



## FOREST STEWARDSHIP SYSTEM

### POLICY AND PROCEDURE FOR THE MANAGEMENT AND PROTECTION OF KOALAS

#### 1 Purpose

This policy and procedure outlines the planning and management framework for the Koala (*Phascolarctos cinereus*) on company land, for the information of staff in planning and conducting forest operations.

#### 2 Application

To custodial (non-plantation) land and eucalypt plantation across the Company estate.

#### 3 Policy

The Company aims to conduct its planning and management activities in a way that considers the conservation and protection of all biodiversity values, including iconic species such as Koalas and their habitat across its estate.

The Company recognizes the iconic status of the Koala and its importance to our national identity. In view of the possible genetic integrity of the Strzelecki Koala population and the implications of this for the long-term survival of the species, as well as the extent and concentration of identified habitats on Company land compared to depleted and fragmented vegetation in surrounding areas, the Koala will be accorded the same level of planning protection that is given to rare and threatened taxa across the Company's estate.

#### 4 Procedure

##### 4.1 Regulatory controls that benefit Koalas

- Under the State Government's Native Vegetation Framework, native vegetation may not be removed without a permit unless an exemption applies. This also protects habitat trees within plantations (native trees more than 10 years older than the plantation) which are important as "stepping stones" for Koalas moving from one habitat area to another, especially across cleared land.

##### 4.2 Company policy and procedure that benefits Koalas

- Native vegetation on Company land, which comprises around 45% of the estate in the Strzelecki Ranges, is protected under Company policy and FSC certification. Also, by legal agreement with DSE, virtually all of this is now permanently protected on title through a Land Management Cooperative Agreement (LMCA), including almost all high quality Koala habitat. This fulfills the National Koala strategy objective of putting covenants or agreements in place to protect high quality habitat, with respect to the HVP estate.
- The Sensitive Streams Policy calls for pine plantations within 20m of permanent streams in sensitive areas to be retired and rehabilitated with indigenous species (many parts of the Strzeleckis with steep slopes, erodible soils, threatened species, water supply catchments, etc.) progressively as the pines are harvested.
- By special agreement, pine plantations within 50m of Traralgon Creek and its permanent tributaries above Koornalla are rehabilitated with indigenous trees,

following harvest. The Traralgon Creek catchment contains large concentrations of primary habitat, and these creek lines will provide linkages.

- All *E. regnans* and *E. globulus* plantation trees within 20m of permanent streams and 5m of temporary streams in the Strzelecki Ranges (excluding Thorpdale and Maryvale forest zones) are retained for soil and water protection, and their habitat value. These riparian corridors provide permanent, essential linkage between native forest habitats, as well as refuges and exit routes for Koalas during plantation harvesting operations.
- Many pine plantations in the higher elevations of the Eastern Strzeleckis are being replaced with *E. nitens*. Although no research has been done on the use of *E. nitens* by Koalas, it is closely related to *E. globulus* which is a primary food tree and observational evidence suggests that Koalas are using *E. nitens* plantations.

### 4.3 Koala management procedures

#### 4.3.1 General management

- The Koala Habitat Management GIS layer should be used as a planning and management tool for harvesting, establishment and stewardship activities. This layer contains:
  - A Koala habitat class field (“Class”) identifying habitat quality from the Koala Atlas, based on eucalypt species present and the proportional mix of species. Classes in decreasing order of quality, which most likely reflects the population of Koalas they support, are Primary (or Blue Gum Plantation), Secondary A, Secondary B, Secondary C.
  - A linkage priority field (“LinkPriority”) classifying associated groups of identified habitat polygons (“habitat units”), regardless of their habitat class, based on their level of connectivity to other units (Table 2).
  - A management priority field (“Mmt\_Priority”) which combines habitat class with linkage priority and ranks these to assist planners and managers in identifying “high risk” habitats which are a priority for management action. These include eucalypt plantations, as well as custodial land. Polygons with the highest management priority number have a probable high density of Koalas combined with restricted options for them to move into other habitat units (Table 3).
- GIS layers will need to be maintained on a regular basis to keep them relevant. Revisions to the Koala Habitat Management layer should be made to reflect
  - changes in plantation species as plantations are harvested and replanted,
  - corrections in land use (plantation to custodial, or vice-versa),
  - alterations in polygon shapes,
  - updated EVC information (based on the dominant and other species present, it will be possible to determine a habitat class based on methodology outlined in the AKF Habitat Atlas report),
  - information on use of *E. nites* by Koalas (note that if observation is confirmed and *E. nitens* is determined to be a Primary or Secondary food species, this will trigger significant changes to the habitat units, Link Priority and Management Priority codes, not just for the *E. nitens* plantations themselves but for adjacent polygons of other plantation species and native forest).

