



CUMBERLAND
CITY COUNCIL

Keepin-A-Hive

Guide booklet



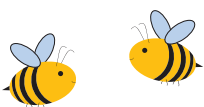
Keepin-A-Hive

Introduction

This guide book is for participants of Cumberland City Council's Keepin-A-Hive Native Bee program. The information in this guide contains useful information about caring for and maintaining your beehive.

The Cumberland City Council's Keepin-A-Hive program is designed around the concept of driving biodiversity through pollination through using native bees and encouraging our residents to plant and protect native habitats, so that we can increase biodiversity throughout the LGA. The program aims at helping residents take action on biodiversity loss and create a positive relationship between people and native insects.

We hope you enjoy your journey into native beekeeping and help us create a more sustainable, inclusive environment.





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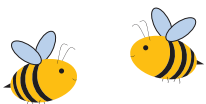
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Understanding Stingless bees

Our local stingless bees – *Tetragonula carbonaria* are small black bees that live in social colonies that contain a queen, workers and males.

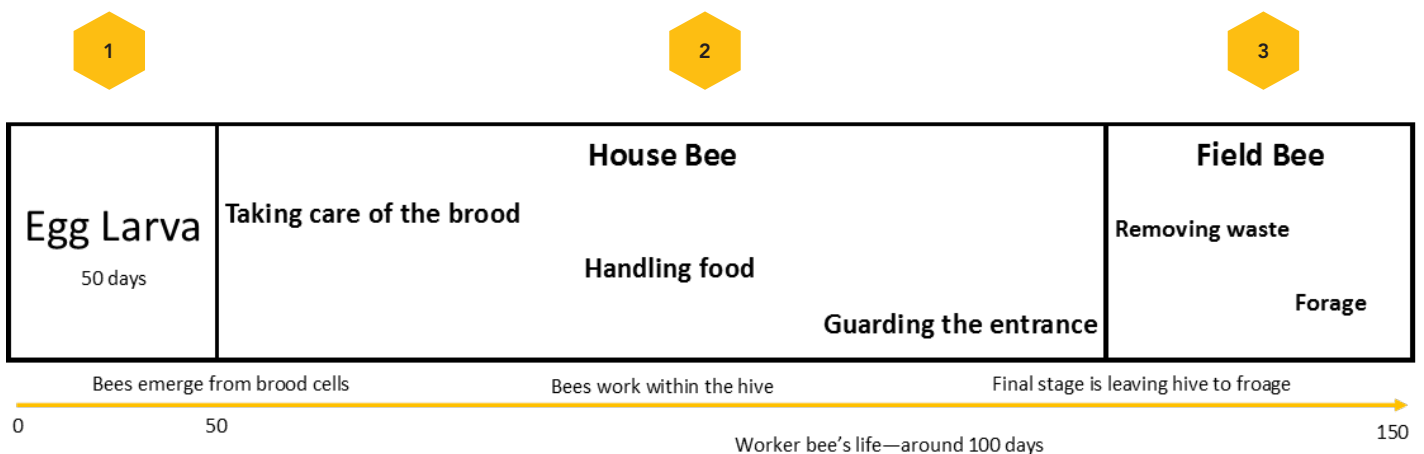
Queen – she is the only fertile female in the hive. After she mates with a male drone the Queen will then spend the rest of her life inside the hive laying eggs. Lives for one year but can live for longer.

Workers – Can be up to 10,000 sterile female workers bees in a hive. These bees do the work within the colony. They perform different tasks at different stages in their life. Live for approximately 100 days.

Males – The primary role is to mate with a virgin queen. Unknown lifespan as they often leave the hive when mature to look for a mate.

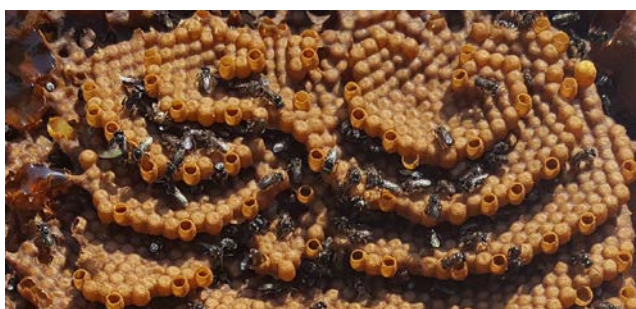
Bee lifecycle

Three development stages



Approximately 50 days from larva to adult

Worker bee's life – around 100 days



Queens and virgin queens

Every stingless beehive will contain an actively fertile queen. It will also contain replacement queens or virgin queens. The fertile queen will lay emergency queen cells on the outer layer of the brood comb. These cells are larger than normal cells which makes them easier to identify.

