

ATTACHMENT F



ECOLOGICAL ASSESSMENT REPORT
PEAK DOWNS HIGHWAY REALIGNMENT
ETON RANGE CROSSING

Department of Transport and Main Roads

November 2009

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1. Introduction

1.1. Background

The Department of Transport and Main Roads is investigating the feasibility of constructing an alternative range crossing of the Eton Range approximately 40km south west of Mackay on the Peak Downs Highway. A preliminary alternative alignment has been identified a maximum of approximately 800m to the west of the existing alignment and 5km in length.

The objectives of this assessment were to:

- map the regional ecosystems and habitat features present along the alignment;
- provide a flora species list for the alignment;
- undertake targeted searches for threatened plant species; and
- assess the potential for threatened flora and fauna species to occur within the study area based on database searches and habitat assessment.

The study area for the assessment was defined by the area within 50m each side of the is alignment centreline.

1.2. Site Description

The identified potential alignment traverses steeply undulating terrain comprising east running spurs and gullies from the higher part of the range to the west. The terrain rises to the west of the proposed alignment and includes escarpments and low cliffs. The ridges tend to support dry sclerophyll woodland to open forest and the gullies supporting closed scrubs to complex notophyll vine forest. At the north eastern end of the proposed alignment as the terrain becomes less steep the level of disturbance increases with areas having been cleared of remnant native vegetation. The gullies along the alignment are ephemeral and there are no permanent watercourses within the study area.

2. Methodology

2.1. Review of Existing Data

Prior to undertaking the field assessment searches were undertaken for the area within 20km of the study area to identify records or potential occurrences of rare and threatened flora and fauna species and threatened ecological communities. The review of existing information included the following database and mapping sources:

- Department of Environment, Water, Heritage and the Arts (DEWHA) Environment Protection and Biodiversity Conservation (EPBC) Act Protected Matters Search Tool (DEWHA 2009b);
- Queensland Herbarium databases – HERBRECS & COREVEG (Queensland Herbarium 2007);
- Queensland Museum database (Queensland Museum 2009);
- QPWS Wildlife Online database (DERM 2009a);
- Australian Natural Resources Atlas (DEWHA 2009a);
- EPA regional ecosystem (RE) and moratorium vegetation mapping 1:100,000 (DERM 2009b & c); and,
- Geoscience Australia geology mapping.

The potential occurrence of threatened species identified during the review of existing information as potentially occurring within the study area is assessed in the Results section of this report.

2.2. Field Surveys

2.2.1. *Flora*

Flora surveys were undertaken over four days between 6 and 9 October 2009.

Site Selection

The field flora survey methods were developed in order to:

- with reference to available aerial photography and regional ecosystem (REs), capture information about all mapped regional ecosystems and any other unusual vegetation communities identified from aerial photography interpretation;
- validate existing Queensland Herbarium regional ecosystem and regrowth vegetation mapping and better define the distribution and composition of REs within observed polygons;
- target rare and threatened flora species and communities and their habitats identified from database searches; and,
- produce a comprehensive quantitative floral inventory for all vegetation assessment sites and the study area as a whole.

The study area was surveyed in compliance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 3.1* (Neldner *et al.*, 2005). Assessment sites were performed along the

entirety of the study area so as to represent existing EPA mapped remnant vegetation and specifically the variation of Regional Ecosystems (REs) within these remnant areas. Areas of non-remnant vegetation were also surveyed in order to ensure site coverage and sampling of all potential habitat types.

A total of seven Secondary Level vegetation assessment sites were performed within the study area. Fifteen Tertiary Level and eleven Quaternary Level vegetation assessment sites were also performed. The details of the sites are provided in Appendix A. The supplementary lower level of sampling (Tertiary and Quaternary assessment sites) were performed to provide additional information relating to the vegetative structure and to assist in mapping the extent and distribution of the identified REs within the study area.. The validation of regional ecosystem mapping and compilation of comprehensive, qualitative floral inventories was performed at a total of thirty-three vegetation assessment sites, with multiple sites being performed within each regional ecosystem type. It is worth noting that detailed secondary site assessment was not performed within field-validated RE 8.11.1 due to its marginal occurrence within the proposed study area.

Secondary Assessment Sites

- Data recorded at each secondary site included: `
- date and precise location (with reference to handheld GPS);
- soils, slope, aspect and landform observations;
- ground-layer, mid-stratum and canopy species composition and abundance;
- structural characteristics;
- condition and disturbance of existing vegetation communities (including distribution of weed species);
- quantitative and qualitative species composition within a 1000m² quadrat, and documentation of ancillary species identified within the immediate area or during foot traverse;
- basal area of vegetation; and
- detailed photographs of the community (north, east, south, west, groundcover and soils).

Tertiary Assessment Sites

- Data recorded at each tertiary site included:
- date and precise location (with reference to handheld GPS);
- soils, slope, aspect and landform observations;
- ground-layer, mid-stratum and canopy species composition and abundance;
- structural characteristics;
- condition and disturbance of existing vegetation communities (including distribution of weed species); and,
- photographs of the community.

Quaternary Sites

- Data recorded at each quaternary site included:

- precise location (with reference to handheld GPS);
- mid-stratum and canopy species composition and abundance;
- structural characteristics of ecologically dominant layer;
- condition; and,
- limited photographs of the community.

Traverses

In addition to Secondary, Tertiary and Quaternary vegetation assessment sites, the entirety of the study area was traversed on foot. The purpose of this type of assessment was to ensure adequate site coverage and to establish a comprehensive floral species list for the study area. This method is also essential for the detection of rare and threatened species.

Floral Inventory and Abundance

A comprehensive flora species list, including native and introduced species, was compiled for the study area and is presented in Appendix B. Relative abundance of flora species was assessed on a site by site basis. Abundance estimates were applied to species within each stratum of the community, with particular focus on the ecologically dominant layer as it is by these species that the community is defined and from this, the regional ecosystem determined (Neldner *et al.* 2005). The status (*remnant / non-remnant*) of existing vegetation is determined by comparing the existing *predominant canopy* with the *undisturbed predominant canopy*. The Queensland Herbarium defines the *predominant canopy* in the VMA 1999, as the ecologically dominant layer (EDL); namely, that stratum of the vegetation which contains the most above ground biomass. The EDL can be defined in terms of growth form, height, cover density and species. In the majority of cases, the EDL is equivalent to the upper stratum or crown cover as described by Walker and Hopkins (1990).

Abundance assessments of canopy species are quantitative (*i.e.* the basal area of stems per hectare was calculated using the Bitterlich stick methodology). This was utilised in conjunction with an estimation of crown cover (based on the crown or line intercept methodology (Greig-Smith 1964, Neldner *et al.* 2005)). This allowed a descriptive measure of cover which, combined with growth form and median height, describe the structure of the vegetation community based on structural formation classes described by Walker and Hopkins (1990). The following table defines these classes:

Table 1: Structural formation classes for woody plant communities qualified by height: (classes defined by growth form, height and cover)

Vegetation cover equivalents	Foliage projective Cover	70-100%	30-70%	10-30%	<10%
	Crown separation	closed or dense	mid-dense	sparse	very sparse
	Field criteria	touching-overlap	touching – slight separation	clearly separated	well separated
	Crown separation ratio ¹	<0	0-0.25	0.25-1	1-20

	CROWNCOVER % ²	100-81%	81-52%	52-20%	20-0.2%
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Growth form and height	GROWTH FORM ³	Structural Formation Classes (qualified by height)			
	Trees > 30m	tall closed-forest	tall open-forest	tall woodland	tall open-woodland
	Trees 10 – 30m	closed-forest	open-forest	woodland	open-woodland
	Trees < 10m	low closed-forest	low open-forest	low woodland	low open-woodland
	Shrubs 2 – 8m	closed-scrub	open-scrub	tall shrubland	tall open-shrubland
	Shrubs 1 – 2m	closed-heath	open-heath	shrubland	open-shrubland
	Shrubs < 1m	-	-	dwarf shrubland	dwarf open-shrubland

¹ Equivalent to Specht (1970) projective foliage cover classes from Walker and Hopkins (1990) Table 14a.

² Equivalent crown cover from Walker and Hopkins (1990) Table 17.

³ Growth form of the predominant layer (the ecologically dominant layer).

[Table extracted from Neldner and Wilson (2003)]

The crown cover definitions and associated crown separation descriptions (eg. sparse) were also applied to the lower strata layers to allow a consistent description of spatial distribution of the respective vegetative layers.

The landform description upon which the field validated vegetation communities occurred was based on simple erosional landform patterns characterised by relief and modal slope and described by Speight (1990).

For compilation of detailed floristic inventories at all secondary level assessment sites, the relative abundance of species was based on the Braun-Blanquet technique (Mueller-Dombois & Ellenberg 1974) as follows: 1 = sparse, <5%; 2 = any number, <5%; 3 = 5 – 25%; 4 = 25 – 50%; 5 = 50 – 75%; 6 = 75 – 100%.

Vegetation Mapping

EPA mapped Regional Ecosystems (REs) were validated in the field using the transect/quadrat data described above and the latest geology mapping (Department of Natural Resources and Mines 2005). The boundaries of vegetation types were mapped in the field using a hand-held *Garmin* geographic positioning system and/or aerial photograph interpretation.

Ancillary Information

Other field characteristics such as habitat areas for rare and threatened species and regional connectivity were recorded and described. Photographic records were taken throughout the study area, capturing each community type, habitat type, potential impact areas and the broader landscape.

2.2.2. Fauna

Mapping of Habitat Features

Habitat features within the study area were mapped via handheld GPS and described. The only type of habitat feature encountered within the study area was hollow bearing trees. Caves may be present in the vicinity of the escarpment located to the west of the study area but no caves were encountered during the traverse of the study area.

Each hollow was assigned a size class of either small, medium or large and an assessment of its suitability for use by birds (including owls), arboreal mammals and bats. Fissures in the bark and trunks of trees are also suitable bat roosting sites and were mapped. Heavily decayed dead trees that have decayed to a single open hollow trunk without any branches were not mapped as these are not considered to provide suitable roosting hollows for fauna. No fauna were observed actively using tree hollows during the field survey.

BioCondition Assessment

The BioCondition Assessment Methodology (Eyre *et. al.* 2008) was developed by the then Environmental Protection Agency to provide a methodology for the rapid assessment of terrestrial ecosystem condition. The methodology is similar to the Habitat Hectare and BioMetric methodologies developed in Victoria and New South Wales respectively. The BioCondition methodology provides a measure of the condition of a patch of vegetation in comparison to the same vegetation in its undisturbed state. This involves that assessment of a patch of vegetation against a 'benchmark' which provides the measured attributes of the vegetation type in its undisturbed state. For example, the number of large trees in a patch is measured and compared against the number of benchmark large trees for that vegetation type and scored accordingly. A BioCondition assessment provides a condition score for a patch of vegetation as a score out of 100.

Unfortunately to date a comprehensive set of benchmarks for regional ecosystems has yet to be developed. In this case the user is required to identify and assess the best available patch of vegetation of the same type to use as a benchmark.

Due to the practical limitations of identifying a suitable and accessible reference site to determine a benchmark for the relevant vegetation type, Ecological Survey & Management developed a simplified BioCondition methodology to enable a rapid assessment of vegetation condition that generally follows the BioCondition methodology without the requirement for a benchmark reference site. The modified methodology is based on judgement of the difference of the vegetation from undisturbed conditions. While this greatly increases the subjectivity of the assessment it still provides an objective assessment framework and is considered an improvement on purely subjective assessments of habitat and vegetation condition.

Without a benchmark a comparison of native species richness within each life form is not possible and therefore this part of the assessment is not conducted. In addition, the modified assessment includes an assessment of the level of cover of native species in the understorey against what would be expected in an undisturbed example of the vegetation type. However, a detailed assessment of native grass cover, native herb and forb cover and native annual species was not considered

possible without a benchmark. Therefore, the modified assessment provides a score out of 80 that is then multiplied by 1.25 to obtain a score out of 100.

2.3. Species Likelihood Assessment

From the results of field and desktop investigations, threatened flora and fauna species identified as part of the desktop review were assigned a likelihood rating of occurring on site. Likelihood of occurrence ratings were assessed against criteria outlined in Table 1.

Table 2: Species Likelihood Assessment Methodology

Likelihood	Definition	Impact assessment required
Low	<p>Database searches indicate the species could potentially occur in the site; however:</p> <ul style="list-style-type: none"> ▪ there are no records of the species from the site or adjacent lands and no suitable habitat exists on site; ▪ previous records predate broad-scale development across the broader site; ▪ previous records from the site and/or adjacent lands are known to be invalid; and/or ▪ the species is considered to be locally extinct. 	No
Moderate	The species is known from the wider region and could potentially occur on site; however, habitat which exists for the species on site is marginal and/or limited in extent.	Yes
High	Though not recorded on site during the current assessment, the species has been recorded on site in the recent past. The species is known to occur nearby and preferred habitat exists on site.	Yes
Present	The species was recorded in the site during field investigations carried out as part of the current assessment.	Yes

2.4. Limitations

Ecological surveys often fail to record all species of flora and fauna present on a site for a variety of reasons such as seasonal absence or reduced activity during certain seasons. However, an assessment of habitat suitability is made for significant species that may occur in an area. A precautionary approach is adopted.

The late dry season survey allowed access (vehicle and foot traverse) to the entirety of the study area. However, late stages of “haying” or “browning-off” was encountered within the groundcover layer throughout the study area, thereby compromising plant vigour and inflorescence set and condition. Despite this, most species were able to be positively identified through the collection of retained inflorescences and/or individual florets. A distinct lack of herbaceous annuals and perennials was encountered due to sub-optimal/seasonal conditions.

The primary focus of the assessment was to identify significant flora and fauna issues in the context of the construction of the alternative alignment. For this

purpose, the review of existing information in combination with the habitat assessment and field survey work is considered adequate.

2.5. Nomenclature

For ease of reference, fauna species are referred to by their common name with the scientific name provided the first time a species is mentioned in the text. Due to the lack of accepted common names for many flora species, flora are referred to by their scientific name with the commonly accepted common name (if available) provided the first time the species is mentioned in the text. Scientific name for flora follow Bostock and Holland (2007) and common were derived from Harden *et al.* (2006a and 2006b), Brooker and Kleinig (2004), Hacker (1990), Sharp and Simon (2002), and Auld and Medd (2002). A full list of scientific names for all flora species mentioned in this report is presented in Appendix B.

Fauna scientific and common names follow Menkhorst and Knight (2004) for birds, Churchill (2008) for bats, Wilson (2005) for reptiles, Barker *et. al.* (1995) for frogs and Pizzey and Knight (2005) for birds except where taxonomic updates have been applied.

An asterisk preceding a species' scientific name is used to denote species that are not native to Queensland *e.g.* **Lantana camara* (Common Lantana).

Co-ordinate System and Map Datum

Positional data was collected with either a handheld *Garmin eTrex Vista HCX* or *Garmin GPS 60* Geographic Positioning System (GPS), with an accuracy of 4 to 10 m. Locations were recorded using the UTM coordinate system. All locations presented in this report are within zone 55K. The map datum used was GDA94/WGS84.

