

# **BUMBLE BEES OF UNAMA'KI**

A Guide to Becoming a Buzzing  
Naturalist

**HANNAH KOSICK**



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For the nature lovers, environmentalists, and  
young change makers of Cape Breton.



Source: Mary Kennedy (2019), [view site](#).



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The emergence of bumble bees in spring is something that naturalists look forward to. These large, fuzzy, flying insects buzzing about the garden is a sign that life has once again returned after a long period of dormancy and rest. This sign of hope is welcome year after year for everyone who enjoys the wonderful world around us.

The world is changing and human activity has resulted in tremendous changes to the natural environment on a global scale. Things such as **climate change**, pollution, **industrial agriculture**, and **pesticide** use have put bumble bees in danger and it is up to us to make things right again.

The goal of this Guide is to teach you the basics about bumble bees so that you can act as an advocate for bumble bee conservation in your community. You will learn about bumble bee life cycles, anatomy structure, identification, threats, and more. You'll even learn a few ways to make a difference for bumble bees in your own backyard!

We need people like you to call attention to the threats bumble bees are facing. If we all work together to create small changes in our daily lives, we can make a big difference when it comes to the survival of bumble bees.



Source: Cody Chapman (2020), [visit site](#).

## PART I

# WHAT'S ALL THE BUZZ ABOUT?

Bumble bees are charismatic creatures that play an important role in our everyday lives. When they are buzzing around and foraging for food, bumble bees pollinate a variety of plants. **Pollination** kick starts the growth of the fruit and vegetables that we eat and is required for many species to produce seeds that become new plants. Other insects, birds, and mammals also rely on bumble bee pollination to produce their food. Bumble bees are a critical part of the earth's **ecosystems** and this online Guide to Bumblebees in Cape Breton will show you just how special these small and mighty creatures are.

Bumble bee behaviour has a huge impact on terrestrial ecosystems. Dwindling bumblebee populations can cause a chain reaction through the ecosystems. This can result in lower **biodiversity** which can make an ecosystem less



A bumble bee found foraging on red clover. Source: Hannah Kosick (2020), [visit site](#).

resilient to change. In a way, when bumble bees are at risk, the entire ecosystem also becomes at risk.

Over the years, **human disturbances** have had a negative effect on bumble bees in more ways than one. **Pesticide** use, **industrial agriculture**, the introduction of **non-native species** such as **honey bees**, housing subdivisions, shopping malls, and other commercial and residential land uses have put vulnerable bumble bee populations at risk. Despite these challenges, some species of bumble bees are thriving in these new environments as they have been able to adapt to changing environmental conditions.

In order to protect the bumble bees of Unama'ki (Cape Breton), we need your help! In the next few chapters, you will learn about bumble bee anatomy, life cycles, and the role each bee plays in a colony.



A yellow-banded bumble bee. Source: David McCorquodale (2020), [visit site](#).



1.

# A BUMBLE BEE'S LIFE

*How do bees go to school? **On the school buzz!***

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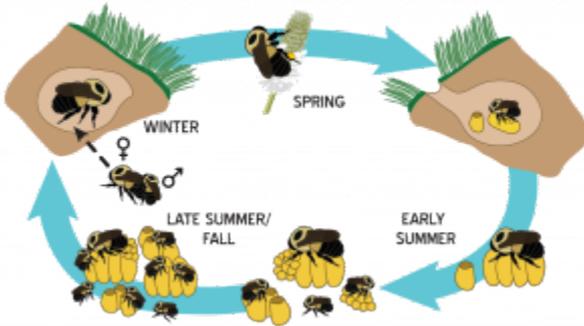
It is important to understand a bumble bee's life cycle for many reasons. Firstly, knowing when bumble bees are active will help us know when to find them! This is essential if we are trying to protect a species at risk. For example, if we know when **queen** bumblebees should be emerging from their nests in spring, we can go out and try and find them in the wild! This is very helpful



A northern amber bumble bee seen foraging on black knapweed. Source: David McCorquodale (2020), [visit site](#).

for scientists who are trying to gather data on bumblebee populations.

Secondly, understanding the life cycles of bees is important if we want to document how species are reacting and adapting to **climate change**. Are queen bumble bees emerging from their burrows earlier or later than they have in the past? When do we start seeing the queen's first batch of workers? Is this timing different compared to previous years? These questions can give us an idea of how a species of bumble bee is performing despite the impact of climate change and other environmental and human-related disturbances.



The life cycle of a bumble bee. Source: Bumble Bees of Wisconsin (2021), [visit site](#).

## Bumble bee Life Cycle

**May until June:** Queen bumble bees awaken after spending the winter months underground. A queen spends her time searching for a nest site and **foraging** on flowers. When she finds a nest, she will lay a brood

of eggs and she will take care of them until they become mature adults (female workers). It is important to note that these queen bumble bees are much larger than your average **worker** bumble bee.



A queen bee observed in early May. Source: David McCorquodale (2020), [visit site](#).

**Mid-June until Early August:** In the early summer months, all of the bumble bees you'll see are female workers (plus the original Queen) who are busily working to keep the colony in tip top shape. Some workers take care of the nest on the home front whereas others head out to forage on flowers and return to the nest with valuable resources; nectar and pollen! The queen stays in her nest laying eggs during this time. At this time, there are dozens to a few hundred small worker bumble bees in a nest. This is why you'll see more bumble bees during this time of year.



A red-belted bumble bee seen foraging in summer.  
Source: David McCorquodale (2020), [visit site](#).

