Ecological Assessment Report

Redlands Sports Precinct

NE30016



Prepared for
Redland City Council

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Cardno

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1 Introduction

Redland City Council (Council) is pursuing the delivery of the Redlands Coast Regional Sports and Recreation Precinct (the Precinct) as part of the master planned development (the Project) of the property located at 277-293 Heinemann Road, Mount Cotton, also described as Lot 420 on S312160 (the Site).

Cardno was commissioned by Council to prepare this Ecological Assessment Report (EAR). The primary purpose of the EAR is to identify how the development proposal responds to the below-listed requirements:

- Environmental Significance Overlay Code and other relevant codes under Redland City Planning Scheme; and
- Federal and State legislation pertaining to ecological matters.

It is understood that Council proposes to rezone the Site from the Rural to Recreation and Open Space under a planning scheme amendment. This EAR builds on the Ecological Assessment completed by Cardno (July 2019) which identified ecological features that require careful consideration for the Master Plan development of the precinct.

1.1 Site Description

In accordance with the Redland *City Plan 2018*, the Site is currently located within the Rural zone and is adjoined by agricultural and residential uses. Presently, the northern extent of the Site contains open woodland and is used for cattle grazing and has been historically cleared, and is degraded as a result of ongoing agricultural use (**Plates 1 and 2**). The southern portion of the Site, though subject to historic logging, is heavily vegetated, supporting Least Concern, Of Concern and Endangered Regional Ecosystems (**Plate 3**). Mapped watercourses traverse the Site from the north and extend along the western boundary (**Plate 4**). An additional watercourse is mapped in the south east of the Site. The location of the Site and its immediate surrounds is shown in **Figure 1**.



Plate 1: Cattle with cattle egrets in northern extent of the Site.



Plate 2: Open woodland within the northern extent of the Site.



Plate 3: View of remnant vegetation within southern portion of the Site.



Plate 4: Aquatic habitat within the northern extent of the Site.

1.2 Development Description

The purpose of the Precinct is to deliver sport, recreation and conservation outcomes for the community. The Site on which the Precinct is proposed to be developed is approximately 101 hectares (ha) in size. The northern portion of the Site will primarily accommodate sporting facilities, while the southern extent includes an estimated 52 ha which will be retained and enhanced as a conservation reserve.

The Master Plan (**Appendix A**) has the following objectives:

- to provide a framework for built infrastructure that appropriately supports sporting activity and recreation;
- to encourage informal recreation activities to be enjoyed by the general community;
- to consider the wider impacts that can be achieved at other community facilities throughout the city as a result of planned development at the Precinct;
- to create safe access and integrated movement through and to the Precinct;
- to promote the natural environment, sustainable development, and practicable maintenance regimes; and
- to foster partnerships for capital development and ongoing management of the Precinct.

The Master Plan states that the Precinct will include the below-listed sub-precincts.

1. Sports field sub-precinct - Includes lit rectangular playing fields on benches, two clubhouses, formal and overflow car parking and small recreation node.
2. Recreation sub-precinct - Includes regional-level play and activity node, barbecues and picnic facilities, kickabout and field games area, sealed multi-use paths and formal car parking.
3. Bike activity sub-precinct - Includes criterium track incorporating three loops, bmx track with track marshal's observation tower and administration booth, pump track, shared clubhouse, formal and overflow car parking.
4. Wetland and forest sub-precinct - Includes sealed multi-use paths, raised boardwalks, unsealed tracks amongst inviting vegetation and wetland areas.
5. Conservation sub-precinct - Includes unsealed tracks and trails for a mix of users.

The Master Plan is provided in **Appendix A**.

2 Methodology

2.1 Desktop Assessment

Prior to undertaking the field assessment, a review of contemporary information was completed by a suitably qualified ecologist. This desktop assessment involved collation and review of relevant information concerning endangered, vulnerable and near threatened (EVNT) flora species likely to occur in the Site locality. The purpose of the desktop assessment was to:

- refine a list of EVNT species to be targeted during the field investigation which had the highest likelihood of occurring on the Site; and
- source available information concerning the specific habitat requirements of the EVNT species as well as to aid in identifying the target species.

A range of database resources and mapping products were utilised as part of the desktop review. Presented below is a list of the contemporary database and mapping resources used, where applicable the outputs from these searches have been presented in **Appendix B**.

- The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool.
- The Wildlife Online database which is maintained by the Queensland Department of Environment and Science (DES).
- The Atlas of Living Australia (ALA) database and Australia's Herbarium database to identify known records of EVNT, least concern and pest species recorded within the vicinity of the Site (these resources include Herbarium HERBREC's records).
- The Regulated Vegetation Management Map produced by the Department of Natural Resources, Mines and Energy (DNRME) for the purposes of the *Vegetation Management Act 1999* (VMA).
- The Protected Flora Survey Trigger Map produced by DES, to identify survey and permit requirements relating to EVNT plants.
- The Pre-clearing Regional Ecosystems map produced by DES.
- The Biodiversity Planning Assessment for the South-east Queensland Bioregion spatial layer produced by DES.
- The mapping and planning requirements associated with the Koala habitat in South-east Queensland (SEQ).
- State Planning Policy (SPP) and Development Assessment mapping tools maintained by the Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP).
- Queensland Globe mapping layers including Koala habitat.
- High resolution aerial photography sourced from Nearmap.
- Ecological Assessment – Redlands Coast Regional Sport and Recreational Facility (Cardno, 2019).

All mapping searches were centred on Latitude: -27.6176, Longitude: 153.2545 with a 3 km buffer, or using Lot 420 on S312160.

To further inform the assessment, the resources in **Table 2-1** were also reviewed.

The process of refining the list of fauna and flora species to be targeted in the field assessment involved reviewing the known and specific habitat requirements for each species and comparing against the known or expected availability of such resources within the Site and immediate surrounds. For each of the identified species, an assessment of the likelihood of occurrence was undertaken with each species being assigned to one of the below-listed categories.

- **Known**: The species has been positively recorded in the Site by a qualified ecologist during past 30 years.

- **Likely**: Suitable habitat for the species occurs in the Site and proximate records[1] exist.
- **Possible**: Suitable habitat for the species occurs on Site but no recent records from the Site or proximate areas exist OR suitable habitat for the species may not occur in the Site but recent records from proximate areas exist.
- **Unlikely**: Suitable habitat for the species does not occur in the Site, and no recent records from the Site or proximate areas exist.

The assessment of the likelihood of occurrence is presented in **Appendix C**.

Table 2-1 Reviewed resources.

Document Scale	Document	Author and date reference
Site specific	Redlands Coast Regional Sport and recreation Precinct Master Plan 2020-2030	Ross Planning (April 2020)
	Detailed Site Survey	AAM (2018)
City-wide	Redland City Plan 2018	Redland City Council (2018)
	Environmental Significance Overlay Code	Redland City Council (2018)
	Waterway Corridors and Wetlands Overlay Code	Redland City Council (2018)
	Planning Scheme Policy (PSP) 1 – Environmental Significance	Redland City Council (2018)
	Wildlife Connections Plan 2018 - 2028	Redland City Council (2018)
State-wide	Koala-Sensitive Design Guideline - A guide to koala-sensitive design measures for planning and development activities	DES (2020)

2.2 Field Assessment Methodology

2.2.1 Flora Assessment

A detailed flora assessment was undertaken on the 10 June 2020 by two Cardno ecologists. The flora assessment aimed to build on previous lists prepared for the Site (Cardno, 2019), identify locations of species of significance and flag weed 'hot spots'. The detailed flora assessment focussing on the northern portion of the Site included:

- site walkover identifying species not previously recorded;
- identification of species of significance; and
- identification and mapping of weed 'hot spots' in accordance with the Queensland Department of Fisheries and Agricultural 'Spatial Pest Attributes Standard Queensland' (DAF, 2012). Infestations of weed species are estimated as 'Scattered', "Low', 'Moderate' and 'High' within the northern portion of the Site.

2.2.2 General Fauna Assessment

The survey techniques outlined in **Table 2-2** employed during the Cardno (2019) Ecological Assessment were augmented by the additional survey effort in 2020 as specified. Fauna surveys completed include:

- One day and one night during a one-day survey period in winter (10th June 2020).

[1]Proximate records are highly reliable records (i.e. identified through GPS precision or an accurate location description) that fall within the search area that are <50years in age.

- Three days and two nights during a 28-day survey period in spring (16th – 17th September and 15th October 2020).
- Five days and four nights during a 14-day survey period in winter (4th – 7th and 17th June 2019).

Specific survey methods were also utilised to target detection of the following species or groups of species:

- Microbats,
- *Pteropus poliocephalus* (Grey-headed flying-fox),
- Gliders (including *Petauroides Volans* (Greater glider), *Petaurus breviceps* (Sugar glider), *Petaurus norfolcensis* (Squirrel glider), and *Petaurus australis* (Yellow-bellied glider)),
- *Ninox strenua* (Powerful owl), and
- *Phascolarctos cinereus* (Koala).

The location of passive monitoring devices and other survey activities completed within the Site during both studies are shown on **Figure 2**.

Table 2-2 Fauna survey details.

Survey Technique	Cardno (2019)	Cardno (2020)
Active diurnal searches	For herpetofauna completed over four days.	Active diurnal searches for herpetofauna were conducted over three days.
Bird Survey	▪ Active diurnal searches (eight 10min searches within Site) completed over four days (suitable for detection of bird species including Powerful owl) ▪ Dawn chorus survey completed over two mornings	▪ Active diurnal bird searches completed over three days. ▪ Dawn chorus surveys completed over two mornings at sunrise (effective for the detection of birds). ▪ Call play-back conducted over three nights (suitable for detection of Powerful owl).
Spotlighting	Over four nights, and including stag watching. Targeting Koala, Greater glider and other gliders (i.e. Sugar glider, Squirrel glider, and Yellow-bellied glider).	Spotlighting and stag watching conducted over three nights.
Call playback	Over three nights, in key habitat locations. Species targeted: ▪ Koala; and ▪ gliders (Squirrel glider, Sugar glider).	Call playback at key habitat locations over three nights (effective for detection of frogs, birds and some mammals).
Camera traps	20 traps were deployed for a two-week period, baited with universal bait or meat (sardines).	20 traps were deployed for a four-week period, baited with universal bait or meat (sardines).
Opportunistic searches	Searches for signs of wildlife including tracks and scats (collectively effective for mammals, birds and reptiles) over four days.	Searches for signs of wildlife including tracks and scats (collectively effective for mammals, birds and reptiles) over three days.
Microbat Surveys	Deployed for 14 nights in an area of suitable habitat. A specialist sub-consultant was engaged to analyse calls.	Active searches for bat activity in suitable habitat areas. Calls recorded using a Song Meter. Passive deployment of a Song Meter detector for four weeks.
Habitat Assessments	Habitat condition assessments were completed at each Quaternary Tertiary site. Individual features (e.g. hollow bearing trees, stags, nests) were also recorded as potential habitat for species of significance (e.g. gliders).	All habitat features that may be impacted as part of the project will be recorded using handheld GPS as part of the Vegetation Management Plan
Aquatic surveys	NA	▪ Traversal of mapped watercourses and drainage features to map and assess sites for aquatic habitat features (i.e. riffles, ponds, snags, undercut banks), instream

Survey Technique	Cardno (2019)	Cardno (2020)
		vegetation and shading, channel width, bank height, and substrate material. ▪ Deployment of collapsible box traps for a (deployed for a period of six to eight hours), and scoop/dip netting in suitable aquatic fauna habitat (e.g. undercut banks, instream and under riparian vegetation) to assess native and exotic aquatic species presence and abundance of watercourses, drainage features, and dams over the course of three days. Scoop/dip nets were used three times in each waterbody encountered; however, the length of use and distance travelled varied depending on the size of each waterbody. ▪ Visual assessment of freshwater turtle basking sites (e.g. exposed logs, rocks, sandbanks) to identify species present. ▪ Observation and mapping of aquatic weed species.

2.2.3 Targeted Fauna Assessments

In addition to the general fauna survey and habitat assessment methodology described above, targeted surveys were completed for species identified by desktop assessment as 'known' or 'likely' to occur within the Site. Species-specific survey methods are described below.

2.2.3.1 Greater Glider and other gliders

The techniques outlined in **Table 2-3** were utilised for the detection of Greater glider, and other gliders within the Site.

Table 2-3 Survey techniques for gliders.

Survey Technique	Cardno (2019)	Cardno (2020)
Spotlighting	Four nights (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).	Three nights (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).
Stag watching	One nights (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).	Three nights (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).
Call playback	Four nights (effective for sugar and squirrel glider but not Greater glider as this species is not known to vocalise).	Three nights (effective for sugar and squirrel glider but not Greater glider as this species is not known to vocalise).
Habitat assessment (searches for presence and abundance of suitable food and habitat trees)	Four days (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).	Three days (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).
Camera traps positioned on potential den trees	Two weeks (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).	Four weeks (suitable for detection of Greater glider, Sugar glider, Squirrel glider, and Yellow-bellied glider).

2.2.3.2 Bats

Spotlighting was completed over four nights, targeting foraging habitat for flying-foxes (including Grey-headed flying-foxes). Searches for camps were completed whilst moving throughout the Site.

A targeted assessment for microbats was completed using the techniques: outlined in **Table 2-4**.

Table 2-4 Survey techniques for bats.

Survey Technique	Cardno (2019)	Cardno (2020)
Harp trap	One harp trap was deployed over a suitable flyway for one night.	NA
Song Meter	A Song Meter was deployed for a period of two weeks to collect bat calls.	A Song Meter was deployed for a period of four weeks to collect bat calls. Refer to **Section 2.2.4** regarding the deployment period of the Song Meter for further information.
Echometer	NA	An Echo Meter Touch bat detector and recorder was used for two nights to collect bat calls in areas of suitable habitat.

2.2.3.3 Koala

Targeted koala surveys conducted during the initial Ecological Assessment (2019) followed the Koala Rapid Assessment Methodology (KRAM) described by Woosnam-Merchez *et al.* (2012). The KRAM is flexible and relies on practitioners to develop their own repeatable approach that is based on set parameters.

The approach Cardno has successfully used on multiple projects involves:

1. Stratification of the vegetation of a Site. For the previous study vegetation was stratified using regional ecosystems - remnant and regrowth vegetation status as a surrogate.
2. Locating a 100m transect in the community along which three 10x10m plots were established at randomised intervals along the transect on alternating sides as illustrated in **Plate 5**, below.

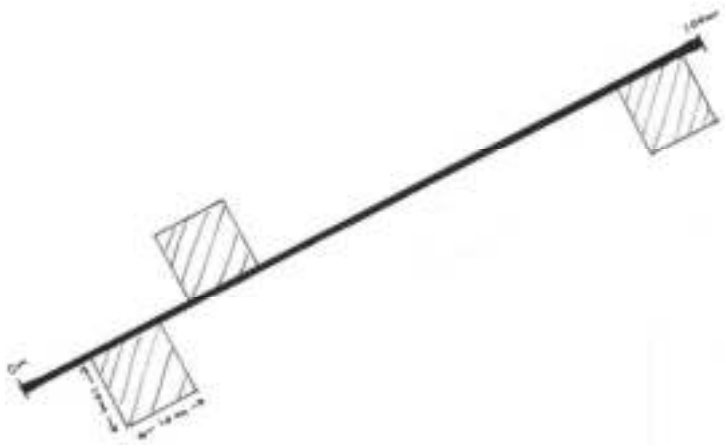


Plate 5: Typical configuration of a KRAM Site.

3. In each plot a distance of 1m was surveyed away from tree trunks and searching continued until such time that a Koala scat was recorded or every tree >10cm diameter at breast height, irrespective of species, had been surveyed.

The locations of the six KRAM transects are displayed in **Figure 2**.

In addition to the KRAM, the survey techniques detailed in **Table 2-5** were also completed to target Koalas.

Table 2-5 Survey techniques for Koalas.

Survey Technique	Cardno (2019)	Cardno (2020)
Incidental diurnal survey observations	Searches for signs of Koalas including scathes and scats over four days.	Searches for signs of Koalas including scathes and scats over three days.
Call playback and spotlighting	Four nights of call playback for Koala.	Three nights of call playback for Koala.

Survey Technique	Cardno (2019)	Cardno (2020)
Potential detection via camera traps	20 traps were deployed for a two-week period.	20 traps were deployed for a four-week period.
Opportunistic assessment for scats and scratches, the locations of scats were recorded by handheld GPS where detected	Searches of scats and scratches were completed at opportunistic locations over four days.	Searches of scats and scratches were completed at opportunistic locations over three days.

Additionally, assessments to confirm presence of Koala habitat were completed in 2019. Density estimates for Koala habitat trees were completed using the point-centred quarter method (PCQM) and density estimates. This methodology is consistent with that described by Khan *et al* (2016) and ultimately provides an estimate of habitat density.

2.2.3.4 Diurnal Birds

As per the Department of Science, Information Technology and Innovation (DSITI) Terrestrial Vertebrate Fauna Survey Guidelines for Queensland the following techniques for detection of threatened diurnal birds were completed:

- Active diurnal bird survey (eight rounds of 10 min area searches);
- Dawn chorus survey (over two mornings); and
- Incidental detection.

Table 2-6 Survey Techniques for birds.

Survey Technique	Cardno (2019)	Cardno (2020)
Active diurnal bird survey	Active diurnal searches (eight 10min searches within Site) completed over four days (suitable for detection of bird species including Powerful owl).	Active diurnal bird and herpetofauna searches completed over three days.
Dawn chorus survey	Dawn chorus survey completed over two mornings.	Dawn chorus survey completed over two mornings.
Incidental detection	Over four days.	Over three days.

2.2.4 Survey Limitations

Surveys were undertaken as follows:

- One day and one night survey during winter (2020);
- Three days and two nights during a 28-day survey period in spring (2020); and
- Five days and four nights during a 14-day survey period in winter (2019).

These survey periods may be outside of the optimal timing for the detectability of several flowering species. This survey timing may also limit the number of fauna species detected, such as frogs outside of their calling period. As such, the absence of detection of a fauna species does not necessarily equate with absence of the species within the Site. Given this, fauna survey techniques have been supplemented with habitat assessments to give a broader view of the full range of species likely to use the Site.

While the Song Meter passive monitoring device was deployed for a period of 28 days in 2020, data was collected on memory cards for a 10-day period due to the high number of high-frequency microbat calls recorded. Additional survey effort (use of an Echo Meter hand-held bat detector device during spotlighting surveys at the beginning and end of the survey period) was implemented to ensure that representative data was captured for the entirety of the survey period.

Aquatic surveys were undertaken within the watercourse in the Site's western extent only in spring 2020 as this was the only area that contained water at the time of survey.

Notwithstanding the limitations identified above, the survey methods and effort used are generally in accordance with relevant published guidelines and are considered adequate for the detection of those species identified by the desktop assessment as 'known' or 'likely' to occur within the locality, with surveys on foot across the Site ensuring adequate coverage and mapping of ecological constraints.

3 Results

3.1 Ecological Features and Functions

3.1.1 Vegetation and flora

3.1.1.1 Threatened flora species

During the field survey, 198 flora species, including 70 exotic species (non-native and non-local), from 81 families were recorded. All native species detected are listed as Least Concern as defined under the provisions of the *Nature Conservation (Wildlife) Regulation 2006* (i.e. no Endangered, Vulnerable or Near Threatened species were recorded). No flora species listed under the EPBC Act were recorded within the Site. Furthermore, no species listed as significant under Planning Scheme Policy 1 - Environmental Significance were recorded.

A complete list of native and exotic flora species detected during the field assessment is provided as **Appendix D**.

3.1.1.2 Vegetation communities

The Site supports Category X (Non-remnant) vegetation, Category B (Remnant) vegetation and Category C (High-value regrowth) vegetation. The field survey confirmed that the vegetation within the Site is generally consistent with the DNRME Vegetation Management Report and Regulated Vegetation Map produced for the Site. Specifically, the regional ecosystem codes appear to be accurately applied; Category B areas appear to support vegetation that meet the requisite height, cover and species compositions; and Category C areas have not been cleared in the past 15 years.

Given the marked difference between vegetation in the north and south of the Site, these areas are discussed separately as follows:

North

Areas of non-remnant vegetation in the Site are characterised as pastoral land that has been subject to historic clearing with the exception of scattered large eucalyptus trees, as shown in **Plate 6**. These large trees include *Eucalyptus tereticornis, E. racemosa* and *E. pilularis* specimens that often support hollows. The ground layer is dominated by exotic *Sporobolus pyramidalis* (Giant rat's tail grass) in some locations, however, the native species *Imperata cylindrica* (Blady grass) dominates in others. The ground layer also is characterised by an abundance of exotic herbs and forbs, including *Senecio madagascariensis* (Fireweed).

Melaleuca dominated swamp areas are associated with watercourses and associated alluvial plains. *Melaleuca quinquenervia* and *Eucalyptus tereticornis* dominate the canopy in these areas, which also supports a sub-canopy largely containing *M. quinquenervia*. The shrub layer, where present, was observed to support a number of *Solanum* species including *S. stelligerum* and the exotic *S. torvum*. The ground layer generally included *Juncus* species and *Axonopus compressus*. An image of this community is shown in **Plate 7.** This vegetation community aligns with RE 12.9-10.4 which allows for the presence of *M. quinquenervia* and *E. tereticornis* on lower slopes.

Areas mapped as regrowth of heterogeneous patches of REs 12.11.24/12.11.25 support vegetation that has greater affiliations with RE 12.11.23.

Remnant and regrowth vegetation described as RE 12.3.11 was confirmed within the Site. The canopy strata of this community was observed to support *E. tereticornis*, *E. siderophloia* and *E. pilularis* as shown in **Plate 8**. The sub canopy strata included *M. quinquenervia* and *Lophostemon suaveolens*. The shrub layer in these areas was generally absent and the ground layer includes *Imperata cylindrica*.

South

Presence of heterogeneous areas of REs 12.11.23/12.11.27, both of which are listed as Endangered under the VMA, was confirmed. The canopy is dominated by *Eucalyptus racemosa* and *Corymbia intermedia* in some areas and shifts to dominance by *E. pilularis* in others (see **Plate 9**). The sub-canopy supports *Lophostemon suaveolens* in some areas and in lower slopes consists of *Melaleuca quinquenervia.* The shrub layer is generally absent. The ground layer includes several native species and is generally dominated by *Entolasia stricta* on drier ridges. Despite evidence of some historic logging, these areas were generally in good condition with little disturbance and weed infestation observed.

No TECs were encountered within the Site. Quaternary data is provided in **Appendix E** and a complete list of all flora species encountered within the Site is provided in **Appendix D**.

Details relating to weeds and other exotic flora encountered on Site are provided in **Section 3.1.5** Threatening Processes.



Plate 6: Category X (non-remnant) vegetation supporting pastoral grasses and scattered remnant Eucalyptus individuals.



Plate 7: *M. quinquenervia* and *E. tereticornis* dominated swamp area.



Plate 8: Regrowth vegetation within the Site supporting *E. pilularis* and *L. suaveolens*.



Plate 9: *E. racemosa* and *C. intermedia* dominated canopy areas described as RE 12.11.23/12.11.27.

3.1.2 Fauna and habitat

3.1.2.1 Threatened fauna species

A summary of the desktop assessment completed in accordance with the methodology outlined in **Section 2.1** is provided in **Table 3-1.** The results of this assessment determined that eleven threatened fauna are considered 'possible', 'likely', or 'known' to occur within Site.

The complete likelihood of occurrence assessment undertaken to determine which species are deemed 'possible', 'likely' or 'known' to occur within the Site is provided in **Appendix C**.

Table 3-1 Threatened fauna considered 'likely' or 'known' to occur within the Site.

Scientific Name	Common Name	Status#		Likelihood of Occurrence
		NC Act	EPBC Act	
Amphibians				
Adelotus brevis	Tusked frog	Vulnerable	-	Likely
Aves				
Apus pacificus	Fork-tailed swift	Special least concern	Marine/Migratory	Possible
Hirundapus caudacutus	White-throated needle tail	-	Vulnerable	Possible
Monarcha melanopsis	Black-faced monarch	Special least concern	Marine/Migratory	Possible
Myiagra cyanoleuca	Satin flycatcher	Special least concern	Marine/Migratory	Possible
Pandion cristatus	Eastern osprey	Special least concern	Marine/Migratory	Possible
Rhipidura rufifrons	Rufous fantail	Special least concern	Marine/Migratory	Possible
Mammals				
Petauroides volans	Greater glider	Vulnerable	Vulnerable	Possible
Phascolarctos cinereus	Koala	Vulnerable	Vulnerable	Known
Pteropus poliocephalus	Grey-headed flying-fox	-	Vulnerable	Likely
Tachyglossus aculeatus	Short-beaked echidna	Special least concern	-	Possible

In Cardno's 2019 study, a total of 61 fauna species were recorded. This included 47 bird species, 10 mammal species, one reptile species and three amphibians. In the current study, a total of 70 fauna species were recorded, including: 37 bird species, 22 mammal species, five reptile species, three amphibians, two fish and one crustacean. Incorporating the results of both studies, 95 fauna species were found within the Site.

Images of fauna species detected within the Site are provided as **Plate 10** to **20**. These images highlight the following findings:

- The Site supports multiple species of reptiles and aquatic amphibians, including *Pseudophryne raveni* (Copper-backed broodfrog) and *Limnodynastes peronii* (Striped marshfrog) as shown in **Plates 10** and **11**. These species were heard calling proximate to drainage lines and waterbodies throughout the Site.
- A number of water bird species, such as *Egretta novaehollandiae* (White-faced heron), as shown in **Plate 12**, were detected on the camera traps and during diurnal surveys. The Site supports a number of pools suitable for foraging by transitory wetland and migratory birds. No Migratory species protected under the EPBC Act were observed within the Site.
- It was noted during the field assessment that the Site supports grazing land and habitat for several macropod species, including *Macropus rufogriseus* (Red-necked wallaby), *Macropus parryi* (Whiptail wallaby), and *Macropus giganteus* (Eastern grey kangaroo). A large population of Red-necked wallabies regularly frequents the northern region of the Site as shown in **Plate 13**.
- The Site supports a large population of breeding *Trichosurus vulpecula* (Common brushtail possum). Common brushtail possums were detected on camera traps at four separate locations throughout the Site (**Plate 14**).
- The camera trap analysis identified a number of species often difficult to detect, including Sugar glider, shown in **Plate 15**. Sugar gliders are colonial breeding species and likely use hollow-bearing trees within the Site for shelter and breeding purposes.
- *Tachyglossus aculeatus* (Short-beaked echidna) was captured using the Site at eight separate camera trap locations between the 2019 and 2020 studies (**Plate 16)**. Echidna is listed as Special Least Concern in accordance with the NC Act.
- Seven species of microbat were detected using passive detection methods, including the Song Meter and Echo Meter. These include *Chalinolobus gouldii* (Gould's wattled bat), *Chalinolobus nigrogriseus* (Hoary wattled bat), *Miniopterus australis* (Little bent-wing bat), *Mormopterus norfolkensis* (East coast freetail bat), *Nyctophilus gouldi* (Gould's long-eared bat), *Scotorepens sp. (Parnaby)* (Central-eastern broad-

nosed bat), and *Tadarida australis* (White-striped freetail bat). All species are colonial breeding species and are likely to use hollow-bearing trees, decorticating bark, rock crevices and man-made structures throughout the Site for shelter and breeding purposes. The presence of Gould's long-eared bat was also detected via camera trap and is shown in **Plate 17.**

- A Wedge-tailed eagle (*Aquila audax*) and nest were observed within the Site. The Wedge-tailed eagle was observed sitting on the nest which is an active breeding behaviour for this species and shown in **Plate 18**.
- Presence of Koala within the Site's southern extent was confirmed from camera trap footage at two separate locations in 2020 (**Plate 19**). Additionally, several indirect observations of Koala were made during the field assessments in 2019 and 2020 (**Plate 20**). This included Koala scats and scratches encountered during targeted surveys and opportunistically. The Koala is listed as Vulnerable under the NC Act EPBC Act.

A full list of fauna species detected during the field assessments is provided as **Appendix D**.



Plate 10: Copper-backed broodfrog encountered during the field survey.



Plate 11: Striped marshfrog captured in the southern extent of the Site in 2020.



Plate 12: White-faced heron captured in Cardno, 2019.



Plate 13: Red-necked wallaby population frequently encountered within the northern region of the Site.



Plate 14: Common brushtail possums captured in the current study.



Plate 15: Sugar glider captured in Cardno, 2019.



Plate 16: Short-beaked echidna captured in Cardno, 2019.



Plate 17: Gould's long-eared bat captured in Cardno, 2019.



Plate 18: Wedge-tailed eagle's nest located within northern portion of the Site.



Plate 19: Koala captured on a camera trap in the southern extent of the Site in 2020.



Plate 20: Likely Koala scratches evident on trunk of eucalypt.

3.1.2.2 Fauna habitat value

The Site supports a large number of notable habitat features, including hollow bearing trees and several chimney hollows, stag trees, nests and logs (**Plates 21 and 22**). The locations of the habitat features recorded during the field assessment within the Site are provided on **Figure 3**.

Hollow-bearing trees and stags within the Site are likely to be used by a rage of hollow dependant birds, such as parrots, as well as arboreal mammals (e.g. Sugar gliders), and microbat species. Hollow logs within the Site similarly may provide shelter for a number of fauna groups including amphibians and reptiles, as well as Echidna. Several species of hollow-nesting bird species, such as *Platycercus adscitus palliceps (*Pale-headed rosella), *Cacatua galerita* (Sulphur-crested cockatoo)*, Cacatua sanguinea* (Little corella)*, Eolophus roseicapilla* (Galah), *Trichoglossus haematodus moluccanus* (Rainbow lorikeet), and *Trichoglossus chlorolepidotus* (Scaly-breasted lorikeet) were observed throughout the Site. Multiple species were seen actively utilising hollows in the Site's northern extent (**Plate 23**).

Active breeding was observed at two locations during the field investigation. Two Sulphur-crested cockatoos were observed emerging from within a hollow bearing tree when stag watching at dusk. A Wedge-tailed eagle was observed sitting on its nest, indicative of active breeding behaviour for this species. The presence

of juvenile Common brushtail possums detected in the northwest of the Site also indicates that hollow-bearing trees in this area are likely being used by these species for breeding and shelter.

Numerous waterbodies were observed throughout the Site. Permanent watercourses and ephemeral aquatic habitats within the Site were observed to be largely shaded by fringing native vegetation that may provide habitat for range of frog, reptiles, fish and other aquatic species, including the Copper-backed broodfrog, Striped marshfrog and *Uperoleia fusca* (Dusky gungun) - all of which were heard calling from within the Site. These sites may also be used for foraging from time-to-time by transitory wetland and migratory birds. The locations of watercourses and ephemeral aquatic habitats identified within the Site are shown on **Figure 3.** Further details regarding the types of aquatic habitat present within the Site are provided in **Section 3.1.3**.

The Site maintains ecological connectivity to vegetated areas along the southern and western boundary of the Site. Furthermore, watercourses within the Site provide fauna movement throughout the Site and into the surrounding environment. The Site is largely mapped within a State-mapped 'Regional biodiversity corridor' and it is likely that the vegetated areas of the Site aid in fauna movement opportunities for a number of species.



Plate 21: Hollow-bearing limb in a Scribbly gum.



Plate 22: Chimney hollow in a Scribbly gum.



Plate 23: Little corella seen utilising a hollow-bearing tree in 2020.

The northern portion of the site contains numerous animal breeding places including hollow-bearing limbs, stags and nests. A Species Management Program is required where an animal breeding place has been identified and activities are required to tamper with the breeding place in order to complete the scope of works. Two SMP templates are available; SMP 'low risk of impacts' and SMP 'high risk of impacts'. An SMP 'low risk of impacts' is required if any animal breeding places (i.e. hollow bearing trees) for Least Concern

fauna species are to be tampered with as part of the proposed works. The SMP 'low risk of impacts' relates to protected animals classed as Least Concern under the *Nature Conservation Act 1992*, where the impacts are unlikely to affect the broader population.

An SMP 'high risk of impacts' relates to EVNT species, Special Least Concern species, or Least Concern colonial breeders, where the broader the population is at greater risk from impacts. Whilst an SMP is not required for Koala (as Koalas do not use a habitual breeding place) - Sugar glider and the various microbat species recorded on Site are considered Least Concern colonial breeders. It is also relevant to note that, while not observed breeding on Site, *Bulbucus ibis* (Cattle egret - another Least Concern colonial breeder) in breeding plumage were observed on Site in October 2020.

3.1.3 Both the SMP 'low risk of impacts' and SMP 'high risk of impacts' require information including the location of the activity, area of impact and species that that are the subject of the tampering of the breeding place. The SMP 'high risk of impacts' requires additional information that is tailored to EVNT species, Special Least Concern species, or Least Concern colonial breeders (such as all seven species of microbat, Sugar glider, and Cattle egret found on Site). As the SMP 'high risk of impacts' can also include measures which extend to Least Concern fauna species, only an SMP 'high risk of impacts' will be required for the Project. Waterways and aquatic habitat

The Site supports numerous ephemeral waterways which have ponded in several areas forming aquatic habitats. These areas provide habitat for aquatic species such as frogs, reptiles, freshwater fish, insects and waterbird species. Additionally, these sites may also be used for foraging from time-to-time by transitory wetland and migratory birds. Watercourses within the Site provide fauna movement opportunities throughout the Site and into the surrounding environment.

The field assessment included an assessment of the aquatic habitat features within the northern extent of the Site shown in **Figure 3**. **Table 3-2** below outlines the aquatic features present including aquatic habitat, riparian vegetation, channel width, bank height and substrate material. Several native aquatic fauna species were detected in these areas, including: *Intellagama lesueurii* (Eastern water dragon), Striped marshfrog, Copper-backed broodfrog, Dusky gungun, *Cherax depressus* (Orange-fingered yabbie), and *Hypseleotris galii* (Firetail gudgeon). Non-native species, including relatively large numbers of *Gambusia holbrooki* (Mosquitofish) and *Rhinella marina* (Cane toad), are also present.

Table 3-2 Waterways and aquatic habitat areas.

Feature/ pond	Aquatic habitat	Riparian vegetation	Channel width	Bank height	Substrate material	Plate reference
218	▪ Waterbody ▪ Moderate level fallen timber/snags	▪ Broad-leaved Paperbark (*Melaleuca quinquenervia*) ▪ *Juncus usitatus* ▪ Rice grass *(Microlaena stipoides)* ▪ Giant rat's tail grass (*Sporobolus pyramidalis*)	10 m	0.5 m sloped bank	Soil substrate	Plate 24
219	▪ Waterbody ▪ High level of fallen timber/snags	▪ Broad-leaved paperbark (*Melaleuca quinquenervia*) ▪ Azolla fern (*Azolla pinnata*) ▪ *Juncus usitatus* ▪ Water primrose (*Ludwigia peploides*) ▪ Giant rat's tail grass (*Sporobolus pyramidalis*) ▪ Blue billygoat weed (*Ageratum houstonianum*)	15 m	0.5 m sloped bank	Soil substrate	Plate 25
220	▪ Waterbody	▪ Broad-leaved Paperbark (*Melaleuca quinquenervia*)	5 – 15 m	1 m embankment	Gravel and rock soil substrate	Plate 26

Feature/ pond	Aquatic habitat	Riparian vegetation	Channel width	Bank height	Substrate material	Plate reference
	▪ Exposed tree roots/snags	▪ *Juncus usitatus* ▪ Giant rat's tail grass (*Sporobolus pyramidalis*) ▪ Blue billygoat weed (*Ageratum houstonianum*)				
222	▪ Ephemeral waterbody	▪ Broad-leaved paperbark (*Melaleuca quinquenervia*) ▪ Narrow-leaved Red Gum *(Eucalyptus seeana)* ▪ Bungwall (*Blechnum indicum*) ▪ *Eleocharis equisetina*	8 m	0.7 m embankment	Soil substrate	Plate 27
223	▪ Waterbody	▪ Broad-leaved paperbark (*Melaleuca quinquenervia*) ▪ *Juncus usitatus* ▪ Bunchy sedge (*Cyperus polystachyos*) ▪ Swamp box (*Lophostemon suaveolens* ▪ Blady grass (*Imperata cylindrica*) ▪ Blue billygoat weed (*Ageratum houstonianum*) ▪ Wiry panic (*Entolasia stricta*)	1.5 m	0.5 m sloped bank	Soil substrate	Plate 28 & Plate 29



Plate 24: View south of aquatic habitat 1 with Broad-leaved paperbarks.



Plate 25: View west of aquatic habitat 2 with fallen trees.



Plate 26: View west of aquatic habitat 3 with a gravel substrate.



Plate 27: View west of ephemeral aquatic habitat 4 with *Eleocharis equisetina* lining the channel.



Plate 28: View west of aquatic habitat 5 with Broad-leaved paperbarks and *Juncus usitatus*.



Plate 29: View east of aquatic habitat 5 with exposed soil substrate and Board-leaved paperbarks.

3.1.4 Ecological Processes

In a regional context, the vegetation within the Site forms part of a regional corridor in the Redlands Catchment and Eprapah Creek Subcatchment (Wetland Info, 2016). The creeks within the catchment together with numerous watercourses and drainage lines flow into Southern Moreton Bay. This is reflected in the *Shaping SEQ - South-east Queensland Regional Plan* (DILGP, 2017) which indicates the Site is predominately located within a Regional biodiversity corridor. Additionally, under the Biodiversity Planning Assessment for the SEQ bioregion, the south-west corner of the Site is mapped within the Biodiversity Planning Assessment terrestrial corridor buffer area.

Significant areas of Redland City Council Local Government Area are mapped under the *Nature Conservation (Koala) Conservation Plan 2017* as core Koala habitat. The terrestrial and riparian corridors within Redland Catchment provide significant habitat for the SEQ Koala population. The Site's presence within the context of the regional Koala corridor is significant, as vegetation within the Site provides movement opportunities from the Site's north-west to south-east extending to Moreton Bay.

The southern portion of the Site adjoins a heavily vegetated conservation areas which support Native Dog Creek. In addition, the Site possesses connectivity to the local network of bushland reserves to the south-east including:

- Days Road Conservation Area;
- Bayview Conservation Area ;
- Kidd Street Conservation Area;
- Serpentine Creek Conservation Area;

- Native Dog Road Conservation Area; and
- Carbook Wetlands Conservation Park.

To the north, the Site has connectivity to Sandy Creek Conservation Area, Eastern Escarpment Conservation Area, Venman Bushland National Park and Daisy Hill Conservation Park; however, the landscape is fragmented by roads, urban areas and agriculture areas. **Figure 4** shows the local and regional corridors within the Site and broader landscape.

Council's Wildlife Corridors Connections Plan (RCC, 2018) shows the southern portion of the Site within a core habitat area with an established corridor extending north to south through the Site, linking Sandy Creek Conservation Area to Days Road Conservation Area. Adjoining the northern boundary of the Site is a mapped stepping stone corridor which crosses Heinemann Road then links back into the core habitat mapped within the Site. One of the priority outcomes identified by Council for this corridor is safe fauna passage across Valley Way and German Church Road. Enhancement and stepping stone corridors provide connectivity from the east of the Site to the wider Moreton Bay catchment. While stepping stone corridors are not physically connected, they are functionally connected as they facilitate connectivity among larger patches. Council has identified established pre-existing corridors of high ecological values that facilitate wildlife movement.

3.1.5 Threatening Processes

A number of threatening processes are either present or occurring within the Site as detailed in **Table 3-3**. It is expected that the Project will exacerbate or otherwise alter the extent to which most of these threatening processes occur on Site if mitigation measures are not adopted.

Table 3-3 Threatening processes present within the Site.

Threatening Process	Description
Land clearing and habitat fragmentation	Loss and fragmentation of natural habitat through land clearing for pastoral purposes and urban development has occurred within and surrounding the Site. The northern extent of the Site has been historically cleared for pastoral purposes, limiting species diversity in this area. Further clearing for the Project will extend the area of this threatening process' occupancy within the Site; however, some of the negative impacts associated with this process may be mitigated through the rehabilitation of other areas within the Site. Further fragmentation of the Site may result in the displacement of wildlife and to an increased incidence of road and vehicle strike surrounding the Site and the proposed internal roads. Increased vehicular traffic in the area as a result of the Project may exacerbate further exacerbate wildlife-vehicle strike incidence if mitigations are not adopted (e.g. speed limits and/or signage). Future upgrades to culverts along Heinemann Road may provide an opportunity to integrate dry passage in cells that are appropriate dimensions to facilitate movement of terrestrial fauna, such as macropods and Koalas.
Inappropriate grazing regimes	The Site's northern extent has been heavily grazed by domestic cattle and horses. In some sections, this grazing has extended into the Site's southern extent as well. Inappropriate grazing regimes can lead to a reduction in in biomass and diversity of native vegetation and habitat for native fauna. The Project will ultimately result in a reduction in grazing within the Site; however, sports field maintenance activities (e.g., mowing) can be expected to have similar effects to that of cattle grazing.
Predation of native fauna by introduced pest animals	Predation of native fauna by introduced pests is currently occurring in varying levels of severity throughout the entirety of the Site. *Vulpes vulpes* (Red fox) and Cane toad were detected on several camera traps throughout the Site. Both species are known to predate upon native fauna. The Project is likely to result in an increase in prevalence of exotic predators on Site. Disturbed areas are attractive to introduced predators, particularly those that favour disturbed habitats, as they can provide increased opportunity to forage on food waste.
Competition with native fauna from introduced pest animals	Two species known to compete with native fauna for habitat, food, and other resources were detected on site: the Cane toad and *Lepus europaeus* (European brown hare). Cane toads compete for food, shelter and breeding sites with native animals. European hares may indirectly compete with native fauna by causing damage when gnawing the bark of young trees and shrubs that provide a food source for native fauna. European hares are not classified as a restricted invasive animal in Queensland, although they are similarly classified in other parts of Australia.

Threatening Process	Description
	Further degradation of waterways within the Site is likely to leave native amphibians and other small fauna increasingly vulnerable to the effects of competition from Cane toads.
Weed encroachment	Invasion of native vegetation by weeds can reduce the amount of suitable habitat for native fauna and outcompete native flora species. Several areas of weed infestation were identified during the field assessments (**Figure 5**). Weed infestations may increase as a result of the Project following increased use of the Site for anthropogenic activities and increasing ratio of edge to natural habitat. Weed management measures must be included in the Construction Environmental Management Plan.

3.1.5.2 Weeds and pest animals

The *Biosecurity Act 2014* imposes a general biosecurity obligation on persons dealing with biosecurity matter to prevent and/or minimise the impact of biosecurity risks on human health, social amenity, the economy and the environment. A general biosecurity obligation requires that all reasonable and practical measures are taken to prevent or minimise biosecurity risk, and that actions are taken to prevent exacerbation of the adverse effects of biosecurity matter. With respect to these points, the *Biosecurity Act 2014* specifically notes that the requirement to manage the impact of invasive plants and animals on a person's land.

Weeds

A total of 70 exotic flora species were recorded within the Site, of these species 11 are listed as Category 3 – Restricted invasive pest plants under the *Biosecurity Act 2014* and five are also listed as Weeds of National Significance (WONS). The following are those listed exotic flora species listed as Category 3 Restricted invasive pest plants under the *Biosecurity Act 2014*. The annotation "^" indicates that the species is also a WONS.

- *Asparagus aethiopicus* (Ground asparagus fern)^;
- *Cinnamomum camphora* (Camphor laurel);
- *Eichhornia crassipes* (Water hyacinth)^;
- *Lantana camara* (Lantana)^;
- *Lantana montevidensis* (Creeping lantana);
- *Senecio madagascariensis* (Fireweed)^;
- *Anredera cordifolia* (Madeira vine)^;
- *Bryophyllum delagoense* (Mother-of-millions);
- *Sporobolus pyramidalis* (Giant rat's tail grass);
- *Sphagneticola trilobata* (Singapore daisy); and
- *Tecoma stans* (Yellow bells).

While Water hyacinth was observed in Cardno (2019), it was not seen during the current study (2020).

Weed hosts of pest plants declared under the *Biosecurity Act 2014* were encountered throughout the Site as shown on **Figure 5**. It was noted during the field assessment the currently used for cattle grazing in the north of the Site is largely infested with both Giant rat's tail grass and Fireweed.

The *Biosecurity Act 2014* notes that Category 3 – Restricted pest plants must not be distributed as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit.

Terrestrial and Aquatic pests

Evidence of predation on a calf was observed within the northern portion of the Site in the grazing paddock. The dismembered remains were likely caused from *Vulpes vulpes* (Red Fox) predation, which was captured on camera traps at numerous locations within the Site. While domestic dogs were observed in camera trap footage, no wild dogs were photographed during study period.

3.2 The results from aquatic surveys indicate that the waterway in the Site's western extent host a relatively large population of Mosquitofish.

Mosquitofish are classified as a restricted noxious fish under the *Biosecurity Act 2014.* The introduction of invasive fish into Queensland's natural waterways and wetlands can significantly affect native fish biodiversity and abundance. If individuals of this species are caught (e.g. during dewatering activities associated with the Project), they must be humanely euthanized and disposed of away from the waterbody.

Ecologically Significant Features

3.2.1 Matters of National Environmental Significance (MNES)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legislative framework to protect and manage nationally and internationally significant flora, fauna, ecological communities and heritage places. The EBPC Act defines these as Matters of National Environmental Significance (MNES). The MNES which are applicable to the Site include the potential to impact upon:

- listed threatened species (flora and fauna); and
- migratory species.

3.2.1.1 Threatened Species

The EPBC Protected Matters Search Tool (PMST) output records 22 threatened species known, or likely, to occur within a 3 km radius of the Site. Further analysis of the PMST output indicated that of these 22 species, four fauna and zero threatened flora species are 'possible', 'likely or 'known' to have suitable habitat in the Site. Those species that are listed under the EPBC Act that may occur within the Site are listed in **Table 3-4**.

The findings of the likelihood of occurrence assessment for all threatened species is attached in **Appendix C**.

Table 3-4 Summarised results of the likelihood of occurrence desktop assessment for EPBC Act listed species.

Species	Common Name	EPBC Act Status	Likelihood of occurrence
Aves			
Hirundapus caudacutus	White-throated needletail	Vulnerable	Possible
Mammals			
Petauroides volans	Greater glider	Vulnerable	Possible
Phascolarctos cinereus	Koala	Vulnerable	Known
Pteropus poliocephalus	Grey-headed flying-fox	Vulnerable	Likely

A review of the National Flying-fox monitoring viewer (DoEE, 2012) illustrates that there are no nationally important flying-fox camps within the Site. Approximately 5km from the Study Area at Weinnam Creek wetlands there is a flying-fox camp (camp number 431) that contains Grey-headed flying-fox (*Pteropus poliocephalus*) which may forage within the Site.

The EPBC Act Policy Statement 1.1, the 'Significant Impact Guidelines' lists a set of 'significant impact criteria' for vulnerable species. The Master Plan design requires the removal of Koala habitat; as such, a significant impact self-assessment against these criteria was completed and determined that the development is unlikely to have significant impact upon a MNES. Nonetheless, referral to the Commonwealth is recommended for adverse impacts to habitat critical to the survival of the Koala (**Appendix F**).

3.2.1.2 Migratory and Marine Species

The EPBC Protected Matters Search Tool (PMST) output records 28 migratory and marine species known, or likely, to occur within a 3 km radius of the Site. Further analysis of the PMST output, identified that of these species, there are eleven migratory and/or marine species that are 'possible', 'likely or 'known' to have suitable habitat in the Site. These species are listed in **Table 3-5.** Two species, including the Cattle egret and *Merops ornatus* (Rainbow beater) have been observed within the Site.

The findings of the likelihood of occurrence assessment for all threatened species is attached in **Appendix C**.

Table 3-5 Summarised results of the likelihood of occurrence desktop assessment for EPBC Act listed marine and migratory species.

Species	Common Name	EPBC Act Listing Status	Likelihood of occurrence
Aves			
Anseranas semipalmata	Magpie goose	Marine/Migratory	Possible
Apus pacificus	Fork-tailed swift	Marine/Migratory	Possible
Ardea alba	Great egret	Marine/Migratory	Possible
Bulbucus ibis	Cattle egret	Marine/Migratory	Known
Haliaeetus leucogaster	White-bellied sea-eagle	Marine/Migratory	Possible
Hirundapus caudacutus	White-throated needletail	Marine/Migratory	Possible
Merops ornatus	Rainbow beeater	Marine/Migratory	Known
Monarcha melanopsis	Black-faced monarch	Marine/Migratory	Possible
Myiagra cyanoleuca	Satin flycatcher	Marine/Migratory	Possible
Pandion cristatus	Osprey	Marine/Migratory	Possible
Rhipidura rufifrons	Rufous fantail	Marine/Migratory	Possible

3.2.2 Matters of State Environmental Significance (MSES)

3.2.2.1 Overview

Matters of State Environmental Significance (MSES) are an element of the biodiversity state interest defined under the *State Planning Policy 2017* (SPP).

The following MSES as defined in the SPP are relevant to the Site:

- Koala habitat.
- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the *Nature Conservation (Wildlife) Regulation 2006.*
- Regulated vegetation under the *Vegetation Management Act 1999* that is:
  - Category B (Remnant) vegetation; and
  - Category C (High-value regrowth vegetation).
- Wetlands.
- Waterways for Waterway Barrier Works under the *Fisheries Act 1994*.

The State maps MSES in their SPP interactive mapping website (https://planning.dsdmip.qld.gov.au/maps) as replicated in **Plate 30**.



Plate 30: SPP mapping extract of MSES.

3.2.2.2 Koala Habitat

Under the *Nature Conservation (Koala) Conservation Plan 2017*, the Koala Conservation Plan Map shows Koala Priority Areas and Koala Habitat Areas. The main purpose of Koala Priority Areas is to strategically focus long-term management and monitoring efforts on areas that have the highest likelihood of achieving conservation outcomes for Koalas. In addition, the purpose of designating Koala habitat areas is to avoid impacts on Koala habitat to ensure the long-term persistence of koala populations in the wild. The Site is mapped within a Priority Koala Area, with the southern and eastern extents mapped as Core Koala habitat and a small patch in the north-western area of the Site is mapped as Locally Refined Koala Habitat Area (**Appendix B** and **Plate 31**).



Plate 31: SPP mapping extract of MSES.

3.2.2.3 Wildlife scheduled under the NC Act

Plate 30 shows that the State has mapped habitat for special least concern wildlife in the northern portion of the Site and koala habitat across the entirety of the Site. The field assessment confirmed that one single Special Least Concern species (Short-beaked echidna) and one Vulnerable species (Koala) occur within the Site; however others, such as *Adelotus brevis* (Tusked frog), *Apus pacificus (*Fork-tailed swift), *Hirundapus caudacutus* (White-throated needletail), *Monarcha melanopsis* (Black-faced monarch), *Myiagra cyanoleuca* (Satin flycatcher) and Greater glider may possibly occur within the Site (**Table 3-6**).