3. Results

3.1. Flora

3.1.1. *EPA Mapped Regional Ecosystems of the Study Area*

Regional ecosystems (REs) are vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil type. REs are designated and reviewed (every two years) by the Queensland Herbarium and are based on satellite imagery provided by the State-wide Land and Tree Study (SLATS) and comparison with pre-clearing vegetation maps.

Vegetation management status: the statutory status of a RE as defined under Section 22 of the VM Act as endangered, of concern or not of concern. This status is based on an assessment of the pre-clearing and remnant extent of a RE and is listed in the *Vegetation Management Regulation 2000*. The vegetation management status only applies to remnant vegetation. The status of each RE is defined as:

- Endangered if:
 - less than 10 per cent of the pre-clearing extent remains, or
 - 10–30 per cent of the pre-clearing extent remains and the area of remnant RE remaining is less than 10 000 hectares.
- Of concern if:
 - 10–30 per cent of the pre-clearing extent remains, or
 - more than 30 per cent of the pre-clearing extent remains and the area of remnant RE remaining is less than 10 000 hectares.
- Not of concern if:
 - more than 30 per cent of the pre-clearing extent remains, and the area of remnant RE remaining is more than 10 000 hectares.

Vegetation is mapped as remnant if the predominant (ecologically dominant) layer:

- covers at least 50 per cent of the undisturbed canopy;
- is at least 70 per cent of the height of the undisturbed height; and,
- includes similar floristic species that exists if the vegetation community is undisturbed.

Remnant vegetation includes vegetation that has been cleared in the past but now meets the above criteria.

The study area supports one mixed polygon and four individual RREs as mapped by the Queensland Herbarium (Table 3). These are represented by five REs.

The vegetation communities identified within the study area ranged from cleared grazing pastures, sclerophyllous woodlands to open forests, closed scrubs to complex notophyll vine forest. The diversity of regional ecosystems reflects the relatively diverse altitudinal gradient across the study area, as well as the geographical location. The study area is located in the Central Queensland Coast bioregion within the central extent of the Clarke-Connors Ranges (3) sub-region in close proximity to the western boundary of the Proserpine-Sarina Lowlands (2) sub-region, and north-western extent of the Clark-Connors Range (12) sub-region which is part of the Brigalow Belt (North) Bioregion.

All of the composite regional ecosystems described for the mapped mixed polygon were confirmed as being present in the study area and were characteristic of both remnant and non-remnant REs. One vegetation community which is not currently mapped by the EPA as occurring within the study area was also recorded. Field verified REs are discussed in Section 3.1.2.

Table 3: EPA Mapped and field verified regional ecosystems and their occurrence within the study area

Regional Ecosystem	Vegetation Management Status	Biodiversity Status	Short Description	Presence
<u>REGIONAL ECOSYSTEMS (EPA mapped within study area)</u>				
8.11.1	Of Concern	Of Concern	<i>Eucalyptus drepanophylla</i> and <i>E.plathyphylla</i> woodland on hills formed from metamorphosed sediments	Yes (remnant and non-remnant)
8.12.5a	Not of Concern	No concern at present	<i>Lophostemon confertus</i> and <i>Eucalyptus portuensis</i> open forest to closed scrub on steep slopes and spurs of Mesozoic to Proterozoic igneous rocks	Yes (remnant)
8.12.7a	Not of Concern	No concern at present	<i>Corymbia citriodora</i> , <i>Eucalyptus portuensis</i> and <i>Corymbia trachyphloia</i> open forest to woodland on hills on Mesozoic to Proterozoic igneous rocks	Yes (remnant and non-remnant)
8.12.12a	Not of Concern	No concern at present	Mixed open forest to woodland of <i>Corymbia intermedia</i> +/- <i>Eucalyptus portuensis</i> +/- <i>E.platyphylla</i> +/- <i>E.drepanophylla</i> +/- <i>E.tereticornis</i> . Occurs on lower and mid-slopes of mountains and hills formed on Mesozoic to Proterozoic igneous rocks	Yes (remnant and non-remnant)
<u>REGIONAL ECOSYSTEMS (not EPA mapped within study area BUT field verified)</u>				
8.12.3a	Not of Concern	No concern at present	Notophyll rainforest/microphyll rainforest +/- <i>Araucaria cunninghamii</i> emergents. Occurs on coastal hills and ranges on Mesozoic to Proterozoic igneous rocks. Lower altitudes and drier or more exposed situations than RE 8.12.2	Yes (remnant and non-remnant)
<u>Mixed Polygon REGIONAL ECOSYSTEMS (EPA mapped within study area)</u>				
8.12.7a/8.12.12.a		<i>Individual Regional Ecosystems described above</i>		Yes [in part]

3.1.2. Field Verified Regional Ecosystems of the Study Area (Vegetation Communities)

The secondary and tertiary level assessment sites allowed the determination of RE types through the collation of structural and composite floristic information. This ground-truthing revealed minor inconsistencies in the certified Regional Ecosystem mapping which is currently applied to the study area. In particular, the central extent of the study area is situated upon a number of close-spaced, steeply inclined

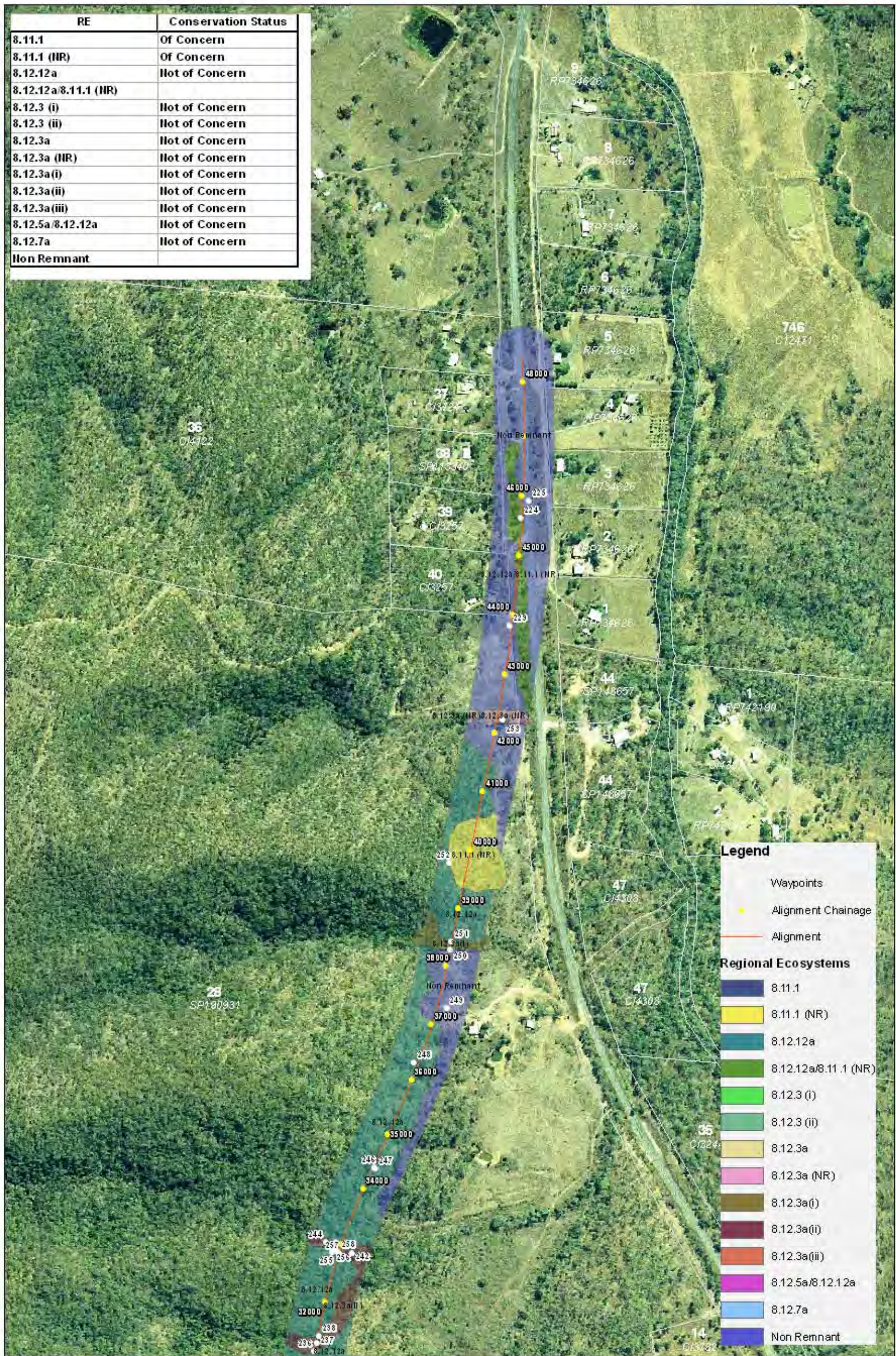
spurs which support protected gullies dominated by narrow bands of vine forest and steep slopes dominated by low brush-box scrubs.

Field mapping of the variations of the current RE mapping was performed through aerial photo interpretation with reference to collated field data and broad GPS mapping. Some areas which were representative of vine forest possessed a population width of less than 35m and as such would not be considered a mappable entity (at an accepted scale of 1:100,000) on a certified RE map (Neldner *et al.* 2005). However, these elements were generally greater than 20m in width and as such could be considered a mappable entity at the property scale (1:10,000) and could be presented in a PMAV (Property Map of Assessable Vegetation).

RE's which are recognised as "endangered ecological communities (EEC)" under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* were not identified in the study area.

The field RE mapping for the study area is presented in Figures 1a, 1b and 1c with description of each RE within the study area provided.

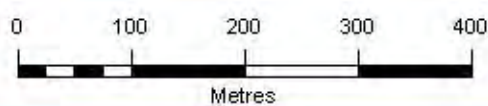
RE	Conservation Status
8.11.1	Of Concern
8.11.1 (NR)	Of Concern
8.12.12a	Not of Concern
8.12.12a/8.11.1 (NR)	
8.12.3 (i)	Not of Concern
8.12.3 (ii)	Not of Concern
8.12.3a	Not of Concern
8.12.3a (NR)	Not of Concern
8.12.3a(i)	Not of Concern
8.12.3a(ii)	Not of Concern
8.12.3a(iii)	Not of Concern
8.12.5a/8.12.12a	Not of Concern
8.12.7a	Not of Concern
Non Remnant	