**End of August until Early September:** By the very end of August, we start to see male bumble bees out and about. Males leave the nest right away and do not return. At this time, the worker bumble bees are much larger than the ones we saw during the peak summer season.



A male tri-coloured bumble bee. Source: David McCorquodale (2020), [visit page](#).

**Mid-September until October:** By late September, we

see a few lingering workers, some gynes searching for nests, and wandering males. A male bumble bee's role is to mate with the potential queens (gynes). After they mate, the potential queens burrow underground for the winter until spring.



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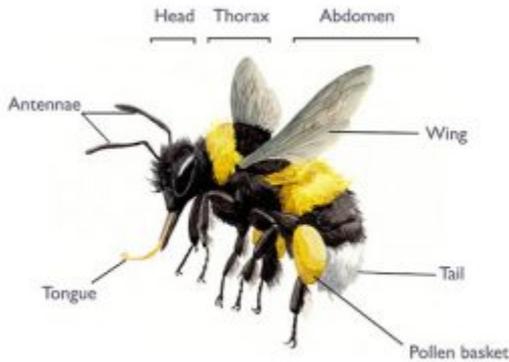
2.

## WHAT MAKES A BUMBLE BEE?

*Why do bees have sticky hair? **Because they use  
honeycombs!***

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Identifying bumble bees is a great skill to have if you want to participate in bumblebee conservation. Every species of bumble bee has a unique shape, colour pattern, and size which can help us identify which bee is which. Knowing these distinguishing characteristics makes identifying bumble bees a lot easier and a lot more fun!



Understanding the anatomy of a bumble bee is essential if we want to learn how to identify them. Source: Blooms for Bees (2021), [visit site](#).

Before we jump into learning about how we can identify a specific species of bumble bee, it is important to understand their basic anatomy. This will help us know the parts of a bee we should look at to identify one species of bee from another.

There are six different parts of a bumble bee that are often used to differentiate between species: the head, thorax, abdominal segments, legs, pollen baskets and antennae. Take the time to familiarize yourself with these structures as they are very important when we want to identify bumble bees.

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In the quizzes below, see if you can recognize important bumble bee identification characteristics on the yellow-banded bumble bee and on the tri-coloured bumble bee. Drag and drop the words in the left column into the

correct position that matches the body part of the bumble bee.



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## Who is that bee?

There are a few different roles within a bumblebee colony that help keep the community in order. Queens, workers, males, and gynes (potential queens for next year) all have slightly different characteristics that we can use to determine what role a particular bee plays in a colony.

## Queens

Queen bumble bees are much larger than **worker** and male bees. You'll usually only see the queen bees during the early spring before the workers emerge from the nest. After that, queens spend the majority of their time in the nest laying eggs as they let the other females do the work. Queens mate in the fall, overwinter and then die about a year after they emerged.

## Workers

Worker bees emerge in early summer until the nest declines in late summer. These females are smaller than queens and male bumble bees as they have six abdominal segments, however, some are bigger as workers are larger later in summer. Workers also have pollen baskets on their hind legs, unlike their male counterparts.

## Males

Males emerge in late summer and in fall and their role in the colony is to mate with **gynes**, the potential queens for next year. Males have longer antennae than workers, seven abdominal segments instead of 6, and usually have yellow hairs on their face.

## Gynes

Gynes, the large females that have the potential to be queens in the next spring, start to emerge from late summer into early fall. These are essentially large worker bumble bees that could potentially become next year's queens. These are the bees that mate with male bumble bees in fall and overwinter in burrows



Source: David McCorquodale (2020), [view page](#).



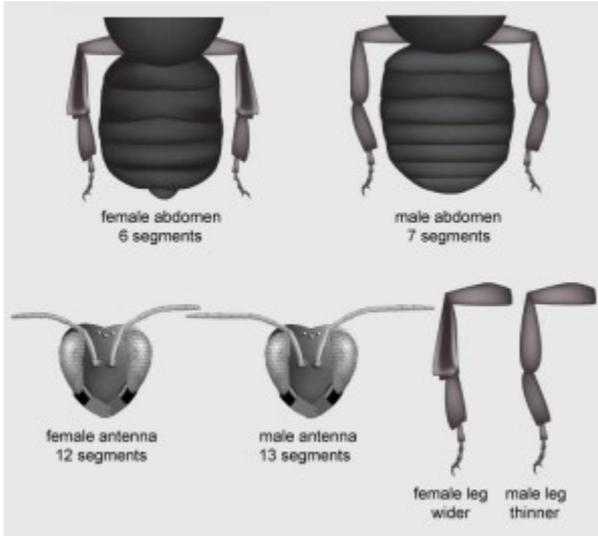
Source: David McCorquodale (2020), [view page](#)



Source: David McCorquodale (2020), [view page](#)



Source: David McCorquodale (2020), [view page](#)



You can differentiate between male and female bumble bees by taking a closer look at their anatomy. Male bumble bees have longer antennae and more abdominal segments than female bumble bees. Source: Bumble Bee Watch (2021), [view site](#).

Queen bumble bees are extraordinary creatures. As previously mentioned, queen bumble bees emerge in the spring when outside temperatures can still be very cold around the time when alders, willows and dandelions are starting to bloom. One of the main reasons that queen bumblebees are able to emerge from hibernation before other insects is because they are able to generate their own internal body heat. This process is known as thermoregulation and without it, queen bumble bees would be unable to fly during these early months. Worker bumble bees are also able to do this!