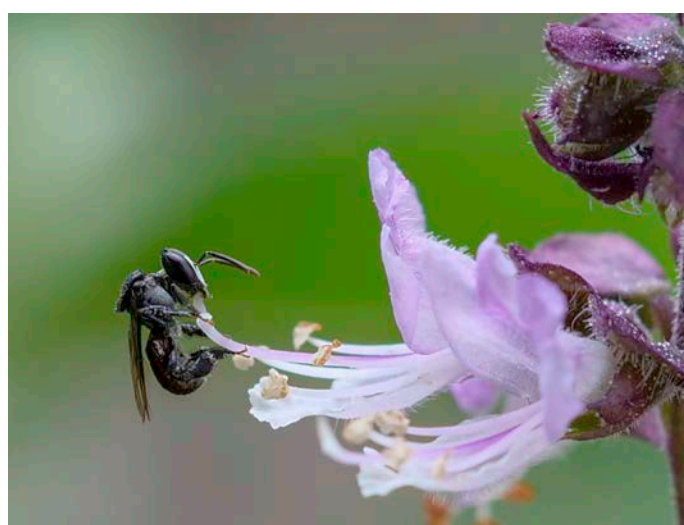
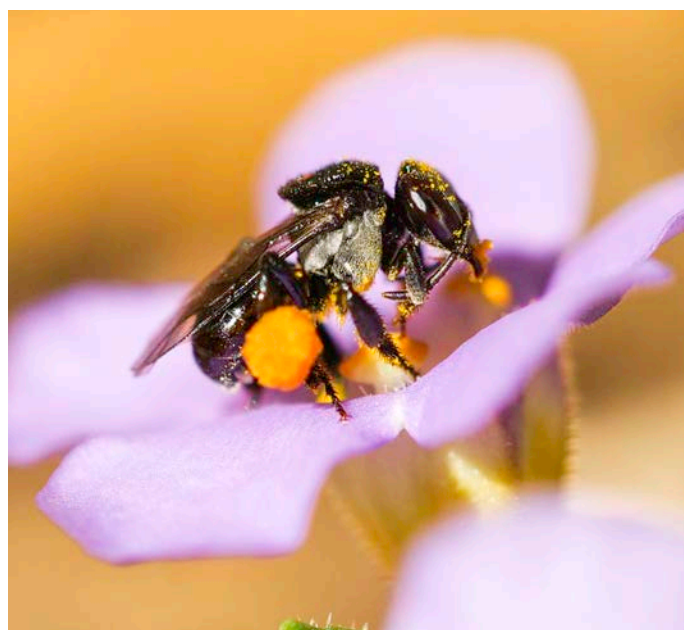


Photo by Geoffrey Dutton - Duttons Native Bees

Foraging bees

Stingless bees forage for resources they need to keep their hive alive and healthy. These include:

- Nectar for energy requirements
- Pollen for protein and other essential nutrients
- Resins and plant material to build their nests

For these reasons, it is essential to have a variety of flowering plants in your area. Planting a variety of native plants will also help increase native habitat for other insects and wildlife.

