TOOWOOMBA REGION
KOALA HABITAT PROJECT

SO, YOU'RE THINKING OF PLANTING KOALA TREES?

TOOWOOMBA REGION KOALA HABITAT PROJECT

WWW.TOOWOOMBAKOALAPROJECT.ORG

Another community project from Save Mt Lofty Inc – Toowoomba Q an urban based Landcare group - www.savemtloftyinc.org ABN 56 569 592 142

ACKNOWLEDGMENT OF COUNTRY

Toowoomba Region Koala Habitat Project & Save Mt Lofty Inc acknowledge the traditional custodians of the land on which our project takes us; the Giabal, Jagera and Western Wakka Wakka people. We respect their elders past, present and emerging, for their care of koalas and their habitat over millenia as we now seek to enhance and renew koala habitat across our Region.

This booklet is your starting point for learning about planting koala trees across the Toowoomba Region.
The **WHY**, the **WHERE**, the **WHEN**, **HOW TO DO IT** & **WHICH SPECIES**.

We have spoken with local landholders, steeped in a history of successful plantings, as well as a range of local consultant ecologists and community groups.

If you find you need more information, please head over to our companion online resource.

TOOWOOMBA REGION KOALAS

We are fortunate still to have koalas in the Toowoomba Region - one of Australia's most iconic native animals. Koalas were once common across the forests and woodlands of Eastern Australia. Koalas have suffered from the loss of large areas of habitat and other threatening processes. In 2022, the koala species was classified as Endangered in Queensland, NSW and the ACT by the Federal Government.

Mapping of koala habitat within the Toowoomba Region is limited compared to other areas of South East Queensland so the extent of remaining koala habitat in the Toowoomba Region is uncertain. Mapping activities have been undertaken but these have only recognised habitat patches that are at least 5 hectares, meaning many smaller patches of linear habitat have not been mapped. Councils in other areas of Queensland conduct regional surveys and research to understand their local koalas and develop strategies for their support.

Here, our local Landcare groups are left to do this work. Local wildlife rescue groups need to focus on supporting injured or sick koalas. This leaves little time to assess the existence and viability of koala populations in their areas of operation.

Every November, Save Mt Lofty Inc conducts the Toowoomba Region Koala Count where community members work as citizen scientists to record their observations at the start of the koala breeding season across our Region. During November 2021, 45 observations were recorded; November 2022 189 observations; and November 2023 219 observations. In November 2024, we hope to have more observers recording more observations.

In the 10 years to August 2024, the iNaturalist platform shows approximately 1,577 koala observations recorded by 175 observers across the Toowoomba Region.