Those species that are listed under the NC Act that may occur within the Site are listed in Table 3-6. The findings of the likelihood of occurrence assessment for all threatened species is attached in **Appendix C**.

Table 3-6 Summarised results of the likelihood of occurrence desktop assessment for NC Act listed species.

Scientific Name	Common Name	NC Act Status	Likelihood of Occurrence
Adelotus brevis	Tusked frog	Vulnerable	Possible
Apus pacificus	Fork-tailed swift	Special least concern	Possible
Hirundapus caudacutus	White-throated needletail	Special least concern	Possible
Monarcha melanopsis	Black-faced monarch	Special least concern	Possible
Myiagra cyanoleuca	Satin flycatcher	Special least concern	Possible
Petauroides volans	Greater glider	Vulnerable	Possible
Phascolarctos cinereus	Koala	Vulnerable	Known
Tachyglossus aculeatus	Short-beaked echidna	Special least concern	Known

3.2.2.4 Regulated vegetation

Queensland's Department of Natural Resources, Mines and Energy (DNRME) Vegetation Management Property Report and Regulated Vegetation Map produced has outlined the Site as supporting Category B (remnant) vegetation, Category C (High-value regrowth) vegetation and Category X (non-remnant) areas, as illustrated in **Appendix C** and **Figure 3**.

The Vegetation Management Property Report identifies six Regional Ecosystems (REs) occurring within the Site. A short description of each RE, taken from the Regional Ecosystem Description Database (REDD), 2019, is provided in **Table 3-7**.

Ground-truthing field assessments found that the boundaries of mapped polygons are accurate to the scale at which they are mapped and, while most attributions are generally correct, areas mapped as RE 12.11.24/12.11.25 shared greater affiliation with RE 12.11.23.

Table 3-7 Regional ecosystems that occur in the Site as described in REDD.

RE Code	Category	Status	Description
12.11.23	B, C	Endangered	*Eucalyptus pilularis* open forest on coastal metamorphics and interbedded volcanics
12.11.27	B, C	Endangered	*Eucalyptus racemosa* subsp. *racemosa* and/or *E. seeana* and *Corymbia intermedia* woodland on metamorphics +/- interbedded volcanics
12.3.11	B, C	Of Concern	*Eucalyptus tereticornis* +/- *Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast
12.11.24	C	Least Concern	*Eucalyptus carnea*, *E. tindaliae*, *Corymbia intermedia* +/- *E. siderophloia* or *E. crebra* woodland on metamorphics +/- interbedded volcanics
12.11.25	C	Of Concern	*Corymbia henryi* and/or *Eucalyptus fibrosa* subsp. *fibrosa* +/- *E. crebra*, *E. carnea*, *E. tindaliae* woodland on metamorphics +/- interbedded volcanics
12.9-10.4	C	Least Concern	*Eucalyptus racemosa* subsp. *racemosa* woodland on sedimentary rocks

3.2.2.5 Wetlands and Waterways

The *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*, details the environmental values for wetlands that are assessed to assign environmental significance to wetlands, including:

- the health of the wetland's ecosystems;
- the wetland's natural state and biological integrity;
- the presence of distinct or unique features, endemic plants or animals and their habitats, including threatened wildlife and near threatened wildlife under the NC Act;
- the wetland's natural hydrological cycle; and
- the natural interaction of the wetland with other ecosystems, including other wetlands.

The Queensland Wetland Environmental Values Map shows two portions of the southern extent of the Site associated with waterways that are mapped as Wetlands of general ecological significance (**Appendix B**). The northern portion supports a Regulated Vegetation defined watercourse.

While not mappable as MSES, it is relevant to note that three waterways for Waterway Barrier Works are mapped within the Site, one orange 'moderate risk' waterway and two green 'low risk' waterways. (**Appendix B**). There is a risk of adverse impacts from in-stream barriers on fish passage; as such, design recommendations to mitigate these impacts are detailed in **Section 3.3.2**.

3.2.3 Matters of Local Environmental Significance

3.2.3.1 Planning scheme

Under the Redland *City Plan* the Site is mapped within the 'Rural zone'. In accordance with the Rural zone code –

> *(1) The purpose of the rural code is to provide for a wide range of primary production activities while protecting the natural resources and significant environmental and landscape values.*

(2) The purpose of the code will be achieved through the following outcomes:

(d) educational, recreational and tourism under uses are accommodated where they do not significantly impact on the environmental and landscape values of the locality.

It is understood that Council proposes to rezone the Site as part of a planning scheme amendment to 'Recreation and Open Space'. In accordance with the Recreation and Open Space zone code –

(1) The purpose of the recreation and open space zone code is to provide for a range of sporting, recreation, leisure, cultural and educational activities and to protect ecological, drainage and flood related functions of open space areas.

A review of the Redland *City Plan* Environmental Significance and Waterway Corridor and Wetland Overlay indicates that the Site is mapped as containing the below-listed Matters of Local Environmental Significance (MLES).

- Areas in the north of the Site are mapped as MLES and areas in the south of the Site are mapped as MSES[2] within the Environmental Significance Overlay as shown in **Plate 32**.
- Areas in the north and west of the Site are mapped within the Waterway Corridors and Wetlands Overlay as shown in **Plate 33**.



Plate 32: Redland City Plan Environmental Significance Overlay (MSES and MLES).



Plate 33: Redland City Plan Waterway Corridors and Wetlands Overlay.

[2] While the Planning Scheme maps areas of MSES, for the purposes of the SPP only those areas shown in **Plate 32** are relevant.

In accordance with the Environmental significance overlay code –

(1) The purpose of the environmental significance overlay code is to manage development to avoid or minimise and mitigate significant impacts on matters of national, state and local environmental significance.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) areas of high biodiversity or environmental significance are retained and protected;

(b) development maximises the retention of native vegetation and significant habitat features;

(c) development minimises the loss of koala habitat trees;

(d) impacts on matters of state or local environmental significance are minimised and mitigated;

(e) development does not cause substantial fragmentation of habitat areas;

(f) opportunities for safe and viable wildlife movement within and between habitat areas are facilitated;

(g) landscaping and planting is undertaken in a manner that contributes to the ecological values of the site; and

(h) *where they occur, significant residual impacts on matters of local environmental significance or another prescribed environmental matter in accordance with section 15(4) of the* Environmental Offsets Act 2014, may need to be offset.

A response to the Environmental significance overlay code has been provided in **Appendix G**.

In accordance with the Waterway corridors and wetland overlay code –

(1) The purpose of the waterway corridors and wetlands overlay code is to manage development to avoid significant impacts on matters of national, state and local environmental significance, specific to the environmental values of waterways and wetlands.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) development is compatible with the environmental values of a waterway or wetland;

(b) water quality in waterways and waterbodies is maintained or improved;

(c) riparian vegetation, in-stream aquatic ecology and biodiversity along waterway corridors and around wetlands are maintained or enhanced;

(d) natural hydrological and geomorphological processes (including bank stability) are maintained;

(e) impacts on waterways and wetland are minimised and mitigated; and

(f) development does not increase long term maintenance or management costs of natural or man-mad water bodies to the community.

A response to the Waterway corridor and wetland overlay has been provided in **Appendix H**.

3.3 Assessment of impacts and recommended mitigation measures

3.3.1 Commonwealth matters

Table 3-8 provides an assessment of impacts on ecological features relevant to the Commonwealth identified in **Section 3.2**.

Table 3-8 Commonwealth matters - potential impacts and considerations.

Ecologically significant feature	Potential impact	Considerations
Threatened Fauna Species: ▪ Koalas and Koala habitat ▪ Grey headed flying-fox	Koala ▪ Loss of ~6.3 ha of Koala habitat tree area and ~19.4 ha of Koala movement opportunity area.	An EPBC Act Self-Assessment was completed to assess the proposed works against the EPBC Act Significant Impact Guidelines 1.1 – Matters of Environmental Significance (DoE, 2013) and the EPBC Act referral guidelines for the vulnerable koala (DoE, 2014).

Ecologically significant feature	Potential impact	Considerations
	▪ Potential to fragment regional corridor. ▪ Reduction in foraging material for local Koala population. ▪ Potential increase in koala injury/mortality due to habitat loss. ▪ Increased traffic resulting in greater fauna vehicle strikes <u>Grey headed flying-fox</u> ▪ Potential to reduce availability of flowering resources for flying-fox populations.	The EPBC Act Significant Impact Self-assessment indicates that the resulting action is unlikely to have significant impact upon a MNES. Nonetheless, referral to the Commonwealth is recommended for adverse impacts to habitat critical to the survival of the Koala (**Appendix F**).

3.3.2 State matters

Table 3-9 provides an assessment of impacts on ecological features relevant to the State as identified in **Section 3.2**.

Table 3-9 State matters - potential impacts and considerations.

Ecologically significant feature	Potential impact	Considerations
Areas mapped as MSES	▪ **Plate 31** illustrates the SPP mapping of MSES. The proposal directly interferes with this mapping in four locations (refer to **Plate 34**).	▪ Values within impacted areas of mapped MSES are discussed in **Table 3-10**. The proposed master plan will likely result in the clearing of some koala habitat trees, some of which support hollows. Measures to compensate for their loss (i.e. ecological restoration) and mitigate impacts (e.g. spotter catchers; re-use of hollows) can be adopted.
Koala habitat	▪ Loss of Koala habitat. ▪ Potential to fragment regional corridor. ▪ Reduction in foraging material for local Koala population. ▪ Potential increase in koala injury/mortality due to habitat loss. ▪ Increased traffic resulting in greater fauna vehicle strikes.	▪ Under the *Planning Regulation 2017* (Planning Regulation) (Schedule 10, Part 10, Division 3, Section 16A), development interfering with koala habitat in the koala priority area and koala habitat area does not apply for the development of infrastructure for parks, recreation and sporting facilities, if the development is carried out by or for the State or a public sector entity. ▪ To mitigate potential impacts, clearing works should be completed in accordance with the Wildlife Habitat Management Plan (WHMP) (**Appendix I**) including: – Staged and sequential clearing; – Limited clearing to a maximum of 3 ha per day and allowing a 12-hour period from 6pm on the day of clearing to 6 am the following day in which no clearing occurs; – Clearing must be supervised by a fauna spotter catcher and koala spotter. – The WHMP is to be included within the Construction Environmental Management Plan documentation. ▪ Include compensatory plantings
Threatened flora and fauna: ▪ Koala	▪ Loss of Koala habitat. ▪ Potential to fragment regional corridor.	▪ Clearing works should be completed in accordance with the Wildlife Habitat Management Plan (WHMP) (**Appendix I**) including:

Ecologically significant feature	Potential impact	Considerations
	▪ Reduction in foraging material for local Koala population. ▪ Potential increase in koala injury/mortality due to habitat loss. ▪ Increased traffic resulting in greater fauna vehicle strikes	– Staged and sequential clearing; – Limited clearing to a maximum of 3 ha per day and allowing a 12-hour period from 6pm on the day of clearing to 6 am the following day in which no clearing occurs; – Clearing must be supervised by a fauna spotter catcher and koala spotter. ▪ The WHMP is to be included within the Construction Environmental Management Plan documentation. ▪ Include compensatory plantings. ▪ Apply and enforce low speed environments within the proposed development. ▪ Maintain permeability of the Site through the use of permeable fencing (consideration should be given to precluding access to Heinemann Road, while funnelling movement to a dedicated crossing).
Habitat features	▪ Loss of habitat features including hollow-bearing trees, stags, nests and logs.	▪ Works are to be completed in accordance with a High-Risk SMP and associated Impact Management Plan that considered all colonial breeding species known to occur on Site. It is recommended that artificial habitat is installed within the retained canopy within the Site at a ratio of 1:1 to mitigate the loss of habitat features within the Site. This can include re-use of cleared hollows.
Regulated Vegetation: ▪ Category B (remnant vegetation) ▪ Category C (high-value regrowth vegetation) ▪ Category X (cleared area)	▪ Loss of regulated vegetation containing endangered, of concern and least concern REs. ▪ Potential fragmentation of regulation vegetation and associated local and regional ecological corridors. ▪ Loss of habitat for threatened fauna species	▪ Under the Planning Regulation, clearing on a Freehold Lot for an urban purpose in an urban area is exempt clearing for regulated regrowth, of concern and least concern Category B (schedule 21, part 2, section 2 (g). – Urban purpose includes sporting and recreation; and – Urban area may be applicable should Council's rezoning under the planning scheme amendment be for an urban area. Noting that this exemption is currently not applicable as the site is zoned as rural. ▪ The exemption for urban purpose would still place limitations on clearing some vegetation, in particular remnant Endangered regional ecosystems. ▪ If clearing is required under the current rural zoning the following will apply: – Clearing Category C (High-value regrowth vegetation) must comply with the *Accepted development vegetation clearing code – Clearing for infrastructure*, otherwise vegetation clearing will be subject to compliance with State Code 16: Vegetation Clearing following receipt of a determination made by the State that the clearing is for a relevant purpose[3].

[3] A form must be lodged with the State prior to progressing with the Code 16 response to attain a determination that the clearing is for a relevant purpose.

Ecologically significant feature	Potential impact	Considerations
		– Clearing of Category B (remnant vegetation) will be subject to compliance with State Code 16: Vegetation Clearing following receipt of a determination made by the State that the clearing is for a relevant purpose.
Waterways and Wetlands	▪ Potential impacts to water quality within wetlands due to erosion and sedimentation. ▪ Potential to modify hydrological function of the waterways within the Site. ▪ Potential loss of wetland ecosystem and associated aquatic habitat. ▪ Potential loss of habitat for aquatic fauna species. ▪ Potential waterway barriers preventing fish passage.	▪ The Master Plan design considers waterways within the Site, however a review of detailed design plans will be required to determine if the development will trigger Operational work for Waterway Barrier Works. It is recommended that the detail design incorporate the requirements of the *Accepted development requirements for operational work that is constructing or raising waterway barrier works*. ▪ A stormwater quality management plan will be required at the detailed design stage to ensure stormwater runoff is appropriately treated prior to entering the waterways. ▪ A certified Erosion and Sediment Control Plan in accordance with IECA 2008 Best Practice Erosion and Sediment Control, that also meets the requirements of the State Planning Policy must be included in the Construction Environment Management Plan documentation. The Erosion and Sediment Control Plan must be certified by a certified professional in Erosion and Sediment Control such as a registered Professional Engineer of Queensland (RPEQ) or Certified Professional in Erosion and Sediment Control (CPESC). ▪ The Erosion and Sediment Control Plan must outline water quality monitoring requirements for the construction phase. Development within the waterways within the Site must be design to retain existing hydrological function and flows. ▪ Development must be set-back from waterways; where this is unavoidable, dewatering activities (if required) by should be supervised by a suitably qualified and experienced fauna spotter catcher. Additional mitigation measures are to be included in the Construction Environment Management Plan.
Weeds and Pests	▪ Potential for restricted weeds listed under the *Biosecurity Act 2014* to spread within the Site as a result of the Project. ▪ Potential encroachment of restricted terrestrial and aquatic fauna pests listed under the *Biosecurity Act 2014* resulting in predation and competition with native fauna.	▪ Specific weed and pest animal management measures should be included in the Construction Environment Management Plan. ▪ Weed incursion should be monitored throughout the construction and operational phases of the Project and controlled as necessary. ▪ A general pest animal control program (i.e. targeting Red fox) may be considered during the operational phase of the Project.



Plate 34: MSES – Wildlife habitat (koala habitat areas – core) (green) and locations where the approximate footprint of infrastructure shown in the Masterplan (black hatch).

Table 3-10 Areas of mapped MSES likely impacted by the Master Plan.

MSES	Description	Plates
1	This area of mapped MSES is an open woodland with a relictual *Eucalyptus racemosa* (Scribbly Gum) and *Corymbia intermedia (*Pink bloodwood) overstorey topping an area that has been cleared for grazing purposes. Hollows occur in a number of the trees. The relictual specimens meet the definition of koala habitat trees. The modified understorey and ground layers provide little habitat for species other than the Red-necked wallaby population.	 **Plate 35:** MSES Area 1 open woodland.
2	Located within the north-western extent of the Site, the area is characterised by an open woodland of *Eucalyptus racemosa* (Scribbly Gum), *Corymbia intermedia* (Pink Bloodwood) and *Lophostemon confertus* (Brush Box). Hollows occur in a number of the trees. The relictual specimens meet the definition of koala habitat trees. The modified understorey and ground layers provide little habitat for species other than the Red-necked wallaby population.	 **Plate 36:** MSES area 2 open woodland.

MSES	Description	Plates
3	This portion of the Site reflects a woodland to open forest dominated by *Melaleuca quinquenervia* (Broad-leaved paperbark) with *Lophostemon suaveolens (*Swamp box) over *Imperata cylindrica (*Blady Grass) understorey. Hollows occur in some of the trees. The relictual specimens meet the definition of koala habitat trees. The modified understorey and ground layers provide little habitat for species other than the Red-necked wallaby population.	 **Plate 37:** MSES area 3 open woodland to open forest.
4	Scattered relictual trees including specimens of *Eucalyptus pilularis* (Blackbutt) occur in this area. Hollows occur in a number of the relictual trees. The relictual specimens meet the definition of koala habitat trees. The modified understorey and ground layers provide little habitat for species other than the Red-necked wallaby population.	 **Plate 38:** MSES area 4 open woodland to open forest.

3.5.3 Local matters

It is understood that Council will be Rezoning the land from Rural to Recreation and Open Space; as such, all assessment in so far as the planning framework is concerned should be undertaken on the basis of the land being zoned as Recreation and Open Space. **Table 3-11** provides an assessment of impacts on ecological features relevant to Local matters identified in **Section 3.2**.

Table 3-11 Local matters - potential impacts and considerations.

Ecologically significant feature	Potential impact	Considerations
Environmental Significance Overlay	▪ Loss of mapped MSES and MLES. ▪ Potential increase in edge effects. ▪ Potential impacts to fauna from lighting, noise and reduction in air quality.	▪ **Appendix G** identifies how the Master Plan proposal responds to the Performance Outcomes of the Environmental Significance Overlay.
Waterway corridors and wetlands overlay code	▪ Potential impacts to water quality within wetlands due to erosion and sedimentation and downstream aquatic habitats. ▪ Potential to modify hydrological function of the waterways within the Site. ▪ Potential loss of wetland ecosystem and associated aquatic habitat.	▪ **Appendix H** identifies how the Master Plan proposal responds to the Performance Outcomes of the Waterway corridors and wetlands overlay.

There are other ecological values associated with the site that are not regarded as MNES, MSES or may not strictly meet the definition of MLES under the Planning Scheme. These values are however regarded as of importance. Measures to ensure the maintenance of these values and the ecological processes that support them are retained and if possible enhanced through implementing the Master Plan are detailed below.

> Wedged Tailed Eagle nest

- Wedged tailed eagles will show fidelity to their nesting tree often returning every year for breeding. Nesting locations are relatively scarce within built-up areas. As such, measures should be implemented to try to limit impacts on the nesting site. This should include:
- Conducting construction works that are proximate to the nest outside of the breeding season.
- Directing walking trails away from the nest tree and establishing restoration in areas surrounding the nest tree.
- Ensuring lighting, particularly that associated with sporting fields, is directed away from the nesting tree.

> Habitat for least concern wildlife

- Numerous species rely on the diverse habitats of the site. While proposed measures to address MNES and MSES will aid least concern wildlife, such as the provision of fauna spotter catchers during clearing, restoration and hollow salvaging, other measures can also be implemented, including the below-listed measures.
- Ensuring lighting is not directed into retained and/or restored natural areas.
- Maintaining the habitat (including edge vegetation and natural substrate) associated with breeding habitat of the Copper-backed broodfrog in areas proximate to waterways.
- Ensuring that rehabilitation efforts consider the retention of some grassed areas (rather than replanting with wooded vegetation) within or adjacent to the rehabilitation area will be necessary to accommodate red necked wallabies.
- Enhancing movement opportunities throughout the Site. Fencing along Heinemann Road to prevent access to the pavement will assist in limiting road kill, but will limit wildlife movement for several species. Future upgrades to culverts along Heinemann Road would provide an opportunity to integrate dry passage in cells that are appropriate dimensions to facilitate movement of terrestrial fauna, such as macropods and Koalas, and enhance aquatic fauna passage.

> Waterway flows

- As a consequence of changing the landform and introducing sporting fields, the hydrological function of waterways in the northern portion of the Site is likely to be affected. Maintenance of water quality will be necessary to ensure existing habitat is maintained. Management of hydrological flows in waterways and aquatic habitat is also important. If armouring is required to protect the channel, then the substrate will change and hence alter the habitat which is required by species such as the Copper-backed broodfrog. Novel engineering solutions may be required to maintain areas of natural substrate throughout the channel.

> Native vegetation and relictual trees:

- All native vegetation provides some habitat. Efforts should be made to avoid the clearing of relictual trees all together and limit the clearing of regrowth vegetation. This is of particular relevance where walking trails and board walks are proposed.

4 Conclusion and recommendations

4.1 Summary of key findings

This EAR considers values of the Site as a whole, but primarily focusses on impacts associated with the establishment of infrastructure associated with sporting facilities in the northern portion of the Site. Within this area, the presence of ecologically significant features has been confirmed. These are listed below along with how delivery of the facilities identified in the Master Plan will need to respond to their presence.

4.1.1 Matters of interest to the Commonwealth

- The Master Plan design will require the removal of Koala habitat and the development is unlikely to have a significant impact on Koalas. Nonetheless, referral to the Commonwealth is recommended for adverse impacts to habitat critical to the survival of the Koala. Recommended mitigation measures to address koalas are discussed in relation to State matters.
- The EPBC Act Self-assessment of the Project determined that the works are unlikely to have a significant impact on the Grey-headed flying-fox.

4.1.2 Matters of interest to the State

- Regulated Vegetation comprising Category B (remnant), Category C (high-value regrowth vegetation) and Category X (cleared area) containing Endangered, Of Concern and Least Concern Regional Ecosystems is located within and adjoining the proposed Precinct. Clearing may meet the exemption for purpose within an urban area, however limitations on clearing some vegetation, in particular remnant Endangered regional ecosystems, still apply. It is recommended that further planning or legal advice be attained in relation to regulated vegetation and its planning implications.
- The Master Plan design will require the removal of Koala habitat and clearing works must be completed in accordance with the WHMP (**Appendix I**). Clearing must be carried out as follows:
  - Staged and sequential clearing;
  - Limited clearing to a maximum of 3 ha per day and allowing a 12-hour period from 6pm on the day of clearing to 6 am the following day in which no clearing occurs;
  - Clearing must be supervised by a fauna spotter catcher and koala spotter. Dewatering activities (if required) must also be supervised by a suitably qualified fauna spotter catcher.
- The Site contains numerous habitat features which will be impacted by the Master Plan design:
  - A High-risk SMP must be obtained if a breeding place of one of the numerous colonial breeders on Site is encountered. Because provisions included in a High-risk SMP incorporate those of a Low-risk SMP, it is recommended that a High-risk SMP be prepared in the first instance given the high likelihood of encountering colonial breeding places.
  - It is recommended that artificial habitat is installed within the retained canopy at a ratio of 1:1 to mitigate the loss of habitat features within the Site.
- Presence of several waterways mapped by DNRME and as Waterways for Waterway Barrier Works:
  - The Master Plan design demonstrates consideration of the waterways within the Site, however a review of detailed design plans will be required to determine if the development will trigger Operational work for Waterway Barrier Works. It is recommended that the detailedesign incorporate the requirements of the Accepted development requirements for operational work that is constructing or raising waterway barrier works.
  - A certified Erosion and Sediment Control Plan must be included in the Construction Environment Management Plan documentation.

4.1.3 Matters regarded of significance in the Local context

- The Master Plan design impacts areas included in relevant Overlays including the Environmental Significance Overlay and the Waterway corridors and wetlands overlay code:
  - **Appendix G** identifies how the Master Plan proposal responds to the Performance Outcomes of the Environmental Significance Overlay.

> **Appendix H** identifies how the Master Plan proposal responds to the Performance Outcomes of the Waterway corridors and wetlands overlay.

4.2 Impacts and mitigation

Table 4-1 summarises the mitigation measures recommended to protect and enhance ecological values and functions within the Site.

Table 4-1 High level impact mitigation measures.

Ecological value	Impact	Mitigation measure
Koalas and Koala habitat	▪ Loss of Koala habitat. ▪ Potential to fragment regional corridor. ▪ Reduction in foraging material for local Koala population. ▪ Potential increase in koala injury/mortality due to habitat loss. ▪ Increased traffic resulting in greater fauna vehicle strikes	▪ Avoid clearing Koala habitat trees to the greatest extent possible. ▪ The design must maximise the retention of Koala habitat trees and habitat trees within the Site by: – Consolidating infrastructure in previously modified areas including the grazed paddocks in the north-eastern extent of the Site; and – Sensitive placement of BMX tracks and pedestrian pathways informed by the tree location identified in the Arboricultural impact assessment to retain vegetation and hydrological flows. ▪ Implement requirements identified for fauna and Koala management within the WHMP (**Appendix I**) including but not limited to: – staged and sequential clearing; and – supervision by a fauna spotter catcher and koala spotter. ▪ Facilitate safe fauna movement throughout the proposed Precinct and within adjoining habitat. ▪ Undertake compensatory planting in the recommended restoration areas as shown in **Figure 6** with the species and density outlined in **Section 4.2.2** below.
Fauna and fauna habitat	▪	▪ The design is to avoid placement of infrastructure and activities within the central waterways within the northern portion of the Site to allow for ecological and hydrological connectivity. Infrastructure located in these areas must be sensitively designed to retain ecological connectivity and allow fish passage. ▪ The lighting design is to be in accordance with the best practice lighting design detailed in the National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds (DAWE, 2020) and should consider the following: – Use adaptive light controls to manage light timing, intensity and colour; – Light only the object or area intended and keep lights as close to the ground, directed and shielded to avoid light spill; – Use the lowest intensity lighting appropriate for the task; – Use non-reflective, dark-coloured surfaces; and – Use lights with reduced or filtered blue, violet and ultra-violet wavelengths. ▪ Ensure that a High-Risk SMP has been submitted and approved by DES for the proposed clearing works. The SMP should include provision for all colonial breeding species on Site.

Ecological value	Impact	Mitigation measure
		▪ Sequential clearing towards the designated conservation area towards the southern extent of the Site must be adopted. ▪ Ensure clearing works are scheduled outside of the breeding seasons for sensitive fauna identified within the Site as detailed in the WHMP (**Appendix I**). ▪ A pre-clearance survey is to be completed by a suitably qualified person with a current Rehabilitation Permit from DES no more than two weeks prior to the commencement of clearing works. ▪ Flagging of habitat trees/features (e.g. arboreal termitaria, nests, and Koala habitat trees) is to be completed prior to clearing by the fauna spotter catcher. Inspection of hollows and nests during the pre-clearance survey should be completed using pole mounted cameras wherever possible. ▪ Ensure all works are undertaken in accordance with the additional mitigation measures provided in the WHMP (**Appendix I**).
Regulated Vegetation	▪ Loss of regulated vegetation containing endangered, of concern and least concern REs. ▪ Potential fragmentation of regulation vegetation and associated local and regional ecological corridors. ▪ Loss of habitat for threatened fauna species	▪ All clearing works must be in accordance with the Vegetation Management Plan (**Appendix J**) including but not limited to: – Clearly demarcate no-go zones on construction plans and in the field prior to the commencement of any vegetation clearing and / or construction works. – A suitably qualified and experienced fauna spotter catcher should undertake a pre-clearing inspection prior to clearing and supervise all vegetation clearing. – Vegetation should be felled away from any vegetation that is to be retained. – Works within the vicinity of trees to be retained should be undertaken in accordance with AS 4970 - 2009 Protection of Trees on Development Sites. – Manage soil erosion and sediment loss during all works as per a specific Construction Environmental Management Plan and Erosion Sediment Control Plan. – All vehicles and plant used during the Projectshould be inspected for weed seed / soil that may result in the introduction of weeds / plant pathogens and if required should be washed-down prior to leaving the Site. – The construction area (including stockpiles and vehicle parking areas) are to be fenced off to prevent fauna access and allow for unimpeded movement outside of these areas. – Any fill / bedding / topsoil materials used as part of the Project should be certified to be clean (i.e. free from weed seeds, fire ants, pathogens and other contaminants) prior to use. ▪ Undertake compensatory planting in the recommended restoration areas shown in **Figure 6** with the species and density outlined **Section 4.2.2**, below.

Ecological value	Impact	Mitigation measure
Aquatic habitat and waterway corridors	▪ Potential impacts to water quality within wetlands due to erosion and sedimentation. ▪ Potential to modify hydrological function of the waterways within the Site. ▪ Potential loss of wetland ecosystem and associated aquatic habitat.	▪ The project will require an Erosion and Sediment Control Plan certified by a suitably qualified person. ▪ Monitoring of upstream and downstream water quality is to be included in the Erosion and Sediment Control requirements in accordance with Council's Healthy Water Code. ▪ A stormwater quality management plan will be required at the detailed design stage to ensure stormwater runoff is appropriately treated prior to entering the waterways. ▪ Supervision of dewatering activities (if required) by a suitably qualified and experienced fauna spotter catcher.

Ecological Restoration

The Environmental Significance Overlay Code requires compensatory planting to be undertaken on-site that is equal to the area of the vegetation cleared. As such, the compensatory planting area is estimated to be approximately 2.3 hectares based on the extent of mapped MLES to be cleared as shown in **Plate 39**. The compensatory planting area is be confirmed following detailed design.

It is recommended that an Ecological Restoration Plan is developed for the precinct which includes compensatory planting and ecological restoration in accordance with the SEQ Restoration Framework. The Ecological Restoration Plan should aim to replicate the Regional Ecosystem present within the Site. It is recommended that artificial habitat including nest boxes and hollow logs are installed within the retained canopy at a ratio of 1:1 to replace the loss of habitat features as a result of the development.

Figure 6 displays recommended compensatory planting areas. The entire planting area accounts for approximately 6 ha of which 0.6 ha is pasture and will require complete restoration.

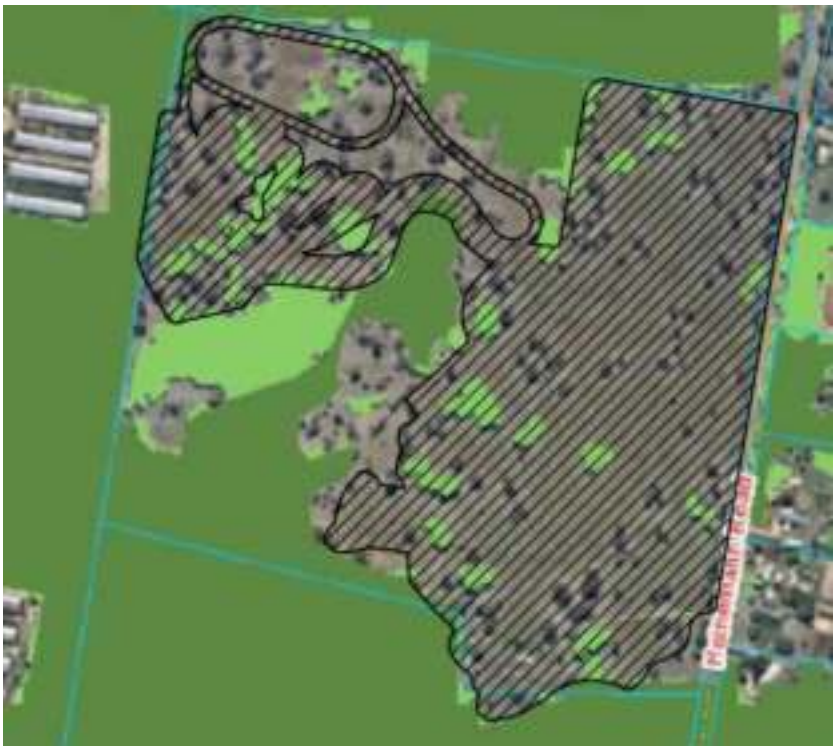


Plate 39: The impact of the Master Plan (hatch) on the Environmental Significance Overlay.

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FIGURE 2 – SURVEY LOCATIONS AND METHODS

FIGURE 3 – ECOLOGICAL FEATURES

FIGURE 4 – ECOLOGICAL PROCESSES

FIGURE 5 – WEED HOTSPOTS

FIGURE 6 – RECOMMENDED MITIGATION



FIGURE 1

1:20,000 Scale at A3

m
0 200 400 600 800

Site Context

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

Redland City Council

Cardno

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Date: 2020-11-27 | Project: NE30016
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30016-GS-000_SiteContext.mxd 02
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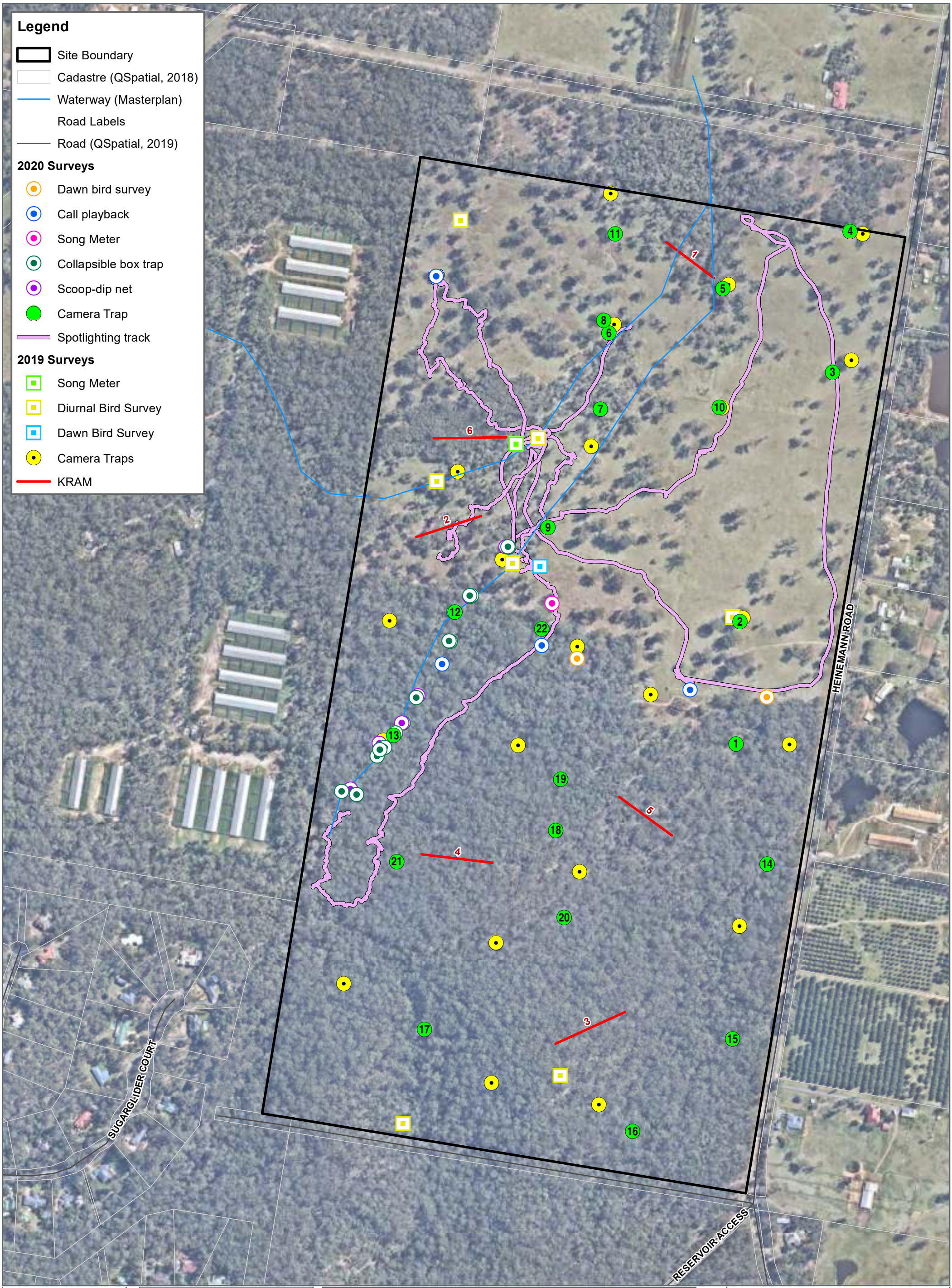


FIGURE 2

1:5,000 Scale at A3

m

0 50 100 150 200

Survey Locations and Methods

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

Redland City Council

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-11-27 | Project: NE30016
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Map: NE30016-GS-001_SurveyLocations_Methods.mxd 02
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Legend

- Cadastre (QSpatial, 2018)
- Site Boundary
- Waterways (Masterplan)
- Aquatic Habitat

EVNT

- Koala scat
- Koala - Camera trap

Habitat Features

- Log
- Nest
- Wedge Tailed Eagle Nest
- Habitat tree

Mapped Regional Ecosystems

- Category A or B area containing endangered RE
- Category A or B area containing of concern RE
- Category A or B area containing least concern RE
- Category C or R area containing endangered RE
- Category C or R area containing of concern RE
- Category C or R area containing of concern RE

12.9-10.4
12.9-10.4
12.11.24/12.11.25
12.11.24/12.11.25
12.9-10.4
12.3.11
non-rem
12.11.24/12.11.25
12.3.11
12.9-10.4
222
223
non-rem
12.3.11
12.3.11
n-rem
12.11.24/12.11.25
219
220
12.3.11
12.3.11
non-rem
12.11.23/12.11.27
12.11.23/12.11.27
218
12.11.23/12.11.27
12.11.23/12.11.27
12.11.23/12.11.27
non-rem
non-rem
12.3.11
12.3.11
12.11.23/12.11.27
12.11.23/12.11.27
12.11.23/12.11.27
12.11.23/12.11.27

Redland CITY COUNCIL

FIGURE 3
1:5,000 Scale at A3

m
0 50 100 150 200

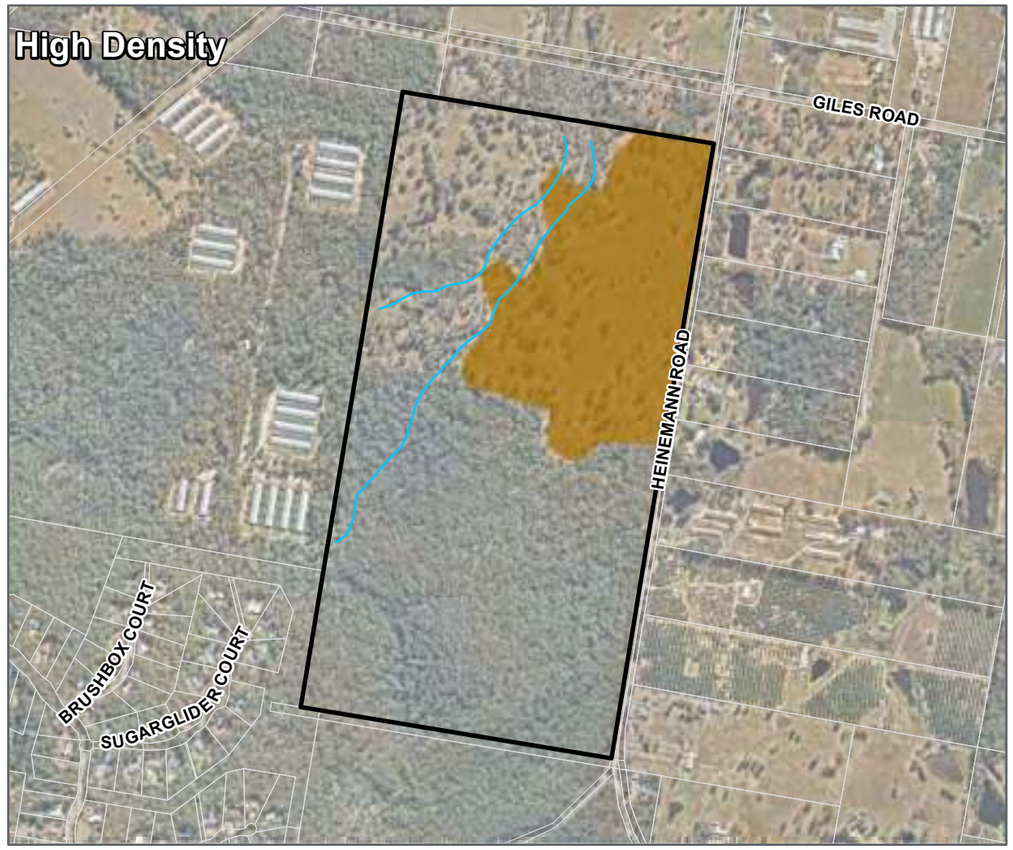
Ecological Features

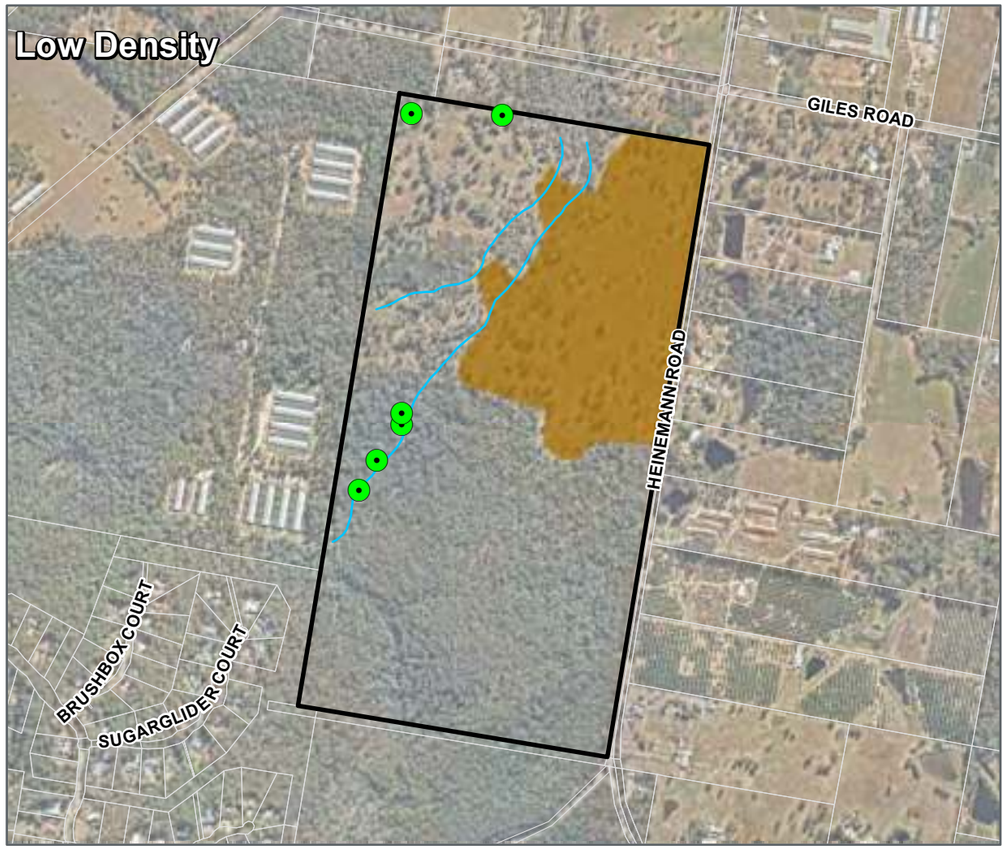
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BRISBANE, QLD

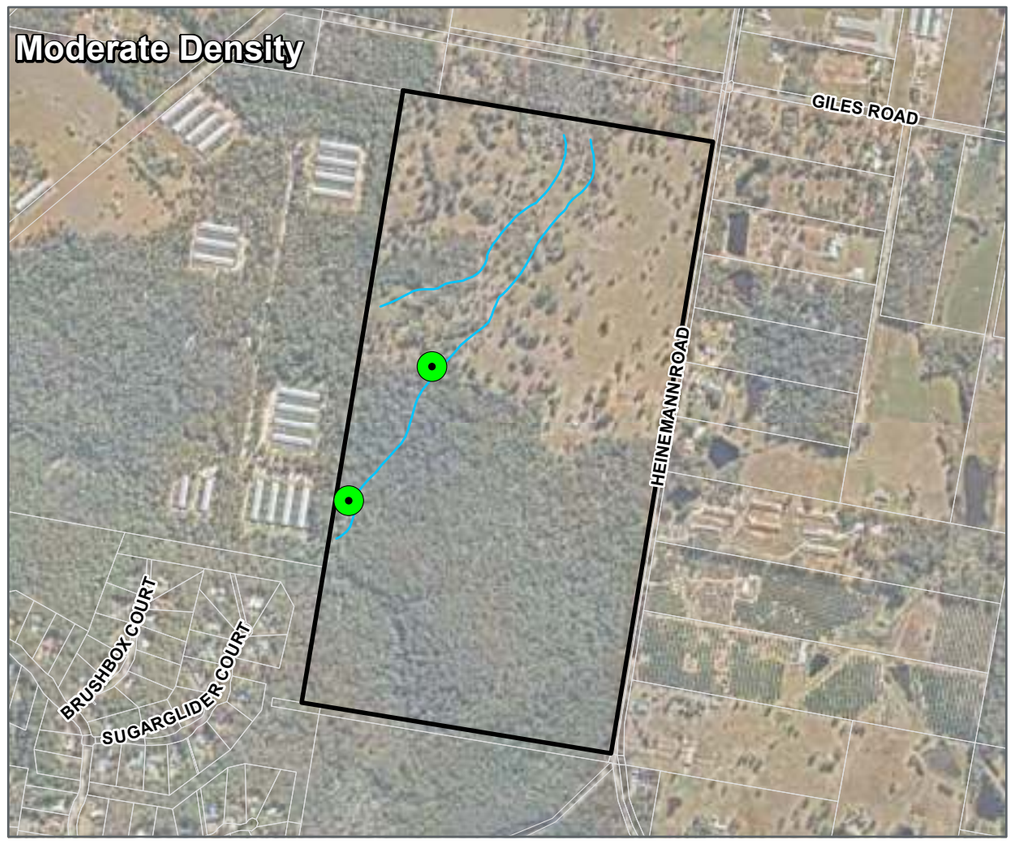
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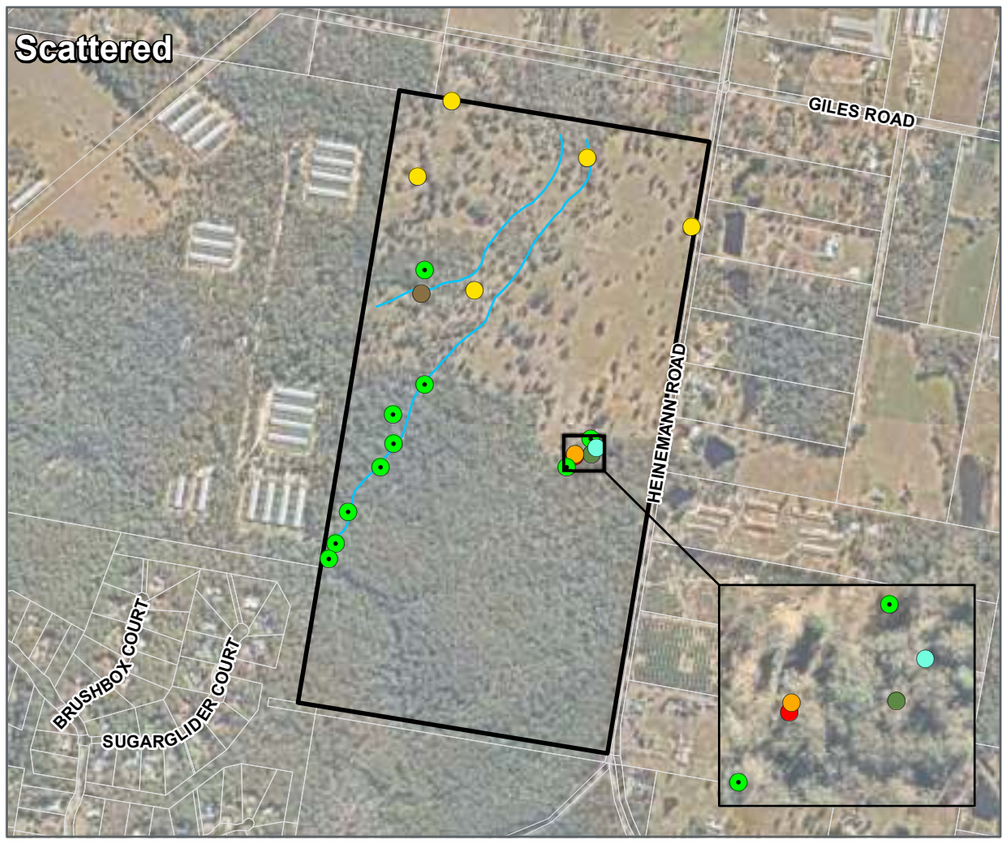
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Weed Hotspots

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

Legend

- Site Boundary
- Waterways (Masterplan)
- Cadastre (QSpatial, 2018)
- Weed Hotspot for High Density Giant Rat's Tail Grass (*Sporobolus pyramidalis*) and Low Density Fire Weed (*Senecio madagascariensis*)

Weeds

- *Bryophyllum delagoense* (mother of millions)
- *Cinnamomum camphora* (camphor laurel)
- *Lantana camara* (lantana)
- *Anredera cordifolia* (madeira vine)
- *Sphagneticola triolbata* (singapore daisy)
- *Tecoma stans* (yellow bells)
- *Eichhornia crassipes* (water hyacinth)

FIGURE 5

1:14,000 Scale at A3

m
0 100 200 300 400

N

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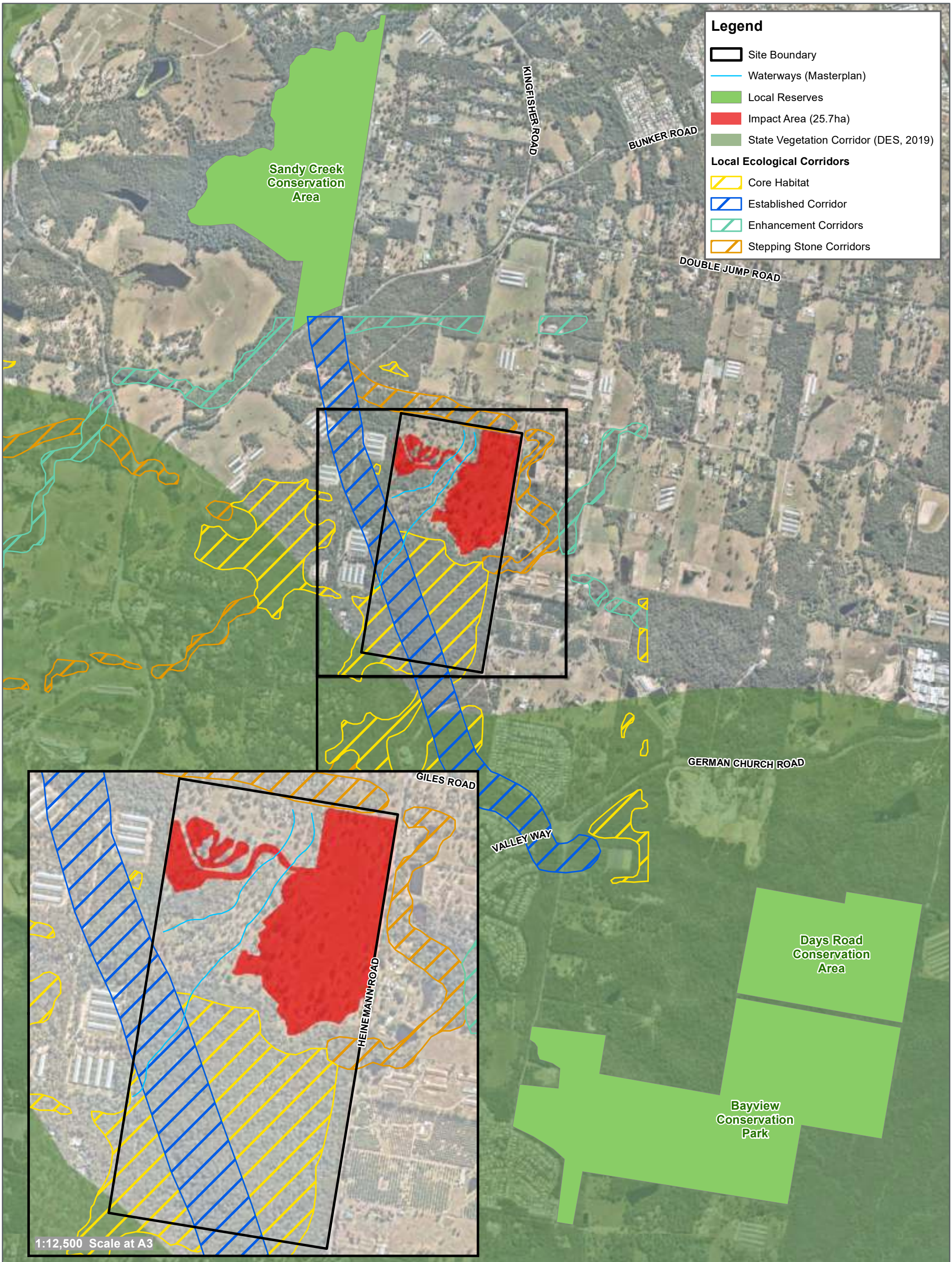


FIGURE 4

1:20,000 Scale at A3

m
0 150 300 450 600

Ecological Processes

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

Redland CITY COUNCIL

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Coordinate System: GDA 1994 MGA Zone 56
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FIGURE 5

1:5,000 Scale at A3

m

0 50 100 150 200

Recommended Mitigation Measures

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

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APPENDIX

A

MASTER PLAN

Redland CITY COUNCIL

Redlands Coast Regional Sport and Recreation Precinct Master Plan

2020–2030



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2	03.12.19	Draft Precinct Master Plan	DC	HC	VS
3	11.12.19	Draft Precinct Master Plan	DC	HC	VS
4	27.04.20	Precinct Master Plan	DC	HC	VS

Disclaimers:

This Master Plan was prepared by an independent consultant in conjunction with Redland City Council. The Master Plan is reflective of a higher level vision for the Redlands Coast Regional Sport and Recreation Precinct and is subject to further consultation and consideration by Council.