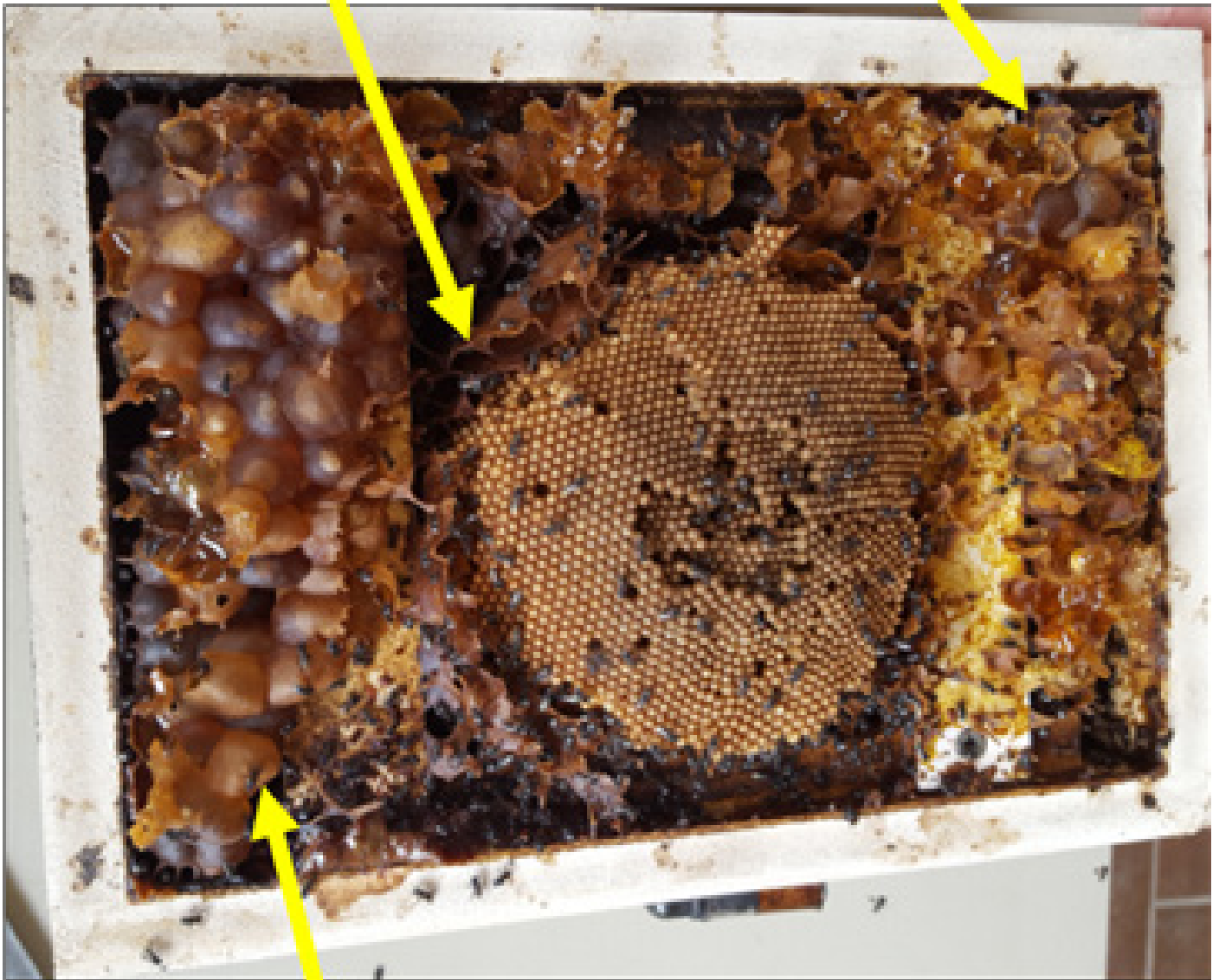
Our stingless bees will not leave the hive if the temperature outside the hive is below 18 degrees Celsius. They may go a few days during winter with no activity outside. However, you may still hear them buzzing away inside.

Temperatures above 40 degrees Celsius can cause nest structure to melt, and temperatures over 45 degrees Celsius can kill bees.

Inside your hive

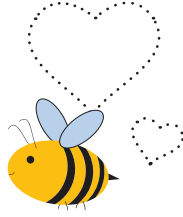
Brood

Pollen Pots



Honey Pots





Taking care of your hive

Setup

Once your hive establishes, they require very little maintenance. However, a good location is necessary for them to thrive. Cumberland City Council hives all require to the same setup.

Types of hives



Goodrich Hives – Standard OATH design hive

Made in 2 sections. Designed to be split to create new hives



Lightweight hive – box design

Made in 1 part with in-built insulation and are larger than the other boxes. This design is made only for buddings and cannot be split.



