

BACKYARD BIODIVERSITY

OUR NATURE: NATIVE BEES

CITY OF
GOLDCOAST.™



Backyard Biodiversity

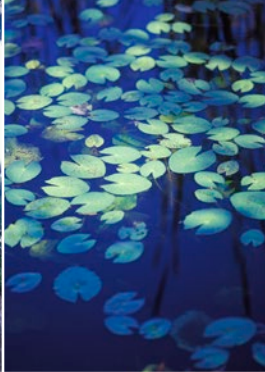
The Gold Coast is one of the most biodiverse cities in Australia.

Our native plants and wildlife are essential to our environmental, social and economic health and wellbeing.

Backyards are an important part of the Gold Coast's natural landscape with more than half of the city's native vegetation on private properties.

If you have a backyard, courtyard or a balcony you have the opportunity to support our native plants and animals by providing habitat for our diverse native wildlife.

ECOSYSTEMS DIVERSITY
Essential for a healthy planet



SPECIES DIVERSITY
Essential for healthy ecosystems



GENETIC DIVERSITY
Essential for healthy species



Threatened species

Biodiversity is reduced when species become extinct. Plant and animal species which are at risk of extinction are known as threatened species.

Threatened species can be identified by their conservation status which is specified under both Federal [*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)] and State [*Nature Conservation Act 1992* (NC Act)] legislation.

A range of factors is used to assess a species' conservation status including:

- the number of individuals remaining
- the overall increase or decrease in the population over time
- breeding success rates and known threats.

While the categories and specific definitions used differs between State and Federal legislation, in both cases the status indicates whether a species still exists and how likely it is to become extinct.

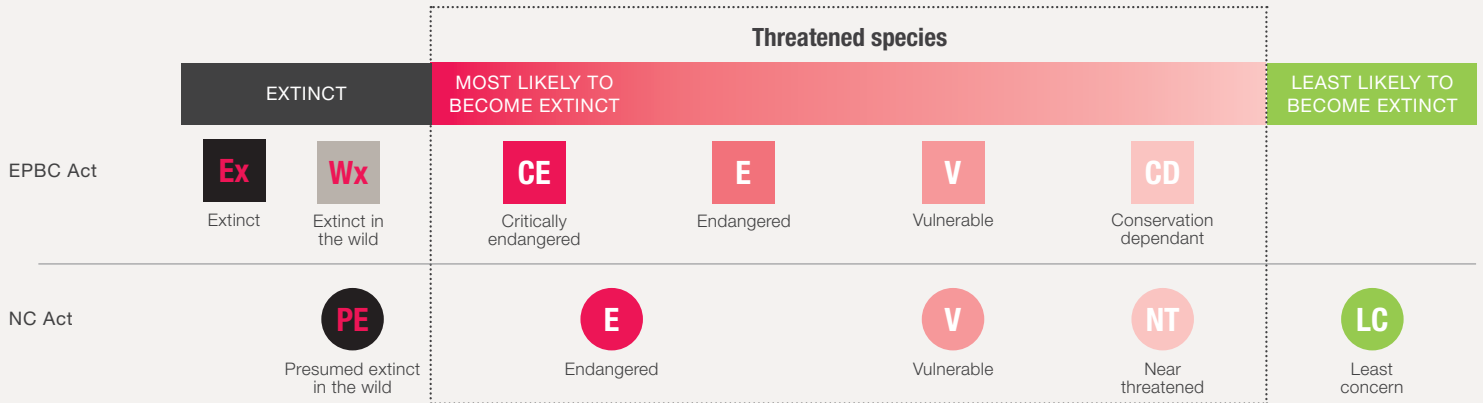
Gold Coast

On the Gold Coast, species which are locally significant are known as City-wide significant (CWS) species. These species are important because they may be threatened, restricted to the Gold Coast, or at the edge of their geographic range.



You and your backyard can contribute to supporting threatened and CWS species by creating and restoring habitat in your backyard.

Throughout this booklet, *Threatened*, *Near threatened* and *CWS* species are identified using the symbols shown below. They are accurate at the time of printing.



OUR NATURE: NATIVE BEES

The Gold Coast region is home to an estimated 200 native bee species. These bees come in all sorts of colours and sizes.

The biggest is 2.5cm long, and the smallest barely more than 2mm long! Some of our native bees are common, some are rare.

Take action in your backyard

- Protect established native plants.
- Plant a variety of local native flowering plants.
- Reduce or stop the use of pesticides in your garden.
- Retain or create places for native bees to nest.



