



# UNE Koala Plan of Management, 2022

**An updated review of the 2015 Koala Management Plan**





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# 1 Introduction

The Armidale campus of the University of New England (UNE) is home to a resident koala population. Koalas are regularly seen in trees throughout the grounds by staff, students and visitors. The campus forms an important corridor for koalas moving from other habitat areas to the north and west into the urban areas of Armidale and to other habitats to the south-west.

These koalas are part of a significant koala population around Armidale, Black Mountain and Uralla. Koalas in eastern Australia are declining in numbers due to habitat loss, bushfire, disease, climate change and other threats. This decline has led to the species being listed as Endangered under NSW and Commonwealth environment legislation.

This Koala Plan of Management updates a previous plan for the UNE campus koalas (University of New England, 2015). It takes account of the recent threatened species listing, changes to legislation, the tornado which hit the campus in October 2021, the 2018-19 drought and the 2019-20 bushfires.

The Plan identifies threats to the campus koala population and makes recommendations for management actions to mitigate or overcome these threats.

## 1.1 Purpose

This Koala Plan of Management (KPoM) is based on the objectives and requirements of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (SEPP(B&E) 2021) and The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The aim of any KPoM is to “*encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline*” (SEPP(B&E) 2021).

Secondarily, the aim is to satisfy all the principles outlined in the Koala Habitat Protection Guidelines, associated with the SEPP(B&E) 2021. These principles are;

- Principle 1. Understanding koala habitat value.
- Principle 2. Avoiding intensifying land use in koala habitat areas through appropriate landscape planning and site selection.
- Principle 3. Encouraging the proper conservation and management of areas of natural vegetation that provide habitat for koalas.
- Principle 4. Minimising potential direct impacts to koalas through koala sensitive design.
- Principle 5. Implementing best practice measures for the management of identified risks to koalas.
- Principle 6. Using compensatory measures only where they can be shown to better promote the aim of the SEPP.
- Principle 7. Using adaptive management strategies to monitor, evaluate and deliver appropriate planning outcomes for koalas.

This Plan demonstrates the University’s support for management of koala populations within UNE’s boundaries. The specific elements within this Plan will form an integral part of the Landscape Management Plan which will be the overarching document for protecting and improving bushland areas within the UNE campus.

This Plan applies to lands where UNE is the consent authority and deals with habitat protection and management as the key to conserving koalas through the development process. Specifically, this plan applies to the Armidale campus of UNE (Figure 1).





Figure 1 The Campus of University of New England, to which this KPoM applies (outlined in green & excluded area in black)

## 1.2 Objectives

- Manage the long-term sustainability and recovery of koalas and their habitat on campus.
- Identify and list the preferred koala food tree species likely to be found in the plan area and map koala habitat.
- Ensure that there is no net loss of koala habitat and (where appropriate) create, manage and/or restore koala habitat linkages to allow for safe koala movement across the landscape.
- Minimise and manage threats affecting koalas and their habitat.
- Provide consistent assessment criteria for the processing of development applications, including guidelines for koala habitat assessment and food tree and koala habitat retention

Specific objectives for UNE are:

- to facilitate Koalas to continue to utilise the woodland on campus after a development.
- To increase UNE's capacity to support a greater number of koalas in the future and at least marginally assist in increasing the overall abundance of koalas in the Armidale area.
- To offset habitat loss caused by the 2021 tornado, prevent further habitat loss in future weather events, and to promote the coexistence of human and koalas without impact.

## 1.3 Legislative Context

### 1.3.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act imposes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas of national significance. It also provides a mechanism for national environment protection and biodiversity conservation.

The EPBC Act is administered The Australian Government Department of the Environment, and provides protection for listed Matters of National Environmental Significance (MNES) including:

- Listed species and communities (e.g. listed threatened species and ecological communities and migratory species);
- Protected areas (e.g. World Heritage properties, Ramsar wetlands of international significance, conservation zones); and
- National, Commonwealth and Indigenous Heritage.

MNES relevant to this plan includes listed threatened species and ecological communities. Under the EPBC Act, any action (which includes a development, project or activity) that is considered likely to have a significant impact on MNES must be referred to the Commonwealth Minister of Environment

In February 2022 the Koala (combined populations of QLD, NSW and ACT) was listed as Endangered under the EPBC Act.

This Act requires that the proposed actions will be tested against the Assessment of Significance to determine if there is any significant impact on koala populations and koala habitat. The Significant Impact Guidelines and referral guidelines for the koala are available for guidance in this process.

### 1.3.2 State Environmental Planning Policy (Biodiversity and Environment) 2021 (SEPP B&E)

### 1.3.3 The previous Koala management plan referred to *State Environmental Planning Policy No 44—Koala Habitat Protection*, which was repealed in 2019. This was replaced by the Koala Habitat SEPP 2020 and the Koala Habitat SEPP 2021, both of which have been incorporated into Chapters 3 and 4 of the State Environmental Planning Policy (Biodiversity and Environment) 2021.-Biodiversity Offset Scheme

Introduced under the Biodiversity Conservation Act 2016, its purpose is to minimise and offset the overall impacts of habitat degradation and loss.

