Hinterland Bush Links

Protecting and restoring koala habitat: a resource for landholders

Acknowledgment of Country

Hinterland Bush Links acknowledges the traditional custodians of the land on which we work, live and play, the Jinibara, Kabi Kabi, and Waka Waka people. We respect elders past, present and emerging, for they hold the memories, traditions, and stories of the land. We continue to learn from their knowledge and practices and work towards a shared dream of a sustainable and resilient land.

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Disclaimer

Other Acknowledgements

This resource was developed by Hinterland Bush Links with input from:

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Australian Government

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Contents

Hinterland Bush Links' Koala Habitat Project

Hinterland Bush Links is a dedicated not-for-profit organisation with the vision of landscape-scale conservation to connect, restore and protect native vegetation.

We work together with the community, volunteers, private landholders, government bodies and like-minded organisations to empower and support landholders to build and maintain healthy wildlife corridors on the Sunshine Coast Hinterland.

Our Koala Habitat Project is expanding and enhancing koala habitat in priority areas in private and public properties across the Sunshine Coast Hinterland.

As part of the project, Hinterland Bush Links is:

- Planting 5000 trees for koala habitat (with at least 20% being koala food and rest trees)
- Holding community volunteer tree planting events
- Removing lantana from properties to aid koala movement across the landscape
- Running community weeding events focusing on removing transformer weeds within koala habitat
- Integrating education about protecting and restoring koala habitat into community weeding and planting events
- Developing educational resources for landholders.

About this resource for landholders

As stewards of the land, landholders wield significant influence in the preservation of Australia's distinctive biodiversity. This comprehensive resource is designed to empower you as a landholder with valuable insights into the habitat and behaviour of koalas, one of the country's most iconic and beloved marsupials.

By fostering a deeper understanding of koala ecology, grounded in scientific understanding and conservation principles this resource provides practical and effective strategies for coexisting harmoniously with koalas while promoting the preservation of their natural habitat.

This resource delves into the ecological dynamics of koalas and their intersection with land management practices.

Whether you are a seasoned landholder or just starting on your journey, this is your go-to guide for fostering a sustainable environment that supports both the well-being of koalas and the vitality of your property.

This resource is divided into four sections:

1. **Understanding threats to koalas**
2. **What is healthy koala habitat?**
3. **Coexisting with koalas – responsible stewardship**
4. **Planning and undertaking a revegetation project**

Understanding threats to koalas

In February 2022, the koala populations in Queensland, New South Wales and the Australian Capital Territory were reclassified from *vulnerable to endangered*. Through the effects of colonisation, urban sprawl, habitat destruction, and introduced pest species and disease, Queensland koala populations have been drastically declining.

The first human inhabitants of Australia, with a history going back more than 60,000 years, developed land management practices that favoured their hunter gatherer lifestyle and supported local plant and animal populations. The settlement of Europeans in Australia was the start of the significant threats that koalas face today. Historically, koalas were threatened by the fur trade. Some of the key threats to koalas now are:

- Fragmentation and loss of habitat
- Introduced species including invasive weeds and introduced animals
- Diseases including chlamydia and koala retrovirus (KoRV)
- Vehicle strike.

Fragmentation and loss of habitat

One of the most significant threats faced by koalas is the loss of habitat and food sources caused by people. Humans have been removing food and habitat trees for hundreds of years to make space for roads, urban development, agriculture, grazing and the timber industry. As a result, there is less than 25% of koala habitat remaining in Queensland compared to pre-European settlement, and this small area is fragmented by roads, railway lines and buildings, as well as existing natural barriers like waterways. This means that koalas must often cross urban and peri urban precincts to reach food, shelter and dispersal opportunities.

High intensity wildfires can also be catastrophic for koalas and their habitat. Wildfires can destroy large areas of habitat. If a koala population is living in an area of bushland which is surrounded by development, the whole colony could be wiped out in a single fire.

Fragmentation and loss of koala habitat causes increased disturbance for koalas which can result in:

- Increased risk of injury or death from motor vehicles
- Increased risk of injury or death from dogs, cats and other introduced animals
- Exposure to effects of pollutants such as garden pesticides in waterways
- Increased competition for food and territory due to overcrowding of populations in areas of reduced habitat
- Elevated stress levels correlated with increased susceptibility to disease.

Introduced species

The introduction of exotic plants and animals has caused disruption within natural ecosystems.

Invasive weeds

Lantana

Broad-leaf privet

Native raspberry

Weed plants increase competition for resources and can take over landscapes, inhibiting and destroying native vegetation. This is incredibly harmful to native biodiversity, reducing critical food and habitat resources for our wildlife. Thick, shrubby weed species can also prevent access to koala food trees by creating impenetrable barriers. These weeds are particularly harmful to koalas in South East Queensland:

- Lantana camara forms thickets on a broad scale which prevents small mammals and marsupials from being able to move across the landscape for resources.
- Broad-leaf privet (Ligustrum lucidum) and Camphor laurel (Cinnamomum camphora) are prolific woody weeds, which can out-compete native vegetation for resources, turning biodiverse ecosystems into forests of privet with low resource availability.
- Native raspberry (Rubus spp.) - in disturbed areas, native raspberry can act similarly to lantana and may need to be selectively minimised when it is in excess.

