Bumble Bees of Alaska

A Field Guide to Identification & Natural History

Fuzzy-horned bumble bee
Bombus mixtus
10-14 mm. (M) T2,3 can have variable amounts of black.

Yellow head bumble bee
Bombus flavifrons
10-13 mm. (L) T1,2 can have black patch in center. T3,4 can be black. Black band on thorax can have more yellow mixed in.

Forest bumble bee
Bombus lapponicus sylvicola
10-14 mm. (M) Bees south of Alaska Range can have more black on face, front and side of thorax, and T5. May be confused with *B. johanseni*.

Black tail bumble bee
Bombus melanopygus
10-16 mm. (M) Hair short and trim. Thorax can have more black in middle. T4,5 can have variable amounts of yellow.

Two form bumble bee
Bombus vancouverensis
8-14 mm. (M) Hair short and trim.

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Cryptic bumble bee
Bombus cryptarum
13-17 mm. (S) Hair short and trim. T4 can have variable amounts of black.

Yellow head bumble bee
Bombus flavifrons
10-13 mm. (L) T1,2 can have black patch in center. T3,4 can be orange. Black band on thorax can have more yellow mixed in.

Sitka bumble bee
Bombus sitkensis
9-14 mm. (M) T5,6 range from pale orange to yellowish.

Confusing bumble bee
Bombus perplexus
11-14 mm. (M)

White tail bumble bee
Bombus jonellus
10-11 mm. (M) T2 can have variable amount of black. T4 can have some black at front. T4,5 can be pale yellow/orange.

Frigid bumble bee
Bombus frigidus
8-11 mm. (M) T4,5 can be pale orange.

McKay's bumble bee
Bombus mckayi
9-15 mm. (S) Back end of thorax and T2 can have variable amounts of yellow.

Tundra Bees

High country bumble bee
Bombus kirbiellus
11-19 mm. (L) T3 can have variable amount of yellow, usually on edges.

High Arctic bumble bee
Bombus natvigi
21-24 mm. (L) This species is parasitic on other tundra bees. It has pollen baskets, unlike most other cuckoo bumble bees.

Polar bumble bee
Bombus polaris
10-16 mm. (M-L) Side of thorax can have more or less black. T3 can have variable amount of yellow, usually in center.

Active bumble bee
Bombus neoboreus
10-16 mm. (M-L) Side of thorax can have variable amount of black.

Kluane bumble bee
Bombus kluanensis
12-18 mm. (L) In Alaska, currently known only from Denali National Park and Preserve.

Key to Species Measurements

10-12 mm = range in body length of worker bee (from top of head to tip of abdomen)

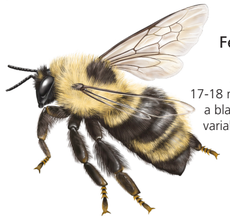
(S,M,L) = cheek length (see section on Bumble Bee Cheeks)

Cuckoo Bees

Cuckoo bee females are shiny and lack pollen baskets

Indiscriminate cuckoo bumble bee
Bombus insularis
16-20 mm. (M) Side of thorax with little to no black. T1 can have some yellow. T2-5 can have variable amounts of yellow.

Ashton cuckoo bumble bee
Bombus bohemicus
17-19 mm. (S) Thorax can have some yellow at rear.



Fernald cuckoo bumble bee
Bombus flavidus
17-18 mm. (S) Thorax can have a black band. T3 can have variable amount of yellow.

Less Common Bees

Johansen's bumble bee
Bombus johanseni
10-14 mm. (M) Thorax can have more yellow in front and on sides. Known from Toolik Lake and western Seward Peninsula but likely occurs in other northern and western parts of Alaska.

Red-belted bumble bee
Bombus rufocinctus
9-13 mm. (S) Hair short and trim. T2 can have variable amount of yellow.

Northern yellow bumble bee
Bombus distinguendus
12 mm. (L) Yellow on top of thorax and T1–4 may have a brown cast. Very few records in Alaska.

Introduction to Bumble Bees of Alaska

Bumble bees are abundant and conspicuous pollinators across most of Alaska. They are well-adapted to cold, harsh climates and live in every habitat where there are flowers offering up pollen and nectar, including forests, shrublands, tundra, wetlands, riparian areas, beaches, and gardens. Some species are generalists, distributed widely across habitats and regions, while others are restricted to particular habitats or known only from certain areas. Bumble bees are pollinators of many Alaskan wildflowers, as well as shrubs like willows, blueberries, and cranberries. Many animals, including humans, rely on these pollinated plants for food, shelter, and medicine. Thus, bumble bees, as well as many other kinds of bees and insect pollinators, are essential members of Alaskan ecosystems.

Using This Guide

The guide covers all 22 bumble bee species known in Alaska. Read the following sections to familiarize yourself with bee anatomy and what to look for when trying to identify a bumble bee. **Note that the guide is for female bees only** (workers or cuckoo females). Use the distribution information to get an idea of which species are known from the area you're in.