### 1.3.4 Environmental Planning and Assessment Act 1979.

The EP&A Act is the legislation for planning in NSW. Parts 4 (Development Assessment) & 5 (Environmental Assessment) outline the considerations that are relevant to koalas. The EP&A Act provides the framework for the NSW planning system, including the creation of policies for specific matters of state significance called State Environmental Planning Policies (SEPPs). It also requires consent authorities such as local councils to take into consideration a range of factors when determining whether to approve a development including the likely environmental impacts of a development on natural and built environments. The EP&A Act interacts with the BC Act in that the threatened species 'test of significance' required under the BC Act and the Biodiversity Assessment Method must be considered in assessing relevant development applications or activities.

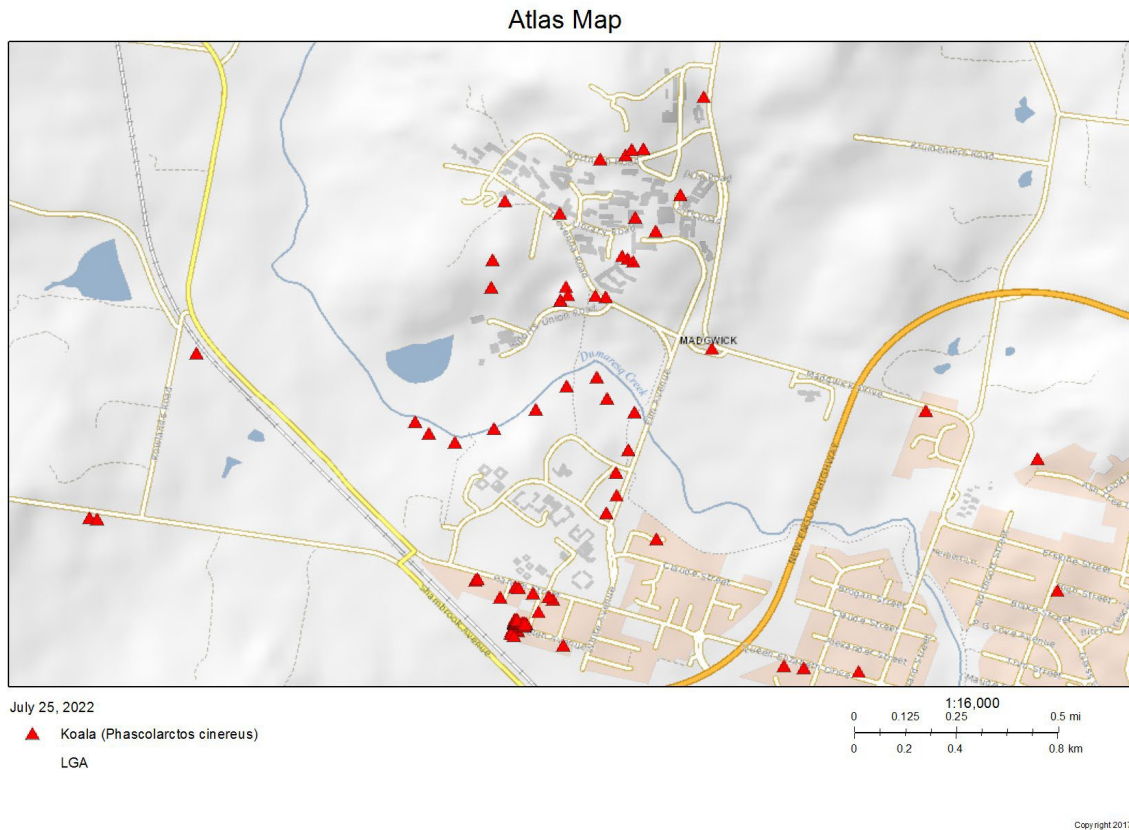
## 1.4 Who is affected by the plan

This KPoM is for the University of New England, and therefore will affect its constituents (current and future managers, staff and students) and the surrounding community. Additionally, the koala population will be affected by the outcome and recommendations of this plan.



## 1.5 Status of Koalas in the plan area

Koalas have been observed on campus for a long time and continue to be recorded on site. Figure 2 shows the BioNet Atlas records of Koala presence in and around the UNE campus. Note that these are records that have been submitted and uploaded. There are often sightings that do not get recorded.



**Figure 2: Records of koala sightings from 2004 to 2022 (BioNet Atlas, 2022)**

Koalas feed almost entirely on *Eucalyptus* trees, and as a result they are mostly arboreal. They are active between dusk and dawn but are mostly nocturnal. Generally, koalas are solitary but are occasionally seen in groups of 2-3, where this is often a mother and a joey, and a breeding male. Koalas are territorial marsupials, with variable sizes of home ranges (NSW Department of Planning and Environment, 2022).

Home range size variation is dependent on multiple factors. Foremost, richer food source and resources lead to smaller ranges, whereas larger ranges are a result of poorer resource availability (Callaghan, et al., 2011). Males have a much larger ranges that overlap with multiple females' smaller territories. Seasonal changes also impact the range sizes. Heinz (1999) found that koalas on the Northern Tablelands have territories ranging from 35-50 hectares. This indicates that the University campus could host up to five koala home ranges. Our (unpublished) research in the Armidale area shows home ranges from 1-4km<sup>2</sup>.