Disease

Sick koala

Across their natural range, both large and small populations of koalas are impacted by bacterial and viral diseases. Effects of diseases can be exacerbated when there are smaller populations and low genetic diversity within those populations. Loss and fragmentation of habitat contributes to the vulnerability of koala populations already at risk of disease.

Koala Retrovirus

The term koala retrovirus (KoRV) refers to a group of viruses specific to koalas, which replicate and integrate into the host cell's genome; this means that after infection, every cell produced will contain the virus. KoRV is known to act similarly in koalas as HIV does in humans, weakening the hosts immune system and triggering unregulated cell growth (tumours). Diagnosis of this disease is only possible through a pathological test. There is currently no known treatment for this disease, however early-stage research is currently being conducted to develop an anti-viral vaccination, but it may be many years before a successful treatment is available.

There are several organisations working on potential prevention and control strategies including:

- Identifying and managing KoRV-free populations
- Selecting koalas with low KoRV loads for breeding programs
- Promoting resilient genetic pools through strategic breeding
- Minimising the translocation of infected individuals
- Avoiding breeding from populations of infected individuals.

Chlamydia

Chlamydia is a bacterial infection affecting Queensland koala populations and may even be considered endemic on the eastern seaboard. It can cause a variety of other diseases, e.g. conjunctivitis leading to blindness.

The symptoms of chlamydia can manifest as sore, pus encrusted eyes, which, if left untreated, could lead to blindness. Chest and respiratory infections can lead to pneumonia and cystitis, 'wet bottom' or 'dirty tail'. Chlamydia may be harmless within robust populations. In Queensland and New South Wales populations, the infection usually results in more severe symptoms compared to Victorian and South Australian populations, potentially resulting in death or euthanasia. It has been hypothesised that stress due to habitat loss and fragmentation could facilitate a more serious health impact on these koala populations, however a causal link has not yet been established.

Animals infected with KoRV are at a higher risk of significant complications from chlamydia infections. Limited research conducted in Queensland and New South Wales koala populations suggests that KoRV may be the reason why chlamydial disease is having such a negative impact in these states. Injectable antibiotics are now provided to animals infected with KoRV and extensive research has facilitated the development of a vaccine that can prevent the disease from occurring as well as reduce the symptoms for those koalas already infected. Further research is ongoing.

Koala suffering from chlamydia

Healthy koala habitat

What is healthy koala habitat?

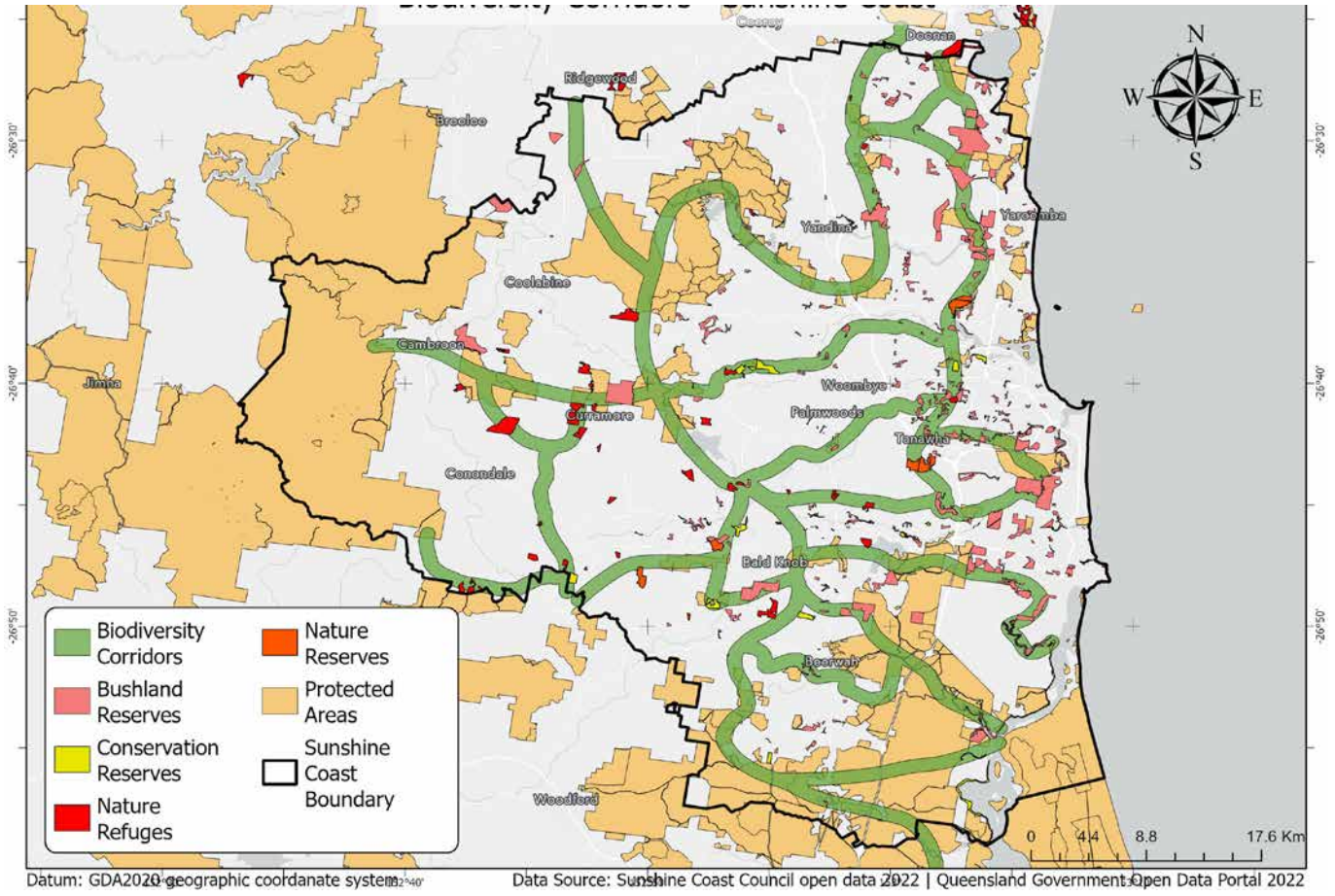
Koala habitat refers to an area of land in which koalas live; this includes a broad range of ecosystems from coastal islands, tall Eucalypt forests, and low inland woodlands. The two most important factors that make an area of land suitable for koala habitat is the presence of primary and secondary koala food tree species and sometimes the presence of other koalas. Note that in many areas of existing good quality koala habitat the koala populations historically became extinct as a consequence of the fur trade.