All illustrative plans, perspectives and imagery contained within this report are indicative impressions to illustrate conceptual ideas only and are subject to further resolution, consultation, detailed design and approvals.

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We acknowledge the Traditional Custodians of the land, the Quandamooka People of the lands, waters and seas. We pay our respects to their Elders past and present, and acknowledge all Aboriginal and Torres Strait Islander people who are part of the Redlands community today.

Queensland Government

The Queensland Government provided funding to Redland City Council through the Get Planning Spaces Program to improve the quality of evidence-based decision making and strategic planning for sport and recreation across Queensland.

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Executive summary

In 2017, Redland City Council purchased a large site on Heinemann Road at the southern end of the local government area (LGA) for future development of a regional-level sport and recreation precinct. Council had identified a shortfall of land for formal sporting opportunities across the city. This large land parcel provides an opportunity to begin to address the demand created by this under-supply. To reflect the expected quality embellishments and the potential for development of formal sport, passive and active recreation, the site has been identified as the Redlands Coast Regional Sport and Recreation Precinct.

There are currently competing demands for the existing sporting spaces across Redlands Coast. Projected population growth may place additional capacity stress on this existing network. Further, issues have arisen such as difficulty hosting community events at the Redland Showgrounds at Cleveland (given formal sporting uses there) and clashes and capacity issues at venues such as the Pinklands Recreation Reserve. These emerging constraints highlight the need for preparation of the Master Plan and ultimate development of the Precinct.

Existing situation

The 101.2ha site is located approximately 9.5km south of the Cleveland central business district. The site is a rectangular block highlighted by a heavily vegetated conservation area in the southern half and a more cleared section in the northern portion.

The northern section of the site is currently used for cattle grazing while the southern area includes a number of Council-managed multi-use trails.

Demand for development

Demand for development at the Precinct has been established through consultation with Councillors, Council officers, potential user groups and peak bodies, local community groups and the wider community and from consideration of both existing and planned nearby opportunities. Importantly, it is clear that the site will not meet all current or future demands. This will result in a need for planning optimisation at existing facilities and identification of future sport and recreation land.

Key directions influencing the preferred layout include:

- pressures at existing facilities within the city (particularly Norm Price Park - Redland Showgrounds, Pinklands Recreation Reserve and Redlands PCYC and BMX Facility)
- growth in a number of field sports, cycling and BMX
- growth in active recreation groups and programs (e.g. parkrun)
- opportunity for a wide range of recreation options
- opportunity to embrace the significant ecological elements within the site and retain conservation areas
- Council's additional planning and investigation activities.

Design directions

The medium- to long-term vision for the Precinct will:

- provide a high quality multi-sports facility that offers a range of opportunities for locals and visiting teams
- be supported by necessary ancillary facilities
- be used daily for training and competition but also be designed and developed such that it has the capacity to host larger sporting events and carnivals.
- provide quality recreation and physical activity pursuits to be enjoyed by facility users and residents
- rehabilitate key environmental features and retain the conservation area as key aspects of the development.

Proposed ultimate embellishment for the Precinct includes:

- approximately 15ha of lit touch and rugby league fields and associated infrastructure
- bike activity sub-precinct including criterium track, BMX track, pump track, shared clubhouse and parking
- regional-level play, kickabout area and activity node
- network of sealed paths, boardwalks and compacted unsealed tracks
- barbecue and picnic nodes across the recreation areas in the north-west section of the Precinct
- mix of tracks and trails throughout the conservation area at the southern end of the Precinct
- formal and overflow car parking options Precinct-wide.



1 Introduction

1.1 Project overview

ROSS Planning has been commissioned by Redland City Council to develop a Master Plan for the Redlands Coast Regional Sport and Recreation Precinct located in the southern part of Redlands Coast. The site is undeveloped greenfield land purchased by Council in 2017 for the purpose of delivering sport, recreation and conservation outcomes for the community.

This Master Plan represents an opportunity to build upon the existing conservation uses and to provide a clear strategic (and sustainable) vision for the Precinct.

1.2 What is a Master Plan?

A Master Plan provides a vision for a site, identifying what it should look like and how it should function into the future. It establishes a strong and consistent direction by providing a framework for ongoing improvement. It considers the interrelationship between:

- current character and functionality of the landscape
- public expectations and needs
- emerging issues and trends
- the realities of the economic, social, environmental and legislative context of the time.

The result is a plan that balances needs across a range of often conflicting interests. The Master Plan does not necessarily suggest that all elements of the plan should proceed immediately, or that Council or the user groups should be responsible for all capital costs, in respect of those items that are progressed.

It is important to note that the intent of a Master Plan is to provide a framework for future development of the Precinct over an extended period of time so that ad hoc improvements are avoided, and community use and long-term viability are maximised. To ensure this intent is achieved, a Master Plan should be monitored regularly to ensure the outcomes continue to meet community needs in the best possible way.

Following the completion of the Master Plan process, Council will prepare an implementation plan to direct development of the Precinct.

1.3 Project objectives

The Master Plan will provide a planning and design framework for the future development and enhancement of the Precinct. The Master Plan will guide the creation of sport and recreation facilities to cater for the needs of the community and user groups over the next 20 years. The Master Plan has the following objectives:

- ☐ to provide a framework for built infrastructure that appropriately supports sporting activity and recreation
- ☐ to encourage informal recreation activities to be enjoyed by the general community
- ☐ to consider the wider impacts that can be achieved at other community facilities throughout the city as a result of planned development at the Precinct
- ☐ to create safe access and integrated movement through and to the Precinct
- ☐ to promote the natural environment, sustainable development, and practicable maintenance regimes
- ☐ to foster partnerships for capital development and ongoing management of the Precinct.

1.4 Process

The project program spans across seven stages and has been delivered as follows:

Stage	Task/s
1	Project initialisation ☐ Inception meeting ☐ Initial site tours
2	Background research and analysis ☐ Document and policy review ☐ Trends analysis
3	Site analysis ☐ Site assessment ☐ Open space context ☐ Technical investigations
4	Consultation ☐ Council engagement ☐ Sport and recreation user group and peak body engagement ☐ External stakeholder engagement ☐ Wider community engagement
5	Needs assessment ☐ Current and future gap analysis ☐ Situational analysis ☐ Options development
6	Draft plan preparation and presentation ☐ Preparation of the draft ☐ Presentation of the draft ☐ Public review of the draft
7	Review and finalisation ☐ Draft review ☐ Finalisation and adoption



View of the proposed location of sporting fields at Heinemann Road site (Redlands Coast Regional Sport and Recreation Precinct)



Aerial imagery of the Heinemann Road site



2

Strategic context

2.1 Literature review

In order to present a clear picture of the background issues and opportunities influencing the potential development of the Precinct, a literature review has been undertaken. A range of documents have been reviewed and considered in preparation of the draft Master Plan.

Over recent years, Council has undertaken a number of key studies relating to the provision of open space and sporting opportunities across the city. In particular, the outcomes of two key studies led directly to the purchase of the Heinemann Road site:

- Redland Open Space Strategy 2026 (2012)
- Redland Sport Land Demand Study (2016).

2.1.1 Redland Open Space Strategy 2026

This Strategy examines open space using an approach that considers what activities people like to do in the city's parks and open spaces. Activity requirements have been matched to the open spaces and parks in people's neighbourhoods and across suburb catchment areas.

While the Strategy recommended a move away from the traditional desired standards of service (hectares per population approach) to open space planning for more local facilities, this approach was retained for medium density residential areas and for sporting land.

Using the desired standards of service for sport, the Strategy identified that, assuming no land for sport is acquired, the projected 2026 population will require an additional:

- 137ha of land for sport on the mainland
- 2ha of land for sport on the islands.

Further, the Strategy recommends:

- development of a sport land acquisition program for the city to supply sporting facilities both outdoor and indoor
- continued investigation, planning and assessments for the development of new sport facilities in the south of the city to meet current and future unmet demand for sport
- ensure future environmental land acquisitions consider multiple benefits and values of space (importantly outdoor recreation).

Clearly, these recommendations have played a significant role in the acquisition of the Heinemann Road site. The site is located at the southern end of Redlands Coast. It has been purchased for sport and recreation opportunities but also as an environmental land acquisition with important conservation values (that will be retained alongside limited-impact outdoor recreation options).

2.1.2 Redland Sport Land Demand Study

This project was undertaken in 2016 to assess the current and future demand for sport land across the city. The study considered:

- the capacity of existing facilities
- membership trends for local clubs
- wider participation trends for the major sporting codes.

The Study used desired standards of service (facilities per member) to identify predicted 2031 land requirements for each of the major sporting codes. The following codes were noted as facing shortfall by 2031 without additional access to facilities:

- athletics - 2 track shortfall
- AFL - 3 oval shortfall
- cricket - 6 oval shortfall
- football - 4 field shortfall
- gymnastics - 1 purpose-built facility shortfall
- netball - new association complex shortfall
- rugby league - 5 field shortfall
- swimming - new aquatic centre shortfall
- tennis - Mt Cotton district shortfall.

While the Sport Land Demand Study was a key driver in the purchase of the Heinemann Road site, changes in local priorities and State Sporting Organisation directions have occurred in a number of instances since 2016. As a result, the findings of the Study have been re-analysed in the engagement undertaken as part of the Precinct Master Plan process.

2.1.3 Additional corporate documents

Corporate Plan 2018-2023

The Corporate Plan is the key document leading Council delivery. It is underpinned by Council's vision: "Forward thinking, engaged and focused on enriching lifestyles".
Key strategies are presented under eight outcome areas. Those with the most direct relevance to the Master Plan include:

- 1. Healthy natural environment
  - 1.1 Redland's natural assets including flora, fauna, habitats, biodiversity, ecosystems and waterways are managed, maintained and monitored
  - 1.2 Threatened species are maintained and protected, including the vulnerable koala species
  - 1.4 Visitors experience our natural assets through high standard facilities, trails, interpretation and low impact commercial ventures
- 6. Supportive and vibrant economy
  - 6.2 Redland City Council delivers events, activities and performances that bring economic and social benefits to the community
- 7. Strong and connected communities
  - 7.2 Council maximises community benefit from the use of its parklands and facilities by improving access to, and the quality and shared use of, public spaces and facilities by groups for sporting, recreational and community activities
  - 7.3 Council's assessment of community issues and needs provides timely opportunities to pursue grants and partnerships that realise long-term benefits.

A number of these strategies provide a clear direction for the future planning and development of the Precinct.

Redlands 2030 Community Plan

The document is a guide to achieve the community's vision for the future "In 2030, the Redlands will be a well-designed, vibrant city of mainland and island communities, each with distinctive character, heritage and lifestyles. Our shared values will shape the way we care for each other and how we protect the land, seas and waters where we choose to be". A range of goals influence the Master Plan process:

HEALTHY NATURAL ENVIRONMENT

- Goal 3 - Extensive wildlife linkages and corridors
  - Strong physical linkages of ecosystems across the landscape form a natural web which sustains and regenerates the biodiversity of flora and fauna within the Redlands and into surrounding regions
- Goal 4 - Thriving koala population
  - Koala habitats are protected and new habitat areas established to support the dietary requirements and roaming nature of bushland and urban koalas
- Goal 6 - Land managed for conservation
  - Land in identified areas is amalgamated to create larger, more viable habitat and conservation reserves which support and protect native flora and fauna

- Goal 8 - Getting around in nature
  - Walking trails and cycling networks in natural areas are sensitively designed to bring people close to nature and keep nature safe with people.

WISE PLANNING AND DESIGN

- Goal 13 - Green, shaded, city
  - Green leafy parklands, selective planting in nature strips, and natural landscaping between buildings and houses all contribute to shading our streets, supporting flora and fauna habitats and beautifying the city
- Goal 14 - Much-loved parklands
  - Well-designed, well-located foreshore and bushland parks, active and passive parks, village greens and local parks spread equitably across the Redlands are attractive places for all

STRONG AND CONNECTED COMMUNITIES

- Goal 11 - Responsive social infrastructure
  - Easily accessible facilities, services and networks cater for the needs of a diverse community to participate fully in arts, heritage and culture, sport and recreation, community development and lifelong learning
- Goal 13 - An active community
  - The community enjoys the many pathways, tracks, trails, skateparks and outdoor, indoor and water-based recreational activities and sports on offer, and community sports centres provide convenient access for community participation and social support

Like the Corporate Plan, the Community Plan provides an over-arching guide for the development of the Heinemann Road site.

LITERATURE REVIEW - SUMMARY

When considered together, the literature review highlights a number of key considerations:

- Council and the community acknowledges the importance of sport and recreation facilities and opportunities for the community
- Retaining environmental corridors, conservation areas and habitat are key considerations for the community
- There are a number of local clubs (and sports codes more broadly) likely to be seeking expansion and/or relocation of facilities
- The Heinemann Road site was first acknowledged as a potential site for sports development more than 12 years ago. A number of sports have developed an 'attachment' to the site in terms of expectations for future facilities.

2.1.4 Additional specific documents

Council has developed a number of specific strategies to guide decision-making. While a number of these documents are now aged and priorities are likely to have changed, those that have been considered in the Master Plan project are mentioned briefly below.

Redland City Events Strategy and Action Plan 2017-2022

- The purpose of the Strategy is to provide a strategic direction and focus for events in Redlands. The Strategy notes that growing existing events and attracting new, larger events to Redlands Coast is currently hampered by limited event facilities as well as conflicting use and availability of facilities for community and event organisers. For example, accessing Norm Price Park (Redland Showgrounds) at Cleveland is difficult as it is used by several sports associations.
  - Opportunities to free up land area at the Showgrounds that is currently used for formal sport have been considered in the development of the Master Plan

Redlands Netball Strategy 2011-2021

- The Strategy recommends relocation of the Association to a new site in the southern corridor
  - this is no longer a preferred direction for either the Association nor Netball Queensland

Redlands Cricket Strategy 2011

- The Strategy recommended upgrades such as oval lighting and the development of turf wickets at existing facilities, rather than the development of additional ovals
  - Queensland Cricket's Infrastructure Strategy 2018-2028 reflects the 2011 findings. This recent Strategy highlights that the Brisbane East and Redlands area has an appropriate ratio of fields to players and preference is for lighting and universal amenities facilities projects.

Pinklands Equestrian Centre Facilities and Management Plan (2006) and Redland Regional Equestrian Centre Site Identification Project (2007)

- Together, these documents recommend the development of a Regional Equestrian Centre (with the two preferred sites being the Heinemann Road site (subject of this Master Plan) and a former University of Queensland site at Mount Cotton
  - equestrian sports were considered in the demand analysis phase of the Master Plan. Given pressures for alternate field sports and BMX/cycling activities, and limited area for sports development within the site, equestrian activities have not been accommodated in the Master Plan.



3

Analysis and planning

3.1 Site context

3.1.1 Location

The 101.2ha site (and proposed Regional Sport and Recreation Precinct) is located approximately 9.5km south of the Cleveland central business district. The only road frontage is Heinemann Road that runs along the full length of the eastern boundary of the block.

Much of the immediate surrounding area is rural lands (predominantly poultry farms and hobby farming). However, there is a small area of low density residential housing less than 1km south of the site. Additionally, the communities of Victoria Point and Redland Bay are approximately 3km to the north-east and east respectively. Finally, a residential community of approximately 3,000 residents is planned through the Victoria Point Structure Plan less than 1.5km north-east of the site. It is important to note that this new development has been planned with a new typology of 'active circuit' and an expectation of a strong link to the Precinct. No significant sport and recreation facilities have been planned with this demand expected to be met at the Precinct.

3.1.2 Climate

The climate of Redlands Coast is sub-tropical and maritime. It is characterised by hot, dominantly humid, rainy summer seasons and by short, mild and relatively dry winters. There may be a minor rainfall peak across June-July. On average, two-thirds of the yearly rainfall occurs in the six months from November to April.

The site is subject to moderate to fresh winds (prevailing northerlies and southerlies). These winds further highlight the importance of sporting facility development in north-south aspects where possible (to avoid regular cross-winds).

3.1.3 Landform

The topography of the northern end of the site is characterised by gentle hill slopes in the eastern and western portions of the site that slope downwards towards a flat low-lying central drainage corridor. This corridor has a north to south alignment and ranges up to approximately 150m in width. Throughout the investigation period for the project, the corridor varied from particularly wet with a number of areas of ponded water and lagoons through to very dry with a hard ground surface.

On the western side of the drainage corridor, the ground surface typically slopes gently downwards from the western site boundary at approximately 5 degrees with localised steeper and flatter sections.

On the eastern side of the drainage corridor, the southern boundary of the cleared area forms a localised flat hillcrest that slopes gently downwards towards the north, east and west.

The sloping portions of the northern portion of the site have historically been cleared with only a sparse covering of mature gum trees and short grass. The hill crest in the south eastern portion of the site includes a small shed and cattle fencing.

The southern end of the site (the conservation area) has a raised central area that falls away to drainage lines to the east and west.

3.2 Planning considerations

3.2.1 Redland City Plan

The latest version of the City Plan came into effect in July 2019.

Rural zone code

The site is currently zoned rural. The purpose of the rural zone code is to:

- provide for a wide range of primary production activities while protecting natural resources and significant environmental and landscape values.

The purpose of the code will be achieved through the following overall outcomes:

- ...(d) educational, recreational and tourism uses are accommodated where they do not significantly impact on the environmental and landscape values of the locality
- ...(i) built form is generally a subservient element in the landscape, and does not significantly alter the rural or natural character or scenic quality of the locality
- (j) all forms of development minimise impacts on the natural environment and maintain a connected network of habitat areas and corridors.

City Plan Table 5.4.22-Rural zone identifies the levels of assessment for desired uses:

- a *park* is considered to be an accepted use and therefore does not require planning approval
- *outdoor sport and recreation* will be subject to code assessment.

The proposed outcomes within the Master Plan will alter the current uses at the site. However, it is important to note that due concern has been given to retaining much of the open and natural character of the site, protecting landscape values and avoiding inappropriate environmental disturbance.

Recreation and sport land expectations

City Plan Table 4.4.3 identifies minimum public park land size and accessibility standards for the recreation park hierarchy and sports parks.

The proposed developments at Heinemann Road include formal sport development (*sport park*) and a range of high quality recreation elements and opportunities (recreation park T1-destination). For both sport parks and recreation parks T1-destination, the minimum land size is 5-20ha. While limited development is proposed in the southern end of the site (where conservation will remain the key outcome), the northern portion of the site (approximately 48ha) reflects suitable land size to accommodate both sport and recreation (and meet planning scheme expectations for minimum land size for development of this nature).

Parking guidelines

City Plan Table 9.3.5.3.2 outlines the vehicle parking expectations for a wide range of uses. The guideline with most relevance to the development of the Master Plan is:

- Sports field - 50 parking spaces per field.

This provision guideline has been used to direct the number of car parks included in the preferred layout plan.



Aerial imagery highlighting the rural nature of the Precinct's immediate surrounds

Redland City Plan - Zones



3.3 Ecological considerations

Council commissioned Cardno in mid-2019 to undertake an ecological assessment of the site (as an adjunct to the Master Plan project). The findings were then reviewed by the ROSS Planning team (led by BAAM Ecological Consultants) to provide further direction for the project.

3.3.1 Vegetation and flora

Vegetation communities

Cardno (2019) reported that the vegetation within the site was found to be generally consistent with the Dept of Natural Resources, Mines and Energy (DNRME) Regulated Vegetation Map. The southern half of the site is mapped as supporting remnant vegetation made up of Endangered RE 12.11.23 and Of Concern RE 12.3.11. The northern half of the site is predominantly cleared, with patches of mapped regrowth vegetation (Category C):

- ☐ Endangered RE 12.11.23/12.11.27 adjacent to the remnant vegetation
- ☐ Of Concern RE 12.11.24/12.11.25 and 12.3.11 in association with the central creekline and adjacent areas
- ☐ Least Concern RE 12.9-10.4 at the northern boundary of the property
- ☐ A small patch of remnant Of Concern RE 12.3.11 is also mapped at the northern boundary.

The table below provides descriptions of the REs present from the Regional Ecosystem Description Database (REDD) (DES, 2018).

Table 01: Regional Ecosystem Descriptions

RE 12.3.23 Endangered
Eucalyptus pilularis open forest on coastal metamorphics and interbedded volcanics
RE 12.11.27 Endangered
Eucalyptus racemosa subsp. ***racemosa*** and/or ***E. seeana*** and ***Corymbia intermedia*** woodland on metamorphics +/- interbedded volcanics
RE 12.3.11 Of Concern
Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast
RE 12.11.24 Least Concern
Eucalyptus carnea, E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics
RE 12.11.25 Of Concern
Corymbia henryi and/or Eucalyptus fibrosa subsp. fibrosa +/- E. crebra, E. carnea, E. tindaliae woodland on metamorphics +/- interbedded volcanics
RE 12.90-10.4 Least Concern
Eucalyptus racemosa subsp. racemosa woodland on sedimentary rocks

Much of the northern end of the site includes areas of non-remnant vegetation (pastoral land) that has been subject to historic clearing with the exception of scattered large eucalyptus trees. These large trees include ***Eucalyptus tereticornis*** and ***Eucalyptus pilularis*** specimens that often support hollows. In the central and north-west portions of the site, a number of these eucalypts are some of the largest examples within the Redlands Coast area. The ground layer is dominated by exotic ***Sporobolus pyramidalis*** (Giant Rat's Tail Grass) and ***Imperata cylindrica (***Blady Grass), with an abundance of exotic herbs and forbs, including ***Senecio madagascariensis*** (Fire weed).

Melaleuca-dominated swamp areas are located within the site associated with watercourses and associated alluvial plains. ***Melaleuca quinquenervia*** and ***Eucalyptus tereticornis*** dominate the canopy in these areas. The shrub layer, where present, was observed to support a number of Solanum species including ***Solanum stelligerum*** (native) and ***Solanum torvum*** (exotic weed). The ground layer generally included Juncus species and ***Axonopus compressus*** (Carpet Grass).

No vegetation communities were reported that are Threatened Ecological Communities under the Environment Protection or Biodiversity Conservation (EPBC) Act.





a. Mature eucalypts at the northern end of the site

b. Melaleucas located along the watercourse near the centre of the site

Threatened flora species

Three threatened flora species have been identified as possibly being present at the site:

- ☐ *Macadamia integrifolia* (Macadamia Nut) Nature Conservation (NC) Act & EPBC Act Vulnerable
- ☐ *Marsdenia longiloba* (Slender Marsdenia) NC Act & EPBC Act Vulnerable
- ☐ *Corchorus cunninghamii* (Native Jute) NC Act and EPBC Act Endangered.

Field surveys identified 174 flora species (including 64 non-native species). No NC Act listed Endangered, Vulnerable or Near Threatened species and no flora species listed under the EPBC Act were recorded.

A list of locally significant species is provided in the Redland City Plan Planning Scheme Policy 1: Environmental Significance. No flora species recorded from the site are listed as locally significant.

Weeds

Cardno (2019) recorded 64 exotic flora species, of which 11 are listed as Category 3 – Restrictive invasive pest plants under the Biosecurity Act 2014. Five of these are also listed as Weeds of National Significance (WONS, indicated by a *):

- ☐ *Asparagus aethiopicus* (Asparagus fern)*
- ☐ *Cinnamomum camphora* (Camphor Laurel)
- ☐ *Lantana montevidensis* (Creeping Lantana)
- ☐ *Senecio madagascariensis1* (Fireweed)*
- ☐ *Sporobolus pyramidalis* (Giant Rat's Tail Grass)
- ☐ *Lantana camara* (Lantana)*
- ☐ *Anredera cordifolia* (Madeira Vine)*
- ☐ *Bryophyllum delagoense* (Mother-of-Millions)
- ☐ *Sphagneticola trilobata* (Singapore Daisy)
- ☐ *Eichhornia crassipes* (Water Hyacinth)*
- ☐ *Tecoma stans* (Yellow Bells).

The Redlands Coast Biosecurity Plan 2018-2023 categorises introduced plant species in relation to management objectives and includes priorities for management. Those that are listed under the Biosecurity Act 2014 are high-priority management species. There are three species recorded from the site (Cardno, 2019) that are listed under Management Objective 2 – Containment, where core populations should be managed by implementing containment strategies. These are ***Solanum torvum*** (High - (Devil's Fig)), ***Urena lobata*** (Medium - (Urena Burr Shrub)) and ***Yucca aloifolia*** (Low - (Yucca)).

Forty species were recorded that are listed under Management Objective 3 – Asset Protection, for protection of high-value natural environment, community and built assets from the impacts of these invasive species.









a. *Lantana montevidensis* (Creeping lantana)
b. *Anredera cordifolia* (Madeira vine)
c. *Solanum torvum* (Devil's fig)
d. *Urena lobata* (Urena burr)

1 *Council has undertaken treatment for this weed*

3.3.2 Fauna

Fauna habitats

Cardno (2019) reported that the site supports a large number of notable habitat features, including hollow-bearing trees, stag trees and logs, permanent watercourses, ephemeral ponds and water bodies. Specifically, the following habitats are discussed:

- drainage lines, water bodies and fringing vegetation providing habitat for fish and other aquatic species, frogs (such as Dusky Toadlet and Copper-backed Brood Frog) and foraging habitat for transitory wetland and migratory birds
- hollow-bearing trees providing nesting habitat for hollow-dependent birds (such as Sulphur-crested Cockatoo) and denning habitat for arboreal mammals (such as Brush-tailed Possum and Sugar Glider)
- hollow logs providing shelter for a number of fauna groups including amphibians and reptiles, as well as Short-beaked Echidna
- koala food trees throughout the site, with the highest densities recorded within remnant vegetation.

Fauna species

The Cardno (2019) field study recorded a total of 58 fauna species from the site. This included 44 birds, 10 mammals, one reptile species and three amphibians.



Large goanna in a mature eucalypt in the north-west of the site

Conservation significant fauna species

Desktop assessment has identified three threatened and three migratory species that could be present at the site:

- Greater Glider ***Petauroides volans volans*** NC Act & EPBC Act Vulnerable (possibly present)
- Koala ***Phascolarctos cinereus*** NC Act & EPBC Act Vulnerable (likely present)
- Grey-headed Flying-fox ***Pteropus poliocephalus*** NC Act Least Concern, EPBC Act Vulnerable (likely present, foraging)
- White-throated Needletail ***Hirundapus caudacutus*** EPBC Act Migratory (possibly present)
- Black-faced Monarch ***Monarcha melanopsis*** EPBC Act Migratory (possibly present)
- Rufous Fantail ***Rhipidura rufifrons*** EPBC Act Migratory (possibly present).

Of the potential conservation significant species predicted to likely or possibly be present, one was detected. Evidence of Koala was recorded in the form of scats and tree scratches.

It is important to note that the Cardno survey took place during winter which is outside of the optimal timing for surveying a number of species. A winter survey would not have detected species of frogs, reptiles and some migratory birds that would be recorded during warmer months. As such, a warm season survey may also be considered.

A list of locally significant species is provided in the Redland City Plan Planning Scheme Policy 1: Environmental Significance. No fauna species recorded from the site by Cardno (2019) are listed as locally significant.

It should also be noted that fire ants have been observed onsite and necessary treatment has commenced.



Red-necked wallabies near the centre of the site

Habitat connectivity

The site maintains ecological connectivity to vegetated areas along its southern and western boundary. Watercourses also provide fauna movement throughout the site and into the surrounding environment.

The site is largely mapped within a State-mapped 'Regional biodiversity corridor'. The Department of Environment and Science defines Regional Biodiversity Corridors as 'areas of ecological value to be maintained and where incremental habitat loss, fragmentation and degradation should be avoided'. They are located to:

- ☐ identify and protect terrestrial and aquatic ecological and evolutionary process at a landscape scale
- ☐ maximise connectivity between large tracts of remnant vegetation
- ☐ identify key areas for rehabilitation.

Consideration of Council's Wildlife Connections Plan (2018) also highlights:

- ☐ the southern portion of the site is mapped as core habitat and forms part of the Sandy Creek Conservation Area to Days Road Conservation Area Established Corridor
  - – Established Corridors are described by Council as local-scale corridors of particularly high ecological value that hold strong, pre-existing values in providing movement opportunities for wildlife. They are the highest priority for protection and rehabilitation
- ☐ a Stepping Stone Corridor has been identified from the central eastern boundary of the site, running north through habitats east of Heinemann Road before continuing westwards along the northern boundary of the property
  - – Stepping Stone Corridors are described by Council as local-scale corridors with isolated patches of habitat that, while not physically connected, are functionally connected, allowing movement between larger patches.



Wildlife corridors through and around the northern end of the site

This figure shows the recorded koala impacts on roads in proximity to the site. As development occurs in the area surrounding the Heinemann Road precinct, the following actions are recommended:

- ☐ install street lighting on Heinemann Road so that koalas on roadsides and crossing the road surface are more visible
- ☐ ensure that there are no shrubby traffic islands on road verges to obscure koala presence from drivers
- ☐ establish a 60km/hr speed limit on Heinemann Road
- ☐ install koala signage to inform drivers that koalas may be present
- ☐ encourage the sporting clubs to educate members on measures they can take to avoid koalas on roads.



Koala vehicle impacts 1996-2017, (DNRME)

3.3.3 Matters of environmental significance

Matters of national environmental significance (MNES)

The following Commonwealth interests are mapped within or proximate to the site:

- ☐ the site is within 10km of the Moreton Bay Wetland of international significance
- ☐ two Threatened Ecological Communities (TEC) are listed as 'may occur' in the area:
  - *Casuarinza glauca* (Coastal Swamp Oak) Forest of New South Wales
  - South East Queensland and Lowland Rainforest of Subtropical Australia
- ☐ 16 listed threatened species are identified as 'known' or 'likely'
- ☐ 8 listed migratory species are identified as 'known' or 'likely'.

No Threatened Ecological Communities were recorded at the site survey.

Evidence of one threatened species (Koala) was recorded from the site.

No migratory species were recorded from the site survey, although the winter timing of the survey was not suitable for detecting summer migrants.

Matters of state environmental significance (MSES)

The following state interests are mapped within the site:

- ☐ Category B (Remnant) vegetation and Category C (High-value regrowth) vegetation
- ☐ one 'moderate risk' waterway and two 'low risk' waterways for waterway barrier works under the Fisheries Act 1994
- ☐ Priority Koala Assessable Development Areas
- ☐ 'High Value Bushland', 'Medium Value Bushland', 'High Value Rehabilitation' and 'Medium Value Rehabilitation' land for Koala conservation
- ☐ the site is largely mapped within a regional biodiversity corridor within the SEQ Regional Plan 2017, and a small area in the south west corner of the site is mapped within a State-wide biodiversity corridor
- ☐ essential habitat for the Koala.

Cardno (2019) survey results found that the site supported Category X (Non-remnant) vegetation, Category B (Remnant) vegetation and Category C (High-value regrowth vegetation). Their field survey confirmed that the vegetation within the site was generally consistent with the DNRME Vegetation Management Report and Regulated Vegetation Map. Specifically, the regional ecosystem codes appeared to be accurately applied; Category B areas appeared to support vegetation that met the requisite height, cover and species compositions; and Category C areas had not been cleared in the past 15 years.

A number of indirect observations of Koala were made during the Cardno (2019) field assessment. This included Koala scats and scratches encountered during targeted surveys and opportunistically. The Koala is listed as Vulnerable under the NC Act and EPBC Act. Cardno (2019) advised that if impacts to Koala habitat (e.g. removal of Koala habitat trees) are anticipated as part of the proposed works then undertaking an EPBC Act Significant Impact Self-assessment for the Koala is recommended.

Matters of local environmental significance (MLES)

Review of the Redland City Plan Environmental Significance, Waterway Corridor and Wetland, Flood and Storm Tide Hazard, and Bushfire Hazard Overlay Mapping found that the site is mapped as containing the following ecological constraints:

- ☐ areas in the north and west of the site mapped within the Waterway Corridors and Wetlands Overlay
- ☐ areas in the north of the site mapped as MLES and areas in the south of the site mapped as MSES within the Environmental Significance Overlay
- ☐ areas in the north, western boundary and south-east of the site are mapped as Flood Prone Areas within the Flood and Storm Hazard Overlay.
- ☐ areas in the south of the site mapped as Very High Potential Bushfire Intensity and High Potential Bushfire Intensity, areas in the north and western boundary are mapped as Medium Potential Bushfire Intensity. The balance of the site is largely mapped as Potential Impact Buffer within the Bushfire Hazard Overlay.

a. Significant eucalypt located centrally within the site
b. Typical waterhole found toward the north-west corner of the site
c. Views across the more cleared pastoral land in the north-east of the site







3.3.4 Ecological constraints and opportunities

Overview

The site supports a relatively large connected remnant bushland patch in its southern portion and a large partly forested area in the northern portion. The latter area is characterised by wooded patches, with scattered large trees over grazing land and wetland habitats associated with drainage lines.

The important ecological features of the site have been identified as:

- remnant bushland in the southern portion of the site providing undisturbed flora and fauna habitat. It supports a range of fauna species, including birds, arboreal and ground-dwelling mammals, reptiles and amphibians, including habitat for the NC Act and EPBC Act Vulnerable Koala. It is well connected to both continuous and fragmented bushland to the south and west and forms a component of a larger core habitat area that spans the south-eastern portion of Redlands Coast and adjacent Logan City
- the site forms a component of recognised regional and local biodiversity/wildlife corridors. A large component of the southern bushland and the western portion of the northern part of the site are within a Regional Biodiversity Corridor as mapped by the State of Queensland. The southern portion of the site and the south-western corner of the northern portion of the site are recognised as a component of the Sandy Creek Conservation Area to Days Road Conservation Area Established Corridor in the Redland City Wildlife Connections Plan 2018, which also identifies a Stepping Stone Corridor from the site, across Heinemann Road and then back across the northern boundary of the site
- patches of remnant and regrowth vegetation in the northern portion of the site provide habitat for flora and fauna and contribute to fauna movement opportunities in the landscape
- large eucalypt trees (diameter at breast height (DBH) of >60cm) in the partly cleared northern portion of the site are old growth trees, possibly over 250-years-old. These trees are significant in that they have developed many hollows that support hollow-dependent birds and mammals. It is also likely that they may have scientific significance in that trees of their size and age are rare in Redlands Coast. These trees are also Koala food trees and many of them are recognised as Matters of Local Ecological Significance on the Environmental Significance Overlay of the Redland City Plan
- wetland habitats associated with drainage lines in the northern portion of the site support many pools and pondage areas that provide sources of fresh water for local fauna and flora during the warmer and wetter months, and the permanent pools provide a year-round water source in seasonally dry periods
- extensive grasslands in the northern portion of the site provide feeding and breeding habitat for Red-necked Wallabies, woodland birds and feeding habitat for Swamp Wallabies
- a dense patch of well-developed Melaleuca wetland approximately 6ha in size in the northern portion of the site provides habitat for a range of species, including amphibians, snakes, Swamp Wallabies, Flying-foxes and nectivorous and insectivorous birds. The wetland also provides a broader ecosystem service by absorbing nutrients and trapping sediment from upstream waters, and so improving downstream waterway health.

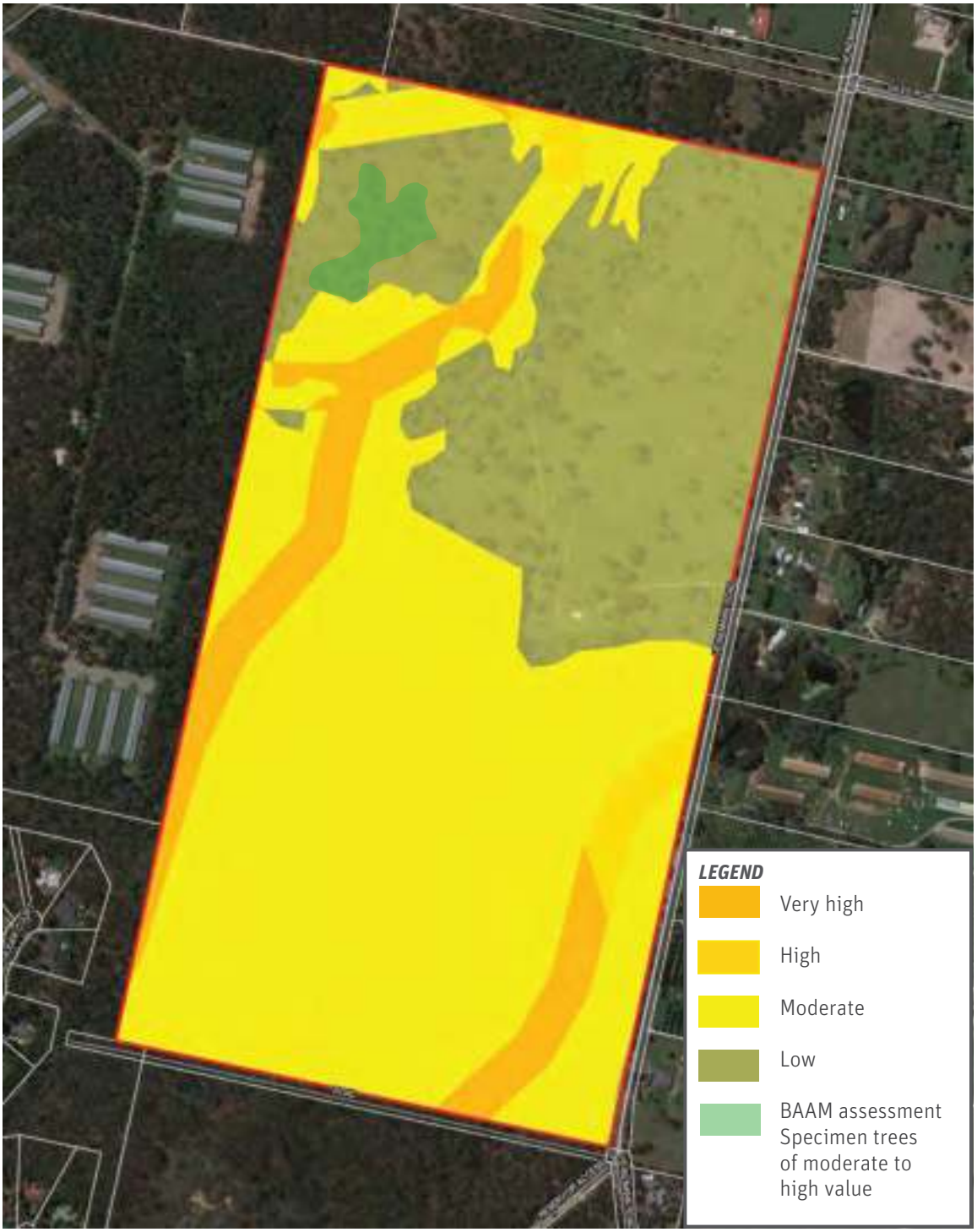
Implications for the Master Plan

The development of the preferred layout and ultimate uses for the site has involved consideration of:

- limiting tree clearing to low value areas (principally the north-east corner of the site) where this is required to allow the construction of sporting facilities and car parks
- proposing more low to medium impact activities (e.g. walking, picnicking, cycling) in those areas with moderate value vegetation
- maintaining high-value vegetation areas and key corridors
  - recognising that an increase in traffic on Heinemann Road may potentially result in an increased number of animals being struck by vehicles
  - recognising that night lighting and noise associated with sporting facilities may impact on resident fauna in adjacent habitats
  - retaining the southern section of the site primarily for conservation with recreation elements limited to walking, bird watching, nature appreciation, mountain biking and horse riding.



Typical lower value area where ground disturbance will be focused



Levels of ecological constraint (Cardno, with BAAM inset), 2019)

Cardno (2019) prepared the map above to highlight over-arching environmental constraints for the site. They concluded that the north-east portion of the site was most conducive to formal sporting facility development. A small section to the west of the water course and toward the north-west corner of the site was also considered of low constraint. However, BAAM Ecological Consultants have identified a number of moderate to high value mature trees in this north-west area that are considered to be of significance. This area is, therefore, considered appropriate for more limited disturbance development, while the north-east portion of the site remains the target for more significant groundworks.

3.4 Bushfire considerations

As highlighted in the image below, the site is affected by the Redland City Plan 2018 Bushfire hazard overlay map for medium, high and very high potential bushfire intensity and potential impact buffer. Therefore, outcomes sought under the Redland City Plan 2018 Bushfire Hazard Overlay Code are relevant to development, management and community access arrangements for the Precinct.

3.4.1 Vegetation hazards

Vegetation hazard class (VHC) mapping for Queensland and corresponding estimates of potential fuel load are based on regional ecosystem mapping, land use mapping and foliage projection cover mapping.

Data used to prepare VHC mapping is broad scale and not always accurate at a site-specific level. As a result, VHC mapping was ground-truthed at assessment reference points across the perimeter of the sites. (The outcomes of this assessment have been provided to Council under separate cover).

Potential bushfire intensity calculations and radiant heat exposure calculations are based on ground-truthed VHCs.

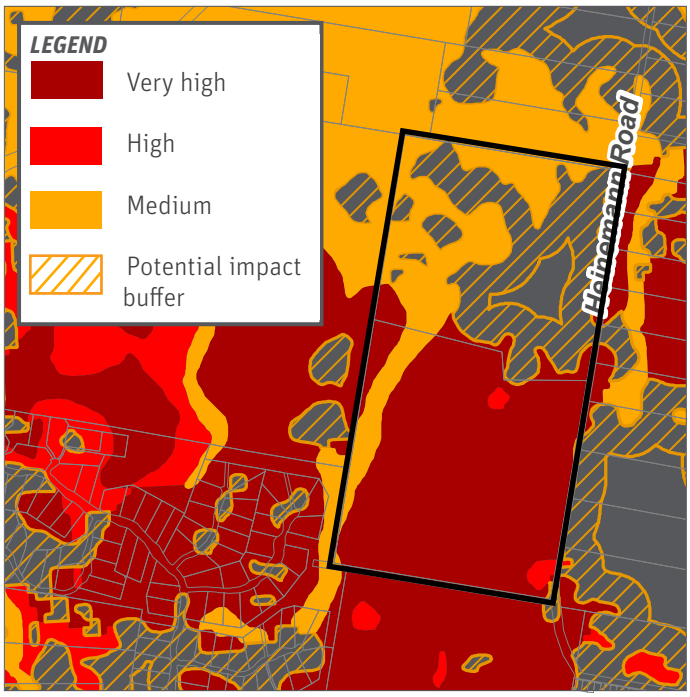
3.4.2 Slope

The slope of land under hazardous vegetation will affect the rate of spread of fire. The steeper the slope, the faster the fire will spread.

The northern part of the Precinct, where the majority of infrastructure is proposed, is undulating with slope measurements up to 3 degrees. Slope will not significantly influence fire behaviour in this area.

Redland City Plan 2018 Bushfire hazard overlay

- potential bushfire intensity



In contrast, the southern part of the area, where bushland vegetation will be retained, has rolling hills with slope measurements up to 12 degrees. Slope will increase the rate of spread and intensity of fires in this area.

3.4.3 Access

The Redland Bay Fire Station is less than 5km from the site via public roads that are capable of accommodating emergency service vehicles.

3.4.4 Fire-fighter water supply

Asset mapping indicates reticulated hydrants are located in the Heinemann Road road reserve.

3.4.5 Bushfire hazard assessment

The potential bushfire intensity of assessment reference points was determined using the Public Safety Business Agency (PSBA) Potential Bushfire Intensity Calculator (version November 2014) which models the method in Part B of the State Planning Policy (SPP) bushfire hazard assessment manual.

Results confirm the southern part of the site is a bushfire hazard area with high to very high potential bushfire intensity. It is also relevant to note that land with bushland vegetation adjoining the southern and western boundaries of the site is also a bushfire hazard area with high to very high potential bushfire intensity.

Development within 100m of a bushfire hazard area is vulnerable from exposure (ie radiant heat, ember attack, burning debris). Therefore, the SPP bushfire hazard assessment manual defines this land as a potential impact buffer, and deems it to be a bushfire hazard area for planning purposes.

3.4.6 Vegetation restoration

Vegetation restoration with a full suite of species from the regional ecosystems that occur in the area will result in a bushfire hazard area when the restoration plantings reach a mature state. For example, any plans for full vegetation restoration of waterways, flood prone areas and areas of vegetation in the northern part of the site, would reduce the area of potentially developable land in this part of the site due to a need to implement an appropriate setback.

3.4.7 Bushfire attack

The likely directions of bushfire attack on the northern part of the site are from the south and west where bushfire hazard areas occur.

3.4.8 Radiant heat exposure assessment

The Bushfire Hazard Overlay Code requires development to be located and designed to ensure proposed buildings or building envelopes achieve a radiant heat flux of 10 kW/m2 where involving a 'vulnerable use' (e.g. a building designed for gathering) and 29 kW/m2 otherwise.

As previously highlighted, the likely directions of bushfire attack on the northern part of the site are from the south and west where bushfire hazard areas occur. Results from bushfire attack modelling indicates the 10 kW/m2 radiant heat flux contour is 43.6m from hazardous vegetation to the south and 30.6m from hazardous vegetation to the west. The 29 kW/m2 radiant heat flux contour is 18.6m from hazardous vegetation to the south and 12.1m from hazardous vegetation to the west.



3.4.9 Mitigation measures

- ☐ Bushfire protection zones
  - Buildings should be sufficiently separated from hazardous vegetation to achieve the appropriate radiant heat exposure outcome based on the use definition of the building, ie 10 kW/m2 where involving a 'vulnerable use' and 29 kW/m2 otherwise
- ☐ Vegetation restoration
  - Vegetation restoration in the northern part of the site should be designed so that it does not result in a large continuous area of bushland vegetation aligned with waterways, flood prone areas and mapped areas of significant vegetation. It should seek to achieve a more 'park-like' landscape with trees, managed grass cover and narrow corridors/small isolated patches of groundcover, shrub and tree plantings
  - A vegetation restoration plan will be required which complies with bushfire management recommendations. It should facilitate efficient access for emergency services and the evacuation of occupants and provide ongoing protection from bushfire for assets and buildings
- ☐ Vehicle access
  - Service roads should be designed to provide efficient access for emergency services and the evacuation of occupants. They should have a dual-lane, all-weather surface and load bearing capacity and turning radii which is suitable for heavy rigid urban fire-fighting appliances
  - Where practical, service roads should be used to separate buildings from hazardous vegetation
  - Given that the Precinct will involve the congregation of large numbers of people, alternative access/egress should be included in the service road layout
- ☐ Fire-fighter water supply
  - Connection to mains water and provision of hydrants should be in accordance with applicable Australian standards and building codes.

3.5 Cultural heritage considerations

In early 2019, Everick Heritage was engaged by Quandamooka Yoolooburrabee Aboriginal Corporation (QYAC) to undertake a Part 6 Cultural Heritage Study for the site for Council consideration.

The Study was undertaken using historic information, oral history and local knowledge, aerial photographs and field observations.