- Koala rescue shelters will be offered both financial and practical assistance. Rehabilitation of animals injured by bushfires or other causes will also be actively supported by offering release sites on Company land if appropriate (animals are to be released as close as possible to where they were found, and no “introduction” of animals from other areas into the Strzelecki population is permitted).
- HVP will participate in cooperative pest animal (fox, dog, cat) control programs with DSE, Parks Victoria, Landcare or other agencies if these agencies wish to coordinate such a program. Such programs are only effective when multiple land managers are involved to control pests over a broad area.
- HVP Plantations will support research initiatives into Koalas and their habitat as opportunities arise, to fill knowledge gaps and address threats. Research topics of current interest include:
  - use of *E. nitens* plantations by Koalas,
  - impacts of bushfires on populations and habitat, and movements of animals following fires,
  - genetics of the Strzelecki population,
  - overall population of Koalas on HVP land and correlation of population density with habitat class modelled in the AKF Atlas,
  - diseases.

#### **4.3.2 Custodial land**

- The database of Koala sightings on HVP and adjoining property will be maintained and expanded, and all staff are encouraged to report all sightings as they occur. This will build up a dataset that will help to determine Koala distribution and habitat use, and test predictive models (eg. the AKF Koala Habitat Atlas).
- Biodiversity monitoring will be carried out and extended across the custodial estate to determine baseline condition and changes over time, and help identify threatening processes resulting in loss of biodiversity. This will provide information for appropriate management of native forest habitats across the estate, including Koala habitat. Permanent monitoring plots established in recent years will be extended to other areas, with timely emphasis on Koala habitat impacted by the 2009 fires and unburnt habitat for comparison. Strategies for monitoring Koala populations on these sites will be determined using the best scientific expertise, to supplement state-of-the-art technology and techniques being employed for other species.
- Where disconnected habitats occur close to public land, reserves (eg. Cores and Links), National Parks or Landcare members’ properties, opportunities to form partnerships with land managers to improve linkages should be pursued. The benefits of linking isolated habitats with core areas are multiplied and applicable to a whole range of species, not just Koalas.
- Opportunities for improving linkages within custodial land will be considered in order of priority and on a case by case basis, with regard to the practicality of carrying out works (eg. site accessibility following plantation harvesting) as well as funding available and the relative importance of other environmental projects currently under way or proposed. See 4.3.3.2.

- Any priority sites where restoration work is to be undertaken should focus on increasing permeability for Koalas by removal of impenetrable weeds such as blackberry as the first priority, and regeneration or replanting of preferred food species endemic to the area (Table 1) at a sufficient density to shade and suppress weed regrowth in the long term. A mixture of acacias, such as Blackwood (*A. melanoxylon*) and other tall woody species with the eucalypts would be appropriate for shading out weeds and other dense understorey.