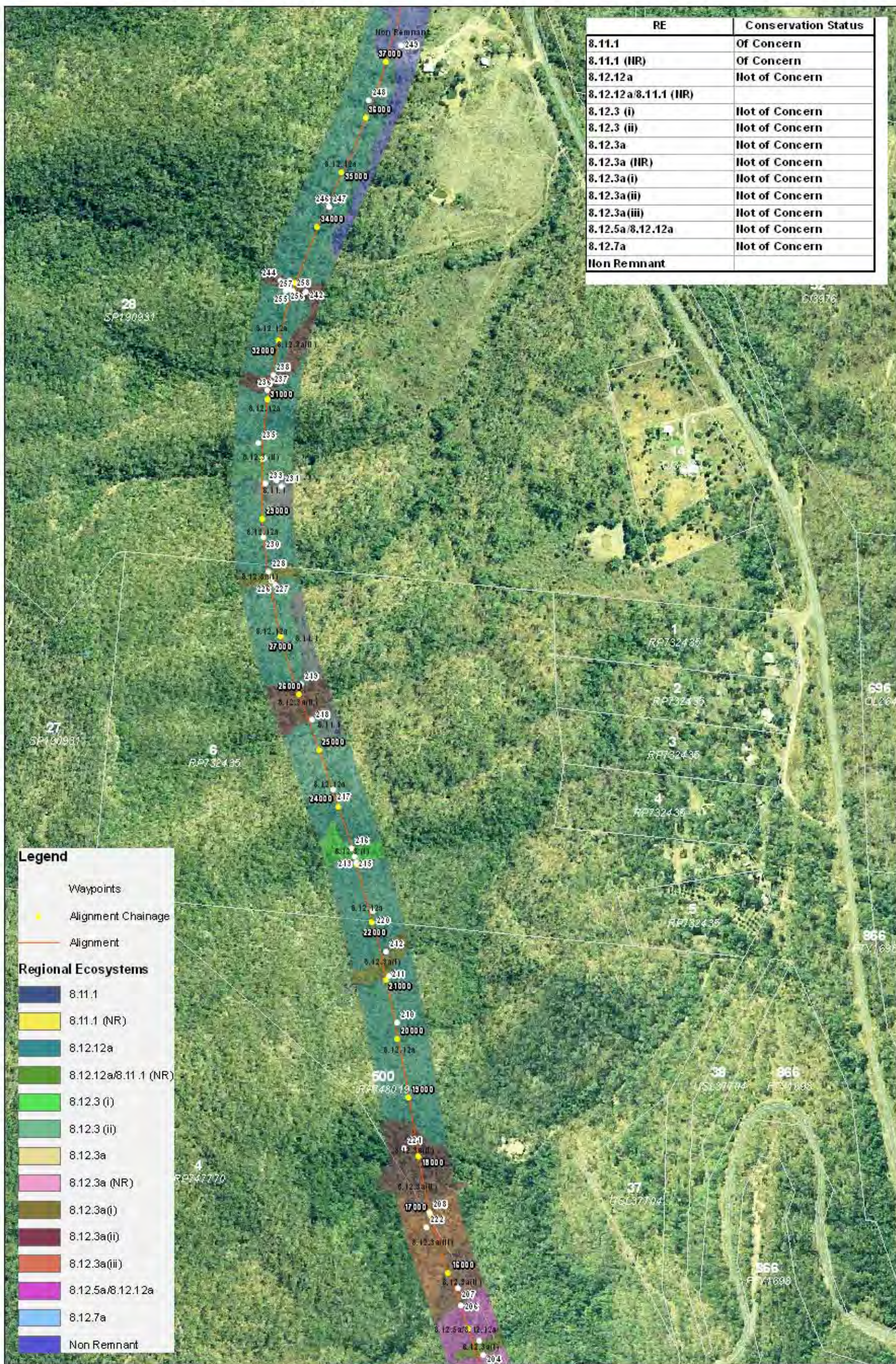


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09030
DATE
22 October 2009

JOB NAME
**Peak Downs
Highway Realignment**

**Figure 1a
Regional Ecosystems**

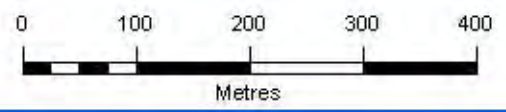


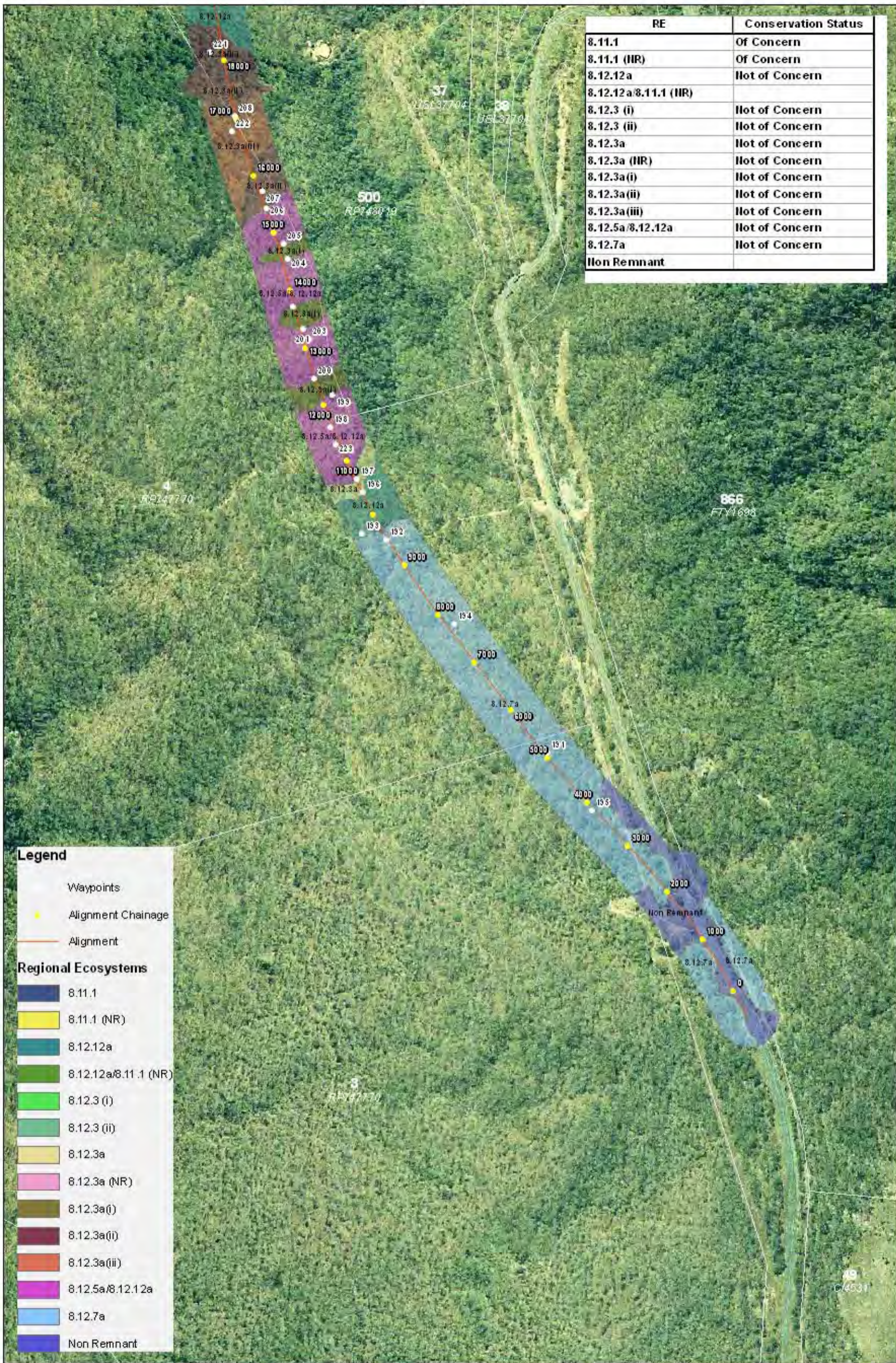


JOB NO
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22 October 2009

JOB NAME
Peak Downs
Highway Realignment

Figure 1b
Regional Ecosystems

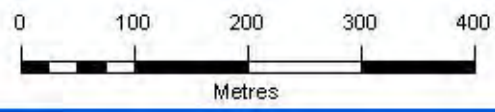




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22 October 2009

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**Peak Downs
Highway Realignment**

**Figure 1c
Regional Ecosystems**



RE 8.11.1 *Eucalyptus drepanophylla* and *E. platyphylla* woodland on hills formed from metamorphosed sediments

Vegetation Management Status: Of Concern

Biodiversity status: Of Concern

EPBC status: *not applicable*

Distribution: This vegetation type was situated on the lower slopes and/or shallow basins at the base of steep sided spurs and hills of Eton Range. Remnant and non-remnant distributions of this vegetation type were marginally intersected by the proposed corridor in three areas within the central and northern extents of the study area.

Composition: The canopy layer of this vegetation type possessed a variable median height, ranging from 11 to 14 metres, and canopy cover, ranging from very sparse to sparse (10 to 35%). *Eucalyptus platyphylla* (poplar gum) dominated the canopy layer, with infrequent emergent *Eucalyptus drepanophylla* (an ironbark) reaching 20m in height.

The sparse to very sparse low tree layer was dominated by *Acacia spirorbis* ssp. *solandri* (no common name) and associated *Eucalyptus platyphylla*, *Corymbia intermedia* and occasional *Eucalyptus drepanophylla*, *Flindersia australis* (Crows Ash), *Erythrina vespertilio* (Bat Wing Coral Tree), *Alphitonia excelsa* (Red Ash) and/or *Corymbia tessellaris* (Carbeen). The sub-canopy possessed a median height of 7m.

The tall shrub layer possessed a very sparse cover of *Acacia spirorbis*, *Alphitonia excelsa* and occasional juvenile sub-canopy species. The low shrub layer was generally dominated by a sparse to mid-dense cover of **Lantana camara* var. *camara* (Common Lantana).

The groundcover layer ranged from a very sparse to sparse cover depending upon the density of the low shrub layer and included species such as *Aristida queenslandica* (a wiregrass), *Themeda triandra* (Kangaroo Grass), *Heteropogon* spp. (speargrasses), **Hyparrhenia rufa* ssp. *rufa* (Thatch Grass) and/or *Panicum effusum* (Hairy Panic).

Condition: The central distribution of this community represented relatively intact *Eucalyptus platyphylla* woodland on lower slopes, while the northern distribution had been markedly impacted by historic land-use and routine maintenance relating to pasture improvement, and weed incursion through ill-management. A high percentage of mature *Eucalyptus platyphylla* were found to support small to medium-sized hollows.

Vegetation Management Status: With respect to the VM Act, the community was analogous with RE 8.11.1, and the central extent of the distribution would satisfy the criteria for remnant status.

Threatened Taxa: With reference to the *Nature Conservation (Wildlife) Regulation 2006* [State] and *Environment Protection and Biodiversity Conservation Act 1999* [Commonwealth], no species of conservation significance were recorded from this vegetation community.



Plate 1:Vegetation representative of RE 8.11.1 on lower slopes (Site T016, vicinity of Chainage 2990, looking east)

RE 8.12.3a Notophyll rainforest/microphyll rainforest +/- *Araucaria cunninghamii* emergents. Occurs on coastal hills and ranges on Mesozoic to Proterozoic igneous rocks

Vegetation Management Status: Not of Concern.

Biodiversity status: No concern at present

EPBC status: not applicable

Distribution: This vegetation type was identified as moderate sized stands upon rocky scree slopes or as narrow residual bands protected within the floor of moderately to deeply dissected, boulder strewn gullies. The predominant distribution of this vegetation type was located upon and between the undulated, steeply inclined spurs and range foothills within the central and northern extent of the study area respectively.

Composition: The overall composition of this vegetation type was found to markedly variable throughout the range of its distribution and tended from low diversity scrubs dominated by generalist microphyll vine forest species to notophyll vine forest to *Araucaria cunninghamii* dominant open forest. As such three primary associations were identified:

RE 8.12.3a (i): This association was representative of the narrow distributions which were primarily restricted to the ephemeral, boulder strewn drainage lines which dissected the undulated spurs and foothills. The sparse to mid-dense canopy layer possessed a variable composition and the median height ranged from 8 to 12 metres. Emergent *Argyrodendron polyandrum* (Brown Tulip Oak), *Flindersia australis* (Crow's Ash), *Paraserianthes toona* (Mackay Cedar), *Pleiogynium timorensis* (Burdekin Plum), *Euroschinus falcatus* var. *falcatus* (Ribbonwood) and *Eucalyptus drepanophylla* were encountered occasionally. The canopy layer was composed of, but not limited to, species which included

Argyrodendron polyandrum, *Polyscias elegans* (Celery Wood), *Drypetes deplanchei* (Yellow Tulip), *Jagera psuedorhus* var. *psuedorhus* (Foambark), *Mallotus philippensis* (Red Kamala), *Chionanthus ramiflora* (Native Olive), *Cupaniopsis anacardioides* (Tuckeroo), *Olea paniculata* (Native Olive), *Flindersia australis*, *Terminalia porphyrocarpa* (a Damson tree), *Cryptocarya triplinervis* var. *pubescens* (Three-veined Laurel) and/or *Gossia bidwillii* (Python Tree). Common canopy vines included *Cissus oblonga* (Water Vine), *Melodorum leichhardtii* (Zig-zag Vine), *Austrosteenisia blackii* (Blood Vine) and *Trophis scandens* (Burney Vine).

The sparse to mid-dense low tree layer was generally dominated by *Gossia bidwillii*, *Drypetes deplanchei*, *Diospyros geminata* (Scaly Ebony), *Mallotus philippensis*, *Baloghia inophylla* (Scrub Bloodwood) and associated juvenile canopy species. The low tree layer possessed a median height range of 5 to 7 metres.

The shrub layer was generally dominated by a sparse to mid-dense cover of *Gossia bidwillii*, *Polyalthia nitidissima* (Canary Beech), *Arytera divaricata* (Coogera), *Psydrax* spp. (canthiums), *Strychnos psilosperma* (Strychnine Tree), *Pouteria cotinifolia* var. *pubescens* (Yellow Lemon), *Acronychia laevis* (Glossy Acronychia) and/or associated juvenile upper strata species.

Depending upon the density of the low shrub layer, the groundcover layer ranged from dense leaf litter with little vegetative cover to a sparse cover of canopy vines, *Jasminum didymum* ssp. *racemosum* (Slender Jasmine) and/or juvenile upper strata species.

RE 8.12.3a (ii): This association was commonly encountered on the larger drainage lines and upon steeply inclined, rocky scree slopes. The composite species of this association were similar to the microphyll vine forest on narrow drainage lines except taller and more floristically diverse, particularly within the mid-stratum. The canopy and ecologically dominant layer also included occasional *Araucaria cunninghamii* (Hoop Pine) and possessed a median height ranging from 17 to 24m and an average crown cover intercept of approximately 45%.

The sub-canopy possessed a median height ranging from 9 to 15m and an average crown cover intercept of approximately 60%. In two areas a low tree layer with a median height of 9m was also recorded.

The sparse to mid-dense tall shrub layer possessed a median height of 4m, while the sparse to mid-dense low shrub layer possessed a median height of 2m and included dominant species such as *Alyxia ruscifolia* (Chain Fruit), *Carissa ovata* (Klunkerberry) and *Diospyros australis* (Black Plum).

The groundcover layer was similarly reduced to a dense cover of leaf litter with canopy vines, *Jasminum didymum* ssp. *racemosum*, *Adiantum hispidulum* var. *hispidulum* (Rough Maidenhair Fern), *Doryopteris concolor* (Resurrection Fern) and/or juvenile upper strata species occurring occasionally.

RE 8.12.3a (ii): This association was located within the central extent of the study area between Chainage 1590 and 1880 upon steeply inclined, rocky scree slopes dissected by a deeply incised boulder strewn drainage line. The canopy layer was dominated by a sparse to mid-dense cover of *Araucaria cunninghamii* and infrequent *Flindersia australis*, *Pleiogynium timorense* and *Argyrodendron polyandrum* and possessed a median height of 28m.

The very sparse sub-canopy was dominated by *Terminalia porphyrocarpa* and juvenile canopy species and possessed a median height of 17m.

The sparse low tree layer was dominated by *Gossia bidwillii*, *Mallotus phillipensis*, *Drypetes deplanchei*, juvenile canopy species and occasional *Harpullia hillii* (Blunt-leaved Tulip) and possessed a median height of 12m.

The very sparse to mid-dense tall shrub layer was primarily comprised of *Gossia bidwillii* and associated *Alectryon tomentosa* (Hairy Alectryon), *Polyalthia nitidissima*, *Maytenus disperma* (Orange Bush), *Pouteria sericea* (Wild Prune) and juvenile upper strata species. The tall shrub layer possessed a median height of 5m.

The very sparse to sparse low shrub layer was dominated by *Gossia bidwillii*, *Alyxia ruscifolia* and occasional juvenile upper strata species and possessed a median height of 2m.

The groundcover layer ranged from a dense cover of leaf litter and rocky scree, to a mid-dense cover of *Drynaria sparsisora* (a fern, no common name) and occasional *Cissus oblonga*.

Condition: As a whole, this vegetation type was found to be relatively free of exotic flora, floristically diverse, in good overall condition and supporting established mature canopy trees and various layers of upper strata recruitment.

Vegetation Management Status: With respect to the VM Act, the community was analogous with RE 8.12.3a. The majority of the identified distributions would satisfy the criteria for remnant status. [NOTE: the assigned associations of “RE 8.12.3a (i), (ii) and (iii)” are not officially recognised associations or sub-associations of RE 8.12.3 or 8.12.3a as defined by the Queensland Herbarium, but have been applied here for ease of appropriating a significance weighting in accordance with the determined likelihood of occurrence of threatened flora.]

Threatened Taxa: With reference to the *Nature Conservation (Wildlife) Regulation 2006* [State] and *Environment Protection and Biodiversity Conservation Act 1999* [Commonwealth], no species of conservation significance were recorded from this vegetation community. However, this community provides potential habitat for threatened species such as *Atalaya rigida*, *Rhodamnia pauciovulata*, *Actephila sessilifolia*, *Taeniophyllum muelleri* and *Parsonsia lenticellata*. Areas supporting association RE 8.12.3a (ii) and/or downstream from larger intact notophyll vine forest possess a higher likelihood of supporting these species. Refer to Section 3.2.6 for further discussion of these species.



Plate 2: Vegetation representative of RE 8.12.3a (i) – microphyll vine forest to closed scrub (Site T007, vicinity of Chainage 2351, looking south-east)



Plate 3: Vegetation representative of RE 8.12.3a (ii) – notophyll vine forest (Site S005, vicinity of Chainage 1263, looking north-west)



Plate 4: Vegetation representative of RE 8.12.3a (iii) - *Araucaria cunninghamii* dominant open forest (Site T010, vicinity of Chainage 1820, looking south)

RE 8.12.5a *Lophostemon confertus* and *Eucalyptus portuensis* open forest to closed scrub on steep slopes and spurs of Mesozoic to Proterozoic igneous rocks

Vegetation Management Status: Not of Concern

Biodiversity status: No concern at present

EPBC status: *not applicable*

Distribution: This vegetation type was located within the central extent of the study area between Chainage 1050 and 1590 and situated upon the steeply inclined slopes of four deeply dissected spurs. The community occurred in combination with *Eucalyptus drepanophylla* woodland to open-forest (RE 8.12.12a) and intergraded with adjacent areas of microphyll/notophyll vine forest.

Composition: The canopy layer of this vegetation type possessed a median height which ranged from 15 to 18 metres, and canopy cover intercept ranging from 30 to 40%. *Eucalyptus portuensis* (White Mahogany) dominated the canopy, with *Eucalyptus drepanophylla* and *Eucalyptus exserta* (Queensland Peppermint) occurring occasionally. The community generally tended to *Eucalyptus drepanophylla* woodland to open forest on the crests of the spurs (RE 8.12.12a, see below).

The sparse to mid-dense sub-canopy layer was dominated by stunted *Lophostemon confertus* and variously associated *Eucalyptus portuensis*, *Eucalyptus exserta*, *Acacia spirorbis* and occasional *Eucalyptus drepanophylla*. The sub-canopy possessed a median height ranging from 9 to 11m.

