

This identification guide includes all species of bumble bees known to be present in the Northwest Territories.

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Details on bumble bee species and diagrams of species colour ranges were crafted from the book *An Identification Guide: Bumble Bees of North America* and reproduced here, with permission from Princeton University Press. All errors remain our own. Museum specimen location data was generously shared by Leif Richardson, University of Vermont. Photos from bugguide.net were used with permission. Other photos have been donated through NWT Species Facebook group (www.facebook.com/groups/NWTSpecies) and used with permission. Thanks to Cory Sheffield for species identification.

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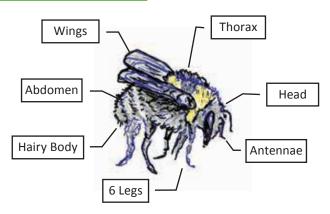


# The Importance of Bumble Bees

There are 22 known species of bumble bees in the NWT. Bumble bees are pollinators for many plants in the NWT. The loss of bumble bees from our ecosystems would cause severe cascading effects. Identification of bumble bee species in the NWT helps to gain a better understanding of the interaction of these species within ecosystems. This guide is an introduction to identifying bees in the field. For more tips go to the Collecting Samples section (page 14).



### **Bumble Bee Anatomy**



### The Bumble Bee Body

Bumble bees are part of the order Hymenoptera, and like other insects, have three distinct body segments: the head, the thorax and the abdomen. They have six legs – the hind legs of non-cuckoo bumble bees have a corbicula, a basket adapted for carrying pollen. A photo showing a filled pollen basket on *Bombus cryptarum* is found on page 2. Bumble bees have two sets of wings, and mouthparts that allow them to extract nectar from plants. The coarse hair on the bumble bee body and legs is a key feature readily noticed.

### **Mimicry**

Animal mimicry is the imitation of visual or behavioural traits of other animals. This imitation is usually used to ward off predators. Mimicry exists within the bee community and can add a fun twist to bumble bee identification. Certain species of flies and other insects, especially the bee flies (Bombyliidae) or hoverflies (Syrphidae), are considered mimics because they have the same colouring patterns as bumble bees. This helps them take advantage of predators' association of the colouring with the chance of getting stung. Beware of sneaky mimics and learn to find key features that might give them away.

**Bumble bee or Fly (Diptera):** Flies have short antennae, forward facing eyes and only one set of wings.

**Bumble bee or Hoverfly (Diptera):** Hoverflies have a distinct way of moving their abdomens up and down while visiting a flower. Bumble bees bumble as they move.

**Bumble bee or Beetle (Coleoptera):** Beetles have a long, hard cover over their wings.

**Bumble bee or Sawfly (Hymenoptera):** Sawflies have long thin antennae with an enlarged tip, and abdomen fused to thorax, not narrowed waisted as is seen in bees.





## The Bumble Bee Colony



Fall New Queens Mate and Males Die off



Young Queens Produced



Winter Mated Queen Hibernates



Early Spring

Queen Emerges and Forages

## The Bumble Bee Life Cycle



Summer Workers Produced and Pollen Collected



Nest is Formed \*potential parasite queen invasion

#### Life Cycle and Stage

- Queen emerges from hibernation and starts a new colony.
- Workers (females) are produced and forage as the colony grows.
- Unfertilized eggs (males) are produced and some of the female larvae develop into new queens.
- New queens mate with males from other colonies before hibernating/overwintering.
- The old queen, workers, and males die and colony life ends.
- · Cycle restarts the following spring season.

Although this photo is beautiful, remember to photograph as many parts of the bumble bee as possible to identify a species. See Collecting Bumble Bees (page 14).



### **Nesting**

Many nests are made in dark and dry underground cavities, although some are above ground. Above ground nests can be made of piles of grass, leaves, sticks or dirt. In some parts of North America, nests can contain up to 400 bees! You can help create suitable nesting spots by leaving shaded areas undisturbed and watching your footing when walking through grassy and wooded areas.