Standard Wooden OATH

Made in 2 sections and designed for both splitting and budding



You must place your hive in a shaded position, under a shrub or tree, on a back deck or beside the house. It can receive some morning sun (until about 10 am) but must remain in the shade for the rest of the day. In winter you may move the hive 1 metre into some morning sun if it does not already receive any.

So why is location so important?

Summer

In summer, hives must not be in positions where they receive direct sun from mid-morning to late afternoon. Native stingless bees do not handle extreme temperatures well, so it is vital they are not in the sun where they are at increased risk of heat stress. Even with proper positioning though, on days of extremely hot weather (higher than 38°C), hives can potentially still heat to dangerous levels.

For any temperatures over 39 degrees, one of the following measures is recommended to prevent potential death of your hive.

- Drape a wet towel over the hive that has one or both ends in a bucket of water (remember to remove the hive box from the outer wooden box and drape the towel over the internal hive).
- Move the hive into air conditioning. Cover the entrance the evening before and move the hive into an air-conditioned room for the day. You may lose some bees, but you will save the colony. This should be your last option and only done on those days where the temperatures will be very extreme.

One sign of an overheating hive is lines of workers on the front of the hive, fanning their wings, radiating out from the entrance. These bees are trying to increase air circulation in the hive in an attempt to cool it. If you see this behaviour on a hive, then **emergency intervention by you is required to cool the hive immediately!**

Remember, we choose where their hive is located. Because of this, it is essential to take that responsibility of caring for the hive.



So why is location so important?

Heatwaves

Heat can be a real killer for our little bees. Our stingless bees have a preferred nest temperature in which they are productive and thrive. Unfortunately, our stingless bees are unable to regulate their nest temperature during extreme heat and cold events. This is because they are unable to conduct the evaporative cooling that honey bees do. Honey bees collect water to disperse around the nest and fan their wings to help cool their hives down; stingless bees do not have this capability.

Killer temperatures

Research on heatwaves and hives conducted by Giorgio Venturieri in 2013 and 2014 in Sydney showed that when the outside temperatures reached 45°C, many colonies died. Laboratory experiments showed that *Tetragonula carbonaria* died after 10 minutes when temperatures reach 39°C inside the hive. Placement of hives and correct insulation aims to keep the internal temperature of the brood below a lethal temperature of around 39°C.

Cold weather

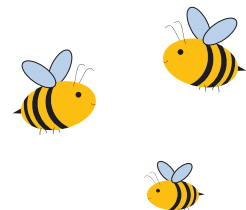
You will notice during winter less activity from your hive. *Tetragonula carbonaria* will not leave the hive when the temperature outside is below 18°C. So do not worry if in winter you see little to no activity on cold days. If you are worried about your hive, these simple steps can help you determine if your hive is ok:

- Check for signs of waste pellets on the ground directly in front of the hive. When it is too cold to leave the hive, your bees will simply drop the pellets of waste out the front. This is a good sign and shows there is still activity inside.
- Check for guard bees at the entrance – all active hives will have a few guard bees at the entrance – sometimes hard to see (if you have a Goodrich hive and cannot see any bees you can remove the black tube and look inside. After checking place the tube back).
- Listen at the entrance of the hive for activity – if you place your ear to the entrance of the hive, you should be able to hear buzzing inside.

Placement of hives is critical, particularly here in Western Sydney, where high temperatures during summer are typical. By placing hives in a cool completely shaded positions during summer, bringing them inside in extreme heatwaves (+40°C) and providing sound insulation, we can protect the hive from extreme outdoor air temperatures.

Winter

You can move your hive, so it receives morning sun. This will help warm them up and get active for the day. The hive may not be needed to move if the site they are currently in has some warmth. They do not need to be out in direct sunlight all day.



If you complete these steps and still see/hear no activity, please contact Council as soon as possible.



Moving a hive



Option 1:

1km move

This method involves transporting your hive at least 1km away from its current location. This is outside the bees foraging range and reduces the chances of foraging bees returning to the original hives location.

Lock the hive up the night before the move – please use the clear tubes provided (if you have lost the tubes, please contact Council). Move the hive at least 1km from its current location. Leave in a suitable area as above. Leave the hive at the new site for one week then return to your place to set up in the new location in your backyard.