The tall shrub layer was variously composed of *Lophostemon confertus*, *Acacia spirorbis*, *Alphitonia excelsa* and various vine forest generalists which included *Maytenus disperma*, *Mallotus phillipensis*, *Psydrax odorata forma australiana*

(Shiny-leaved Canthium) and *Polyscias elegans*. The tall shrub layer possessed a median height of 6m.

The low shrub layer was generally dominated by a sparse to mid-dense cover of **Lantana camara*, juvenile upper strata species and occasional *Cycas media* (a cycad, no common name).

The groundcover layer was dominated by a mid-dense cover of *Themeda triandra* and associated *Heteropogon contortus* (Bunched Speargrass), *Heteropogon triticeus* (Giant Speargrass), **Hyparrhenia rufa*, *Aristida queenslandica*, *Panicum effusum*, *Eragrostis spartinooides* (a grass, no common name) and *Xanthorrhoea latifolia ssp. latifolia* (Forest Grass Tree).

Condition: The greater balance of this community represented relatively intact *Eucalyptus portuensis* woodland intergrading with *Eucalyptus drepanophylla* woodland and microphyll/notophyll vine forest. The continued expansion of shrub layer **Lantana camara* threatens the overall diversity of the community through suppression of groundcover species and increased fire load which can be more easily carried into the crown of stringy-bark eucalypts rather than the encroaching *Eucalyptus drepanophylla*. A high percentage of the canopy specimens of *Eucalyptus exserta* were found to be in poor condition.

Vegetation Management Status: With respect to the VM Act, the community was analogous with RE 8.12.5a and, in part, 8.12.12a, and the greater balance of the distribution would satisfy the criteria for remnant status. These areas of RE 8.12.5a have been grouped with 8.12.12a due to their overlapping and generally narrow distribution.

Threatened Taxa: With reference to the *Nature Conservation (Wildlife) Regulation 2006* [State] and *Environment Protection and Biodiversity Conservation Act 1999* [Commonwealth], no species of conservation significance were recorded from this vegetation community.



Plate 5: Vegetation representative of RE 8.12.5a (Site T012, vicinity of Chainage 1170, looking north- west)

RE 8.12.7a *Corymbia citriodora*, *Eucalyptus portuensis* and *Corymbia trachyphloia* open forest to woodland on hills on Mesozoic to Proterozoic igneous rocks

Vegetation Management Status: Not of Concern

Biodiversity status: No concern at present

EPBC status: *not applicable*

Distribution: This vegetation type was located within the southern extent of the study area between Chainage 0 and 940 and situated upon the gently to moderately undulated crest and upper slopes of the range. The community was intersected by a number of shallowly incised, ephemeral drainage lines, access tracks and small lay-down areas.

Composition: The canopy layer of this vegetation type possessed a median height which ranged from 18 to 20 metres, and canopy cover intercept ranging from 30 to 40%. *Corymbia citriodora* ssp. *citriodora* (Lemon-scented Gum) dominated the canopy, with *Eucalyptus drepanophylla* and/or *Eucalyptus portuensis* occurring occasionally.

A narrowly incised drainage line located in the southern extent of the study area (Chainage 270) was dominated by a sparse cover of canopy *Eucalyptus tereticornis* (Queensland Blue Gum) and sub-canopy *Lophostemon grandiflorus* (Northern Swamp Box). Vine forest generalists were also identified within the low tree and shrub layers.

The sparse sub-canopy layer was dominated by *Corymbia citriodora* and variously associated *Eucalyptus drepanophylla*, *Eucalyptus portuensis*, *Lophostemon confertus*, *Lophostemon suaveolens* (Swamp Box), *Corymbia trachyphloia* ssp. *trachyphloia* (Brown Bloodwood) and occasional *Eucalyptus exserta*, *Eucalyptus platyphylla* and *Corymbia dallachiana* (Dallachy's Gum). The sub-canopy possessed a median height ranging from 11 to 14m.

A low tree layer was also recorded in some areas and found to possess a very sparse cover of *Acacia disparrima* ssp. *disparrima* (Hickory Wattle), *Acacia spirorbis* and juvenile upper strata species. The low tree layer, where present, possessed a median height of 9m.

The tall shrub layer was variously composed of juvenile upper strata species and locally dominant *Melaleuca viridiflora* (Broad-leaved Tea Tree) and possessed a median height ranging from 4 to 6m. The low shrub layer was generally dominated by a very sparse to mid-dense cover of **Lantana camara*, *Melaleuca viridiflora*, *Acacia disparrima* and/or juvenile upper strata species.

The groundcover layer ranged from a mid-dense to dense cover depending upon the density of the low shrub layer and was dominated by *Themeda triandra* and associated *Heteropogon* spp., **Hyparrhenia rufa*, *Aristida queenslandica*, *Panicum effusum*, *Xanthorrhoea latifolia* ssp. *latifolia* and/or **Mimosa pudica* var. *unijuga* (Common Sensitive Plant). In the vicinity of non-remnant vegetation located along the Peak Downs Highway, exotic grasses such as **Hyparrhenia rufa*, **Melinis minutiflora* (Molasses Grass), **Rhynchelytrum repens* (Red Natal Grass) and **Chloris inflata* (no common name) dominated the groundcover layer.

Condition: The greater balance of this community represented relatively intact *Corymbia citriodora* woodland, while the northern extent of the distribution had been markedly impacted by the creation of temporary lay-down/rest areas,

tracks and drainage swales. Weed incursion, particularly exotic grasses, **Stachytarpheta jamaicensis* (Blue Snakeweed) and **Lantana camara* was found to be well-established within these areas.

Vegetation Management Status: With respect to the VM Act, the community was analogous with RE 8.12.7a, and the greater balance of the distribution would satisfy the criteria for remnant status.

Threatened Taxa: With reference to the *Nature Conservation (Wildlife) Regulation 2006* [State] and *Environment Protection and Biodiversity Conservation Act 1999* [Commonwealth], no species of conservation significance were recorded from this vegetation community.



Plate 6: Vegetation representative of RE 8.12.7a (Site S003, vicinity of Chainage 823, looking north)

RE 8.12.12a Mixed open forest to woodland of *Corymbia intermedia* +/- *Eucalyptus portuensis* +/- *E. platyphylla* +/- *E. drepanophylla* +/- *E. tereticornis* on lower and mid-slopes of mountains and hills formed on Mesozoic to Proterozoic igneous rocks

Vegetation Management Status: Not of Concern

Biodiversity status: No concern at present

EPBC status: *not applicable*

Distribution: This vegetation type was located within the central extent and northern half of the study area between Chainage 1050 to 1590 and 1880 to 4150 respectively. The community was situated upon the crests of steeply inclined spurs within the central extent of the study area and slopes and crests of undulated rolling hills and footslopes to the north. The community occurred in combination with *Eucalyptus portuensis* woodland (RE 8.12.5a) within the central extent of the study area and intergraded with adjacent areas of microphyll/notophyll vine forest throughout its distribution.

Composition: The canopy layer of this vegetation type possessed a median height which ranged from 15 to 19 metres, and canopy cover intercept ranging from 30 to 45%. *Eucalyptus drepanophylla* dominated the canopy, with *Corymbia intermedia*, *Eucalyptus portuensis* and/or *Eucalyptus exserta* occurring occasionally.

The sparse to mid-dense sub-canopy layer was dominated by *Eucalyptus drepanophylla* and *Lophostemon confertus* and variously associated *Eucalyptus portuensis*, *Eucalyptus exserta*, *Acacia spirorbis* and occasional *Corymbia dallachiana* and *Eucalyptus platyphylla*. The sub-canopy possessed a median height ranging from 7 to 12m.

The tall shrub layer was variously composed of *Lophostemon confertus*, *Acacia spirorbis*, *Alphitonia excelsa* and various vine forest generalists which included *Maytenus disperma*, *Cyclophyllum coprosmoides* var. *coprosmoides* (Coastal Canthium), *Mallotus philipensis*, *Diospyros geminata*, *Psydrax odorata* forma *australiana* and *Polyscias elegans*. The tall shrub layer possessed a median height ranging from 4 to 6m.

The low shrub layer, where present, was generally dominated by a very sparse to mid-dense cover of **Lantana camara*, juvenile upper strata species and occasional *Cycas media*.

The groundcover layer was dominated by a mid-dense cover of *Themeda triandra* and associated *Heteropogon* spp., **Hyparrhenia rufa*, *Aristida queenslandica*, *Panicum effusum*, *Eragrostis spartinooides*. *Lomandra* spp. (matrushes) and/or *Xanthorrhoea latifolia* ssp. *latifolia*.

Condition: The greater balance of this community represented relatively intact *Eucalyptus drepanophylla* woodland to open forest intergrading with *Eucalyptus portuensis* woodland and microphyll/notophyll vine forest. The natural condition of the community is currently threatened by routine farm maintenance (timber-getting, thinning) and continued expansion of shrub layer populations of **Lantana camara*, **Senna obtusifolia* (Sicklepod) and **Stachytarpheta jamaicensis*. Various herbaceous and graminoid weeds were frequently recorded within this community in the northern extent of the study area.

Vegetation Management Status: With respect to the VM Act, the community was analogous with RE 8.12.12a, and the greater balance of the distribution would

satisfy the criteria for remnant status. Within the central extent of the study area this vegetation type was found to intergrade with RE 8.12.5a on the crests of steeply inclined spurs. As such these areas have been mapped as mixed polygons.

Threatened Taxa: With reference to the *Nature Conservation (Wildlife) Regulation 2006* [State] and *Environment Protection and Biodiversity Conservation Act 1999* [Commonwealth], no species of conservation significance were recorded from this vegetation community.



Plate 7: Vegetation representative of RE 8.12.12a (Site T015, vicinity of Chainage 2910, looking north)

3.1.3. *Species Richness*

Database searches of the area within 20km of a central point within the study area identified a total of 373 and 381 species from the HERBRECS/COREVEG (Queensland Herbarium) and Wildlife Online (EPA) databases respectively.

The current dry-season field survey (to which this report applies) identified 225 species (187 native and 38 exotic). These are listed in Appendix B where they have been assigned in accordance with their relative abundance within field-validated regional ecosystems.

The species richness of field validated vegetation communities was found to be marginally lower than benchmark condition in most cases but this was probably a function of sub-optimal survey conditions. [Note: The benchmark condition in relation to species richness refers to the quantitative value of flora life-forms (tree, shrub, grass, forbs and other) for a specific RE, which is generated from an average value from mature and long undisturbed reference or 'Best on Offer' sites (Eyre *et al.* 2008). Given that no such values currently exist for the REs identified on site, reference of data collated by the author during optimal conditions in similar habitats was used as a comparison base.] As such, the relative abundance of native graminoid and herbaceous species within the sclerophyllous woodland and open forest areas was markedly reduced. Aside from **Hyparrhenia rufa*, **Stylostanhes*

scabra, **Stachytarpheta jamaicensis* and **Lantana camara*, the occurrence of exotic flora was generally low within the greater balance of the study area. The species richness was greatest within the vine forest communities, where weed incursion was primarily suppressed.

Historic farm maintenance and active timber harvesting within the northern portion of the study area has also resulted in a lower than benchmark distribution of canopy and, to a lesser extent, sub-canopy layer species in some of the sampled communities. Weed incursion was also prevalent.

3.1.4. *Species of Conservation Significance*

Three species listed as threatened under the NC Regulation and/or the EPBC Act were identified during an EPBC Protected Matters search. Of these only one, *Eucalyptus raveratiana* (Black Ironbox), has been listed as positively occurring within the defined search areas (ie. within 20km radius of the study area) which were applied to the HERBRECS and Wildlife Online databases. The three species afforded a commonwealth conservation significance and identified during the EPBC Protected Matters Search, their preferred habitat and an assessment of the likelihood within the study area are listed in Table 4 and described further Section 3.2.6.

A further six species, which are currently afforded a conservation status of 'rare' under the NC Regulation were identified within the defined search areas which were applied to the HERBRECS and Wildlife Online databases. Two of these species were identified as occurring on the eastern side of the existing range crossing.

3.1.5. *Threatened Flora*

From the various database searches, a total of nine threatened flora species were identified as occurring, or potentially occurring within the search areas defined in Section 2.2.1. These species are listed in Table 4. Of these, three are listed as 'vulnerable' under the EPBC Act and the Queensland NC Regulation, or the EPBC Act alone and as such these species are therefore considered matters of national environmental significance. The additional six species presented in Table 4 were also assessed because of their habitat preference for vegetation identified on site and the disjunct nature of their distribution within the wider region. An assessment of the likelihood of presence of the State and Commonwealth listed species, based on published knowledge of preferred habitat and observations of habitat present within the study area is presented in Table 4.

No state and commonwealth listed significant species were recorded during field surveys.

Table 4: Threatened plant records returned from database searches for the study area

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Actephila sessilifolia</i>	Broad-leaved Actephila	R	-	Wildlife Online	Shrub in dry rainforest and vine thickets north from Yarrol (Monto district to south of Gladstone) to Rollingstone near Townsville from altitude of 50 to 900m (Cooper 2004, Harden et al 2006a)	Low to Moderate: Suitable habitat present, but detailed searches failed to locate.
<i>Atalaya rigida</i>	Veiny Whitewood	R	-	Wildlife Online, HERBRECS	Small tree to 8m in dry rainforest, monsoon forest, littoral rainforest and vine thickets north from Mt Glastonbury near Gympie to Cairns district from altitude of 40 to 500m (Harden et al 2006a)	Moderate: Suitable habitat present, but detailed searches failed to locate. Records known from within two kilometres
<i>Cartonema brachyantherum</i>	ncn	R	-	HERBRECS	Limited information is available for this species, but based on habitat and locality descriptions of Queensland Herbarium records (HERBRECS), the slender herb is known to occur on sandy soils in eucalypt open forest, primarily in the Townsville and Cairns districts with disjunct populations in the Rockhampton and Mackay areas. The cryptic species is known to flower between March and July (pers comms Queensland Herbarium)	Low to Moderate: Suitable habitat present, but detailed searches failed to locate.
<i>Eucalyptus raveretiana</i>	Black Ironbox	V	V	DEWHA	Occurs on the banks of rivers, creeks and moderate sized watercourses on clayey or sandy loam and is often associated with <i>Melaleuca leucadendra</i> and/or <i>Melaleuca fluviatilis</i> fringing open forest. Endemic to Central and North Queensland and known from Mackay to Ayr, with disjunct populations occurring in the Rockhampton area (DEWHA 2008a, Brooker and Kleinig 2004). The author has also witnessed this species as a planted street and park tree in Townsville, Collinsville and Bowen.	Low: Suitable habitat absent. No records within the immediate vicinity.
<i>Eulophia venosa</i> (syn. <i>Eulophia bicallosa</i>)	Veined Corduroy Orchid	R	-	HERBRECS	Terrestrial orchid with irregularly shaped somewhat flattened tuberous rhizomes, solitary leaf on a slender stalk (200-400mm long) and flower stem to 800mm tall. Highly localised and rarely seen, species occurs in open woodland, grassy forest and on rainforest margins in disjunct localities of Cape Tribulation, Yarrabah (near Cairns) and in the Mackay area. Flowers from July to November (Jones 2006).	Low to Moderate: Suitable habitat present, but detailed searches failed to locate. Due to dry season vegetative growth may have been absent.