## 1.6 Threats to koalas in the plan area

Table 1 Threats to koalas in the plan area

Impact	Management measures
Dog Attack	<ul style="list-style-type: none"> <li>Restrictions on the movement of dogs, including use of dog- and koala-proof fencing that effectively contains dogs and excludes koalas, with the provision of koala furniture that allows koalas to escape yards should they gain entry.</li> <li>Signage and education.</li> <li>Dogs excluded from koala habitat areas and only allowed off leash in areas established as not being habitat.</li> </ul>
Vehicle strike	<ul style="list-style-type: none"> <li>Maintain traffic speed limitations as far as possible.</li> <li>Traffic calming measures and roadside lighting.</li> <li>Use of koala proof exclusion fencing, with the provision of escape mechanisms should koalas gain access to the road.</li> <li>Inclusion of koala movement aids such as land bridges and/or underpasses if required and in combination with koala proof exclusion fencing.</li> </ul>
Bushfire	<ul style="list-style-type: none"> <li>Development and implementation of a bushfire management plan with measures that specifically address risks to koala habitat.</li> <li>Core koala habitat should not form part of the Asset Protection Zone (APZ). The APZ should occur beyond any koala habitat.</li> <li>Develop an emergency response plan that identifies key contacts in RFS, local wildlife carers and vets, and list of appropriate Government resources.</li> </ul>
Introduction or spread of disease	<ul style="list-style-type: none"> <li>Use of biosecurity and hygiene procedures in instances where vegetation pathogens known to affect koala trees might be spread or introduced. For example, strict enforcement of vehicle wash-down points.</li> <li>Reporting to Southern New England Landcare for any koala onsite with obvious signs of disease (red or fused-closed eyes, wet-looking or staining on posterior end (behind)).</li> </ul>
Disturbance	<ul style="list-style-type: none"> <li>Establishment of tree protection zones around any retained koala trees within the site area and preclusion of any development activities within the tree protection zones.</li> <li>Habitat restoration and strategic plantings to improve connectivity of retained habitat and trees.</li> <li>Where there may be indirect impacts on koala habitat, use of a <i>suitably qualified koala spotter</i> to inspect habitat prior to any development taking place.</li> <li>Where koalas are identified, temporary suspension of works that might disturb the koala and/or prevent it from moving to adjacent undisturbed habitat of its own volition.</li> <li>Koalas should be protected from disturbance and indirect impacts via appropriate exclusion fencing from urban areas and roads.</li> <li>Fencing of urban areas should still allow for koalas to disperse through the koala habitat in the landscape and to connect with other koalas and koala colonies.</li> </ul>

## 2 General Provisions

### 2.1 Land to which the plan applies

The KPOM applies to the University of New England Armidale Academic Precinct (Fig 1). The academic precinct is classified in five zones: north, east, south, west and central and further broken down into Landscape Management Zones (Figure 3). There are two conservation zones for an endangered ecological community known as the *Ribbon Gum - Mountain Gum - Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion*. One conservation zone sits between Mary White College and Dumaresq Creek. Additionally, to the north of the academic campus is an area of native bushland with high cultural significance and ecological value.

A complete description of the UNE Campus is found in the Landscape Management Plan (University of New England, 2022) with the history of the site.

This plan applies to Lot 10, DP 1142199.



Figure 3 Landscape Management Zones on UNE campus (University of New England, 2022)



## 2.2 Land to which the plan does not apply

This KPoM is specific to the main UNE campus in Armidale (Lot 10 DP 1142199). The surrounding SMART Farms and UNE urban and regional campuses are excluded from this plan.

Additionally, in the middle of the campus is an area of land designated as 'Non-UNE Property Reserve' and does not apply to this land (Figure 3).

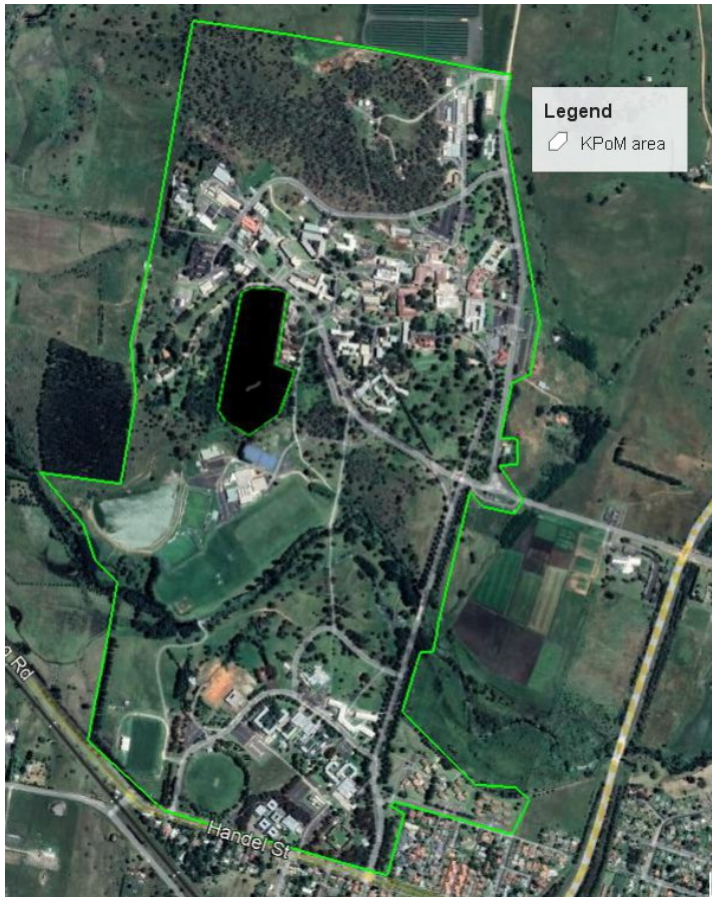


Figure 4 Extent of which the KPoM applies

## 2.3 Koala Habitat Mapping

Under the State Environmental Planning Policy (Biodiversity and Environment) 2021, *core koala habitat* means—

- a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
- b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

Figure 5 shows the map of core koala habitat by this definition on campus. These areas have been assessed and categorised as core koala habitat by the authors of this Plan, who are *suitably qualified and experienced persons*, as defined in the SEPP.