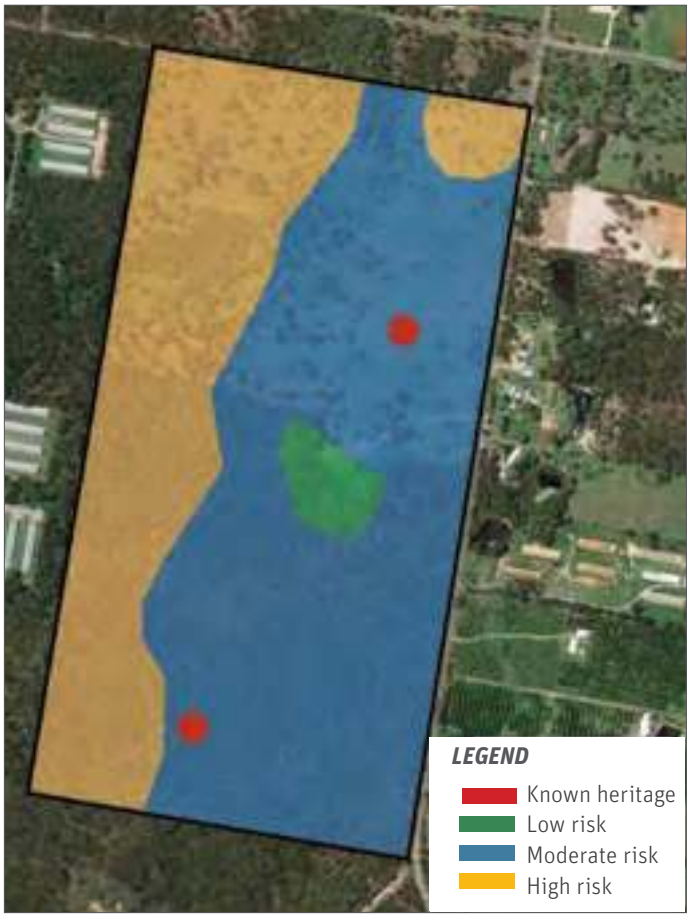
Key findings from the Cultural Heritage Study have been summarised to highlight impacts on the development of the Master Plan.

3.5.1 Previous site disturbance

A review of historical photography indicates that the area has been subject to significant ground disturbance - as such, the site can be classified as Category 4 within the meaning of the Duty of Care Guidelines.

'Disturbance', in this instance includes:

- the post-1955 quarry in the south of the site
- the post-1983 clearing event in the north
- further evidence of forestry in the south amidst the dense woodland. However, it has been deemed that it is likely that only one clearing event took place and that disturbance was limited.



Areas of known heritage and risk (Everick, 2019)

3.5.2 Areas of known heritage

Potential scar tree

A potential scar tree was identified on an upslope adjacent east to tributaries and wetland areas in the south-west of the site. The living, standing ironbark tree exhibits a single, large oval scar orientated south-east. Due to growth of the tree, the scar has a warped appearance. The scar is approximately 550mm above ground, is 1650mm long, 150mm deep and is currently 205mm wide.

It was determined that the original width was likely closer to 300mm judging by regrowth within the scar, and an apparently original outer circumference visible around the scar. The tree has an approximate circumference of 2140mm at 1500mm above the ground surface.

No axe marks were identified on the tree.

Isolated artefact

The isolated artefact was observed centrally within the cleared section of the north-east portion of the site. The artefact is a single flake of retouched red silcrete identified within an exposure at the base of a box tree.

The flake is fine grained, approximately 15mm in diameter and exhibits slight signs of retouch towards the distal end.

3.5.3 Areas of potential high risk

Two areas were identified as being of high risk to cultural heritage. The two locations are along the western boundary for the full length of the site and in the far north-east corner. These are elevated areas near a water source with minimal history of ground disturbance and, therefore, demonstrate reasonable potential for sub-surface materials.

The remainder of the site has been assessed as having moderate and low potential to contain cultural heritage sites that may be impacted by sport and recreation development.

3.5.4 Impacts for future site development

The cultural heritage results highlight that, despite vegetation clearance within the site, it still has cultural heritage value. Future disturbance activities in the areas of known heritage and the high risk areas should be avoided where possible, unless with the express agreement of QYAC.

In the event that impacts are required to allow development, works plans should be referred to QYAC for consideration. Responsibilities of QYAC may include:

- consideration of the proposal to fully understand likely direct and ancillary impacts
- completion of subsurface investigations (if necessary)
- salvage of surface artefacts (if necessary)
- development of agreed terms to allow works.

Where possible, the proposed development has tried to largely direct the key disturbances to the low risk areas.

3.6 Engineering-based considerations

3.6.1 Geotechnical

Pacific Geotech undertook geotechnical investigations for the site in mid-2019.

Earthworks and site preparation considerations

The majority of the top soil on site was found to be suitable for re-use as structural fill, provided the material is free of organic matter and deleterious material.

It is likely that the soils may require conditioning to bring the soils to optimum standard. If the clays were overly moist, difficulty in achieving compaction of the materials will be encountered and moisture conditioning will be required.

While the top soil is appropriate, the natural clays (generally encountered in the central portion of the site in the overland flow path) would be expected to be highly reactive. If they are reused as structural fill on site, an increase in the potential ground surface movements may result. Difficulties in reusing these high-plastic clay soils as structural fill are expected. Additionally, construction in these areas (such as the lower sections of the criterium track and the access roadway leading to the cycling and bmx facilities) will require modifications such as removal of and/or limiting water infiltration to reactive clays and expansion joints in concrete.

Batters

Maximum short-term batter slopes of 45 degrees and maximum long-term batter slopes of 26 degrees are recommended for the natural clay soils subject to new fill material placed in accordance with AS3798.

Where weathered sandstone and siltstone rock are exposed in cut batters, short-term batter slopes of 60 degrees and maximum long-term batter slopes of 45 degrees are recommended. Steeper batters are also possible by use of retaining structures.

Benches may be required to reduce the total height of both cut and fill batters. However, maximum cut and fill depths should remain below 6m.

Building foundations

Given the largely varied ground conditions across the site, the appropriate foundation system for the support of the proposed structures will be dependent on:

- ☐ location within the site
- ☐ the final loads
- ☐ ability of the structure to tolerate the settlement and potential ground surface movements
- ☐ scale of building and inclusions.





a. Overland flow areas where natural clays are more common

b. Batters and benching will be required to create suitable areas for sports fields

3.6.2 Stormwater and flooding

Existing context

The site is located within the upper reaches of the Eprapah Creek catchment,approximately 8km south-west from the Eprapah Creek delta debouching into Point Halloran Conservation Area.

A well-defined ephemeral creek/overland flow path runs centrally through the site. This flow path conveys runoff from a 320 hectare rural catchment and is the subject of the flood investigation.

The highest point of the site is at approximately 69m AHD towards the south, falling to 23m AHD towards the north. The site has well defined overland flow paths towards the south at grades ranging from 1% to 2%, flattening to 0.5% towards the northern open grassed areas.

Modelling

Flood modelling of the 1% AEP (100-year ARI) storm indicates relatively slow flowing waters (<1.3 m/s). Maximum flow depths only range between 0.5m and 1m in the main flow path for a duration of approximately 65 minutes.

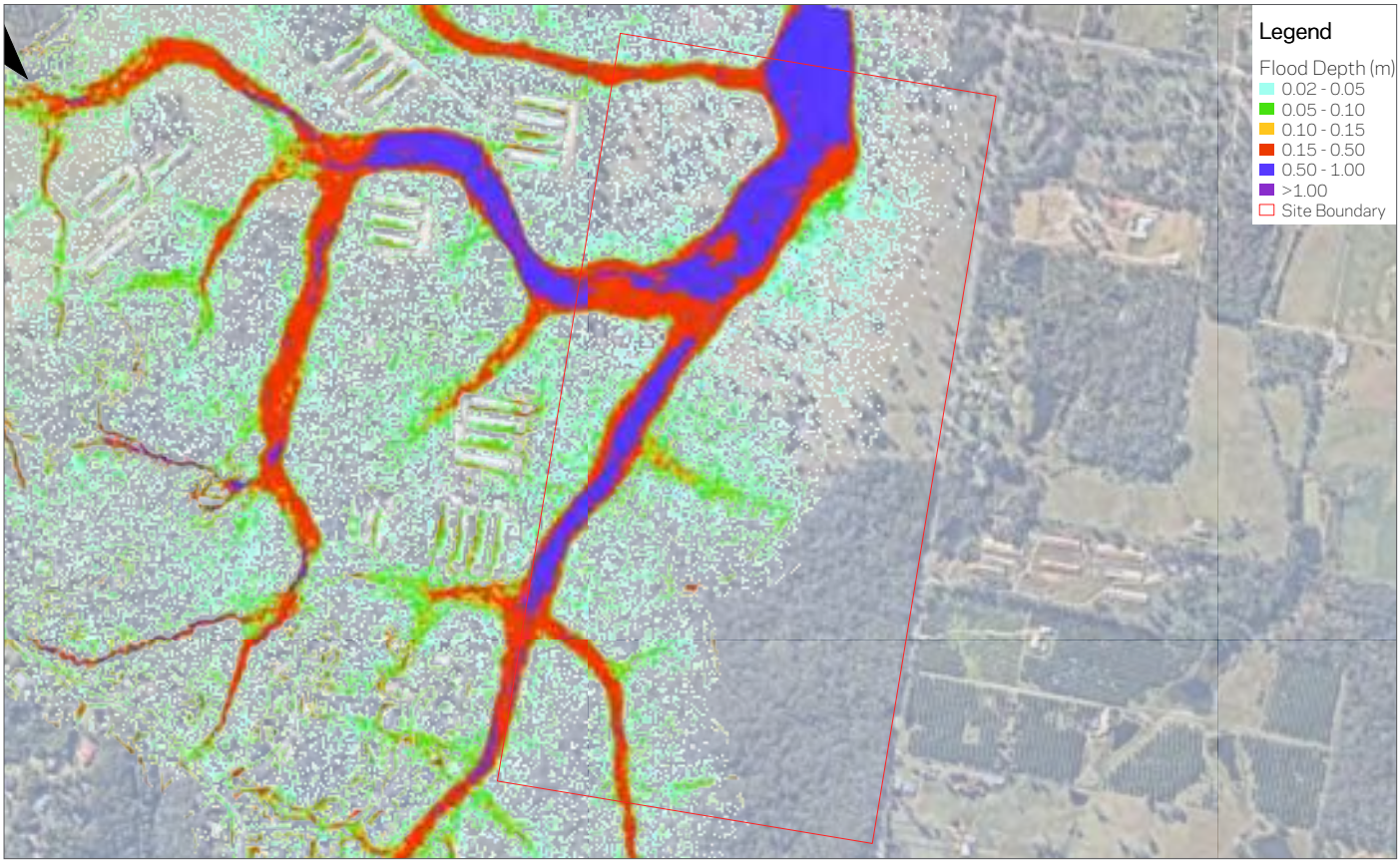
Hazard values, a function of depth and velocity, indicate extreme hazard in the main flow path for a duration of approximately 40 minutes (65 minutes for children).

There is also a risk users could become isolated in the western end of the site by floodwaters in the major flow path. However, this is unlikely as people tend to evacuate open space areas upon the onset of storm events (and there is also opportunity for the internal road way to be built up above this flooding level).

In the rare instance users were isolated, there is ample high ground outside of flood extents for refuge and the impact will be relatively short lived (<65 minutes).

Flooding in open space areas is shallow (less than 10cm) and slow flowing and, as such, is only considered a minor nuisance.

1% AEP (100-year ARI) maximum depths



Stormwater management

The proposed stormwater strategy is focused on stormwater retention via stormwater harvesting from sporting fields and infiltration via permeable pavements from internal driveways and car parks. These features will reduce stormwater runoff and satisfy the SPP stormwater quality requirements.

The development of the site will increase the hardstand areas associated with proposed structures and paved areas. The increase in site imperviousness is likely to increase peak flows in localised areas within the site. However, these will be mitigated by improvements in soil infiltration associated with proposed sports fields including topsoiling, subsoil drainage and stormwater harvesting.

Impervious areas will also be buffered by grass and bushland. These features will reduce stormwater runoff, satisfy the SPP stormwater quality requirements and prevent actionable nuisance on downstream areas.

Stormwater can be captured via sand strips, cut-off drains, swales and inlet pits, and transported to storage tanks for irrigation re-use. Implementation of permeable pavements in internal driveways and car parks can also unlock an additional stormwater source.

3.6.3 Sewerage

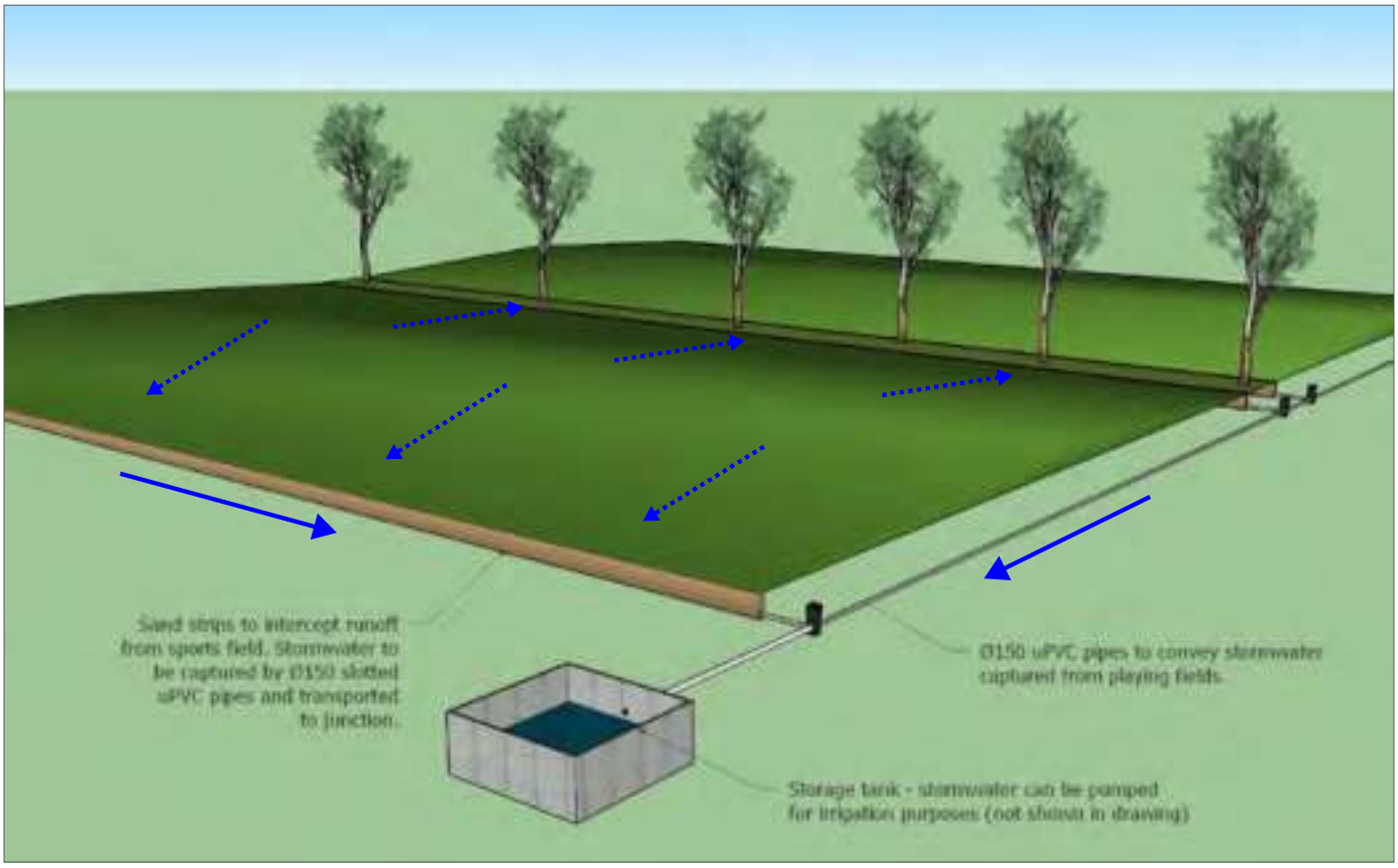
Options to connect with existing mains sewerage are limited. The nearest point to the north is almost 2.5km away and, given elevations, would require a pump station. Similarly, to come from the south is more than 1.5km and would also require a pump station. However, depending on the ultimate timing of development, the preference is to link into the new system that will be required as part of the Victoria Point Structure Plan. If this Structure Plan sewerage work becomes significantly delayed, an on-site sewerage treatment system may be established.

If required, an on-site system would comprise four 2m (diameter) treatment tanks and 200m² land application area. Set-back requirements are detailed by the Queensland Plumbing and Wastewater Code (2011). There is a 50m clearance requirement of the entire system from the top of the bank of the ephemeral waterway. However, 50m clearance from the flood extent is preferred.

There are also local clearance requirements for the land application area specifically:

- 10m from recreation and dwelling areas
- 2m from property boundaries, pedestrian paths and walkways.

Indicative stormwater harvesting schematic



3.6.4 Traffic and transport

Site access

Several site access options were explored from adjacent easements and properties. However, Council does not own this land, therefore, Heinemann Road is considered the most feasible option.

Heinemann Road is sub-arterial in accordance with Council's road hierarchy. The road reserve measures approximately 20m in width, falling short of the 29m sub-arterial standard. The road cross section provides a 6.0m road width lined pavement with table drains and no pedestrian paths. Utilities poles line the western edge of the road and non-frangible vegetation lines the eastern side of the road. Further, a crest is located approximately 750m south of Giles Road that limits sight distances. As a result, site land resumption may be required for incorporation of intersection treatments and bus services.

Heinemann Road is posted as an 80km/h speed limit past the site. However, lower speed limits are noted in the vicinity to the site which include:

- 60km/h posted speed limit between Valley Way and 260 Heinemann Road
- 60km/h posted speed limit in vicinity of:
  - Double Jump Road/Heinemann Road intersection
  - Double Jump Road/Boundary Road intersection
  - Valley Way/Heinemann Road Roundabout
- 60km/h posted speed limit off Giles Road heading east.

Sight distance assessment

The figure below highlights that access closest to Giles Road achieves the preferred standard defined within Council's Transport, Servicing, Access and Parking Planning Scheme Policy (TSAP PSP). However, sight distances in the central section of the site are reduced due to the vertical crest and should be subject to more detailed design development. Noting the above consideration and the existing 60km/h posted speed limits on sections of Heinemann Road, a reduced posted speed limit of 60km/h in the central section should be implemented.

Based on the sight line assessment, three possible locations and treatments have been adopted, as follows:

- the use of roundabouts to access the site to provide both speed control and improved traffic flow during peak demands over priority intersection control at the two more northern access locations (roughly either end of the longer green 'preferred' line shown below)
- the use of a left-in/left-out only intersection for the southern access location (roughly the location of the shorter green line shown below).

A left-in/left-out only approach will require the use of an auxiliary turning lane heading north and a separator island to restrict right turn movements. A roundabout option could also be reviewed for this location during design development.

Preferred (green) and not preferred (red) locations of site access points



Infrastructure planning

Review of Council's Local Government Infrastructure Planning Table SC 3.1.4 reveals there is strategic planning to upgrade the surrounding road network with no direct upgrades bordering the site. Key upgrades in the vicinity include:

- ☐ Heinemann Rd (Sub Arterial Road): Intersection upgrade at Double Jump Rd (2017-2021)
- ☐ Double Jump Rd: Realignment Heinemann to Kingfisher, new intersection Heinemann Rd (2017-2021)
- ☐ Double Jump Rd: Seal widening from Cleveland-Redland Bay Rd to Heinemann Rd (2022-2026)
- ☐ German Church Rd: Seal widening from Cleveland-Redland Bay Rd to Heinemann Rd (2027-2031)
- ☐ Giles Rd: Road improvement and upgraded intersection from Heinemann Rd to Cleveland-Redland Bay Rd (2027-2031).

Vehicle queueing

The queue provisions of the site were reviewed against Council's TSAP PSP.

Table 02: Queue provision assessment

Assessed queue	Proposed access	Queue provision	Required queue provision (TSAP PSP)	Adequacy
Standard queueing provisions (more than 100 cars)	Access 1 North	Greater than 16 car lengths (100m min.)	45 car lengths total	AO18.1 achieved
	Access 2 Central	Greater than 40 car lengths (240m min.)		
	Access 3 South	Greater than 16 car lengths (130m min.)		

Based on the above assessment, the proposed queue provisions achieve Acceptable Outcome 18.1 (AO18.1) of Council's TSAP Code and appear more than adequate from a traffic engineering perspective.

Public transport

Council's PSP Infrastructure works 5.6.1 (5)(i) states T1 parks generally require good public transport access. However, a review of the public transport in the immediate vicinity of the site demonstrates limited existing public transport options:

- ☐ Bus stop on Valley Way (Stop: 31846 & 318464 near Taffeta Drive) located approximately 3.2km from the south access
- ☐ Bus stop terminates on Bunker Road (Stop: 313499, Stop: 313500 Brookvale Drive) located approximately 4.9km from the north access
- ☐ Cleveland-Redland Bay Road (Stop: 311162, Stop: 310912) located approximately 3.9 km from the north access
- ☐ Cleveland Railway Station located approximately 12km from the north access.

As more detailed planning is undertaken for the site, additional consultation with the State Government will be important to advocate for additional public transport opportunities such as extending services from either Bunker Road or Valley Way.

Active transport opportunities

Currently, Heinemann Road has no shared paths, is posted at 80km/h and has no road shoulder. This is undesirable from an active transport and safety perspective. Council's Cycling and Walking guide denotes Double Jump Road as an on-road recreational cycling link and Valley Way as an on-road commuter link with a shard path option. There is an opportunity to provide a connection between Double Jump Road, Valley Way and the site with a shared path running along the western verge. This will be particularly important as the Victoria Point Structure Plan residential area to the north is developed.

Council's mapping system denotes mountain bike trail connections through the southern boundary of the site, adjoining lot (Lot 2 RP227426) and connecting Valley Way via Balthazar Circuit and Taffeta Drive. Consideration should be given to establishing trails for all users across the site. This will form part of a growing trail network including trails between Bayview Conservation Park, recently completed Gramzow Road trail link, Cornubia Forest Nature Refuge and Daisy Hill Conservation Park via Leo Lindo Drive, Kimberly Park.

Car parking requirements

Council's TSAP PSP prescribes the following parking rates - Outdoor sports (sports fields) - 50 spaces per field and Outdoor sports (other) - 20 spaces per other use.

Given that the playing fields have an undefined sporting use, it is difficult to accurately assess the parking demand. However, the proposed number of formal and overflow car parking spaces included in the Master Plan appears acceptable from a traffic engineering perspective and should be adequate to accommodate the anticipated design peak parking demand on site. Final parking provisions are subject to design development once playing field uses are resolved.

Traffic impact assessment

Council has provided 2018 daily traffic data that summarises the Annual Average Daily Traffic (AADT) in proximity to the site.

Table 03: Annual average daily traffic (AADT)

Road	Location	AADT
Heinemann Road	South of Giles Road	1725
Heinemann Road	North of Giles Road	1256
Giles Road	Running east-west	3300
Double Jump Road	Running east-west	6776

A first principal approach of 10% of the AADT is adopted to determine the peak hour traffic that is passing the site. There are approximately 173 vehicles passing the site in a peak hour event. Further, a review of Council's Road Infrastructure Planning: Traffic Forecasts and Assessments (Veitch Lister Consulting, 2014) was undertaken to understand the traffic development in the vicinity. It is noted that the 2018 recorded AADT are already greater than the 2021 forecasts presented in Veitch Lister Consulting's report for Heinemann Road south of Giles Road. Clearly, residential developments and road network upgrades have increased vehicle usage.

Traffic generation

A review of the potential traffic generation based on the expected uses (and uses to be decided) for the site has been undertaken. A highly conservative 3,200 potential users has been adopted for the playing fields based on the area nominated. The assumption also considers that both training and matches are participated in during the week with only matches undertaken on the weekend. Further, it is recognised that while some sports are seasonal, overlaps will occur.

Weekday training and mid-week matches are conducted approximately between 5:00pm to 9:00pm. Therefore, the potential attendance was distributed across this period based on time slots. Weekend racing and matches are more challenging to estimate due to larger cycling races taking place less frequently (once or twice each month). Races start at varying times across the day, i.e. cycling may start at 5:00am while BMX racing at 8:00am. As an assumption for this assessment, half of the potential attendance to arrive during the peak hour was conservatively adopted.

Table 04: Adopted weekday PM trip generation

Land use	Weekday	Potential attendance	Period	Frequency	Peak hour trips
BMX	Training	70	5:00pm - 9:00pm	4-5 nights	25
Cycling	Training	40		1-2 nights	15
Playing fields	Training and mid-week matches	1,200		5 nights	400
				Total	440

Table 05: Adopted weekend PM trip generation

Land use	Weekday	Potential attendance	Period	Frequency	Peak hour trips
BMX	Racing	235	8:00am - 3:00pm	Monthly	118
Cycling	Racing	200	5:00am - 12:00pm	Weekly	100
Playing fields	Matches	700	8:00am - 8:00pm	Weekends	100
				Total	318

Uses outside touch, rugby league, bmx and cycling include:

- regional-level play and picnic node
- pump track
- boardwalks, viewing platforms and path network
- trail head and trails through the conservation area.

Such use is not expected to generate a material traffic peak during the standard weekday commuter peak hour periods. Instead, the proposed development is expected to generate peak traffic volumes on Saturdays and Sundays when the adjacent road network is significantly less trafficked.

Notwithstanding, the expected traffic volumes to be generated by these uses has been quantified from a first principles perspective. The adopted trip generation rate is summarised in the table below. This rate has been determined based on the parking space within the vicinity to the regional-level play and activity node turning over in 2.5 hours. This is a conservative approach.

Table 06: Adopted trip generation rate

Land use	Weekend peak hour trips	Unit
Park - car park supporting recreation areas	0.8	Trips per car parking space

Based on the above the weekend peak hour trip generation, park-related generation associated with the proposed development is summarised below.

Table 07: Development trip generation

Land use	Yield	Weekend peak hour trips
Park - car park supporting recreation areas	227 spaces	182 trips per hour

Further, during a standard weekday commuter peak the estimated trip generation is expected to be significantly less than estimated for a weekend peak period. In the order of 60 trips per hour is considered a conservative estimate (approximately one third of the trips generated during a typical weekend peak hour).

The approximate (conservative) trip generation associated with the proposed development is summarised below.

Table 08: Development trip generation

Land use	Weekday peak hour trips	Weekend peak hour trips
BMX	25	118
Cycling	15	100
Playing fields	400	100
Park	60	182
Total	500	500

Land resumption

Potential land resumption will be required along the frontage of the site to incorporate turn treatments and intersections that may include:

- an auxiliary left turn lane for priority intersection control heading north along Heinemann Road at the most southern access point (left-in/left-out intersection)
- area surrounding roundabouts to contain island, trafficked lanes and standard width verges
- potential bus bay indents for public transport bus stops
- shared pedestrian/cycling path on the western side of Heinemann Road.

Summary

While the formal sports provided for at the facility have been identified, there are a number of development details that are currently unknown but may affect traffic operations e.g. the exact types of events/carnivals that will be held at the site, the timing of individual events/carnivals and when the Precinct may be ultimately developed.

There are also likely to be several other factors, potentially unrelated to the development, that may ultimately affect traffic operations e.g. traffic volumes created by the Victoria Point Structure Plan.

It is recommended that a detailed traffic impact assessment be undertaken after further planning has been completed, the Master Plan has been refined and matters such as those mentioned above are confirmed.



4 Demand analysis

Demand for development at the Precinct has been established through consultation with Council, potential user groups, peak bodies and external stakeholders; review of demographics, participation and facility design trends and impacts; combined with an analysis of key open space issues existing within the city.

4.1 Demographic considerations

In order to understand the make-up for the Precinct 'catchment', a snapshot of existing and future population and demographic characteristics has been undertaken.

Given the Redlands Coast Regional Sport and Recreation Precinct's proposed position as a future premier sport and recreation facility, population characteristics for the entire city area have been the focus where possible. It is acknowledged that some participants will come from outside this catchment. Core participation, however, will come from within the City's boundaries. It is also important to note that the site will also play a role as the 'local' park for nearby residents. As a result, demand created for this facility 'role' has also been included.

4.1.1 Population changes

Analysis of city-wide population characteristics[2] reveals:

- a population of 151,987 for 2016 with population increases of approximately 33,600 by 2036. Of this increase, the vast majority is predicted to be from older adults 65+yrs (an increase of more than 24,000). By comparison, the number of young people 0-34yrs is only expected to increase by less than 3,000 residents
- a median age of 41 that has increased by more than 3 years over the last 10 years. This trend is expected to continue with the proportion of older adults 65+yrs predicted to increase from 17% in 2016 to 27% by 2036. Across the same time span, the proportion of young people 0-34yrs is predicted to decrease from 43% to 37%

2 *Queensland Government Statistician's Office (medium series)*

4.1.2 Household considerations[3]

- City-wide high SEIFA Index (1,027) - reflecting lower levels of disadvantage
- very few households without a motor vehicle
- most households with internet connection.

3 *ABS Census QuickStats, 2016*

DEMOGRAPHIC CONSIDERATIONS - KEY IMPLICATIONS

In terms of impacts for the future development of the Precinct, these demographic considerations suggest:

- a range of sport and recreation opportunities that are attractive across the ages should be made available at the Precinct (e.g. both formal sport and passive recreation activities)
- younger people make up a large proportion of formal sport participants. With only slight increases predicted in the number of young people living in the area, formal sports that offer opportunities for older adults and masters participants should prove particularly successful. Additionally, this suggests that demand for new facilities will not necessarily come from growth in junior numbers at existing clubs or the development of new clubs, rather demand will result from changing trends, facility requirements and other external influences
- the vast majority of Precinct users are likely to drive to the facility. However, those attending cycling activities or recreation pursuits may ride (or walk) to the venue if suitable off-road links are available
- internet- and social media-based advertising will continue to prove a preferred method for activity providers.

4.2 Trends considerations

4.2.1 Formal sport trends

Masters sport

There are indications that people may continue to engage in sport later into their old age[4]. The Australian Sports Commission highlights that organisations may need to provide a wider range of products tailored to meet the needs of older Australians.

The provision of opportunities for older participants will be particularly important in Redlands Coast, where the population is projected to age markedly. The development of the preferred layout at the site has clearly considered the need for formal and informal activities that are attractive across the ages.

Busy lifestyles

Shift work, increases in part-time and casual employment and family commitments influence participation as:

- ☐ people do not have the time to commit as a regular participant or volunteer
- ☐ people seek facilities and participation opportunities with flexible hours.

If membership stagnation or decline became a concern for the user groups based at the Precinct, additional delivery models such as social fixtures or 'pay as you play' approaches should be considered.

From extreme to mainstream

There has been a recent rise in adventure, extreme and alternative sports that are proving particularly popular with younger generations. These sports typically involve complex and advanced skills and often have some element of inherent danger and thrill-seeking. Examples include freestyle BMX and rock-climbing. These sports are also characterised by a strong lifestyle element and participants often obtain cultural self-identity and self-expression through their involvement.

International associations for adventure sports are working hard to obtain inclusion in Paralympic and Olympics events (with both skate boarding and rock climbing included as exhibition sports in the delayed Tokyo 2020 Olympic Games).

While participation rates in some mainstream and organised sports have held constant (or slightly) declined over the past decade, extreme and action sports have risen in both demand (participation) and supply (industry). These sports are gaining popularity among large segments of Generation Y who connect to a counter-culture of adventure and freedom of expression. At this point, however, solid longitudinal participation data in these sports and activities remains scant.

Diversification of sport

Road cycling, mountain biking and eco-tourism activities are all growing as non-traditional activities, while modified sports such as T20 cricket and 7s rugby are burgeoning. Changes are placing additional pressure on councils with regard to playing field capacity, facility flexibility and need to plan for additional demand.

Field and court quality

Facility providers face an increasing trend to develop and re-develop sporting fields and courts to a higher level in order to increase carrying capacity. Upgrades, such as lighting and field irrigation, allow training and competition times to be extended and increases the ability of turf playing fields to cope with the resulting wear and tear. Further, to achieve ongoing field quality, fields need 'rest periods' (of up to four weeks) where necessary maintenance can be undertaken.

The replacement of turf fields with synthetic fields, however, can significantly increase carrying capacity by limiting maintenance-required field down time. A number of facility providers are moving toward the provision of synthetic fields (particularly for football and hockey where internationally certified surfaces are available). In determining the preferred sports for the rectangular field space area within the site, Council may consider demand for synthetic surfaces.

Field sharing

With many sports extending the lengths of pre-season and season fixtures, sports are no longer classifying themselves as strictly summer or winter sports, this has led to the sharing of field space becoming more difficult. While providers strive to maximise the use of community resources (and State Government espouses field sharing), the reality is that shared use of ancillary facilities (e.g. clubhouses, car parks) rather than fields will be more likely.

The proposed north-west bike activity sub-precinct includes shared use of a clubhouse and car parking. Council will also be looking at shared-use models for the rectangular fields (touch and rugby league) to allow flexibility of use. Many of the formal and overflow car parking areas will also be shared by formal sport participants and recreation users.

Facility management

Councils across Australia employ various management structures over their sport and recreation facilities. Where resources allow, there is a growing trend towards councils taking on more responsibility for the overall management (and maintenance) of facilities. This involves users (tenant clubs) paying higher user fees, but being able to focus more on their core function of providing the relevant sport/activity, rather than face the burden of maintenance and asset management.

4 *Australian Sports Commission, 2013*

4.2.2 Recreation trends

Park design

Parks play multiple roles in establishing and maintaining a community's quality of life; ensuring the health of residents and visitors and contributing to economic and environmental well-being. The design of a park is critical in ensuring that it is successfully utilised by the community. Public open spaces should include:

- a range of recreation nodes that comprise clustered activities such as picnic and play areas that are attractive and safe open areas with good lighting, seating, shade, shelters and areas for play
- well-lit, level and shaded walk/cycleways that provide links to open space, community, commercial areas, and public transport (where available)
- a range of infrastructure that supports all abilities participation.

Creating connections

Numerous studies highlight the need for trails linking residential areas with parks and other types of open spaces. Walking continues to be the preferred physical activity for both men and women. ParkRun has experienced unprecedented growth and is one of the largest running events in the world. There is, therefore, a recognised need for path systems that provide good connectivity between places of activity, are aesthetically appealing, provide safe links for users, and are easy to navigate.

Rationalisation

Where open space parcels are undeveloped, are poorly located, are attracting regular anti-social behaviour and/or are not providing recreation opportunities desired by the nearby catchment (and are thus sitting idle), opportunities may exist to rationalise the land. Depending on the land tenure, this may include re-purposing as an alternate use, 'planting out' with trees to reduce maintenance, sale of the land or returning the land to the State.

Councils are becoming more cognisant of not retaining (and maintaining) open space that does not serve a community recreation function.

'Challenge' parks (with nature play)

Challenge parks are an emerging type of park. They generally feature multiple play nodes to cater for different ages, gardens, water play areas and lagoons, large open grassy spaces, shady picnic spots with quality facilities, ponds and water features, areas of natural woodland and vegetation and kilometres of shared paths and boardwalks to explore. High tree house structures, sky walks and natural elements are introducing risk back into play, enabling children to develop an awareness of limits and boundaries.

Excitingly, the Precinct has clear potential to provide a facility of this nature.

Ageing communities

Redlands Coast is an aging community, with a median age of 41 (higher than the State with a median age of 37).

An ageing community requires:

- greater emphasis on low-impact physical activity
- ability to compete in age-appropriate formal sport opportunities (e.g. masters)
- access to community infrastructure that requires wider paths, improved wheelchair/disabled access/parking, more lighting, shaded seats for resting along pathways
- places offering a sense of safety and serenity
- increased use of mobility scooters as a convenient method of transportation.

Impacts of technology

Technology remains one of the main contributors towards decreased physical activity and increased sedentary behaviour. However, many councils are now using technology within recreation areas to attract users. Opportunities such as the provision of WiFi in key parks, and by using digital tools for information and marketing on tracks and signage can help to reinvigorate parks and recreation areas.



Examples of challenge play and nature play

4.2.3 Outdoor recreation trends

Participation trends

Longitudinal outdoor recreation participation data (at a wider population level) is becoming more readily available through publications such as the SEQ Outdoor Recreation Demand Study, and more recent studies such as QSERSA (Queensland Sport Exercise and Recreation Survey of Adults) and AusPlay.

Unfortunately, it is very difficult to compare results across these studies given the different methodologies used. For example, QSERSA specifically assessed mountain bike and bushwalking participation whilst the Outdoor Recreation Demand Study analysed bicycle riding and walking more generally. Additionally, there are marked differences in some results that make direct comparisons questionable (e.g. horse riding that varies from 1.6% to 7% participation rate between surveys).

Regardless, when the results are considered together, it is appropriate to ascertain that bushwalking and water activities remain popular while participation in horse riding and mountain biking activities appears steady.

Increasing health and environmental awareness

People are becoming increasingly concerned about their health, with conditions such as obesity and stress on the rise. Surveys conducted in Melbourne and Sydney[5] indicated that residents having good access to the natural environment reported a higher quality of life. The surveys showed steady increases in people's preference for large, managed and accessible natural areas. This, combined with a growing awareness of the environment and its challenges (global warming, pollution and urbanisation), has led to a growth in visitation to natural areas.

A term referred to as 'returning to nature' has emerged where people feel the desire to become reconnected to their natural environments.

The Precinct includes more than 50ha of heavily treed conservation area, ephemeral ponds and drainage lines. The site also links well with more developed natural areas such as Days Road and Sandy Creek Conservation Areas and is well-positioned to establish a role as an outdoor recreation hub.

Tourism – cultural and nature appreciation

It is estimated that the market for nature-based tourism is increasing at six times the rate of tourism overall. Some of the factors that have contributed to this growing trend in nature-based tourism are that people are looking for new experiences, adding diversity to their experiences, combining business travel with holidays, and looking to "get back to nature".





Mountain biking and horse riding within Redlands Coast

Impacts of technology

Technology is also bringing about an increasing divergence of outdoor recreation activities. Participants are able to map their route, record their times and upload digital images of their experience. This allows them to compete and compare results with past and/or future users (Strava, Map My Ride etc). Growth in these activities has encouraged research into more refined technologies to engender wider participation in activities such as geocaching and mountain biking.

Increasing affluence and expectations of recreation

As a society, Australians are becoming more affluent - the proportion of income being spent on recreation goods and leisure is increasing. While outdoor recreation equipment such as kayaks, mountain bikes and camping goods may have previously been considered too expensive for many in the community, discount department stores are increasing access to affordable options. As people spend more money on outdoor recreation and associated equipment, an increase in outdoor recreation activities previously offered by commercial operators has been observed.

Despite cost being a barrier to participation in organised sport, participants appear more prepared to make a one-off investment in equipment for outdoor recreation that they can use at their convenience. As such, demand is increasing for a diversification of natural areas offering unique experiences and higher levels of infrastructure.

5 *SKM 2010, Recreation Implications from Residential Diversification*

4.3 Gap analysis

The supply and demand (gap analysis) has been prepared by considering a range of inputs. Consultation has been undertaken with Councillors, Council officers, wider community, potential local sporting clubs (and their peak bodies) and additional identified stakeholders (school sport providers, environmental groups, adjoining councils etc). Further, the team has reviewed previous research and Council's sports club 'health check' survey data and considered wide-ranging trends.

4.3.1 Council engagement

Each councillor was invited to have an individual discussion with the project team to share their thoughts on the site. Additionally, separate councillor workshops were conducted regarding initial findings, concept option review, draft and final Master Plan. A wide range of individual and group discussions were held with Council staff across many work areas. Key outcomes from this Council engagement includes:

Issues

- ☐ importance of data-driven (evidence-based) demand and transparent outcomes
- ☐ need to address both future demand from population changes and existing city-wide open space issues - particularly capacity concerns at Pinklands Recreation Reserve and the Redland Showgrounds at Cleveland (where the presence of sport impacts availability of space for community events)
- ☐ need to be careful in selecting future uses at the site to ensure a sustainable approach (that does not result in ongoing capacity issues nor extensive environmental limitations)

Opportunities

- ☐ in addition to formal sport, the site can be a key venue for a wide range of recreation opportunities. It is quite unique to be developing a single site that can offer formal sport, recreation and conservation. It is very important that key links to the wider trails network are established
- ☐ connectivity with the Victoria Point Structure Plan and to meet some unfilled demand at Shoreline (e.g. AFL).

Additional considerations

- ☐ Heinemann Road is not the preferred location for a feature rectangular field facility with premier grandstand seating given its location away from business districts, residential areas and a range of public transport options
- ☐ Heinemann Road is not considered a potential venue for indoor sport and recreation development, aquatic facility development nor community centre development given city-wide location, current low level of public transport and the potential of other locations and development opportunities Council is investigating.



Pinklands Recreation Reserve



Norm Price Park - Redland Showgrounds at Cleveland

4.3.2 Formal sport engagement

While the Heinemann Road site was only purchased in 2017, Council's desire to identify and develop a new site for sport and recreation had been discussed for a number of years prior. As such, there are a number of formal sporting bodies that have approached Council staff and Councillors with regards to the potential project.

A number of groups are keen to relocate, whilst others have voiced concern of perceptions of being 'forced' to relocate. Finally, there are also groups currently without a 'home' that see the Precinct as an opportunity for facility development. The groups (and peak bodies) chosen for consultation were either identified by Council officers or Councillors, came forward as a result of Council informing all existing sporting groups of the project or as a result of a review of background studies. Findings from this engagement are summarised in the Directions table in the following section. Additionally, the table below compares national, state and local participation trends for key sports considered in the development of the Master Plan.

Table 09: Formal sport participation trends

Sport	National trends		State trends		Local trends*	
	Children	Adults	Children	Adults	Children	Adults
AFL	steady	steady	increasing	steady	increasing	steady
Baseball	decreasing	decreasing	steady	steady	decreasing	decreasing
BMX	increasing	increasing	steady	decreasing	increasing	increasing
Cricket	decreasing	decreasing	increasing	decreasing	decreasing	steady
Cycling	increasing	increasing	increasing	increasing	increasing	increasing
Equestrian	steady	steady	increasing	increasing	steady	steady
Football (soccer)	increasing	increasing	increasing	increasing	increasing	increasing
Hockey	decreasing	decreasing	steady	steady	steady	decreasing
Mountain biking	increasing	increasing	increasing	increasing	increasing	increasing
Netball	steady	decreasing	increasing	steady	increasing	steady
Pony club	steady	steady	increasing	increasing	increasing	increasing
Rugby league	decreasing	steady	increasing	steady	increasing	steady
Rugby union	steady	decreasing	steady	steady	steady	steady
Touch football	increasing	decreasing	increasing	increasing	steady	steady

** trends are taken from Council's sports club surveys and engagement undertaken with clubs and peak bodies throughout the development of the Master Plan*

4.3.3 Environmental and wildlife group engagement

A workshop was conducted to introduce the project to local environmental groups and to discuss directions with regards to the project. Key considerations included:

- ☐ fauna and flora
  - – importance of protection of habitat
  - – fauna movements in, around and through the site need to be recognised
  - – impacts of floodlighting on nocturnal fauna
  - – protecting valuable koala trees (including lone trees)
  - – retaining vegetation (including grasses and reeds) that support wetland areas and attract birds
  - – recognising the needs of bird and nature watchers
- ☐ waterways
  - – options to establish permanent water bodies/flow
  - – downstream impacts from development at the site
- ☐ tracks and trails
  - – balance the number of trails required across the site with potential environmental impacts
  - – develop separate trails (and at varied widths) for different users groups.

4.3.4 Wider community engagement

The general public has been kept well informed of the project process and afforded opportunities to provide input. Council has provided regular project updates through the 'yoursay' section of their website (and social media platforms). Additionally, a list of Frequently Asked Questions is also provided on the website. Information flyers have also been hand-delivered to nearby residents.

A community drop-in session provided the opportunity for the community to further understand the need for the project, to appreciate the site constraints and to provide early feedback in the Master Plan process. Key outcomes include:

- ☐ important that the site includes both formal sport and recreation/play elements
- ☐ ensure the environmental aspects (significant trees, fauna and drainage areas) at the site are retained
- ☐ consider options to limit impacts on neighbouring properties.

Further opportunity for feedback will be available when the draft is released for formal public review as part of a draft engagement process.

Formal sports action

a. Equestrian
b. BMX
c. Football
d. Baseball
e. Touch Football











4.4 Demand directions

The table below summarises the key drivers that have influenced the preferred layout for the site. There are also additional sport and recreation demands that cannot be met at the site that Council is considering in alternate planning activities. Examples of existing facility demand include AFL, hockey, football and recreation activities (e.g. flyball, dog obedience, aeromodelling, drone flying).

Table 10: Precinct design considerations

Direction	Rationale	Master Plan implications
Conservation		
Very limited disturbance in the southern portion of the site	This area provides key habitat and is an important environmental corridor	Only trails to be developed in this area
Consider a range of potential users	The conservation area is attractive to bushwalkers, bird watchers (and nature appreciation), mountain bikers and horse riders	Develop a variety of trails - single use track to wider multi-purpose trails. Encourage user groups to assist identify preferred locations
Recreation		
Provide both a local and regional function	The Precinct needs to provide recreation opportunities for locals (including the future Victoria Point Structure Plan residential area). Also, as a recognised regional-level facility, the activities need to be attractive for residents from further afield within the LGA and to visitors	Ensure a wide range of quality recreation options are available at the site. Design these options with a view to the Precinct attracting significant numbers at peak times
Embrace the natural aspects of the site	Where possible, the vision is for the proposed development to embrace the naturalness of the site	Consider the development of nature play elements, boardwalks and viewing points around water bodies and limited-impact walking tracks through vegetated areas
Build upon the expansive nature of the site	Encourage users to explore large sections (and the variety of attributes) of the Precinct	Rather than retain all recreation elements in one node, develop multiple nodes with various levels of embellishment
Recognise the recreation 'role' that formal sport facilities can play	Many formal sport facilities can also offer important recreation functions when not being used for formal training or competition. This dual role helps to reduce unnecessary potential duplication of facilities	Where practical, ensure facilities such as playing fields, sealed cycling tracks and bmx tracks are available for public use when not required for formal activities
Provide facilities that encourage all ages and abilities	A well-planned Precinct will offer a wide range of opportunities that attract people of all ages and abilities. This will ensure a vibrant community hub is established	Develop play elements for all ages. Provide wide sealed paths suitable for prams, bicycles and mobility scooters. Establish quieter areas for picnics and reflection and active nodes for loud play and adventure
Sport		
Develop a lower impact formal sport and recreation node amongst the trees in the north-west corner of the site	While this area has fewer constraints than many other areas within the site, a number of significant trees need to be protected. As a result, significant clearing for playing fields or courts is not considered appropriate. Demand has been identified for a cycling facility that provides a range of opportunities including criterium racing, learn-to-ride and junior development and duathlon. Demand has also been established for a new BMX facility within the LGA that allows for expansion and is not located in a residential area.	Develop a quality bike activity sub-precinct suitable for both local and state-level events. The sub-precinct should include a criterium track and additional looped opportunities, BMX facility and community pump track. Establish a shared clubhouse and both formal and overflow car parking
Provide a central hub for infrequent mountain bike events	The Redlands is growing in popularity as a mountain biking area. Facilities such as the Redlands Track Park and Bayview Conservation Park and successful events such as the Bayview Blast have helped to drive this status Mountain bike enthusiasts and event promoters have noted the possibility of establishing a 100km event linking areas such as the Heinemann Road site, Bayview Conservation Park, Sandy Creek and Eastern Escarpment Conservation Areas and Daisy Hill Conservation Park. A large staging area with room for extensive parking and camping and access to amenities and canteen would be essential for such an event	Ensure there are track and trail links across the length and breadth of the site to allow for future links beyond the Precinct Facilities required for parking, camping and amenities and canteen will be developed for the on-site formal user groups. Arrangements can be made between these user groups and the mountain bike event team to organise access to necessary facilities (and to avoid event clashes)

Direction	Rationale	Master Plan implications
Develop playing fields in the north-east corner of the site and ensure planning reflects the topography of the site	Much of the site has medium- to high-level environmental value. The area in the north-east corner along Heinemann Road has previously been cleared and offers the best opportunity for playing field development Rectangular fields built into benches will ensure most efficient use of this area and will require less earthworks than large oval fields	Develop rectangular playing fields using benches and batters that reflect the topography in the north-east corner of the site
Develop a new home for the Redlands Touch Association as part of the rectangular playing field node (in order to facilitate relocation from the Cleveland Showgrounds)	As noted in a number of sections of the Master Plan, opportunities for event expansion at the Cleveland Showgrounds are limited given the current (10-field) footprint and operational arrangements of touch Similarly, ongoing growth in player numbers and carnival hosting is difficult for the Touch Association given the event and activity requirements of the Showgrounds. Indeed, a 'forced break' in touch activities occurs across most of September due to the Showgrounds hosting Redfest and the Caravan, Camping, Boating and 4x4 Expo Car parking and access at the Showgrounds site during large touch carnivals are also problematic The largest carnival currently hosted by the Touch Association requires 16 fields (achieved by setting up fields on the Showgrounds multi-purpose field and adjoining football facility) The location at the southern end of the LGA is likely to offer an opportunity for Association growth as it will be attractive for players from areas such as Logan and Beenleigh where existing touch competitions are not affiliated with Queensland Touch, limiting playing pathways A facility with access to at least 18 quality fields (potentially some fields could be marked on field space for other sports) and large areas for car parking would be highly attractive for hosting a range of large multi-day carnivals	Ensure that at least 14 quality lit touch fields are developed as part of the rectangular playing field node Potential for access to additional sporting code field space for irregular large carnivals would also be advantageous
Develop a new home for the Redlands Rugby League Club as part of the rectangular playing field node (in order to facilitate relocation from the Pinklands Recreation Reserve)	As noted in a number of sections of the Master Plan, the Pinklands Recreation Reserve is a very busty site throughout the winter sporting season The Rugby League Club and adjoining Redlands Netball Association continue to achieve growth in both membership and carnival attendees. This has caused significant angst as the site has issues with access and parking and has very little capacity to encourage further growth amongst the tenant groups. In fact, the Rugby League Club has noted that, with only two fields, it will need to cap membership in the very near future whilst the Netball Association has contacted Council regarding their need for additional court space in order to accommodate for training and fixture requirements The local dressage group (Redlands and Southern District Equestrian Group) currently share the Pony Club facilities at Pinklands Recreation Reserve. The group is keen to access additional land in order to provide a range of quality equestrian experiences	Ensure that 3 quality lit rugby league fields are developed as part of the rectangular playing field node Potential for access to additional sporting code field space for training and irregular large carnivals would also be advantageous



5 Master plan

Maintaining a current Master Plan is a key requirement to guide facility development (to avoid ad hoc and piecemeal progress) and can be a key resource in assisting to attract funding.

The Redlands Coast Regional Sport and Recreation Precinct draft Master Plan has been developed by considering all consultation, appropriate strategic contexts and previous research. Overall, it provides an ideal opportunity to develop the facility to meet the identified needs of the sporting community, the recreation needs of Precinct visitors and locals whilst also maintaining and rehabilitating key environmental areas within the site.