20,000+

Number of
bee species
GLOBALLY



1630+

Number of
bee species in
AUSTRALIA



200

Estimated number of
bee species on the
GOLD COAST



70%

of Australia's bees
nest in tunnels
in the ground



Most Australian native
bee species can sting,
but only the females.
MALE BEES
CANNOT STING



5c

Queensland has the
SMALLEST BEE
in the world, at just
1.8mm

Types of native bees

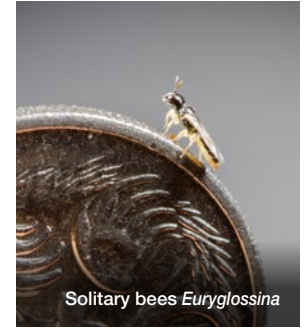
Bees have various forms of social structures, with the most famous type being 'highly eusocial'. Just as in European honey bees, highly eusocial bees nest in large colonies of thousands, with a queen and worker bees, and make and store honey. Despite the fame, being a highly eusocial bee species is actually uncommon, and there are only three native, highly eusocial bee species on the Gold Coast. These are the stingless bees, also known as sugarbag bees or bush bees. These tiny black bees nest in cavities in trees and logs, or in human-made structures such as walls and water meter boxes. They are completely stingless, and they are commonly kept by people in hives. Their honey is tangy and delicious.

Most bees, though, do not live in colonies. Instead they live alone. For these 'solitary' bees, single females make their own small nests, collect all their own food, and lay all their own eggs. They are their own ladies, and no queen bee bosses them around. Most solitary bees are



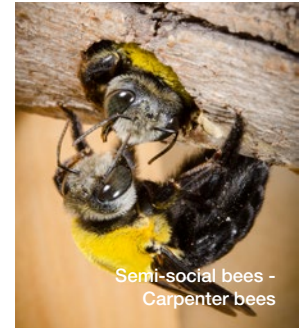
Eusocial bees - Stingless bees

ground nesters, digging nest tunnels in the soil. Some common ground nesting solitary bees on the Gold Coast include the blue banded bees, teddy bear bees, emerald *Homalictus* bees and *Lipotriches* bees. Other solitary bees nest in holes above ground, such as in beetle holes in dead trees. Common above ground nesting bees include masked bees (also sometimes called wasp-mimicking bees), leaf cutter bees, and the tiniest *Euryglossina* bees.



Solitary bees *Euryglossina*

In between the highly eusocial and solitary bees are some semi-social species. These bees commonly live in small, often cooperative colonies of less than 10 individuals. Common semi-social bees on the Gold Coast include the reed bees, which chew small tunnel nests in the pithy centres of some dead plant stems and branches, and large carpenter bees which usually chew nest tunnels into tree branches.



Semi-social bees - Carpenter bees

Eusocial

Animal species, (especially an insect) showing an advanced level of social organisation, in which a single female or caste produces the offspring and non-reproductive individuals cooperate in caring for the young.



Tetragonula carbonaria on a strawberry flower.

We need bees; bees need backyards

Bees are the world's most important group of pollinators. Not only do they pollinate many of our crops, but they are fundamental to the ongoing persistence of natural ecosystems through the pollination they provide to wild plants. But bees have many threats, with habitat loss being the biggest. For bees, habitat loss means the loss of potential nest sites and loss of food sources.

Bees need flowers, and lots of them. Bees eat pollen (a source of protein and fats) and nectar (a source of sugar), and they collect these to feed to their offspring. They need these resources from a range of different types of plants. Like us, diverse diets make bees healthy. As well as that, areas with greater plant diversity often have great bee diversity too.



Lipotriches on a tomato flower.

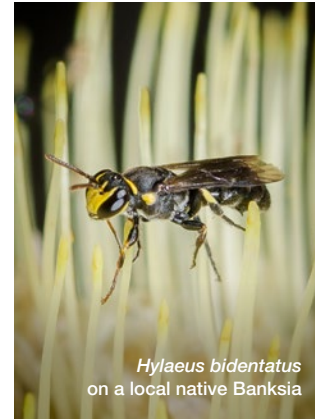
Local native plants help local native bees

One of the first steps we can take to help protect bees is to **protect existing native vegetation** in our backyards and landscapes. Established native plants provide a bounty of pollen and nectar to bees and other pollinators, and their loss will have an impact on bee numbers. A second step to support bees is to **actively grow more local native plants**. Planting a range of different local native plants in your garden will help support a variety of bees, as well as other pollinators.

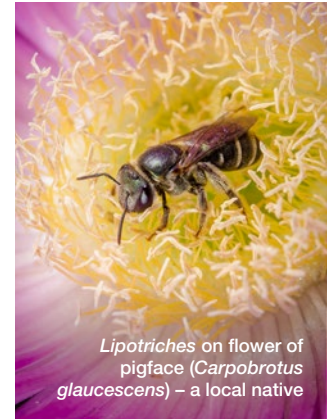
Bees will visit flowers from all sorts of plants, including ground covers, vines, shrubs, and trees. While some native bees will commonly visit the flowers of exotic plants such as fruit tree, vegetable and edible herbs, many native bees will mostly, or only, visit native plants. So, to maximise the number of species that may visit your garden, plant lots of local native plants. **Native plants help native bees!**



Native Bee on *Melastoma*



Hylaeus bidentatus
on a local native *Banksia*



Lipotriches on flower of
pigface (*Carpobrotus*
glaucescens) – a local native

Which local native plants should I grow?