#### **Parasitism**

Bumble bees are social insects that live together in a single colony. They have one female queen bee who produces female worker bees and male bees (drones) as well as the next generation of queen bees. Female worker bees take care of the nest and new larvae, and collect pollen and nectar for the colony. Males usually patrol in search of mates. Mated queen bees overwinter and restart a new hive the following summer. Although most species in the NWT have this life cycle, there are some species that are social parasites and thrive by taking over the nest of other bumble bee species. These humble bees are called cuckoo humble bees or parasitic bumble bees. A parasitic queen invades a nest and her offspring are cared for by those resident workers. Parasitic humble bees will mate and overwinter the same as other bumble bees, but will spend the initial months after hibernation searching for host colonies to begin laying eggs.

### **Bumble Bees in the Wild**

Bumble bees are present in all of the NWT regions. Some species have been spotted as far north as Banks Island!

#### **Threats**

Currently the NWT is home to three bumble bee species at risk of extirpation in Canada (*Bombus occidentalis mckayi*, *Bombus terricola* and *Bombus bohemicus*). These species are declining due to threats, including:

- · Climate change
- Declines in host populations for the parasitic species (B. bohemicus only)
- Introduction of exotic bumble bee species for pollination
- · Use of pesticides
- · Stress from high parasite load
- · Habitat degradation

Visit nwtspeciesatrisk.ca for more information on Species at Risk in the NWT and updates on species assessments in the NWT.

#### Conservation

- Watch for "at risk" bumble bee species. Help document the presence of all bumble bee species by posting sightings to www.facebook.com/groups/NWTSpecies and to www.bumblebeewatch.org.
- Offer bee friendly shelters and watering stations in gardens and fields in your area. See bee friendly garden poster and other materials at www.enr.gov.nt.ca.
- Grow bee attracting plants and avoid the destruction of naturally occurring food sources.
- Reduce your pesticide use by supporting organic gardening and agricultural practices and not buying products harmful to bees.
- Avoid destruction of bee colonies in your area. If unwanted colonies occur on your property, wait until winter to close up the area.

Congratulations! You have already taken the first step in helping bumble bee populations in the NWT by picking up this guide. In addition to field identification, we hope it helps you gain a better understanding of bumble bee habitats, feeding patterns and life cycles, and that it inspires you to promote their conservation within the NWT.

# **Collecting Bumble Bees**

Bumble bee species are most accurately identified through collection and review under a microscope, but the average field identifiers eyes are the tool for distinguishing key features. For more detailed species identification, please visit www.enr.gov.nt.ca and search *Photographic Key to Bees in the NWT*.

A camera is a great tool because it allows more time to seek out features before the insect flies away. It is important to get as many body features in the photograph as possible. Photographs will also broaden the identification community. Photos can be posted to www.facebook.com/groups/NWTSpecies, where others can give input on the identification. Important traits to capture are listed below.

**Expert Tip:** Mark down the date, plants visited, location and other information to help with identification and tracking of the species.



#### **Traits to Capture:**

- Body size
- Patterning
- · Face colours
- · Hair length
- · Plant type
- · Habitat or nesting location
- · Geographical location

**Expert Tip:** Check out "Similar To" if some traits seem off during identification.

 This guide has many examples of photos that capture critical traits to help identify species.



### How to Use this Guide

#### **Quick Colour Guide**

Species are organized by the first colour seen with the eye; this is called a "Quick Colour ID". These distinguishing colours can be found by scanning the side of this book.

### **Species Pages**

Because of their range of features, bumble bee species can be difficult to identify. Try to identify as many key features as possible. Colour is one of the easiest features to see, but it isn't the most reliable way to identify bumble bee species as many have overlapping colours and patterns. Use colour as a starting point, but focus on other features to more accurately distinguish between species.