This does not include areas used by koalas to move through the campus or to move to areas beyond the campus.



**Figure 5 Core Koala Habitat on UNE campus**

According to the SEPP (B&E), koalas use the species listed for the Northern Tablelands koala management area in Schedule 3 of the SEPP (B&E) 2021 (see appendix 5.1). These species have been mapped on campus (Figure 6 & Figure 7). There are records in these areas of koalas from the last 18 years (Figure 2)



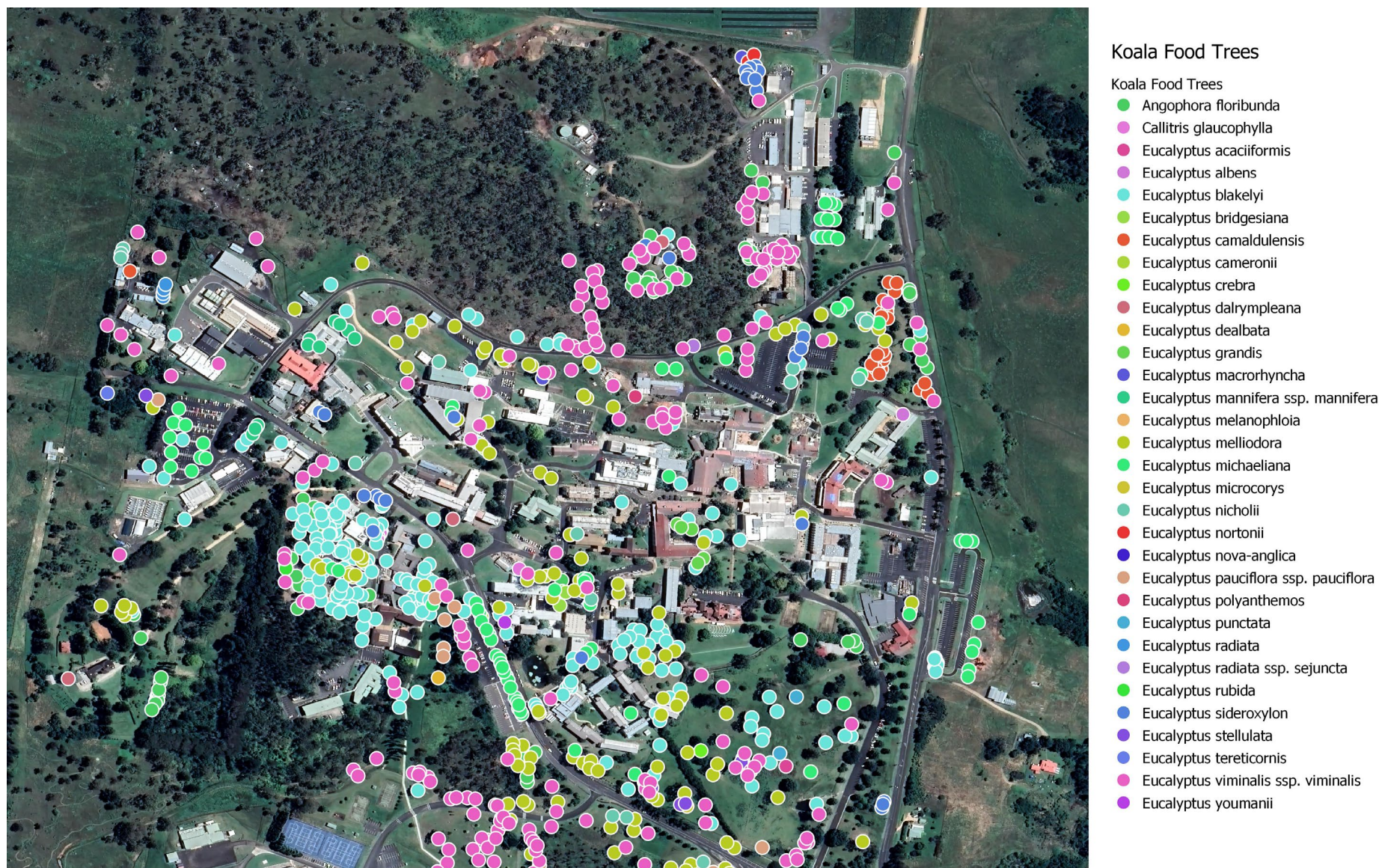


Figure 6 Tree species mapped on North of campus



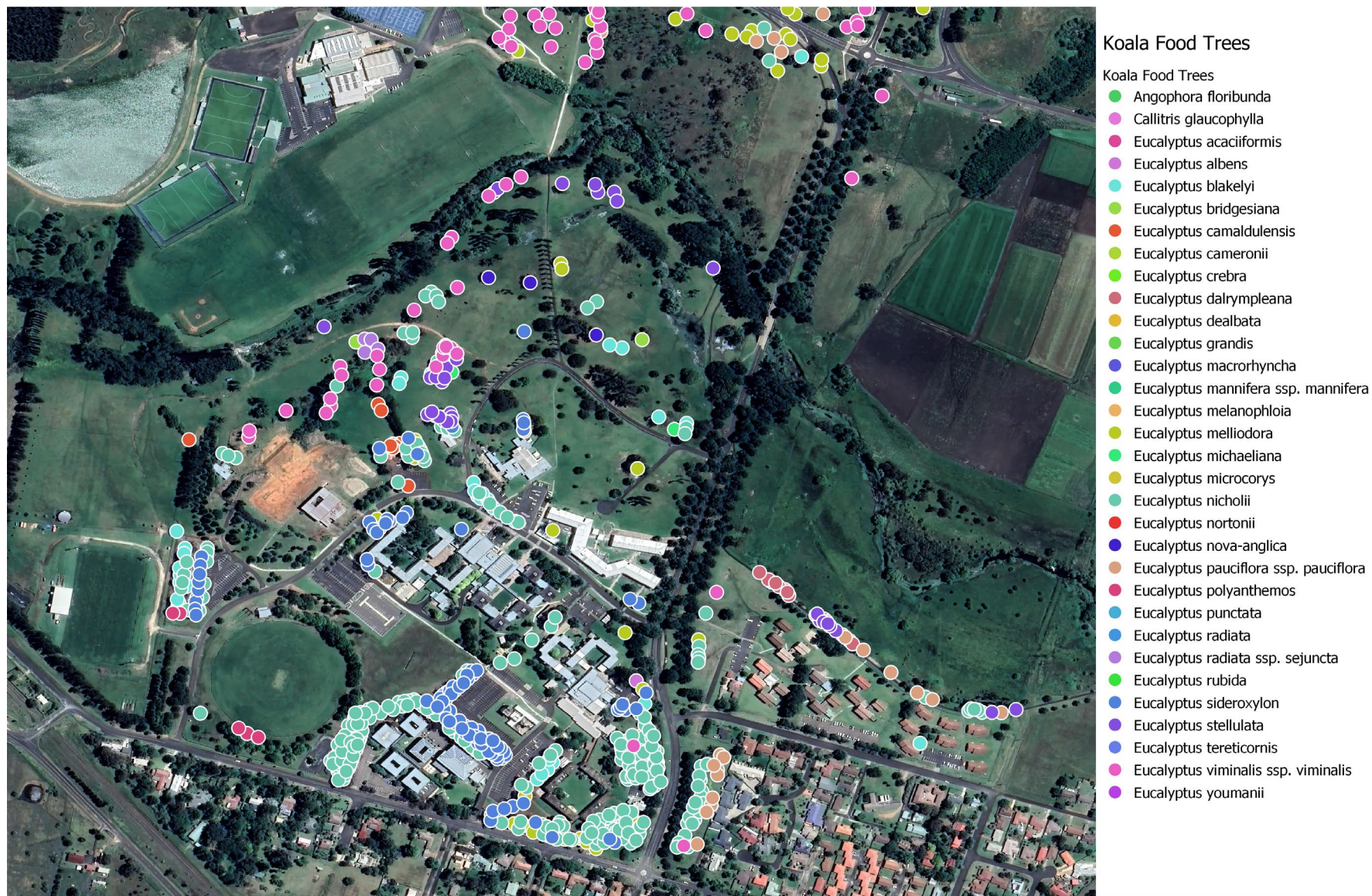


Figure 7 Tree species mapped on South of Campus



## 2.4 Relationship of the plan to other KPoMs in the area

The University of New England is located in the Armidale Regional Council area and does interact and significantly overlap with their KPoM (Armidale Regional Council, 2021). Much of the information in its KPoM is relevant in this one.

## 2.5 Duration of the plan

This plan will be due for renewal in September 2027 (lasting 5 years), unless Policy changes call for earlier renewal.

# 3 Management and monitoring activities

Koala management in the plan area should not be limited to forested areas but should extend over areas of fragmented habitat which support a koala population and identified links between koala habitats.

There are opportunities to improve connectivity of koala habitat in the *People and Infrastructure* section of campus.