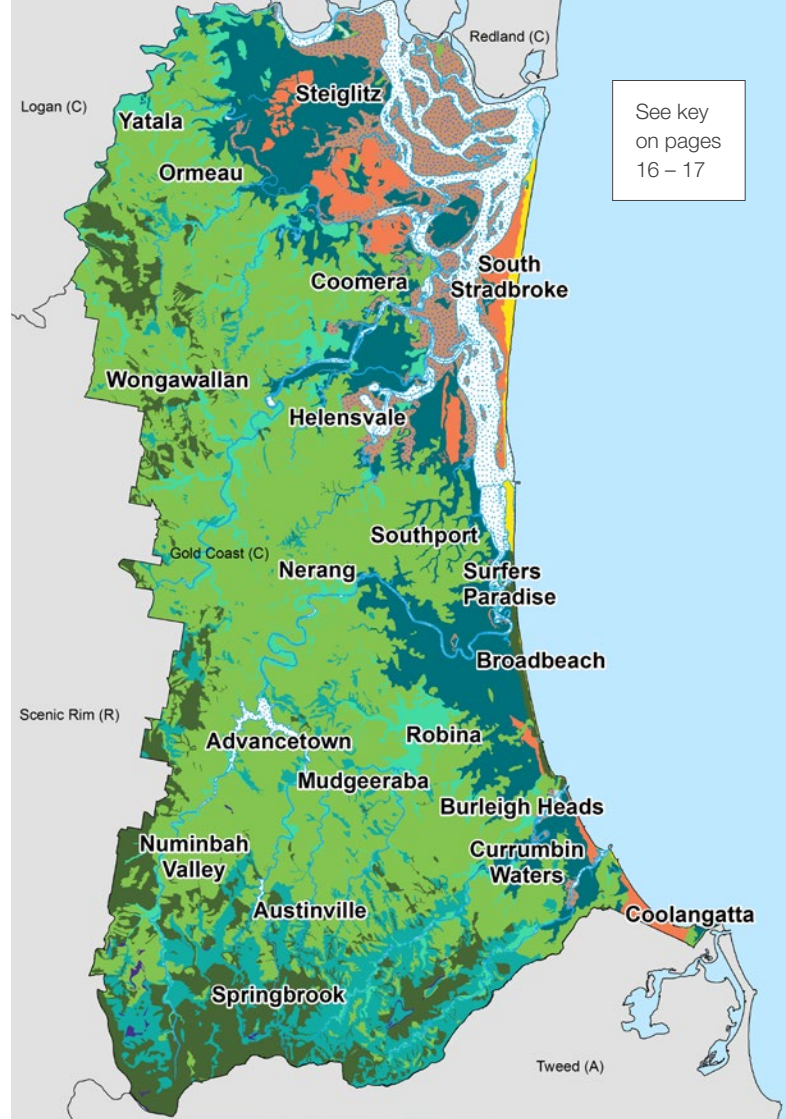
Local native plants are those that occur naturally in a location. Native vegetation grows in groups of local native plants and these groups vary depending on local conditions such as soil, landform, aspect and climatic features such as rainfall.

It is useful to understand the native vegetation group which grows on your property, or has grown in the past. These can provide a guide to selecting the most suitable local native plants for your backyard.

This map shows the historic location of vegetation groups found on the Gold Coast.

Find the vegetation group that grows where you live. You can then choose local native plants from this group to grow in your backyard by looking for the matching colour code in the local native plant list on pages 19 to 51.

When you plant the right local native plant in the right place, you save time, money, effort, energy and you do less maintenance. You also create the most appropriate habitat for local wildlife.



DUNES



D

TIDAL WETLANDS



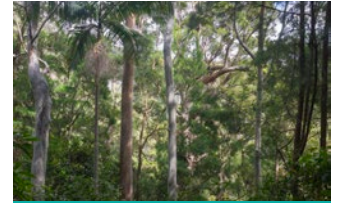
TW

RIVERINE & ALLUVIAL



RA

WET EUCALYPT



WE

COASTAL



C

SWAMP FOREST



SF

RAINFOREST



RF

MONTANE



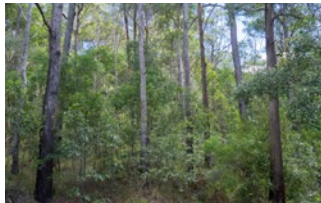
MT

FRESHWATER WETLANDS



FW

EUCALYPT



E

Grow these local native plants for local native bees

The Gold Coast is home to more than 1730 species of native plants.

They come in a diverse range of textures, colours and sizes and can be used in any style of garden. These local natives are great for local native bees.

Not all plants species listed will be available, but the range of local native plants available is growing.

Asking your local garden centre or native nursery to stock specific local native species that you would like to grow will encourage them to increase the range of species available.