### Species identification will include:

- Species common name, species scientific name
- · Assessed status
- · Colour range diagram
- Body size of each bumble bee role specific to species
- Traits (face colour, head sizes, hair length and characteristics)
- Food plants NWT native only
- Parasitism host or parasite information
- Nesting and habitat features
- Map of sightings in the NWT1
- · Listing of "similar to" species
- · Boxes with tips, tricks and facts

<sup>&</sup>lt;sup>1</sup> Geographic location and sighting information is often incomplete, especially over a large area such as the NWT. The best data often comes from areas that are well-travelled or easily accessible to humans. For areas that are poorly known or seldom visited there may not be any sighting information, but this does not mean that a species does not exist in those areas.

# **Confusing Bumble Bee**

Bombus perplexus





Queen: 18-20 mm Worker: 11-14 mm Male: 13-14 mm

**TRAITS:** Black with intermixed yellow on head, yellow on

the thorax and abdomen, hair long. One of the few species that does not have black hairs on the top of the thorax. In females at least, the sides of the thorax are dark below, which helps

distinguish it from B. sandersoni.

**FOOD PLANTS:** Bluebell, thistle, honeysuckle, beardtongue

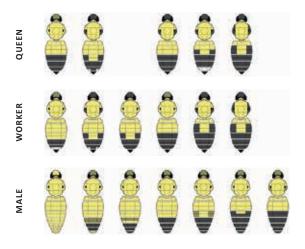
PARASITISM: Host to B. flavidus

**HABITAT:** Wooded areas, gardens, parks and wetlands

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. sandersoni

Additional photos on cover and page 64



• One of the first colonies to end in the summer.

# Sanderson's Bumble Bee

Bombus sandersoni





Queen: 15-17 mm Worker: 10-14 mm Male: 12-15 mm

**TRAITS:** Black with yellow hairs head, hair short and even

**FOOD PLANTS:** Fireweed, alpine laurel, raspberry, cranberry,

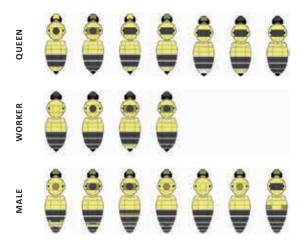
blueberry

PARASITISM: Unknown

**HABITAT:** Wooded areas

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. frigidus, B. perplexus



 Named after Dr. E. Dwight Sanderson who served as president of the American Association of Economic Entomologists

## **Yellow-banded Bumble Bee**

Bombus terricola





Queen: 19-21 mm Worker: 10-15 mm Male: 13-15 mm

TRAITS: Black head, hair short and even

**FOOD PLANTS:** Asters, gooseberry, rose, raspberry, cranberry,

blueberry

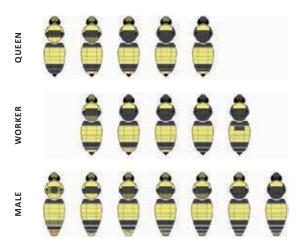
PARASITISM: Host to B. bohemicus, as well as B suckleyi and

B. insularis

**HABITAT:** Wetlands and wooded areas

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. occidentalis, B. cryptarum



• Named for thick yellow band across both abdomen and top of thorax.

# **Yellow Cuckoo Bumble Bee**

Bombus flavidus





Queen: 17-18 mm Male: 11-15 mm

**TRAITS:** Head black and yellow near antennal base,

hair medium length. All of the cuckoos lack

corbicula or pollen baskets.

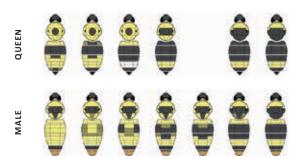
**FOOD PLANTS**: Thistle, ragworts, goldeneye

PARASITISM: Parasite to B. occidentalis

**HABITAT**: Unknown

**NESTING:** Social parasite, males patrol for mates

**SIMILAR TO**: B. insularis, B. bohemicus, B. suckleyi



• Look for small orange tip on abdomen – for male *B. flavidus*.