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Source: BBC Earth (2012). [View site.](#)

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Let's put what we have learned thus far to the test. In these multiple choice quizzes, can you identify if a bumble bee is male or female?



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3.

## TO BEE OR NOT TO BEE?

*What's another name for a wasp? A **wanna-bee**.*

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Did you know that **honey bees** and bumble bees are very different from one another? In fact, honey bees are not native to North America and their presence can harm native bumble bee populations. Honey bees are managed livestock and they are farmed just like cows or chickens. Therefore, they are not even wild at all!

One of the main reasons honey bees are so popular is because they produce a sweet treat that a lot of people enjoy...honey! Many farmers bring honey bees to their farms in hopes of increasing **pollination** for their crops. What many people do not realize is that honey bees are not the most efficient pollinators for your gardens. In fact, there are lots of other insects aside from honey bees that are excellent pollinators. So who might be one of the best

pollinators for your garden you might ask? Bumble bees of course!



If you don't understand insect anatomy, it is easy to confuse honey bees for bumble bees (and vice versa). This honey bee is the Western Honey Bee which is non-native species that was introduced to North America by humans. Source: David McCorquodale (2020), [view site](#).

Honey bees are not as tolerant of colder climates and they do not tend to pollinate in cool weather conditions. Additionally, honey bees have short tongues which means they cannot pollinate as many different types of flowers as a variety of bumble bee species could in a biodiverse **ecosystem**.

Bumble bees, however, are resilient pollinators that are built to withstand cold climates. They can be found foraging in both rain and shine and they typically start foraging much earlier in the day than honey bees. Bumble bees can pollinate quickly, for a longer period of time, and

they are able to pollinate a wider variety of native plants and crops.

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Can you identify a honey bee from a bumble bee?

### Honey bee

Honey bees are slimmer and smaller than most bumble bees (similar to a wasp).

There is only one species of honey bee that is found in Cape Breton. The Western honey bee (*Apis mellifera*) was introduced to North America from Europe and only lives in hives managed by people.

Western honey bees have short tongues meaning they are only able to **forage** on flowers that are more open in shape.



Source: Steven McGrath (2019), [view page](#).

### Bumble bee

Bumble bees are usually larger and more rounded.

There are about a dozen species of bumble bees found in Cape Breton that come in different colors.

Since there are many different species, they all have different tongue lengths. Some are shorter. This means that bumblebees forage on different types of flowers, which allows for more pollination of various plants.



Source: Marian Whitcomb (2019), [view page](#).

Let's put what we have learned thus far to the test. In these multiple choice quizzes, can you identify if an individual is a honey bee or a bumble bee?



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## PART II

# AMU OF UNAMA'KI

Being able to identify bumble bees is very important if we want to collect data on bumble bee populations. To determine if a species of bee is thriving or threatened, bee researchers and naturalists go out into the field and count the number of bees they see as well as what species of bee are present in an area. This is incredibly important for conservation purposes as we can look back over the years and determine if bumble bee populations are increasing or decreasing in a particular area based on the population data we collect.

Did you know that the Mi'kmaw word for bumble bee is ***amu***? These small but mighty insects play an important role in Mi'kmaw culture as they pollinate traditional L'nu medicines and foods.

In this section, we will learn about what bumble bees you might find in Cape Breton as well as what flowers you may find them foraging on. Keep reading to learn all about the bees and the flowers of Unama'ki!



Source: Jeannie Fraser (2020), [view site](#).

4.

## WHAT BUMBLE BEES WILL YOU FIND IN CAPE BRETON?

*What do you call a bee that can't make up their mind? A  
maybe*

---

To the best of our knowledge, bees have been present on earth since the early **cretaceous period** which occurred about 130 million years ago. Scientists believe that during a global cooling period, **natural selection** favoured bees that were able to withstand colder temperatures. And so, a genus of bee that was able to adapt and live in cooler environments evolved over several generations. The *Bombus* genus consists of both true bumble bees as well

as the subgenus *Psithyrus* which are commonly known as **cuckoo bumble bees**.

True bumble bee **queens** emerge from their winter burrows in early spring and they create their own nest and caste of female **workers**. Cuckoo bees, however, emerge later in spring and summer than their true bumble bee counterparts. At this time, true bumble bees have already established their nests and have hatched a number of worker bees. Cuckoo bees then usurp the true bumble bee queen and steal her nest and caste of worker bees. The cuckoo bee then lays her own eggs and becomes the new queen of the true bumble bee workforce who then raise her young for her.

Today, there are about 250 known species of bumble bee around the world. In this chapter, you will learn how to identify the different bumble bees found in Cape Breton using the skills you have already learned.

Interested in learning about other bumble bees you will find in North America? [Bumble bee watch](#) is an excellent online resource for naturalists who are keen to learn more about bumble bee identification. The images below that display characteristic traits of bees are courtesy of their online bumble bee species identification guide.

**Yellow-banded bumble bee (*Bombus terricola*)**

The yellow-banded bumble bee is currently listed as a Species of Special Concern by **COSEWIC** which stands for the Committee on the Status of Endangered Wildlife in Canada. This means that a group of experts have determined that this species is at risk due to a variety of environmental conditions. You can still find them in Cape Breton, however, it has become increasingly difficult for them to thrive in urban environments. You're more likely to find yellow-banded bumble bees in wild meadows and other areas that have not been heavily impacted by humans.



*Bombus terricola* Source: Bumble Bee Watch (2021), [view page](#).