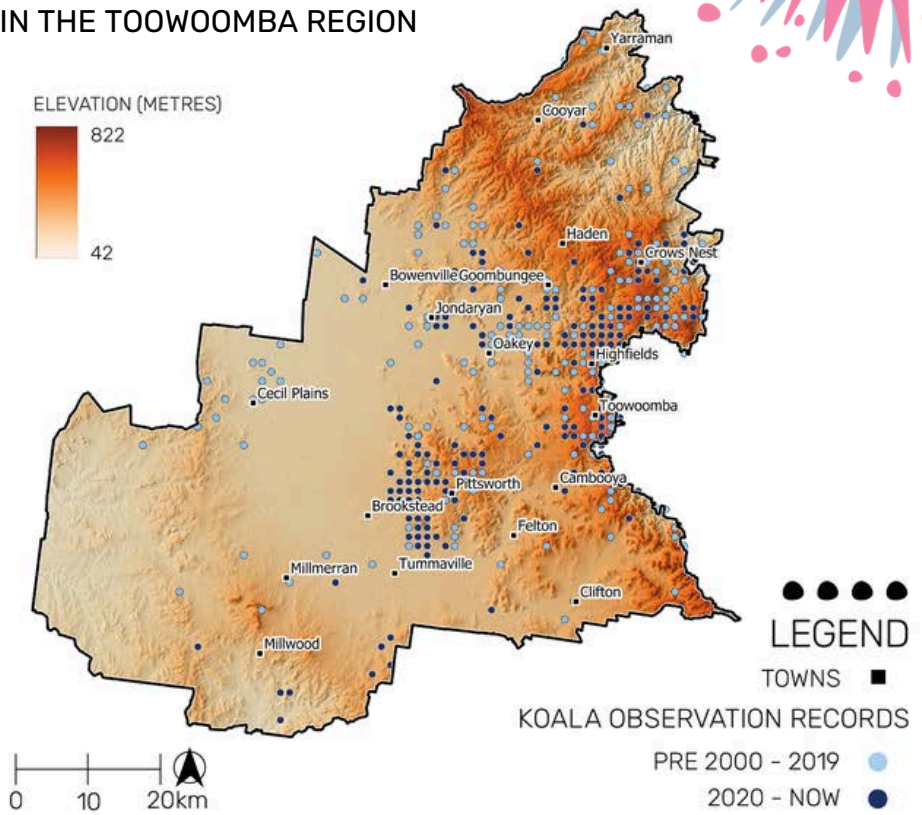
1577

KOALA OBSERVATIONS IN TOOWOOMBA REGION

IN THE 10 YEARS TO AUGUST 2024, THE INATURALIST PLATFORM SHOWS APPROXIMATELY 1577 KOALA OBSERVATIONS.

KOALA OBSERVATIONS

IN THE TOOWOOMBA REGION



175

OBSERVERS

IN THE 10 YEARS TO AUGUST 2024, INATURALIST RECORDED ONLY 175 OBSERVERS ACROSS THE TOOWOOMBA REGION.

1 REGION

THE TOOWOOMBA REGION STRETCHES FROM YARRAMAN TO MILLWOOD FROM CECIL PLAINS TO CLIFTON.

1 SPECIES

KOALA, Phascolarctos cinereus.

You will see that there are particular densities of koala observations in the areas between Highfields & Crows Nest (north of Toowoomba City) and between Pittsworth and Brookstead (west of Toowoomba City). We have received landholder reports of koala sightings around Quinalow & Maclagan in the north west of our Region where there are no koala sightings recorded on iNaturalist or the QWildlife apps.

Do the number of these sightings relate more to there being more people living in these areas to observe more koalas? The basic answer is yes - the more effort you put into looking for something, then the more you'll find. The increased number of observations in recent years definitely does not reflect an increase in population sizes. It's a result of engaging the community to go out and look and then report their sightings.

So, it is important that all koala sightings across the Toowoomba Region be reported using the National Geographic's iNaturalist platform or the Queensland Government's QWildlife app or both.

Without this current and historical koala data, government agencies and our community have no way of knowing the extent of our Toowoomba Region koala populations. Without knowing the current status of koala populations (including their distribution and/or size) in the Region, informed decisions on their conservation may not be appropriately made. Successful conservation outcomes can only be achieved when we have robust insight of population trends.

WHY YOU SHOULD PLANT KOALA TREES

Koalas require an extensive range of habitat including a variety of koala food tree species. Depending on quality of trees, a koala's home range may extend from 3-4 to 10-20 square kilometres that is influenced by rainfall, soils and also what feed-tree species naturally grow in the area. Our Region has small pockets of high quality koala habitat that support koalas as these pockets connect to larger areas of bushland habitat.

Our local koala habitat has suffered from generations of land clearing for agriculture and urban development. Over the last 150 years, grain farming and beef cattle grazing has replaced koala habitat right across the Darling Downs. Bulldozing of koala habitat associated with the spread of suburbs such as Kearney Springs, Westbrook, Highfields and Kleinton on the edge of the Toowoomba City area has contributed to net habitat loss.

The koala habitat that remains is quite fragmented with isolated remnant patches, in particular, on the remaining forested hills unsuitable for intensive agriculture. These hills, such as Scrubby Mountain near Pittsworth and Sugarloaf Mountain near Kingsthorpe, are the eroded plugs from extinct volcanos along our escarpment and adjacent plains.

the habitat that remains is often overrun by exotic weeds such as lantana (Lantana camara), broad-leafed privet (Ligustrum lucidum) and vines that dominate the lower storey and make ground movement impossible for travelling koalas and other wildlife.