### 4.3.3 Plantation operations

#### 4.3.3.1 Harvesting and harvest planning

- The Koala Habitat Management GIS layer should be used as a planning and management tool for eucalypt harvesting activities (see 4.3.1).
- Refer to Appendix 2; Decision tree for management of Koalas while planning and conducting eucalypt harvesting operations.
- Before any harvesting in plantations of *E. globulus*, *E. viminalis* or other primary food species (Table 1) takes place, stands without sufficient retained trees or accessible alternative permanent habitat (within 100m) as a refuge and food source for displaced animals should be planned to retain a small number of plantation trees for this purpose. This should be about 50 trees minimum, or larger if it is a large block (eg. >20 ha) or more than 2 animals have been seen during planning or as harvesting progresses. Large branched or low value trees, or those in sensitive, difficult to harvest or peripheral areas would be suitable for this purpose as long as they are accessible to koalas (not separated by blackberries, dense undergrowth, a main road or a river). Plantation trees close to any native remnants are preferable for retention. The retained area should be taped off from harvesting and marked on the THP, but may be harvested if no animals are evident once the remainder of the plantation has been harvested.
- All eucalypt harvesting should be planned to push animals towards refuge areas without cutting off access routes. Management priorities shown in the Koala Habitat Management GIS layer (see Tables 2 & 3) indicate where alternative habitat occurs on Company land and what its quality is, or use aerial imagery to infer where habitat might be on other properties, with adjacent HVP habitat mapping as a guide.
- Currently, all *E. viminalis* plantations are to be retained as Koala habitat.
- Staff marking and inspecting eucalypt coupes prior to harvest as part of the normal planning process should look for and mark any trees within the coupe boundary where Koalas or scats are observed during the course of this work (the majority of scats are found within 1 metre of the base of the trees Koalas have been using). If animals are heard within the coupe, an effort should be made to locate them. Marking of trees with Koalas in or scats around them should be done using an alternative coloured tape that indicates to operators that the tree should be inspected for Koalas, along with those within at least 15m radius, before felling takes place. Supervisors should indicate to operators on coupe plans which coupes have confirmed recent scat or animal sightings (including marked trees) and encourage extra vigilance to take place when operating in these coupes.
- Operators must be encouraged to report evidence or sightings of Koalas to Company staff during coupe operations. Staff should make efforts to locate the animals and

mark trees they are in, or otherwise manage their welfare using guidelines in this procedure.

- Operators should be encouraged to take a brief look around the immediate work area for Koalas, scats and presence of other animal species (eg. nests in trees) before commencing work and following rest or lunch breaks. As Koalas may move around on a day to day basis, operator awareness and vigilance is the most practical option for their immediate protection and should be encouraged as sound environmental practice.
- It should be assumed that Koalas may be encountered in any eucalypt coupe, including *E. nitens* (they have been previously seen in *E. nitens* plantations).
- Capture and relocation of animals is considered a “last resort” alternative in all situations. Protocols and standards for the capture and transport of Koalas are detailed in Appendix 2 of Victoria’s Koala Management Strategy: <http://www.dse.vic.gov.au/dse/nrenpa.nsf/LinkView/E260BBD07DD52CF4CA256DE3007F11443B3BE6168C8BE71ECA256E5A0010BD5C#2>

A permit is required to capture and handle protected wildlife (contact the local DSE office). The Southern Ash Wildlife Centre (5165 3583) has the necessary permits and expertise so should be the first contact if only 1 or 2 animals are involved.

#### 4.3.3.2 Establishment and establishment planning

- The Koala Habitat Management GIS layer should be used as a planning and management tool for establishment activities (see 4.3.1). Vegetation connecting Koala habitats with high or very high management priority (1 to 12) should be considered for rehabilitation works including blackberry removal and supplementary tree planting, regardless of whether pine or eucalypt plantation is being established in the adjacent coupe. A considered decision should be made as to the medium and long term benefits of rehabilitating each corridor as the opportunity arises. Medium term benefits may include providing escape routes for Koalas from plantation habitats (eg. *E. globulus* plantation) to be harvested at some time in the future. Long term benefits may include providing permanent connections between native habitats, especially between different habitat units (see Koala Habitat Management maps).
- When establishing eucalypt plantations, including *E. nitens*, thought should be given to the possible future use of this plantation by Koalas and the provision or rehabilitation of escape routes to cater for the needs of animals during future harvesting operations. The best opportunity to provide for the future welfare of Koalas is during the plantation planning and establishment phase, as undertaking remedial works to protect animals already using these areas is difficult, expensive and potentially limited in effect (eg. the lead time from establishing a new corridor to the trees growing and providing good quality habitat for Koala movement may not be sufficient to minimize the effect of harvesting adjoining plantations).
- All revegetation or rehabilitation plantings should include seedlings of *E. cypellocarpa*, *E. viminalis*, *E. globulus*, *E. muelleriana* or other preferred food species if appropriate to the site (Table 1). These will include
  - creekline vegetation restored or replanted to provide Koala habitat linkages, as above,