Koalas predominantly consume Eucalypt, Corymbia, and Lophostemon species, however diversity in their diets is important for individuals to meet nutritional needs, to aid digestion and some species have medicinal benefits. Research has shown that there may even be a link between an individual's chosen food trees, the social structure and the home range of that individual!

Koalas live in societies just like humans and they need contact with other koalas. They live in social units consisting of an 'alpha' male with females sharing his home range and the nearby surrounds as well as sub adult males. They are however often solitary in nature until the breeding season when a male searches for reproductively active females. The 'alpha' male will often fight with and force out smaller males from his home range. There is greater interaction between koalas at this time. Females are regularly seen with their offspring for up to two years until they reach sub adulthood. During the breeding season, the sub adult male is often pushed out of the home range of his mother to find his own home range. A sub adult female can often remain within or close to her mother's home range.

Depending on the quality of the koala food trees, a koala's home range can be small. For instance, within urban areas with high rainfall and good soil quality, a home range can be 3 to 4 square kilometres in size. However, in marginal locations with poor soils and low rainfall, home ranges can be much larger - 10 to 30 square kilometres in size. A large residential koala population will require larger areas of suitable habitat to maintain the size of that population. Koala populations can still be sustainable in smaller pockets of good quality habitat provided there is connectivity to larger areas of bushland habitat. Due to habitat loss from human related impacts, wildlife corridors and connectivity are an essential component and are a core aspect of koala habitat conservation.

A diversity of species for koala habitat



Sunshine Coast and Hinterland Biodiversity corridors

Wildlife corridors and connectivity of habitat are critical to supporting remaining koala populations. Corridors provide uninterrupted stretches of natural vegetation that connect larger areas of undisturbed bushland. The role of corridors is to expand available habitat by allowing movement between patches without the threat of roads, railway lines and urbanisation. This can facilitate the recolonisation of isolated habitat areas, providing additional habitat and resources to individuals, and connecting gene pools to increase genetic diversity and resilience within the species.

Another essential component crucial to the sustainability of the koala population is the need to replant koala food trees and other natives in parks, reserves and open spaces to provide additional sources of food, shelter and dispersal opportunities. The rehabilitation of secondary, marginal habitat via weed removal and natural regeneration will also increase the carrying capacity of remaining koala habitat.

Koalas aren't the only benefactors from nature corridors; when managed correctly, nature corridors provide food, habitat, and resources to all local native wildlife, creating a flow on effect which improves species resilience in both flora and fauna.

Humans also benefit from nature corridors as an increase in natural vegetation helps:

- Maintain clean air and water
- Enhance climate change resilience
- Minimise human-animal conflicts (e.g. snake bites)
- Prevent transmission of zoonotic diseases to humans.