## **Indiscriminate Bumble Bee**

Bombus insularis





Queen: 16-20 mm Male: 11-16 mm

TRAITS: Yellow head, hair medium length, wings light

brown

FOOD PLANTS: Aster, goldeneye, raspberry, goldenrod,

blueberry, cranberry

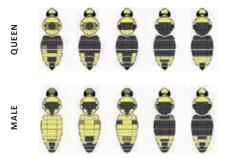
PARASITISM: Parasite to B. flavifrons, B. ternarius, B. terricola

and B. occidentalis

**HABITAT:** Unknown

**NESTING:** Social parasite, males patrol for mates

SIMILAR TO: B. suckleyi, B. bohemicus, B. flavidus



• Less than 5% distribution in the NWT.

## **Suckley's Cuckoo Bumble Bee**

Bombus suckleyi





Queen: 18-23 mm Male: 13-16 mm

TRAITS: Black head, hair short and even

FOOD PLANTS: Aster, thistle, goldenrod

PARASITISM: Parasite to B. occidentalis, potential to

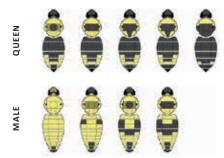
B. terricola

HABITAT: Unknown

NESTING: Social parasite, males patrol for mates

SIMILAR TO: B. bohemicus, B. insularis, B. flavidus

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### **Northern Amber Bumble Bee**

Bombus borealis





Queen: 18-22 mm Worker: 13-15 mm Male: 14-16 mm

TRAITS: Pale cream yellow head, head long – long

cheek, hair medium and even

FOOD PLANTS: Milk-vetch, thistle, raspberry, goldenrod

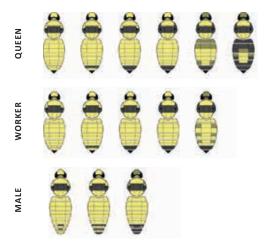
PARASITISM: Unknown

**HABITAT:** Wooded areas

**NESTING:** Underground, males gather outside nest in

search of mates

SIMILAR TO: No known species in the NWT



Named for slight amber colouration.
 \*Dark female patterns are rare.

## **Heath Bumble Bee**

Bombus jonellus





Queen: 16 mm Worker: 10-11 mm Male: 10-12 mm

TRAITS: Black head with yellow tuff near antenna, head

medium – cheek as long as broad, hair long,

distinct black band between wings

**FOOD PLANTS:** Bearberry, fireweed, sweet vetch, blueberry,

cranberry

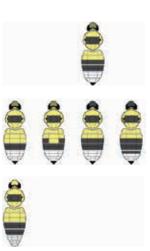
PARASITISM: Unknown

**HABITAT**: Tundra/taiga

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. sandersoni, B. perplexus, B. frigidus,

B. mixtus



- Some folklore states that bumble bees could serve as messengers for health.
- Some bees were thought to have stings that could treat pain or human ailment.

# White-tailed Bumble Bee

Bombus cryptarum





Queen: 19-21 mm Worker: 13-17 mm Male

Male: 14-17 mm

TRAITS: Black head, short head – cheek shorter than

broad, hair medium

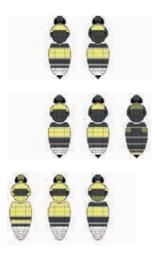
FOOD PLANTS: Fireweed, potentilla, willow

PARASITISM: Unknown

HABITAT: Tundra/taiga

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. occidentalis, B. terricola



• Named after its bright white tipped abdomen.