- any revegetation works in environmentally sensitive areas or where special agreements apply (eg. Traralgon Creek 50m buffers),
  - creekline vegetation which was formerly pine plantation, restored under the Sensitive Streams Policy,
  - any areas which are commercially unviable for ongoing plantation use due to steep slopes, inaccessibility or other factors (these areas may provide an opportunity to establish Koala refuges from future plantation harvesting activities, especially where no native habitat exists nearby),
  - offset plantings for removal of native vegetation elsewhere,
  - amenity planting on public road reserves where pine plantation has been removed, or
  - other stewardship projects (where appropriate).
- Blackberries provide a significant physical barrier to Koala movement. Creek line vegetation infested with blackberries is not a suitable corridor and effective control of blackberries in these areas should be first priority (blackberries are also a declared noxious weed and required by law to be controlled). Hand spraying for establishment around the edges of plantations (within helicopter spray buffer zones) is often patchy and ineffective for the long term control of weeds. Weeds proliferating around plantation edges, especially after clear felling, are a major threat not just to Koala habitat but to many other biodiversity values including rainforest and threatened species, and every effort should be made to control weeds effectively as well as extending control into riparian zones, especially in priority areas for Koalas and other biodiversity values. Contractors should be well trained or supervised and aware of the need to protect native plants as far as possible while spraying, as well as keeping herbicide out of waterways. Metsulfuron methyl is the safest blackberry-effective herbicide for use near waterways, but should be used with great care around tree ferns and applied only to the point of runoff (avoid soil saturation).

#### **4.3.3.3 Road construction**

- All trees in native forest (custodial land) where new roads are being constructed, should be inspected before felling. If Koalas are found, treat as for harvesting operations (leave the tree and those adjacent standing until the animal leaves, and have the animal relocated only as a last resort by an experienced professional).

#### **4.3.4 Long term planning considerations**

- Strategies to improve linkages with high risk blue gum plantations should include consideration of plantation age and harvesting schedules. It will take time to establish effective linkages and forward planning is required to provide the best practical benefits in the long term. Options available in the short term will often be limited to a “damage control” situation, eg. attempting to retain some plantation trees which will provide only a minimal short-term benefit to animals.
- Plantations within larger habitat units, especially those with management priority 4, 5 and 6 (where the majority of available habitat is plantation to be gradually harvested), may be able to sustain harvesting activity on a coupe by coupe scale in the short term without major risk to the overall population. However as harvesting progresses over a period of years, there is an increasing risk of a major population impact due to depletion of refuges and food available for a potentially large population of animals.

Therefore priority 4 to 6 areas should not be ignored in overall management strategies.

Table 1a: Use of eucalypt species by Koalas, based on a survey of 119 sites in the Strzelecki Ranges conducted by AKF.

Common name	Scientific name	Classification	Strike rate (% of trees used)
Mountain Grey-gum	<i>E. cypellocarpa</i>	Primary	0.36
Blue Gum (Eurabbie)	<i>E. globulus ssp. bicostata</i> <sup>^</sup>	Primary	0.33
Yellow Stringybark	<i>E. muelleriana</i>	Primary	0.33
Manna Gum	<i>E. viminalis</i>	Primary	0.26
Messmate	<i>E. obliqua</i>	Secondary*	0.17
Mountain Ash	<i>E. regnans</i>	Secondary*	0.14
Yertchuk	<i>E. consideniiana</i>	Secondary	0.14
Apple Box	<i>E. angophoroides</i>	Secondary	0.11
Narrow-leaf Peppermint	<i>E. radiata</i>	Supplementary	0.10
Swamp Gum	<i>E. ovata</i>	Supplementary	0.10
Silvertop Ash	<i>E. sieberi</i>	Supplementary	0.05

\* Only Secondary when mixed with Primary food species, which increases the strike rate for *E. obliqua* to 0.23 and for *E. regnans* to 0.34.

<sup>^</sup> Subspecies endemic to the Strzelecki and South Gippsland study area, identified by AKF as *bicostata*.

Table 1b: Other species classified through similar studies in the region and elsewhere

Common name	Scientific name	Classification
Red-gum	<i>E. tereticornis</i>	Primary
Southern Blue-gum	<i>E. globulus ssp. globulus</i>	Primary
Gippsland Blue-gum	<i>E. globulus ssp. pseudoglobulus</i>	Likely Primary
Yellow Box	<i>E. melliodora</i>	Secondary
Red Box	<i>E. polyanthemos</i>	Secondary
Coast Manna-gum	<i>E. viminalis ssp. pryoriana</i>	Secondary
Brown Stringybark	<i>E. baxteri</i>	Likely Secondary
But But	<i>E. bridgesiana</i>	Likely Secondary
Southern Mahogany	<i>E. botryoides</i>	Likely Secondary
Strzelecki Gum	<i>E. strzeleckii</i>	Likely Secondary
White Stringybark	<i>E. globoidea</i>	Likely Supplementary
Mealy Stringybark	<i>E. cephalocarpa</i>	Likely Supplementary
Shining Peppermint	<i>E. willisii</i>	Likely Supplementary

Table 2: Habitat linkage priorities identified in the Koala Habitat Management GIS layer.