Southern Boobook Owl. Photo Christine Bull

Coexisting with koalas: responsible stewardship

Koalas and your property

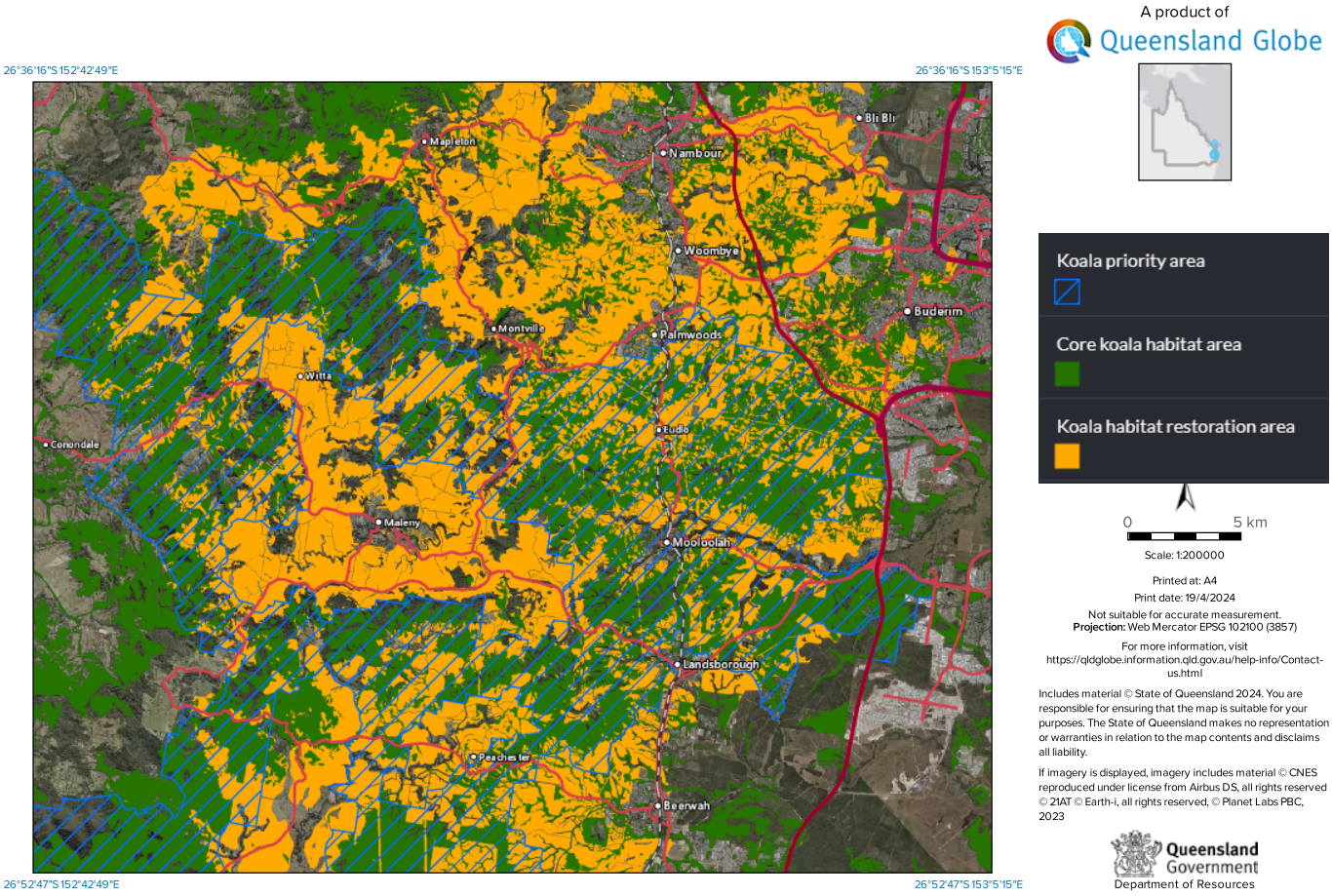
Depending on where your property is, as a landholder you may have an opportunity to help local koala populations through improving and expanding existing koala habitat and managing your property in a way that is advantageous for koalas.

Does your property contain koala habitat?

Use Queensland Globe (https://qldglobe.information.qld.gov.au/), an online mapping system provided by the Queensland Government, to search for your property and add the koala habitat overlays below. You can find your property by searching an address, coordinates, or by lot on plan. Queensland Globe is simple to navigate; layers and annotations can be added to create a specific map for your property.

The following layers are useful to understand koala habitat in and around your property:

- Koala priority areas - large, connected areas that focus on habitat protection, habitat restoration and threat mitigation in areas that have the highest likelihood of safeguarding koala populations in South East Queensland.
  Under the koala conservation planning protections for South East Queensland[1], clearing of core and locally refined koala habitat areas within koala priority areas is prohibited, subject to certain exemptions.
- Core koala habitat areas - the best quality koala habitat areas, based on modelling of biophysical measures including climate, topography, soil quality, suitable vegetation for both food and shelter, as well as koala sightings.



Sunshine Coast and Hinterland koala habitat areas

[1] Department of Environment, Science and Innovation *Koala legislation and policy*: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy

- Locally refined koala habitat areas - areas of mature vegetation that might not meet the Queensland Government's criteria for core koala habitat areas. However, these areas may contain locally important vegetation for koalas, including many areas previously protected under local government planning schemes.
- Koala habitat restoration areas - identify land that could be restored and established as koala habitat areas. These areas feature low threats or constraints, and high conservation opportunities.

Watch out for koalas on your property

Spotting koalas on your property can be difficult; koalas are masters of disguise, blending seamlessly into the grey bark of their resting trees. Often koalas are known to be in an area not because we see them, but because they leave behind poop! Koala faeces are unique, as the diet of the koala can influence the colour. Scats vary in colour from blue/grey, chocolate brown to dark, rusty red and are usually found around the bases of their favourite food and resting trees.

Koalas are also often heard in the evenings making loud and deep grunting and bellowing noises which can travel far across the landscape. They also make a variety of snarls, squeaks and screams. Although both males and females can make calls, it is most often males calling to attract mates and to define their home range.

Another sign of koalas are scratch marks around the base of trees; these are more noticeable on smooth barked trees. This method can be less reliable in identifying koala presence and activity as other clawed animal species such as possums and goannas can leave similar markings that are easily mistaken for koalas. For more information, check out Wildlife Watcher[2].

If you see a koala on your property, report it via the Qwildlife[3] app or via the ArcGIS Survey123 online form[4]. The data collected provides an insight into current koala populations and key habitat areas for protection and restoration. It helps the Department of Environment, Science, and Innovation, with conservation planning and action at local, state and national levels.