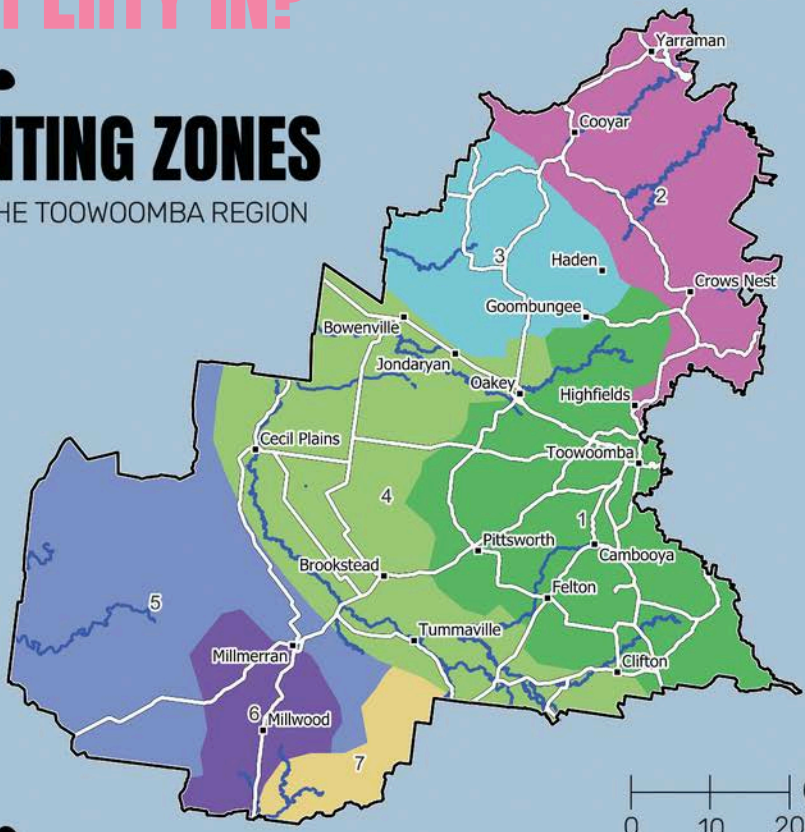
WHICH PLANTING ZONE IS MY PROPERTY IN?

You should start by checking your planting zone from our district map of the Toowoomba Region.

You will see we have divided our region into 7 zones for planting koala trees - based on climate, soils and existing vegetation.

PLANTING ZONES

WITHIN THE TOOWOOMBA REGION



LEGEND

- TOOWOOMBA REGION
- MAJOR WATERCOURSES
- MAJOR ROADS
- TOWNS

TOOWOOMBA REGION ZONES

- 1
- 2
- 3
- 4
- 5
- 6
- 7

WHERE TO PLANT

Revegetation planting to restore koala habitat is most effective when it involves one or more of the following:

- Expanding existing patches of koala habitat;
- Creating connectivity between existing koala habitat patches (corridor planting); and/or
- Creating corridors of koala habitat along watercourses.

You should take the advice of your neighbours and local planting experts as to where to best plant koala trees on your property. Factors to consider include:

- Avoid gullies and other known frost prone areas;
- Avoid steep slopes to reduce the risk of flooding and erosion;
- Consider aspect to reduce risk of exposure to severe seasonal wind (Summer NW'erlies / Winter SW'erlies);
- Avoid areas of high predator (hares & wallabies) activity;
- Ensure that cattle can be excluded by a single electric tape;
- Aim to plant along contours or close to creek banks to maximize moisture in dry periods;
- Encourage development of koala corridors connecting existing habitats across your district – start by reviewing local habitat by locating your property district on Google Earth;
- Consider the need to clear ground cover such as lantana that prevents ground level movement of koalas into your planting area;
- Consider planting in patches rather than rows to limit edge effect factors and to keep the planting aesthetically natural;
- Avoid planting close to roadways so as not to encourage koalas to cross roads;
- Be mindful of bushfire considerations and ensure that adequate access and egress routes are maintained for safety;
- Consider a thermal drone survey of your property and neighbouring properties to determine existing koala populations and corridors;
- Consider whether your preferred planting site will be subject to future development or encroachment.