Option 2:

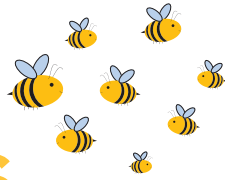
1m move (preferred)

To do this, you may move your hive no more than 1m at a time. This can be done day or night the bees will find the new location, but it must be no more than 1m from its position. If you need to move it further than 1m to receive the morning sun, you may move it short distances (no more than 1m) over successive days until it is in its final location for winter. This process will need to repeat in reverse once it starts to warm up again.



Photo by Geoffrey Dutton - Duttons Native Bees

Swarms



At some point, you may experience a swarm. These are nothing to be overly concerned about; generally, there are three types of swarms each having distinct displays by the bees and all show different signs of what's happening in the hive.

Fighting swarm

Occur when another hive in the area tries to take over your hive. Bees from a competing hive will grip onto another bee and fight to the death. The result is a mass of dead bees on the ground in front of the entrance. These swarms can last for a few weeks and generally occur in summer. Usually, the hive will survive even if it has been taken over by the competing bees. Please contact Council if you think you have a fighting swarm.

Defending swarm

This may happen when a bee from another hive tries to enter your hive. This generally will only happen if you move hives or have hives close to one another. For this type of swarm you will not find any dead bees on the ground and it usually only happens for a few days to a few weeks.

Mating swarm

Generally less aggressive than fighting swarms. A mating swarm will happen when a hive needs a new queen. The daughter queen will leave the hive and mate once with a male. Many males can be seen gently flying around the hive and can stay for days or even weeks, for a chance to mate with the queen.

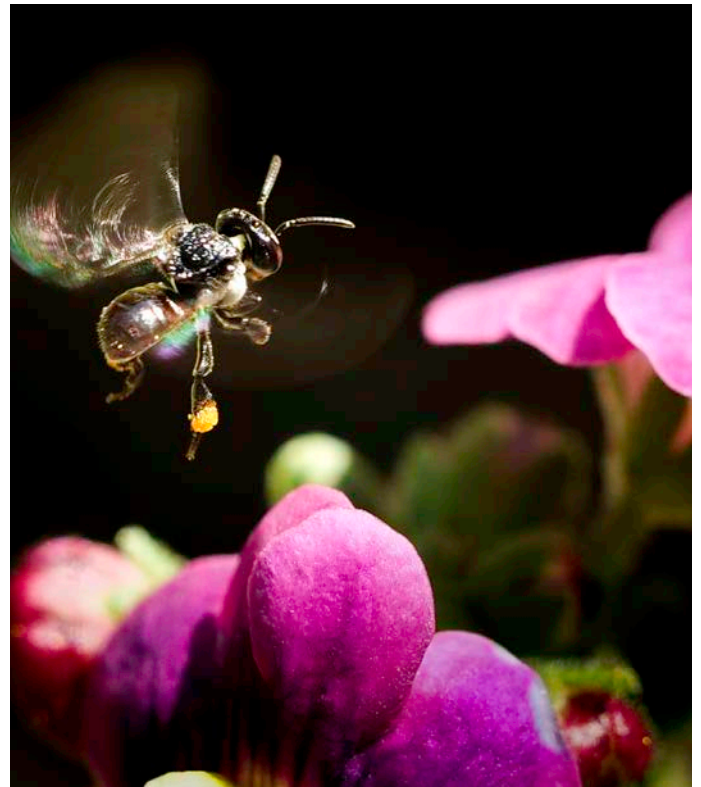
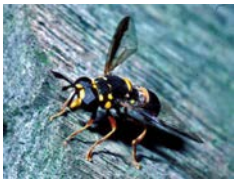


Photo by Geoffrey Dutton - Duttons Native Bees



Pests and diseases

Stingless bees do have a few common pests that can attack the hive. If the hive is strong many of these are not going to impact your hive. However, there are a few that can destroy hives, and it is good to be aware of them and how to control them.



Syrphid Fly – (wasp-mimic Hoverfly)

These flies need open joints and gaps to enter and lay their eggs. They are most common after a split and can enter the weakened hive. To prevent this, please ensure the gaps are sealed with tape. If required, the tape may need to be replaced.