*How to identify:* These bees are easily distinguished from other bumblebees in Cape Breton due to their distinctive yellow black banded pattern. This pattern is unique to *Bombus terricola* as no other bumblebee has a similar pattern. These bees love fireweed and you'll often find them **foraging** on it in July.

*Where can you find them:* Yellow-banded bumble bees are normally found in rural or wild areas that are not disturbed by the presence of human activity.



Yellow-banded bumble bee. Source: mkkennedy (2020), [view page](#).

### **Tri-coloured bumble bee** (*Bombus ternarius*)

Tri-coloured bumble bees are one of the easiest bumble bees to identify. The tri-coloured bumble bee is a very common bee that you can find foraging on many **native species** of plants as well as non-native plants that you may find in backyard or community gardens.

*How to identify:* These bees have a mainly yellow **thorax** with a black downward facing arrow that points towards the **abdomen**. The abdomen is yellow, then orange, then yellow again.

*Where can you find them:* Tri-coloured bumble bees are



*Bombus ternarius* Source: Bumble Bee Watch (2021), [view page](#).

very common and you can find them just about anywhere! You can find these bees in both urban and rural areas as well as in wild areas.



Tri-coloured bumble bee. Source: Brian Starzomski (2019), [view page](#).

### Red-belted bumble bee (*Bombus rufocinctus*)

Red-belted bumble bees can vary in appearance. These bees are fairly common and can be found on flowers such as St. John's Wort.

*How to identify:* For the most part, these bees have a yellow **thorax** with a black ovular shape in the center of the thorax. The first two **segments** on the bumble



*Bombus rufocinctus*  
Source: Bumble Bee Watch (2021), [view page](#).

bee's **abdomen** are yellow followed by orange and then black.

*Where can you find them:* Red-belted bumble bees are common in urban and suburban areas as well as local parks.



Red-belted bumble bee. Source: Clayton D'Orsay (2018), [view page](#).

### **Northern amber bumble bee** **(*Bombus borealis*)**

The northern amber bumble bee is one of the larger bumble bees that you will find in Cape Breton. These bees are commonly found foraging on New England Aster, tufted vetch, and **non-native species** such as bee balm.

*How to identify:* These bees have a yellow face with a black band between their wings. The rest of their body is a yellow



*Bombus borealis* Source: Bumble Bee Watch (2021), [view page](#).

amber-ish colour with the exception of the sides of the bee's body which are black.

*Where can you find them:* Northern amber bumble bees can be found in urban and suburban environments but also in some rural and wild areas. Generally, you can find these bees around aquatic environments such as lakes, rivers, and oceans.



Northern amber bumble bee. Source: Steven McGrath (2020), [view page](#).

### Golden northern bumble bee (*Bombus fervidus*)

These larger bumble bees look very similar to the Northern amber bumble bee and therefore it is important to pay close attention to the key identification characteristics when trying to identify an individual.

*How to identify:* The golden northern bumble bee has very dark black wings which stand out against its mainly yellow body. These bees have a black face as well as a stripe of black between their wings and on their last **segment** of their **abdomen**. Younger bees can have bright yellow hairs on their bodies whereas older workers will be more pale yellow in colouring. Unlike the northern amber bumble bee, *Bombus fervidus* has yellow colouring along the side of its body.

Where can you find them: Golden northern bumble bees are normally found in urban and suburban environments



*Bombus fervidus* Source:  
Bumble Bee Watch  
(2021), [view page.](#)



Golden northern bumble bee. Source: Steven McGrath (2018), [view page](#).



Golden northern bumble bee. Source: Steven McGrath (2018), [view page](#).

### ***Pyrobombus***

*Pyrobombus* is a subgenus of bumble bee which consists of 43 different species of bees. In some cases, bees in the subgenus *Pyrobombus* have to be examined under a microscope in order to properly identify them. This can make identifying these bees in the field very challenging,

therefore, to prevent the risk of misidentifying these bumble bees, we will focus on the identifying characteristics of the subgenus *Pyrobombus* as a whole instead of the individual species found in Cape Breton.

For reference, there are four species of bumble bee within the *Pyrobombus* subgenus in Cape Breton: the common eastern bumble bee (*Bombus impatiens*), the perplexing bumble bee (*Bombus perplexus*), the half-backed bumble bee (*Bombus vagans*) and the two-spotted bumble bee (*Bombus bimaculatus*).

*How to identify:* All of these bees are identified by notable characteristics such as a mainly yellow **thorax** with yellow on the first one to two **segments** on the **abdomen**.

**Common eastern bumble bee**



Source: mkkennedy (2019), [view page](#).

**Perplexing bumble bee**



Source: Steven McGrath (2020), [view page](#).

**Half-backed bumble bee**



Source: Cody Chapman (2020), [view page](#).

**Two-spotted bumble bee**



Source: Jeannie Fraser (2020), [view page](#).

### **Fernald's cuckoo bumble bee (*Bombus fernaldae*)**

The Fernald's **cuckoo bumble bee** is a member of the subgenus *Psithyrus*. As previously mentioned, these bees emerge from their winter burrows later in the season so you're more likely to see them in summertime as opposed

to spring. This cuckoo bumblebee chooses the red-belted bumble bee or the perplexing bumble bee as their host species

*How to identify:* The Fernald's cuckoo bumble bee has a yellow **thorax** with a black ovular shaped marking on the center of the thorax. The first segment of the **abdomen** is yellow followed by two black **segments**, then one yellow segment with the end of the abdomen being black. Like all other cuckoo bumble bees, the Fernald's cuckoo bumble bee does not have **pollen baskets**.