GROUND COVERS AND SCRAMBLERS



HERBS AND FORBS

Flax lilies (*Dianella* species)



Blueberry Flax Lily

Dianella caerulea



Blue Flax Lily

Dianella caerulea var. *assera*



Blue Flax Lily

Dianella caerulea var. *caerulea*



Blue Flax Lily

Dianella caerulea var. *producta*



Other local *Dianella caerulea* varieties

- var. *petasmatodes*
- var. *protensa*
- var. *vannata*



Suckering Flax Lily

Dianella congesta



Short-flowered Flax Lily

Dianella brevipedunculata

Blue Flax Lily

Dianella longifolia

Spreading Flax Lily

Dianella revoluta



HERBS AND FORBS

Blue Bells (*Wahlenbergia* species)



Tufted Bluebell

Wahlenbergia communis

Australian Bluebell

Wahlenbergia gracilis

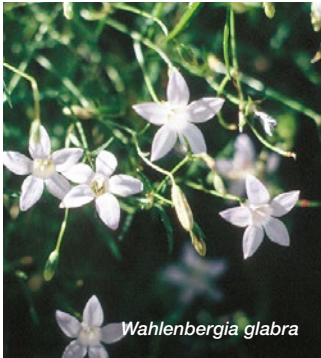
Tall Bluebell

Wahlenbergia stricta

E

A blue bell

Wahlenbergia glabra



Rock-face Bluebell

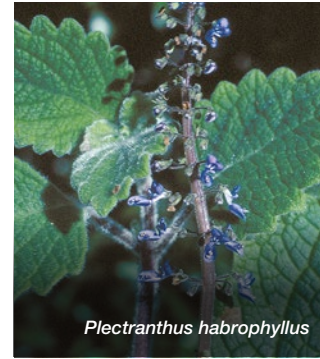
Wahlenbergia scopulicola



MT



Plectranthus species



Native Coleus

Plectranthus habrophyllus



Cockspur Flower

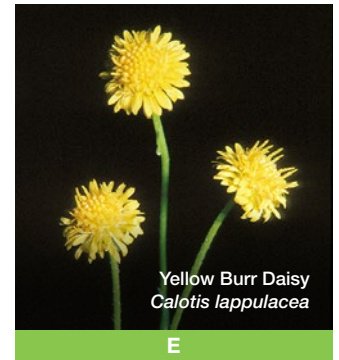
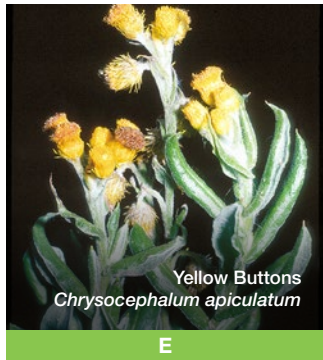
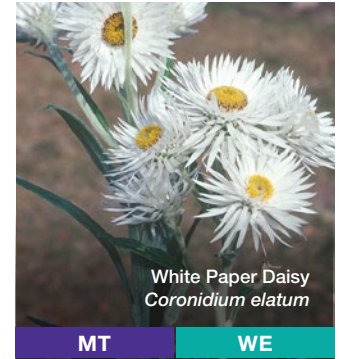
Plectranthus parviflorus

E



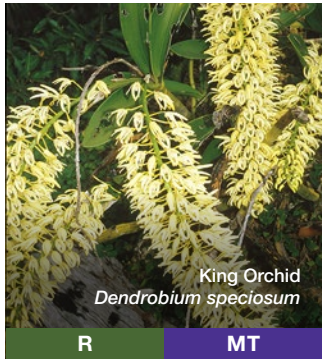
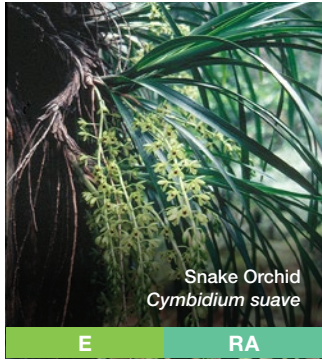
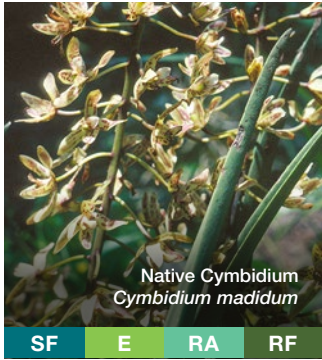
HERBS AND FORBS

Daisies (*Asteraceae* family)





ORCHIDS



SHRUBS

Tea Trees (*Leptospermum* species)



Wallum Tea Tree

Leptospermum semibaccatum

Olive Tea Tree

Leptospermum liversidgei



Lemon-scented Tea Tree

Leptospermum petersonii



Wild May

Leptospermum polygalifolium



Prickly Tea Tree

Leptospermum juniperinum



Leptospermum trinervium



SHRUBS

Grass trees (*Xanthorrhoea* species)