Small Hive Beetle

Although this bug is far more common in Honey beehives, they have been known to enter stingless bee hives. Good housecleaning around honey bees hives is a must to reduce the risk of these bugs entering your hive.



Phorid Fly

This little fly enters the hive through any opening and lays its eggs inside, within days they can destroy the hive. Also never open the hive without prior consent from Council, as broken pots can attract this fly. If you have honey bees, please keep the area clean and do not leave honey lying around.

Predators and other insects outside your hive

Bembix Wasp

Prevalent attack insects, they hover outside your hive and grab bees when they are flying out. The best way to rid yourself of these bugs is to get a fly swatter and swat them away.

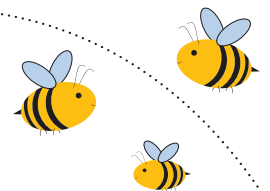


Ants

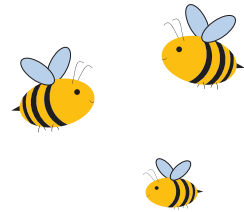
Ants are a common sight around many hives but seem to be more familiar with log hives. They do not seem to pose a risk to our bees and generally live outside the hive. However, they can sometimes enter the hive. If this happens, please contact Council. If you have problems with ants and want to deter them, place the hive off the ground on a pedestal and grease the posts or place the hive around a water barrier or moat.

Spiders

Spiders are prevalent around hives and can be left alone; after all, they eat pest insects as well as a few bees. Just make sure they are not setting up their web in front of the hive. One participant has had great success deterring spiders by soaking a cotton ball in lemon juice and leaving on the top of the hive.



Other insects to watch out for



Black soldier fly

To prevent these from attacking your hive keep it away from compost or worm farm bins

Assassin bugs

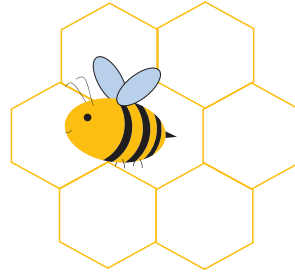
Will only take a few bees and not much of a significant threat

Other bees

Generally not a threat and only take some resin from the entrance. Be mindful of lots of honey bees though as they can steal everything from the hive leaving it empty



How we create new hives



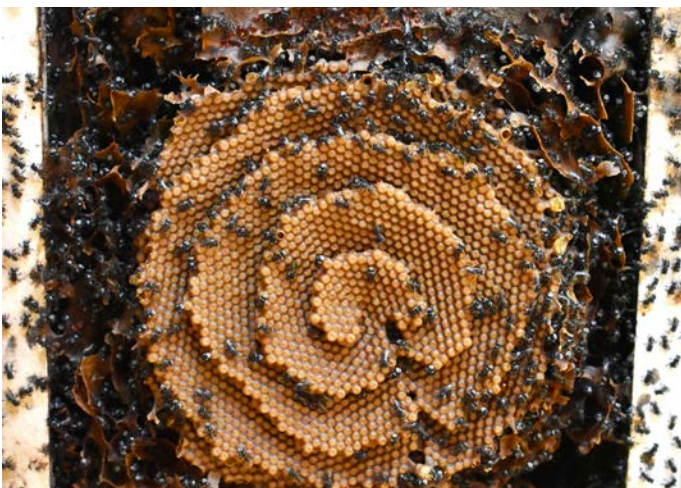
Splitting method

In this method the two sections of a hive are separated from the full hive, these two sections are then placed with a new empty half. This can only be done with the Goodrich hive boxes and the OATH boxes which are designed as two halves that sit on top of each other that can be separated.

When to split

Cumberland City Council's Goodrich hives and OATH hives will only be split after an 18 month period from receiving your hive. They are required to be at least 7kg in weight and on a warm day should have around 30 to 60 bees returning to the hive per minute. If your hive needs to be split, you are required to attend and participate in the split with guidance from a Council officer.

Splitting hives can increase the risk of pest invasion, and if not done correctly, you could potentially lose both hives. There is also the risk that one half will not re-queen, and after a split, both hives should be monitored to see the activity of a new queen (mating swarms or increase weight in the hive). There will be a step-by-step guide provided to those who prefer to split their hive over a budding.