# **Gypsy Cuckoo Bumble Bee**

Bombus bohemicus





Queen: 17-19 mm Male: 11-17 mm

**TRAITS:** Black hair on head, hair medium length

FOOD PLANTS: Thistle, raspberry, goldenrod, Nahanni aster,

blueberry, cranberry

PARASITISM: Parasite to B. terricola and B. crytarum

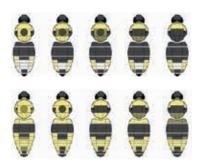
**HABITAT:** Unknown

**NESTING:** Social parasite, males patrol for mates

SIMILAR TO: B. insularis, B. suckleyi, B. flavidus

QUEEN

MALE



- Look for white patch on back of abdomen for female *B. bohemicus*.
- This bee was identified as *B. ashtoni* in the past.

### **Western Bumble Bee**

Bombus occidentalis (mckayi)





Queen: 20-21 mm Worker: 9-15 mm Male: 12-16 mm

**TRAITS:** Short head – cheek longer than broad,

hair even – long in the north

FOOD PLANTS: Thistle, Richardson geranium, Arctic lupine,

raspberry, goldenrod

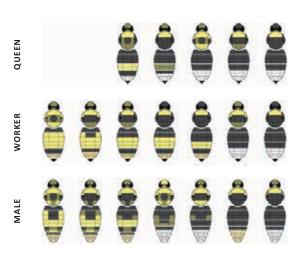
**PARASITISM:** Host to *B. suckelyi*, potential host to

B. bohemicus, B. insularis, B. flavidus

**HABITAT:** Open parks, gardens, grass, meadows **NESTING:** Underground, males patrol for mates

SIMILAR TO: B. terricola, B. cryptarum, B. insularis,

B. flavidus



 Look for a yellow band on the abdomen on this species in the NWT.

## **Yellow-faced Bumble Bee**

Bombus flavifrons





Queen: 16-18 mm Worker: 10-13 mm Male: 10-14 mm

TRAITS: Pale yellow head, head long - distinctly long

cheek, hair medium and uneven

FOOD PLANTS: Thistle, fireweed, mint, beardtongue,

blueberry, cranberry

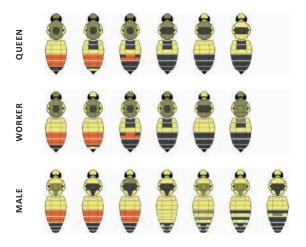
PARASITISM: Host to B. insularis

**HABITAT:** Mountain meadows, open grassy areas and

northern forest areas

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. mixtus



• Named "yellow-faced bumble bee" for the pale yellow on its face.

# **High Arctic Cuckoo Bumble Bee**

Bombus natvigi





Queen: 21-24 mm Male: 17-19 mm

TRAITS: Black head, hair long and uneven
FOOD PLANTS: Wooley lousewort, willow, saxifrage

**PARASITISM:** Parasite to *B. polaris* 

**HABITAT:** Tundra

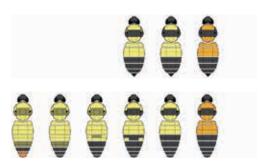
**NESTING:** Social parasite, males patrol for mates

**SIMILAR TO:** B. polaris, B. kirbiellus, B. neoboreus,

B. flavifrons

QUEEN

JAL



- Look for bees with both orange abdomen and thorax.
- Darker males found only in the NWT.
- Bombus natvigi is the new synonym for the bee identified as B. hyperboreus in North America.

## **Red-tailed Bumble Bee**

Bombus sylvicola





Queen: 15-17 mm Worker: 10-14 mm Male: 11-14 mm

TRAITS: Head black, hair long and uneven

**FOOD PLANTS:** Sandwort, fireweed, Arctic lupine, Arctic

butterbur, mountain heather

PARASITISM: Unknown

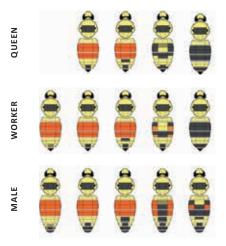
**HABITAT:** Mountain meadows, open grassy areas

**NESTING:** Underground (occasionally on surface), males

patrol for mates

SIMILAR TO: B. melanopygus, B. bifarius, B. ternarius,

B. sandersoni



• Known for its dark orange, almost red, patch on the abdomen.