*Where can you find them:* Fernald's cuckoo bumble bees are normally found in wild areas that are not disturbed by human presence.



Fernald's cuckoo bumble bee. Source: Clayton D'Orsay (2018), [view page](#).

### **Gypsy cuckoo bumble bee (*Bombus bohemicus*)**

This bumble bee is currently listed as endangered by **COSEWIC** as it is the cuckoo bumble bee associated with yellow-banded bumble bees. Since their host species is in decline, so is the gypsy cuckoo bumble bee. These bees have not been seen in Cape Breton in about two decades; therefore, if you find one it is very important that you share your findings.



*Bombus bohemicus* Source: Bumble Bee Watch (2021), [view page](#).



Gypsy cuckoo bumble bee. Source: Claude Nozères (2020), [view page](#).

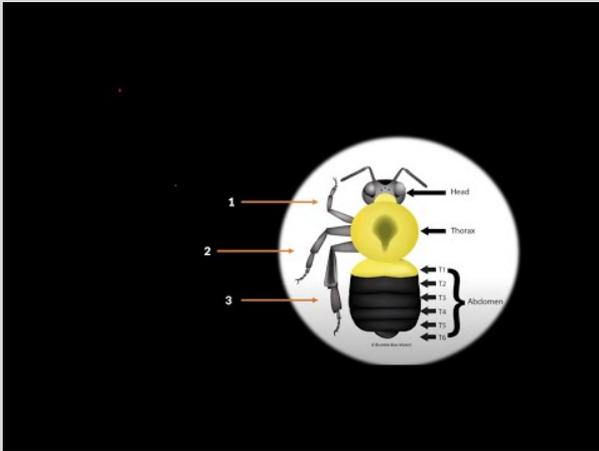
*How to identify:* The gypsy cuckoo bumble bee has black face colouring with yellow hair colouring on the part of

the **thorax** near the **head**. This is followed by black hairs then some yellow hairs (usually lighter in colour) leading towards the back of the thorax. The **abdomen** is mostly black with light white/yellowish hairs on the last few **segments** of the abdomen. This species lacks **pollen baskets** on their legs as they do not bring pollen back to the nest. The worker true bees of the host species (in this case the yellow-banded bumble bee) forage for them.



Gypsy cuckoo bumble bee. Source: Claude Nozères (2020), [view page](#).

*Where can you find them:* As previously mentioned, gypsy cuckoo bumble bees are an endangered species and if you find one it would be quite a rare find! If you do want to look around for this at risk bee, rural and wild areas where yellow-banded bumble bees are found would be a good place to start looking.



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<https://caul-cbua.pressbooks.pub/bumblebees/?p=135>

Source: Wildlife Preservation Canada (2020). [View Site.](#)

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Let's put what we have learned thus far to the test. In this matching quiz, can you identify the species of bumble bee in each photo?



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5.

## **BUMBLE BEE FORAGING FAVOURITES**

*What did the bee say to the sunflower? “Hello honey!”*

---



Source: Steven McGrath, (2020). [View page.](#)

**Foraging** is an important daily task for busy bumble bees. Bumble bees leave the nest early in the morning and spend most of the day foraging for nectar and pollen from plants, **pollinating** as they go about their rounds. Bumble bees are such efficient pollinators that some flowering plants have evolved to exclusively be pollinated by these loveable insects.

Bees forage on plants for both their nectar and pollen resources. Pollen contains the necessary proteins to help bees grow and nectar is a source of water and sugar which is an important part of every bee's diet.

As expected, the plants that bees forage on flower at different times of the year; therefore, bees have to shift their foraging preferences as the season wears on. In early June, you might find bumble bees foraging on red clover whereas in July they may prefer to forage on fireweed even though red clover is still present.

Every species of bee has different foraging preferences

and this all depends on their unique anatomy including factors such as the bee's size, weight, and length of their tongue (also referred to as a **proboscis**). Each species of bee also has a unique foraging range. Some bees prefer to forage closer to their nests where other bees forage kilometers away from their home base. All of these preferences have evolved in each species over several generations as they have adapted to the world around them. In this chapter, we will discuss ten different types of flowers that you can find bumble bees on in Cape Breton so that you can go out and find bumble bees in your neighbourhood.

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### **Fireweed (Genus *Chamaenerion*)**

Fireweed is a genus of flowers known as *Chamaenerion*. These brightly coloured flowers are a favourite of the yellow-banded bumble bee, a **COSEWIC** Species of Special Concern. Fireweed blooms from July to September with peak flowering times from mid-July to early August.

#### *How to identify:*

Fireweeds have bright purple or pink **inflorescence** (a cluster of flowers that branch out from the main stem) that extend from a tall woody stem. Their leaves wrap around the entire stem in



Genus *Chamaenerion*. Source: David McCorquodale (2020), [view page](#).

a spiral pattern that extends from the base of the plant up to the flowers.

### **White sweet clover (*Melilotus albus*)**

White sweet clover is not a native species to Cape Breton as it was introduced to North America by humans. You can commonly find these plants along the side of roads, near soccer fields, playgrounds, or other unnatural outdoor habitats. Flowers can start appearing in May and some plants can flower until mid-October.

*How to identify:* These small, white flowers can form clusters up to 20 cm long along the length of the plant's stem. The plant has a **compound leaf arrangement** which means that the leaves are grouped together and contain more than one leaflet. The leaves themselves are toothed and they alternate along the stem.