LEARN ABOUT YOUR DISTRICT

- Talk to your neighbours as to recent koala sightings, check iNaturalist, QWildlife species databases for your area / district. Where have koalas been seen, in what trees and at what time of year?
- Join your local Landcare group – see list below – attend meetings and learn more about your district and your property.
- Find out what koala trees grow locally, in which soils.
- Look for koalas on your property and adjoining properties using binoculars and looking for scats (koala poo) at the base of trees and scratch marks on tree trunks.
- Go to Google Earth or QldGlobe to identify your local eucalypt habitat, and likely existing & future koala corridors.
- Take advice as to the best place to plant your koala trees in terms of soils, aspect, predators, weather (in particular, frost & wind) & site drainage. Your local Landcare group is a great place to start to access local ecological knowledge & practical planting experience.

The Queensland Herbarium offers a service to provide a map of your property showing remnant and pre-clearing vegetation types, known as Regional Ecosystems (RE). This will give you an idea of what vegetation communities existed pre-clearing and what now remains. It also describes what species naturally occur in each RE, but this information can be quite technical and occasionally incorrect. This information can also 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 which can be obtained from the Queensland Globe website.

Once you work out which zone your property sits in and a little about your property area, then you can check out the koala tree species list for your Zone.

WHAT SPECIES SHOULD YOU PLANT?

Koalas can be fussy and are very specific in their dietary requirements.

Koalas prefer to eat only a small percentage of the approximately 700 species of Eucalyptus found in Australia. Eucalypt leaves contain very strong chemical compounds that are poisonous to most animals.
The leaves are also very tough and low in nutritional value. Within a given area only a few of the available eucalypt species will be a preferred food species, while others, including some non-eucalypts, may be incorporated into the diet as a supplementary food source and/or utilized for other purposes.

Given that koalas travel across habitats, it is important to consider planting a variety of koala tree species. Not all species flower or grow new leaves at the same time or season. By planting a variety, a particular species with fresh attractive leaves may be available when a koala chooses to travel across your property.

In this guide, we recommend 7 species of koalas trees that are generally accepted by koalas as food sources across the Toowoomba Region. Whilst Eucalyptus tereticornis (forest red gum) is the predominant koala feed tree in our Region, you should consider always planting a mix of 3 to 4 species.

By planting a variety of koala tree species together with other native trees and shrubs, you will provide for visiting koalas who may choose to feed on different trees in different seasons. A mix of species can also still leave you with habitat if one particular species fails for some reason in your plantings.

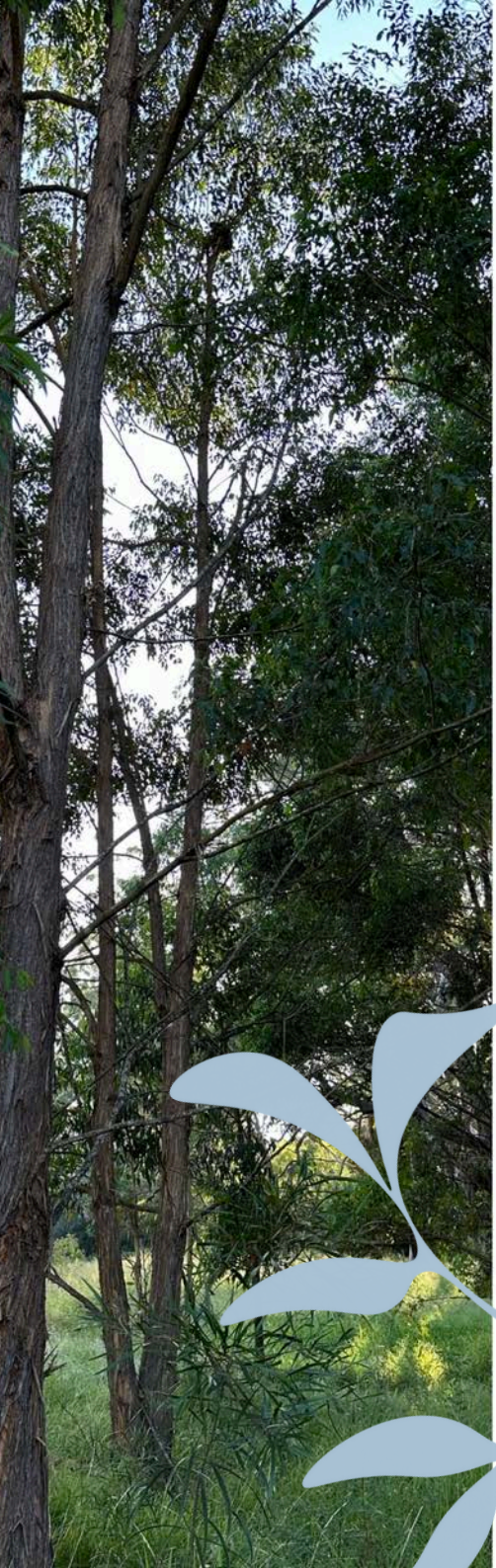
You should consider the following table to decide on the species of koala trees to plant - depending on your property zone, soils, site drainage etc.