The core koala habitat areas shown in Figure 8 could be better connected to improve koala safety in moving between areas. To create a safe pathway for koalas we recommend improving vegetation on the western side of campus to connect to the creek as it is a known corridor for koalas. Trees could also be planted in other areas of the campus to increase connectivity between these areas.



Figure 8 Potential improved corridors on campus

It is important to note that the tallest trees on campus are remnant forest trees that have been there longer than the University. When the tornado went through campus, these remnant trees were most of the trees that fell and caused the most damage.

It is recommended that the new corridors that will be developed, provide maximum habitat availability and minimum risk for koalas. It is suggested to direct the corridors away from the busiest urban areas of the University, therefore a corridor development on the western side is most ideal to connect the current core koala habitat areas. Additionally, where there is opportunity to add more core habitat, it is important to incorporate the management measures listed in Table 1.

New trees that are planted on campus will take the woodland form, growing a broader canopy but not as tall as the forest form (Ashton, 2000). These are much safer and with proper limb management pose a far lower risk of falling. Species with woodland form could be planted 20m or more from existing buildings and infrastructure with minimal risk to these structures. Species with forest form (such as *Eucalyptus viminalis* and *E. dalrympleana*) should be planted at least 30m from infrastructure. Figure 9 shows areas around campus buildings from where all new tree planting should be excluded, based on the 20m exclusion.