Swamp Grass Tree

Xanthorrhoea fulva



Blue-leaf Grass Tree

Xanthorrhoea glauca



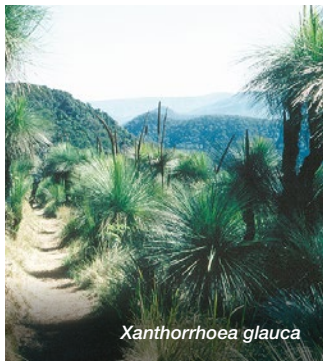
Forest Grass Tree

Xanthorrhoea johnsonii



Bottle Brush Grass Tree

Xanthorrhoea macronema



Banksia species



Swamp Banksia

Banksia robur



Dwarf Banksia

Banksia oblongifolia



Golden Candlesticks

Banksia spinulosa var. *collina*



Mountain Banksia

Banksia conferta



Hairpin Banksia

Banksia spinulosa cunninghamii



SHRUBS

Melaleuca species



Prickly-leaved Paperbark
Melaleuca nodosa
C E

Snow in Summer
Melaleuca linariifolia
SF

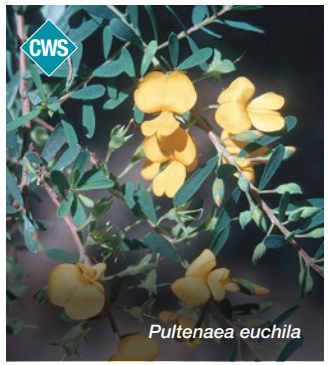
Wallum Bottlebrush
Melaleuca pachyphylla

Thyme Honey Myrtle
Melaleuca thymifolia
C SF



Small-leaved Paperbark
Melaleuca sieberi
C SF

Pea flowers (*Fabaceae* family)



Hairy Bush Pea
Pultenaea villosa

Blunt-leaved Pea
Pultenaea retusa
C E MT

Orange Pultenaea
Pultenaea euchila
E

Pointed-leaved Hovea
Hovea acutifolia
C E



Narrow-leaved Pea Bush
Hovea heterophylla
E

SHRUBS

Pea flowers (*Fabaceae* family) /continued



Daviesia umbellulata
C E

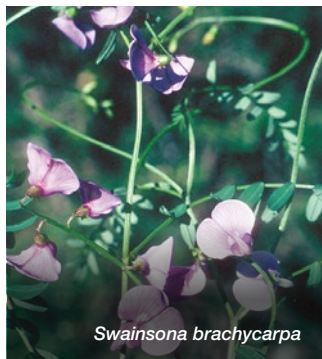
Daviesia villifera CWS

Long-leaf Bitter-pea
Daviesia wyattiana
E

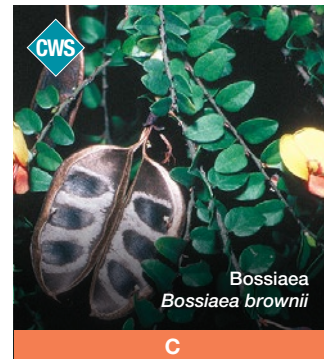
Slender Swainson-pea
Swainsona brachycarpa CWS

Darling Pea
Swainsona galegifolia

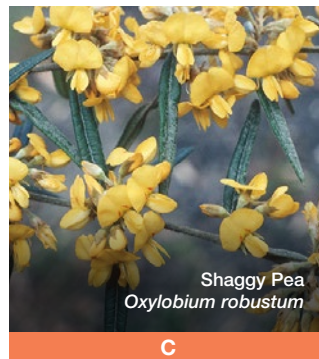
Smooth Darling Pea
Swainsona queenslandica
E



C



C



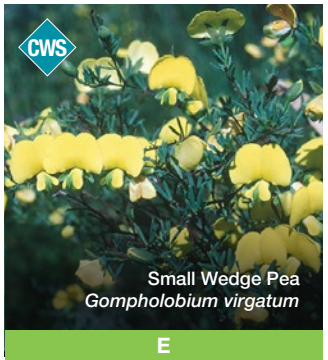
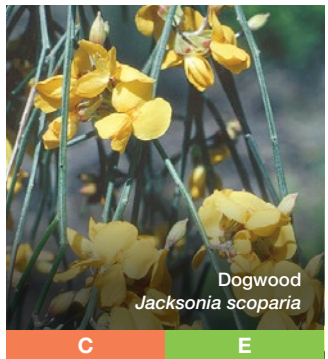
C



C E

SHRUBS

Pea flowers (*Fabaceae* family) /continued



Nightshades (*Solanum* species)



Shirley's Nightshade
Solanum shirleyanum

CWS

RF

Kangaroo Apple
Solanum aviculare

RF

Star Nightshade
Solanum stelligerum

E

Guinea Flowers (*Hibbertia* species)



Rough Guinea Flower
Hibbertia aspera

E

Tree Guinea Flower

NT CWS

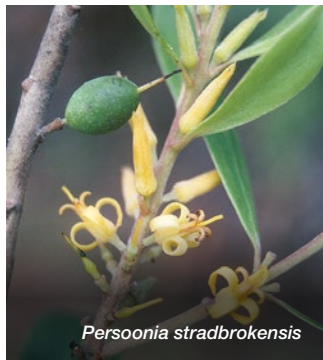
M

Guinea Flower
Hibbertia vestita

D E

SHRUBS

Geebung (*Persoonia* species)



Broad-leaved Geebung

Persoonia stradbrokensis
Persoonia cornifolia
Persoonia media



Wallum Geebung

Persoonia virgata



Mountain Geebung

Persoonia volcanica



Plectranthus species



Shiny-leaved

Plectranthus

Plectranthus nitidus



Native Coleus

Plectranthus graveolens

White *Plectranthus*

Plectranthus argentatus



Cockspur Flower

Plectranthus suaveolens



Prostanthera species



Oval-leaf Mint Bush

Prostanthera ovalifolia



Spiked Mint Bush

Prostanthera phyllifolia



Westringia species



Slender *Westringia*

Westringia eremicola



Blake's Mintbush

Westringia blakeana

Westringia rupicola



SHRUBS

Fan Flowers (*Scaevola* species)