A Scott King

B Liz Osborn

Bees are easiest to identify when they are foraging. Position yourself near an active patch of flowers—blue, pink, or purple are often favored by bumble bees—and spend some time observing. Close-focus binoculars can be helpful. Taking a photo that you can refer to later is also a good way to practice. You can submit photos to online groups like *iNaturalist* or *BugGuide* for more help.

Look for distinctive patterns: (A) The cryptic bumble bee has a white "tail." (B) Cuckoo bees have shiny abdomens. (C) The forest bumble bee is one of several species with a wide orange belt.

C Matt Muir

Is It a Bumble Bee? Mimics

There are a surprising number of insects that mimic bumble bees to fool predators into thinking they can sting. Many of these bee impostors also forage at flowers. Here are some common bumble bee look-alikes:

A John Meikle

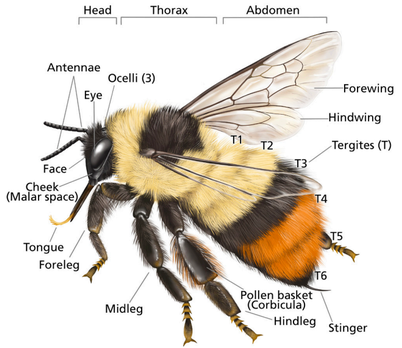
B Paul Tavares

C Robert Brown

(A) The caribou warble fly (*Hypoderma tarandi*) looks like a bumble bee but lacks mouthparts as an adult. (B) This orange-legged drone fly (*Eristalis flavipes*) is another excellent mimic, but note the large eyes, single pair of wings, and tiny bristly antennae that identify it as a fly. (C) Even moths can mimic bumble bees! The furry body and colored bands of this hummingbird clearwing moth (*Thysbe hemaris*) can fool a predator.

Bumble Bee Anatomy

Like most insects, bumble bees have 3 main body sections, 3 pairs of legs, and 2 pairs of wings. Bumble bees are larger than most other bees and much of their body is covered in long, colorful hair. Most female bumble bees have a concave pollen basket on each hind tibia for carrying loads of pollen and nectar back to the nest; these yellow or orange pollen balls are often visible.

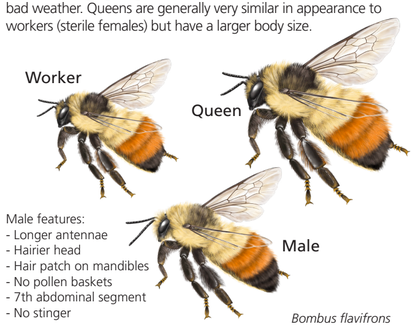


Tips for Identification

Many bumble bees can be identified to species based on hair color alone. Check the color on the face, top and sides of thorax, and six abdominal tergites (T1-T6). Some species show a lot of color variation regionally, see notes for each species. Bees may also lose hair as the season goes on, making them look darker. Besides hair color, features like cheek length or the texture of the exoskeleton can be important for identification, but these require careful examination under magnification.

Males, Workers, and Queens

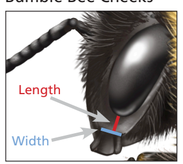
The anatomy of male and female bumble bees differs (see below). Males are typically produced later in the season, when new queens also appear. Once males leave the nest they don't return, and can be found congregating with other males on flowers at night or in bad weather. Queens are generally very similar in appearance to workers (sterile females) but have a larger body size.



Male features:
- Longer antennae
- Hairier head
- Hair patch on mandibles
- No pollen baskets
- 7th abdominal segment
- No stinger

Bombus flavifrons

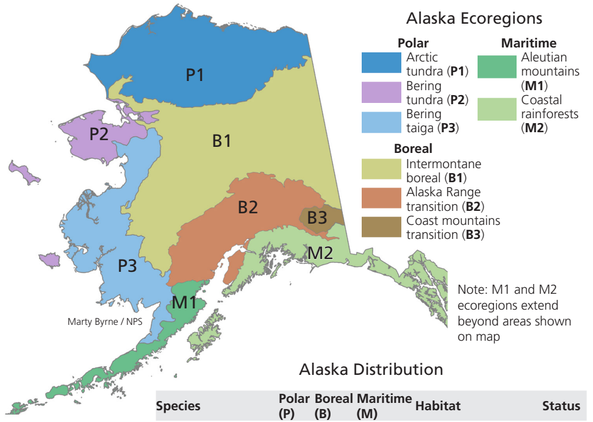
Bumble Bee Cheeks



There are several species that can be told apart reliably only by looking at the length of their cheeks. This is the distance from the bottom of the eye to the "hinge" of the mandible. The cheek is hard to see with the naked eye but we have included its length in the species descriptions.
Short (**S**): Length < Width
Medium (**M**): Length = Width
Long (**L**): Length > Width

Bumble Bee Distribution and Status

The table below provides information on the known distribution, habitat associations, and status of each bumble bee species across Alaska. Note that there are still a lot of information gaps, especially in more remote areas of the state, so you may make new discoveries.