Figure 9 Buildings on campus and the 20m exclusion planting zones

By following these guidelines, we can safely plan to plant more eucalypts through the campus to improve koala connectivity (Figure 8).

### 3.1 Education

The University of New England is a tertiary education institution and can tailor education on the general health, local population ecology and vehicle management to staff, students and surrounding community.

### 3.1.1 Tracking opportunities

Radio-tracking and GPS-tracking studies enable insights into factors that contribute to koala ecology. The methods have been previously used on other UNE properties and showed unique preferences of different koalas (D. Carr, pers. comm). Individual koalas are captured and fitted with a tracking collar which is monitored for a period of several months. The data shows where the koalas are moving, what species of trees they prefer, the times of day they are active and the extent of their home ranges.



As there is a resident population of koalas on campus, and previous studies in the region have shown how individual koalas operate in their home ranges (Carr, 2020), it would be beneficial to understand how the UNE koalas use their ranges. Data collected could assist in shaping the future plantings and infrastructure with specific reference to the local koala residents. It would also allow for close monitoring of the overall health and ecology of the populations on campus.

For immediate and general record keeping, we encourage all staff and students to download the 'I Spy Koala' smartphone app. All data contributed via the app is made accessible through BioNet, NSW's corporate biodiversity data repository. Researchers, land managers, planners, consultants, the government, and the general public can then access the data via the BioNet website and related data services. (NSW Department of Planning and Environment, 2020)

Figure 10 'I Spy Koala' smartphone app

In late 2022 UNE's School of Environmental and Rural Sciences implemented a koala sighting register where students, staff and visitors are encouraged to record koala sightings using the QR code, or via [koala@une.edu.au](mailto:koala@une.edu.au).

## Have you seen a koala on campus?

If you see a koala on campus, or any of UNE's rural properties, we'd like to know.

Take a photo with your phone and send to [koala@une.edu.au](mailto:koala@une.edu.au) or scan the QR code

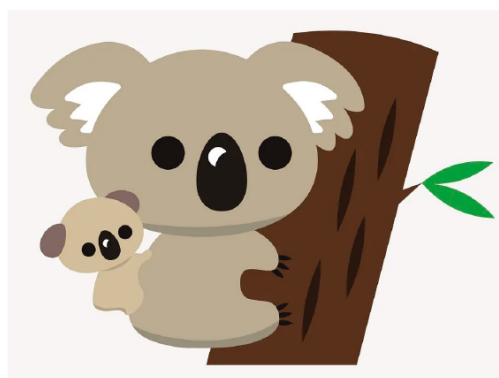


Figure 11: Koalas on Campus UNE Initiative

### 3.1.2 Vehicle management

It is difficult to estimate the precise number of koalas hurt or killed by vehicles because many of these incidents are likely not reported. However, wildlife rehabilitation organisations regularly list automobile strikes as one of the leading causes of injury and death, and they are seen as a major threat to NSW koalas (DPIE, 2022).

Several variables affect the road-related death of koalas. The likelihood of a koala car strike may be increased by vehicle speed, heavy traffic, wide road shoulders, road fencing, the availability of wildlife crossings (like culverts), or season (like breeding season). Roads that pass-through koala habitat in specific places, or "hotspots," are where wildlife vehicle strikes frequently happen (DPIE, 2020). Koalas can be kept off roads and driving behaviour can be altered with the use of a variety of structures and procedures.



### 3.2 Management actions table

Table 2 Management actions for UNE

Action ID	Action	Priority	Action Duration	Indicative Budget	Indicative budget funding source
1. Implementation and Monitoring					
1.1	Implementation of Koala Plan of Management	High	5 Years	Internal	UNE
1.2	Inclusion of relevant committees and public	Medium	As required	Internal	UNE
1.3	Review habitat spatial layers and incorporate the most up to date Plant Community Types (PCTs) on campus to model the koala corridors from preliminary mapping.	High	5 Years	Internal	UNE
1.4	Secure funding for Koala tracking and monitoring to have a clear understanding of how koalas use home ranges on and around campus	Medium	Ongoing	Internal	UNE, grants
2. Regulatory Processes					
2.1	Creation of interactive koala habitat planning layer to support habitat provisions	High	2 Years	Internal	UNE
3. Restoration and Management					
3.1	Ensure no net loss of core koala habitat and koala corridors with actions guided by this KPOM .	High	Ongoing	Internal	UNE
3.2	Funding for more blinky drinkers around campus for when drought inevitably returns	Medium	As required	Internal	UNE
3.3	Increase koala habitat and connectivity through revegetation and ecological restoration	High	5 Years	Internal	UNE