Fan Flower

Scaevola calendulacea



Purple Fan Flower

Scaevola ramosissima



Palm Lilies (*Cordyline* species)



Broad-leaved Palm Lily

Cordyline petiolaris

Palm Lily

Cordyline congesta



Narrow-leaved Palm Lily

Cordyline stricta



Myoporum species



Mangrove Boobialla

Myoporum boninense subsp. *australe*



Coastal Boobialla

Myoporum acuminatum



Boobialla

Myoporum montanum



SHRUB



SHRUBS

Other species

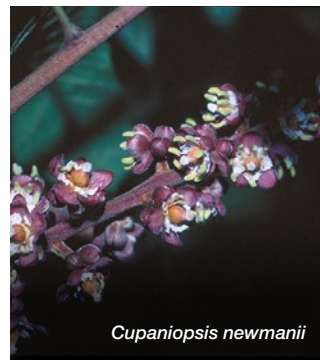


TREE



TREES

Tuckeroos (*Cupaniopsis* species)



Tuckeroo

Cupaniopsis anacardioides



Brown Tuckeroo

Cupaniopsis flagelliformis



Small-leaved Tuckeroo

Cupaniopsis parvifolia



Long-leaved Tuckeroo

Cupaniopsis newmanii



Banksia species



Red Honeysuckle

Banksia serrata



Wallum Banksia

Banksia aemula



Coastal Banksia

Banksia integrifolia



TREES

Wattles (*Acacia* species)



Hickory Wattle

Acacia falcata

Mountain Hickory Wattle

Acacia penninervis var.
longiracemosa

Blackwood

Acacia melanoxylon

E

Early Black Wattle

Acacia leiocalyx

C

E

Blunt-leaved Wattle

Acacia obtusifolia



C

M



Lilly Pillies (*Syzygium* species)



Blue Cherry

Syzygium oleosum

C

WE

RF

Scrub Cherry

Syzygium australe

SF

RA

RF

Purple Cherry

Syzygium crebrinerve

Giant Water Gum

Syzygium francisii

Riberry

Syzygium luehmannii

RF

Lilly Pilly

Acmena smithii

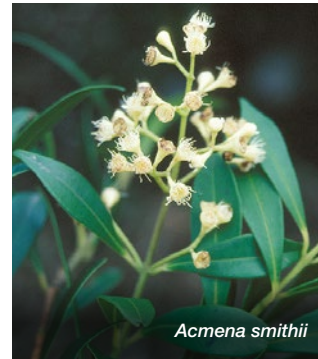
WE

RF

Red Apple

Acmena ingens

RF





TREES

Melaleuca species



Melaleuca viminalis

Willow Bottlebrush

Melaleuca salicina



Black Tea Tree

Melaleuca bracteata

Weeping Bottlebrush

Melaleuca viminalis



Broad-leaved Paperbark

Melaleuca quinquenervia



Tristaniopsis species



Tristaniopsis laurina

Water Gum

Tristaniopsis laurina



Hill Kanuka

Tristaniopsis collina



Ash (*Alphitonia* species)



Alphitonia excelsa

Red Ash

Alphitonia excelsa

White Ash

Alphitonia petriei



Alphitonia excelsa





TREES

Grevillea species



Grevillea hilliana




White Yiel-Yiel
Grevillea hilliana 


Silky Oak
Grevillea robusta
 

Macadamia species

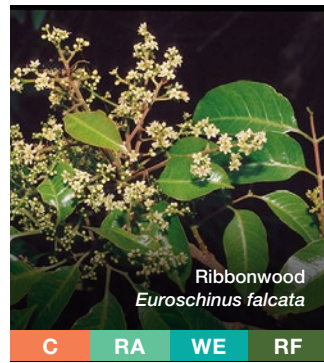


Macadamia tetraphylla

Macadamia Nut
Macadamia integrifolia   

Macadamia tetraphylla   


Other species



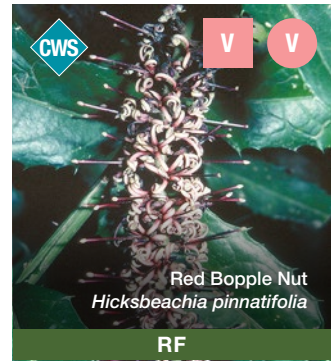
Ribbonwood
Euroschinus falcata

Native Hibiscus
Hibiscus heterophyllus

Golden Pea
Daviesia arborea

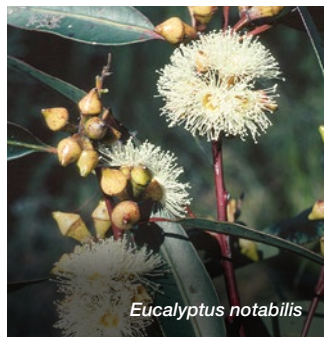
Red Bopple Nut
Hicksbeachia pinnatifolia