*Melilotus albus*. Source: David McCorquodale (2020), [view page](#).

### **Black Knapweed (*Centaurea nigra*)**

This **non-native species** arrived in Cape Breton from Europe after settlers arrived in Unama'ki. Like white sweet clover, black knapweed can be found in man-made environments such as along the sides of roads and in fields.

*How to identify:* These bright purple flowers emerge from a smooth green stem that has an alternating leaf pattern. The leaves of black knapweed are lobed and not separated into leaflets. The purple flower head has what we call **disk flowers**. This means that the flower head itself contains many individual tiny flowers that make up the entire head. Black knapweed is very hardy and therefore you can usually find it in bloom from June until as late as November.



*Centaurea nigra*. Source: David McCorquodale (2020), [view page](#).

### Goldenrod (Genus *Solidago*)

The genus *Solidago* contains several different species that bumble bees love. Canada goldenrod, rough-stemmed goldenrod, and northern seaside goldenrod are just a few species of goldenrod that you might find bumble bees foraging on.



*Solidago*. Source: David McCorquodale (2020), [view page](#).

*How to identify:* Goldenrods have bright yellow **disk flowers** and **ray flowers** (a single, long petal that extends from the flower head) that branch out at the very top of the plant's tall stem. The lobed leaves alternate up the length of the stem. You can usually find goldenrod in

bloom in large numbers in meadows and fields from mid-summer to early autumn.

### **Tufted vetch (*Vicia cracca*)**

These bright purple flowers are a member of the pea family and therefore, before they are in bloom, you may notice small pea pods on the plant. Like peas, these plants climb other plants and structures around



*Vicia cracca*. Source: David McCorquodale (2020), [view page](#).

them using their long tendrils to cling to their surroundings. You may also know this species as cow vetch which is another popular name for this species.

*How to identify:* These small tubular-shaped flowers are nestled on one side of the **raceme** and are normally bright lavender or blue in colouring. A raceme is a flowerhead that contains individual flowers that run along a strand of the plant. The **compound leaves** of this plant are a grey-green colour which have about 8-12 leaflets in each compound leaf. Tufted vetch is normally in bloom from early June to late August.

### **Red clover (*Trifolium pratense*)**

Red clover is also a member of the pea family and therefore they share many of the same characteristics of tufted vetch. This non-native species is a favourite for bumble bees with longer tongues as those bees have the ability to drink nectar from the long, tubular shaped **florets**.



*Trifolium pratense*. Source: David McCorquodale (2020), [view page](#).

*How to identify:* the head of the flower is quite densely packed with magenta, tubular florets. The leaves are characteristic of clovers which contain three leaflets per composite leaf. The leaves are mostly green with a white v-shaped marking. These plants are a resilient species that are tolerant to cooler temperatures therefore you can find them in early spring until late October in some places.

### **Canada thistle (*Cirsium arvense*)**

Contrary to what the name might suggest, Canada thistle is actually a non-native species. In other countries, it is more commonly referred to as creeping thistle. These plants are very prickly so if you are looking for bumble bees around them, be careful!

*How to identify:* Canada thistles have pale lavender coloured flower heads with disk florets (similar to the disk florets we discussed previously in black



*Cirsium arvense*. Source: hannahkosick (2020), [view page](#).

knapweed). Their stems are smooth and highly branched and the plant itself can grow as tall as 150 cm. The leaves are green, sharply toothed, and have small tiny hairs that run along the length of the stalkless leaves. You can usually find these large plants in bloom from July to September.

### **Common St. John's wort (*Hypericum perforatum*)**

These vibrant flowers are not only a favourite among bees, but they have also been known for their uses in traditional Mi'kmaq medicines.



*Hypericum perforatum*.  
Source: David McCorquodale (2020), [view page](#).

*How to identify:* These bright yellow flowers branch out from a plant that can grow to be upwards of 75 cm in height. Each flower has five petals with long **stamens** that extend upwards from the center of the flower. A stamen is a long, reproductive component of a flower that contains pollen at the very top of it. The leaves of this plant are long, rounded, and have small translucent dots on them. They are also arranged in an opposite formation. This means that the leaves are directly opposite from one another along the length of the stem. You can find common St. John's wort in flower from July until September.

### **Roses (Genus *Rosa*)**

Roses in general are very popular among bees. They come in a variety of shapes, colours, and sizes and can be found along shorelines, in forested areas, and even in your own backyard!



*Rosa*. Source: David McCorquodale (2020), [view page](#).

*How to identify:* Rose bushes can grow very large and they contain clusters of

flowers each with 5 petals. Their leaves are sharply toothed compound leaves. Wild roses in Cape Breton are usually a light pink or white colour. Roses usually have sharp and prickly thorns along their stems so be mindful when looking for bees around them. You can usually find them in flower from early summer until September.

### **Queen Anne's Lace (*Daucus carota*)**

Also known as wild carrot, Queen Anne's lace is commonly found in fields and along roadsides. These flowers are not usually the first choice for bees, however, in areas where no other foraging favourites are available, bees will forage on Queen Anne's lace if necessary.



*Daucus carota*. Source: nathanpeckham (2020), [view page](#).

*How to identify:* These white flowering clusters are flat at the top and can grow as tall as 90 cm in height. The leaves of Queen Anne's lace are compound, triangular-shaped, and finely toothed giving them an almost fern-like appearance. The leaf pattern alternates along the length of the stem. You can find these flowers in bloom from early summer to mid-autumn.