Linkage priority	Habitat class of polygon from Koala Atlas	Plantation or custodial	Habitat unit size	Characteristics of best existing links or core habitats	Characteristics of core habitat (within + outside HVP)
1C	Primary or Secondary A, B or C.	Custodial	<150 ha	None, eg. open farmland or clear felled plantation.	N/a
1P	Plantation of prim/sec A & B food species.	Plantation	<150 ha	None, eg. open farmland or clear felled plantation.	N/a
2C	Primary or Secondary A, B or C.	Custodial	>150 ha (core)	Probable insufficient refuge as primary plantation species in core are converted.	<30% native forest overall
2P	Plantation of prim/sec A & B food species.	Plantation	>150 ha (core)	Major component of core is primary plantation species to be converted.	<30% native forest overall
3C	Primary or Secondary A, B or C.	Custodial	<150 ha	Low permeability (pine plantation <10 yo, euc plantation <3 yo, or highly modified veg with many blackberries or missing canopy).	N/a
3P	Plantation of prim/sec A & B food species.	Plantation	<150 ha	Low permeability (pine plantation <10 yo, euc plantation <3 yo, or highly modified veg with many blackberries or missing canopy).	N/a
4C	Primary or Secondary A, B or C.	Custodial	<150 ha	Medium permeability (pine pln >10 yo or euc pln >3 yo).	N/a
4P	Plantation of prim/sec A & B food species.	Plantation	<150 ha	Medium permeability (pine plantation >10 yo or euc plantation >3 yo).	N/a
5C	Primary or Secondary A, B or C.	Custodial	>150 ha (core)	Potential population pressure as primary plantation species in core are converted.	>30% native forest overall
5P	Plantation of prim/sec A & B food species.	Plantation	>150 ha (core)	Lesser component of core is primary plantation species to be converted.	>30% native forest overall

Table 3: Management Priority rankings in the Koala Habitat Management GIS layer; a function of linkage priority and habitat class, identifying priority (high risk) areas where population density is likely to be high and linkage to other habitat units restricted.

<b>Linkage status</b>	<b>Habitat Class</b>	<b>Management Priority</b>
1	Primary or Likely Primary or Blue Gum plantation	1
1	Secondary A or Likely Secondary A	2
1	Secondary B or Likely Secondary B	3
2	Primary or Likely Primary or Blue Gum plantation	4
2	Secondary A or Likely Secondary A	5
2	Secondary B or Likely Secondary B	6
3	Primary or Likely Primary or Blue Gum plantation	7
3	Secondary A or Likely Secondary A	8
3	Secondary B or Likely Secondary B	9
4	Primary or Likely Primary or Blue Gum plantation	10
4	Secondary A or Likely Secondary A	11
4	Secondary B or Likely Secondary B	12
1	Secondary C or Likely Secondary C	13
5	Primary or Likely Primary or Blue Gum plantation	14
2	Secondary C or Likely Secondary C	15
5	Secondary A or Likely Secondary A	16
3	Secondary C or Likely Secondary C	17
5	Secondary B or Likely Secondary B	18
4	Secondary C or Likely Secondary C	19
5	Secondary C or Likely Secondary C	20

Table 4a): Decision rules for assignment of Koala Habitat Classes based on EVC mapping data (used by AKF to compile the Habitat Atlas).