3.3a	Coordinate with colleges and the public to host volunteer days to increase Koala habitat	High	Ongoing	Internal	UNE
3.3b	Supply trees for restoration activities/ events	High	Ongoing	Internal	UNE, External Grants and Local Organisations
4. Communication and Education					
4.1	Identify a position on campus responsible for coordinating collection of koala sightings	Medium	Ongoing	Internal	UNE
4.2	Set up a Koala Sightings register/ encourage staff and students of UNE to download 'I Spy Koala' app	High	Ongoing	Internal	UNE
4.3	Disseminate information on how to identify signs of poor health in koalas – signs, emails.	High	Ongoing	Internal	UNE
4.4	In partnership with local organisations, install Koala signage and plaques around campus to actively educate on koala related issues.	Low	Ongoing	Internal	UNE
4.5	Promote koala awareness through social media engagement	Low	Ongoing	Internal	UNE
5. Road and Traffic Management					
5.1	Identify current and emerging vehicle strike 'hotspots' and employ mitigation measures	High	Ongoing	Internal	UNE
5.2	Incorporate Koala friendly crossings into future road/ parking lot developments	High	Project pending	Internal	UNE
5.3	Upgrade road signage around campus to reflect reduced speeds in koala habitat zones and enforce speed limits	High	As required	Internal	UNE
5.4	Include/ install road infrastructure (speed humps, lighting, etc.) in core habitat and corridors	High	Ongoing	Internal	UNE

6. Dog Management					
6.1	Install signage around campus to ensure dogs are leashed and handlers are aware of rules	High	Ongoing	Internal	UNE
6.3	Install koala friendly fencing in high activity zones	Medium	TBC	Internal	UNE
7. Koala Health and Welfare					
7.1	Remove any non-koala friendly fencing, and replace with infrastructure that allows for free passage through the campus  Ensure new fencing is koala friendly	High	As required	Internal	UNE
7.2	Support rescuers and carer effort and investment of koalas on campus	Medium	Ongoing	Internal	UNE
8. Bushfire Management					
8.1	<i>Refer to Bushfire Management Plan</i>	Medium	Ongoing	Internal	UNE
9. Funding					
9.1	Secure funding for tracking and monitoring	High	Ongoing	Internal	UNE
9.2	Set up a koala committee under the Infrastructure Committee that prioritises koalas and can apply for grants and research opportunities	High	Ongoing	Internal	UNE
10. Research					
10.1	Continue to encourage students of UNE to embark on koala specific research opportunities	High	Ongoing	Internal	UNE
10.2	Work with Armidale Council and other organisations to gather and assess the trends of Koalas in the region	High	Ongoing	Internal	UNE

## 4 Development Assessment Framework

### 4.1 When the development assessment framework is triggered

If a development were to occur where Core Koala Habitat has been Identified (Figure 6), the Biodiversity Offset Scheme will be automatically triggered.

This defines when the development assessment framework is triggered. This must be for any areas identified as core koala habitat in the KPoM and is recommended for other koala habitat important for maintaining habitat connectivity and function.



Figure 12 Core Koala Habitat on UNE Campus

### 4.2 Assessment pathways

Any development where UNE is the *determining authority* under part 5 of the EP&A act, requires the university to take into account to the fullest extent possible all matters affecting or likely to affect the environment (including koalas and their habitat) by reason of that activity. Part 5.5 of the EP & A Act specifies that planning instruments, such as the SEPP (B & E) must be considered as part of this consideration of impacts upon the environment.

These impacts, should be identified as part of the Review of Environmental Factors (REF) and the development assessment framework followed.

The following considerations must be addressed (with specific reference to koalas) in any project that requires a REF:

- Is any vegetation to be cleared or modified? (includes vegetation of conservation significance or cultural landscape value)
- Is the activity likely to have a significant effect on threatened flora species, populations, or their habitats, or area of outstanding biodiversity value (refer to threatened species assessment of significance (5-part test))?
- Does the activity have the potential to endanger, displace or disturb fauna (including fauna of conservation significance) or create a barrier to their movement?
- Is the activity likely to have a significant effect on threatened fauna species, or their habitats, or areas of outstanding biodiversity value (refer to threatened species assessment of significance (5-part test))?
- Is the activity likely to impact on an ecological community of conservation significance?
- Is the activity likely to have a significant effect on an endangered ecological community or its habitat (refer to threatened species assessment of significance (5-part test))?
- Is the activity likely to cause a threat to the biological diversity or ecological integrity of an ecological community?
- Is the activity likely to introduce noxious weeds, vermin, feral species or genetically modified organisms into an area?
- Is the activity likely to affect any declared area of outstanding biodiversity value?
- Is the activity likely to affect any joint management agreement under the BC Act?

The 5-part test (s.5AA Environmental Planning and Assessment Act)

1. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
2. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
  - (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
  - (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
3. in relation to the habitat of a threatened species or ecological community:
  - (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
  - (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
  - (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
4. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).
5. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

### 4.3 Development in Core Koala Habitat or which will have a significant impact on koalas

Where a Review of Environmental Factors identifies that a development will have a significant impact on an environmental matter, including koalas, Section 5.7 of the EP&A Act specifies that an Environmental Impact Statement (EIS) must be produced.

In relation to koalas, an EIS should include:

- Map of any koala food trees to be impacted,
- Map of koala sightings from the past 18 years,
- REF,
- Measures to avoid, mitigate or offset impacts on koala populations.

Section 5.7 (4) specifies that: “Before carrying out an activity [that will significantly affect the environment] or in determining whether to grant an approval in relation to such an activity, a determining authority which is satisfied that the activity will detrimentally affect the environment—

(b) may, where it is the proponent of the activity—

- (i) modify the proposed activity so as to eliminate or reduce the detrimental effect of the activity on the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats, or
- (ii) refrain from undertaking the activity.”

Section 4.4 below, suggests measures UNE could take to modify developments so as to eliminate or reduce the detrimental effects upon koalas (Table 1).