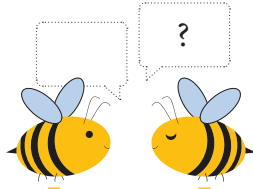
Budding method

Budding method can be used on all hives. Budding is a method where an empty hive box is attached to the entrance of a full hive, and over time the bees begin to build a new hive within the empty box. This method also requires a robust and healthy hive as the bees will not create a new hive if they are not strong and healthy. This means hives will only be duplicated after 18 months.

This method takes much more time, usually around six months, but can take up to 12 months. It also requires regular checking on the hive (about every two weeks on average which should be done after

dark) to observe the progress of the hive. Although this process takes more time, it is less invasive has a lower risk of pest invasion from ruptured pollen and honey pots, and there is little risk of losing the mother hive during the process. This process also allows you to observe the building of a new hive which can be an enriching experience.





Commonly asked questions

Many bees are hanging around outside the hive after dark

In winter and sometimes in summer, you may find bees congregating on the outside of the hive or roosting in nearby branches. Research suggests these are most likely male drones who have matured and left the hive looking to mate with a virgin queen. These bees will not re-enter the hive and should be left to live out the rest of their days outside the hive. This is a natural process and nothing to be concerned about.

I moved my hive to another spot in the garden, but all the bees are flying back the old spot

Please see the section on moving a hive. Bees have a memory of where the hive is placed, and if the hive is moved within the foraging range 500m, they will instinctively go back to the original location of the hive. You will need to move the hive back to its original location and do one of the methods mentioned, i.e. move it 1m per day until it is in the required location.

There are brown liquid stains on the entrance of the front of the hive

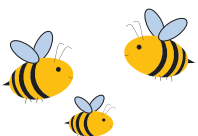
All hives will have some moisture build-up inside of them. To reduce this, the bees will spit it out of the front entrance creating this brown stain. This can be reduced by ensuring the ventilation holes are clear and to allow proper airflow through the hive. If you think the amount of liquid is too much, please contact Council.

Do my bees need water?

Stingless bees do not use water for cooling their hives like the European honey bee does. However, you can leave a small dish of water with pebbles during hotter, drier months. Stingless bees may collect water to dilute honey and for nutrition during the hot, dry months. It is not needed for the whole year.

There are many bees on the outside of my hive in lines (hot day over 35°C)

The hive is over-heating and if nothing is done the hive will die. Place a wet towel over the hive to cool it down. If this does not work, lock the hive up and move it inside – do not worry about the bees on the outside.



Further information

For general enquiries

For general enquiries about your hive, please contact Council's Environmental Management Project Officer to learn more about stingless bees.