The draft Master Plan integrates the existing environmental features with a range of new elements and embellishments. The provision of quality sport and recreation facilities and a more attractive environment will encourage passive recreation use from the non-sporting community. Additionally, with the range of facilities and programs available, all age groups will find activities to enjoy.

A set of guiding design principles has been developed based on the issues and opportunities identified.

The Redlands Coast Regional Sport and Recreation Precinct draft Master Plan can be found on the following pages. The draft includes an overall layout and perspective illustrations.

5.1 Vision

The medium- to long-term vision for the Precinct will:

provide a high quality multi-sports facility that offers a range of opportunities for local members and visiting teams

be supported by necessary ancillary facilities

be used daily for training and competition but also be designed and developed such that it has the capacity to host larger sporting events and carnivals.

provide quality recreation and physical activity pursuits to be enjoyed by facility users and residents

rehabilitate key environmental features and retain the conservation area as fundamental aspects of the development.

GUIDING DESIGN PRINCIPLES

The guiding design principles outlined below describe the over-arching intentions for the planning and design of the Redlands Coast Regional Sport and Recreation Precinct. They should be considered as key drivers for decision-making.

Adaptable

Precinct facilities will reflect 'smart design' so they can be adapted to support the varied needs of the community. Importantly, Council will look to cater for current and future sports and recreation demands through an evidence-based strategic approach that reflects a clear understanding of quantified needs and trends.

Quality (and value for money)

Quality infrastructure design and provision will encourage the community to value the Precinct and its facilities, and to foster high levels of use. Importantly, facilities will be designed considering the resource limitations of both Council and the community.

Partnership-driven

The Redlands Coast key user groups and community stakeholders, including sport and recreation clubs, will be provided with opportunities to be involved in the design processes for relevant components. Additionally, Council will look to foster partnerships for capital development and ongoing management.

Accessible and connected

Quality access to and circulation through the Precinct is critical. Further planning and upgrade of the surrounding road network will be undertaken to reflect nearby residential development and impacts from the Precinct. As many users are likely to travel to the Precinct by car, the surrounding road network will be upgraded and reflect nearby residential development and Precinct impacts. Access for users who walk or cycle to the site will also be developed, and supported by a system of integrated walk and cycle opportunities via a range of path, track and trail types across the site.

Sustainable

Sustainability will be key to the planning, development, ongoing management and use of the Precinct. Sustainability will be assessed and managed through regular audits and evaluation processes. Sustainable outcomes may include:

- ☐ considering the orientation of buildings to enhance the use of solar options
- ☐ water harvesting initiatives
- ☐ potential use of recycled water and other recycled materials
- ☐ waste minimisation
- ☐ maintaining natural drainage lines wherever possible, via turf and/or vegetated swales and integrated within passive recreation elements
- ☐ incorporating biofiltration devices, appropriately integrated as part of the Precinct's overall character and amenity
- ☐ ensuring car parks are landscaped and designed to contain recessed areas that encourage the detention and treatment of stormwater
- ☐ innovative management and maintenance practices to reduce resource requirements.

Environmentally-aware

While recognising the need for selective clearing to create sport and recreation spaces, key habitats and areas of environmental value will be retained, protected and rehabilitated where practical. The Precinct will offer a wide range of recreation spaces, offering users the opportunity to experience our bushland and to walk 'within and above' the wetlands, vegetation and fauna.

Wide-range appeal

The Precinct will provide sport and recreation opportunities for all ages and abilities. The Precinct will support the community's existing health and wellbeing facilities by providing areas for contemplation, recreation areas including intergenerational play and opportunities for activities such as bird watching and nature appreciation. Importantly, the Precinct also includes a number of sports recognised for providing masters opportunities.

Inclusive play design will be incorporated in the regional-level play area to ensure access for those with a disability. Embellishment and landscaping will provide tactile and sensory opportunities, and many of the paths, trails and boardwalks will be designed to allow access for all.

Clearly signed

Wayfinding will be primary to all aspects of the Precinct ensuring quality experiences. Wayfinding will include directional signage on the roads leading to the Precinct, gateway signs into key entry points, directional roadway and pedestrian signs within the Precinct and interpretive signage to tell the 'stories' related to the history, flora and fauna of the site.

Establishing a vibrant well-used community Precinct - a key goal for Council











Redlands Coast Regional Sport and Recreation Precinct Master Plan - Sub-precincts

1 ***Sports field sub-precinct***
Includes lit rectangular playing fields on benches, two clubhouses, formal and overflow car parking and small recreation node

2 ***Recreation sub-precinct***
Includes regional-level play and activity node, barbecues and picnic facilities, kickabout and field games area, sealed multi-use paths and formal car parking

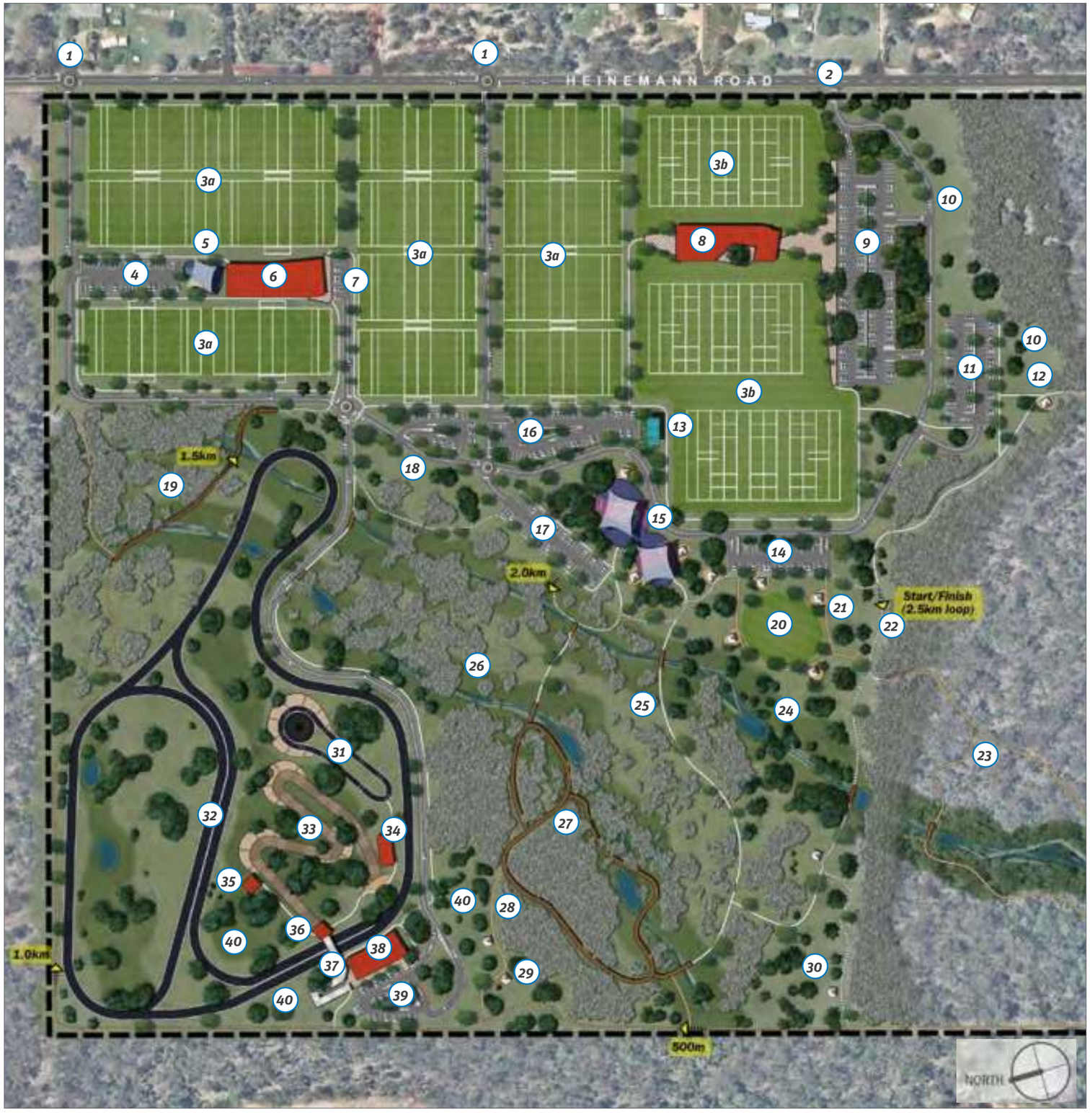
3 ***Bike activity sub-precinct***
Includes criterium track incorporating three loops, bmx track with track marshal's observation tower and administration booth, pump track, shared clubhouse, formal and overflow car parking

4 ***Wetland and forest sub-precinct***
Includes sealed multi-use paths, raised boardwalks, unsealed tracks amongst inviting vegetation and wetland areas

5 ***Conservation sub-precinct***
Includes unsealed tracks and trails for a mix of users



Redlands Coast Regional Sport and Recreation Precinct Master Plan



1. Primary Precinct entries (with signage)
2. Precinct exit point (left turn only)
3. Lit playing fields - built on benches with spectator batters (a - touch, b - rugby league)
4. Formal car park (52 spaces)
5. Small recreation node
6. Clubhouse incorporating amenities, changerooms, canteen, offices and viewing areas
7. Formal car park and service vehicle entry (10 spaces)
8. Clubhouse incorporating amenities, changerooms, canteen, offices and viewing areas
9. Formal car park (152 spaces)
10. Unsealed (overflow) car parking (grass areas suitable for float parking)
11. Formal car park (92 spaces)
12. Formal trail head (shelter and seating, interpretive and directional signage, water). Leading to a network of multi-use trails (mountain bikes, horses, pedestrians)
13. On-site sewerage treatment location (only if required)
14. Formal car park (50 spaces)
15. Regional-level play and activity node (including amenities, picnic areas, water play etc)
16. Formal car park (107 spaces)
17. Formal car park (70 spaces)
18. Unsealed (overflow) car parking
19. Raised boardwalk across wetland
20. Kickabout and field games area
21. Barbecue and picnic node
22. Start-finish 2.5km loop (includes sealed paths, boardwalks and unsealed track)
23. Unsealed tracks throughout the conservation area
24. Drainage line revegetation and rehabilitation
25. Sealed path network
26. Drainage line revegetation and rehabilitation
27. Raised board walk and viewing platforms throughout wetland and forest areas
28. Compacted unsealed track
29. Picnic node
30. Picnic node
31. Pump track
32. Sealed criterium track (outer loop 1.2km, secondary loop 1km, inner loop 0.6km)
33. BMX track (with sic surfacing and perimeter fencing)
34. Administration booth
35. Track marshal observation tower
36. Start ramp (with local- and state-level start options)
37. Overpass (and track commisaire observation area)
38. Clubhouse incorporating amenities, changerooms, canteen, offices and viewing areas
39. Formal car park (45 spaces)
40. Unsealed (overflow) car parking

The bike activity sub-precinct will be a popular node for formal sports, informal use and physical activity



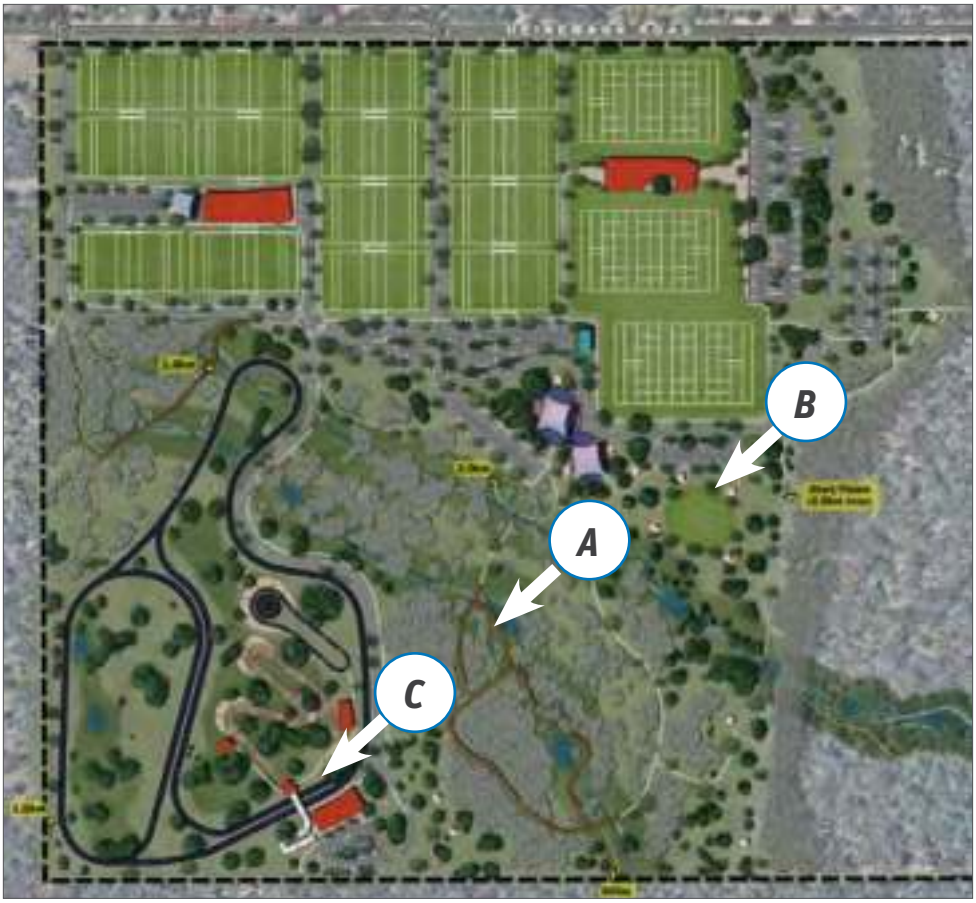








Artist's impressions of the Precinct



VIEW A: Central boardwalk

With a series of boardwalks and viewing platforms amongst forest areas and permanent ponds, this area will prove popular for all ages.





VIEW B: Kickabout and field games area

This activity site adjoins the play node and will provide an area for more active play and games. It will be supported by picnic shelters and barbecues overlooking the grassed space.

VIEW C: Bike activity area

The north-west corner of the site will be a busy bmx and cycling node that includes a criterium circuit and BMX track both capable of hosting events. A pump track will also complement these facilities.



5.2 Master Plan elements

5.2.1 Sports field sub-precinct



Rectangular playing fields

Rectangular playing fields (lit to competition standard) will provide a wide range of opportunities for touch and rugby league. Additionally, options for field sharing will also be available.



Rectangular fields have been designed as they have a smaller footprint than ovals (reducing the amount of cut and fill required). Additionally, these fields will allow for benches to be established. These benches can cater for a number of fields, provide suitable batters for spectators and allow spaces for internal access roads.



Clubhouses

To cater for the proposed formal field sports, clubhouses have been proposed toward the northern and southern ends of the area.



The clubhouses should include changerooms, officials' rooms, first aid areas, canteen, amenities and viewing areas. The clubhouses have been proposed at two of the higher points of the entire Precinct. The development of two-storey buildings would provide attractive views across the Precinct.



Access, circulation and car parking



Given that this sub-precinct adjoins Heinemann Road, vehicular access will be directly via the two entry roads. Cars will then be able to park near to the clubhouse or field they are using given there are formal car parks at the northern, central and southern ends of the sub-precinct (a total of 533 sealed spaces). Additionally, at peak times, overflow car parking will be available on the grass adjoining the entry roads and in the areas to the west and south of the playing fields. Sealed paths will link car parks with the fields and clubhouses.



Three exit points will be available. (Given constraints associated with sightlines, left hand turn only will be available from the southernmost location).



Kerb and channel, bollards and shade trees will define internal roads and car parks across the Precinct, with WSUD drainage integrated into all car park designs.



Recreation node

A small recreation node incorporating simple toddler/lower primary play elements, seating and shade is included at the northern end of the sub-precinct. This area will prove popular for younger siblings not involved in formal training and competition.



5.2.2 Recreation sub-precinct









Regional-level play and activity node

As a key feature within the site, a large regional-level play and picnic node is proposed in a central location. This area would be the interface between the formal sporting fields to the east and the natural areas toward the western side of the facility.

This node is intended to attract users from across the whole LGA, but to also provide complementary recreation opportunities to users of the sport facilities within the Precinct.

Potential embellishments in this area include play elements attractive to children of all ages and abilities, natureplay opportunities and interactions with water (via zero-depth interactive water play elements).

Suitable amenities will also be provided at this location reflective of the regional-level nature of the facility.

Kickabout and field games area

The open grassed area directly south of the play and activity node will provide opportunities for kickabout and games such as tiggy, frisbee and touch.

Picnic facilities

A range of large and small picnic and barbecue nodes will be spread across this sub-precinct. Importantly, they will be established to provide for both larger gatherings (e.g. birthday parties) and smaller groups (e.g. families).

Access, circulation and car parking

Vehicles will be able to make their way quite close to this area via the internal roads. Car parking has been provided along the eastern edge of this sub-precinct with a smaller car park also located to the north-east of the play and activity node. In total, there are 227 sealed spaces adjoining the area with additional overflow parking available directly to the north.

Sealed paths will link car parks with the activity nodes. These paths then form a system of opportunities that continue into further areas within the Precinct. Additionally, a 2.5km loop involving sealed paths, boardwalks and compacted unsealed track will start and finish from this sub-precinct.











5.2.3 Bike activity sub-precinct



Criterium cycling track

The proposed criterium track will be the only one of its kind within Redlands Coast. The bitumen track includes three looped 'options' - the outer loop 1.2km, secondary loop 1km and the inner loop 0.6km. These loops allow for a range of training and racing opportunities. Additionally, the venue will prove attractive for sports such as duathlon. A facility of this nature will host regular events (up to state-standard).

The proposed overpass will be used by spectators, competitors and commisaires. It will also be used to display notices such as lap counters and any hazards on the track.

Options to light this track should be investigated.



BMX track

The proposed state-level BMX facility will be lit and include a start ramp with both local and state-level options and a quality track with Sic surfacing. The start ramp will be accessible via the overpass or from ground level. A track marshal observation tower will provide views across the track, and an administration booth will be provided at the finish line.



Given the quality of surfacing, and the potential damage that can be caused by inappropriate use, the track will be fenced (with a 900mm high fencing option).



Pump track

To complement the criterium and BMX opportunities, a pump track will be established within the sub-precinct. This bitumen track will prove attractive for all ages and abilities (and can also be used as a warm-up area for BMX events).



Clubhouse

A shared clubhouse has been proposed for the highest location within this area. A two-storey building would provide views across all of the bike and cycle facilities and incorporate amenities, changerooms, canteen, office space, storage and social areas.



Natural elements

Given the significance of some of the vegetation within this sub-precinct, the various tracks should be designed to retain specimens where practical. Where the criterium track crosses the drainage areas, culverts and pipes will be constructed so as not to unnecessarily impact flow paths.



Access, circulation and car parking

An internal road will lead from the east of the Precinct to the sub-precinct. A formal car park (with 45 spaces) and areas of overflow parking have been provided near to the clubhouse. It will be important that the overflow areas include large spaces for cars and trailers. (Overflow nose-in parking for vehicles will also be available off the access road). Both sealed and unsealed paths will link the sub-precinct with the wider activity areas within the Precinct.



5.2.4 Wetland and forest sub-precinct



Rehabilitated drainage areas

The central west side of the Precinct includes drainage corridors and significant vegetation. These areas will be rehabilitated through weed management and revegetation practices. Not only will this enhance the visual amenity, it will also further re-establish the habitats within this sub-precinct.

Boardwalks, viewing platforms, path network

A network of boardwalks, viewing platforms, sealed and unsealed paths are proposed across this sub-precinct. They will weave in and out of heavily forested areas and provide opportunities to walk 'within and above' the wetlands, vegetation and fauna. This network will link with all of the key activity areas across the Precinct.





5.2.5 Conservation sub-precinct



Conservation practices

The southern end of the Precinct has been identified as an area of high-value vegetation and key corridors. Council's natural areas teams are already managing this area reflective of the important conservation values (e.g. unnecessary tracks are being rationalised).

The development of the northern end of the Precinct will not alter the conservation-focus for the remainder of the site.



Track network

While conservation will remain the key focus for the southern end of the Precinct, opportunity exists for low impact track and trail development. A range of potential users have been identified.



Horse riders and mountain bikers will be seeking slightly wider cleared tracks that link with the wider riding network. Council's multi-use trails (that play an important role in fire management) are appropriate for these uses.

Bushwalkers, bird watchers and nature appreciation enthusiasts prefer smaller tracks where they can enjoy a 'quieter' experience without unexpected disturbance from horse riders and mountain bikers. Council is encouraged to work with these users to identify the areas within the conservation sub-precinct where the vegetation and topography will be attractive for track development.





Trailhead

A trailhead is proposed at the interface between the sports field and conservation sub-precincts. This facility would include a shelter, seating, interpretive and directional signage and access to water. Additionally, grassed areas for overflow car parking (and horse float parking) adjoin this trailhead.





5.3 Staged implementation

5.3.1 Staging

It is important to note that realising this Master Plan will require resource commitment from both Council and the user groups. Additionally, State and Federal Government grants will be sought to assist fund the infrastructure items.

Adopting the Master Plan does not commit Council to fully fund each project. The expected cost of the development of the Master Plan is likely to beyond the Council's and the community's ability to realise in the short-term. Thus, this section provides a staged approach to implementation. The information provided is designed as a flexible guide—changes in user group priorities or earlier opportunities for funding may alter staging.

There is potential for sports field development to be brought forward as a short-term priority or held back for longer-term capital works depending on the preferences of Council and the user groups.

Initial

- ☐ Bulk earthworks, services and access infrastructure

Stage 1

- ☐ Sports field sub-precinct
- ☐ Bike activity sub-precinct

Stage 2

- ☐ Recreation sub-precinct
- ☐ Wetland and forest sub-precinct

Stage 3

- ☐ Conservation sub-precinct.

5.3.2 Cost estimation

Project costs (and ultimate project staging) will be dependent on many factors such as relevant approvals, cost estimate refinement, development stages, procurement scheduling and cashflow management.

Projects of a similar nature undertaken in Queensland in recent times include the Highfields Sport and Recreation Precinct, Fraser Coast Sports and Recreation Precinct, Springfield Central Sports Complex and a number of projects led by Moreton Bay Regional Council. Comparing scope and scale (and noting the influencing factors highlighted above), the Redlands Coast Regional Sport and Recreation Precinct project is likely to cost in the range of $40m-$60m.

5.4 Management considerations

5.4.1 Current arrangements

Council's current model for sports facility management is for the user groups (clubs) to be offered leases over building footprints and permits to occupy for playing fields and courts. Clubs are then responsible for much of the day-to-day control of the facility - including facility maintenance. To assist clubs meet these costs, Council pays them the equivalent of what it would cost Council to mow the fields 30 times each year. Under this arrangement, Council retains responsibility for irrigation practices and major renovation requirements.

5.4.2 Future considerations

While the current arrangement allows Council to minimise resources required for sports facility operations, Council officers indicate that it impacts the quality of the playing facilities and potentially hinders longer-term sustainability. As highlighted in Section 4.2, there is a growing trend towards councils taking on more responsibility for the overall management (and maintenance) of sports facilities. Under this approach, tenants pay higher user fees reflective of the increased resourcing provided by Council. However, it allows these volunteers to then focus more on their core function of providing the relevant sport/activity, rather than face the burden of maintenance and asset management.

At the Precinct, Council will have full maintenance and management responsibility for the recreation, conservation and wetland and forest sub-precincts. As a result, expanding these roles to include the sports facilities simply provides a consistent approach for the entire Precinct.

With the Precinct set to be home to a number of sporting groups, it is recommended that Council lead the establishment of an over-arching 'scheduling and directions group' for the Precinct. In addition to representatives from each of the formal sporting groups, representatives from active recreation groups (parkrun, mountain biking, bird watching etc) using the Precinct could also be included in the over-arching group. This group could meet regularly (3-4 times each year) to minimise potential impacts from activity and event clashes and to continue to discuss ongoing development initiatives.

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APPENDIX

B

DESKTOP SEARCHES

Biodiversity Planning Assessment

27°36'32"S 153°14'38"E

27°36'32"S 153°15'53"E



27°37'39"S 153°14'38"E

27°37'39"S 153°15'53"E

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Queensland Government

Department of Natural Resources, Mines and Energy

Biodiversity Planning Assessment

Legend

Biodiversity significance

- State Habitat for EVNT taxa
- State
- Regional
- Local or Other Values

Cities and Towns

Road crossing

- Bridge
- Tunnel

Road

- Highway
- Main
- Local
- Private

Railway

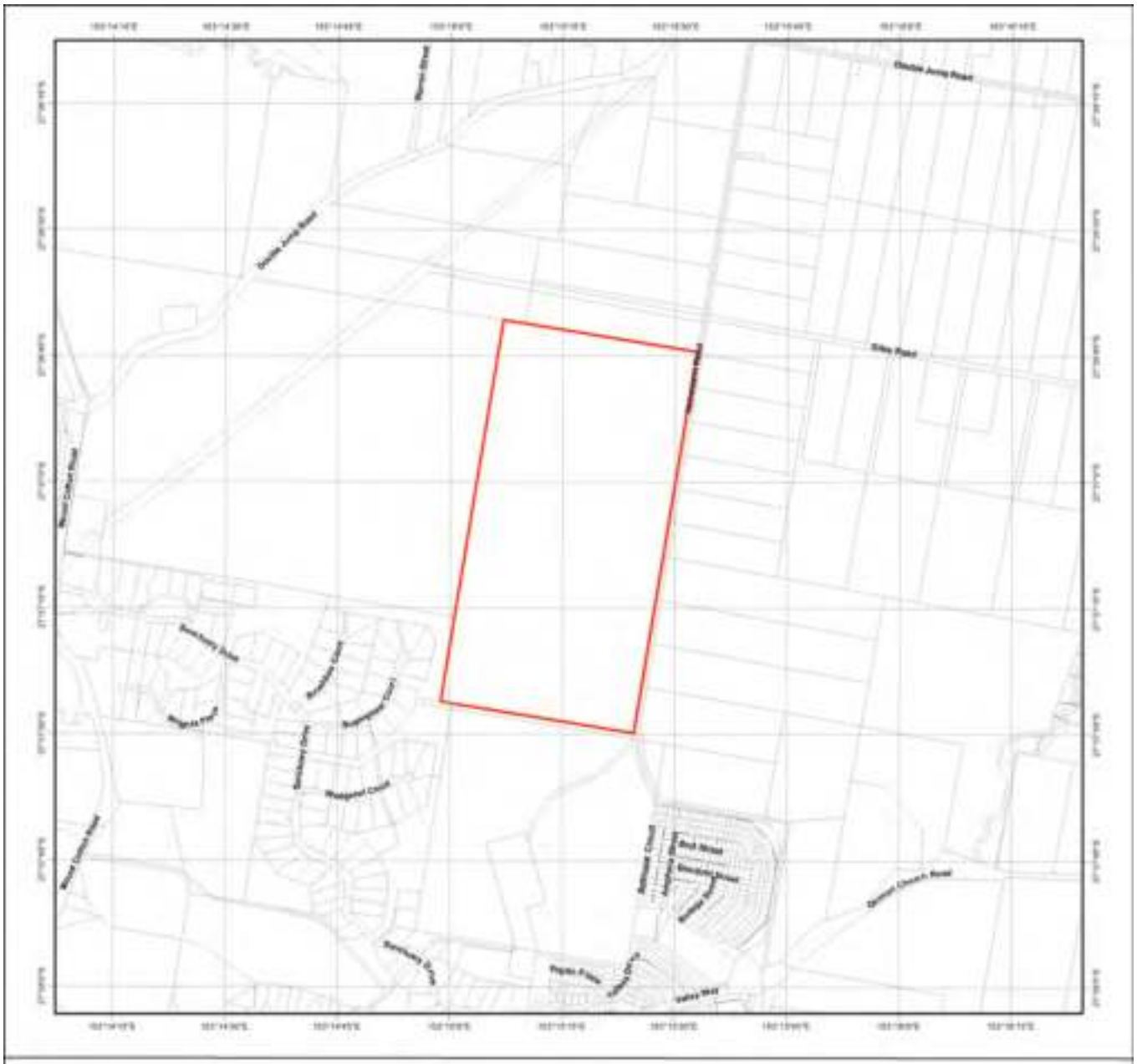
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Map of Great Barrier Reef Wetland Protection Areas

Selected Lot and Plan
Cadastral Boundary
Wetland in a wetland protection area
Great Barrier Reef wetland protection area

LOCALITY DIAGRAM

N

Note:
This map shows the location of wetland protection areas which are defined under the Environmental Protection Regulation 2008. Within wetland protection areas, certain types of development involving high impact earthworks are made assessable under Schedule 3 of the Sustainable Planning Regulation 2009.

The Department of State Development, Manufacturing, Infrastructure and Planning is the State Assessment Referral Agency (SARA) under Schedule 7 of the Sustainable Planning Regulation 2009 for assessable development involving high impact earthworks within wetland protection areas. The Department of Environment and Science is a technical agency.

The policy outcome and assessment criteria for assessing these applications are described in the State Development Assessment Provisions (SDAP) *State Code 9 : Great Barrier Reef Wetland Protection Areas*.

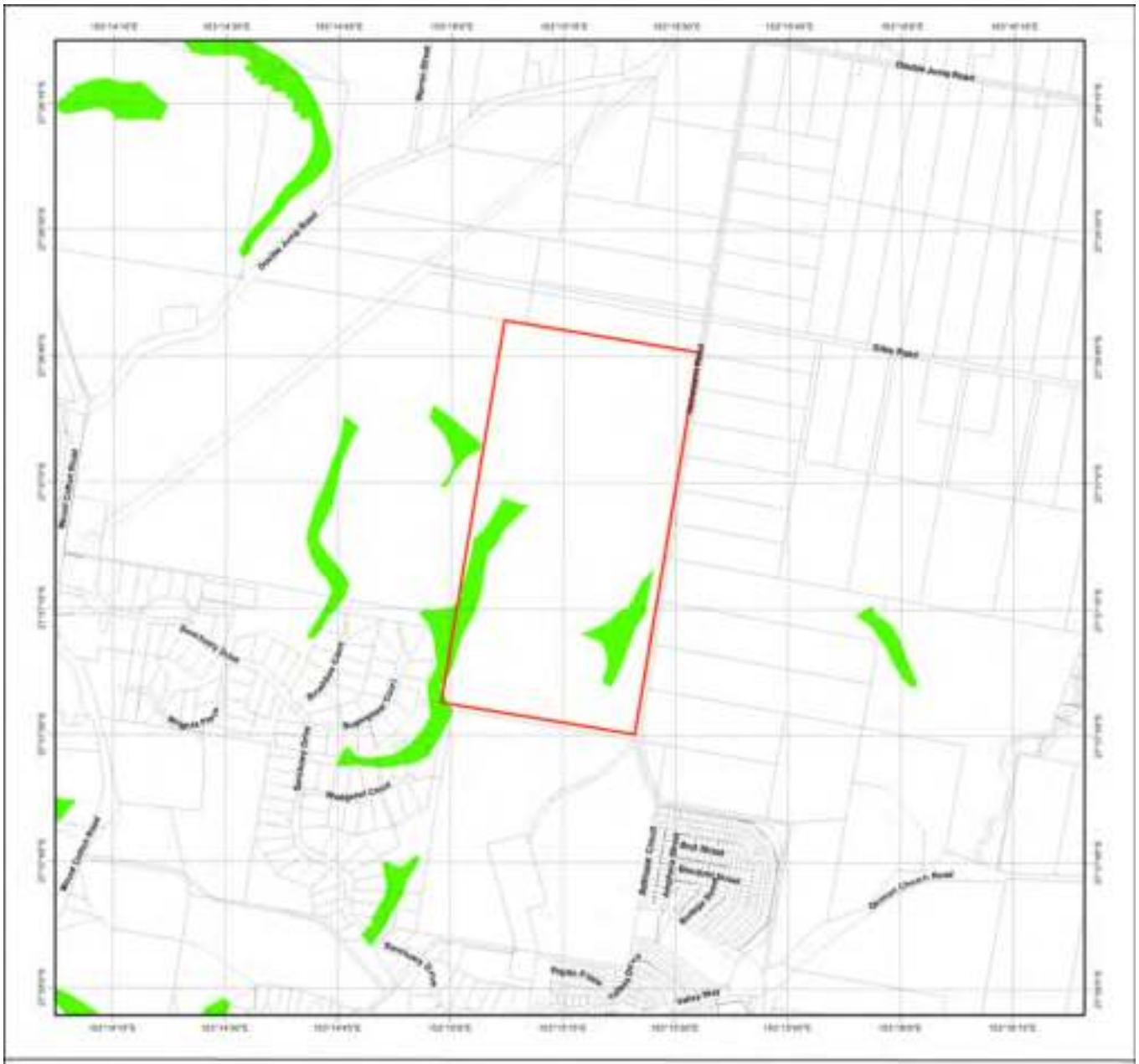
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Map of Queensland Wetland Environmental Values

Selected Lot and Plan

Cadastral Boundary

High ecological values waters management intent

Wetlands assessed under section 7

GBR wetland of high ecological significance

Wetland of high ecological significance

Wetland of general ecological significance

LOCALITY DIAGRAM

N

Note:
This map shows the location of wetlands on the Map of Queensland Wetland Environmental Values under the Environmental Protection (Wetland and Water Biodiversity) Policy 2019. The map also shows high ecological value waters management intent under Schedule 2 of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019.

Wetlands are assessed for ecological significance using the environmental values for wetlands in section 7 of the Environmental Protection (Wetland and Water Biodiversity) Policy 2019. Wetlands are considered either High Ecological Significance (HES) or of General Ecological Significance (GES) for the purposes of the environmental values.

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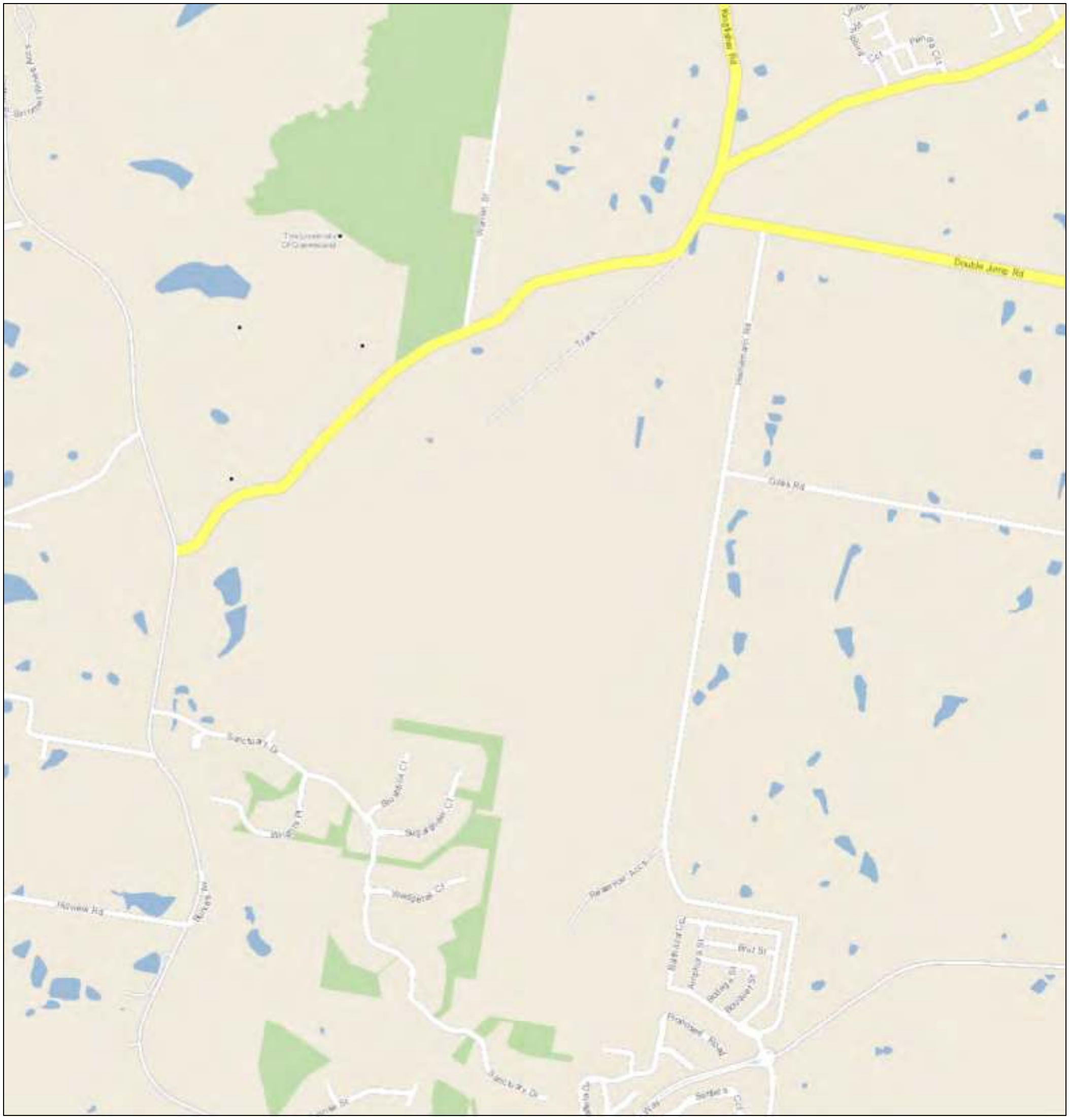
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FF Camps



May 29, 2020

1:18,056

0 0.2 0.4 0.8 mi

0 0.325 0.65 1.3 km

Flying-fox Camps

- Nationally Important Flying-fox Camp
- Other Flying-fox Camp

Grey-headed Flying-fox (GHFF)(EPBC Vulnerable) Numbers

- <500
- >=500 but <2,500
- >=2,500 but <10,000
- >=10,000 but <16,000
- >=16,000 but <50,000
- >=50,000

Spectacled Flying-fox (SFF)(EPBC Vulnerable) Numbers

- <500
- >=500 but <2,500
- >=2,500 but <10,000
- >=10,000 but <16,000
- >=16,000 but <50,000
- >=50,000

Black Flying-fox (BFF) Numbers

- <500
- >=500 but <2,500
- >=2,500 but <10,000
- >=10,000 but <16,000
- >=16,000 but <50,000
- >=50,000

Little Red Flying-fox (LRFF) Numbers

- <500
- >=500 but <2,500
- >=2,500 but <10,000
- >=10,000 but <16,000
- >=16,000 but <50,000
- >=50,000

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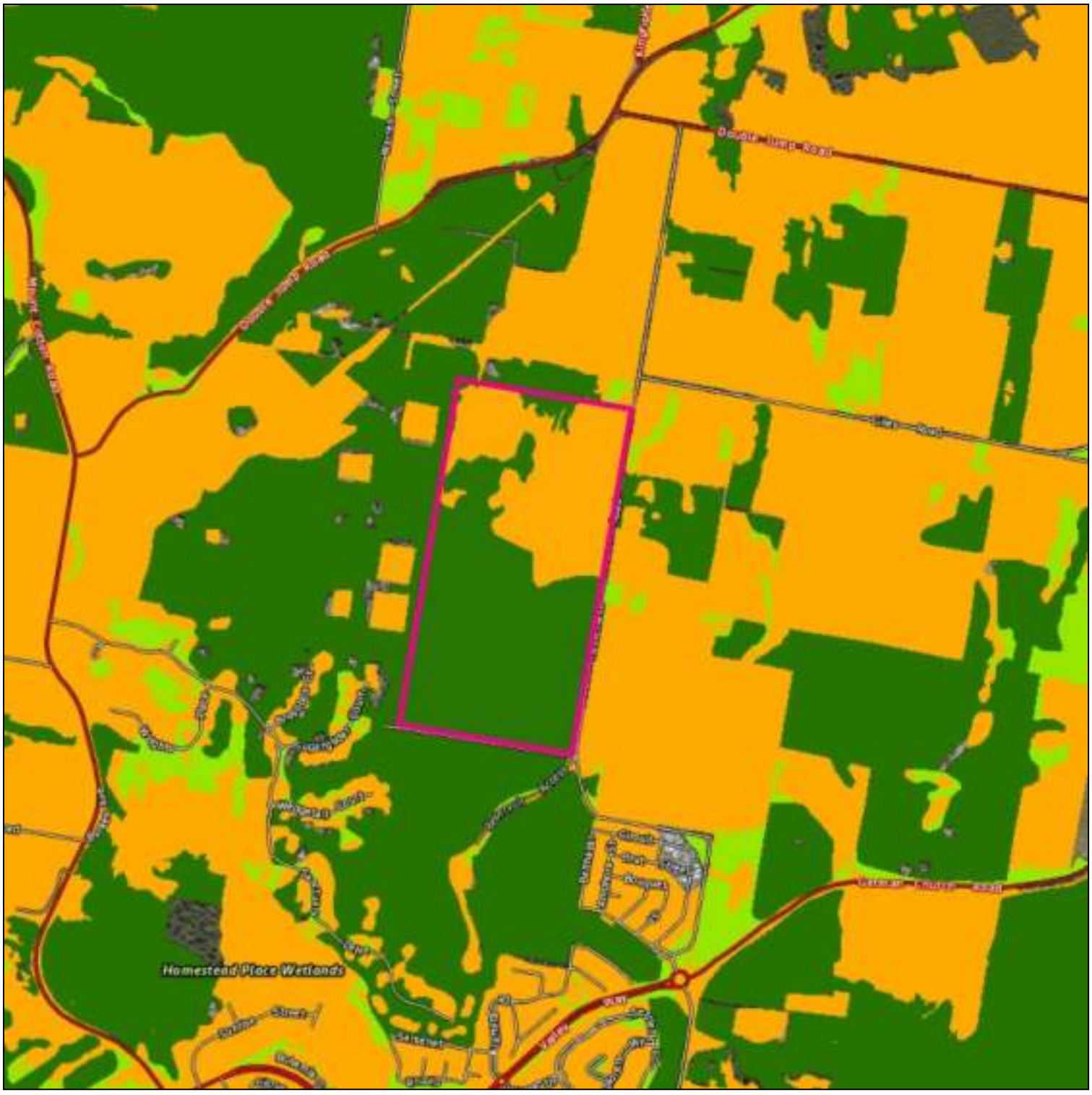
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Koala Habitat Areas

27°35'52"S 153°13'60"E

27°35'51"S 153°16'40"E



27°38'14"S 153°14'0"E

27°38'13"S 153°16'41"E

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Queensland Government

Department of Natural Resources, Mines and Energy

Koala Habitat Areas

Legend

Core koala habitat area

Locally refined koala habitat area

Koala habitat restoration area

Road

- Highway
- Main
- Local
- Private

Railway

Cities and Towns

Attribution

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Koala Priority Areas

27°27'24"S 153°6'24"E

27°27'20"S 153°27'1"E



27°45'40"S 153°6'29"E

27°45'36"S 153°27'6"E

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Queensland Government

Department of Natural Resources, Mines and Energy

Koala Priority Areas

Legend

Koala priority area



Core koala habitat area



Locally refined koala habitat area



Road



- Highway
- Main
- Local
- Private

Cities and Towns

Railway

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Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

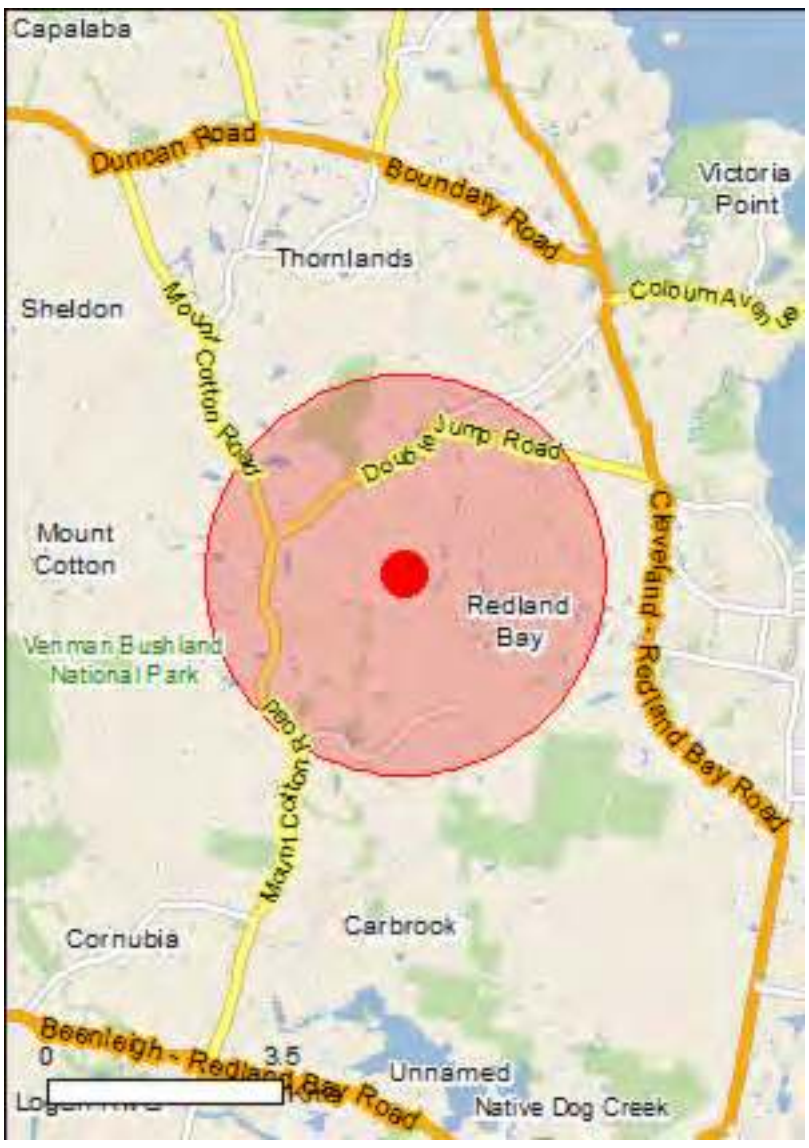
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/11/20 13:19:42

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

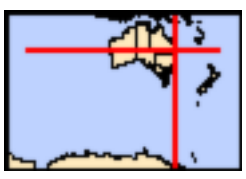
Caveat
Acknowledgements



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Coordinates

Buffer: 3.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	40
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	23
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	38
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Moreton bay	Within 10km of Ramsar

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Thinornis cucullatus cucullatus Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat may occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Corchorus cunninghamii Native Jute [14659]	Endangered	Species or species habitat known to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area
Endiandra floydii Floyd's Walnut [52955]	Endangered	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Planchonella eerwah Shiny-leaved Condoo, Black Plum, Wild Apple [17340]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species

Name	Threatened	Type of Presence
		habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Bayview	QLD

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur

Name	Status	Type of Presence within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India		Species or species

Name	Status	Type of Presence
Rubbervine, Palay Rubbervine, Purple Allamanda [18913] Eichhornia crassipes		habitat likely to occur within area
Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Opuntia spp.		Species or species habitat likely to occur within area
Prickly Pears [82753]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Sagittaria platyphylla		
Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-27.6176 153.2545

Acknowledgements

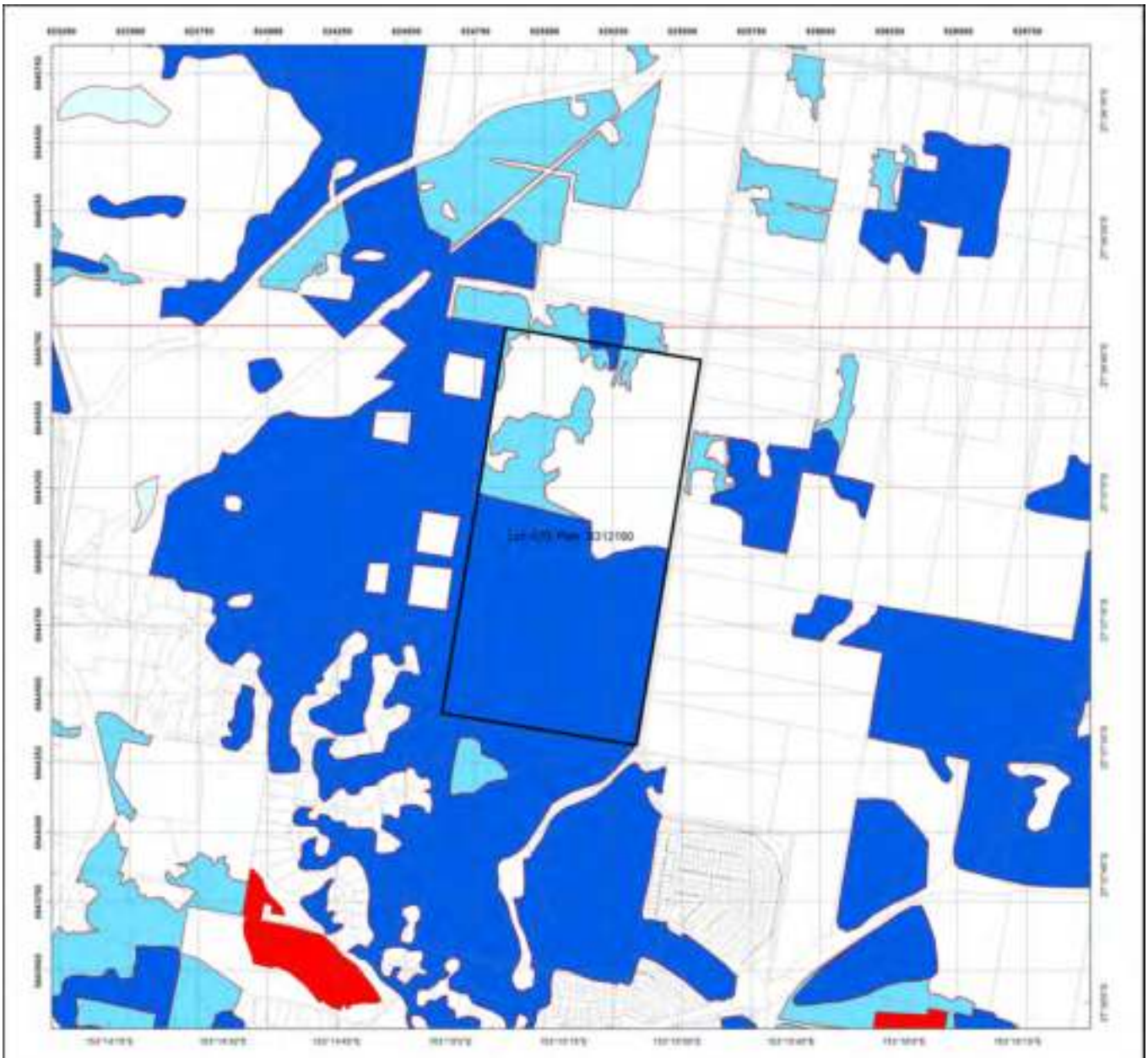
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Regulated Vegetation Management Map