SPECIES LIST

KOALA TREE SPECIES	DESCRIPTION	SOILS & LOCATIONS	ZONES
EUCALYPTUS CAMALDULENSIS RIVER RED GUM	Short thick trunk, heavy twisting branches, long thin dull green to grey leaves - 15-50 metres in height	Prefers heavy clay soils, often found along riverbanks and floodplains where soils are fertile and have high moisture content. It can also grow in sandy soils but requires regular water supply	**1, 4, 7**
EUCALYPTUS CREBRA NARROW-LEAVED RED IRONBARK	Long straight trunk to straggly crown, bark deeply furrowed exuding reddish gum, dull green to grey leaves - 10-30 metres in height	Prefers well-drained sandy soils but is also found in clay loams. It is adapted to a variety of soil types with good drainage	**1, 2, 3, 5, 6, 7**
EUCALYPTUS BITURBINATA GREY GUM	Smooth, patchy white to grey bark shedding in large plates. Tree to 30m high	Prefers sloping sites with well drained soils of medium fertility.	**1, 2, 3**
EUCALYPTUS MELLIODORA YELLOW BOX	Straight trunk rounded crown with drooping branchlets, grey to orange brown bark, upper limbs smooth & grey - 10-30m height	Prefers well-drained soils, often found in loamy soils with moderate to high fertility.	**1, 2, 3, 5, 7**
EUCALYPTUS ORGADOPHILA MOUNTAIN COOLIBAH	Bending trunk with box bark on trunk before first branches - 15-20m in height	Grows in well-drained soils, including sandy and clay loams and areas with moderate fertility	**1, 3**
EUCALYPTUS POPULNEA POPLAR BOX	A grey barked box tree with glossy, orbicular leaves - 15-20m in height	Prefers heavier clay soils but can also grow in loamy soils. It is commonly found in areas with moderate to high fertility	**3, 4, 5, 6, 7**
EUCALYPTUS TERETICORNIS FOREST RED GUM	Tall with rough, fibrous bark shedding in long strips revealing grey trunk with lance -shaped leaves – 30-50 metres in height	Grows well in a range of well-drained soils, from sandy loams to clay loams. It is often found in areas with fertile soils	**1, 2, 3, 4, 5, 6, 7**

You can find our additional recommended eucalypt species on our on-line resource.

These additional species have also been recorded as being used by our koalas as feed trees. You should look to this on-line resource where you learn of koalas being sighted in particular trees around your property. You should also take local advice from neighbours, your local nursery and planting experts from your district recommended by your local landcare group. For example, landholders at Geham (border of Zones 1 & 2) have had success with Eucalyptus microcorys (tallowwood) preferred by koalas visiting their property. You should keep a note what species you plant and where so you can monitor how each species develops and which tree species your visiting koalas prefer.



HOW YOU SHOULD DEAL WITH FROST

Across the Toowoomba Region, frost can pose a significant threat to young eucalypt seedlings, particularly when vulnerable species are planted in frost-prone areas such as gullies and low-lying spots.

If you propose to plant in frost-prone areas, you should closely follow our species selection guide to avoid planting species known to not handle moderate to severe frost conditions.