Alaska Distribution

Habitat:

Al = Alpine meadows
Bo = Boreal forest
Fo = Forest
Gr = Grassy meadows
Sh = Shrublands
Tu = Tundra
Ur = Urban gardens

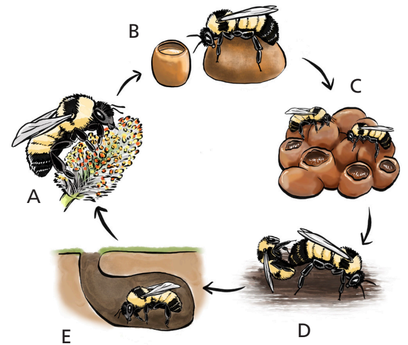
Status in Alaska:

R = Rare
U = Uncommon
C = Common
A = Abundant
? = Status unknown

Species	Polar (P)	Boreal (B)	Maritime (M)	Habitat	Status
bohemicus	1,3	1,2	2	Sh,Tu	U
cryptarum	1,2,3	1,2,3	1,2	Bo,Sh,Tu	C
distinguendus		1,2	1	Bo,Tu	R
flavidus	1,3	1,2	1,2	Bo,Sh,Tu	U
flavifrons	1,2,3	1,2	1,2	Al,Bo,Fo,Gr, Sh, Tu	A
frigidus	1,2,3	1,2,3	1,2	Al,Bo,Sh,Tu	A
insularis	1,3	1,2	1,2	Al, Bo,Sh,Tu	C
johanseni	1,2		1?,2?	Tu,?	?
jonellus	1,2,3	1,2	1,2	Bo,Sh,Tu	A
kirbiellus	1,2,3	1,2	1,2	Bo,Tu	U
kluanensis		2		Tu	R
lapponicus sylvicola	1,2,3	1,2,3	1,2	Al,Bo,Gr,Sh,Tu	A
mckayi	1,3	1,2	1,2	Al,Bo,Gr,Sh,Ur	A
melanopygus	1,2,3	1,2,3	1,2	Al,Bo,Fo,Sh,Tu,Ur	A
mixtus	1,2,3	1,2,3	2	Al,Bo,Gr,Sh,Tu	A
natvigi	1,2	1,2		Tu	U
neoboreus	1,2	1,2		Tu	U
perplexus	1	1,2		Fo,Gr	U
polaris	1,2,3	1,2,3	2	Tu	U
rufocinctus	1	1	2	Fo,Ur	R
sitkensis		2	1,2	Fo,Gr	C
vancouverensis	2	1,2	2	Al,Sh,Ur	C

Annual Life Cycle of Bumble Bees

Bumble bees are among the first insects to be active in the spring, feeding on willows and other early-blooming plants (**A**, below). These emerging queens have spent the last 7 or more months underground. After building up her energy reserves, the queen will establish a nest in an abandoned burrow or underground cavity and begin to lay eggs (**B**). She produces her first brood of workers (sterile females) and they will take over the work of foraging and raising the young (**C**). Later in the summer, the queen switches to producing males and fertile females (new queens), which will mate with bees from other colonies (**D**). When colder weather sets in, most of the colony members die. Only the newly-mated queens will overwinter (**E**).



Alternative Lifestyles: Cuckoo Bumble Bees

A few bumble bee species in Alaska are parasitic on other bumble bees. A female "cuckoo" bee invades the nest of a social bumble bee, kills the queen and forces the workers to raise her young. Most cuckoo bees are fairly specific about which species they parasitize. Because they never need to carry pollen, most female cuckoo bumble bees lack pollen baskets on their legs.

Conservation Status of Bumble Bees in Alaska

We still have a lot to learn about bumble bees in Alaska: how species are distributed across our vast landscapes and how their populations are faring. Some species of conservation concern in other parts of North America (e.g., the Western bumble bee and its parasite, the Ashton cuckoo bumble bee) appear to be fairly stable in Alaska. Climate change is an accelerating threat for many plants and animals at northern latitudes, and bumble bees living in vulnerable habitats (e.g., tundra) are likely at risk. Inventory, monitoring, and conservation of bumble bee diversity will be essential to preserving the health of our wild and cultivated landscapes. You can help by learning more about bumble bees in places you live and visit.

Resources to Learn More

Bumble bees of North America. P. Williams, R. Thorp, L. Richardson, and S. Colla. 2014. University of Princeton Press.

Update to the identification guide to female Alaskan bumble bees and a summary of recent changes to the Alaskan bumble bee fauna. D. Sikes and J. Rykken. 2020. Alaska Entomological Society Newsletter 13:31-38. (available at www.akentsoc.org)

Alaskan bumble bee conservation status reports: accs.uaa.alaska.edu/wildlife/pollinator-diversity

Downloadable PDF and online versions of this guide are available at www.nps.gov/articles/000/alaska-bees.htm