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Leucopogon cuspidatus</i>	ncn	V	-	DEWHA	Dwarf to small shrub with a spreading habit. Located in eastern Queensland from Blackdown Tableland to Mount Stewart near the Homestead township. Occurs in open forest, woodland and heath on rocky slopes with granitic or serpentinite substrates and generally found to be locally common within its location (DEWHA 2008b).	Low: Marginal habitat present, but easily discernible family which was not recorded within the study area. No records within the vicinity.
<i>Parsonsia lenticellata</i>	ncn	R	-	Wildlife Online	Twiner of rainforest, gallery rainforest and open forest from the Daintree to Mackay area from an altitude of 0 to 450m (Cooper 2004). [Note: The very similar <i>Parsonsia paulforsteri</i> occurs at its northern limit in the Eton area (Harden et al 2006b, Cooper 2004).]	Low to Moderate: Suitable habitat present, but detailed searches failed to locate.
<i>Rhodamnia pauciovulata</i>	Small-leaved Malletwood	R	-	Wildlife Online, HERBRECS	Shrub or small tree to 6m in dry rainforest, littoral rainforest and vine thickets from near sea level to 300m altitude north from Kilkivan and Gundiah (north of Gympie) to the Goodnight Scrub (south-west of Bundaberg) and also in the Mackay area and Whitsundays region (Cooper 2004, Harden et al 2006a)	Moderate: Suitable habitat present, but detailed searches failed to locate. Records known from within two kilometres
<i>Taeniophyllum muelleri</i>	Minute Orchid	V	-	DEWHA	Common in shrubs and trees in rainforest, sheltered areas in open forest, humid gullies and streamside vegetation. Occurs from Wilson River (near Wauchope, NSW) to Cape York Peninsula from 50 to 1200m in altitude (Jones 2006)	Low to Moderate: Suitable habitat present, but detailed searches failed to locate.

- 1 - NC Act status: Conservation status of each taxon under the Status taken from the Queensland Nature Conservation (Wildlife) Regulation 2006: Vulnerable (V), Rare (R), Least Concern (C).
- 2 - EPBC status: Conservation status of each taxon under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): Vulnerable (V), Endangered (E), Not Listed (-).
- 3 - Source: DEWHA(a) (DEWHA 2009a), Wildlife Online (EPA 2007), HERBRECS (EPA 2009a), DEWHA(b) (DEWHA 2009b)
- 4 - Very Low = The study area is outside the species normal range, habitat and/or underlying geology does not exist;
 Low = Database searches indicate the species could potentially occur in the study area; however previous records are likely to be historic or invalid, the study area is outside the species normal range, habitat does not exist or the species is considered locally extinct (no further impact assessment required).
 Moderate = Habitat exists for the species; however it is either marginal or not particularly abundant. The species is known from the wider region and could potentially occur (further impact assessment required).
 High = The species is known to occur in the local area and core habitat exists in the study area (further impact assessment required).
 Recorded = The species was recorded in the study area as part of field surveys

3.1.6. *State Listed Threatened Communities*

Not of Concern

Aside from the small areas of open pastoral expanse in the northern extent of the study area and disturbance areas associated with constructed tracks, lay-down areas and historic land use (pasture improvement through timber harvesting and thinning), the majority of the vegetation identified within the study area aligns with remnant REs that are afforded a VM Act Vegetation Management Status of 'Not of Concern' or 'Of Concern'. A total of four 'Not of Concern' REs were identified. RE 8.12.5 is endemic to the subregion, while the balance of the 'Not of Concern' REs occur ubiquitously upon ranges, hills and/or footslopes throughout the Central Queensland Coast bioregion. This is more a reflection of the reduced suitability of this landform for agricultural purposes.

These vegetation types are primarily threatened by ongoing or potential farming practices including aerial herbicide application, active thinning and timber getting, forestry and expansion of established graminoid, herbaceous and woody weeds which lead to an increase in the ability of the groundcover to carry a higher intensity of fire.

Of Concern

One 'Of Concern' RE was recorded within the study area. This RE (RE 8.11.1) is well represented within the immediate vicinity of the study area and is only marginally impacted by the proposed alignment.

This RE faces a similar suite of threats as described above, but is more likely to be impacted given the topographical preference for lower slopes and undulated low hills.

Endangered

No 'Endangered' REs were recorded within the study area.

3.1.7. *Commonwealth Listed Threatened Communities*

One threatened ecological communities as defined under the *Environment Protection and Biodiversity Conservation Act 1999* was identified as potentially occurring within the study area during the review process. This community was the:

- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin.

This community is afforded an 'endangered' status. As indicated within Section 3.2.2, no endangered ecological communities as defined under the *EPBC Act 1999* were recorded in the study area.

3.1.8. *Exotic Flora*

Approximately 9,535 species of vascular plants are recognised in Queensland (Bostock and Holland 2007), of which 12.5% are naturalised exotic species (weeds). Weeds are plants that occur in an area outside their historical natural range, and which have negative environmental,

economic or health impacts. Under this definition, weeds can include Australian native species outside their natural range, such as the West Australian species, *Corymbia torrelliana* (Cadaghi), which has become well established in coastal areas of New South Wales and southern Queensland, as well as the more familiar weed species such as **Lantana camara* (Common Lantana). Not all weed species pose significant economic, environmental or health threats, nor are there sufficient resources to deal with all weed species. Therefore weed species have been prioritised for attention from a national and state perspective.

Nationally Declared Species

On a national scale, a group of twenty-one 'Weeds of National Significance' (WONS) were identified in 2000 (Thorp and Lynch 2000), with the goal of ranking weed species against which nationally co-ordinated action programs would bring greatest benefits. The ranking criteria were based on assessments of the weed's invasiveness, economic, social and environmental impacts, the potential for spread, and socio-economic (such as impacts on health, fire risk, and recreational values of land) and environmental values. There is no legislated requirement for the control of WONS – this task is primarily a state and local government responsibility.

No WONS were identified during the current surveys.

State Declared Species

At a State level, the *Land Protection (Pest and Stock Route Management) Act 2002* provides a framework and powers for improved management of pest plants, under which control of pest plants by land owners is enforceable. Declared pest plants (Class 1, Class 2 or Class 3) are listed in the schedules of the *Land Protection (Pest and Stock Route Management) Regulation 2003*. Those species recorded during surveys are summarised in Table 5.

Table 5: List of declared pest plants

Botanical Name	Common Name	WONS	LP Regulation	Regional Ecosystems Supporting Species ()
<i>*Lantana camara var. camara</i>	Common Lantana	Yes	Class 3	REs 8.11.1, 8.12.3a (infrequently), 8.12.5a, 8.12.7a, 8.12.12a
<i>*Senna obtusifolia</i>	Sicklepod	-	Class 2	Non-remnant areas in the southern extent of study area

Relative Abundance

Most of the weed species which were recorded during the current survey were well established within their suitable habitats. Notably, **Lantana camara* was ubiquitously distributed throughout the greater balance of the study area, limited only by the dense vegetative cover within the microphyll and notophyll vine forest areas. Other woody weeds included sporadic outbreaks of **Stylosetanthes scabra* (Shrubby Stylo), **Stachytarpheta jamaicensis* (Blue Snakeweed) and **Triumfeta rhomboidea* (Chinese Burr) and dense infestations of **Senna obtusifolia*

(Sicklepod) in the degraded paddocks within the southern extent of the study area. Herbaceous weeds were primarily limited to road verges and the degraded paddocks. Graminoid (grass) species were similarly limited to the aforementioned disturbance areas, except for *Hyparrhenia rufa ssp. rufa* (Thatch Grass) which occurred commonly in the groundcover layer of sclerophyllous woodland and open forest throughout the study area.

Table 6 describes the relative abundance of both declared and non-declared woody, climbing and herbaceous weeds, as well as exotic pastoral grasses for each field-validated Regional Ecosystem.

Table 6: Relative abundance of exotic flora per Regional Ecosystem¹

Regional Ecosystem	WONS	State Declared Exotic Flora	Non-Declared Exotic Flora (excl. grasses)	Exotic Pastoral Grasses
8.11.1	4	4-5	3	3-6
8.12.3	1-2	1-2	1	nil – 1
8.12.5a	3-4	3-4	1-2	2
8.12.7	3-4	3-4	2-3	3-5
8.12.12a	3-4	3-4	2-3	3-4
non-remnant	2-5	2-5	3-4	4-6

¹The relative abundance of recorded species was assigned in correlation with the Braun-Blanquet technique, wherein:

nil = exotic flora species absent

1 = provides less than 5% cover within the occupied stratum and encountered infrequently within community;

2 = provides less than 5% cover within the occupied stratum but encountered frequently within community;

3 = provides 5 to 25% cover within the occupied stratum;

4 = provides 25 to 50% cover within the occupied stratum;

5 = provides 50 to 75% cover within the occupied stratum; and,

6 = provides 75 to 100% cover within the occupied stratum.

3.2. Fauna

3.2.1. *Threatened Fauna*

A total of 17 rare or threatened fauna species were identified as being previously recorded or potentially present within the search area. It should be noted that the EPBC Protected Matters Search Tools uses predictive modelling of species occurrence as well as actual records to determine potential presence of species. These species are listed in Table 7 along with an assessment of their potential to occur within the study area.

None of these species were confirmed as occurring within the study area or considered likely to occur. However, four species were considered to have a moderate potential to occur within the study area. These were the Square-tailed Kite (*Lophoictinia isura*), Squatter Pigeon (*Geophaps scripta scripta*), Black-chinned Honeyeater (*Melithreptus gularis*) and the Ghost Bat (*Macroderma gigas*). The remainder of the species were assessed as having a low to moderate or low potential to occur within the study area.

Table 7: Threatened fauna records returned from database searches for the study area

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Eulamprus amplus</i>	Lemon-barred Forest Skink	R	-	Qld Museum	Confined to rainforest in the Eungella National Park, Finch Hatton, Mt Blackwood and Conway State Forest areas where it is often seen basking on rocks along waterways (Wilson 2005).	Low to Moderate: Appears to be restricted to wet rainforests.
<i>Lophoictinia isura</i>	Square-tailed Kite	R	-	Wildlife Online	This species hunts primarily over open forest, woodlands and mallee vegetation types that are rich in passerines, as well as adjacent low scrubby areas and wooded towns. It appears to prefer a structurally diverse landscape (Garnett & Crowley 2000).	Moderate: This species could potentially occur within the study area.
<i>Tadorna radjah</i>	Radjah Shelduck	R	-	Wildlife Online	Tropical coast wetlands and rivers, mud-flats, salt-marsh, mangroves, paperbark swamps (Simpson & Day 1998).	Low: Suitable habitat not present within study area
<i>Nettapus coromandelianus</i>	Cotton Pygmy-goose	R	-	Wildlife Online	This species is found on freshwater lakes, swamps and large water impoundments (Garnett and Crowley 2000).	Low: Suitable habitat not present within study area
<i>Calyptorhynchus lathami</i>	Glossy Black-cockatoo	V	-	Wildlife Online	This species occurs in eucalypt woodlands with an understorey or sub-canopy of Casuarina or Allocasuarina on the seeds of which its diet is based. It nests in tree hollows (Garnett & Crowley 2000).	Low There are few Allocasuarina trees within the study area.

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Geophaps scripta scripta</i>	Squatter Pigeon	V	V	Wildlife Online	This species is known from tropical dry, open sclerophyll woodlands and sometimes savanna (Higgins and Peter 1996). It appears to favour sandy soil dissected with low gravelly ridges and is less common on heavier soils with dense grass cover. It is nearly always found in close association with permanent water. The southern subspecies of the Squatter Pigeon is described as occurring south of the Burdekin River (Higgins and Davies 1996).	Moderate: Although this species is more common west of the range it is possible that it may occur within the woodland vegetation types within the study area.
<i>Meliphreptus gularis</i>	Black-chinned Honeyeater	R	-	Wildlife Online	This species occurs in the dry eucalypt woodlands with an annual rainfall of 400 - 700mm usually on the inland slopes of the Great Divide but extending to the coast between Brisbane and Rockhampton. It appears to favour vegetation associations with box and ironbark (Garnett and Crowley 2000).	Moderate: This species could potentially occur within the woodland vegetation types within the study area.
<i>Macroderma gigas</i>	Ghost Bat	V	-	Wildlife Online	The Ghost Bats roosts in shallow caves along cliff lines, boulder pile and deep limestone caves. They occur in a broad range of habitats including arid spinifex hill sides, grasslands, monsoon forest, savannah woodlands, tall open forest, deciduous vine forest and tropical rainforest (Churchill 2008).	Moderate: Suitable roosting habitat potentially exists for this species close to the study area and potentially along the boulder strewn waterway at chainage 1685 and it could potentially forage within the study area.

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Erythrotriorchis radiatus</i>	Red Goshawk	E	V	DEWHA	The Red Goshawk is generally found in open woodland, the edges of rainforest, and in dense riverine vegetation of coastal and subcoastal forests (Marchant & Higgins 1993). This species is known to have a large home range but nest in tall trees usually within 1km of a waterway or wetland (Garnett and Crowley 2000)	Low to Moderate: It is possible that the Red Goshawk could occur within the study area although the lack of substantial waterways or wetlands make it unlikely to nest within the study area.
<i>Neochmia ruficauda ruficauda</i>	Star Finch	E	E	DEWHA	The Star finch usually inhabits low dense damp grasslands bordering wetlands and waterways and also open savanna woodlands near water or subject to inundation (Higgins et. al. 2006). Absent from expanses of open county and uplands usually occurring in valleys (Higgins et. al. 2006). In Queensland this species' range has largely contracted to the southern Cape York. There have not been any confirmed records from the Cairns to Townsville region for some time and none were recorded during the Birds Australia Atlas project (Higgins et. al. 2006). Recent records around Rockhampton are thought likely to be aviary escapees (Higgins et. al. 2006).	Low: This species is usually found in valleys and the study area lacks suitable habitat.
<i>Rostratula australis</i>	Australian Painted Snipe	-	V	DEWHA	This species occurs in shallow, vegetated temporary or infrequently filled wetlands, sometimes with trees or shrubs where it feeds at the water's edge on seeds and invertebrates (Garnett and Crowley 2000). Since 1990 there have been fewer than 100 records of this species throughout Australia (Garnett and Crowley 2000).	Low: Suitable habitat not present within study area

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Taudactylus eungellensis</i>	Eungella Day Frog	E	E	DEWHA	Occurring in upland rainforest streams primarily within Eungella National Park, Cathu State Forest and Eungella State Forest (DEH 2005).	Low: This species is associated with wet tropical rainforest which does not occur within the study area.
<i>Dasyurus hallucatus</i>	Northern Quoll	-	E	DEWHA	The Northern Quoll was once widespread in Queensland but has undergone a severe range contraction and is now absent from much of its former range. It is usually associated with dissected rocky escarpments but also known from eucalypt forest and woodlands, around human settlement and occasionally rainforest. In the Northern Territory Northern Quoll populations are becoming extinct within one year of the arrival of the Cane Toad (<i>Rhinella marina</i>) although in Queensland some remnant quoll populations persist in areas where Cane Toads have long been present (Van Dyck & Strahan 2008). The areas where the quoll persist in Queensland tend to be steep, rocky areas close to water that have not been recently burnt and appear to have become extinct in many lowland habitats formerly occupied (Woinarski et. al. 2008).	Low to Moderate: It is possible that this species occurs within the broader area but is considered more likely to be associated with the steeper and less accessible areas of the Eton / Connors Range.
<i>Nyctophilus timoriensis</i>	Eastern Long-eared Bat	V	V	DEWHA	Strahan (1995) notes that the eastern long-eared bat is distributed south of the Tropic of Capricorn but uncommon and localised. This species has undergone recent taxonomic review and is now considered to be <i>Nyctophilus species 2</i> (Churchill 2008).	Low: This species is generally not considered to occur as far north as Mackay and is generally found further inland.