### 4.4 Development modification measures for the protection of koalas

Table 3 General mitigation measures

Impact	Management measures
Impacts to core koala habitat	<ul style="list-style-type: none"> <li>• Minimising the impacts on koalas by retaining current core koala habitat</li> <li>• Any developments that are set to occur, will be physically marked out with flagging tape to show the extent of the development footprint. No works to occur outside of the flagging tape.</li> <li>• Develop and follow an erosion and sediment control plan that takes core koala habit (existing and future) into account</li> <li>• Future developments to include consideration for core koala habitat, and planting of koala food trees (where it is safe to do so) to help secure the future of the koala populations on site</li> </ul>
Impediments to movement	<ul style="list-style-type: none"> <li>• Minimising the impacts on koalas by retaining and reducing the loss of current corridors</li> <li>• Retaining koala habitat corridors while minimising negative impacts and preserving existing corridors</li> <li>• Infrastructure or new construction must be planned so that it is reliably known to not obstruct the safe mobility of koalas. Including the removal of barbed wire fencing.</li> <li>• In certain circumstances, it can be necessary to limit koala movement into development regions where they are more vulnerable (e.g. through the use of exclusion fencing along habitat corridors). This fencing cannot prevent dispersal, though.</li> </ul>



Dog attack	<ul style="list-style-type: none"> <li>• The use of dog and koala proof fences that successfully confines dogs and excludes koalas, as well as the installation of koala furniture that allows koalas to escape yards should they manage to get inside.</li> <li>• Signage and education.</li> <li>• Dogs that visit campus are to be leashed at all times, and in full control of handlers</li> </ul>
Vehicle strike	<ul style="list-style-type: none"> <li>• Traffic speed limited as much as possible.</li> <li>• Efforts to calm traffic and inclusion of koala deterrents like roadside lighting</li> <li>• The use of koala-proof exclusion fencing with escape routes in case the animals manage to get onto the road.</li> <li>• Where appropriate, adding koala land bridges and/or underpasses in conjunction with koala-proof exclusion fencing.</li> </ul>
Bushfire	<ul style="list-style-type: none"> <li>• Creating and implementing a Bushfire Management Plan with actions that directly address threats to koala habitat and koalas. Asset Protection Zone shouldn't include the core koala habitat (APZ). There should be an APZ outside of any koala habitat.</li> <li>• Create an emergency response strategy that includes a list of suitable government resources, essential RFS contacts, and local wildlife veterinarians and carers.</li> </ul>
Introduction or spread of disease	<ul style="list-style-type: none"> <li>• Use of biosecurity and hygiene precautions in situations where koala tree-affecting plant diseases could be disseminated or introduced.</li> </ul>
Disturbance	<ul style="list-style-type: none"> <li>• The creation of tree protection zones (where feasible) around any koala trees that are still standing on the land and the prohibition of any development operations inside of these zones.</li> <li>• Habitat restoration includes deliberate plantings to increase the connectivity of trees and habitat that has been preserved.</li> <li>• Use of a suitably trained koala spotter or koala sniffer dog to assess habitat prior to any development taking place where there may be indirect effects on koala habitat.</li> </ul>

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## Appendix A Koala use trees in the Northern Tablelands

Table 4 Koala Use Trees in the Northern Tablelands (State Environmental Planning Policy (Biodiversity and Conservation) 2021)

Scientific Name	Common Name
<i>Allocasuarina littoralis</i>	Black She-oak
<i>Angophora floribunda</i>	Rough-barked Apple
<i>Callitris glaucophylla</i>	White Cypress Pine
<i>Eucalyptus acaciiformis</i>	Wattle-leaved Peppermint
<i>Eucalyptus albens</i>	White Box
<i>Eucalyptus amplifolia</i>	Cabbage Gum
<i>Eucalyptus biturbinata</i>	Grey Gum
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum
<i>Eucalyptus bridgesiana</i>	Apple Box
<i>Eucalyptus brunnea</i>	Mountain Blue Gum
<i>Eucalyptus caleyi</i>	Drooping Ironbark
<i>Eucalyptus caliginosa</i>	Broad-leaved Stringybark
<i>Eucalyptus camaldulensis</i>	River Red Gum
<i>Eucalyptus campanulata</i>	New England Blackbutt
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark

## Appendix B Glossary and Definitions

Term	Definition
Determining authority	Means a Minister or public authority and, in relation to any activity, means the Minister or public authority by or on whose behalf the activity is or is to be carried out or any Minister or public authority whose approval is required in order to enable the activity to be carried out.
Proponent,	in relation to an activity, means the person proposing to carry out the activity, and includes any person taken to be the proponent of the activity
Core Koala Habitat:	<p>an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or</p> <p>an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.</p>
Corridor	Areas of vegetation with koala feed trees, that allow for passive and free movement of koalas between core habitat areas
Campus	The main campus of the University of New England, Armidale. The area of which this KPOM refers to.
KPoM	Koala Plan of Management
EIS	Environmental Impact Statement
REF	Review of Environmental Factors
UNE	The University of New England
Koala friendly fencing	Fencing that koalas can easily climb over, through, or under, allowing them to move freely around their habitat. The most common types of koala friendly fencing include post and rails and post and wire ( <b>no barbed wire</b> ).
<i>suitably qualified and experienced person</i>	<p>(a) a tertiary qualification in ecology, environmental management, forestry or other equivalent qualifications, and</p> <p>(b) experience in flora and fauna identification, survey and management, including experience in conducting koala surveys.</p>