Habitat Class	Decision rules
Primary	<ul style="list-style-type: none"> <li>• Primary tree species in the Dominant column, or</li> <li>• no tree species in the Dominant column, but a Primary species is the first tree species mentioned in the Comments column.</li> </ul>
Secondary A	<ul style="list-style-type: none"> <li>• Secondary species (other than <i>E. obliqua</i> or <i>E. regnans</i>) in the Dominant column, or</li> <li>• no Primary or Secondary species in the Dominant column, but with a Primary species mentioned in the first 3 species in Comments, or</li> <li>• <i>E. obliqua</i> or <i>E. regnans</i> in the Dominant column and a Primary species mentioned after the first 3 species in Comments.</li> </ul>
Secondary B	<ul style="list-style-type: none"> <li>• No Primary or Secondary species (other than <i>E. obliqua</i> or <i>E. regnans</i>) in the Dominant column, but with a Primary species mentioned after the first 3 species in Comments, but excluding Primary trees with a "trace", or</li> <li>• no Primary or Secondary species (other than <i>E. obliqua</i> or <i>E. regnans</i>) in the Dominant column, but with a secondary species (other than <i>E. obliqua</i> or <i>E. regnans</i>) mentioned in the first 3 in Comments, or</li> <li>• <i>E. obliqua</i> or <i>E. regnans</i> in the Dominant column with a "trace" of a Primary species in Comments.</li> </ul>
Secondary C	<ul style="list-style-type: none"> <li>• <i>E. obliqua</i> or <i>E. regnans</i> in the Dominant column, with no Primary species in Comments, or</li> <li>• no Primary or Secondary species in the Dominant column, no Primary species in Comments, but with a Secondary species (excluding <i>E. obliqua</i> and <i>E. regnans</i>) mentioned after the first 3 species in Comments, or</li> <li>• a Primary food species mentioned after the 6th species in Comments, including as a "trace".</li> </ul>
Supplementary	<ul style="list-style-type: none"> <li>• No Primary or Secondary species mentioned, but with Supplementary species in the Dominant or Comments columns, or</li> <li>• <i>E. obliqua</i> or <i>E. regnans</i> mentioned after the first 3 species in Comments.</li> </ul>

Table 4b): Summary of decision rules applied in the Koala Habitat Atlas model.

Relative cover (out of all vegetation present, eucalypt and non-eucalypt)			
Dominant cover species	Sub-dominant species	Moderate representation	Trace only
<b>Primary</b>	Any	Any	Any
<b>Ash or Messmate</b>	<b>Primary</b> in at least one of these categories		Any
<b>Secondary (other)</b>	No primary	No primary	No primary
No primary or secondary	<b>Primary</b>	Any	Any
<b>Ash or Messmate</b>	No primary	No primary	<b>Primary</b>
No primary or secondary	<b>Secondary (other)</b>	No primary	No primary
No primary or secondary	No primary or secondary	<b>Primary</b>	Any
<b>Ash or Messmate</b>	No primary	No primary	No primary
No primary or secondary	No primary or secondary	<b>Secondary (other)</b>	No primary
No primary or secondary	No primary or secondary	No primary or secondary	<b>Primary</b>
No primary or secondary	<b>Only Ash or Messmate</b> in either of these categories		No eucalypts
Only <b>Supplementary</b> in any of these categories			
<b>No eucalypts</b>			<b>Ash, Messmate or no eucalypts</b>
<b>HABITAT CLASS COLOUR CODES:</b>	<b>Primary habitat</b>	<b>Secondary B habitat</b>	<b>Supplementary habitat</b>
	<b>Secondary A habitat</b>	<b>Secondary C habitat</b>	<b>Other vegetation</b>

Note 1: If blackberry is sub-dominant or dominant, habitat suitability will be lower or much lower respectively than the Atlas indicates. Blackberries and other barriers to koala movement were not considered in the Atlas model.

Note 2: 'Other vegetation' may be used for shelter or dispersal between habitats especially if it has tree cover & few blackberries.