If you see a sick or injured koala on your property, contact 1300 ANIMAL or Wildcare Australia via their Emergency Hotline 07 5527 2444. They will contact wildlife rescuers in the local area. Prompt and timely

Koala scats

rescue into a 24/7 wildlife hospital is one way you can take an active role in supporting koala conservation efforts. Search for your nearest wildlife rescue here: Care and Rescue | Wildlife Watcher[5].

Look for these key signs and symptoms:

- Inflamed, red, puffy, crusty and/or weeping eyes
- A dirty and wet looking bottom
- Sitting at the base of a tree or lying on or beside a road
- Skinny and emaciated appearance
- Signs of lacerations or bleeding.

How to protect koalas on your property

In addition to revegetating and minimising invasive weeds, here's some other actions to consider in order to help provide koalas with happier homes to live in:

- Install a wildlife water station or maintain natural water sources on your property - koalas usually rely on the moisture from the leaves they eat for hydration. During dry periods, it can be hard to find natural water sources. Ensure animals can enter and leave the natural water source easily and safely. If you have a swimming pool, make sure you have a trailing waterproof rope attached to the outside of the pool or a branch available to help them get out if they have fallen into the pool accidentally.

[2] Wildlife Watcher: https://wildlifewatcher.com.au/

[3] Department of Environment, Science and Innovation *Koala sightings*: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/report-sightings

[4] ArcGIS Survey 123 *Koala Sighting Report*: https://survey123.arcgis.com/share/a04107821ce54cdc91a4cd388ca6aa17?portalUrl=https://spatial.information.qld.gov.au/arcgis

[5] Wildlife Watcher *Find koala care and rescue*: https://wildlifewatcher.com.au/care-and-rescue/

Camphor laurel

Hinterland Bush Links revegetation

- Install koala proof fencing - if you live by roads or railways, installing koala proof fencing may prevent roadkill incidents and can restrict domestic pets' and feral animals' movement through areas of known koala habitat.
- Keep dogs on leash – this is a simple but responsible approach to pet ownership. Do not take pets into restricted areas such as national parks.
- Investigate local pest animal schemes – many local councils also have pest animal schemes, which can be helpful in managing wild dogs, foxes, wild cats, and other pest animals on your property that cause harm to native fauna.

The Sunshine Coast Council's website also has some useful information on koala conservation including their Koala Conservation Plan[6].

How to protect koala habitat on your property

If your property has existing koala habitat, or you have had sightings or evidence of koalas on your property, there may be opportunities to protect and enhance it, as well as connecting with other areas of habitat by creating wildlife corridors.

Manage fire risk

Fire is a natural and important ecological process in koala habitat. An appropriate fire regime is essential for maintaining forest health and regenerating koala food trees. Refer to Queensland Fire and Emergency Services[7] for your responsibilities as a landholder in managing fire risk, or consider obtaining an evaluation from your local fire brigade for advice on how to appropriately manage your property. This could be through organised controlled burns to minimise leaf litter and encourage germination of native species, or minimising fire risk through vegetation management practices.

Manage animal movement

Pressure from grazing and pest animals can be minimised through targeted fencing. Restricting the movement of these animals to certain parts of your property will help koalas' capacity to move across priority areas of habitat on your property.

Manage invasive weeds

On-going weed management is usually needed to minimise the spread and severity of weed infestations. This will likely decrease as native plant growth is promoted and the ecosystem returns to its natural state.

If your property already has a good variety of koala food trees such as Eucalypts, Lophostemon and Corymbia as canopy trees, remove invasive weeds to improve this habitat and promote regeneration of the native plant species.

Focus on removal and management of Lantana, Broad-leaved privet, Camphor laurel, and Rubus in these areas.

[6] Sunshine Coast Council *Koalas*: https://www.sunshinecoast.qld.gov.au/environment/native-animals/koalas
[7] Queensland Fire and Emergency Services *Bushfire planning*: https://www.qfes.qld.gov.au/planning-and-compliance/bushfire-planning

Brisbane Weeds[8] is a great online resource to help identify a broad range of environmental weed species, as well as providing recommended treatment methods for each target weed species.

For identification and treatment of *Lantana camara*[9]

For identification and treatment of *Broad-leafed privet Ligustrum lucidum*[10]

For identification and treatment of *Camphor Laurel, Cinnamomum camphora*[11]

Weed removal will likely need to be followed by revegetation to fill gaps and outcompete returning weeds.

Revegetation

Revegetation of koala habitat by the planting of native food and resting trees can help to expand existing habitat and connect fragmented sections of habitat. It is also useful when combined with weed management, helping to restore native vegetation in these areas. In areas of existing koala habitat, revegetation should be strategic, aiming to create the biggest impact possible. Strategic habitat restoration promotes individuals finding food, shelter and mates, while also having broader biodiversity benefits, as koala habitat is also home to many native birds, mammals and reptiles serving ecological functions.

Planted seedling with weed mat and tree guard to protect against weeds and pests

The Roving Restorers team carefully planting seedlings

There's lots of activities for everyone to help with during a tree planting day!

It's satisfying getting getting the last stake in the ground!

