B. fervidus*)**

14 mm					
	<p>♀ 18-21 mm (♣); 11-17 mm (♀); 13-16 mm (♂)</p>				
<p>🏠 Nests aboveground or on surface, occasionally underground   🔍 Most commonly found in the shortgrass prairie and Sandhills ecoregions</p>					





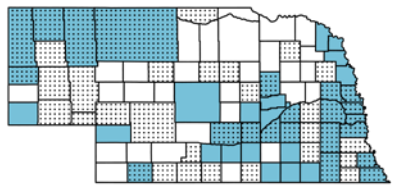
**6 Hunt's bumble bee (*B. huntii*)**

13 mm					
	<p>♀ 19-20 mm (♣); 11-14 mm (♀); 9-13 mm (♂)</p>				
<p>🏠 Nests underground   🔍 Most commonly found in the shortgrass prairie ecoregion of the panhandle</p>					

**7 Two-spotted bumble bee (*B. bimaculatus*)**

14 mm						
	<p>♀ 18-22 mm (♣); 10-16 mm (♀); 12-15 mm (♂)</p>					
<p>🏠 Nests underground, occasionally aboveground   ⌚ Early emerging species, often in April   🔍 Most commonly found in the tallgrass and mixed-grass prairie ecoregions; modern records, while few, expand range into western NE</p>						

**8 Southern Plains bumble bee (*B. fraternus*)**

19 mm					
	<p>♀ 25-27 mm (♣); 15-19 mm (♀); 22-25 mm (♂)</p>				
<p>🏠 Nests underground   🔍 Most commonly observed in the tallgrass prairie ecoregion   ⚠️ Species of Greatest Conservation Need (SGCN, Tier 1)—evidence-supported species in decline; Nebraska Game and Parks Commission manages the list of SGCNs and prioritizes these species when planning conservation efforts</p>					

**9 Nevada bumble bee (*B. nevadensis*)**

17 mm		<p>🏠 Nests underground, occasionally on surface</p> <p>⌚ Very large, robust species   🔍 Most commonly observed in the panhandle</p>			
	<p>♀ 24-25 mm (♣); 15-21 mm (♀); 16-19 mm (♂)</p>				

**10 Half-black bumble bee (*B. vagans*)**

14 mm					
	<p>♀ 17-21 mm (♣); 11-14 mm (♀); 11-14 mm (♂)</p>				
<p>🏠 Nests underground, occasionally aboveground   ⌚ Associated with forested areas   🔍 Found throughout state in relatively low abundance</p>					



## Appendix B: Plant Lists

Below are 50 plants that are widely distributed across the state and frequently visited by a diversity of bumble bees (data from the NEBBA). The top 10 bumble bee preferred plants that are unique to each ecoregion are also included.

### Top 50 Bumble Bee Plants of Nebraska

	SCIENTIFIC NAME	COMMON NAME			
Early	<i>Amorpha fruticosa</i>	Wild-indigo, false indigo-bush	MAY–JUN	P	SH
	<i>Astragalus canadensis</i>	Canada milkvetch	MAY–AUG	P	F
	<i>Glycyrrhiza lepidota</i>	Wild licorice	MAY–JUL	P	F
	<i>Lathyrus polymorphus</i>	Hoary vetchling	MAY–JUN	P	F
	<i>Lithospermum carolinense</i>	Plains puccoon	MAY–JUN	P	F
	<i>Penstemon grandiflorus</i>	Large beardtongue	MAY–JUN	P	F
	<i>Psoraleidum tenuiflorum</i>	Slender-flowered scurfpea	MAY–JUL	P	F
	<i>Rosa arkansana</i>	Arkansas rose	MAY–AUG	P	SU
	<i>Vicia americana</i>	American vetch	MAY–JUL	P	F
Mid	<i>Amorpha canescens</i>	Leadplant	JUN–JUL	P	SH/SU
	<i>Apocynum cannabinum</i>	Dogbane	JUL–AUG	P	F
	<i>Asclepias incarnata</i>	Swamp milkweed	JUN–AUG	P	F
	<i>Asclepias speciosa</i>	Showy milkweed	JUN–AUG	P	F
	<i>Asclepias syriaca</i>	Common milkweed	JUN–JUL	P	F
	<i>Bidens cernua</i>	Nodding bur-marigold / beggarticks	JUL–OCT	A	F
	<i>Cirsium flodmanii</i>	Flodman's thistle	JUL–AUG	P	F
	<i>Cirsium undulatum</i>	Wavyleaf thistle	JUN–AUG	P	F
	<i>Dalea candida</i>	White prairie clover	JUN–SEP	P	F
	<i>Dalea purpurea</i>	Purple prairie clover	JUN–AUG	P	F
	<i>Dalea villosa</i>	Silky prairie clover	JUN–AUG	P	F
	<i>Echinacea angustifolia</i>	Narrowleaf purple coneflower	JUN–JUL	P	F
	<i>Helenium autumnale</i>	Sneezeweed	JUL–OCT	P	F
	<i>Helianthus petiolaris</i>	Plains / prairie sunflower	JUL–OCT	P	F
	<i>Heliopsis helianthoides</i>	False sunflower	JUL–OCT	P	F
	<i>Monarda fistulosa</i>	Wild bergamot	JUL–AUG	P	F
	<i>Oenothera clelandii</i> (syn. <i>O. rhombipetala</i> )	Fourpoint evening primrose	JUN–JUL	B/A	F
	<i>Onosmodium bejariense</i>	Marbleseed	JUN	P	F
	<i>Peritoma serrulata</i> (syn. <i>Cleome serrulata</i> )	Rocky Mountain bee-plant	JUN–AUG	A	F
	<i>Persicaria amphibia</i> (syn. <i>Polygonum amphibium</i> )	Water smartweed	JUL–SEP	P	F
	<i>Salvia azurea</i>	Pitcher sage	JUL–OCT	P	F
	<i>Solanum rostratum</i>	Buffalo-bur	JUN–OCT	A	F
	<i>Solidago missouriensis</i>	Prairie goldenrod	JUL–SEP	P	F
	<i>Symphoricarpos occidentalis</i>	Wolfberry	JUN–JUL	P	W
	<i>Teucrium canadense</i>	American germander	JUN–JUL	P	F
	<i>Verbena hastata</i>	Common vervain	JUL–SEP	P	F
	<i>Verbena stricta</i>	Hoary vervain	MAY–SEP	P	F
	<i>Vernonia fasciculata</i>	Ironweed	JUL–SEP	P	F