**Orange-rumped Bumble Bee** 

Bombus melanopygus





Queen: 16-19 mm Worker: 10-16 mm Male: 11-14 mm

TRAITS: Yellow head, hair short (longer in more

northern individuals) and even

FOOD PLANTS: Bearberry, Arctic lupine, willow

PARASITISM: Unknown

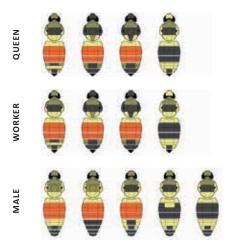
**HABITAT:** Grassy areas, parks, gardens, mountain

meadows and shrubby locations

**NESTING:** Underground or aboveground, males patrol for

mates

SIMILAR TO: B. bifarius, B. ternarius, B. bohemicus



• First species to start nesting and producing males.

## **Mountain Bumble Bee**

Bombus kirbiellus





Queen: 19-21 mm Worker: 11-19 mm Male: 13-17 mm

TRAITS: Head black, yellow tuff near antenna and

intermixed on sides of head

FOOD PLANTS: Indian paintbrush, larkspur, fireweed,

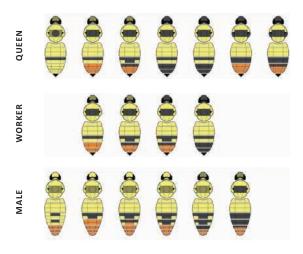
beardtongue, bluebells

PARASITISM: B. hyperboreus (Europe)

**HABITAT:** Boreal regions – found above tree line **NESTING:** Underground, males patrol for mates

SIMILAR TO: B. polaris, B. neoboreus, B. natvigi,

B. frigidus, B. flavifrons, B. mixtus



• *Bombus kirbiellus* is the new synonym for the bee identified as *B. balteatus* in North America.

# **Winter Bumble Bee**

Bombus frigidus





Queen: 17-19 mm Worker: 8-11 mm Male: 10-15 mm

TRAITS: Hair long with an orange tipped abdomen, hair

at front of thorax is pale yellow

**FOOD PLANTS:** Fireweed, sweetvetch, Arctic lupine, potentilla,

willow, blueberry, cranberry

PARASITISM: Unknown

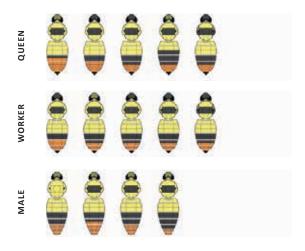
**HABITAT:** Boreal forest – tundra/taiga and mountain

meadows

**NESTING:** Aboveground, males patrol for mates

**SIMILAR TO:** B. polaris, B. kirbiellus, B. mixtus, B. sandersoni,

B. jonellus



• Look for orange tip of abdomen on *frigidus* and white for *jonellus*.

#### **Brown-tailed Bumble Bee**

Bombus mixtus





Queen: 15-17 mm Worker: 10-14 mm Male: 11-14 mm

TRAITS: Hair long and uneven, hair on face

FOOD PLANTS: Fireweed, beardtongue, Franklin's

scorpionweed, ragwort

PARASITISM: Unknown

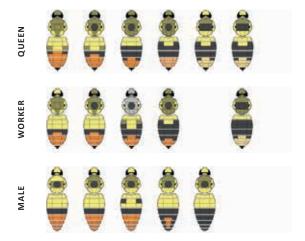
**HABITAT:** Grassy or shrubby areas, mountain meadows

**NESTING:** Variable (above or underground), males patrol

for mates

**SIMILAR TO:** B. frigidus, B. sandersoni, B. polaris,

B. kirbiellus, B. melanopygus



## **Tundra Bumble Bee**

Bombus neoboreus





Queen: 21-22 mm Worker: 10-13 mm Male: 17-18 mm

TRAITS: Black head, top black with yellow intermixed,

hair moderately long and even

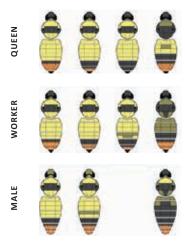
FOOD PLANTS: Unknown
PARASITISM: Unknown

HABITAT: Tundra

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. polaris, B. natvigi, B. kirbiellus,

B. frigidus, B. flavifrons



- Body elongated and rectangular.
- Bumble bees in the High Arctic use their flight muscles to keep them warm.