Scientific Name	Common Name	NC Reg'n ¹	EPBC Act ²	Source ³	Preferred habitat	Potential to occur in the study area? ⁴
<i>Pteropus conspicillatus</i>	Spectacled Flying-fox	-	V	DEWHA	Confined to coastal QLD from Hinchbrook Island north to Cape York. Found in tall gallery rainforest but also camp in mangroves, paperbark, eucalypt forests and tall acacia trees (Churchill 1998).	Low: Suitable habitat for this species does not occur within the study area.
<i>Egernia rugosa</i>	Yakka Skink	V	V	DEWHA	A ground dwelling reptile found in dry open forests, woodlands and rocky areas of the brigalow belt. It is often found under dead timber and in deep rock crevices (Wilson, 2005).	Low: This species is usually found further inland and from drier habitats.
<i>Rheodytes leukops</i>	Fitzroy River Turtle	V	V	DEWHA	Known from the Fitzroy River and its tributaries (Cogger 2000).	Low: There is not suitable habitat for this species within the study area.

3.2.2. *Habitat Features*

A total of 107 hollow bearing trees were mapped within the study area. The details of the trees are provided in Appendix C and the location of the trees is shown on Figure 2.. The majority of hollows mapped were medium sized hollows that are suitable for all hollow roosting or nesting fauna species. Small sized hollows were considered to be suitable for bats and small mammals such as Feathertail Gliders (*Acrobates pygmaeus*). The only rare or threatened fauna species identified as potentially occurring within the study area from database searches that utilise hollows were the Glossy-black Cockatoo and Eastern Long-eared Bat.

3.2.3. *BioCondition Assessment*

Eight modified BioCondition assessments were undertaken along the proposed alignment. The location of the modified BioCondition assessment sites is shown in Figure 2 and the results of the assessments are summarised in Table 2 over.

According to section 5 of the BioCondition Assessment Manual a score of less than 60% is considered to be Condition Class 1 or 'poor' biodiversity condition and a score of between 60% and 69% is Condition Class 3, between 70% and 84% is Condition Class 2 and greater than 85% is Condition Class 1 or 'good' biodiversity condition. The average score across the three sites is 50.3% which equates to a poor biodiversity condition.

The modified BioCondition assessments indicate that the areas of rainforest along the narrow gullies have the highest scores due to the intact canopy and lack of weeds. All of the vegetation within the study area scores highly for landscape attributes such as size of patch and connectivity.

Table 8: Modified BioCondition Scores

BioCondition Variable	Maximum Possible Score	HA01	HA02	HA03	HA04	HA05	HA06	HA07	HA08	HA09
Chainage		820	1260	2260		4620	2740	3045	3680	3337
Easting		700758	700554	700346	700433	700605	700220	700190	700394	700249
Northing		7638909	7639290	7640271	7639713	7642542	7640731	7641041	7641625	7641312
RE										
Canopy Cover & Health	5	4	5	4	5	2	4	5	4	5
Canopy Recruitment	5	5	5	3	0	3	5	5	5	5
Canopy Height	5	5	5	5	5	5	5	5	5	5
Shrub Layer	5	5	5	5	5	3	3	5	5	5
Ground Cover	10	6	10	10	10	2	6	10	6	10
Large Trees	10	0	4	6	4	4	5	5	5	5
Fallen Logs	5	3	5	5	5	0	2	5	3	3
Weed Cover	10	3	10	10	10	0	3	10	0	10
Organic Litter	5	5	5	5	5	5	5	5	5	5
Size of Patch	10	10	10	10	10	10	10	10	10	10
Connectivity	5	5	5	5	5	2	4	4	4	4
Context	5	5	5	5	5	4	4	4	4	4
Overall /80	80	56	74	73	69	40	56	73	56	71
Overall x 1.25 /100	100	70	93	91	86	50	70	91	70	89

4. Summary

Five REs were identified within the study area comprising four Not of Concern REs and one Of Concern RE. No REs listed as Endangered under the *Vegetation Management Act 1999* were identified within the study area.

A total of 223 flora species were identified from the proposed alignment. No flora species listed as rare or threatened under State or Commonwealth legislation were identified during the field survey. However, two flora species listed as Rare under the Queensland *Nature Conservation Act 1992* were considered to have a moderate potential to occur within the study area. These species were *Atalaya rigida* (Veiny Whitewood) and *Rhodamnia pauciovulata* (Small-leaved Malletwood). They were not recorded during the field survey despite targeted searches, however, they have been recorded nearby and suitable habitat is present within the study area. If these species are present within the study area they are likely to be present in low numbers.

No rare or threatened fauna species were observed within the study area during the field survey of are considered likely to occur. However, four species comprising the Square-tailed Kite, Squatter Pigeon, Black-chinned Honeyeater and the Ghost Bat were considered to have a moderate potential to occur within the study area.

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Appendix A

Vegetation Assessment Sites

Table A-1: Location and Type of Vegetation Assessment Sites

Waypoint	UTM Grid	Vegetation Assessment Site	Regional Ecosystem	Remnant	Comments
<u>Quaternary Sites</u>					
242	55 K 700278 7641310	Q019	8.12.3a (ii)	yes	
229	55 K 700582 7642353	Q030	8.11.1	no	
211	55 K 700372 7640164	Q027	8.12.12a	yes	8.12.12a with 8.12.3 elements in mid-stratum
238	55 K 700217 7641174	Q031	8.12.12a	yes	northern edge of 8.12.3a (v/c CH3191)
249	55 K 700452 7641716	Q032	8.12.12a	no	
253	55 K 700564 7642196	Q023	8.12.3a(i)	no	
218	55 K 700260 7640596	Q028	8.12.3a(i)	yes	southern edge of 8.12.3a (v/c CH2600)
250	55 K 700461 7641813	Q033	8.12.3a(i)	no	southern edge of 8.12.3a (v/c CH3878), tending to RE 8.12.3a (ii) upslope to west
198	55 K 700565 7639242	Q025	8.12.5a/8.12.12a	yes	
203	55 K 700535 7639390	Q026	8.12.5a/8.12.12a	yes	
225	55 K 700622 7642561	Q029	<i>non-remnant</i>	no	
<u>Tertiary Sites</u>					
191	55 K 700906 7638684	T001	8.12.7a	yes	
224	55 K 700607 7642533	T013	8.11.1	yes	
210	55 K 700383 7640086	T006	8.12.12a	yes	
217	55 K 700291 7640478	T008	8.12.12a	yes	
230	55 K 700190 7640904	T015	8.12.12a	yes	
231	55 K 700225 7640987	T016	8.11.1	yes	
246	55 K 700321 7641452	T020	8.12.12a	yes	
252	55 K 700466 7641959	T022	8.12.12a/8.11.1	yes & no	site at ecotone
215	55 K 700323 7640365	T007	8.12.3a(i)	yes	
221	55 K 700387 7639875	T010	8.12.3a(iii)	yes	
237	55 K 700213 7641162	T018	8.12.3a(ii)	yes	
223	55 K 700572 7639212	T012	8.12.5a/8.12.12a	yes	
227	55 K 700202 7640831	T014	8.12.3a(i)	yes	
192	55 K 700650 7639050	T002	8.12.7a	yes	
195	55 K 700977 7638585	T004	8.12.7a	yes	edge of 8.12.7a and 8.12.5a/8.12.12a
<u>Secondary Sites</u>					
194	55 K 700758 7638906	S003	8.12.7a	yes	
220	55 K 700350 7640273	S009	8.12.12a	yes	
248	55 K 700394 7641626	S021	8.12.12a	yes	
199	55 K 700570 7639296	S005	8.12.3a(ii)	yes	

Waypoint	UTM Grid	Vegetation Assessment Site	Regional Ecosystem	Remnant	Comments
222	55 K 700419 7639742	S011	8.12.3a(iii)	yes	
234	55 K 700198 7641036	S017	8.12.3a(ii)	yes	
254	55 K 700254 7641313	S024	8.12.3a(ii)	yes	

Appendix B

Study Area Flora Species List

Table B1: Flora Species Recorded from the Study Area (All Secondary Level Vegetation Assessment Sites and associated Traverses)

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Cyperaceae	<i>Abildgaardia ovata</i>	ncn	C							1				
Fabaceae	<i>Abrus precatorius</i>	Gidee-Gidee	C	1										
Mimosaceae	<i>Acacia bidwillii</i>	Corkwood Wattle	C									1		
Mimosaceae	<i>Acacia disparrima ssp. disparrima</i>	Hickory Wattle	C									4		
Mimosaceae	<i>Acacia leiocalyx ssp. leiocalyx</i>	Black Wattle	C								2-3			
Mimosaceae	<i>Acacia spirorbis ssp. solandri</i>	ncn	C	1	1					4	2-4	2		2
Rutaceae	<i>Acronychia laevis</i>	Glossy Acronychia	C		3		3	3			1			
Adiantaceae	<i>Adiantum aethiopicum</i>	Maidenhair Fern	C				2							
Adiantaceae	<i>Adiantum hispidulum var. hispidulum</i>	Rough Maidenhair Fern	C		3		3	3						
Asteraceae	<i>Ageratum conyzoides ssp. conyzoides</i>	Blue Top	C					1			1-2			1
Rubiaceae	<i>Aidia racemosa</i>	Archer Cherry	C	2		1	3	2						
Simaroubaceae	<i>Ailanthus triphysa</i>	White Bean	C						1					
Sapindaceae	<i>Alectryon connatus</i>	Grey Bird's Eye	C		2	1				1				
Sapindaceae	<i>Alectryon tomentosa</i>	Hairy Alectryon	C		1	3				1				
Rhamnaceae	<i>Alphitonia excelsa</i>	Red Ash	C		1					2	2	2		1
Fabaceae	<i>Alysicarpus vaginalis</i>	Alyce Clover	C								1			
Apocynaceae	<i>Alyxia ruscifolia</i>	Chain Fruit	C	2	3	3-4		2						
Loranthaceae	<i>Amyema congener ssp. rotundifolium</i>	Variable Mistletoe	C											
Poaceae	<i>Ancistrachne uncinulata</i>	Hooky Grass	C					1						
Ulmaceae	<i>Aphananthe philippinensis</i>	Rough-Leaved Elm	C		2	1								
Araucariaceae	<i>Araucaria cunninghamii</i>	Hoop Pine	C			6								
Mimosaceae	<i>Archidendron thoetiana</i>	Southern Siris	C	1										
Sterculiaceae	<i>Argyrodendron polyandrum</i>	Brown Tulip Oak	C		3-4	3	5	2						
Poaceae	<i>Aristida gracilipes</i>	(a) wiregrass	C	2										
Poaceae	<i>Aristida queenslandica</i>	(a) wiregrass	C							3	2	2		3
Poaceae	<i>Aristida sp. (n-r)</i>	ncn	C							2				
Sapindaceae	<i>Arytera divaricata</i>	Coogera	C		3		3							

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Polypodiaceae	<i>Asplenium paleaceum</i>	Scaly Asplenium	C		2									
Rubiaceae	<i>Atractocarpus fitzilani</i>	Native Gardenia	C	1										
Fabaceae	<i>Austrosteenisia blackii</i>	Blood Vine	C		4	1	3	3						
Poaceae	<i>Austrostipa sp. (n-r)</i>	ncn	C								1			
Scrophulariaceae	<i>Bacopa procumbens</i>	ncn	*								1			
Euphorbiaceae	<i>Baloghia inophylla</i>	Scrub Bloodwood	C			1	2	3						
Sterculiaceae	<i>Brachychiton australis</i>	Broad-Leaved Bottle Tree	C	1										
Euphorbiaceae	<i>Bridelia leichhardtii</i>	Small-Leaved Scrub Ironbark	C	2										
Capparaceae	<i>Capparis arborea</i>	Native Pomegranite	C		2		3	2						
Capparaceae	<i>Capparis ornans</i>	Showy Caper	C			1								
Apocynaceae	<i>Carissa ovata</i>	Klunkerberry	C		3		3							
Lauraceae	<i>Cassytha filiformis</i>	Dodder Laurel	C				1				1			
Fabaceae	<i>Centrostema molle</i>	Centro	*								1			
Caesalpiniaceae	<i>Chamaecrista rotundifolia</i>	Wynn's Cassia	*											2
Adiantaceae	<i>Cheilanthes distans</i>	Bristle Fern	C								1			
Adiantaceae	<i>Cheilanthes tenuifolia</i>	Rock Fern	C								2	1		
Oleaceae	<i>Chionanthus ramiflora</i>	Native Olive	C		3			4						
Poaceae	<i>Chloris inflata</i>	ncn	*								2			
Poaceae	<i>Chrysopogon fallax</i>	Golden Beard Grass	C								1			
Vitaceae	<i>Cissus cardiophylla</i>	Heart-Leaved Water Vine	C	1										
Vitaceae	<i>Cissus oblonga</i>	Smooth Water Vine	C			4	4	3			1			
Euphorbiaceae	<i>Cleistanthus dallachyanus</i>	ncn	C		3									
Vitaceae	<i>Clematocissus opaca</i>	Forest Grape	C			1								
Verbenaceae	<i>Clerodendrum floribundum</i>	Smooth Lolly Bush	C		4-5						1			
Myrtaceae	<i>Corymbia citridira ssp. citriodora</i>	Lemon-Scented Gum	C									6		
Myrtaceae	<i>Corymbia dallachiana</i>	Dallachy's Gum	C							1	2			3