KEY  BLOOM PERIOD  BLOOM TIME  LIFE CYCLE: Anual, Biennial, Perennial  FORM: Forb, Subshrub, Shrub, Woody

Continued on next page...

## Top 50 Bumble Bee Plants of Nebraska *continued*

🌸	SCIENTIFIC NAME	COMMON NAME	📅	🔄	🌿
Late	<i>Cirsium altissimum</i>	Tall thistle	AUG–OCT	P	F
	<i>Helianthus annuus</i>	Common sunflower	AUG–SEP	A	F
	<i>Helianthus grosseserratus</i>	Sawtooth sunflower	AUG–SEP	P	F
	<i>Helianthus maximiliani</i>	Maximilian's sunflower	SEP–OCT	P	F
	<i>Liatris lancifolia</i>	Lanceleaf gayfeather	AUG–OCT	P	F
	<i>Liatris punctata</i>	Dotted gayfeather	AUG–OCT	P	F
	<i>Liatris squarrosa</i>	Hairy gayfeather	AUG–OCT	P	F
	<i>Solidago canadensis</i>	Canada goldenrod	AUG–OCT	P	F
	<i>Solidago gigantea</i>	Giant goldenrod	AUG–OCT	P	F
	<i>Solidago rigida</i> (syn. <i>Oligoneuron rigidum</i> )	Stiff goldenrod	AUG–SEP	P	F
	<i>Symphotrichum ericoides</i>	Heath aster	AUG–OCT	P	F
	<i>Symphotrichum oblongifolium</i>	Aromatic aster	AUG–OCT	P	F
<i>Symphotrichum praealtum</i>	Willowleaf aster	SEP–OCT	P	F	

**KEY** 🌸 BLOOM PERIOD 📅 BLOOM TIME 🔄 LIFE CYCLE: Annual, Biennial, Perennial 🌿 FORM: Forb, Subshrub, Shrub, Woody

## Top 10 Bumble Bee Plants of the Sandhills Region

🌸	SCIENTIFIC NAME	COMMON NAME	📅	🔄	🌿
Early	<i>Anemone canadensis</i>	Meadow anemone	MAY–JUN	P	F
	<i>Cirsium canescens</i>	Platte thistle	MAY–JUN	B	F
	<i>Ribes aureum</i>	Golden currant	APR–JUN	P	SH
	<i>Ribes missouriense</i>	Missouri gooseberry	APR–JUN	P	SH
Mid	<i>Asclepias arenaria</i>	Sand milkweed	JUN–AUG	P	F
	<i>Asclepias stenophylla</i>	Slimleaf / narrow-leaved milkweed	JUN–JUL	P	F
	<i>Grindelia squarrosa</i>	Curlycup gumweed	JUL–OCT	P/B	F
	<i>Mentzelia nuda</i>	Sand lily	JUL–SEP	B/P	F
Late	<i>Solidago speciosa</i>	Showy / showy-wand goldenrod	AUG–SEP	P	F
	<i>Symphotrichum novae-angliae</i>	New England aster	AUG–OCT	P	F





**KEY** 🌸 BLOOM PERIOD 📅 BLOOM TIME 🔄 LIFE CYCLE: Annual, Biennial, Perennial 🌿 FORM: Forb, Subshrub, Shrub, Woody





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LEFT TO RIGHT: Black-and-gold bumble bee (*Bombus auricomus*) on wild bergamot (*Monarda fistulosa*); American bumble bee (*B. pensylvanicus*) stealing nectar from pitcher sage (*Salvia azurea*); Southern Plains bumble bee (*B. fraterus*) on Canada goldenrod (*Solidago canadensis*); male common eastern bumble bees (*B. impatiens*) on New England aster (*Symphotrichum novae-angliae*). (Photos: Sarah Bailey / Prairie Plains.)