[8] Brisbane City Council *Weed Identification Tool*: https://weeds.brisbane.qld.gov.au/
[9] Brisbane City Council *Weed Identification Tool* – Lantana camara: https://weeds.brisbane.qld.gov.au/weeds/lantana
[10] Brisbane City Council *Weed Identification Tool* – Broad-leaved privet: https://weeds.brisbane.qld.gov.au/weeds/broad-leaved-privet
[11] Brisbane City Council *Weed Identification Tool* – Camphor laurel: https://weeds.brisbane.qld.gov.au/weeds/camphor-laurel

Planning and undertaking a revegetation project

Before revegetation

Revegetation planted

Revegetation 10 months on

Revegetation 10 months on

There are several steps which are important when planning your revegetation project. Remember that there is plenty of advice and help available to support you.

Seek advice

Local knowledge is a valuable resource when gathering information about your property. Consider consulting local specialists such as your Land for Wildlife officer, Bushcare groups, local bush regeneration contractors, local native nurseries or other knowledgeable groups before beginning your revegetation project.

These groups have expert knowledge and experience and can assist in identifying areas of healthy and unhealthy habitat, recommending priority works within your habitat for natural bush regeneration and suggesting appropriate plant species for revegetation projects.

Hinterland Bush Links[12] – supports landholders through volunteer led and contracted weeding and planting. Hinterland Bush Links also runs education events on a range of topics associated with protecting, connecting and restoring native vegetation.

Land for Wildlife – South East Queensland[13] – this program supports landholders to manage wildlife habitat on their properties.

Barung Landcare[14] – Barung Natural Area Services has a variety of services to support landholders with weed control, planting and surveys. Their native nursery can supply plants for your revegetation project and advise on species selection for your property.

Source funding

Funding for your revegetation project to protect koala habitat is available through local, state and federal organisations local, state and federal governments.

If you are interested in local funding opportunities but unsure where to start looking, contact your local koala protection not-for-profit organisations, Landcare groups, and Land for Wildlife officer for more information on current opportunities and support in the application process.

Plan your revegetation project

Connectivity of habitat for koalas can be improved through expanding existing vegetation to create wildlife corridors, preferably at least 20 metres wide (for a wildlife corridor to have any value for dispersal, it must be a least 100 metres wide). First identify a suitable area and size for your revegetation project. Then identify the most appropriate revegetation technique for your project's goals.

Identify a suitable revegetation site

Use Queensland Globe[15] to identify potential revegetation areas, focusing on existing habitats and prioritising core areas and restoration sites (refer to the Does your property contain koala habitat? section). Once potential sites have been located, assess the condition of bushland, particularly the ratio of native vegetation to invasive species. This assessment can be conducted independently or with assistance from organisations such as Land for Wildlife or local bush regenerators.

Target areas for planting strategically:

- Expand areas adjacent to healthy koala habitats
- Connect fragmented areas of koala habitat
- Infill planting in degraded habitats or priority restoration zones to enhance overall habitat quality.

Consider accessibility including safety on steep slopes for both initial planting and ongoing maintenance tasks such as watering, weeding and brush cutting. Understanding the topography and soil type of the site is also essential, as rocky terrain or contaminated soil can impede tree establishment and nutrient uptake.

Identify your project size

The size of your project will depend upon the specific characteristics of the site. Ensure that it is proportionate to the available space and resources, ensuring the feasibility of both planting and maintenance. The number of trees to be planted must strike a balance between being substantial enough to make a significant impact on habitat restoration, yet manageable for ongoing care. This could range from 200 to 1000 trees depending on the scale of your project and your capacity for maintenance.

Spacing between trees is a critical factor; most revegetation projects plant trees at an approximate 1.5 metre spacing; however this can be modified to allow for maintenance machinery. Planting trees doesn't have to be neat, nature doesn't let seeds fall in perfect lines, so allow yourself flexibility in the distribution of seedlings. Proper spacing ensures optimal growth conditions for each tree and contributes to the overall success of the restoration initiative. By carefully considering these factors, the project size can be determined in a manner that maximizes effectiveness while remaining practical and sustainable.

[12] Hinterland Bush Links: https://www.hinterlandbushlinks.org/
[13] Land for Wildlife South East Queensland: https://www.lfwseq.org.au/
[14] Barung Landcare: https://barunglandcare.org.au/
[15] Queensland Government *Queensland Globe*: https://qldglobe.information.qld.gov.au/

Select revegetation techniques

The scale of revegetation, your budget and time availability, soil type and the condition of existing vegetation (native and introduced species) will determine the most appropriate method(s) for your project.

There are three main techniques used to revegetate an area:

- Assisted natural regeneration
- Direct planting of seedlings
- Direct sowing of seeds.

Assisted natural regeneration

Assisted natural regeneration is a blend of active and passive restoration where people intervene to help trees and native vegetation naturally recover by eliminating barriers and threats to their growth (e.g. competing environmental weeds), leaning on their knowledge of the land and on ancestral traditions such as burning for guidance. This method involves removing invasive species as they emerge and leaving the native species to grow, and allows you to revegetate the land from the seed bank naturally occurring on your property. However this means if you do not have koala food tree species pre-existing in the soil, it is less likely that you will see them emerge as you regenerate your land.

Direct planting of seedlings

Direct planting of seedlings involves transplanting young plants directly into the soil where they will grow to maturity, skipping the step of starting seeds indoors or in a greenhouse, and bypassing the need for seed treatments to encourage germination. This is a quick method of establishing healthy vegetation in a local area.