Legend

- Selected Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Other land parcel boundaries

LOCALITY DIAGRAM

N

0 200 400 600 800 1,000 m

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information required for the assessment of vegetation values is provided in the accompanying 'Vegetation Management Supporting map'. For further information go to the web site: www.dnrme.qld.gov.au or contact the Department of Natural Resources, Mines and Energy.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

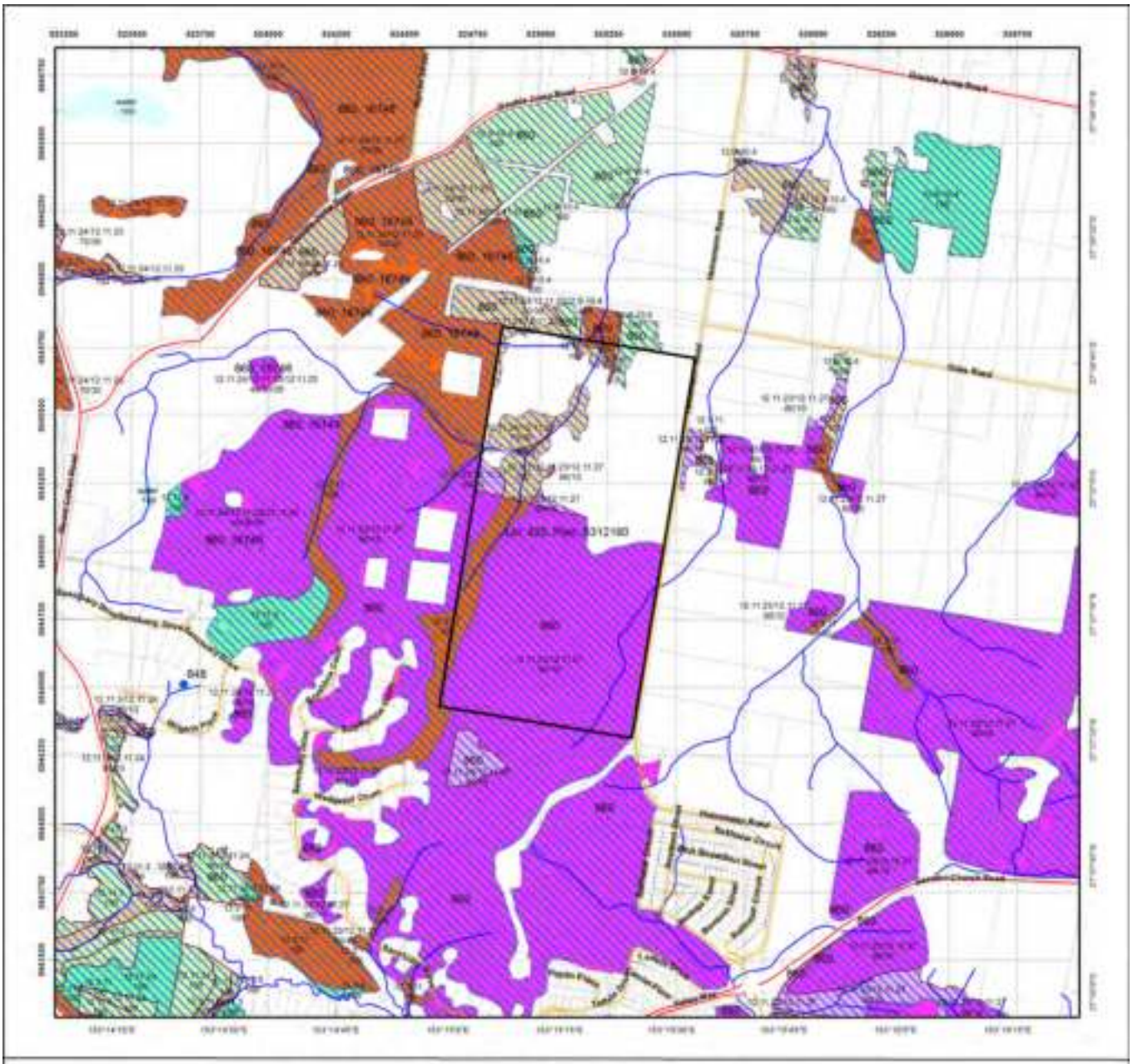
Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

Queensland Government

This product is projected into:
GDA 1994 MGA Zone 56

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Vegetation Management Supporting Map

Legend

- Selected Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area under Section 20AH. These areas are edged in yellow and filled with the remnant RE Status
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category C area under Section 20AI. These areas are edged in purple and filled with the remnant RE Status
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries

Queensland Government

LOCALITY DIAGRAM

N

0 140 280 420 560 700 m

This product is projected into: GDA 1994 MGA Zone 56

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.dnrme.qld.gov.au or contact the Department of Natural Resources, Mines and Energy.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources, Mines and Energy website (http://www.dnrme.qld.gov.au) has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or

2) in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
860	Phascolarctos cinereus	koala	V	SEQ: Open eucalypt forest and woodland that has: a) multiple strata layers containing Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca trees that-at 1.3 metres above the ground-have a diameter both greater and less than 30 centimetres; and b) at least 1 of the following species: Eucalyptus tereticornis, E. fibrosa, E. propinqua; E. umbra, E. grandis, E. microcorys, E. tindaliae, E. resinifera, E. populnea, E. robusta, E. nigra, E. racemosa, E. crebra, E. exserta, E. seeana, Lophostemon confertus, L. suaveolens, Melaleuca quinquenervia. Outside SEQ: Open eucalypt forest and woodland that contains Eucalyptus &/or Corymbia spp. Tree species used for food varies across State and can include Eucalyptus tereticornis, E. camaldulensis, E. coolabah; E. drepanophylla, E. platyphylla, E. orgadophilla, E. thozetiana, E. melanophloia, E. populnea, E. melliodora, E. dealbata, E. microtheca, E. crebra, E. exserta, E. blakelyi, E. papuana, Corymbia tessellaris, C. citriodora, Melaleuca quinquenervia, M. leucadendra.	Sea level to 1000m.	None	Riparian areas, plains and hill/escarpment slopes.
848	Petauroides volans	greater glider	V	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	None

Label	Regional Ecosystem (mandatory unless otherwise specified)
860	SEQ: 11.3.2, 11.3.4, 11.3.25, 11.3.26, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.9.9, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28. Outside SEQ: 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.4.1, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.1, 7.8.2, 7.8.4, 7.8.5, 7.8.6, 7.8.7, 7.8.8, 8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5, 8.1.6, 8.1.7, 8.1.8, 8.1.9, 8.1.10, 8.1.11, 8.1.12, 8.1.13, 8.1.14, 8.1.15, 8.1.16, 8.1.17, 8.1.18, 8.1.19, 8.1.20, 8.1.21, 8.1.22, 8.1.23, 8.1.24, 8.1.25, 8.1.26, 8.1.27, 8.1.28, 8.1.29, 8.1.30, 8.1.31, 8.1.32, 8.1.33, 8.1.34, 8.1.35, 8.1.36, 8.1.37, 8.1.38, 8.1.39, 8.1.40, 8.1.41, 8.1.42, 8.1.43, 8.1.44, 8.1.45, 8.1.46, 8.1.47, 8.1.48, 8.1.49, 8.1.50, 8.1.51, 8.1.52, 8.1.53, 8.1.54, 8.1.55, 8.1.56, 8.1.57, 8.1.58, 8.1.59, 8.1.60, 8.1.61, 8.1.62, 8.1.63, 8.1.65, 8.1.66, 8.1.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.4.3, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.13, 9.5.14, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.5, 10.3.6, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.17, 10.3.20, 10.3.27, 10.3.28, 10.4.3, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, 10.10.7, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.21, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.11, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10.
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State Planning Policy

Making or amending a local planning instrument and designating land for community infrastructure

Date: 26/11/2020

Department of State Development, Manufacturing, Infrastructure and Planning

Queensland Government

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0 290 580 870 1,160

Metres

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Legend

Drawn Polygon Layer

Override 1

Cadastre (25k)

Cadastre (25k)

MSES - Regulated vegetation (intersecting a watercourse)

MSES - Regulated vegetation (intersecting a watercourse)

MSES - High ecological value waters (watercourse)

MSES - High ecological value waters (watercourse)

MSES - Wildlife habitat (endangered or vulnerable)

MSES - Wildlife habitat (endangered or vulnerable)

MSES - Wildlife habitat (special least concern animal)

MSES - Wildlife habitat (special least concern animal)

MSES - Wildlife habitat (koala habitat areas - core)

MSES - Wildlife habitat (koala habitat areas - core)

MSES - Wildlife habitat (koala habitat areas - locally refined)

MSES - Wildlife habitat (koala habitat areas - locally refined)

MSES - Strategic environmental areas (designated precinct)

MSES - Strategic environmental areas (designated precinct)

MSES - High ecological significance wetlands

MSES - High ecological significance wetlands

MSES - High ecological value waters (wetland)

MSES - High ecological value waters (wetland)

MSES - Legally secured offset area (offset register)

MSES - Legally secured offset area (offset register)

MSES - Legally secured offset area (regulated vegetation offsets)

MSES - Legally secured offset area (regulated vegetation offsets)

MSES - Protected areas (estate)

MSES - Protected areas (estate)

MSES - Protected areas (nature refuge)

MSES - Protected areas (nature refuge)

MSES - Marine park (highly protected areas)

MSES - Marine park (highly protected areas)

MSES - Declared fish habitat area

MSES - Declared fish habitat area

MSES - Regulated vegetation (category B)

MSES - Regulated vegetation (category B)

MSES - Regulated vegetation (category C)

MSES - Regulated vegetation (category C)

MSES - Regulated vegetation (category R)

MSES - Regulated vegetation (category R)

MSES - Regulated vegetation (essential habitat)

MSES - Regulated vegetation (essential habitat)

MSES - Regulated vegetation (wetland)

MSES - Regulated vegetation (wetland)

State Planning Policy

Making or amending a local planning instrument and designating land for community infrastructure

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Vegetation Management Pre-clear Regional Ecosystem Map

Legend

- Selected Lot and Plan
- Road Names
- Pre-clearing area containing Endangered RE
- Pre-clearing area containing Of Concern RE
- Pre-clearing area that is a Least Concern RE
- Water
- Highway
- Connector
- Street/Local Road
- Other land parcel boundaries

Queensland Government

LOCALITY DIAGRAM



N

0 60 120 180 240 300 m

This product is projected into:
GDA 1994 MGA Zone 56

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Digital data for the Pre-clearing regional ecosystem map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries shown are provided as a locational aid only.

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Department of Natural Resources, Mines and Energy



Vegetation management report

For Lot: 420 Plan: S312160

Current as at 17/11/2020

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 6 April 2020 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, wetland, high-value regrowth and essential habitat mapping.

Improvements to the format of the report were made in July 2020 to more clearly delineate the three regulatory frameworks of vegetation management, protected plants and koala habitat protection. The Vegetation Management Pre-clear Regional Ecosystem map was also removed from the Vegetation Management Report but can still be requested as a separate map.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Natural Resources Mines and Energy who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 9 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 420 Plan: S312160, including links to relevant Smart Maps, are listed in Table 1. The tenure of the property (whether it is freehold, leasehold, or other) may be viewed by clicking on the Smart Map link(s) provided.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Link to property on SmartMap	Property title area (sq metres)
420	S312160	Freehold	http://globe.information.qld.gov.au/cgi-bin/SmartMapgen.py?q=420\S312160	1,011,710

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 420 Plan: S312160, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Redland City

Bioregion(s)	Subregion(s)
Southeast Queensland	Sunshine Coast - Gold Coast Lowlands
Southeast Queensland	Burringbar - Conondale Ranges

Catchment(s)
Logan-Albert

2. Vegetation management framework (administered by the Department of Natural Resources, Mines and Energy (DNRME))

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify DNRME or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact DNRME before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at
https://www.qld.gov.au/environment/land/vegetation/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact DNRME prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at
https://www.qld.gov.au/environment/land/vegetation/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify DNRME before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://apps.dnrm.qld.gov.au/vegetation/

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the DNRME and then follow the conditions and requirements listed in the AMP.
https://www.qld.gov.au/environment/land/vegetation/area-plans/

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at
https://www.qld.gov.au/environment/land/management/vegetation/development

2.5. Contact information for DNRME

For further information on the vegetation management framework:
Phone 135VEG (135 834)
Email vegetation@dnrme.qld.gov.au
Visit https://www.dnrme.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 420 Plan: S312160

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 101.46ha

Vegetation category	Area (ha)
Category B	54.0
Category C	10.6
Category X	36.8

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact DNRME to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact DNRME to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

There is no Property Map of Assessable Vegetation (PMAV) present on this property.

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
12.11.23	Endangered	B	44.33	Eucalyptus pilularis open forest on coastal metamorphics and interbedded volcanics	Mid-dense
12.11.23	Endangered	C	1.35	Eucalyptus pilularis open forest on coastal metamorphics and interbedded volcanics	Mid-dense
12.11.24	Least concern	C	2.31	Eucalyptus carnea, E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics	Sparse
12.11.25	Of concern	C	0.99	Corymbia henryi and/or Eucalyptus fibrosa subsp. fibrosa +/- E. crebra, E. carnea, E. tindaliae woodland on metamorphics +/- interbedded volcanics	Sparse
12.11.27	Endangered	B	4.93	Eucalyptus racemosa subsp. racemosa and/or E. seeana and Corymbia intermedia woodland on metamorphics +/- interbedded volcanics	Sparse
12.11.27	Endangered	C	0.15	Eucalyptus racemosa subsp. racemosa and/or E. seeana and Corymbia intermedia woodland on metamorphics +/- interbedded volcanics	Sparse
12.3.11	Of concern	B	4.75	Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast	Mid-dense
12.3.11	Of concern	C	5.08	Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast	Mid-dense
12.9-10.4	Least concern	C	0.77	Eucalyptus racemosa subsp. racemosa woodland on sedimentary rocks	Sparse
non-rem	None	X	36.82	None	None

Please note:

1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
860	Phascolarctos cinereus	koala	V	SEQ: Open eucalypt forest and woodland that has: a) multiple strata layers containing Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca trees that-at 1.3 metres above the ground-have a diameter both greater and less than 30 centimetres; and b) at least 1 of the following species: Eucalyptus tereticornis, E. fibrosa, E. propinqua; E. umbra, E. grandis, E. microcorys, E. tindaliae, E. resinifera, E. populnea, E. robusta, E. nigra, E. racemosa, E. crebra, E. exserta, E. seeana, Lophostemon confertus, L. suaveolens, Melaleuca quinquenervia. Outside SEQ: Open eucalypt forest and woodland that contains Eucalyptus &/or Corymbia spp. Tree species used for food varies across State and can include Eucalyptus tereticornis, E. camaldulensis, E. coolabah; E. drepanophylla, E. platyphylla, E. orgadophilla, E. thozetiana, E. melanophloia, E. populnea, E. melliodora, E. dealbata, E. microtheca, E. crebra, E. exserta, E. blakelyi, E. papuana, Corymbia tessellaris, C. citriodora, Melaleuca quinquenervia, M. leucadendra.	Sea level to 1000m.	None	Riparian areas, plains and hill/escarpment slopes.
848	Petauroides volans	greater glider	V	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	None

Label	Regional Ecosystem (mandatory unless otherwise specified)
860	SEQ: 11.3.2, 11.3.4, 11.3.25, 11.3.26, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.9.9, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28. Outside SEQ: 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.4.1, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.4.3, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.9, 9.11.10, 9.11.11, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.20, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.9, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.40, 9.12.44, 10.3.2, 10.3.3, 10.3.5, 10.3.6, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.17, 10.3.20, 10.3.27, 10.3.28, 10.4.3, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, 10.10.7, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.21, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.11, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10.
848	7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.38, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 9.3.1, 9.3.2, 9.3.3, 9.3.5, 9.3.6, 9.3.8, 9.3.10, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.24, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.13, 9.5.14, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.40, 9.12.44, 10.3.2, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.20, 11.7.1, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.15, 11.11.16, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.11, 11.12.13, 11.12.14, 11.12.16, 11.12.17, 11.12.19, 11.12.20; 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.2.11, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.12, 12.3.14, 12.3.15, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.5, 12.5.6, 12.5.7, 12.5.8, 12.5.10, 12.5.11, 12.5.12, 12.7.1, 12.7.2, 12.8.1, 12.8.2, 12.8.8, 12.8.10, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.23, 12.8.24, 12.8.25, 12.8.26, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.13, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.20, 12.9-10.21, 12.9-10.23, 12.9-10.24, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.20, 12.11.21, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.20, 12.12.21, 12.12.22, 12.12.23, 12.12.24, 12.12.25, 12.12.26, 12.12.27, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

Class B: 0.59ha

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 420 Plan: S312160.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

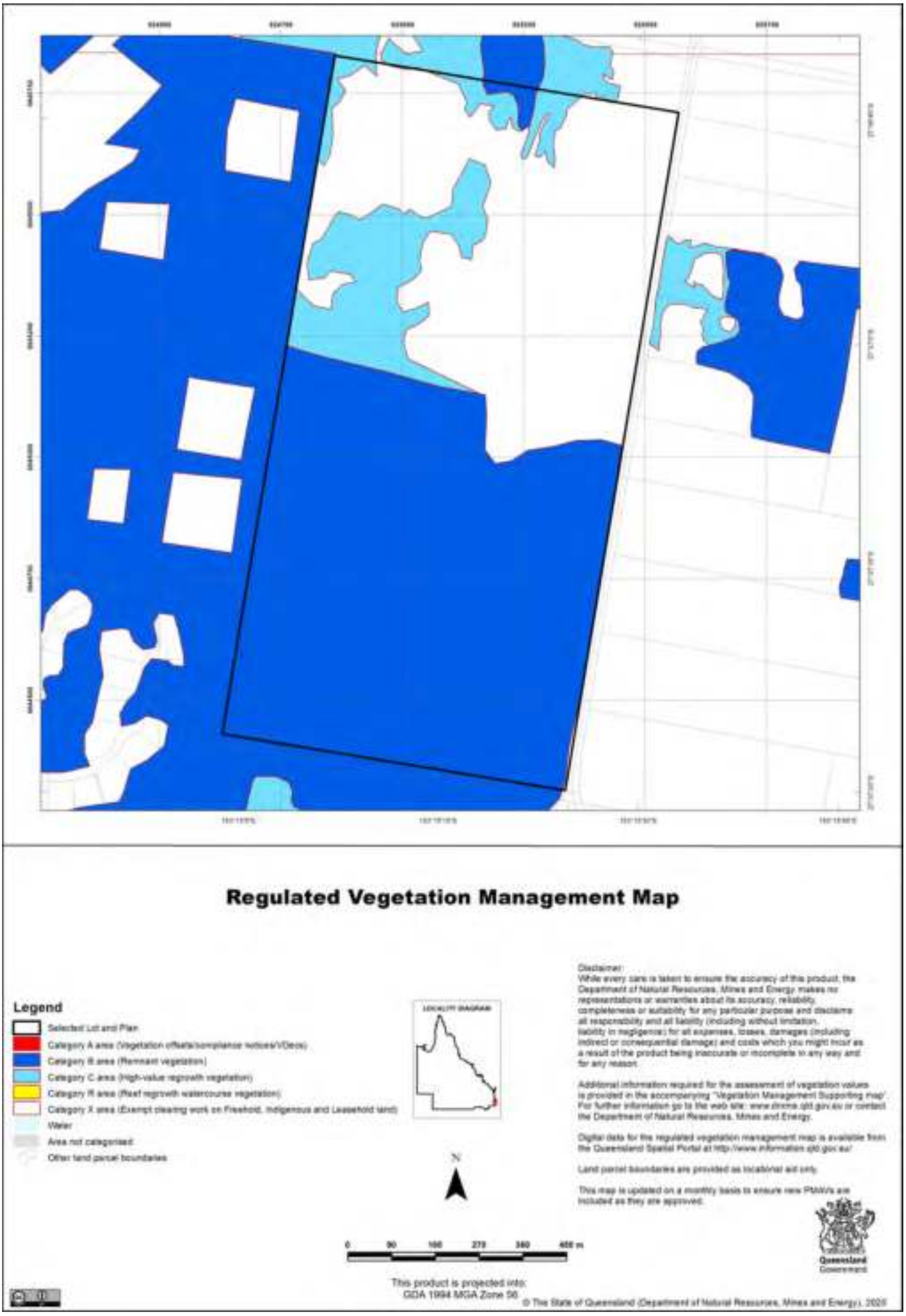
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

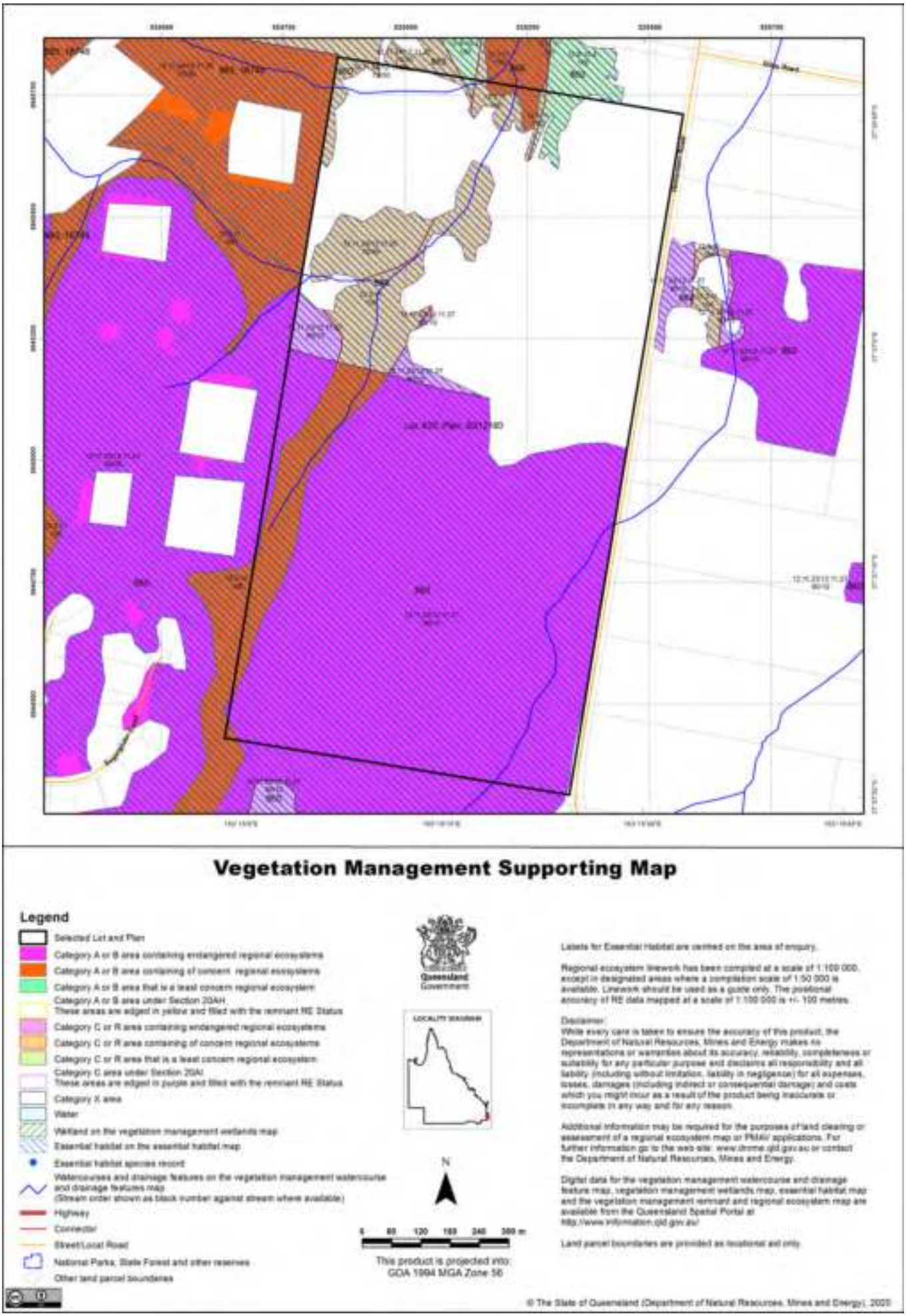
Agricultural Land Class A or B

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

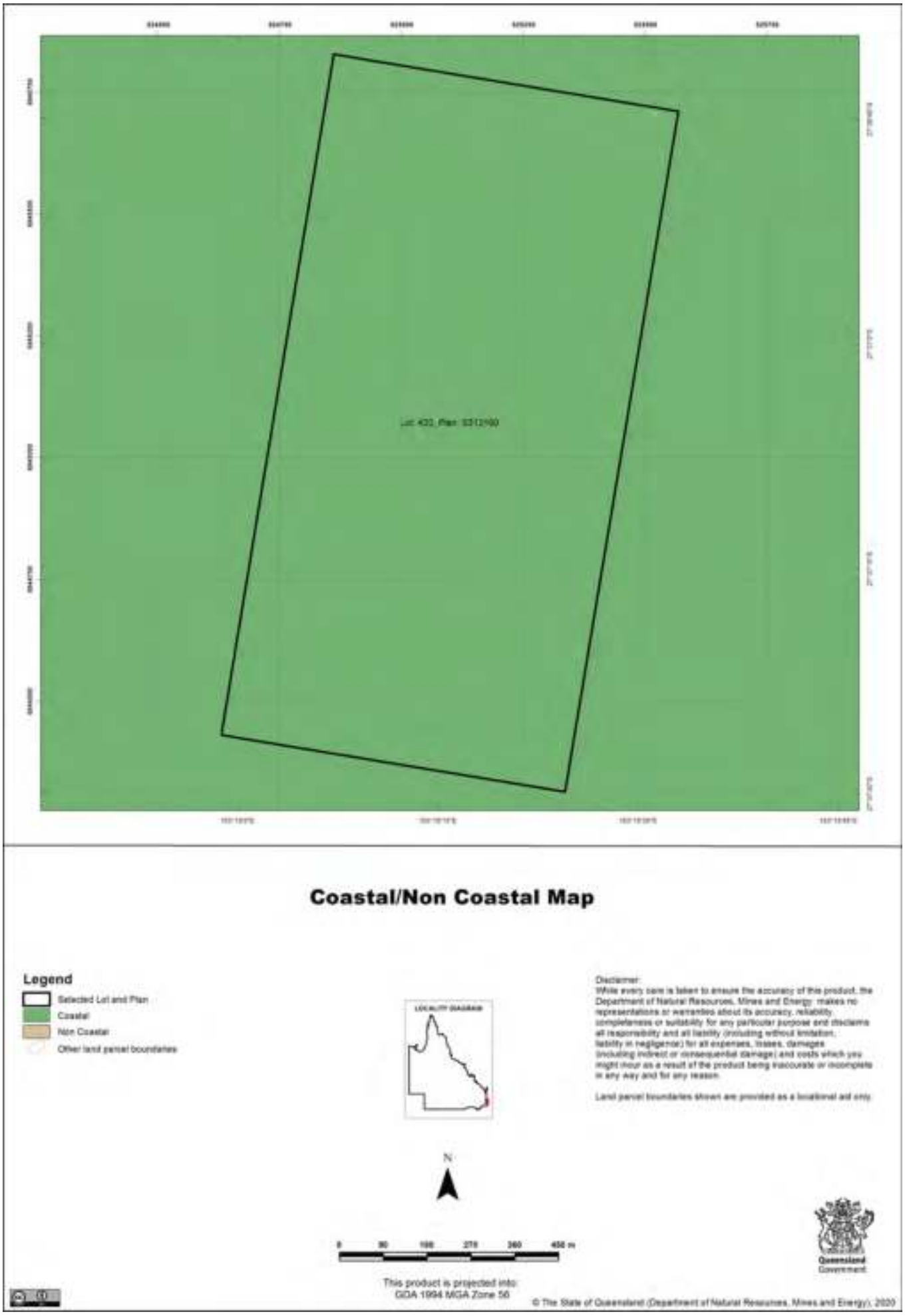
4.1 Regulated vegetation management map



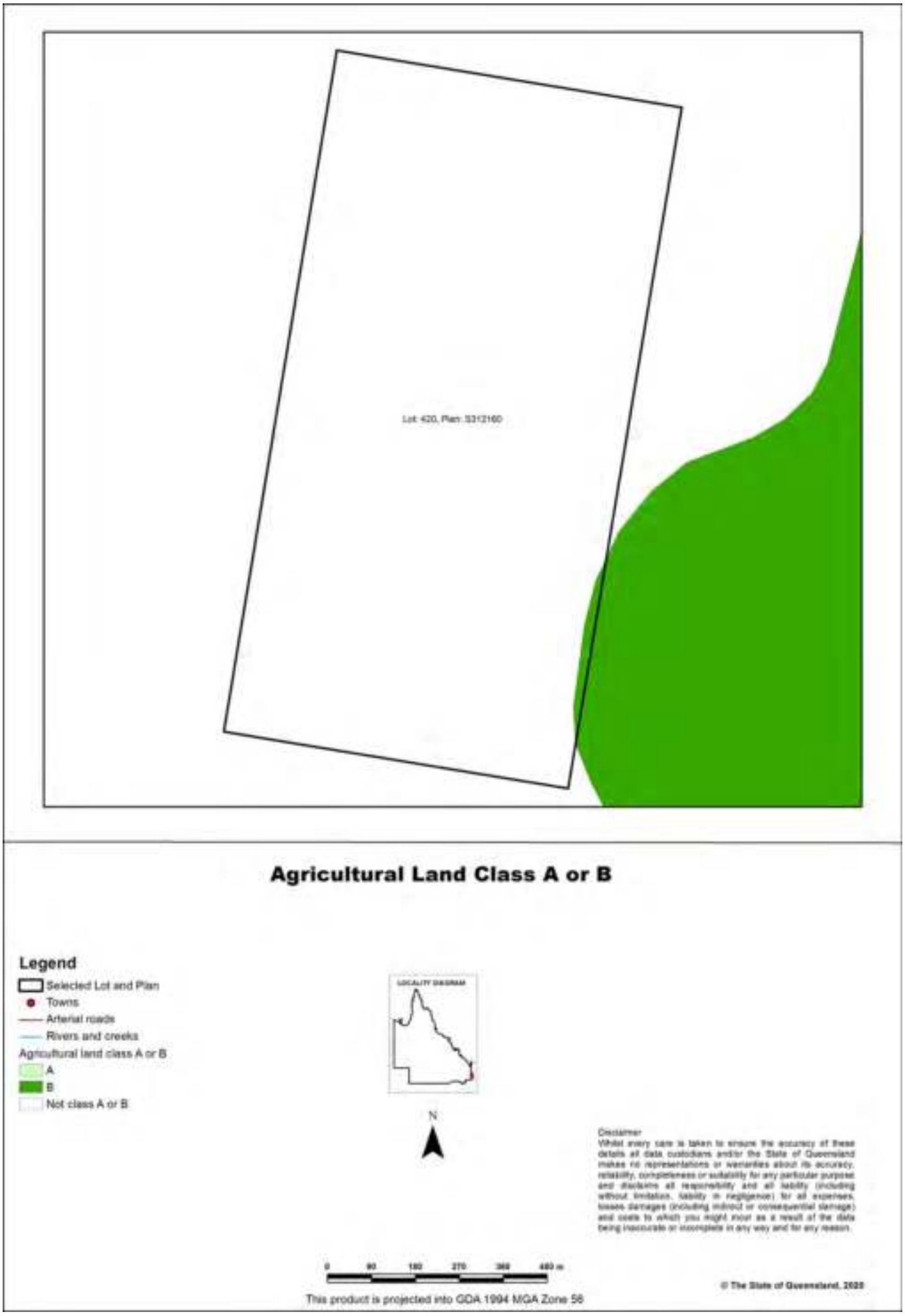
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B map



5. Protected plants framework (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for endangered, vulnerable or near threatened (EVNT) plants. These are areas where EVNT plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any EVNT plants that may be present in the clearing impact area.

If the flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the application form clearing permit.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DES

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

Legend

- Selected Lot and Plan
- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets



N

0 60 120 180 240 300 m

This product is projected into:
GDA 1994 MGA Zone 56

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@ehp.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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6. Koala protection framework (administered by the Department of Environment and Science (DES))

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.
Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley,

Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1) Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2) Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:
  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DES

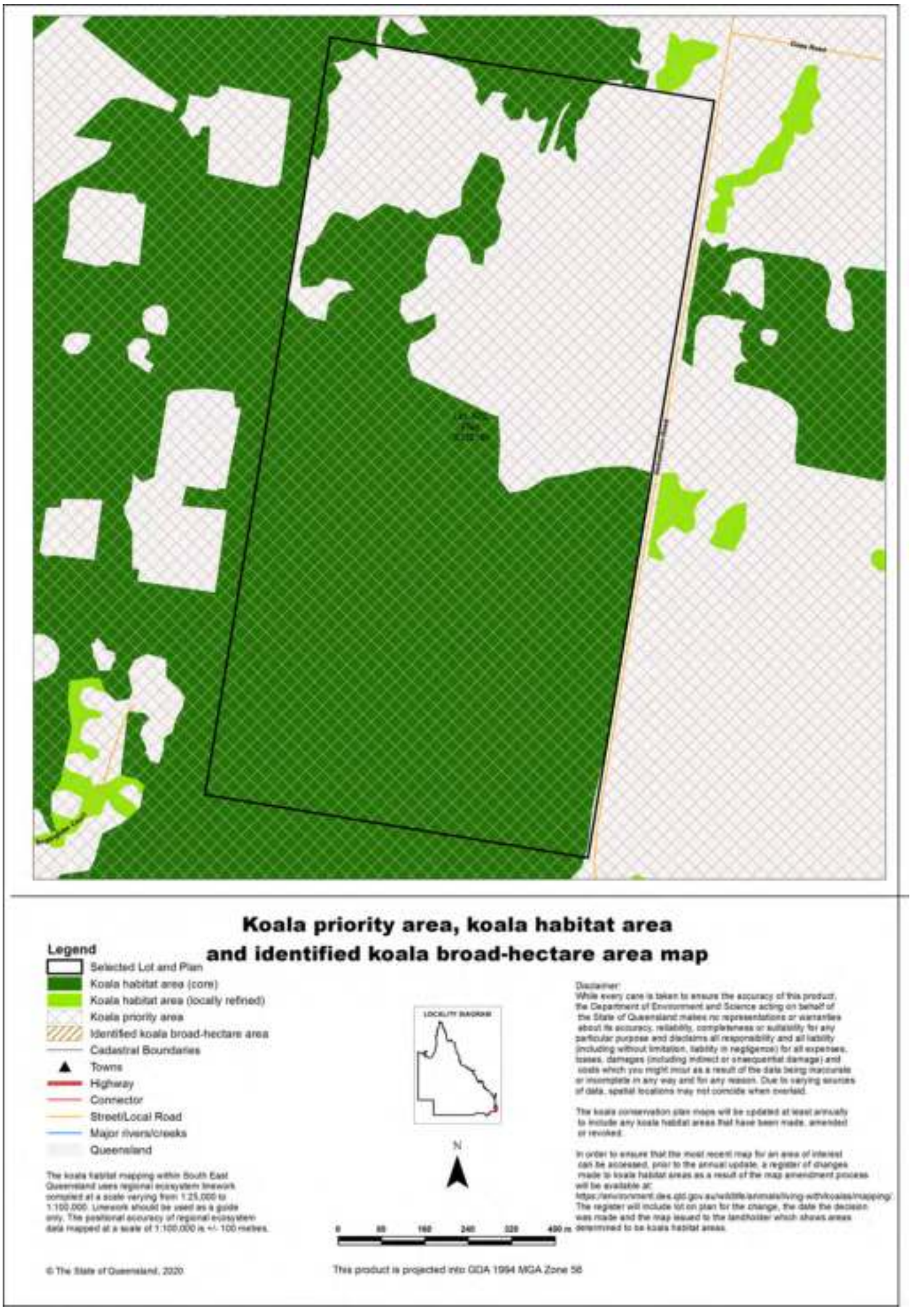
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@des.qld.gov.au
Visit https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 420 Plan: S312160

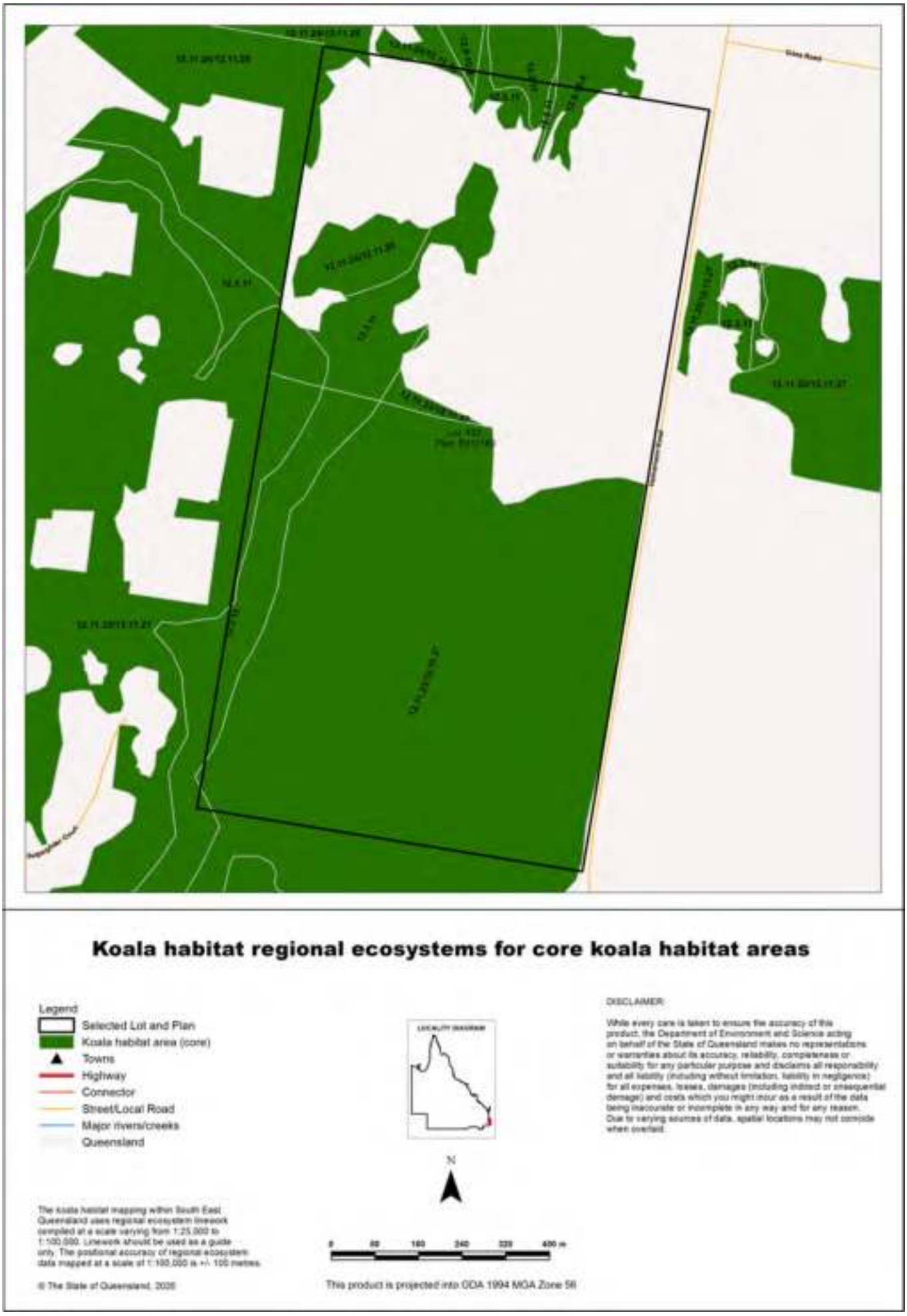
7.1 Koala districts

Koala District A

7.2 Koala priority area, koala habitat area and identified koala broad-hectare area map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	*Water Act 2000* *Soil Conservation Act 1986*	Department of Natural Resources, Mines and Energy (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues • Protected areas	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992* *Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities on State land tenures	*Fisheries Act 1994* *Forestry Act 1959*	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Treasury Department of State Development, Tourism and Innovation (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au www.statedevelopment.qld.gov.au
• Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Department of Local Government, Racing and Multicultural Affairs (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -27.6176
Longitude: 153.2545
Distance: 3
Email: agatha.dolan@cardno.com.au
Date submitted: Tuesday 17 Nov 2020 12:20:43
Date extracted: Tuesday 17 Nov 2020 12:30:02

The number of records retrieved = 263

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Rhinella marina*	cane toad	Y			7
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		1
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		1
animals	amphibians	Hylidae	*Litoria fallax*	eastern sedgefrog		C		6
animals	amphibians	Hylidae	*Litoria tyleri*	southern laughing treefrog		C		2
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		4
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		2
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		1
animals	amphibians	Myobatrachidae	*Pseudophryne coriacea*	red backed broodfrog		C		1
animals	amphibians	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog		C		2
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		1
animals	amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog		C		4
animals	birds	Acanthizidae	*Acanthiza nana*	yellow thornbill		C		1
animals	birds	Acanthizidae	*Acanthiza lineata*	striated thornbill		C		2
animals	birds	Acanthizidae	*Acanthiza pusilla*	brown thornbill		C		8
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		2
animals	birds	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren		C		9
animals	birds	Acanthizidae	*Sericornis magnirostra*	large-billed scrubwren		C		1
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		10
animals	birds	Accipitridae	*Circus assimilis*	spotted harrier		C		1
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		1
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		5
animals	birds	Accipitridae	*Aviceda subcristata*	Pacific baza		C		4
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		6
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		2
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		1
animals	birds	Accipitridae	*Accipiter novaehollandiae*	grey goshawk		C		1
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		4
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		2
animals	birds	Alcedinidae	*Ceyx azureus*	azure kingfisher		C		1
animals	birds	Anatidae	*Anas platyrhynchos*	northern mallard	Y			2
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		13
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		11
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		1
animals	birds	Anatidae	*Aythya australis*	hardhead		C		2
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		2
animals	birds	Anseranatidae	*Anseranas semipalmata*	magpie goose		C		3
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	3
animals	birds	Ardeidae	*Egretta garzetta*	little egret		C		4
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		8
animals	birds	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron		C		1
animals	birds	Ardeidae	*Ardea alba modesta*	eastern great egret		C		1
animals	birds	Ardeidae	*Bubulcus ibis*	cattle egret		C		8
animals	birds	Ardeidae	*Ardea intermedia*	intermediate egret		C		1
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		28
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		11

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		3
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		11
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		1
animals	birds	Cacatuidae	*Calyptorhynchus funereus*	yellow-tailed black-cockatoo		C		1
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		5
animals	birds	Cacatuidae	*Cacatua sanguinea*	little corella		C		2
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		5
animals	birds	Campephagidae	*Coracina tenuirostris*	cicadabird		C		4
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		1
animals	birds	Campephagidae	*Lalage leucomela*	varied triller		C		5
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		17
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		4
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		1
animals	birds	Charadriidae	*Vanellus miles*	masked lapwing		C		2
animals	birds	Cisticolidae	*Cisticola exilis*	golden-headed cisticola		C		7
animals	birds	Climacteridae	*Climacteris affinis*	white-browed treecreeper		C		2
animals	birds	Climacteridae	*Climacteris picumnus*	brown treecreeper		C		1
animals	birds	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper		C		2
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		3
animals	birds	Columbidae	*Streptopelia chinensis*	spotted dove	Y			5
animals	birds	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove		C		3
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		14
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		3
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		7
animals	birds	Columbidae	*Geopelia striata*	peaceful dove		C		9
animals	birds	Columbidae	*Columba livia*	rock dove	Y			3
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		5
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		16
animals	birds	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo		C		1
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		6
animals	birds	Cuculidae	*Eudynamys orientalis*	eastern koel		C		3
animals	birds	Cuculidae	*Centropus phasianinus*	pheasant coucal		C		7
animals	birds	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo		C		4
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		7
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		10
animals	birds	Estrildidae	*Neochmia temporalis*	red-browed finch		C		9
animals	birds	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		4
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		3
animals	birds	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar		C		3
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		1
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		1
animals	birds	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher		C		9
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		16
animals	birds	Halcyonidae	*Todiramphus macleayii*	forest kingfisher		C		5
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		5
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		10

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		1
animals	birds	Jacanidae	*Irediparra gallinacea*	comb-crested jacana		C		2
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		10
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		2
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		11
animals	birds	Megaluridae	*Megalurus timoriensis*	tawny grassbird		C		1
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		13
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		14
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		10
animals	birds	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird		C		1
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		13
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		4
animals	birds	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill		C		1
animals	birds	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater		C		1
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		9
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		4
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		11
animals	birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater		C		15
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		11
animals	birds	Monarchidae	*Monarcha melanopsis*	black-faced monarch		SL		4
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		6
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		12
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		2
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		8
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		4
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		8
animals	birds	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird		C		10
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		12
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		13
animals	birds	Pachycephalidae	*Pachycephala pectoralis*	golden whistler		C		7
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		12
animals	birds	Pardalotidae	*Pardalotus punctatus*	spotted pardalote		C		5
animals	birds	Passeridae	*Passer domesticus*	house sparrow	Y			2
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		1
animals	birds	Petroicidae	*Petroica rosea*	rose robin		C		4
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		12
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		2
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		1
animals	birds	Phasianidae	*Coturnix ypsilophora*	brown quail		C		4
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		6
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		4
animals	birds	Podicipedidae	*Poliocephalus poliocephalus*	hoary-headed grebe		C		1
animals	birds	Psittacidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)		C		3
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		15
animals	birds	Psittacidae	*Glossopsitta concinna*	musk lorikeet		C		1
animals	birds	Psittacidae	*Parvipsitta pusilla*	little lorikeet		C		6

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		11
animals	birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		12
animals	birds	Psophodidae	*Psophodes olivaceus*	eastern whipbird		C		8
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		4
animals	birds	Rallidae	*Gallirallus philippensis*	buff-banded rail		C		1
animals	birds	Rallidae	*Porphyrio melanotus*	purple swamphen		C		5
animals	birds	Rallidae	*Porzana pusilla*	Baillon's crake		C		1
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		7
animals	birds	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail		SL		4
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		11
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		9
animals	birds	Strigidae	*Ninox boobook*	southern boobook		C		3
animals	birds	Sturnidae	*Acridotheres tristis*	common myna	Y			2
animals	birds	Sturnidae	*Sturnus vulgaris*	common starling	Y			2
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		6
animals	birds	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill		C		1
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		6
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		1
animals	birds	Timaliidae	*Zosterops lateralis cornwalli*	silvereye (eastern)		C		1
animals	birds	Timaliidae	*Zosterops lateralis*	silvereye		C		14
animals	insects	Nymphalidae	*Danaus plexippus*	monarch	Y			1
animals	insects	Nymphalidae	*Euploea corinna*	common crow				1
animals	insects	Nymphalidae	*Hypocysta metirius*	brown ringlet				1
animals	insects	Nymphalidae	*Melanitis leda bankia*	evening brown				1
animals	malacostracans	Parastacidae	*Cherax depressus*					1
animals	mammals	Canidae	*Vulpes vulpes*	red fox	Y			3
animals	mammals	Dasyuridae	*Planigale maculata*	common planigale		C		2
animals	mammals	Dasyuridae	*Sminthopsis murina*	common dunnart		C		2
animals	mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)		C		3
animals	mammals	Felidae	*Felis catus*	cat	Y			3
animals	mammals	Leporidae	*Lepus europaeus*	European brown hare	Y			3
animals	mammals	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby		C		7
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		6
animals	mammals	Molossidae	*Mormopterus norfolkensis*	east coast freetail bat		C		2
animals	mammals	Molossidae	*Tadarida australis*	white-striped freetail bat		C		3
animals	mammals	Muridae	*Rattus lutreolus*	swamp rat		C		1
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		2
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			2
animals	mammals	Muridae	*Rattus rattus*	black rat	Y			2
animals	mammals	Peramelidae	*Perameles nasuta*	long-nosed bandicoot		C		1
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		5
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		C		2
animals	mammals	Petauridae	*Petaurus breviceps sensu lato*	sugar glider		C		4
animals	mammals	Petauridae	*Petaurus norfolcensis*	squirrel glider		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		6
animals	mammals	Phalangeridae	*Trichosurus caninus*	short-eared possum		C		5
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	483
animals	mammals	Pseudocheiridae	*Pseudocheirus peregrinus*	common ringtail possum		C		5
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		V	V	2
animals	mammals	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox		C	V	1
animals	mammals	Suidae	*Sus scrofa*	pig	Y			2
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		3
animals	mammals	Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat		C		1
animals	mammals	Vespertilionidae	*Myotis macropus*	large-footed myotis		C		1
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		1
animals	mammals	Vespertilionidae	*Chalinolobus morio*	chocolate wattled bat		C		1
animals	ray-finned fishes	Anguillidae	*Anguilla australis*	southern shortfin eel				1
animals	ray-finned fishes	Anguillidae	*Anguilla reinhardtii*	longfin eel				2
animals	ray-finned fishes	Eleotridae	*Hypseleotris compressa*	empire gudgeon				3
animals	ray-finned fishes	Eleotridae	*Hypseleotris galii*	firetail gudgeon				4
animals	ray-finned fishes	Plotosidae	*Tandanus tandanus*	freshwater catfish				1
animals	ray-finned fishes	Poeciliidae	*Gambusia holbrooki*	mosquitofish	Y			5
animals	ray-finned fishes	Poeciliidae	*Xiphophorus hellerii*	swordtail	Y			1
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		5
animals	reptiles	Agamidae	*Intellagama lesueurii*	eastern water dragon		C		4
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		3
animals	reptiles	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle		C		1
animals	reptiles	Colubridae	*Dendrelaphis punctulatus*	green tree snake		C		1
animals	reptiles	Diplodactylidae	*Nebulifera robusta*	robust velvet gecko		C		1
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		4/1
animals	reptiles	Elapidae	*Demansia psammophis*	yellow-faced whipsnake		C		3
animals	reptiles	Gekkonidae	*Gehyra dubia*	dubious dtella		C		1
animals	reptiles	Gekkonidae	*Hemidactylus frenatus*	house gecko	Y			2
animals	reptiles	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis		C		6
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		6
animals	reptiles	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink		C		3
animals	reptiles	Scincidae	*Lampropholis amicula*	friendly sunskink		C		2
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		1
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		10
animals	reptiles	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus		C		3
animals	reptiles	Scincidae	*Eulamprus quoyii*	eastern water skink		C		2
animals	reptiles	Scincidae	*Carlia vivax*	tussock rainbow-skink		C		3
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		2
animals	reptiles	Typhlopidae	*Anilios proximus*	proximus blind snake		C		1/1
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		5
fungi	Agaricomycetes	Agaricaceae	*Macrolepiota dolichaula*			C		1/1
fungi	Agaricomycetes	Amanitaceae	*Amanita*					1/1
fungi	Agaricomycetes	Boletaceae	*Tylopilus*					1/1
fungi	Agaricomycetes	Panaeolaceae	*Panaeolus sphinctrinus*			C		1/1
fungi	Agaricomycetes	Strophariaceae	*Psilocybe cubensis*			C		3/3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
fungi	arthoniomycetes	Opegraphaceae	*Dictyographa*					1/1
fungi	lecanoromycetes	Caliciaceae	*Buellia dissa*			C		1/1
fungi	lecanoromycetes	Candelariaceae	*Candelaria concolor*			C		1/1
fungi	lecanoromycetes	Cladoniaceae	*Cladonia rigida var. rigida*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema crinitum*			C		1/1
fungi	lecanoromycetes	Pertusariaceae	*Pertusaria thiospoda*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Heterodermia speciosa*			C		1/1
plants	land plants	Apocynaceae	*Marsdenia longiloba*			V	V	3
plants	land plants	Araliaceae	*Hydrocotyle paludosa*			C		1/1
plants	land plants	Aristolochiaceae	*Aristolochia meridionalis subsp. meridionalis*			C		1/1
plants	land plants	Asteraceae	*Acmella grandiflora var. brachyglossa*			C		1/1
plants	land plants	Asteraceae	*Senecio madagascariensis*	fireweed	Y			1/1
plants	land plants	Bignoniaceae	*Saritaea magnifica*		Y			1/1
plants	land plants	Calceolariaceae	*Calceolaria tripartita*	lady's slipper	Y			1/1
plants	land plants	Campanulaceae	*Lobelia stenophylla*			C		1/1
plants	land plants	Chenopodiaceae	*Einadia hastata*			C		2/2
plants	land plants	Cyperaceae	*Fuirena ciliaris*			C		1/1
plants	land plants	Cyperaceae	*Cyperus aquatilis*			C		2/2
plants	land plants	Cyperaceae	*Machaerina teretifolia*			C		1/1
plants	land plants	Dryopteridaceae	*Lastreopsis decomposita*	trim shield fern		C		1/1
plants	land plants	Hypopterygiaceae	*Hypopterygium tamarisci*			C		1/1
plants	land plants	Hypoxidaceae	*Hypoxis hygrometrica var. villosisepala*			C		1/1
plants	land plants	Juncaginaceae	*Cycnogeton multifructus*			C		1/1
plants	land plants	Mimosaceae	*Acacia fimbriata*	Brisbane golden wattle		C		2/2
plants	land plants	Myrtaceae	*Leptospermum juniperinum*	prickly tea-tree		C		1/1
plants	land plants	Myrtaceae	*Eucalyptus resinifera*	red mahogany		C		1/1
plants	land plants	Orchidaceae	*Spiranthes australis*			C		1/1
plants	land plants	Poaceae	*Steinchisma hians*		Y			1/1
plants	land plants	Poaceae	*Eragrostis elongata*			C		1/1
plants	land plants	Proteaceae	*Macadamia integrifolia*	macadamia nut		V	V	2/2
plants	land plants	Proteaceae	*Macadamia tetraphylla*			V	V	1/1
plants	land plants	Pteridaceae	*Pteris tremula*			C		1/1
plants	land plants	Schizaeaceae	*Schizaea bifida*	forked comb fern		C		1/1
plants	land plants	Solanaceae	*Solanum americanum*		Y			2/2
plants	land plants	Sparrmanniaceae	*Corchorus cunninghamii*			E	E	7/2