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Let's put what we have learned thus far to the test. In this matching quiz, can you identify the species or genus of flower in each photo?



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## PART III

# **BEE-COMING AN ADVOCATE FOR BUMBLEBEES**

Throughout this guide, we have discussed bumble bee life cycles, anatomy, and the role they play within the diverse ecosystems of the world. We have also learned how to identify different species of bumble bees that you might find in Cape Breton as well as the flowers that they are often seen foraging on. Now that you have learned more about bumble bees, let's discuss why bumble bees are at risk and what you can do about it.

In this section, we will discuss how you can become an advocate for bumble bee conservation in your community.



Source: Steven McGrath (2020), [view site](#).

6.

## THRIVING OR THREATENED?

*Why did the bee get in trouble? They weren't bee-hiving themselves*

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There are many theories that explain why bumble bee populations have declined over the years. Many researchers agree that things such as **pesticide** use in farms and a decrease in bumble bee habitat are some of the leading causes for these population declines. When farming is conducted on a large scale we refer to this as **industrial agriculture**. To make industrial agriculture efficient, large fields are planted with a single crop to make harvesting easier. This practice is called monoculture and it reduces the **biodiversity** of an area as there is only one species of plant present as opposed to

many different species like what we would see in a natural habitat.

Bumble bees depend on a wide variety of plant species for **foraging**, therefore, when an entire field is planted with a crop that they are unable to forage on throughout their lifetime, they are unable to thrive in that area. Having a large diversity of flowers available for bees is essential for bumble bee survival.



Source: Star Vancouver (2019), [visit site](#).

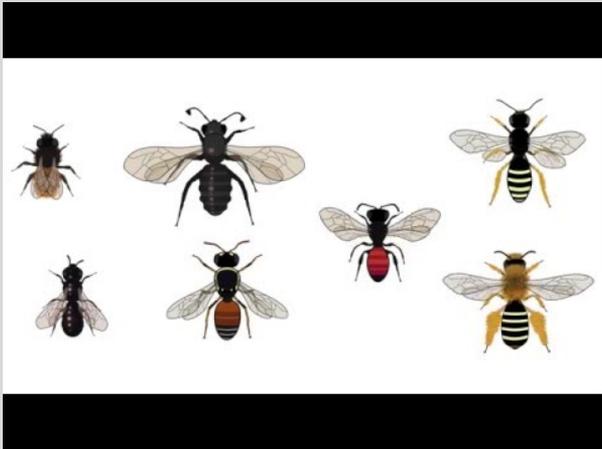
As we previously mentioned in Chapter 3, **non-native species** such as **honey bees** also have a negative impact on native bumble bee species. Non-native bees compete with bumble bees for food and other resources and they can also introduce dangerous **pathogens** that can harm or kill bumble bees. When humans introduce non-native bees as pollinators for agricultural purposes or when they start a commercial beekeeping operation with honey bees, this can deter native bumble bees from that area.



Source: Humboldt Journal (2020), [visit site](#).

Additionally, **climate change** has a big impact on bumble bee survival. Fluctuating weather patterns, changing flower blooming times, and temperature extremes all influence a bumble bee's ability to thrive.

Overall, bumble bee populations are very much at risk. Species such as the yellow-banded bumble bee and the gypsy cuckoo bumble bee in particular have been significantly impacted by human activity. It is our responsibility to do what we can to protect these important pollinators for the wellbeing of the natural environment.



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Source: Bartomeus Lab (2016). [View site.](#)

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Let's put what we have learned thus far to the test. In the following quiz, fill in the missing words to show that you've grasped the concepts we have discussed in this chapter.



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## 7.

# HELPING BEES IN YOUR OWN BACKYARD

*What do bees do when they get married? They go on a  
honeymoon!*

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Now that you've learned more about bumble bees, let's talk about how you can become an advocate for bumble bee conservation by helping bees in your own backyard! In this chapter, we will highlight several different ways you can get involved in bee conservation through the magic of the internet.

### **Creating a Pollinator Garden**

Building a bumble bee oasis is much easier than you might think. In fact, pollinator gardens are usually much easier to maintain than traditional lawns and decorative

gardens. When creating a habitat for bumble bees in our backyard we use native plant species that grow easily in our climate and therefore they require less maintenance and little watering once they get going. Here are a few tips on how you can create habitat in your own backyard that is welcoming to bees:

1. Plant **native species** of flowers – Transform a part of your lawn into a bumble bee paradise. Visit your local garden centre to learn about local species of flowering plants that you can purchase for your pollinator garden.



Source: Clayton D'Orsay (2017), [view site](#).

2. Create a [bumble bee bath](#) – Bees need water too! Use a shallow plate, stone, or plant pot tray and fill it slightly with water (not too much as you do not want the bees to drown). Add decorative stones and other objects to your bee bath to provide a perch for drinking bees or a nice resting place. Change the water every few days to prevent mold growth and to dispose of mosquito larvae.



Source: Experience Life (2016), [view site](#).

3. Maintain a messy garden – That’s right! Keeping your garden untidy and in its natural state will encourage bumble bees and other insects to make their home in your yard. Instead of raking leaves, leave them scattered across your lawn to provide shelter and habitat for insects and their larvae.



Source: Hannah Kosick (2020).

4. Avoid using pesticides – **Pesticides** and other harsh chemicals such as fertilizer have no place in your pollinator garden! Keep your bee oasis as natural and organic as possible to avoid harming any bee visitors.



Source: Steven McGrath (2019), [view site](#).