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Myrtaceae	<i>Corymbia erythrophloia</i>	Variable-Barked Bloodwood	C						1					
Myrtaceae	<i>Corymbia intermedia</i>	Pink Bloodwood	C							2				2
Myrtaceae	<i>Corymbia tessellaris</i>	Carbeen	C		1									1
Myrtaceae	<i>Corymbia trachyphloia</i> ssp. <i>trachyphloia</i>	Brown Blood	C								1-4			
Fabaceae	<i>Crotalaria gorrensii</i>	Gambia Pea	*								1		1	
Lauraceae	<i>Cryptocarya bidwillii</i>	Yellow Laurel	C											
Lauraceae	<i>Cryptocarya triplinervis</i> var. <i>pubescens</i>	Three-Veined Laurel	C		3		2							
Lauraceae	<i>Cryptocarya triplinervis</i> var. <i>triplinervis</i>	Three-Veined Laurel	C					3			1			
Sapindaceae	<i>Cupaniopsis ancardioides</i>	Tuckeroo	C		3-4	3	3	3			1	1		
Asteraceae	<i>Cyanthium cinereum</i>	ncn	C								1			1
Zamiaceae	<i>Cycas media</i>	ncn	C					1		1	1			
Rubiaceae	<i>Cyclophyllum coprosmoides</i>	Coat Canthium	C		2			3						
Orchidaceae	<i>Cymbidium canaliculatum</i>	Black Orchid	C								1			
Cyperaceae	<i>Cyperus sp (n-r)</i>	ncn	C				1							
Fabaceae	<i>Desmodium rhytidophyllum</i>	Hairy Tre-Foil	C							1	2			
Hemerocallidaceae	<i>Dianella caerulea</i>	Blue Flax Lily	C		1					1	1			
Poaceae	<i>Dichanthium aristatum</i>	Angleton Grass	*								1		4	
Poaceae	<i>Digitaria sp. (n-r)</i>	ncn	?							3	3			
Ebenaceae	<i>Diospyros australis</i>	Black Plum	C		1-4									
Ebenaceae	<i>Diospyros geminata</i>	Scaly Ebony	C		1	2	3	2		1	1			1
Ebenaceae	<i>Diospyros hebecarpa</i>	(an) ebony	C								1 (ck)			
Orchidaceae	<i>Dockrilla bowmanii</i>	ncn	C	1										
Sinopteridaceae	<i>Doryopteris concolor</i>	ncn	C			1	3	2						
Polypodiaceae	<i>Drynaria sparsisora</i>	ncn	C			3								
Euphorbiaceae	<i>Drypetes deplanchei</i>	Yellow Tulip	C		3	3-4	3	5		1	1			1
Elaeocarpaceae	<i>Elaeocarpus obovatus</i>	Hard Quandong	C	1										

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Euphorbiaceae	<i>Elaeodendron melanocarpum</i>	Black Olive Plum	C			1	4	1						
Sapindaceae	<i>Elattostachys xylocarpa</i>	White Tamarind	C					2	1					
Poaceae	<i>Eleusine indica</i>	Crows Foot Grass	C								2			
Lauraceae	<i>Endiandra muelleri ssp. bracteata</i>	Rose Walnut	*	2										
Asteraceae	<i>Epaltes australe</i>	ncn	C								3-4			
Poaceae	<i>Eragrostis megalosperma</i>	ncn	C									1		
Poaceae	<i>Eragrostis spartinoides</i>	ncn	C											
Fabaceae	<i>Erythrina vespertilio</i>	Bat Wing Coral Tree	C											2
Myrtaceae	<i>Eucalyptus drepanophylla</i>	Northern Grey Ironbark	C		1		1			5-6	2-5			6
Myrtaceae	<i>Eucalyptus exserta</i>	Queensland Peppermint	C							3	2			
Myrtaceae	<i>Eucalyptus platyphylla</i>	Poplar Gum	C								1	2		4
Myrtaceae	<i>Eucalyptus portuensis</i>	White Mahogany	C							2	1-4			
Myrtaceae	<i>Eucalytus tereticornis</i>	Queensland Blue Gum	C								3 (ck)			
Anacardiaceae	<i>Euroschinus falcata</i>	Ribbonwood	C		2						1			
Laxmanniaceae	<i>Eustrephus latifolius</i>	Wombat Berry	C								2			2
Santalaceae	<i>Exocarpos latifolius</i>	Broad-Leaved Cherry	C		1									
Moraceae	<i>Ficus fraseri</i>	Sandpaper Fig	C	1										
Moraceae	<i>Ficus opposita</i>	Sandpaper Fig	C										2	
Moraceae	<i>Ficus rubiginosa forma rubiginosa</i>	Rock Fig	C		1			1			1			
Moraceae	<i>Ficus watkinsiana</i>	Stangler Fig	C	1										
Rutaceae	<i>Flindersia australis</i>	Crows Ash	C		2	2	2							1
Rutaceae	<i>Flindersia schottiana</i>	Cudgeree	C	1										
Phyllanthaceae	<i>Flueggea leucopyros</i>	Currant Bush	C								1			
Cyperaceae	<i>Gahnia aspera</i>	Saw Sedge	C	1										
Rutaceae	<i>Geijera salicifolia var. latifolia</i>	Braod-Leaved Wilga	C				3				1			1-2
Phyllanthaceae	<i>Glochidion apodogynum</i>	Cheese Tree	C									2		1
Asteraceae	<i>Glossocardia bidens</i>	Native Cobblers Pegs	C											

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Verbenaceae	<i>Glossocarya hemiderma</i>	Glossocarya	C	1										
Fabaceae	<i>Glycine tabacina</i>	Glycine Pea	C											
Fabaceae	<i>Glycine tomentosa</i>	Woolly Glycine	C						1	3				
Rutaceae	<i>Glycosmis trifoliata</i>	Glycosmis	C	1			1							
Apocynaceae	<i>Gomphocarpus physocarpus</i>	Balloon Cotton	*					1						
Myrtaceae	<i>Gossia bidwillii</i>	Python Tree	C		5	5	4	4						
Myrtaceae	<i>Gossia hillii</i>	Scaly Myrtle	C							1 (ck)				
Sapindaceae	<i>Harpullia hillii</i>	Blunt-Leaved Tulip	C			2								
Asteraceae	<i>Helichrysum bracteatum</i>	Golden Everlasting	C							1				
Poaceae	<i>Heteropogon contortus</i>	Bunched Speargrass	C							2				
Poaceae	<i>Heteropogon triticeus</i>	Giant Speargrass	C							2-4	2		3	
Malvaceae	<i>Hibiscus divaricatus</i>	ncn	C						1					
Malvaceae	<i>Hibiscus splendens</i>	ncn	C							2				
Apocynaceae	<i>Hoya australis ssp. australis</i>	Native Hoya	C	2										
Poaceae	<i>Hyparrhenia rufa ssp. rufa</i>	Thatch Grass	*						3	5				
Lamiaceae	<i>Hyptis suaveolens</i>	Hyptis	*							1				
Poaceae	<i>Imperata cylindrica</i>	Blady Grass	C											
Sapindaceae	<i>Jagera psuedorhus var. psuedorhus</i>	Foam Bark	C		3		3	2		1	1			2
Oleaceae	<i>Jasminum didymum ssp. racemosum</i>	Slender Jasmine	C		4	2	5	3		1	1	1		
Rubiaceae	<i>Kailarsenia ochreatea</i>	Native Gardenia	C							1				
Verbenaceae	<i>Lantana camara var. camara</i>	Common Lantana	*						1		3			5
Caesalpiniaceae	<i>Leucaena leucocephala</i>	White Popinac	*							1				
Lamiaceae	<i>Leucas linifolia</i>	ncn	*											1
Laxmanniaceae	<i>Lomandra filiformis ssp. filiformis</i>	(a) mat rush	C		3							2		
Laxmanniaceae	<i>Lomandra multiflora ssp. multiflora</i>	Many-Headed Mat Rush	C		2						3	1		
Myrtaceae	<i>Lophostemon confertus</i>	Brush Box	C						4-5	2-3				2
Myrtaceae	<i>Lophostemon grandiflorus</i>	Northern Swamp Box	C							2				
Myrtaceae	<i>Lophostemon suaveolens</i>	Swamp Box	C								3			
Fabaceae	<i>Macroptilium atropurpureum</i>	Siratro	*							2				

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Euphorbiaceae	<i>Mallotus philippensis</i>	Red Kamala	C		3-4	2	4	4						
Apocynaceae	<i>Marsdenia sp. (n-r)</i>	ncn	C											
Celastraceae	<i>Maytenus disperma</i>	Orange Bush	C			2				2	1			
Poaceae	<i>Megathyrsus maximus var. maximus</i>	Guinea Grass	*								4-5			
Myrtaceae	<i>Melaleuca viridiflora</i>	Broad-Leaved Tea Tree	C								2	3-4		
Myrtaceae	<i>Melaleuca fluviatilis</i>	Paper-Barked Tea Tree	C								2 (ck)			
Poaceae	<i>Melinis minutiflora</i>	Molasses Grass	*								2			
Annonaceae	<i>Melodorum leichhardtii</i>	Zig-Zag Vine	C		4	4	3	3						
Melastomataceae	<i>Memecyclon pauciflorum var. pauciflorum</i>	ncn	C	2										
Rutaceae	<i>Micromelum minutum</i>	Micromelum	C	2									2	
Polypodiaceae	<i>Microsorium sp. (n-r)</i>	ncn	C	1										
Mimosaceae	<i>Mimosa pudica var. unijuga</i>	Common Sensitive Plant	*									2		
Sapindaceae	<i>Mischocarpus anodontus</i>	Veiny Pear-Fruit	C		1									
Myoporaceae	<i>Myoporum acuminatum</i>	Boobialla	C							1	2			
Lauraceae	<i>Neolitsea brassii</i>	Northern Bolly Gum	C	2										
Oleaceae	<i>Notelaea microcarpa var. microcarpa</i>	Narrow-Leaved Mock Olive	C								1 (ck)			
Oleaceae	<i>Olea paniculata</i>	Native Olive	C	1-3			2							
Poaceae	<i>Oplismenus undulatifolius</i>	(a) basket grass	C	2										
Poaceae	<i>Ottochloa gracillima</i>	Gracefull Grass	C											
Pandanaceae	<i>Pandanus cookii</i>	Screw Pine	C								1			
Bignoniaceae	<i>Pandorea pandorana</i>	Wonga Vine	C								1			
Poaceae	<i>Panicum effusum</i>	Hairy Panic	C							1	2	3		
Poaceae	<i>Panicum larconianum</i>	ncn	C									1		3
Mimosaceae	<i>Paraserianthes toona</i>	Mackay Cedar	C		1	1	1	2			1			
Apocynaceae	<i>Parsonsia longipetiolata</i>	Green-Leaved Silk Pod	C		1									

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Apocynaceae	<i>Parsonsia paulforsteri</i>	Narrow-Leaved Silkpod	C				2	1						
Apocynaceae	<i>Parsonsia velutina</i>	Hairy Silkpod	C				1							
Passifloraceae	<i>Passiflora foetida</i>	Stinking Passionvine	*								1 (ck)			
Passifloraceae	<i>Passiflora suberosa</i>	Corky Passionvine	*			1	3	2						
Rubiaceae	<i>Pavetta australiensis</i>	Butterfly Bush	C		1		1							
Asteraceae	<i>Peripleura hispidula</i>	ncn	C							1	1	2		
Phyllanthaceae	<i>Phyllanthus gunnii</i>	Gunn's Phyllanthus	C			1								
Phyllanthaceae	<i>Phyllanthus sp. (n-r)</i>	ncn	C							1				
Pittosporaceae	<i>Pittosporum ferrugineum ssp. linifolium</i>	Rusty Pittosporum	C		2									
Menispermaceae	<i>Pleioogyne australe</i>	Wiry Grape	C		2		2	3						
Anacardiaceae	<i>Pleiogynium timorensis</i>	Burdekin Plum	C	1		3	2	3						
Rubiaceae	<i>Pogonolobus reticulatus</i>	ncn	C						1					
Annonaceae	<i>Polyalthia nitidissima</i>	Canary Beech	C		3-4	3	3	3						
Araliaceae	<i>Polyscias elegans</i>	Celery Wood	C		2	2	4				1	1		
Fabaceae	<i>Pongamia pinnata</i>	ncn	C				2							
Sapotaceae	<i>Pouteria cotinifolia var. pubescens</i>	Yellow Lemon	C	2	3	2	1							
Sapotaceae	<i>Pouteria myrsinifolia</i>	Blunt-Leaved Coondoo	C	1										
Sapotaceae	<i>Pouteria pohlmaniana</i>	Yellow Boxwood	C	2										
Sapotaceae	<i>Pouteria sericea</i>	Wild Prune	C			2	1							
Asteraceae	<i>Praxellis clematidea</i>	Praxellis	*										1-2	
Rubiaceae	<i>Psychotria sp. (Shute Harbour L.J. Webb 7916)</i>	ncn	C		3	3								
Rubiaceae	<i>Psydrax attenuatum</i>	ncn	C						1					
Rubiaceae	<i>Psydrax lamprophyllum</i>	Large-Leaved Canthium	C				1							
Rubiaceae	<i>Psydrax odorata forma australiana</i>	Shiny Canthium	C		2		2	2		1	1	1		
Asteraceae	<i>Pterocaulon redolens</i>	ncn	C						1					
Asteraceae	<i>Pterocaulon sphacelatum</i>	Applebush	C								1			2

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Polypodiaceae	<i>Pyrrhosia confluens</i>	Robber Fern	C	1										
Poaceae	<i>Rhynchelytrum repens</i>	Red Natal Grass	*								1			
Lamiaceae	<i>Salvia reflexa</i>	Mintweed	*											1
Cyperaceae	<i>Scleria mackaviensis</i>	ncn	C								1			1
Flacourtiaceae	<i>Scolopia braunii</i>	Flintwood	C	1										
Apocynaceae	<i>Secamone elliptica</i>	Corky Milk Vine	C						1					
Caesalpinaceae	<i>Senna obtusifolia</i>	Sicklepod	*											1
Poaceae	<i>Setaria oplismenioides</i>	ncn	C				1	1						
Malvaceae	<i>Sida cordifolia</i>	Flannel Weed	C								1	1		2
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne	*							1				1
Malvaceae	<i>Sida subspicata</i>	Spiked Sida	C						2					
Asteraceae	<i>Sigesbeckia orientalis</i>	Indian Weed	*						1					
Smilacaceae	<i>Smilax australis</i>	Austral Sarsparilla	C		3	1	1	1						
Solanaceae	<i>Solanum nigrum</i>	Balckberry Nightshade	*								2			
Solanaceae	<i>Solanum seafortianum</i>	Brazilian Nightshade	*		1			2		1				
Asteraceae	<i>Sonchus oleraceus</i>	Milk Thistle	*								2-3			
Verbenaceae	<i>Spartothamnella juncea</i>	Red-Fruited Stick Plant	C	1										
Rubiaceae	<i>Spermacoce brachystema</i>	ncn	C								1	1		1
Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Blue Snakeweed	*								1			3-4
Menispermaceae	<i>Stephania japonica var. discolor</i>	Tape Vine	C	1										
Moraceae	<i>Streblus brunonianus</i>	Whalebone Tree	C		2									
Logoniaceae	<i>Strychnos psilosperma</i>	Strychnine Tree	C		3		2							
Fabaceae	<i>Stylosetos scabra</i>	Shrubby Stylo	*								3	1		1
Myrtaceae	<i>Syzygium australe</i>	Brush Cherry	C	1										
Combretaceae	<i>Terminalia porphyrocarpa</i>	(a) damson tree	C		1	3	3	4						
Vitaceae	<i>Tetrastigma nitens</i>	Native Grape	C	2			1							
Poaceae	<i>Themeda quadrivalvis</i>	Grader Grass	*								1			
Poaceae	<i>Themeda triandra</i>	Kangaroo Grass	C									5		

Family	Botanical Name	Common Name	Status	8.12.3a					8.12.5a		8.12.7a		8.12.12a	
				trav	S005	S011	S017	S024	trav	S009	trav	S003	trav	S021
Ulmaceae	<i>Trema tomentosa var. tomentosa</i>	Poison Peach	C								2			
Asteraceae	<i>Tridax procumbens</i>	Tridax Daisy	*								2-3			
Rubiaceae	<i>Triflorensia ixoroides</i>	Shiny-Leaved Tarrena	C		2									
Ulmaceae	<i>Triumfetta rhomboidea</i>	Chinese Burr	*									2		1
Moraceae	<i>Trophis scandens</i>	Burney Vine	C		4		3	2			1 (ck)			
Poaceae	<i>Urochloa mosambicensis</i>	Sabi Grass	*								2			
Asteraceae	<i>Xanthium pungens</i>	Noogoora Burr	*											2
Laxmanniaceae	<i>Xanthorrhoea latifolia ssp. latifolia</i>	Forest Grass Tree	C							4		3-4		
Fabaceae	<i>Zornia sp.</i>	ncn	C								1			

Legend

- NCA status indicates the Queensland conservation status of each taxon under the *Nature Conservation (Wildlife) Regulation 2006*. The codes are Common ('C'), non-local Australian native ('NL'), cultivated Australian native ('n/a') and Naturalised Exotic (*). Specimens of threatened taxa which were recorded on site – Rare (R).
- 'trav' indicates the species was recorded during a traverse through the particular vegetation type.
- NOTE: Individual species were not listed for RE 8.11.1 as a Secondary Level assessment site was not performed within this vegetation type due to either the small size of the identified polygons or degree of fragmentation and degradation
- Relative abundance species was based on the Braun-Blanquet technique cover-abundance scale (Mueller-Dombois & Ellenberg 1974) as follows:
 - 1 = sparse, <5%;
 - 2 = any number, <5%;
 - 3 = 5 – 25%;
 - 4 = 25 – 50%;
 - 5 = 50 – 75%;
 - 6 = 75 – 100%.