Books

Australian Native Bee Book

by Tim Heard

Australian Native Bees

by NSW Department of Primary Industries

Websites

www.aussiebee.com.au

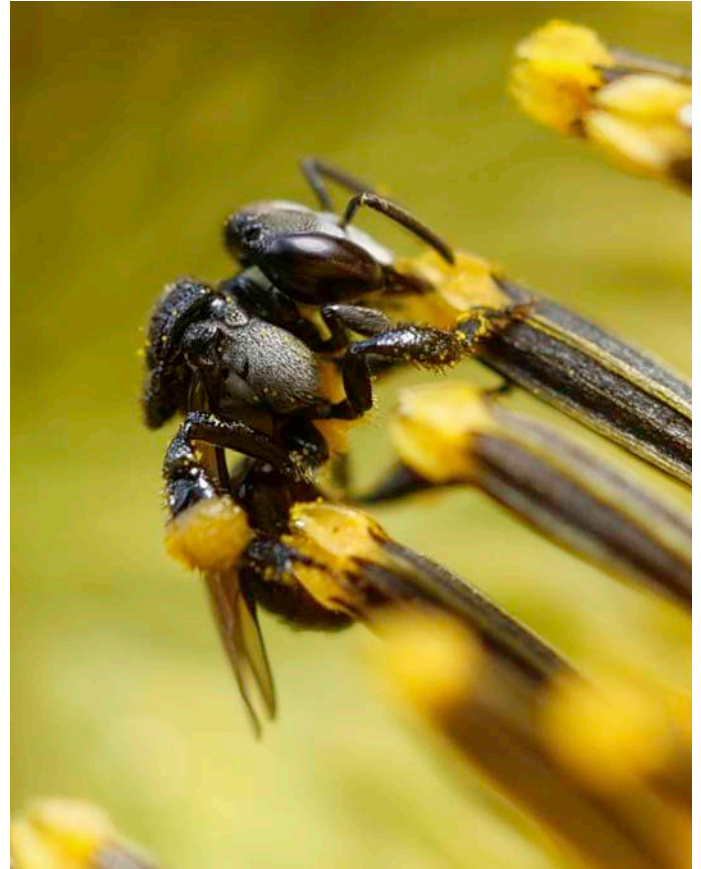


Photo by Geoffrey Dutton - Duttons Native Bees

Acknowledgements

The Australian Native Bee Book, Sugarbag Bees, Tim Heard - 2016

Australian Stingless Bees: A guide to Sugarbag Beekeeping, Earthling Enterprises, John Klumpp - 2007

And work by:

Anne Dollin from Aussie Bee & Australian Native Bee Research Centre

Photos by

Geoffrey Dutton - Duttons Native Bees



Local native plants for Cumberland City



BOTANICAL NAME	HEIGHT (M)	WIDTH (M)	FULL SUN	PARTIAL SUN
Grasses, ground covers, climbers				
<i>Brachycome anquistifolia</i>	0.15	1-1.5	X	X
<i>Convolvulus erubescens</i>	0.2	1	X	X
<i>Austrodanthonia</i> sp	0.8	0.5	X	X
<i>Dianella lonaifolia</i>	0.5-1	0.5-1	X	X
<i>Dichelachne crinita</i>	0.6-1	0.5	X	X
<i>Hardenbergia violacea</i>	Climber		X	X
<i>Hibberta diffusa</i>	0.2	0.5	X	X
<i>Kennedia rubicunda</i>	Climber		X	X
<i>Lomandra longifolia</i>	1	1	X	X
<i>Scaevola albida</i>	0.2	0.5	X	X
<i>Themeda australis</i>	1	0.5	X	X
<i>Viola hederacea</i>	trailer	1-1.5		X
<i>Wahlenbergia stricta</i>	0.3	0.4	X	X
SHRUBS				
<i>Acacia falcata</i>	4-6	2-3	X	X
<i>Bursaria spinosa</i>	2-5	1.2-5	X	X
<i>Callistemon citrinus</i>	0.6-1	2-3	X	X
<i>Clerodendrum tomentosum</i>	3-5	1.5-2	X	X
<i>Daviesia ulicifolia</i>	1	1	X	X
<i>Dillwynia sieberi</i>	1-1.2	1	X	X
<i>Dodonaea triquetra</i>	1-3	0.5-2	X	X
<i>Indigofera australis</i>	2-2.5	1-2	X	X
<i>Kunzea ambigua</i>	2-3	2-2.5	X	X
<i>Maytenus silvestris</i>	1.5-2	1-1.5	X	X
<i>Melaleuca erubescens</i>	1.5-2	0.6-1	X	X
<i>Melaleuca thymifolia</i>	0.5-1	0.3-0.8	X	X
<i>Pultanaea microohylla</i>	1	0.5	X	X
TREES				
<i>Acacia decurrens</i>	5-15	5-8	X	
<i>Acacia parramattensis</i>	6-8	3-5	X	X
<i>Acmena smithii</i>	8-20	4-15	X	X
<i>Angophora floribunda</i>	10-25	6-15	X	X
<i>Backhousia myrtifolia</i>	2-7	1.5-3	X	X
<i>Eucalyptus fibrosa</i>	15-20	10-15	X	X
<i>Eucalyptus moluccana</i>	10-25	10-20	X	X
<i>Eucalyptus sideroxylon</i>	10-30	8-20	X	X
<i>Exocarpe cupressiformis</i>	6-8	3-5	X	X
<i>Melaleuca decora</i>	4-7	1.5-2.2	X	X
<i>Melaleuca styphelioides</i>	5-10	3-6	X	X





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