## Top 10 Bumble Bee Plants of Shortgrass Prairie Region

	SCIENTIFIC NAME	COMMON NAME			
Early	<i>Lupinus pusillus</i>	Small lupine	MAY–AUG	A	F
	<i>Scrophularia lanceolata</i>	American figwort	MAY–JUL	P	F
Mid	<i>Campanula rotundifolia</i>	Harebell	JUN–SEP	P	F
	<i>Gutierrezia sarothrae</i>	Snakeweed	JUL–SEP	P	F
	<i>Lactuca biennis</i>	Tall blue lettuce	JUN–AUG	B	F
	<i>Mulgedium oblongifolium</i> (syn. <i>Lactuca tatarica</i> )	Pretty blue lettuce	JUL–AUG	B/P	F
	<i>Oenothera suffrutescens</i>	Scarlet gaura	JUN–SEP	P	F
	<i>Penstemon eriantherus</i>	Crested beardtongue, fuzzytongue penstemon	JUN	P	F
Late	<i>Chrysothamnus viscidiflorus</i>	Sticky / yellow rabbitbrush	AUG	P	SH/SU
	<i>Cirsium discolor</i>	Field thistle	AUG–SEP	B/P	F





KEY  BLOOM PERIOD  BLOOM TIME  LIFE CYCLE: Annual, Biennial, Perennial  FORM: Forb, Subshrub, Shrub, Woody





## Top 10 Bumble Bee Plants of the Mixedgrass Prairie Region

	SCIENTIFIC NAME	COMMON NAME			
Early	<i>Asclepias viridiflora</i>	Green (comet) milkweed	MAY–JUL	P	F
	<i>Rhus aromatica</i>	Fragrant sumac	MAY–JUN	P	W
	<i>Oxytropis lambertii</i>	Purple locoweed	MAY–AUG	P	F
Mid	<i>Chamaecrista fasciculata</i>	Showy / common partridge pea	JUL–OCT	A	F
	<i>Mimosa nuttallii</i>	Sensitive brier, Nuttall's sensitive brier	JUN–JUL	P	F
	<i>Rhus glabra</i>	Smooth sumac	JUN–JUL	P	W
	<i>Vernonia baldwinii</i>	Baldwin's / western ironweed	JUL–SEP	P	F
Late	<i>Eupatorium altissimum</i>	Tall boneset	AUG–SEP	P	F
	<i>Helianthus tuberosus</i>	Jerusalem artichoke	AUG–SEP	P	F
	<i>Liatris aspera</i>	Rough gayfeather	AUG–OCT	P	F

KEY  BLOOM PERIOD  BLOOM TIME  LIFE CYCLE: Annual, Biennial, Perennial  FORM: Forb, Subshrub, Shrub, Woody

## Top 10 Bumble Bee Plants of the Tallgrass Prairie Region

	SCIENTIFIC NAME	COMMON NAME			
Early	<i>Baptisia alba</i>	White false indigo	MAY–JUN	P	F
	<i>Erigeron annuus</i>	Annual fleabane	MAY–SEP	A	F
Mid	<i>Asclepias tuberosa</i>	Butterfly milkweed	JUN–AUG	P	F
	<i>Chamaecrista fasciculata</i>	Showy partridge pea	JUL–OCT	A	F
	<i>Veronicastrum virginicum</i>	Culver's root	JUN–JUL	P	F
Late	<i>Agastache foeniculum</i>	Lavender giant hyssop	AUG	P	F
	<i>Cirsium discolor</i>	Field thistle	AUG–SEP	B/P	F
	<i>Sicyos angulatus</i>	Bur-cucumber	AUG–SEP	A	F
	<i>Symphyotrichum novae-angliae</i>	New England aster	AUG–OCT	P	F
	<i>Verbesina alternifolia</i>	Wingstem	AUG–SEP	P	F

KEY  BLOOM PERIOD  BLOOM TIME  LIFE CYCLE: Annual, Biennial, Perennial  FORM: Forb, Subshrub, Shrub, Woody



Help put bumble bees on the map! Join forces with conservation and science partners from Nebraska to collect information and create the first-ever bumble bee atlas for the region.



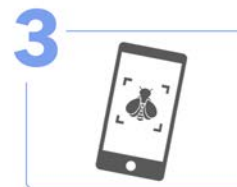
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Adopt a grid cell



Survey for bumble bees



Submit your data



The Nebraska Bumble Bee Atlas is funded through a grant from the Nebraska Environmental Trust. The Trust is funded by proceeds from the Nebraska Lottery and has awarded more than \$305 million to more than 2,200 conservation projects across the state of Nebraska since 1994.