Where you are following this advice you may still wish to protect your young plants from frost damage by considering the following preventive measures.

FROST

COVERINGS

You may cover young plants with frost cloths or horticultural fleece during frosty nights to shield them from the cold without the coverings directly touching the foliage. This takes a lot of work so may prove impractical if you are planting many seedlings.

TEMPORARY SHELTERS

You may use stakes and cardboard guards to act as a physical barrier, keeping frost away from the young trees.

MULCHING

Applying a thick layer of mulch around the base of the seedlings helps insulate the roots and retain warmth in the soil, which is vital during cold spells.

PROPER WATERING

Moist soil retains heat better than dry soil, so watering the plants in the evening before a frost can help insulate the roots. However, it's important to avoid getting water droplets on the leaves or trunk of the plants, as these can freeze overnight and cause damage. To prevent this, watering should be done by using irrigation methods that deliver water directly to the soil without wetting the foliage.

EXISTING WINDBREAKS

Windbreak barriers such as mature trees, shrubs or fences can reduce the impact of cold winds on your plants, further protecting them from frost.

By taking these steps, you can give your young eucalyptus seedlings a better chance of surviving and thriving in frost-prone areas

THE BEST TIME TO PLANT A TREE WAS 20 YEARS AGO. THE SECOND BEST TIME IS NOW.

CHINESE PROVERB

WHEN SHOULD YOU PLANT YOUR KOALA TREES?

We recommend you aim to do your planting of koala tree seedlings in SPRING - late September / October – across the Toowoomba Region. SPRING is the ideal time to plant.Planting throughout the year, other than mid summer or mid winter is possible but requires more post-planting care and maintenance.

SPRING is the season of milder soil temperature and, hopefully, spring rains across the Region. Planting at this time gives the seedlings time to establish their root system after the last winter frost and before the heat of the impending summer.

If your property is in a western zone, historically you receive heavier later frosts so you should take care to ensure frost season is over before you plant.

Where the long-range weather forecasts point to an impending hot, dry summer, you may be wise to delay planting until the next Spring, or possibly early Autumn if you are in arelatively frost-free area.

Local landholders may have had success planting at other times of the year. You should think about planting koala trees as a minimum 10 year project. As such, you want to give your trees the best possible start on this journey.

HOW SHOULD YOU PLANT KOALA TREES?

Our project has reviewed the literature and consulted with a broad range of local ecologists and experienced landholders to arrive at this recommendation.

At the end of the day, it is your planting project, so the decisions are yours. We can only guide you with your project.

SITE PREPARATION

Ideally, if you have access, you should use a plough to rip a single narrow (<200mm) shallow (<300mm) furrow about 2-3 months before planting. You should redo the furrow about one week before planting to create a clod-free soil in which to plant.

This narrow furrow should help avoid invasive weeds developing that choke seedling growth. We recommend placing mulch along the furrow lines rather than using herbicides to control weed growth.

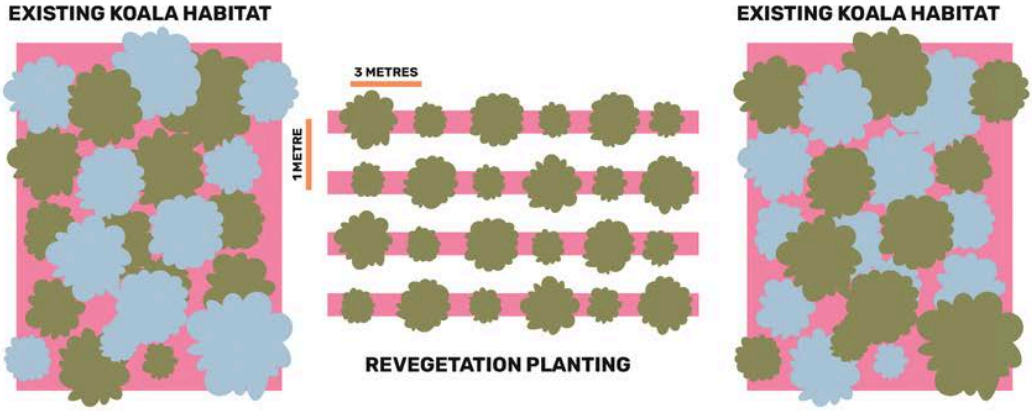
SPACING & DESIGN

If you are planting adjacent to existing vegetation, ensure that your planting is set some distance away from the the cover of larger trees.. A good guide is the minimum distance to plant is the height of the existing trees. By separating the existing trees from the planted trees, you reduce competition for resources (such as water) giving the younger, weaker plants a better chance of growing vigorously.