## **Northern Bumble Bee**

Bombus polaris





Queen: 18-22 mm Worker: 10-16 mm Male: 14-16 mm

TRAITS: Black head

FOOD PLANTS: Arnica, lagotis, heather, Jacobs's ladder,

knotweed, willow, blueberry, cranberry

PARASITISM: Host to B. natvigi

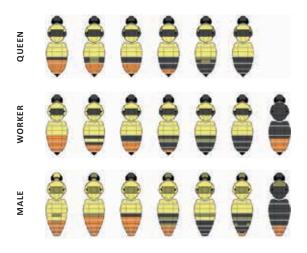
**HABITAT:** Tundra

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. kirbiellus, B. neoboreus, B. natvigi,

B. frigidus, B. flavifrons, B. mixtus

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• Body is short and rounded.

## **Two-ranked Bumble Bee**

Bombus bifarius





Queen: 15-19 mm Worker: 8-14 mm Male: 8-13 mm

**TRAITS:** Yellow or white head, hair short and even,

usually has the V-shaped notch of dark hair on

back of thorax

**FOOD PLANTS:** Aster, thistle, fireweed, swamp sunflower,

gooseberry, ragwort, goldenrod, snowberry

PARASITISM: Unknown

**HABITAT:** Grassy prairies, parks, gardens, shrubby

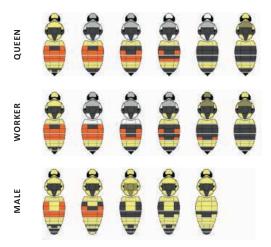
locations, mountain meadows

**NESTING:** Underground (occasionally on surface), males

patrol for mates

**SIMILAR TO:** B. ternarius, B. sylvicola, B. melanopygus,

B. sandersoni



 Hair on front of thorax is normally more white compared to ternarius, and the two orange bands, when present, usually have some dark hairs intermixed.

## **Tri-coloured Bumble Bee**

Bombus ternarius





Dueen: 17-19 mm Worker: 9-13 mm Male: 10-14 mm

**TRAITS:** Black head with patches of yellow, hair short

and even, distinguished by two orange bands,

and a "V" on back of thorax

**FOOD PLANTS:** Spring beauty, raspberry, goldenrod, blueberry,

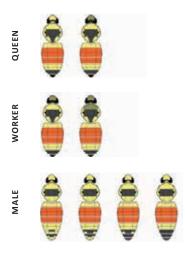
cranberry

**PARASITISM:** Host to B. insularis

**HABITAT:** Wetlands or within and around woodlands

**NESTING:** Underground, males patrol for mates

SIMILAR TO: B. sylvicola, B. melanopygus, B. bifarius



• "Ternarius" refers to the number three, which represents this species three colours.

#### For more information, please contact:

Government of the Northwest Territories Environment and Natural Resources

Web: www.enr.gov.nt.ca

E-mail: NWTBUGS@gov.nt.ca

### **Helpful Resources:**

An Identification Guide to Bumble Bees of North America by Paul Williams, Robbin Thorp, Leif Richardson and Sheila Colla. ISBN 978-0-691-15222-6

www.xerces.org/publications\_trashed/identification-guides/bumble-bee-pocket-id

https://bumblebeeconservation.org

http://savethebumblebees.com

www.bumblebeewatch.org

http://bugguide.net







For free copies, contact NWTBUGS@gov.nt.ca