Appendix C

Details of Mapped Hollow Bearing Trees

Table C1: Hollow Bearing Trees Recorded from the Study Area

Tree #	Wypt #	Photo #	Easting	Northing	Approx. Chainage	Tree Common Name	Tree Scientific Name	Tree DBH	Hollow description	Potential Fauna Use
1	33	1	701027	7638497	320	Lemon-scented Gum	<i>Corymbia citriodora ssp. citriodora</i>	700	Two large hollows and possible small hollows	Birds, bats and mammals
2	34	2	701024	7638526	350	Poplar Gum	<i>Eucalyptus platyphylla</i>	400	Small branch hollow	Small mammals and bats
3	35	4	700994	7638567	400	Stag	-	500	Small basal entrance to hollow stag	Mammals
4	36	5	700963	7638568	430	Queensland Peppermint	<i>Eucalyptus exserta</i>	600	Medium branch hollow	Birds, bats and mammals
5	37	6	700966	7638585	450	Queensland Peppermint	<i>Eucalyptus exserta</i>	400	Medium trunk hollow	Birds, bats and mammals
6	38	7	700925	7638601	490	Stag	-	350	Medium branch hollow	Birds, bats and mammals
7	39	8	700919	7638608	490	Queensland Peppermint	<i>Eucalyptus exserta</i>	400	Decayed medium branch hollow	Birds, bats and mammals
8	40	9	700925	7638634	505	Dead Ironbark	<i>Dead Ironbark</i>	400	Deep bark fissure	Bats
9	41	10	700909	7638669	540	Lemon-scented Gum	<i>Corymbia citriodora ssp. citriodora</i>	300	Medium branch hollow	Birds, bats and mammals
10	42	11	700873	7638697	585	Dead Poplar Gum	<i>Dead Eucalyptus platyphylla</i>	300	Large trunk hollow	Birds, bats and mammals
11	43	12	700740	7638887	820	Poplar Gum	<i>Eucalyptus platyphylla</i>	300	Medium branch hollow	Birds, bats and mammals
12	44	13	700667	7639012	970	Lemon-scented Gum	<i>Corymbia citriodora ssp. citriodora</i>	1000	Large trunk and branch hollows	Birds, bats and mammals
13	45	14	700685	7639037	970	Lemon-scented Gum	<i>Corymbia citriodora ssp. citriodora</i>	1000	Large trunk and branch hollows	Birds, bats and mammals
14	46	15	700609	7639086	1060	Lemon-scented Gum	<i>Corymbia citriodora ssp. citriodora</i>	400	Medium trunk hollow	Birds, bats and mammals
15	47	16	700599	7639099	1070	Poplar Gum	<i>Eucalyptus platyphylla</i>	300, 250 & 250	Group of three trees with multiple small branch hollows	Small mammals and bats
16	49	19	700644	7639093	1050	Lemon-scented Gum	<i>Corymbia citriodora ssp. citriodora</i>	600	Medium branch hollow	Birds, bats and mammals
17	50	20	700609	7639121	1075	Swamp Box	<i>Lophostemon suaveolens</i>	500	Medium trunk hollow	Birds, bats and mammals
18	51	21	700612	7639142	1095	Pink Bloodwood	<i>Corymbia intermedia</i>	600	Multiple trunk and branch hollows	Birds, bats and mammals
19	52	23	700592	7639162	1130	White Mahogany	<i>Eucalyptus portuensis</i>	800	Multiple branch hollows	Birds, bats and mammals

20	53	24	700575	7639162	1130	White Mahogany	<i>Eucalyptus portuensis</i>	450	Multiple small branch hollows	Small mammals and bats
21	54	25	700576	7639168	1150	White Mahogany	<i>Eucalyptus portuensis</i>	600	Large trunk hollow	Birds, bats and mammals
22	55	26	700584	7639186	1150	White Mahogany	<i>Eucalyptus portuensis</i>	600	Small branch hollow	Small mammals and bats
23	56	27	700574	7639212	1180	Stag	-	600	Medium branch hollow	Birds, bats and mammals
24	57	28	700586	7639219	1180	Stag	-	600	Medium branch hollows	Birds, bats and mammals
25	59	31	700545	7639335	1310	White Mahogany	<i>Eucalyptus portuensis</i>	800	Multiple branch hollows	Birds, bats and mammals
26	60	32	700535	7639359	1330	Pink Bloodwood	<i>Corymbia intermedia</i>	700	Multiple medium and large branch hollows	Birds, bats and mammals
27	61	33	700521	7639353	1335	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	600	Medium branch hollow	Birds, bats and mammals
28	62	34	700543	7639381	1350	Stag	-	500	Medium and small branch hollows	Birds, bats and mammals
29	63	35	700528	7639419	1400	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Small branch hollow	Small mammals and bats
30	64	37	700515	7639486	1465	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow	Birds, bats and mammals
31	65	38	700511	7639493	1470	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow	Birds, bats and mammals
32	66	39	700502	7639497	1475	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow	Birds, bats and mammals
33	67	40	700475	7639618	1600	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Small branch hollow	Small mammals and bats
34	68	41	700464	7639631	1625	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	600	Small branch hollow	Small mammals and bats
35	69	47	700423	7639809	1795	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Large branch hollow	Birds, bats and mammals
36	70	49	700421	7639918	1900	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Small branch hollow	Small mammals and bats
37	71	50	700410	7639924	1910	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Bark fissure	Bats
38	72	51	700403	7639964	1960	White Mahogany	<i>Eucalyptus portuensis</i>	450	Medium branch hollow	Birds, bats and mammals
39	73	52	700417	7639978	1965	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	550	Medium and large branch hollows	Birds, bats and mammals

40	74	53	700365	7640017	2010	Stag	-	450	Small branch hollow	Small mammals and bats
41	75	54	700390	7640037	2020	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	600	Medium branch hollow	Birds, bats and mammals
42	76	55	700382	7640048	2040	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Large branch hollow	Birds, bats and mammals
43	77	56	700397	7640057	2040	Stag	-	450	Small branch hollow	Small mammals and bats
44	78	57	700385	7640115	2100	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Two medium branch hollows	Birds, bats and mammals
45	79	58	700370	7640135	2130	White Mahogany	<i>Eucalyptus portuensis</i>	300	Small branch hollow	Small mammals and bats
46	80	59	700369	7640151	2140	Queensland Peppermint	<i>Eucalyptus exserta</i>	450	One small and one medium branch hollow	Birds, bats and mammals
47	81	60	700362	7640162	2155	Queensland Peppermint	<i>Eucalyptus exserta</i>	450	Several small and medium branch hollows	Birds, bats and mammals
48	82	61	700376	7640188	2165	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	600	Large trunk hollow	Birds, bats and mammals
49	83	62	700355	7640218	2210	Poplar Gum	<i>Eucalyptus platyphylla</i>	250	Small trunk hollow	Small mammals and bats
50	84	63	700353	7640244	2240	Queensland Peppermint	<i>Eucalyptus exserta</i>	600	Small and large branch hollows	Birds, bats and mammals
51	85	64	700347	7640270	2265	Queensland Peppermint	<i>Eucalyptus exserta</i>	450	Medium trunk hollow	Birds, bats and mammals
52	86	65	700342	7640269	2265	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Two medium branch hollows	Birds, bats and mammals
53	87	66	700362	7640264	2260	Stag	-	250	Medium trunk hollow	Birds, bats and mammals
54	88	67	700367	7640273	2265	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium decayed branch hollow	Bats
55	89	68	700373	7640268	2265	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium branch hollow	Birds, bats and mammals
56	90	69	700344	7640372	2360	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	550	Large trunk hollow	Birds, bats and mammals
57	91	70	700324	7640391	2370	Stag	-	450	Medium decayed branch hollow	Bats
58	92	71	700318	7640400	2380	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium branch hollow	Birds, bats and mammals
59	93	72	700307	7640408	2400	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch and trunk hollow	Birds, bats and mammals

60	94	73	700298	7640456	2445	Dead Northern Grey Ironbark	<i>Dead Eucalyptus drepanophylla</i>	450	Medium trunk hollow	Birds, bats and mammals
61	95	74	700291	7640452	2450	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium trunk hollow	Birds, bats and mammals
62	96	75	700296	7640462	2460	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium trunk hollow	Birds, bats and mammals
63	97	76	700284	7640542	2540	Poplar Gum	<i>Eucalyptus platyphylla</i>	300	Medium branch hollow	Birds, bats and mammals
64	98	77	700262	7640606	2620	Queensland Peppermint	<i>Eucalyptus exserta</i>	400	Medium branch hollow	Birds, bats and mammals
65	99	79	700216	7640684	2655	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow	Birds, bats and mammals
66	103	83	700201	7640825	2837	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium decayed branch hollow	Bats
67	104	84	700198	7640808	2820	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	600	Medium branch hollow & bark fissure	Birds, bats and mammals
68	105	85	700184	7640797	2810	Dead Northern Grey Ironbark	<i>Dead Eucalyptus drepanophylla</i>	450	Medium spout hollow	Birds, bats and mammals
69	106	86	700209	7640790	2820	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow	Birds, bats and mammals
70	107	87	700199	7640777	2780	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow & bark fissure	Birds, bats and mammals
71	108	88	700212	7640748	2765	Stag	-	450	Small trunk and medium branch hollow	Birds, bats and mammals
72	109	89	700201	7640744	2765	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Two medium branch hollows	Birds, bats and mammals
73	110	90	700200	7640733	2750	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium trunk and branch hollows	Birds, bats and mammals
74	111	91	700201	7640717	2735	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Small trunk hollow	Small mammals and bats
75	112	92	700206	7640712	2730	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Small trunk hollow	Small mammals and bats
76	113	93	700207	7640694	2710	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium branch hollow	Birds, bats and mammals
77	114	94	700204	7640690	2710	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	500	Medium branch hollow	Birds, bats and mammals
78	116	96	700220	7640731	2880	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	400	Small branch hollow	Small mammals and bats
79	117	97	700172	7640872	2875	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	700	Multiple small and medium branch hollows	Birds, bats and mammals

80	118	98	700172	7640896	2900	Two stags	-	450	Medium branch hollows	Birds, bats and mammals
81	119	99	700183	7641027	3045	Archer Cherry	<i>Aidia racemosa</i>	200	Small trunk hollow	Small mammals and bats
82	121	100	700188	7641062	3075	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	700	Medium branch hollow	Birds, bats and mammals
83	122	101	700189	7641092	3110	Variable-barked Bloodwood	<i>Corymbia erythrophloia</i>	350	Small branch hollow	Small mammals and bats
84	123	102	700200	7641123	3140	Poplar Gum	<i>Eucalyptus platyphylla</i>	300	Small trunk hollow	Small mammals and bats
85	124	104	700220	7641173	3195	Variable-barked Bloodwood	<i>Corymbia erythrophloia</i>	350	Medium branch hollow	Birds, bats and mammals
86	125	105	700239	7641183	3200	Stag	-	450	Small & medium branch hollows	Birds, bats and mammals
87	126	106	700225	7641199	3210	Poplar Gum	<i>Eucalyptus platyphylla</i>	300	Medium trunk hollow	Birds, bats and mammals
88	127	107	700230	7641207	3220	Stag	-	450	Medium branch hollow	Birds, bats and mammals
89	128	108	700217	7641223	3240	Stag	-	600	Three medium branch hollows	Birds, bats and mammals
90	129	109	700236	7641221	3240	Stag	-	500	Two medium branch hollows	Birds, bats and mammals
91	130	110	700246	7641292	3320	Pink Bloodwood	<i>Corymbia intermedia</i>	500	Two medium branch hollows	Birds, bats and mammals
92	131	111	700272	7641331	3355	Stag	-	400	Medium decayed branch hollow	Bats
93	132	112	700263	7641346	3365	Stag	-	450	Large decayed trunk hollow	Bats
94	133	113	700277	7641366	3395	Stag	-	350	Medium branch hollow	Birds, bats and mammals
95	134	114	700276	7641372	3400	Pink Bloodwood	<i>Corymbia intermedia</i>	500	Medium & small branch hollow	Birds, bats and mammals
96	135	115	700285	7641398	3460	Pink Bloodwood	<i>Corymbia intermedia</i>	450	Small branch hollow	Small mammals and bats
97	136	116	700279	7641400	3460	Pink Bloodwood	<i>Corymbia intermedia</i>	600	Medium branch hollow	Birds, bats and mammals
98	137	118	700311	7641440	3475	Variable-barked Bloodwood	<i>Corymbia erythrophloia</i>	500	Two medium branch hollows	Birds, bats and mammals
99	138	120	700354	7641512	3560	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	550	Two medium and 1 large branch hollows	Birds, bats and mammals
100	139	121	700361	7641572	3620	Poplar Gum	<i>Eucalyptus platyphylla</i>	450	Medium branch hollow	Birds, bats and

										mammals
101	141	123	700411	7641611	3680	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	450	Medium branch hollow	Birds, bats and mammals
102	142	124	700404	7641674	3730	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	650	Two medium and 1 small branch hollows	Birds, bats and mammals
103	143	126	700431	7641773	3830	Northern Grey Ironbark	<i>Eucalyptus drepanophylla</i>	600	Large branch hollow	Birds, bats and mammals
104	144	127	700478	7641872	3945	Variable-barked Bloodwood	<i>Corymbia erythrophloia</i>	400	Medium branch hollow	Birds, bats and mammals
105	145	128	700464	7641975	4080	Poplar Gum	<i>Eucalyptus platyphylla</i>	400	Medium and small branch hollows	Birds, bats and mammals
106	146	129	700473	7641977	4080	Poplar Gum	<i>Eucalyptus platyphylla</i>	400	Small branch hollow	Small mammals and bats
107	147	132	700560	7642200	4280	Northern Swamp Box	<i>Lophostemon grandiflorus</i>	450	Three small trunk hollows	Small mammals and bats