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

APPENDIX

C

FLORA AND FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT

Scientific Name	Common Name	Status		Source^	General habitat requirements	Are these requirements known or expected to be present on site?	Recorded on Wildlife online within 3km of site?	Is a suitable landzone present?	Are known or expected associated species present?	Likelihood of Occurrence of Suitable Habitat
		NC Act	EPBC Act							
Flora										
Arthraxon hispidus var. hispidus	Hairy-joint grass	C	V	PMST	Fringes of rainforest and wet Eucalypt forests.	Yes	No	Yes	Yes	Unlikely
Bosistoa transversa	Three-leaved bosistoa	C	V	PMST	Wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. Associated vegetation includes Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photiNophylla, Acmena ingens, Diploglottis australis and Diospyros mabacea.	Yes	No	Yes	Yes	Unlikely
Corchorus cunninghamii	Native jute	E	E	PMST	Ecotone of wet sclerophyll forest and dry to dry-subtropical rainforest (e.g. araucarian microphyll vine forest), and in Hoop Pine (Araucaria cunninghamii) plantations. It often occurs on hill crests, exposed slopes, ridges or upper slopes of hilly terrain on south or south-east aspect.	Possible	No	Yes	Yes	Possible
Endiandra floydii	Floyd's walnut	E	E	PMST	Found in warm-temperate and subtropical rainforest, from sea level to 430 m altitude.	No	No	Yes	No	Unlikely
Macadamia integrifolia	Macadamia nut	V	V	PMST	Remnant rainforest, preferring partially open areas such as rainforest edges. High nutrient alluvial and volcanic soils predominate often with considerable exposure of rock fragments or substrate, mostly basalt and diorite. The surface soils are uniformly dark, slightly acid (pH 5.5–6.5) and varying in texture from clayey-sand through various loams to silty-clay. All sites are well-drained, some excessively so.	No	Yes	Yes	No	Unlikely
Macadamia tetraphylla	Rough-shelled bush nut	V	V	WO	subtropical rainforest and complex Notophyll vineforest, at the margins of these forests and in mixed sclerophyll forest. It occurs in restricted habitat, growing on moderate to steep hillslopes on alluvial soils at well-drained sites.	Possible	Yes	Yes	Yes	Possible
Marsdenia longiloba	Slender marsdenia	V	V	WO	Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops. Associated species include Eucalyptus crebra, E. microcorys, E. acmeNoides, E. saligna, E. propinqua, Corymbia intermedia and Lophostemon confertus.Flowering occurs in summer.	Yes	Yes	Yes	Yes	Possible
Persicaria elatior	Knotweed	V	V	PMST	Grows in damp places, including coastal swampy area, along watercourses, streams and lakes, and swamp forest. May occurin disturbed areas.	Yes	No	Yes	Yes	Unlikely
Planchonella eerwah	Shiny-leaved condoo	E	E	PMST	Sub-tropical rainforest, dry rainforest, and hoop pine vine scrub. Populations known from Ipswich-Beaudesert, Beenleigh-Ormeau-Pimpama, and Nambour-Maleny.	No	No	Yes	No	Unlikely
Samadera bidwillii	Quassia	V	V	PMST	Occurs in lowland rainforest often with Araucaria cunninghamii or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland, it is commonly found in areas adjacent to both temporary and permanent watercourses up to 510 m altitude	No	No	Yes	Possible	Unlikely
Mammals										
Dasyurus maculatus maculatus	Spotted-tail quoll	V	E	PMST	Intact eucalypt forests and woodlands, coastal heathlands and rainforests.	Yes	No	Yes	Yes	Unlikely
Petauroides volans volans	Greater glider	V	V	PMST	Largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees	Yes	Yes	Yes	Yes	Possible
Phascolarctos cinereus	Koala	V	V	PMST	Eucalypt woodland, forest with an abundance of Food and shelter trees of the genus's Eucalyptus, Corymbia and Lophostemon.	Yes	Yes	Yes	Yes	Likely
Pteropus poliocephalus	Grey-headed flying fox	C	V	PMST	Suitable foraging resources and roosting sites are provided by a variety of forest types including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. The primary food source is blossom from Eucalyptus and related genera.	Yes	Yes	Yes	Yes	Likely
Tachyglossus aculeatus	Short-beaked echidna	SL	-	WO	May be found in most habitats.	Yes	No	Yes	Yes	Possible
Xeromys myoides	Water mouse	V	V	PMST	Mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands.	Possible	No	Yes	Yes	Unlikely
Amphibians										
Adelotus brevis	Tusked frog	V	-	WO	Rainforests, wet sclerophyll forests and open grasslands. Usually is found under logs, stones or leaf litter near puddles, creeks and ponds.	Yes	Yes	Yes	Yes	Likely
Birds										
Actitis hypoleucos	Common sandpiper	SL	Ma/Mi	PMST	Coastal and sometimes inland wetlands, around muddy margins or rocky shores. Found in estuaries, stream deltas, around lakes, pools, dams etc. Sometimes found in mangrove areas, in rocky and snag littered mud.	Possible	No	Yes	No	Unlikely
Anseranas semipalmata	Magpie goose	C	Ma/Mi	PMST	Found in open wetland areas such as floodplains and swamps.	0	No	Yes	Possible	Possible
Anthochaera phrygia	Regent Honeyeater	E	CE	PMST	The most fertile sites within dry box-ironbark eucalypt woodland and dry sclerophyll forest associations	Yes	No	Yes	Yes	Unlikely
Apus pacificus	Fork-tailed swift	SL	Ma/Mi	PMST	This species is an almost exclusively aerial species, flying from <1 m to >300 m above ground overflying a range of habitat types over inland plains but sometimes above foothills or in coastal areas. Likely roost aerially, but have been observed landing.	Possible	No	Yes	Yes	Possible
Ardea alba	Great egret	C	Ma/Mi	PMST	Found in a variety of wetland habitats, including inland to coastal, saline to freshwater, open to vegetated, and a range of sizes. Usually inhabits shallow waters.	Yes	No	Yes	Yes	Possible
Ardea ibis	Cattle egret	C	Ma/Mi	PMST	Found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor.	Yes	No	Yes	Yes	Possible
Botaurus poiciloptilus	Australasian Bittern	C	E	PMST	Freshwater wetlands with tall dense vegetation	Possible	No	No	Possible	Unlikely
Calidris acuminata	Sharp-tailed sandpiper	SL	Ma/Mi	PMST	Found on muddy edges of shallow wetlands, fresh or brackish, with sedges, grass, and saltmarsh vegetation present. For example, lakes, swamps, dams, saltpans, flooded paddocks, sheltered intertidal mudflats.	Possible	No	Possible	No	Unlikely
Calidris canutus	Red knot	E	E	PMST	Intertidal mudflats and sandflats, in estuaries, bays, inlets, and lagoon areas. Sometimes occur on terrestrial saline wetlands near the coast.	Possible	No	Possible	No	Unlikely

Scientific Name	Common Name	Status		Source^	General habitat requirements	Are these requirements known or expected to be present on site?	Recorded on Wildlife online within 3km of site?	Is a suitable landzone present?	Are known or expected associated species present?	Likelihood of Occurrence of Suitable Habitat
		NC Act	EPBC Act							
Calidris ferruginea	Curlew sandpiper	E	CE	PMST	Intertidal mudflats in sheltered coastal areas, including bays, inlets, estuaries and lagoons. Sometimes occur around non-tidal swamps, lakes or ponds near the coast, in fresh or brackish waters.	Possible	No	Possible	No	Unlikely
Calidris melanotos	Pectoral sandpiper	SL	Ma/Mi	PMST	Mostly found around shallow wetlands, fresh or saline, usually coastal. Prefers wetlands with open fringing mudflats and low vegetation. Forages in shallow water and soft mud.	Possible	No	Possible	No	Unlikely
Cuculus optatus	Oriental cuckoo	SL	Ma/Mi	PMST	Usually inhabits forest canopy, open wooded areas, hill country, coniferous forest, and sometimes above the tree line.	Yes	No	Yes	No	Unlikely
Erythrotriorchis radiatus	Red goshawk	E	V	PMST	Forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins.	Yes	No	Yes	Yes	Unlikely
Falco hypoleucos	Grey falcon	V	-	PMST	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	Yes	No	Yes	Yes	Unlikely
Gallinago hardwickii	Latham's snipe	SL	Ma/Mi	PMST	Found in wetlands up to 2000 m elevation, usually open freshwater with low dense vegetation, but also brackish and saline wetlands.	Possible	No	Possible	No	Unlikely
Haliaeetus leucogaster	White-bellied sea-eagle	C	Ma/Mi	PMST	Inhabits coastal areas, around terrestrial wetlands or near large open water bodies of water. Can occur inland or in proximity to the sea.	Yes	No	Yes	Yes	Possible
Hirundapus caudacutus	White-throated needle tail	SL	V	PMST	Almost exclusively aerial, up to heights of 1000 m. Mostly occur over open forest, rainforest, clearings, and sometimes below the canopy. Sometimes occur over sandy beaches and mudflats.	Possible	Yes	Yes	Yes	Possible
Lathamus discolor	Swift parrot	E	CE	PMST	A variety of woodlands with mature eucalypts, where nectar production is plentiful and reliable.	Yes	No	Yes	Yes	Unlikely
Merops ornatus	Rainbow beeater	C	Ma/Mi	PMST	Found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels.	Yes	Yes	Yes	Yes	Likely
Monarcha melanopsis	Black-faced monarch	SL	Ma/Mi	PMST	Found mostly in rainforest environments, sometimes in open eucalypt forests, mountain gullies, coastal foothills and scrub, and occasionally among mangroves.	Possible	Yes	Yes	Yes	Possible
Myiagra cyanoleuca	Satin flycatcher	SL	Ma/Mi	PMST	Mostly found in eucalypt forest, particularly wet sclerophyll forest.	Yes	No	Yes	Yes	Possible
Numenius madagascariensis	Eastern curlew	E	CE	PMST	Forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline.	No	No	No	No	Unlikely
Pandion haliaetus	Osprey	SL	Ma/Mi	PMST	Coastal and littoral habitats, mainly tropical and temperate terrestrial wetlands such as mangrove swamps, estuaries, rivers, lakes. Preference for coastal cliffs and elevated offshore islands. Forage in large areas of water (fresh, saline, or brackish).	Possible	No	Yes	Yes	Possible
Rhipidura rufifrons	Rufous fantail	SL	Ma/Mi	WO	Found mainly in wet sclerophyll forests, often in gullies, sometimes found in subtropical and temperate rainforest.	Yes	No	Yes	Yes	Possible
Rostratula australis	Australian painted snipe	V	E	PMST	Shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled.	Yes	No	Yes	Yes	Unlikely
Symposiachrus trivirgatus	Spectacled monarch	SL	Ma/Mi	PMST	Occurs mainly in rainforests within thick understorey, waterside vegetation, wet gullies, and mangroves.	Possible	No	Yes	No	Unlikely
Thinornis rubicollis rubicollis	Hooded plover	C	V	PMST	Sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding, much beachcast seaweed, and backed by sparsely vegetated sand-dunes for shelter and nesting. Occasionally found in tidal bays and estuaries.	No	No	No	No	Unlikely
Tringa nebularia	Common greenshank	SL	Ma/Mi	PMST	Found in sheltered coastal habitats and inland wetlands, with large mudflats, saltmarsh, mangroves, or seagrass. Can inhabit artificial wetlands such as flooded cropland and sewage farms, but mostly occur around rivers, estuaries, creeks, lakes.	No	No	Possible	Possible	Unlikely
Turnix melanogaster	Black breasted button-quail	V	V	PMST	Drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest and Araucarian Notophyll vine forest mostly in areas with 770-1200 mm rainfall per annum.	Possible	No	Yes	Yes	Unlikely

E = Endangered, V = Vulnerable under both NC Act and EPBC Act. CE = Critically Endangered under the EPBC Act. NT = Near Threatened; LC = Least Concern under the NC Act.
^WO = Wildlife Online; PMST= EPBC Protected Matters Report

APPENDIX

D

FLORA AND FAUNA SPECIES LIST

Class	Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status
Fauna					
amphibians	Limnodynastidae	*Limnodynastes peronii*	Striped marshfrog	C	-
amphibians	Myobatrachidae	*Pseudophryne raveni*	Copper backed broodfrog	C	-
amphibians	Bufonidae	*Rhinella marina*	Cane toad	-	-
amphibians	Myobatrachidae	*Uperoleia fusca*	Dusky gungan	C	-
birds	Meliphagidae	*Acanthorhynchus tenuirostris*	Eastern spinebill	C	-
birds	Ptilonorhynchidae	*Ailuroedus crassirostris*	Green catbird	C	-
birds	Anatidae	*Anas superciliosa*	Pacific black duck	C	-
birds	Accipitridae	*Aquila audax*	Wedge-tailed eagle	C	-
birds	Ardeidae	*Bubulcus ibis*	Cattle egret	C	-
birds	Cacatuidae	*Cacatua galerita*	Sulphur-crested cockatoo	C	-
birds	Cacatuidae	*Cacatua sanguinea*	Little corella	C	-
birds	Cuculidae	*Cacomantis flabelliformis*	Fan-tailed cuckoo	C	-
birds	Meliphagidae	*Caligavis chrysops*	Yellow-faced honeyeater	C	-
birds	Anatidae	*Chenonetta jubata*	Australian wood duck	C	-
birds	Pachycephalidae	*Colluricincla harmonica*	Grey shrike-thrush	C	-
birds	Campephagidae	*Coracina novaehollandiae*	Black-faced cuckoo-shrike	C	-
birds	Climacteridae	*Cormobates leucophaea metastasis*	White-throated treecreeper (southern)	C	-
birds	Corvidae	*Corvus coronoides*	Australian raven	C	-
birds	Corvidae	*Corvus orru*	Torresian crow	C	-
birds	Phasianidae	*Coturnix ypsilophora*	Brown quail	C	-
birds	Artamidae	*Cracticus nigrogularis*	Pied butcherbird	C	-
birds	Artamidae	*Cracticus torquatus*	Grey butcherbird	C	-
birds	Halcyonidae	*Dacelo novaeguineae*	Laughing kookaburra	C	-
birds	Dicruridae	*Dicrurus bracteatus bracteatus*	Spangled drongo (eastern Australia)	C	-
birds	Ardeidae	*Egretta novaehollandiae*	White-faced heron	C	-
birds	Meliphagidae	*Entomyzon cyanotis*	Blue-faced honeyeater	C	-
birds	Cacatuidae	*Eolophus roseicapilla*	Galah	C	-
birds	Petroicidae	*Eopsaltria australis*	Eastern yellow robin	C	-
birds	Cuculidae	*Eudynamys orientalis*	Eastern koel	C	-
birds	Columbidae	*Geopelia humeralis*	Bar-shouldered dove	C	-
birds	Columbidae	*Geopelia striata*	Peaceful dove	C	-
birds	Monarchidae	*Grallina cyanoleuca*	Magpie-lark	C	-
birds	Artamidae	*Gymnorhina tibicen*	Australian magpie	C	-
birds	Hirundinidae	*Hirundo neoxena*	Welcome swallow	C	-
birds	Maluridae	*Malurus lamberti*	Variegated fairy-wren	C	-
birds	Maluridae	*Malurus melanocephalus*	Red-backed fairy-wren	C	-
birds	Meliphagidae	*Manorina melanocephala*	Noisy miner	C	-
birds	Meliphagidae	*Manorina melanophrys*	Bell miner	C	-
birds	Meliphagidae	*Melithreptus albogularis*	White-throated honeyeater	C	-
birds	Meropidae	*Merops ornatus*	Rainbow bee-eater	C	-
birds	Meliphagidae	*Myzomela sanguinolenta*	Scarlet honeyeater	C	-
birds	Estrildidae	*Neochmia temporalis*	Red-browed finch	C	-
birds	Columbidae	*Ocyphaps lophotes*	Crested pigeon	C	-
birds	Pachycephalidae	*Pachycephala pectoralis youngi*	Golden whistler (south-eastern Australia)	C	-
birds	Pachycephalidae	*Pachycephala rufiventris*	Rufous whistler	C	-
birds	Pardalotidae	*Pardalotus striatus*	Striated pardalote	C	-
birds	Psittacidae	*Parvipsitta pusilla*	Little lorikeet	C	-
birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little black cormorant	C	-
birds	Columbidae	*Phaps chalcoptera*	Common bronzewing	C	-
birds	Meliphagidae	*Philemon corniculatus*	Noisy friarbird	C	-
birds	Meliphagidae	*Phylidonyris niger*	White-cheeked honeyeater	C	-
birds	Psittacidae	Platycercus adscitus palliceps	Pale-headed rosella (southern form)	C	-
birds	Podargidae	*Podargus strigoides*	Tawny frogmouth	C	-
birds	Psophodidae	*Psophodes olivaceus*	Eastern whipbird	C	-
birds	Rhipiduridae	*Rhipidura albiscapa*	Grey fantail	C	-
birds	Rhipiduridae	*Rhipidura leucophrys leucophrys*	Willie wagtail (southern)	C	-
birds	Estrildidae	*Taeniopygia bichenovii*	Double-barred finch	C	-
birds	Threskiornithidae	*Threskiornis spinicollis*	Straw-necked ibis	C	-
birds	Halcyonidae	*Todiramphus macleayii*	Forest kingfisher	C	-
birds	Psittacidae	*Trichoglossus chlorolepidotus*	Scaly-breasted lorikeet	C	-
birds	Psittacidae	*Trichoglossus haematodus moluccanus*	Rainbow lorikeet	C	-
birds	Charadriidae	*Vanellus miles novaehollandiae*	Masked lapwing (southern subspecies)	C	-
malacostracans	Parastacidae	*Cherax depressus*	Orange-fingered yabbie	-	-
mammals	Dasyuridae	*Antechinus flavipes flavipes*	Yellow-footed antechinus (south-east Queensland)	C	-
mammals	Bovidae	*Bos taurus*	European cattle	-	-
mammals	Canidae	*Canis lupus familiaris*	Dog	-	-
mammals	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C	-
mammals	Vespertilionidae	*Chalinolobus nigrogriseus*	Hoary wattled bat	C	-
mammals	Equidae	*Equus caballus*	Horse	-	-
mammals	Leporidae	*Lepus europaeus*	European brown hare	-	-
mammals	Macropodidae	*Macropus giganteus*	Eastern grey kangaroo	C	-

Class	Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status
Fauna					
mammals	Macropodidae	*Macropus parryi*	Whiptail wallaby	C	-
mammals	Macropodidae	*Macropus rufogriseus*	Red-necked wallaby	C	-
mammals	Miniopteridae	*Miniopterus australis*	Little bent-wing bat	C	-
mammals	Molossidae	*Mormopterus norfolkensis*	East coast freetail bat	C	-
mammals	Muridae	*Mus musculus*	House mouse	-	-
mammals	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat	C	-
mammals	Petauridae	*Petaurus breviceps*	Sugar glider	C	-
mammals	Phascolarctidae	*Phascolarctos cinereus*	Koala	V	V
mammals	Muridae	*Rattus norvegicus*	Brown rat	-	-
mammals	Muridae	*Rattus Rattus*	Black rat	-	-
mammals	Vespertilionidae	*Scotorepens sp. (Parnaby)*	Central-eastern broad-nosed bat	C	-
mammals	Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked echidna	SL	-
mammals	Molossidae	*Tadarida australis*	White-striped freetail bat	C	-
mammals	Phalangeridae	*Trichosurus vulpecula*	Common brushtail possum	C	-
mammals	Canidae	*Vulpes vulpes*	Red fox	-	-
mammals	Macropodidae	*Wallabia bicolor*	Swamp wallaby	C	-
ray-finned fishes	Poeciliidae	*Gambusia holbrooki*	Mosquitofish	-	-
ray-finned fishes	Eleotridae	*Hypseleotris galii*	Firetail gudgeon	-	-
reptiles	Scincidae	*Cryptoblepharus virgatus*	Striped snake-eyed skink	C	-
reptiles	Elapidae	*Demansia psammophis*	Yellow-faced whipsnake	C	-
reptiles	Agamidae	*Diporiphora australis*	Tommy roundhead	C	-
reptiles	Agamidae	*Intellagama lesueurii*	Eastern water dragon	C	-
reptiles	Agamidae	*Pogona barbata*	Bearded dragon	C	-
reptiles	Varanidae	*Varanus varius*	Lace monitor	C	-

Family	Scientific Name	Common Name	Status
Flora			
Mimosaceae	*Acacia disparrima subsp. disparrima*	Hickory Wattle	
Mimosaceae	*Acacia fimbriata*	Brisbane wattle	
Mimosaceae	*Acacia leiocalyx*	Early Black Wattle	
Mimosaceae	*Acacia maidenii*	Mainden's wattle	
Amaryllidaceae	*Agapanthus sp.*	Agapanthus	*
Asteraceae	*Ageratum houstonianum*	Billy goat weed	*
Casuarinaceae	*Allocasuarina littoralis*	Black she-oak	
Poaceae	*Alloteropsis semialata*	Cockatoo grass	
Rhamnaceae	*Alphitonia excelsa*	Soap tree	
Amaranthaceae	*Alternanthera brasiliana*	Purple joyweed	*
Amaranthaceae	*Alternanthera denticulata*	Lesser joyweed	
Myrtaceae	*Angophora leiocarpa*	Smooth-barked apple	
Basellaceae	*Anredera cordifolia*	Madeira vine	*R WONS
Araucariaceae	*Araucaria bidwillii*	Bunya pine	
Araucariaceae	*Araucaria cunninghamii*	Hoop pine	
Poaceae	*Aristida queenslandica*		
Poaceae	*Aristida warburgii*		
Apocynaceae	*Asclepias curassavica*	Bloodflower	*
Asparagaceae	*Asparagus aethiopicus*	Ground asparagus fern	*R WONS
Asteraceae	*Aster subulatus*	Wild aster	*
Poaceae	*Axonopus compressus*	Broadleaf carpet grass	*
Azollaceae	*Azolla pinnata*	Ferny azolla	
Proteaceae	*Banksia integrifolia*	Coastal banksia	
Cyperaceae	*Baumea articulata*	Jointed twig rush	
Blechnaceae	*Blechnum indicum*	Bungwall	
Acanthaceae	*Brunoniella australis*	Blue trumpet	
Crassulaceae	*Bryophyllum delagoense*	Mother-of-millions	*R
Crassulaceae	*Bryophyllum pinnatum*	Live leaf	*
Commelinaceae	*Callisia fragrans*	Fragrant itch plant	*
Dicksoniaceae	*Calochlaena dubia*	Rainbow fern	
Cannaceae	*Canna indica*	Arrowroot	*
Solanaceae	*Capsicum annuum var. glabriusculum*	Chilli	*
Brassicaceae	*Cardamine hirsuta*	Hairy bitter cress	*
Apocynaceae	*Catharanthus roseus*	Madagascar periwinkle	*
Apiaceae	*Centella asiatica*	Penny wort	
Fababceae	*Chamaecrista rotundifolia*	Round-leaf cassia	*
Adiantaceae	*Cheilanthes seberi*		
Asteraceae	*Chrysocephalum apiculatum*	Yellow buttons	
Lauraceae	*Cinnamomum camphora*	Camphor laurel	*R
Asteraceae	*Cirsium vulgare*	Spear thistle	*
Vitaceae	*Clematocisis opaca*	Pepper vine	
Araceae	*Colocasia esculenta*	Taro	*
Commelinaceae	*Commelina diffusa*	Wandering jew	*
Myrtaceae	*Corymbia intermedia*	Pink bloodwood	
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo	
Lythraceae	*Cuphea carthagenensis*	Colombian waxweed	*
Asteraceae	*Cyanthillium cinereum*	Purple fleabane	
Juncaginaceae	*Cycnogeton procerus*		
Orchidaceae	*Cymbidium suave*	Snake orchid	
Poaceae	*Cymbopogon refractus*	Barbed wire grass	
Poaceae	*Cynodon dactylon*	Bermuda grass	*
Cyperaceae	*Cyperus brevifolius*	Mullumbimby Couch	*
Cyperaceae	*Cyperus difformis*		

Family	Scientific Name	Common Name	Status
Flora			
Cyperaceae	*Cyperus exaltatus*		
Fabaceae	*Daviesia villifera*	Short-leaved bitter-pea	
Fabaceae	*Desmodium gunnii*	Slender tick-trefoil	
Fabaceae	*Desmodium rhytidophyllum*		
Hemerocallidaceae	*Dianella caeruellea*	Blue flax-lilly	
Hemerocallidaceae	*Dianella longifolia*	Blueberry Lily	
Poaceae	*Dichelachne micrantha*	Shorthair plumegrass	
Convolvulaceae	*Dichondra repens*	Creeping dichondra	
Iridaceae	*Dietes grandiflora*	Butterfly iris	*
Poaceae	*Digitaria parviflora*	Small-flowered finger grass	
Orchidaceae	*Dipodium punctatum*	Hyacinth-orchid	
Asparagaceae	*Dracaena fragrans*	Happy plant	*
Caryophyllaceae	*Drymaria cordata subsp. cordata*	Tropical chickweed	*
Verbenaceae	*Duranta erecta*	Duranta	*
Pontederiaceae	*Eichhornia crassipes*	Water hyacinth	*R WONS
Cyperaceae	*Eleocharis dulcis*	Water chestnut	
Asteraceae	*Emilia sonchifolia var. javanica*	Little Emily	*
Poaceae	*Entolasia stricta*	Wiry panic	
Poaceae	*Entolasia whiteana*		
Poaceae	*Eragrostis brownii*	Brown's Lovegrass	
Poaceae	*Eremochloa bimaculata*	Poverty grass	
Poaceae	*Eriachne pallescens*		
Myrtaceae	*Eucalyptus microcorys*	Tallowwood	
Myrtaceae	*Eucalyptus pilularis*	Blackbutt	
Myrtaceae	*Eucalyptus propinqua*	Small-fruited grey gum	
Myrtaceae	*Eucalyptus racemosa*	Scribbly gum	
Myrtaceae	*Eucalyptus resinifera*	Red mahogany	
Myrtaceae	*Eucalyptus seeana*	Fine-leaved red gum	
Myrtaceae	*Eucalyptus siderophloia*	Grey ironbark	
Myrtaceae	*Eucalyptus tereticornis*	Forest red gum	
Myrtaceae	*Eucalyptus tindaliae*	Queensland white mahogany	
Myrtaceae	*Eugenia uniflora*	Brazilian cherry	*
Laxmanniaceae	*Eustrephus latifolius*	Wombat berry	
Moraceae	*Ficus benjamina*	Weeping fig	#
Moraceae	*Ficus coronata*	Sandpaper fig	
Moraceae	*Ficus obliqua*	Small-leaved fig	
Rutaceae	*Flindersia australis*	Crow's ash	
Cyperaceae	*Gahnia aspera*	Sword sedge	
Hemerocallidaceae	*Geitonoplesium cymosum*	Srambling lily	
Phyllanthaceae	*Glochidion ferdinandi*	Cheese tree	
Fabaceae	*Glycine clandestina*		
Apocynaceae	*Gomphocarpus physocarpus*	Balloon cotton bush	*
Goodeniaceae	*Goodenia rotundifolia*		
Rubiaceae	*Gynochthodes jasminoides*	Sweet morinda	
Haloragaceae	*Haloragis heterophylla*	Rough raspwort	
Sapindaceae	*Harpullia pendulla*	Tulipwood	
Dilleniaceae	*Hibbertia stricta*		
Fababceae	*Hovea heterophylla*		
Violaceae	*Hybanthus stellarioides*	Spade flower	
Araliaceae	*Hydrocotyle tripartita*		
Clusiaceae	*Hypericum gramineum*	Native St Johns Wort	
Dennstaedtiaceae	*Hypolepis muelleri*	Harsh ground fern	
Poaceae	*Imperata cylindrica*	Blady grass	

Family	Scientific Name	Common Name	Status
Flora			
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda	*
Sapindaceae	*Jagera pseudorhus*	Foambark	
Juncaceae	*Juncus continuus*		
Juncaceae	*Juncus usitatus*		
Verbenaceae	*Lantana camara*	Lantana	*R WONS
Verbenaceae	*Lantana montevidensis*	Creeping lantana	*R
Poaceae	*Leersia hexandra*	Rice grass	
Cyperaceae	*Lepidosperma laterale*	Variable sword sedge	
Myrtaceae	*Leptospermum polygalifolium*	Wild may	
Ericaceae	*Leucopogon juniperinus*	Prickly beard-heath	
Lindsaeaceae	*Lindsaea ensifolia*		
Campanulaceae	*Lobelia purpurascens*	White root	
Campanulaceae	*Lobelia quadrangularis*		
Laxmanniaceae	*Lomandra confertifolia subsp. pallida*		
Laxmanniaceae	*Lomandra filiformis*	Wattle mat-rush	
Laxmanniaceae	*Lomandra laxa*		
Laxmanniaceae	*Lomandra longifolia*	Spiny-headed mat rush	
Laxmanniaceae	*Lomandra multiflora*	Many-flowered Mat-rush	
Myrtaceae	*Lophostemon confertus*	Brush box	
Myrtaceae	*Lophostemon suaveolens*	Swamp box	
Onagraceae	*Ludwigia octovalvis*	Willow primrose	
Onagraceae	*Ludwigia peploides*	Willow primrose	
Anacardiaceae	*Mangifera indica*	Mango	*
Apocynaceae	*Marsdenia rostrata*	Milk vine	
Myrtaceae	*Melaleuca linariifolia*	Flax-leaved paperbark	
Myrtaceae	*Melaleuca quinquenervia*	Paper-barker Tea-tree	
Meliaceae	*Melia azedarach*	White cedar	
Rutaceae	*Melicope elleryana*	Pink euodia	
Poaceae	*Melinis repens*	Natal red grass	*
Poaceae	*Microlaena stipoides*	Weeping grass	
Ericaceae	*Monotoca scoparia*		
Haloragaceae	*Myriophyllum gracile*		
Fabaceae	*Neonotonia wightii*	Glycine	*
Nephrolepidaceae	*Nephrolepis cordifolia*	Fishbone fern	#
Ochnaceae	*Ochna serrulata*	Ochna	*
Poaceae	*Oplismenus aemulus*	Australian basket grass	
Poaceae	*Ottochloa gracillima*		
Oxalidaceae	*Oxalis corniculata*	Yellow woodsorrel	*
Bignoniaceae	*Pandorea pandorana*	Wonga wonga vine	
Poaceae	*Panicum effusum*	Hairy panic	
Apocynaceae	*Parsonsia straminea*	Monkey rope vine	
Poaceae	*Paspalum scrobiculatum*	Ditch millet	
Passifloraceae	*Passiflora edulis*	Stinking passion fruit	*
Passifloraceae	*Passiflora suberosa*	Corky passion	*
Polygonaceae	*Persicaria strigosa*	Spotted knotweed	
Philydraceae	*Philydrum lanuginosum*	Woolly frog's mouth	
Phytolaccaceae	*Phytolacca octandra*	Ink weed	*
Thymeleaceae	*Pimelea linifolia*	Rice flower	
Pittosporaceae	*Pittosporum multiflorum*	Orange thorn	
Plantaginaceae	*Plantago debilis*		
Polygalaceae	*Polygala paniculata*		*
Rubiaceae	*Pomax umbellata*		
Acanthaceae	*Pseuderanthemum variabile*	Pastel flower	

Family	Scientific Name	Common Name	Status
Flora			
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	
Petiveriaceae	*Rivina humilis*	Coral berry	*
Dracaenaceae	*Sansevieria trifasciata*	Mother in laws tongue	*
Araliaceae	*Schefflera actinophylla*	Queensland umbrella tree	#
Cyperaceae	*Schoenoplectus validus*	River club rush	
Plantaginaceae	*Scoparia dulcis*	Sweet broom	*
Asteraceae	*Senecio macroglossus*	Wax ivy	*
Asteraceae	*Senecio madagascariensis*	Fireweed	*R WONS
Caesalpiniaceae	*Senna pendula var. glabrata*	Easter cassia	*
Poaceae	*Setaria sphacelata*	Pigeon grass	*
Malvaceae	*Sida cordifolia*	Flannel weed	*
Solonaceae	*Solanum capsicoides*	Devil's apple	*
Solanaceae	*Solanum chrysotrichum*	Devil's fig	*
Solanaceae	*Solanum mauritianum*	Wild tobacco	*
Solanaceae	*Solanum nigrum*	Blackberry nightshade	*
Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	*
Solanaceae	*Solanum stelligerum*	Devil's needles	
Solanaceae	*Solanum torvum*	Devil's fig	*
Asteraceae	*Sonchus asper*	Prickly sowthistle	
Asteraceae	*Sonchus oleraceus*	Common sow thistle	*
Asteraceae	*Sphagneticola trilobata*	Singapore daisy	*R
Araceae	*Spirodela oligorrhiza*	Duck weed	
Araceae	*Spirodela punctata*		
Poaceae	*Sporobolus pyramidalis*	Giant rat's tail grass	*R
Menispermaceae	*Stephania japonica*	Tape vine	
Arecaceae	*Syagrus romanzoffiana*	Cocos palm	*
Araceae	*Syngonium podophyllum*	Arrowhead vine	*
Asteraceae	*Tagetes minuta*	Stinking roger	*
Bignoniaceae	*Tecoma stans*	Yellow bells	*R
Commelinaceae	*Tradescantia fluminensis*	Spiderwort	*
Johnsoniaceae	*Tricoryne elatior*	Yellow autumn-lily	
Malvaceae	*Urena lobata*	Urena burr	*
Goodeniaceae	*Velleia spathulata*	Wild pansies	
Plantaginaceae	*Veronica plebeia*	Trailing speedwell	
Violaceae	*Viola hederacea*	Australian native violet	
Campanulaceae	*Wahlenbergia gracilis*	Australian blue-bell	
Xanthorrhoeaceae	*Xanthorrhoea johnsonii*	Johnson's grass tree	
Xanthorrhoeaceae	*Xanthorrhoea macronema*		
Agavaceae	*Yucca aloifolia*	Yucca	*

* = Exotic; R= Category 3 Restricted Matter under the Biosecurty Act 2014; WONS = Weed of National Significance; # = Native species out of range

APPENDIX

E

QUATERNARY DATA

Site Number	T1 - Species	T1 - Height (m)	T2 - Species	T2 - Height (m)	Shrub - Species	Shrub - Height (m)	Ground Layer - Species	Date	x	y
1	*Eucalyptus racemosa* *Corymbia intermedia*	20	*Melaleuca quinquenervia*	15	Absent		*Imperata cylindrica* *Lomandra longifolia*	7/06/2019 0:25	153.2566695	-27.61206763
2	*Eucalyptus tereticornis* *Melaleuca quinqueneria*	18	*Ficus obliqua*	3	Absent		*Axonopus compressus*	7/06/2019 1:07	153.2556119	-27.61201038
3	*Melaleuca quinquenervia* *Lophostemon suaveleons*	18	*Melaleuca quinquenervia*	10	*Solanum torvum*	3	*Juncus spp*	7/06/2019 1:21	153.2543122	-27.61431692
4	*Melaleuca quinquenervia*	10	Absent		*Solanum stilligerum*	1.5	*Ottochloa gracillima*	7/06/2019 1:51	153.2527108	-27.61491471
5	*Eucalyptus sideropholia* *Eucalyptus tereticornis* *Eucalyptus pillularis*	25	*Melaleuca quinquenervia* *Lophostemon suaveleons*	15	*Solanum torvum*	1.5	*Imperata cylindrica*	7/06/2019 2:03	153.2524056	-27.61618386
6	*Eucalyptus pillularis* *Lophostemon confertus*	18	*Eucalyptus racemosa* *Eucalyptus carnea*	10	*Acacia disparrima*	2	*Lomandra filiformis*	7/06/2019 4:04	153.2539846	-27.62313451
7	*Eucalyptus pillularis* *Eucalyptus resinifera* *Eucalyptus propinqua*	20	*Lophostemon suaveleons* *Melaleuca quinquenervia*	8	Absent		*Entolasia stricta*	7/06/2019 4:42	153.2541149	-27.61881951
8	*Melaleuca quinquenervia* *Eucalyptus sideropholia* *Lophostemon suaveleons* *Eucalyptus tereticornis*	20	*Allocasuarina littoralis*	15	*Lophostemon suaveleons*	1.5	*Entolasia stricta*	7/06/2019 4:56	153.252193	-27.61765836

APPENDIX

F

EPBC ACT SELF-ASSESSMENT

1 Introduction

Cardno was commissioned by Redland City Council to undertake a Significant Impact Assessment for those Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) likely to be impacted by the proposed Redland Coast Regional Sports and Recreation Precinct.

1.1 Proposed works

Redland City Council is seeking to attain environmental approvals for the Redlands Sport and Recreational Precinct (the Precinct) as part of the master planned development (the Project) of the property located at 277-293 Heinemann Road, Mount Cotton, also described as Lot 420 on S312160 (the Site). The purpose of the Precinct will be to service the current and future sports and recreation needs of the city and to enhance environmental values (refer to the extract of the Master Plan Concept Design in **Attachment A)**.

The Site is approximately 101 hectares (ha) and is within the Rural zone in accordance with the Redland *City Plan 2018*. Presently, the northern extent of the Site is degraded as a result of ongoing agricultural use and historical clearing. The southern portion of the Site, though subject to historic logging as evidenced by cut stumps throughout, is heavily vegetated. The northern portion of the site is proposed for use as the Precinct, while the southern extent, which includes approximately 52 ha is proposed to be retained and enhanced as a conservation reserve.

The project design aims to minimise environmental impacts by utilising areas that have been historically cleared and avoiding impacts on remnant vegetation, high value regrowth and waterways. Additionally, previously cleared areas and waterways will be rehabilitated as part of ecological restoration activities. A project-specific Construction Environmental Management Plan (CEMP) will be prepared for the works and will outline construction methodology and mitigation measures to be implemented to minimise impacts on MNES.

1.2 What is significant?

As per the Matters of National Environmental Significance Significant Impact Guidelines 1.1 (the Guidelines) *Environment Protection and Biodiversity Conservation Act 1999*,

> "*A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts...*"

With respect to the project, the works involve clearing native vegetation that contain threatened fauna species including (*Phascolarctos cinereus*) Koalas and (*Pteropus poliocephalus*) Grey headed flying-fox.

2 Methodology

2.1.1 Desktop Assessment

Prior to undertaking the Significant Impact Self-assessment the EPBC Act Protected Matters Search Tool (PMST) was reviewed for the Project footprint and a 3 km buffer to determine the range of MNES that may occur in the broader Project locality. It is relevant to note that the PMST is a predictive tool only and does not necessarily mean that all listed species are present. Consequently, a desktop likelihood of occurrence assessment for those species identified by the PMST as 'known' or 'likely' to occur in the search area was completed. The PMST is enclosed as **Attachment B** and the results of the likelihood of occurrence assessment as **Attachment C**.

The process of refining the list of species to be targeted during the field and the subsequent EPBC Act Self-assessment involved reviewing the known and specific habitat requirements for each species against the known or expected availability of such resources in the Project area and immediate surroundings. For each of the identified species an assessment of the likelihood of occurrence was undertaken with each species being assigned to one of the following categories:

- **Known**: The species has been positively recorded in the Project area by a qualified ecologist during the past 30 years.
- **Likely**: Suitable habitat for the species occurs in the Project area and proximate records[1] exist.
- **Possible**: Suitable habitat for the species occurs in the Project area but no recent records from the Project area or proximate areas exist OR suitable habitat for the species may not occur in the Project area but recent records from proximate areas exist.
- **Unlikely**: Suitable habitat for the species does not occur in the Project area, and no recent records from the within the Project area or proximate areas exist.

2.1.2 Field Assessment

Field assessments were undertaken as follows:

- One day and one night survey during Winter (2020);
- Three days and three nights during a 28-day survey period in spring (2020); and
- Five days and four nights during a 14-day survey period in winter (2019).

The field assessments were completed by suitably qualified Cardno Ecologists and based on the results of the likelihood of occurrence assessment the target species were Koala and Grey headed flying-fox.

The field assessment methodology included the survey techniques shown in **Table 2-1**.

Table 2-1 Survey techniques for Koala

Survey Technique	Cardno (2019)	Current study (2020)
Koala		
Koala Rapid Assessment Methodology (KRAM)	Six KRAM transects throughout the Site.	-
Incidental diurnal survey observations	Searches for signs of Koalas including scathes and scats over four days.	Searches for signs of Koalas including scathes and scats over three days.
Call playback and spotlighting	Four nights of call playback for Koala.	Three nights of call playback for Koala.
Potential detection via camera traps	20 traps were deployed for a two-week period.	20 traps were deployed for a four-week period.

[1] Proximate records are highly reliable records (i.e. identified through GPS precision or an accurate location description) that fall within the search area that are <50years in age.

Survey Technique	Cardno (2019)	Current study (2020)
Opportunistic assessment for scats and scratches, the locations of scats were recorded by handheld GPS where detected	Searches of scats and scratches were completed at opportunistic locations over four days.	Searches of scats and scratches were completed at opportunistic locations over three days.
Grey headed flying fox		
Spotlighting	Over four nights.	Over three nights.
Opportunistic nocturnal searches	Searches for signs of wildlife including roosts and scats over four days.	Searches for signs of wildlife including roosts and scats over three days.

3 Significant Impact Self-assessment

A self-assessment of the likelihood for the Precinct to have a significant impact on those MNES identified in the protected matters search tool and assessed as 'Known' or 'Likely' to occur within the project area is provided below.

The significant impact criteria below have been extracted from the Guidelines and have been used to complete the MNES significant impact self-assessments for the Project.

3.1.1 Threatened Species

3.1.1.1 Vulnerable Species – Significant Impact Assessment

Suitable habitat for two vulnerable species has potential to occur within the project footprint, these fauna species are the Koala and Grey headed flying fox. Due to more extensive material required to make a determination of significant impact with respect to the Koala, this has been addressed separately in **Section** Error! Reference source not found..

Table 3-1 Significant Impact Assessment: Grey headed flying fox

Species	**(*Pteropus poliocephalus*) Grey-headed flying-fox**
Status	**Vulnerable**
The Grey headed flying-fox (GHFF) was assessed as 'likely' to occur within the project footprint. However, Wildlife online and ALA records display only one record of the species within 5 km of the locality, dated 1993. Notwithstanding, GFHH were not recorded during the field assessments. The Project footprint may impact 6.3 ha of foraging habitat for this species.	
Significant Impact Assessment	
The following Significant Impact Assessment has been prepared based on the significant impact criteria for Vulnerable species as per the Guidelines.	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will	
▪ *lead to a long-term decrease in the size of an important population[2] of a species;*	
No roosts occur within the Site. A review of the National Flying-fox monitoring viewer (DoEE, 2012) illustrates that there are no nationally important flying-fox camps within the Site. Approximately 5km from the Study Area at Weinnam Creek wetlands there is a flying-fox camp (camp number 431) that contains GHFF which may forage within the Site. Habitat for the species is well represented within the broader Site and surrounding bushland. The Project footprint may impact 6.3 ha of foraging habitat for this species and may reduce the availability of flowering resources for GHFF populations. The Project is unlikely to lead to a long-term decrease in the size of an important population.	
▪ *reduce the area of occupancy of an important population;*	
Based on the Master Plan Concept Design, the Precinct impacts an estimated 25.7 ha of grazed paddocks and Eucalypt woodland. The clearing of foraging resources for GHFF will be minimised as far as practically possible and the Project includes ecological restoration of approximately 6 ha. The Project is unlikely to reduce the occupancy of an important population.	
▪ *fragment an existing important population into two or more populations;*	
The Project is unlikely to fragment an existing important population into two or more populations. No important populations of the species are known to occur within the Site. Habitat for this species including flowering trees will be retained as far as practicable. Additionally, the project will retain and conserve ~52ha of remnant vegetation for conservation and recreation purposes. The Project fragment an existing important population into two or more populations	
▪ *adversely affect habitat critical to the survival of a species;*	
Habitat for the GHFF includes urban areas, forests, woodlands and intertidal mangroves. At night GHFF search for food and may travel up to 50 km to feeding areas. Their diet consists of native and exotic fruits	

[2] An important population for a Vulnerable species includes populations identified as such in recovery plans, and/or that are:
- > key source populations either for breeding or dispersal
- > populations that are necessary for maintaining genetic diversity, and/or
- > populations that are near the limit of the species range

Species	(*Pteropus poliocephalus*) Grey-headed flying-fox
	including figs and nectar and pollen from native trees. No GHFF roosts were located within or adjoining the Site. The Project is considered unlikely to adversely affect habitat critical to the survival of a species as the project footprint does not contain habitat critical to the survival of this species.
	▪ *disrupt the breeding cycle of an important population;*
	The Project is unlikely to disrupt the breeding cycle of an important population, given that no roosts are located within the Site.
	▪ *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;*
	The Project impact area will be limited to the northern extent of the Site where on-going agricultural use and historically clearing have degraded the habitat value. The southern extent of the Site, includes ~52ha of remnant vegetation will be retained as part of the Project. As such, the action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	▪ *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;*
	The Project will have a site-specific CEMP which will include weed pest animal management. The Project is unlikely to result in invasive species that are harmful to GHFF becoming established in this species' habitat.
	▪ *introduce disease that may cause the species to decline; or*
	The Project is unlikely to introduce disease that may cause the species to decline. The relocation of fauna species with the potential to introduce disease to within the Site is not proposed.
	▪ *interfere substantially with the recovery of the species.*
	The Project is unlikely to interfere substantially with the recovery of the species.
Conclusion	
	It is considered unlikely the project will result in a significant impact to this species.
References	
	DoEE (2012) *National Flying-fox monitoring viewer*, Department of the Environment, Canberra.

4 Koala

The Koala (*Phascolarctos cinereus*) is a species with wide distribution and whose Significant Impact Assessment requires consideration of important requirements to determine whether a proposal is likely to result in significant impacts on the species with subsequent submission of a referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE).

The following sections assess key important requirements to undertake Significant Impact Assessment for the Koala based on the DoE (2014) *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (hereafter referred to as the 'koala referral guidelines').

The significant impact assessment for Koala detailed in Error! Reference source not found..