You should aim to rip your furrows approximately 5-10 metres apart to allow you to bring in a tractor for subsequent slashing or watering.

Where possible, your ripping should be undertaken along contour lines to maximize moisture retention.

Planting can be done in a diamond pattern to allow for canopy spread and an eventual interlocking canopy.



We recommend you aim to plant your seedlings in patches; avoiding planting lines of single trees. Round or square planting areas are preferable to long narrow strips. The exception to this is if you are wanting to create a corridor or plant along a fence-line.

This clump planting should limit the 'edge-effect' where plants on the edge of a habitat are likely to be more affected by adverse climatic factors such as wind, heat, frost, flooding, and other factors including insect and animal predators, weeds, spray drift, bushfires etc.

You need to think about the mature size of koala habitat trees, both in terms of height (usually <50m) and spread (usually <20m), with koalas enjoying interlocking canopy to facilitate above ground movement through a habitat. This means seedlings should be planted at least 7-8m apart in rows which are at least 5-10m apart. You should ensure adequate separation from infrastructure such as power-lines, fence-lines and buildings. A general rule to follow is to plant your trees 20-30m away from critical infrastructure to reduce the risk of bushfire damage.

YOU'LL NEED FENCES & GUARDS

You'll need to plan for adequate fencing to ensure livestock (cattle, sheep, goats etc) and predators (hares, wallabies etc) are excluded from planted seedlings for at least 3-5 years.

We recommend a mobile solar-powered single electric line to keep livestock away. If you consider permanent barbed-wire fencing is necessary, you should make sure you have at least a 50cm gap beneath the lowest strand of wire to allow travelling koalas ground access.

We recommend the GreenPod recycled cardboard Tree Guards (450mm high x 170mm diameter, approx $2.30 each), supported by 2 bamboo stakes (700mm x 10-12mm diameter, approx. $0.40 each),

These biodegradable guards last for 2-3 years and should exclude hares & wallabies during that initial period.

YOUR PLANTING OPERATION

Depending on the size of your planting operation, tubestock, guards, stakes, mulch & a water pod should be brought in by trailer to the planting site.

You should have sufficient labour available to plant approximately 6-8 plants per person per hour for a 3 hour period early in the spring morning (between 6am - 9am) before the heat of the day. Volunteers should be closely supervised to ensure proper planting technique, using a small hand spade and a mattock where rocks may be a problem.

HOW WE SUGGEST YOU PLANT

With earlier furrow ripping, you should use a small spade to make a 300mm hole into the soft soil base without clods. We recommend your prepare the hole by lightly flooding with water. The tubestock should be pre-watered, possibly by soaking in a bucket, just prior to planting.

The tubestock should be removed from its plastic container by inverting and lightly tapping on the edge of the tube so as not to damage the roots. Particularly in drier area you should deep plant (long stem planting) - with at least 2/3 of the tubestock stem planted