The [David Suzuki Foundation](#) has an excellent series of blog posts that discuss how you can create pollinator gardens in your own backyard. Visit their [website](#) and explore the resources they have available if you want to learn more about creating a beautiful pollinator garden.

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### **Join an Online Conservation Initiative**

You can take your bee learning journey one step further by getting involved with a national organization that promotes healthy habitats for bees. Take advantage of their educational resources and free programming to learn more about these important insects. Here are a few ways you can get involved in bee conservation online:

1. Take Bee City Canada's [Pollinator Pledge](#) and join a national network of pollinator pals! Looking to go the extra mile? Pitch the idea to your school or community to become a [Bee](#)

- [School](#) or [Bee City](#)! Explore their [website](#) to learn more about bees and other pollinators through online webinars, activities, and more.
2. Join the David Suzuki Foundation [Bee-bnb](#) revolution by becoming a backyard super host for wild bees and other pollinators. As a Bee-bnb host, you'll pledge to provide habitat in your backyard for bees by planting native wildflowers, creating suitable nesting habitats, and more! They also have lots of [resources](#) on their website if you're interested in learning more about bees and how you can help them.
  3. Register an account with [iNaturalist](#) or [Bumble Bee Watch](#) and upload photos of bumble bees you find in your community. These online citizen science platforms record your findings and scientists use them in conservation research. You can also check out our [iNaturalist project](#) for citizen science bumble bee observations in Cape Breton.



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## Photographing Pollinators

Bumble bees are an important part of ecological communities. They pollinate the plants of the food we eat and they contribute to the overall **biodiversity** of **ecosystems**. Interestingly enough, the best thing you can do to help protect bumblebees is to photograph them! In this section, we will discuss how you can help protect bumble bees one photograph at a time.



When photographing bumble bees and other insects, it is important to get a photo of the bee's back, side, and face. For example, the tri-coloured bumble bee has a black, arrow shaped marking on its thorax which distinguishes it from other bumble bees. Source: Bob Noble (2018), [view site](#).

Taking photos of bumble bees is an important part of conservation research. The more citizens we have photographing bees and participating in data collection, the more we can learn about the vulnerable populations that we are trying so hard to protect. Bumble bees are very gentle creatures and they generally don't mind when you get up close and personal to get that perfect shot! When approaching a bee, make sure you walk up to it slowly and try to avoid blocking their light with your shadow. Most importantly, if a bee appears to be agitated, make sure you back off and give it some space to forage and pollinate without a camera in its face!

*How to photograph these bee-utiful creatures*

Try taking a slow motion video of a bumble bee. You can then sort through the footage to find the perfect shot! Source: Steven McGrath (2019), [visit site](#).

Lights...camera...conservation! When taking photos of bumble bees, it is important to capture their identifying characteristics which are found on their back, side, and face. It is much easier to identify a bumblebee to species if you have clear, quality photos of these components.

After you photograph your bumble bee, you can upload your photos to platforms such as [iNaturalist](#) or [Bumble Bee Watch](#) to share your observation with budding naturalists and researchers. When you share your findings online, bee researchers will be able to identify the bee and determine what type of habitat it is found in as well as the range of different types of bumble bees. This information is very helpful when we are trying to conserve Species of Special Concern. The more we know about these charismatic creatures, the more we can do to protect them!

If you want to learn more about how you can photograph bumble bees visit [Photographing bumble](#)

[bees](#). You can also check out Brett Forsyth's free pocket guide on photographing bumble bees [here](#).



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# ACKNOWLEDGEMENTS

Writing Bumble bees of Unama'ki: A Guide to Becoming a Buzzing Naturalist has been an incredible journey for me. It was an excellent outlet for me to offload my creativity as I worked on my honours thesis for my undergraduate degree and I am deeply grateful for everyone who helped make this Guide a possibility.



Source: Ian Harte (2020).

To Dave, thank you for sharing your passion for insects, science, and the little things in life with me. To Jasmine, thank you for providing lots of tech support, creative ideas, and for giving me confidence boosts along the way. And to Katherine, thank you for inspiring me to create an honours project that was a little out of the norm but a lot more me.

To my loving parents, sister, and partner, thank you for fostering my love for nature and for taking the time to drag me away from my work to enjoy it for myself!

I would also like to extend a special thanks to the citizen scientists of iNaturalist that contributed to this book in the form of bumble bee photographs. Thanks to you, this book has been transformed from a simple written document to one that is full of life and colour.

Lastly, thank you to the bumble bees of Unama'ki, for showing me how beautiful life really is.

# QUIZZES



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# SOURCES

Looking to learn more about bumble bees? Here is a list of resources I consulted that you can explore if you want to learn even more about these fascinating creatures!

## **Books:**

Bumblebees: Behaviour, Ecology, and Conservation by  
Dave Goulson

## **Websites:**

[Bee City Canada](#)

[Blooms for Bees](#)

[Bumble bees of Wisconsin](#)

[Bumble bee conservation trust](#)

[Bumble Bee Watch](#)

[David Suzuki Foundation](#)

[iNaturalist](#)

[Photographing Bumble bees](#)

**Youtube Videos:**

[Clever Queen Bumble Bees | Life In The Undergrowth |](#)

[BBC Earth](#) – BBC Earth

[Introduction](#) – Photographing Bumble bees

[What's Happening to the Bees?](#) – Bartomeus Lab

[WPC's Native Pollinator Initiative Episode 6 – Bumble Bee Identification](#) – Wildlife Preservation Canada