Direct sowing of seeds

Direct sowing of seeds entails planting seeds directly into the soil where they will germinate and grow without the need for transplanting from seed trays or pots. This can be done by purchasing native seeds that are local to your property or collecting and disseminating seeds of native flora already found on your property. This method can be time consuming as some species of Australian native trees have tough seed casings that require fire or consumption by animals in order for the seed to germinate.

Both direct planting of seedlings and direct sowing of seeds requires maintenance to minimise weed infestations and reduce competition for resources such as light and nutrients, until the tree species reach canopy height and are able to outcompete weed species. Refer to Maintain your revegetation project section.

Select species

If your property is in a koala habitat corridor, or on the edges of large parcels of koala habitat, consider planting a mix of native species including koala food and resting trees to expand existing koala habitat areas and promote a healthy ecosystem.

At least 20% of canopy trees in a habitat patch or corridor should be species which koalas use at a range of ages. Patches should also contain a range of other native trees and shrubs to provide shelter and encourage a diversity of fauna such as birds and insects to promote the natural pollination and dissemination of seeds.

The Queensland Herbarium offer a service to provide a map of your property showing remnant and pre-clearing Regional Ecosystems (RE). This will give you an idea of what vegetation communities existed pre-clearing and what now remains. This information can be used to connect any existing regional ecosystems and guide the revegetation plant species selection. Refer to Remnant and pre-clearing Regional Ecosystem (RE) mapping[16].

When revegetating to expand koala habitat, it can be beneficial to plant a variety of species including food and resting trees in additional to pollinator attracting species local to your area to create a healthy and functioning ecosystem.

Direct planting

[16] Queensland Government *Request a map of Biodiversity Status or Broad Vegetation Group:* https://www.qld.gov.au/environment/plants-animals/biodiversity/request-a-map

Below is a selection of some of the common koala food species found in the Blackall range area (note this is not a full list):

Scientific Name	Common Name	Description	Soil Type/Preferred Location	Typical Height	Flower Description
Eucalyptus grandis	Flooded gum	Smooth, papery, pale or blue-grey to white colour bark. Bark is rough and brown in the bottom 1–4 m of the trunk. Glossy dark green leaves are stalked, lanceolate[17] shaped and glaucous (lighter green to white in colour on underside). They are arranged alternately along the branches.	Fertile alluvial loams, commonly found on flat land, and lower slopes within these regions.	50 to 80 metres	White flowers from mid-autumn to late winter (April to August). Conical, pear or cone-shaped fruit follow flowers.
Eucalyptus microcorys	Tallowwood	Rough brown to brown-red, tessellated bark and distinctive tallow-like smell when crushed. When bark is peeled away from the trunk small pores are present.	Best grown in clay-loam. Tolerant to low drainage, frost and wind. Does not tolerate deep sand.	20 to 40 metres	Clusters of creamy white to yellow flowers from spring into summer, followed by conical to pyriform shaped fruits.
Eucalyptus tereticornis	Forest red gum	Tall with rough, fibrous bark shedding in long strips revealing grey trunk, lance-shaped leaves.	Usually found on heavier soils such as clay and alluvium.	30 to 50 metres	Clusters of creamy white or yellow flowers from spring to summer.
Eucalyptus propinqua	Grey gum	Rough, fibrous grey bark peeling from orange-brown trunk, and glossy green leaves.	Prefers well drained soils, can tolerate sand and gravelly soils with some clay.	20 to 30 metres	Clusters of creamy white flowers from summer to autumn.
Eucalyptus acmenoides	White mahogany	Rough, fibrous bark, typically grey to reddish-brown shedding in long strips to reveal smooth white or greyish trunk. Egg-shaped or broad lance-shaped leaves that are glossy green with glaucous underside.	Deep loam soils with moderate nutrient levels and regular moisture. Can tolerate sand, clay and loam.	20 to 30 metres	Clusters of cream-coloured to lemon yellow flowers in late autumn. Clusters of white flowers in spring and summer.
Eucalyptus siderophloia	Grey ironbark	Hard, deeply furrowed bark, dark grey to black. Long, narrow lanceolate shaped leaves.	Typically found in coastal forests and adjacent foothills.	20 to 35 metres	Clusters of white flowers in spring and summer.
Eucalyptus racemosa	Scribbly gum	Distinctive markings on smooth bark by larvae of scribbly gum moths, creating intricate patterns. Slender, curved leaves.	Thrives in poor nutrient sandstone soils. Requires good drainage due to shallower root system.	10 to 25 metres	Clusters of creamy white flowers from winter into spring.

[17] Refer to iNaturalist Illustrated glossary of leaves.