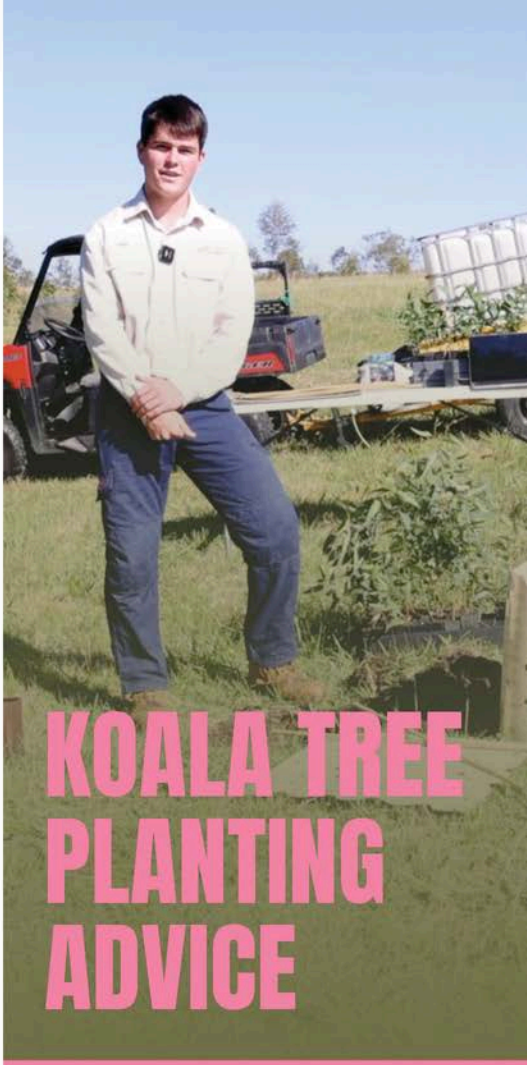
beneath the surface, in a slightly depressed saucer around the emerging stem.

Once the tubestock is placed in the hole, the surrounding soil can be lightly pressed around the stem to form a small bowl where moisture can be retained.

You should then place the guard and stake over the planted seedling, then add mulch around the seedling stem inside the guard (whilst not choking the seedling stem) and over a 200-300mm area surrounding the guard.

We do not recommend using augers or post-hole diggers to make the
planting hole. Local landholders tell us augers tend to create a hole with smooth or glazed sides that limits root growth and development. Augers are used widely in the sandier soils found in coastal areas. We have had positive reports on the use of water-spears in planting - to flood the planting hole to promote root development.

Plants should be generously watered on planting with a follow up watering in the next 2-3 days particularly where there has been no follow-up rain.



KOALA TREE PLANTING ADVICE

PLANTING VIDEO

YOUR ON-GOING TREE MAINTENANCE

You should ensure you regularly monitor and maintain your planting site, particularly with seasonal changes in temperature and rainfall.

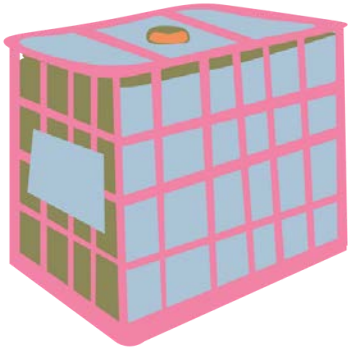
Seedlings should be monitored every couple of days for the first month then weekly thereafter. You should avoid over-watering to encourage tubestock tap-roots to descend in search of deeper, more reliable ground moisture.

You should allow native grasses to grow around the trees to protect the seedling and support soil development. We do not recommend use of herbicides unless absolutely necessary where weeds and vines are choking seedlings and mechanical slashing is impractical.

You should look to manage undergrowth to address bushfire risk but avoid severe slashing and aim to throw stubble into the planted rows to promote mulching.

After 2-3 years, you may want to consider a secondary planting project to enhance your koala planting – replacing failed trees or adding to the original planting to enhance existing corridors.

If lucky, you may get to see koalas in your planted trees at around 3 years of age depending on the seasons – allowing you to enjoy the fruits of your labour.



You will need to plan to have water infrastructure available at the onset of any prolonged dry period.

We recommend a small (<1,000 litre) water pod – easily transportable on a ute or small trailer – rather than any reticulated irrigation system.

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- Shannon Michael
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FUNDING

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DISCLAIMER

FURTHER READING

FOR FURTHER INFORMATION

You may wish to access the many other existing planting and koala habitat resources from across Queensland and nationally.

YOUR LOCAL TOOWOOMBA REGION LANDCARE & KOALA GROUP CONTACTS

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4698 4748

GEHAM
KOALA LAND AND WILDLIFE SUPPORT INC
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GOOMBUNGEE
GOMAREN & DOCTORS CREEK LANDCARE
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MILLMERRAN
LANDCARE INC
0427 952 336

OAKEY
URBAN LANDCARE GROUP
0428 751 070

PITTSWORTH
DISTRICT LANDCARE ASSOC INC
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