TREES

Gums (*Eucalyptus* species, *Corymbia* species, *Lophostemon* species)

SMALL TO MEDIUM TREES (7 – 30 METRES)



Eucalyptus notabilis

Tumbledown Gum

Eucalyptus bancroftii



E

Blue Mountains Mahogany

Eucalyptus notabilis



C

E

Bell-fruited Mallee Ash

*Eucalyptus
codonocarpa*



Plunkett Mallee

Eucalyptus curtisii



M



Eucalyptus curtisii



TALL TREES (30 – 40 METRES)



Eucalyptus planchoniana

New England Blackbutt

Eucalyptus campanulata

Red Bloodwood

Corymbia gummifera

Planchon's Stringybark

Eucalyptus planchoniana

Gum-topped Box

Eucalyptus moluccana

Brown Bloodwood

Corymbia trachyphloia

E

Blue Mountains Ash

Eucalyptus oreades

Grey Gum

Eucalyptus biturbinata

Yellow Box

Eucalyptus melliodora



E

Scribbly Gum

Eucalyptus racemosa



C

E

Swamp Box

Lophostemon suaveolens

SF

RA

E



Lophostemon suaveolens

TREES

Gums (*Eucalyptus* species, *Corymbia* species, *Lophostemon* species)

VERY TALL TREES (>40 METRES)



Large-leaved Spotted Gum

Corymbia henryi



Flooded Gum

Eucalyptus grandis



Brush Box

Lophostemon confertus



Tallowwood

Eucalyptus microcorys



Grey Ironbark

Eucalyptus siderophloia



Pink Bloodwood

Corymbia intermedia



White Stringybark

Eucalyptus acmenoides



Sydney Blue Gum

Eucalyptus saligna



Red Mahogany

Eucalyptus resinifera



Narrow-leaved Red Gum

Eucalyptus seeana



Spotted Gum

Corymbia citriodora



Blackbutt

Eucalyptus pilularis



Forest Red Gum

Eucalyptus tereticornis



Swamp Mahogany

Eucalyptus robusta



Moreton Bay Ash

Corymbia tessellaris



Small-fruited Grey Gum

Eucalyptus propinqua



Narrow-leaved Ironbark

Eucalyptus crebra



Reduce pesticide use

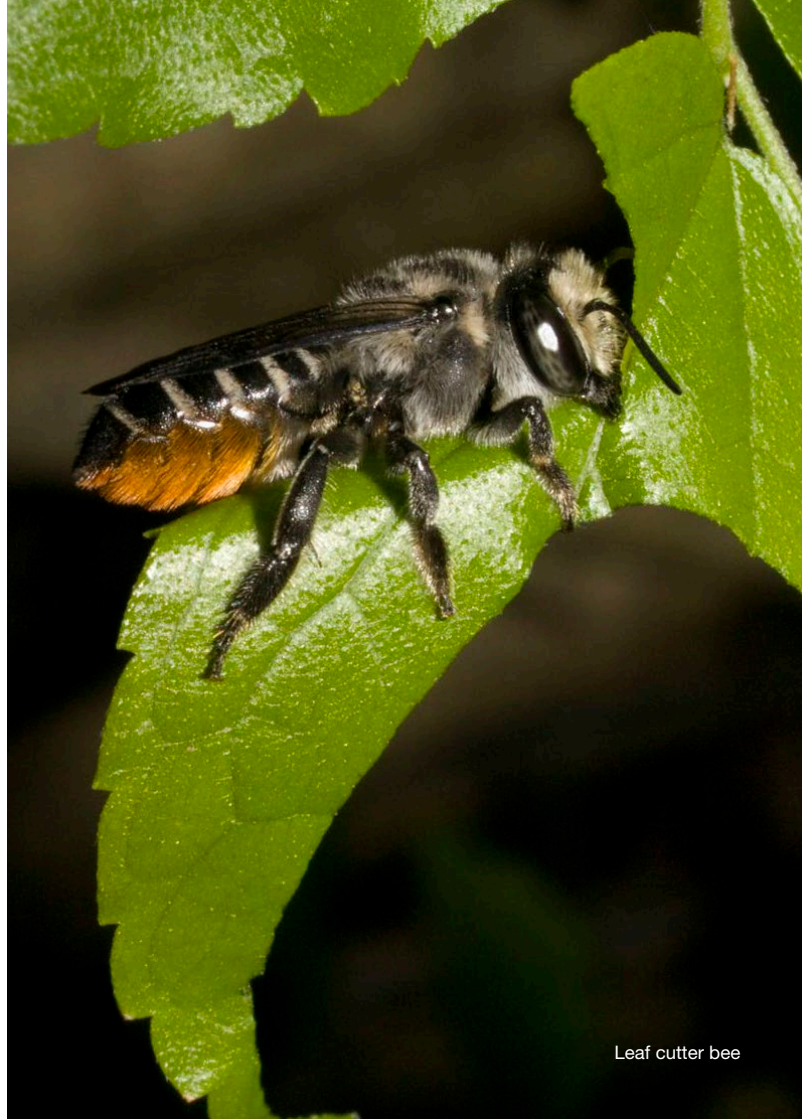
Another major threat to bees is the use of pesticides.