## Appendix 1: Decision rules and methods applied to defining Koala habitat units and assigning linkage priority codes.

- Habitat units consist of one or more polygons of custodial and/or plantation habitat (as identified in the Atlas) that are contiguously linked by habitat of high permeability. Strips (eg. roadside or creek line vegetation through cleared land) need to be at least 40m wide, or where there is a section between zero and 40m wide this section must be less than 100m long, for habitat to be considered contiguous. This is based on the assumption that Koalas will readily move through up to 100m of cleared land between habitats.
- Habitat units are delineated using GIS databases and aerial imagery. They may include forest on non-company property which is assumed to be suitable habitat based on the classification of adjoining vegetation within company land, and the presence of eucalypt canopy.
- Linkage priority recognises that plantation habitats are transient, and link priority is assigned based on connectivity only with other habitat units that include native habitat >2ha in area.
- Habitat units >150 hectares are considered as core areas for Koala refuge. The link priority of the polygons within core habitat units reflects the overall proportion of plantation and native forest making up the unit (ie. whether there is sufficient native refuge to support the population that may currently be in the plantation). As eucalypt plantation is removed, units with a higher proportion of plantation will become fragmented and smaller overall, making it more important to maintain linkages between remaining polygons.
- Identification of linkages with low permeability is based on vegetation that is mapped as “highly modified”, or which has few or no canopy trees indicating major disturbance most likely leading to the proliferation of dense, scrubby, opportunistic species or weeds. Medium permeability linkages are assumed where they consist of pine plantation > 10 years old or poorly utilised plantation eucalypts > 3 years old, based on advice from Peter Menkhorst. Obviously this will change over time and classifications will need to be reviewed.
- Plantations of primary or secondary class A or B food species are regarded as habitat for this exercise. These are mostly Blue Gum (all sub-species) but include *E. dunnii*, *E. viminalis*, *E. tereticornis*, *E. botryoides* and *E. robusta*. Plantations of species identified as “likely primary” or “likely secondary class A or B” food species are treated the same as primary or secondary class A or B and included as habitat. Plantations of species identified as Secondary class C or likely secondary class C are considered unlikely habitat and not included in habitat units or assigned linkage priority codes.
- Isolated habitat patches of less than 2 hectares are ignored. There is a large number of these, including isolated clumps of trees (pre-plantation remnants) and small patches of vegetation dotted along creeks and tributaries, within non-habitat plantations such as pine. Considering the low likelihood of these patches containing a permanent population of Koalas, the work involved in identifying and assigning a link priority code to each is not warranted.
- Fire damaged plantation is treated as bare ground (neither habitat nor linkage). Burnt plantations will be replanted with either *P. radiata* or *E. nitens*, neither of which are identified as habitat species in the Atlas. Fire damaged native forest is treated the same as unburnt forest and retains its habitat classification.
- Areas of plantation and custodial habitat within the Cores and Links final boundary are not included in the mapping exercise, however they are considered the same as habitat on non-company property when defining habitat units and assigning link priority codes to polygons on adjacent company land.
- Habitat unit and linkage mapping is based on 2009 Koala Habitat Atlas data supplied by AKF, combined with EVC mapping, plantation and fire maps at the time of the mapping exercise. The exercise should be repeated periodically and when information on *E. nitens* as a food preference becomes available.

**Appendix 2: Decision tree for management of Koalas while planning and conducting all eucalypt harvesting or clearing operations.**

<b>A:</b> Is the eucalypt plantation species <i>E. globulus</i> or <i>E. viminalis</i> (or mixed species that include one of these)?	Yes No	Go to B Go to D
<b>B:</b> Is there sufficient adjacent refuge to support the population short-term (up to 6 months) <u>and</u> accessible permanent habitat in the wider area (within 1 km) where Koalas may gradually migrate?	Yes No	Go to D Go to C
<b>C:</b> Retain adequate plantation food trees or have animals relocated (last resort).		Go to D
<b>D:</b> Staff and contractors to look/listen for Koalas & fresh scats during routine operations (during coupe planning/marketing, after contractors' work breaks in immediate area of operation).	Seen in tree Heard/scats seen but koala not found Koala not noticed, accidentally injured.	Go to E and G Go to G Go to I and G
<b>E:</b> Mark tree with koala in it for retention. Retain tree and those immediately adjacent as long as the koala remains, and make operators aware of presence. Retain an escape route for as long as possible.	Koala relocates Koala does not relocate during operation	Go to F Go to H
<b>F:</b> Resume harvest of marked tree(s)		Return to D
<b>G:</b> Notify HVP supervisor, supervisor to look for Koalas/record presence of Koalas on coupe plan or site diary and reinforce E with contractors.	Koala found Koala not found	Return to E Return to D
<b>H:</b> Retain tree(s) after operation complete. Relocate animals only if the tree(s) have to be felled and there is no other alternative.		
<b>I:</b> If a koala is accidentally injured or orphaned, contact the HVP supervisor or Southern Ash Wildlife Centre on <b>(03) 5165 3583</b> or the 24 hr emergency wildlife rescue number: <b>13 000 94535</b> . Do not handle without advice. HVP to assign an approved person to monitor the animal until help arrives		Return to D

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