Scientific Name	Common Name	Description	Soil Type/Preferred Location	Typical Height	Flower Description
Lophostemon confertus	Brush box	Tall evergreen tree with glossy green leaves with slight lanceolate shaped arranged alternately in a pseudo-whorl. Bark is smooth and pale grey on juvenile trees, but as it matures it peels in strips revealing a coppery colour.	Prefers deep fertile alluvial loams but can thrive in a variety of soils.	20 to 30 metres	Clusters of cream-coloured flowers from spring through to summer.
Lophostemon suaveolens	Swamp box	Rough, furrowed red-brown bark that with a fibrous-papery texture, with ovate to elliptical glossy green leaves arranged in a pseudo-whorl.	Well suited to moist and wet soil conditions, prefers swampy or alluvial areas.	10 to 25 metres	Attractive creamy white flowers from spring into summer.
Corymbia intermedia	Pink bloodwood	Smooth pinkish to grey bark that is rough and tessellated, extending from the trunk to the branches. Leaves are lanceolate to broad-lanceolate, typically glossy green in colour.	Adaptable to a variety of soil conditions and can thrive in sand, loam, and clay.	15 to 25 metres	Clusters of white or cream flowers from summer through to autumn.

Lophostemon confertus. Credit Australian Plant Society

Eucalyptus microcorys. Credit Australian plants society

Eucaplyptus tereticornis. Credit Australian Plant Society

Corymbia intermedia with fruit and flowers

Eucaplyptus tereticornis, Credit Australian Plant Society

Maintain your revegetation project

Revegetation projects need some love and attention in the first few years before they can sustain themselves as a functioning ecosystem. It is important to pay attention to soil moisture levels; watering revegetation projects is essential immediately after planting and should be continued for the first 6-12 months after planting depending on your local climate. Also remember that over watering plants can lead to fungal disease and death.

Weeds growing within the planting area should be managed appropriately. This can be done by brush cutting, chemical treatment with foliar spray, or mowing between planted trees, with tree guards providing some level of protection from heavy tools and machinery. Hand removing weeds growing within the tree guards may also be required. Use mulch or weed mats to help minimise weed growth close to the plant.

Pest animals and disease are leading causes of failure in revegetation projects. Animals such as deer, kangaroos, wallabies, and insects including caterpillars and larvae are all herbivorous creatures that will not turn down the opportunity to snack on readily available, freshly planted seedings. Install tree guards to help prevent damage from larger mammals in the first few weeks of establishment. In some situations, fencing may be required to create an exclusion zone until the trees are above head height and are resilient to pests. Remove larvae of invasive species from site. Native larvae can be carefully removed by gentle pruning the affected branch and relocating larvae to a well-established adjacent area of habitat.

Sunshine Coast Council have pest animal management programs targeted toward deer, horses, foxes, wild dogs and cats, and more. If you have pest animals on your property you can find out more here: Pest management plant and animal (sunshinecoast.qld.gov.au)[18].

Undertake secondary planting

After 2-3 years, it is worth considering secondary planting to further enhance your koala habitat. However, it is important to assess whether this is truly necessary. Often, the introduction of wildlife to a revegetation area can naturally facilitate the dispersal of native seeds, promoting natural recruitment of flora without the need for additional planting. If you opt for secondary planting, the primary consideration should be the capacity for maintaining the site effectively. Consider whether you are equipped to handle the workload of managing two planting areas and whether the initial planting area is self-sustaining.

[18] Sunshine Coast Council Pest management plant and animal: https://www.sunshinecoast.qld.gov.au/environment/education-resources-and-events/environment-resources-and-publications/pest-management-plant-and-animal

Further reading and references

Below is a list of resources and organisations which you may find useful for further research:

Australian Plant Society NSW Plant Database Resource: https://resources.austplants.com.au/

Barung Landcare "A Landholders' Guide to Living on the Blackall Range" 3rd edition, edited by Elaine Green

Brisbane City Council Weed Identification Tool: https://weeds.brisbane.qld.gov.au/

Currumbin Wildlife Hospital: https://currumbinsanctuary.com.au/wildlife-hospital

iNaturalist, Glossary of Leaves: https://www.inaturalist.org/posts/30456-illustrated-glossary-of-leaves

Koala Action Inc.: https://www.koalaactioninc.org/

Land for Wildlife South East Queensland: https://www.lfwseq.org.au/

Queensland Koala Crusaders: https://www.koalacrusaders.org.au/

Queensland Fire and Emergency Services, Bushfire Planning: https://www.qfes.qld.gov.au/planning-and-compliance/bushfire-planning

Queensland Globe mapping: https://qldglobe.information.qld.gov.au/

Queensland Government, Biodiversity Status and Broad Vegetation Group Mapping: https://www.qld.gov.au/environment/plants-animals/biodiversity/request-a-map

Queensland Government Department of Environment, Science and Innovation, Koala Legislation and Policy: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy

Sunshine Coast Council, Koala Conservation Plan: https://www.sunshinecoast.qld.gov.au/environment/native-animals/koalas

Sunshine Coast Council Pest Management: https://www.sunshinecoast.qld.gov.au/environment/education-resources-and-events/environment-resources-and-publications/pest-management-plant-and-animal

Wildlife Watcher Koala Care and Rescue: https://wildlifewatcher.com.au/

Report koala sightings here:

Koala Sighting Report: https://survey123.arcgis.com/share/a04107821ce54cdc91a4cd388ca6aa17?portalUrl=https://spatial.information.qld.gov.au/arcgis

QWildlife for Apple: https://apps.apple.com/au/app/qwildlife/id1500668021

QWildlife for Android: https://play.google.com/store/apps/details?id=gov.qld.dnrme.QWildlife&pli=1

Koala sightings: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/report-sightings

Expanding habitat for koalas in a koala priority area over two plantings in Reesville 2023/2024

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