Reducing or stopping the use of pesticides in the garden can benefit bees. Insecticide exposure can kill or weaken bees, fungicides can harm the beneficial microbes that live with bees, and herbicides kill plants that may otherwise provide food to bees.

Herbaceous lawn weeds offer more benefit to bees than lawn grass! You could even go one step further and consider giving up part of your lawn altogether, and instead plant some native flowering plants, or even let local natives regrow naturally.



Austroplebeia australis building the clearance to the hive in a tree hollow.



Leaf cutter bee



Bamboo homes for solitary bees such as masked bees, leaf cutter bees, and resin bees.



Timber homes for solitary bees such as masked bees, leaf cutter bees, and resin bees.



Hives for eusocial stingless bees



Mudbrick homes suitable for blue banded bees

Create homes for native bees

After first providing bees with flowers for food, we can next consider providing them with additional places to nest.

Where it is safe to do so, dead trees, shrubs and branches should be left protected where they stand, as these may be home to countless small borer holes in which some bees will nest.

Dead trunks and branches also provide places for large carpenter bees to excavate nest holes. Bees and other insects benefit from complexity in the garden: Multiple vegetation layers, leaf litter and sticks, dead branches, dead bark, and patches of bare ground. These provide hiding places and potential nest sites.

Messy is good when it comes to gardening for bees. It is also possible to create artificial nest sites for some solitary bees. These can be as simple as drilling short holes in blocks of timber, or bundling together

hollow bamboo lengths, and leaving them in protected positions around the garden.

These will attract a range of bees, including various masked bees, leaf cutter bees, and resin bees. With a little more effort you could make some mud bricks to put out in the garden for local blue banded bees to nest in.

You could even become a native stingless bee keeper and invest in a native stingless bee hive. Check with Biosecurity Queensland and City of Gold Coast's Local Laws for current statutory requirements for keeping native bee hives.



Friends of the Gardens nursery

Want to know more?

Purchasing plants that are local provenance is an important contribution you can make to the environment. Local provenance means that the plant is grown from local, naturally occurring specimens.

Planting these, rather than plants sourced from far afield, preserves the local gene pool of that species. It also supports local native plant nurseries, which play a vital role in contributing to the greening of the city and supporting the local economy.

Where to buy local native plants

Use the GroNative App to find nurseries in South East Queensland who stock plants listed in the app.

Search for suppliers and native plant sale events online:

- Native Plants Queensland has autumn and spring plant sales which are a great way to buy interesting and hard to find native plants. Nurseries are listed on their website.
- The Australian Native Plants Society website provides a list of native plant nurseries.
- Gardening events and shows are held regularly on the Gold Coast and across south east Queensland.
- There are a number of online plant suppliers which you can find by searching for plants by species names.

Visit the Friends of the Gardens nursery at the Gold Coast Regional Botanic Gardens. The nursery stocks a wide range of local native plants and is open from 8 – 11am on the first Friday of each month.

Opportunities to learn more

Naturally GC

A variety of free and low cost nature based workshops, activities and events are available across the Gold Coast including native bee keeping workshops – check out the City of Gold Coast Website for further information.

Gold Coast Regional Botanic Gardens

Visit Gold Coast Regional Botanic Gardens in Benowa.

Friends of the Gardens volunteers are on site every day to provide advice.

You can also join a native bee guided walk to learn more about our native bees – check out their facebook for dates and times of walks.

Books and resources available from City Libraries

- Heard, T. (2016) *The Australian Native Bee Book: Keeping Stingless Bee Hives for Pets, Pollination and Sugarbag Honey*, Sugarbag Bees, Brisbane.
- Houston, T. (2018) *A Guide to Native Bees of Australia*, CSIRO Publishing, Melbourne.
- Klumpp, J. (2007) *Australian Stingless Bees: A Guide to Sugarbag Beekeeping*, Earthling Enterprises, Brisbane.

Other books and resources

- Dollin, A et al. (2016) *Australian Native Bees*, AgGuide Series, Department of Primary Industries, Paterson.

Digital and Websites

- **GroNATIVE App:** Information on more than 400 local natives you can use in your garden including where to buy them. Download from the App store or Google Play
- **CSIRO - How to make your garden native bee friendly:** Information on creating native bee friendly gardens
- **Bee Aware Brisbane – native bee species:** More about local native bees
- **Australian Native Bee Research Centre - Aussie Bee Website:** More about Australian native bees
- **Valley Bees - Planting and Creating Habitat to Attract Bees:** How to create habitat for native bees

Photo Credits

Bee photos (Page 8 – 13, and 52 – 53)

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Page 12

Emerald Homalictus on Snake Vine
(*Hibbertia scandens*) – *Veronica Gama*

Page 13

Native bee on *Melastoma*
malabathricum – *Todd Burrows*

Plant photos (Page 16 – 51)

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Page 21

Dianella congesta – *Narelle Power*

Page 26

Dendrobium speciosum – *Jason Searle*

Page 38

Cordyline congesta – *Lui Weber*

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FOR MORE INFORMATION

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