Table 4-1 Significant Impact Assessment: Koala (*Phascolarctos cinereus*)

Species	**Koala (*Phascolarctos cinereus*)**
Status	**Vulnerable**
Koala (*Phascolarctos cinereus*) is considered as 'known' to occur in the project footprint based on the presence of suitable habitat for the species and the evidence of Koala presence recorded during the field assessments. The Wildlife Online search outlines 481 records of Koalas within 3 kilometres of the project footprint. A detailed assessment of Koala in accordance with the Significant Impact Guidelines for Koala is provided in **Table 4-2** and **Table 4-3**.	
Significant Impact Assessment	
The following Significant Impact Assessment has been prepared based on the significant impact criteria for Vulnerable species as per the Guidelines.	
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will	
▪ *lead to a long-term decrease in the size of an important population[3] of a species;*	
The Site is known to support a population of Koala. The Project requires clearing of Koala food trees in an area mapped within the Priority koala Areas as containing areas of Core Koala Habitat and Locally Refined Koala Habitat Area. The Site adjoins the Biodiversity Planning Assessment terrestrial corridor and is located within an established local ecological corridor (RCC, 2018). The Project covers an estimated 25.7 ha of grazed paddocks and Eucalypt woodland. The area of paddocks and vegetation supporting Koala habitat tree areas and Koala movement opportunities to be impacted by the project area is approximately 6.3 ha and 19.4 ha, respectively (refer to **Plate 1** and **2** below). Additionally, the project includes the restoration of approximately 6 ha of degraded grazing land. It is not anticipated that the Project will lead to the long-term decrease in an important Koala population.	
▪ *reduce the area of occupancy of an important population;*	
The Project may reduce the area of occupancy of an important population of the koala. The Project will require clearing within the following Regional Ecosystems (RE): ▪ Least Concern RE 12.9-10.4; ▪ Of Concern RE 12.3.11; and ▪ Of Concern RE 12.11.24/12.11.25. The abovementioned REs are considered mandatory essential habitat factors for Koalas. As also noted previously, areas mapped within the Priority koala Areas as containing areas of Core Koala Habitat and Locally Refined Koala Habitat Area will be impacted by the Project.	
▪ *fragment an existing important population into two or more populations;*	
The Project is located in an area which has been subject to historical clearing and grazing, however the area is a Eucalypt woodland and contains significant Koala habitat. The Project is unlikely to fragment an existing important population into two or more populations as the Project will retain and enhance the central waterway corridor within the northern portion of the Site.	
▪ *adversely affect habitat critical to the survival of a species;*	

[3] An important population for a Vulnerable species include, populations identified as such in recovery plans, and/or that are:
- > key source populations either for breeding or dispersal
- > populations that are necessary for maintaining genetic diversity, and/or
- > populations that are near the limit of the species range

Species	Koala (*Phascolarctos cinereus*)
	The Project requires clearing of an estimated 6.3 ha of koala habitat and as such, the Project is unlikely to adversely affect habitat critical to the survival of the Koala.
	▪ *disrupt the breeding cycle of an important population;*
	The breeding cycle of the Koala is approximately August to February and is a period of increased movement for Koalas. Provided works could be undertaken in periods outside of the recognised breeding period it is unlikely that the breeding cycle of the Koala would be significantly disrupted.
	▪ *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;*
	The Project does not fragment or isolate vegetation patches, and the project will retain the local waterway corridor within the central northern portion of the Site. The watery corridors will be retained and enhanced through ecological restoration to ensure the Project does not isolate Koala populations.
	▪ *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;*
	The Project is unlikely to result in invasive species that are harmful to koala becoming established in this species' habitat. It is considered unlikely the proposed project will result in an increase in dogs or other feral predators, however due to the proposed increase in recreation use in the area, there may be an increase in domesticated dogs occupying walking trails. The risk of domestic dogs will be minimised by establishing the Precinct as an on-leash-on. The project-specific CEMP will incorporate measures for pest and waste management to ensure construction does not indirectly impact this species through increase in invasive species.
	▪ *introduce disease that may cause the species to decline; or*
	The Project is unlikely to introduce disease that may cause the species to decline. No relocations of fauna species with the potential to introduce disease to within the project footprint are proposed, and the works are unlikely to increase or facilitate spread of any diseases and the works are unlikely to increase or facilitate spread of any diseases such as chlamydia.
	▪ *interfere substantially with the recovery of the species.*
	The Project is unlikely to interfere substantially with the recovery of Koala.
Conclusion	
	The Project is unlikely to have a significant impact on Koala.
References	
	RCC (2018) *Wildlife Connections Plan 2018 – 2028*. Redlands City Council. DAWE (2020) SPRAT Profile: *Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT) – Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory). Commonwealth Department of Agriculture, Water and the Environment. On-line profile accessed via: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=85104



Plate 1: Koala habitat tree area (green)



Plate 2: Koala movement opportunity area (red)

4.2 Habitat Critical for the survival of the species

The Koala Habitat Assessment Tool (Table 4 of the koala referral guidelines) has been used to determine whether the project footprint supports habitat critical to the survival of the koala. The results of this analysis are presented in **Table 4-2** below.

Table 4-2 Koala habitat assessment tool

Attribute	Score	Coastal	Comment
Koala occurrence	**+2 (high)**	**Evidence of one or more koalas within the last 2 years.**	A number of direct and indirect observations of Koala were made during the field assessments. Two Koalas were recorded on the camera traps within the Site and scats were encountered during KRAMs and opportunistic searches. Wildlife online and ALA recorded 481 Koalas within a 3 kilometres radius of the Site. **Score:+ 2**
	+1 (medium)	Evidence of one or more koalas within 2 km of the edge of the impact area within the last 5 years.	
	0 (low)	None of the above.	
Vegetation composition	**+2 (high)**	**Has forest, woodland or shrubland with emerging trees with 2 or more known koala food tree species, OR** **1 food tree species that alone accounts for >50% of the vegetation in the relevant strata.**	Vegetation within the project footprint includes forest and woodland that supports a number of Koala food trees including: ▪ *Eucalyptus tereticornis* ▪ *E racemosa* ▪ *E seeana* ▪ *E propinqua* ▪ *E siderophloia* ▪ *E tindaliae* ▪ *E pilularis* ▪ *Corymbia intermedia* ▪ *Lophostemon confertus* ▪ *L suaveolens* **Score: +2**
	+1 (medium)	Has forest, woodland or shrubland with emerging trees with only 1 species of known koala food tree present.	
	0 (low)	None of the above.	
Habitat connectivity	+2 (high)	Area is part of a contiguous landscape ≥ 500 ha.	The project in within a local corridor that extends north to the Sandy Creek conservation area and south-east towards Days Road Conversation Area, however barriers to fauna movement are present including Heinemann Road, German Church Road roundabout and Double Jump Road. **Score: 0**
	+1 (medium)	Area is part of a contiguous landscape < 500 ha, but ≥ 300 ha.	
	0 (low)	**None of the above.**	
Key existing threats	**+2 (high)**	**Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.** **Areas which score 0 for koala occurrence and have no dog or vehicle threat present.**	The project footprint is parallel to Heinemann road, resulting in potential vehicle strikes. Records of dogs were recorded on the camera traps within the Site, however these were likely domestic dogs off-leash as evidenced by associated walkers. The southern boundary of the Site connects to a residential area.
	+1 (medium)	Evidence of infrequent or irregular koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence, OR	

Attribute	Score	Coastal	Comment
		Areas which score 0 for koala occurrence and are likely to have some degree dog or vehicle threat present	Therefore, the occasional presence of pet or stay dogs are possible. **There is no evidence of koala mortality from vehicle strike of dog attack at present.** **Score: +2**
	0 (low)	Evidence of frequent or regular koala mortality from vehicle strike or dog attack in the study area at present, OR Areas which score 0 for koala occurrence and have a significant dog or vehicle threat present.	
Recovery value	+2 (high)	Habitat is likely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.	Habitat within the Site is important to achieving the interim recovery objectives including the protection and conservation of large, connected areas of Koala habitat and maintain corridors and connective habitat that allow movement of Koalas between large areas of habitat. **Score: +1**
	+1 (medium)	**Uncertain whether the habitat is important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.**	
	0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.	
		TOTAL SCORE	**7**

4.3 Adverse Effects to 'habitat critical to the survival of the koala'

A flow chart to assess adverse effects on habitat critical to the survival of the koala (Figure 2 of the koala referral guidelines) was analysed for the Project footprint. The results of this analysis are presented in **Table 4-3** below.

Table 4-3 Assessment of Adverse Effects on Habitat Critical to the Survival of the Koala

Prompt as per Figure 2 of the guidelines	Response
Does your impact area contain habitat critical to the survival of the koala (habitat score ≥ 5)?	Yes, the Precinct contains "habitat critical to the survival of the Koala" as a score of 7 was achieved.
Do the area(s) proposed to be cleared contain known koala food trees?	Yes, the area of paddocks and vegetation supporting Koala habitat tree areas and Koala movement opportunities to be impacted by the project is approximately 6.3 ha and 19.4 ha respectively. In consideration of Koala habitat in the broadest extent, koala habitat can be considered as those areas that are treed and those areas that provide relatively unencumbered movement opportunities.
Are you proposing to clear ≤ 2 ha of habitat containing known koala food trees in an area with a habitat score of 5?	No, clearing is estimated to be 6.3 ha of koala habitat containing known koala food trees with a score of 7.
Are you proposing to clear ≥ 20 ha of habitat containing known koala food trees in an area with a habitat score of ≥ 8?	No, the Project will require clearing of 6.3 ha of koala habitat containing known koala food trees in an area with a habitat score of 7.
IMPACTS UNCERTAIN, REFERRAL DECISION DEPENDS ON THE NATURE OF YOUR ACTION	

As noted in Figure 2 of the referral guidelines for the koala, it is also necessary to assess the action considering the points below:

- **The score calculated for the impact area (higher score = greater risk of significant impact).**

  While achieving a habitat quality score of 7, it aligns an existing road reserve, is fragmented and fringed by rural residential properties. That is, local conditions mean that the area does not have the same values as an unencumbered patch that achieves an equal score.

- **Amount of koala habitat being cleared (more habitat cleared = greater risk of significant impact).**

  The area proposed to be cleared ~ 6.3 ha of koala habitat within existing grazed paddocks which has been degraded by historical clearing and adjacent to Heinemann Road and urban areas to the east.

- **The method of clearing (i.e. clear-felling has a greater risk of a significant impact than selective felling with understory and koala food tree retention).**

  Sequential clearing of all vegetation will occur within the Site under the guidance of a spotter catcher and koala spotter. All vegetation outside of the Project will be retained for the purpose of this Action.

- **The density or abundance of koalas (relatively high density or abundance for the region means greater risk of significant impact).**

  According to mapping contained within Rhodes et al. (2015)[4], the area in the immediate vicinity of the Site is predicted to support 0.016 - 0.341 koalas per ha. Within the ~6.3 ha this density would account for ~0.1 – 2.14 koalas.

- **Level of fragmentation caused by the clearing (greater degree of fragmentation has greater risk of significant impact).**

  The Project is located within a grazed paddock with a Eucalypt woodland and adjoin Heinemann Road and urban land use to the east, the level of fragmentation is relatively low.

Given the responses above, the Project is unlikely to have an adverse impact on “habitat critical to the survival of the Koala”, notwithstanding referral is recommended. The Project is unlikely to constitute a significant impact upon MNES for Koala and an EPBC Referral to the minister as ‘not a controlled action’ is recommended.

[4] Rhodes, J. R., Beyer, H. L., Preece, H.J. and McAlpine, C.A. 2015. *South East Queensland Koala Population Modelling Study*. UniQuest, Brisbane, Australia

5 Conclusions

This EPBC Act self-assessment has sought to consider whether any of the above noted MNES are likely to be significantly impacted by the Project and so determine if a Referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) is required.

The likelihood of occurrence assessment indicated two Vulnerable species which are considered 'known' or 'likely' to occur within the Site including GHFF and Koala.

The following are the key findings and recommendations associated with this assessment:

1. The assessment of the proposed Project determined the works are unlikely to have a significant impact on the GHFF.
2. The significant impact assessment for Koala, resulted in the Precinct being assessed as unlikely to have a significant impact to Koala.
3. Notwithstanding the above, this EPBC self-assessment has concluded that the resulting action for the Project is unlikely to constitute a significant impact upon MNES for Koala, an EPBC Referral to the minister as 'not a controlled action' is recommended.

Attachment A – Extract of Master Plan

Redlands Coast Regional Sport and Recreation Precinct Master Plan - Sub-precincts

1 ***Sports field sub-precinct***
Includes lit rectangular playing fields on benches, two clubhouses, formal and overflow car parking and small recreation node

2 ***Recreation sub-precinct***
Includes regional-level play and activity node, barbecues and picnic facilities, kickabout and field games area, sealed multi-use paths and formal car parking

3 ***Bike activity sub-precinct***
Includes criterium track incorporating three loops, bmx track with track marshal's observation tower and administration booth, pump track, shared clubhouse, formal and overflow car parking

4 ***Wetland and forest sub-precinct***
Includes sealed multi-use paths, raised boardwalks, unsealed tracks amongst inviting vegetation and wetland areas

5 ***Conservation sub-precinct***
Includes unsealed tracks and trails for a mix of users



Attachment B – Protected Matters Search Tool

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

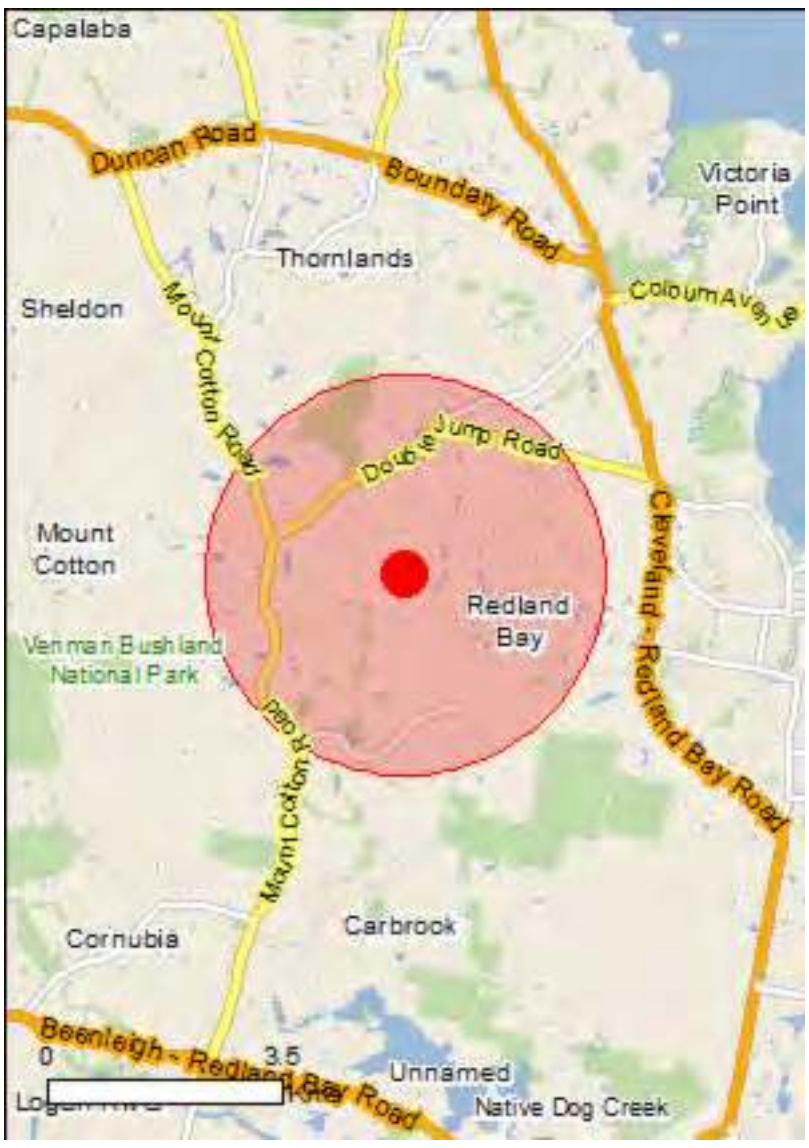
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/11/20 13:19:42

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

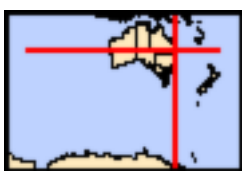
Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 3.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	40
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	23
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	38
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Moreton bay	Within 10km of Ramsar

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Thinornis cucullatus cucullatus Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat may occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Corchorus cunninghamii Native Jute [14659]	Endangered	Species or species habitat known to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area
Endiandra floydii Floyd's Walnut [52955]	Endangered	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Planchonella eerwah Shiny-leaved Condoo, Black Plum, Wild Apple [17340]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species

Name	Threatened	Type of Presence
		habitat likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Bayview	QLD

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur

Name	Status	Type of Presence within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India		Species or species

Name	Status	Type of Presence
Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-27.6176 153.2545

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Attachment C – Desktop Assessment

Scientific Name	Common Name	Status		Source^	General habitat requirements	Are these requirements known or expected to be present on site?	Recorded on Wildlife online within 3km of site?	Is a suitable landzone present?	Are known or expected associated species present?	Likelihood of Occurrence of Suitable Habitat
		NC Act	EPBC Act							
Flora										
Arthraxon hispidus var. hispidus	Hairy-joint grass	C	V	PMST	Fringes of rainforest and wet Eucalypt forests.	Yes	No	Yes	Yes	Unlikely
Bosistoa transversa	Three-leaved bosistoa	C	V	PMST	Wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. Associated vegetation includes Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photiNophylla, Acmena ingens, Diploglottis australis and Diospyros mabacea.	Yes	No	Yes	Yes	Unlikely
Corchorus cunninghamii	Native jute	E	E	PMST	Ecotone of wet sclerophyll forest and dry to dry-subtropical rainforest (e.g. araucarian microphyll vine forest), and in Hoop Pine (Araucaria cunninghamii) plantations. It often occurs on hill crests, exposed slopes, ridges or upper slopes of hilly terrain on south or south-east aspect.	Possible	No	Yes	Yes	Possible
Endiandra floydii	Floyd's walnut	E	E	PMST	Found in warm-temperate and subtropical rainforest, from sea level to 430 m altitude.	No	No	Yes	No	Unlikely
Macadamia integrifolia	Macadamia nut	V	V	PMST	Remnant rainforest, preferring partially open areas such as rainforest edges. High nutrient alluvial and volcanic soils predominate often with considerable exposure of rock fragments or substrate, mostly basalt and diorite. The surface soils are uniformly dark, slightly acid (pH 5.5–6.5) and varying in texture from clayey-sand through various loams to silty-clay. All sites are well-drained, some excessively so.	No	Yes	Yes	No	Unlikely
Macadamia tetraphylla	Rough-shelled bush nut	V	V	WO	subtropical rainforest and complex Notophyll vineforest, at the margins of these forests and in mixed sclerophyll forest. It occurs in restricted habitat, growing on moderate to steep hillslopes on alluvial soils at well-drained sites.	Possible	Yes	Yes	Yes	Possible
Marsdenia longiloba	Slender marsdenia	V	V	WO	Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops. Associated species include Eucalyptus crebra, E. microcorys, E. acmeNoides, E. saligna, E. propinqua, Corymbia intermedia and Lophostemon confertus.Flowering occurs in summer.	Yes	Yes	Yes	Yes	Possible
Persicaria elatior	Knotweed	V	V	PMST	Grows in damp places, including coastal swampy area, along watercourses, streams and lakes, and swamp forest. May occurin disturbed areas.	Yes	No	Yes	Yes	Unlikely
Planchonella eerwah	Shiny-leaved condoo	E	E	PMST	Sub-tropical rainforest, dry rainforest, and hoop pine vine scrub. Populations known from Ipswich-Beaudesert, Beenleigh-Ormeau-Pimpama, and Nambour-Maleny.	No	No	Yes	No	Unlikely
Samadera bidwillii	Quassia	V	V	PMST	Occurs in lowland rainforest often with Araucaria cunninghamii or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland, it is commonly found in areas adjacent to both temporary and permanent watercourses up to 510 m altitude	No	No	Yes	Possible	Unlikely
Mammals										
Dasyurus maculatus maculatus	Spotted-tail quoll	V	E	PMST	Intact eucalypt forests and woodlands, coastal heathlands and rainforests.	Yes	No	Yes	Yes	Unlikely
Petauroides volans volans	Greater glider	V	V	PMST	Largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees	Yes	Yes	Yes	Yes	Possible
Phascolarctos cinereus	Koala	V	V	PMST	Eucalypt woodland, forest with an abundance of Food and shelter trees of the genus's Eucalyptus, Corymbia and Lophostemon.	Yes	Yes	Yes	Yes	Likely
Pteropus poliocephalus	Grey-headed flying fox	C	V	PMST	Suitable foraging resources and roosting sites are provided by a variety of forest types including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. The primary food source is blossom from Eucalyptus and related genera.	Yes	Yes	Yes	Yes	Likely
Tachyglossus aculeatus	Short-beaked echidna	SL	-	WO	May be found in most habitats.	Yes	No	Yes	Yes	Possible
Xeromys myoides	Water mouse	V	V	PMST	Mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands.	Possible	No	Yes	Yes	Unlikely
Amphibians										
Adelotus brevis	Tusked frog	V	-	WO	Rainforests, wet sclerophyll forests and open grasslands. Usually is found under logs, stones or leaf litter near puddles, creeks and ponds.	Yes	Yes	Yes	Yes	Likely
Birds										
Actitis hypoleucos	Common sandpiper	SL	Ma/Mi	PMST	Coastal and sometimes inland wetlands, around muddy margins or rocky shores. Found in estuaries, stream deltas, around lakes, pools, dams etc. Sometimes found in mangrove areas, in rocky and snag littered mud.	Possible	No	Yes	No	Unlikely
Anseranas semipalmata	Magpie goose	C	Ma/Mi	PMST	Found in open wetland areas such as floodplains and swamps.	0	No	Yes	Possible	Possible
Anthochaera phrygia	Regent Honeyeater	E	CE	PMST	The most fertile sites within dry box-ironbark eucalypt woodland and dry sclerophyll forest associations	Yes	No	Yes	Yes	Unlikely
Apus pacificus	Fork-tailed swift	SL	Ma/Mi	PMST	This species is an almost exclusively aerial species, flying from <1 m to >300 m above ground overflying a range of habitat types over inland plains but sometimes above foothills or in coastal areas. Likely roost aerially, but have been observed landing.	Possible	No	Yes	Yes	Possible
Ardea alba	Great egret	C	Ma/Mi	PMST	Found in a variety of wetland habitats, including inland to coastal, saline to freshwater, open to vegetated, and a range of sizes. Usually inhabits shallow waters.	Yes	No	Yes	Yes	Possible
Ardea ibis	Cattle egret	C	Ma/Mi	PMST	Found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor.	Yes	No	Yes	Yes	Possible
Botaurus poiciloptilus	Australasian Bittern	C	E	PMST	Freshwater wetlands with tall dense vegetation	Possible	No	No	Possible	Unlikely
Calidris acuminata	Sharp-tailed sandpiper	SL	Ma/Mi	PMST	Found on muddy edges of shallow wetlands, fresh or brackish, with sedges, grass, and saltmarsh vegetation present. For example, lakes, swamps, dams, saltpans, flooded paddocks, sheltered intertidal mudflats.	Possible	No	Possible	No	Unlikely
Calidris canutus	Red knot	E	E	PMST	Intertidal mudflats and sandflats, in estuaries, bays, inlets, and lagoon areas. Sometimes occur on terrestrial saline wetlands near the coast.	Possible	No	Possible	No	Unlikely

Scientific Name	Common Name	Status		Source^	General habitat requirements	Are these requirements known or expected to be present on site?	Recorded on Wildlife online within 3km of site?	Is a suitable landzone present?	Are known or expected associated species present?	Likelihood of Occurrence of Suitable Habitat
		NC Act	EPBC Act							
Calidris ferruginea	Curlew sandpiper	E	CE	PMST	Intertidal mudflats in sheltered coastal areas, including bays, inlets, estuaries and lagoons. Sometimes occur around non-tidal swamps, lakes or ponds near the coast, in fresh or brackish waters.	Possible	No	Possible	No	Unlikely
Calidris melanotos	Pectoral sandpiper	SL	Ma/Mi	PMST	Mostly found around shallow wetlands, fresh or saline, usually coastal. Prefers wetlands with open fringing mudflats and low vegetation. Forages in shallow water and soft mud.	Possible	No	Possible	No	Unlikely
Cuculus optatus	Oriental cuckoo	SL	Ma/Mi	PMST	Usually inhabits forest canopy, open wooded areas, hill country, coniferous forest, and sometimes above the tree line.	Yes	No	Yes	No	Unlikely
Erythrotriorchis radiatus	Red goshawk	E	V	PMST	Forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins.	Yes	No	Yes	Yes	Unlikely
Falco hypoleucos	Grey falcon	V	-	PMST	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	Yes	No	Yes	Yes	Unlikely
Gallinago hardwickii	Latham's snipe	SL	Ma/Mi	PMST	Found in wetlands up to 2000 m elevation, usually open freshwater with low dense vegetation, but also brackish and saline wetlands.	Possible	No	Possible	No	Unlikely
Haliaeetus leucogaster	White-bellied sea-eagle	C	Ma/Mi	PMST	Inhabits coastal areas, around terrestrial wetlands or near large open water bodies of water. Can occur inland or in proximity to the sea.	Yes	No	Yes	Yes	Possible
Hirundapus caudacutus	White-throated needle tail	SL	V	PMST	Almost exclusively aerial, up to heights of 1000 m. Mostly occur over open forest, rainforest, clearings, and sometimes below the canopy. Sometimes occur over sandy beaches and mudflats.	Possible	Yes	Yes	Yes	Possible
Lathamus discolor	Swift parrot	E	CE	PMST	A variety of woodlands with mature eucalypts, where nectar production is plentiful and reliable.	Yes	No	Yes	Yes	Unlikely
Merops ornatus	Rainbow beeater	C	Ma/Mi	PMST	Found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels.	Yes	Yes	Yes	Yes	Likely
Monarcha melanopsis	Black-faced monarch	SL	Ma/Mi	PMST	Found mostly in rainforest environments, sometimes in open eucalypt forests, mountain gullies, coastal foothills and scrub, and occasionally among mangroves.	Possible	Yes	Yes	Yes	Possible
Myiagra cyanoleuca	Satin flycatcher	SL	Ma/Mi	PMST	Mostly found in eucalypt forest, particularly wet sclerophyll forest.	Yes	No	Yes	Yes	Possible
Numenius madagascariensis	Eastern curlew	E	CE	PMST	Forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline.	No	No	No	No	Unlikely
Pandion haliaetus	Osprey	SL	Ma/Mi	PMST	Coastal and littoral habitats, mainly tropical and temperate terrestrial wetlands such as mangrove swamps, estuaries, rivers, lakes. Preference for coastal cliffs and elevated offshore islands. Forage in large areas of water (fresh, saline, or brackish).	Possible	No	Yes	Yes	Possible
Rhipidura rufifrons	Rufous fantail	SL	Ma/Mi	WO	Found mainly in wet sclerophyll forests, often in gullies, sometimes found in subtropical and temperate rainforest.	Yes	No	Yes	Yes	Possible
Rostratula australis	Australian painted snipe	V	E	PMST	Shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled.	Yes	No	Yes	Yes	Unlikely
Symposiachrus trivirgatus	Spectacled monarch	SL	Ma/Mi	PMST	Occurs mainly in rainforests within thick understorey, waterside vegetation, wet gullies, and mangroves.	Possible	No	Yes	No	Unlikely
Thinornis rubicollis rubicollis	Hooded plover	C	V	PMST	Sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding, much beachcast seaweed, and backed by sparsely vegetated sand-dunes for shelter and nesting. Occasionally found in tidal bays and estuaries.	No	No	No	No	Unlikely
Tringa nebularia	Common greenshank	SL	Ma/Mi	PMST	Found in sheltered coastal habitats and inland wetlands, with large mudflats, saltmarsh, mangroves, or seagrass. Can inhabit artificial wetlands such as flooded cropland and sewage farms, but mostly occur around rivers, estuaries, creeks, lakes.	No	No	Possible	Possible	Unlikely
Turnix melanogaster	Black breasted button-quail	V	V	PMST	Drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest and Araucarian Notophyll vine forest mostly in areas with 770-1200 mm rainfall per annum.	Possible	No	Yes	Yes	Unlikely

E = Endangered, V = Vulnerable under both NC Act and EPBC Act. CE = Critically Endangered under the EPBC Act. NT = Near Threatened; LC = Least Concern under the NC Act.
^WO = Wildlife Online; PMST= EPBC Protected Matters Report

APPENDIX

G

ENVIRONMENTAL SIGNIFICANCE OVERLAY CODE

8.2.4 Environmental significance overlay code

Table 8.2.4.3.A—Performance outcomes and acceptable outcomes

Performance outcomes	Acceptable outcomes	Response
For development that is accepted subject to requirements		
PO1 Development does not result in a significant reduction in the level or condition of biodiversity and ecological functions and processes in the locality. *Editor's note— See Planning Scheme Policy 1 – Environmental significance for advice on achieving compliance with this outcome*	**AO1.1** Compensatory planting is undertaken on-site that is equal in area to the area of the vegetation cleared.	**Complies with AO1.1** The proposed development footprint is estimated to be 25.7 hectares. However, the clearing area will be confirmed at the detailed design phase and compensatory planting areas have been identified in the Ecological Assessment Report (EAR) **Figure 6**.
For assessable development		
Values to be protected		
PO2 Development does not result in a significant reduction in the level or condition of biodiversity and ecological functions and processes in the locality.	No acceptable outcome is nominated.	**Complies with PO2** Section 3 and 4 of the Ecological Assessment Report outline the ecological features and functions present within the Site. The development footprint is confined to the northern extent of the Site which has been historically cleared, and is degraded as a result of ongoing agricultural use. The southern portion of the Site, though subject to historic logging, is heavily vegetated, supporting Least Concern, Of Concern and Endangered Regional Ecosystems The Master Plan will require clearing of an estimated ~25.7ha limited to the northern portion of the Site. The southern extent which includes ~54ha of remnant vegetation will be retained for conservation and recreation purposes. As the development will be limited to portions of the landscape that are historically modified, there will not be a significant reduction in the level or condition of biodiversity. Further, the local waterway corridor located centrally within the northern portion of the Site will be retained and enhanced by the

Performance outcomes	Acceptable outcomes	Response
		development. As such, there will not be a significant reduction in the ecological function of the local corridor present within the Site.
PO3 Development does not cause substantial fragmentation of habitat areas.	No acceptable outcome is nominated.	**Complies with PO3** The development footprint is confined to areas of the Site that have been subjected to historic clearing. Remnant vegetation will be retained within a ~54ha conservation area. The development will avoid clearing of high value regrowth as far as practically possible. The local waterway corridor located centrally within the northern portion of the Site will be retained and enhanced by the development. As such, the development will not cause substantial fragmentation of habitat areas.
PO4 Connections between habitat areas are retained, so that movement of key species and normal gene flow between populations is not inhibited or made less safe. Connections may include both continuous corridors and “stepping stone” patches and refuges.	No acceptable outcome is nominated.	**Complies with PO4** The development will be confined to areas of the site that are subject to historic clearing. Remnant vegetation will be retained with a ~54ha conservation area. Connection between habitat areas will be retained through the retention and enhancement of the local waterway corridor located centrally within the northern portion of the Site. Connections between habitat areas will be retained allowing for species movement and gene flow.
Minimising and mitigating impacts		
PO5 Edge effects on retained habitat areas are minimised by providing the smallest possible perimeter to area ratio.	No acceptable outcome is nominated.	Disturbance and development in the retained habitat areas will be minimised to the greatest extent possible. It is understood that walking tracks proposed in the conservation area (i.e. southern portion of the Site) and local waterways will retain the remnant canopy and minimise disturbance to vegetation. The local waterway corridors located centrally within the northern portion of the Site will be rehabilitated to minimise perimeter to area ratio of the retained habitat associated within the waterways.

Performance outcomes	Acceptable outcomes	Response
PO6 The design, scale and intensity of development minimises impacts on retained habitat.	No acceptable outcome is nominated.	**Complies with PO6** The development footprint will avoid impacts on retained habitat by designing infrastructure that meanders around areas of high-ecological value. Additionally, the Master Plan development has been consolidated in previously disturbed and modified areas of the Site and will be set-back from the conservation area to provide a buffer. The recreation walkways within the ~54ha retained for conservation will avoid clearing remnant vegetation as far as practically possible with unnecessary tracks being rationalised.
PO7 Retained habitat is protected to ensure its ongoing health and resilience, and to avoid degradation as a result of edge effects.	No acceptable outcome is nominated.	**Complies with PO7** Retained habitat will be protected for conservation and recreation use. Rehabilitation of the local waterway corridors has been proposed to ensure the resilience of the waterways. It is understood that the Site will be rezoned from Rural to Recreation and Open Space in the Conservation Zone under a proposed planning scheme amendment. This rezoning will ensure the protection of the 54 ha area within the Site.
PO8 Barriers restricting the movement and dispersal of wildlife are removed, except where they are necessary for the safety of people or animals.	No acceptable outcome is nominated. *Editor's note: Guidance on fencing design, fauna movement structure and the like is provided in Planning Scheme Policy 1 – Environmental significance*	**PO8 Not applicable** The development footprint will not result in barriers within the landscape that will restrict the movement or dispersal of wildlife. The central waterway corridor within the northern portion of the Site is a local established waterway corridor (refer to **Figure 4** in the EAR).
PO9 Development does not result in the introduction of pest species (plant or animal), that pose a risk to ecological integrity or disturbance to native fauna.	No acceptable outcome is nominated. *Editor's note—Weed species are identified in Council's Pest Management Plan 2012 – 2016, Part B.*	**Complies with PO9** The project will have a site-specific Construction Environmental Management Plan and will include a weed and pest animal management plan to ensure weed and pest animals are not introduced to the Site as a result of the development.

Performance outcomes	Acceptable outcomes	Response
PO10 Development minimises alterations to natural landforms, flow regimes, groundwater recharge and surface water drainage patterns.	No acceptable outcome is nominated.	**Complies with PO10** The level of alterations to natural landforms (i.e. extent of earthworks) is unknown at the Master Planning phase. It is understood that the development will support the existing hydrological regime and drainage patterns of the Site and recharge of the wetland and waterway will not be adversely impacted.
PO11 Development minimises potential for disturbance of wildlife as a result of noise, light, vibration or other source.	No acceptable outcome is nominated.	**Complies with PO11** Development works will minimise the potential for disturbance of wildlife as a result of noise, light, vibration and other sources through the implementation of a site-specific Construction Environmental Management Plan (CEMP). The CEMP will outline appropriate hours for construction and mitigation responses to reduce adverse effects on wildlife. The lighting design will be required to consider minimising light spill into surrounding bushland areas and must include directional and shielded lighting. During the operational phase, the sporting fields will require floodlights and night-time operational hours are to be limited where possible (i.e. 6pm – 10 pm). Lighting fixtures are to be maintained to ensure shields are in place and light is directed downwards towards courts/fields.
PO12 Roads and public access within and adjacent to areas of ecological significance are located and designed to avoid disturbance of ecological values or danger to wildlife.	No acceptable outcome is nominated.	**Complies with PO12** The construction of roads with the development footprint have been designed to avoid areas of ecological significance, including remnant vegetation and high value regrowth. Public access to the conservation area will be limited by walking trails. Entry into the Site will only be available via Heinemann road in the east, limiting disturbance to ecological values and the threat of vehicle strikes on wildlife around the Site perimeter. Internal roads will have reduced speed signage to reduce the risk of vehicle strike to fauna species.

Performance outcomes	Acceptable outcomes	Response
Corridors and enhancement planting		
PO13 Development contributes to the restoration of waterway or land based ecological corridors, where they would significantly enhance the health and resilience of habitat and wildlife on and near the site.	No acceptable outcome is nominated.	**Complies with PO13** Ecological restoration has been proposed within the waterway corridors located in the northern portion of the Site. Recommended restoration areas have focused on the cleared areas of the waterway corridor (refer to **Figure 6** in the EAR) and account for approximately 6 ha where they would enhance the health and resilience of the habitat wildlife on and near the Site.
PO14 Corridors have sufficient width to maintain viable wildlife or habitat linkages.	**AO14.1** Ecological corridors have a minimum width of 100m.	**Complies with AO14.1** The established ecological corridor located in the southern portion of the Site is approximately 300 m in with and provides a viable habitat linkage. The waterway corridors within the Site have a buffer of 25 m from the centreline. The waterway buffers have been subject to previous clearing and currently function as stepping stone corridors. Restoration of the two waterway corridors has been proposed to enhance these local habitat linkages (refer to **Figure 6** in the EAR). The combined width of the two waterway corridors is 100m.
PO15 Development incorporates opportunities for revegetation to enhance habitat condition, biodiversity and wildlife movement.	No acceptable outcome is nominated.	**Complies with PO15** Restoration of the two waterway corridors has been proposed to enhance habitat condition, biodiversity and wildlife movement (refer to **Figure 6** in the EAR).
PO16 Enhancement plantings and landscaping utilise endemic native species which replicate or complement the composition of the habitat it is connected to, unless this would increase bushfire risk.	No acceptable outcome is nominated. *Editors note—Guidance to assist applicants is contained within the Queensland Government's Regional Ecosystem Mapping*	**Complies with PO16** Rehabilitation will be conducted throughout the site in order to improve ecological functioning, connectivity, and habitat value. Rehabilitation and landscaping will include species representative of the regional ecosystems within the Site. Refer to **Section 3.2** of the EAR.
PO17 Where clearing occurs, it is sequenced and undertaken in a manner that	No acceptable outcome is nominated.	**Complies with PO17**

Performance outcomes	Acceptable outcomes	Response
provides opportunities for fauna to vacate affected land.	*Editor's note—It is likely that a wildlife habitat management plan, prepared by an ecologist with suitable experience may be needed to address survival and ongoing access to habitat trees during construction and operation of the development.*	Clearing will occur in a sequenced matter that provides opportunities for fauna to vacate the affected area. Refer to the Wildlife Habitat Management Plan for further detail.
Offsets		
PO18 Where development results in, or is likely to result in, a significant residual impact on matters of local environmental significance, despite all reasonable on-site mitigation measures, the impact will be offset.	**AO18.1** Offsets are provided in accordance with offset arrangements set out in Planning Scheme Policy 1 – Environmental significance.	**Compliance with this PO18** Ecological restoration has been proposed within the waterway corridors located in the northern portion of the Site. Recommended restoration areas have focused on the cleared areas of the waterway corridor (refer to **Figure 6** in the EAR) and account for approximately 6 ha.

APPENDIX

H

WATERWAY CORRIDORS AND WETLANDS OVERLAY CODE

8.2.11.3 Waterway corridors and wetlands overlay code – Specific benchmarks for assessment

Table 8.2.11.3.1—Benchmarks for assessable development

Performance outcomes	Acceptable outcomes	Response
For assessable development		
PO1 Development does not adversely impact on the hydrological regime or recharge of a wetland or waterway.	No acceptable outcome is nominated.	**Complies with PO1** The development will retain and rehabilitate waterways. Waterway crossings will be designed to retain the hydrological regime within the Site and the development is not anticipated to adversely impact the recharge of the wetland area located in the southern extent of the Site. A stormwater quality management plan will be required at the detailed design stage to ensure stormwater runoff is appropriately treated prior to entering the waterways.
PO2 A core riparian buffer is maintained along and around waterways and wetlands that is vegetated, development free, and is of a sufficient width to: (1) protect water quality; (2) protect the stability of stream bank and bed; (3) allow for natural hydrological and geomorphological processes; (4) minimise erosion; (5) maintain or achieve healthy water temperatures and in-stream conditions; and (6) support viable wildlife habitat and movement.	**AO2.1** A development free, vegetated buffer area is provided in accordance with Table 8.2.11.3.2. **AO2.2** No clearing occurs within the buffer area provided in accordance with Table 8.2.11.3.2.	**Complies with AO2.2** The Master Plan indicates that the sealed criterium track crosses the waterways and it is understood that the tracks have been located to minimise impacts to vegetation. In order to comply with AO2.2, the detailed design must avoid clearing within the waterway and this can be demonstrated in the Vegetation Management Plan. Should clearing be required within the waterways to facilitate the tracks, the development will be required to further increase the compensatory planting area within the waterway corridor.

Performance outcomes	Acceptable outcomes	Response
PO3 Riparian vegetation provides sufficient shade over the stream to protect in-stream habitat, biodiversity and ecological processes.	**AO3.1** Vegetation achieves 70% canopy cover over streams 10m or less in width and 70% canopy cover over near bank areas along other streams.	**Alternative solution to AO3.1** Riparian vegetation will be retained as far as practically possible, including a dense patch of Broad-leaved Paperbark (*Melaleuca quinquenervia*) towards the northern extent of the Site. Infrastructure around waterways and riparian areas will include low-impact development such as walking trails and will be sited to minimise impacts to vegetation. Weed management and revegetation works will be conducted within core riparian buffer areas and wetlands. Compensatory planting aims to reinstate vegetation including canopy cover in previously cleared areas of the waterway corridor.
PO4 Development maximises opportunities for natural filtration of sediments, nutrients and other pollutants, and slowing of overland flow.	No acceptable outcome is nominated.	**Complies with PO4** It is understood that the development will include natural filtration systems to manage sediment, nutrients and other pollutants from entering the waterways within the Site.
PO5 The development is designed to avoid any worsening of water quality in a waterway or wetland. Editor's note—Applicants must also have regard to the Healthy waters code.	No acceptable outcome is nominated.	**Complies with PO5** It is understood that stormwater management measures will be designed to maintain water quality within the waterways within the Site. Stormwater drainage design will be requited to consider the Healthy Waters Code.

Performance outcomes	Acceptable outcomes	Response
PO6 Bank erosion and slumping is avoided and hydrological and geomorphological processes of a waterway or wetland are maintained by: 1) providing an area either side of the existing channel to allow for natural lateral and longitudinal movement; 2) restoring bank vegetation and large woody debris within the channel; 3) implementing bank and bed stabilisation measures; and 4) reinstating a stable hydrology and geomorphology where it is modified or unstable.	No acceptable outcome is nominated. Editor's note—An environmental management plan may be required to support any proposed hydrology reinstatement works.	**Complies with PO6** The development will avoid bank erosion and slumping by excluding high impact development within waterways and wetlands within the Site. Riparian vegetation will be retained as far as practically possible, and previously cleared riparian areas will be restored through ecological restoration works as part of the compensatory planting requirement. The ecological restoration plan should include the addition of large woody debris within the channel to assist bank stabilisation and create aquatic habitat. Weed management and revegetation works will be conducted within core riparian buffer areas to stabilise banks, allow natural movement and reinstate a stable hydrology.
PO7 Barriers to in-stream or land-based wildlife movement are removed unless they are naturally occurring or necessary for the safety of wildlife.	No acceptable outcome is nominated.	**Complies with PO7** The development will not create barriers to in-stream or land-based wildlife movement. A recommendation of the Ecological Assessment Report is the removal of the existing barbed wire fencing to encourage land-based wildlife movement.

Performance outcomes	Acceptable outcomes	Response
PO8 Development incorporates opportunities for revegetation to enhance stream and habitat condition, biodiversity and wildlife movement wherever possible.	No acceptable outcome is nominated.	**Complies with PO8** The development will incorporate ecological restoration including compensatory planting of a recommended 6 ha of the previously cleared waterway corridor to enhance stream and habitat condition, biodiversity and wildlife movement opportunities.
PO9 Enhancement plantings and landscaping utilise endemic native species which replicate or complement the composition of the habitat it is connected to.	No acceptable outcome is nominated.	**Complies with PO9** The development will include ecological restoration and landscaping and the species palette will include locally endemic native species. Wildlife corridors and areas identified as containing high ecological value will be high priority for restoration to enhance the natural amenity and connectivity to surrounding habitats.
PO10 Development does not result in the introduction of non-native pest species (plant or animal) and removes existing pest species that pose a risk to ecological or stream integrity.	No acceptable outcome is nominated. *Editor's note* *Weed species are identified in Council's Pest Management Plan 2012–2016, Part B.*	**Complies with PO10** The development will include a site-based Construction Environmental Plan which must include pest (plant and animal) management to ensure the development does not result in the introduction of non-native pest (plant and animal). The removal of existing invasive plant species will be included as part of the ecological restoration works. It is understood that the Site is managed for pest animals by Council's Animal Management Team.

Performance outcomes	Acceptable outcomes	Response
PO11 Disturbance or predation of native fauna by domestic pets and livestock is prevented.	No acceptable outcome is nominated.	**Complies with PO11** Livestock will be removed from the landscape prior to commencing development works. Domestic pets will not be allowed onto the Site during the construction phase. Once open for public use, ensure the Site is a dog-on-leash area. It is recommended that domestic dogs are excluded from areas maintained for conservation.
PO12 Development minimises potential for disturbance of wildlife as a result of noise, light, vibration or other sources.	No acceptable outcome is nominated.	**Complies with PO12** A site-specific Construction Environmental Management Plan (CEMP) will minimise the potential for disturbance of wildlife as a result of noise, light, vibration and other sources. The CEMP will outline appropriate hours for construction and mitigation responses to reduce adverse effects on wildlife. The Precinct will require floodlighting for the sports fields and the lighting must be designed to be directional and shielded to minimise light pollution into the bushland areas and particularly the central waterway corridor within the northern portion of the Site. Night-time operational hours are to be limited where possible (i.e. 6pm – 10 pm).
PO13 Public access to or along waterways and wetlands is located and designed to minimise disturbance of environmental values.	No acceptable outcome is nominated.	**Complies with PO13** Disturbance to waterways and wetlands will be minimised by formalising public access via a network of boardwalks, viewing platforms and pathways. High use areas will be limited to locations of the site that are distanced from waterways as far as practically possible. Environmental values will be enhanced through ecological restoration and conservation.

APPENDIX

I

WILDLIFE HABITAT MANAGEMENT PLAN

Wildlife Habitat Management Plan

Redlands Sports Complex

NE30016



Prepared for
Redland City Council

29 November 2020

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1 Introduction

Redland City Council (Council) is pursuing the delivery of the Redlands Coast Regional Sports and Recreation Precinct (the Precinct) as part of the master planned development (the Project) of the property located at 277-293 Heinemann Road, Mount Cotton, also described as Lot 420 on S312160 (the Site). The Site is located on undeveloped greenfield land owned by Council intended for the purpose of delivering sport, recreation and conservation outcomes for the community. This Wildlife Habitat Management Plan (WHMP) has been prepared by Cardno on behalf of Council to minimise, manage and mitigate potential impacts to fauna that may arise as a result of the Project.

1.1 Site Description

In accordance with the Redland *City Plan 2018*, the Site is currently within the Rural zone and is adjoined by agricultural and residential uses. Presently, the northern extent of the Site contains open woodland and is used for cattle grazing and has been historically cleared, and is degraded as a result of ongoing agricultural use. The southern portion of the Site, though subject to historic logging, is heavily vegetated, supporting Least Concern, Of Concern and Endangered Regional Ecosystems. Mapped watercourses traverse the Site from the north and extend along the western boundary. An additional watercourse is mapped in the south east of the Site.

1.2 Proposed Development

The purpose of the Precinct is to deliver sport, recreation and conservation outcomes for the community. The Site on which the Precinct is proposed to be developed is approximately 101 hectares (ha) in size. The northern portion of the Site will primarily accommodate sporting facilities, while the southern extent includes an estimated 52 ha which will be retained and enhanced as a conservation reserve.

The Master Plan has the following objectives:

- to provide a framework for built infrastructure that appropriately supports sporting activity and recreation;
- to encourage informal recreation activities to be enjoyed by the general community;
- to consider the wider impacts that can be achieved at other community facilities throughout the city as a result of planned development at the Precinct;
- to create safe access and integrated movement through and to the Precinct;
- to promote the natural environment, sustainable development, and practicable maintenance regimes; and
- to foster partnerships for capital development and ongoing management of the Precinct.

The Master Plan states that the Precinct will include the below-listed sub-precincts.

1. Sports field sub-precinct - Includes lit rectangular playing fields on benches, two clubhouses, formal and overflow car parking and small recreation node.
2. Recreation sub-precinct - Includes regional-level play and activity node, barbecues and picnic facilities, kickabout and field games area, sealed multi-use paths and formal car parking.
3. Bike activity sub-precinct - Includes criterium track incorporating three loops, BMX track with track marshal's observation tower and administration booth, pump track, shared clubhouse, formal and overflow car parking.
4. Wetland and forest sub-precinct - Includes sealed multi-use paths, raised boardwalks, unsealed tracks amongst inviting vegetation and wetland areas.
5. Conservation sub-precinct - Includes unsealed tracks and trails for a mix of users.

The section of the Master Plan relevant to this WHMP is provided in **Appendix A**.

2 Fauna Habitat Assessment

2.1 Vegetation Communities

The field survey confirmed that the Site is characterised by six vegetation communities that generally correlate with the Department of Natural Resources and Mines (DNRME) Vegetation Management Report and Regulated Vegetation Map produced for the Site. Specifically, the regional ecosystem codes appear to be accurately applied.

The Site supports Category X (Non-remnant) vegetation, Category B (Remnant) vegetation and Category C (High-value regrowth vegetation). A short description of each RE mapped within the Site, according to the Regional Ecosystem Description Database (REDD) (DES, 2019)[1], is provided in **Table 2-1** below. The respective locations and extents each RE are shown in **Figure 1**.

Table 2-1 Regional ecosystems that currently occur in the Site as described in REDD.

RE Code	Status	Description
12.11.23	Endangered	*Eucalyptus pilularis* open forest on coastal metamorphics and interbedded volcanics
12.11.27	Endangered	*Eucalyptus racemosa* subsp. *racemosa* and/or *E. seeana* and *Corymbia intermedia* woodland on metamorphics +/- interbedded volcanics
12.3.11	Of Concern	*Eucalyptus tereticornis* +/- *Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast
12.11.24	Least Concern	*Eucalyptus carnea*, *E. tindaliae*, *Corymbia intermedia* +/- *E. siderophloia* or *E. crebra* woodland on metamorphics +/- interbedded volcanics
12.11.25	Of Concern	*Corymbia henryi* and/or *Eucalyptus fibrosa* subsp. *fibrosa* +/- *E. crebra*, *E. carnea*, *E. tindaliae* woodland on metamorphics +/- interbedded volcanics
12.9-10.4	Least Concern	*Eucalyptus racemosa* subsp. *racemosa* woodland on sedimentary rocks

2.2 Fauna and habitat

2.2.1 Terrestrial Fauna Habitat

A total of 95 fauna species were recorded. This included 58 bird species, 24 mammal species, six reptile species, four amphibians, two fishes, and one crustacean as follows:

- The Site supports multiple species of reptiles and aquatic amphibians, including *Pseudophryne raveni* (Copper-backed broodfrog), as shown in **Plate** 1, and *Limnodynastes peronii* (Striped marshfrog). These species were heard calling proximate to drainage lines and waterbodies throughout the Site.
- A number of water bird species, such as *Egretta novaehollandiae* (White-faced heron), were detected on the camera traps and during diurnal surveys (**Plate 2**). The Site supports a number of pools suitable for foraging by transitory wetland and migratory birds. No Migratory species protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were observed within the Site.
- It was noted during the field assessment that the Site supports grazing land and habitat for several macropod species, including *Macropus rufogriseus* (Red-necked wallaby), *Macropus parryi* (Whiptail wallaby), and *Macropus giganteus* (Eastern grey kangaroo). A large population of Red-necked wallabies regularly frequents the northern region of the Site (**Plate 3**).

[1] Queensland Herbarium (2019) Regional Ecosystem Description Database (REDD). Version 11.1 (April 2019) (DES: Brisbane).

- The Site supports a large population of breeding *Trichosurus vulpecula* (Common brushtail possum). Common brushtail possums were detected on camera traps at four separate locations throughout the Site.
- The camera trap analysis identified a number of species often difficult to detect, including *Petaurus breviceps* (Sugar glider), shown in **Plate 4**. Sugar gliders are colonial breeding species and likely use hollow-bearing trees within the Site for shelter and breeding purposes.
- *Tachyglossus aculeatus* (Short-beaked echidna) was captured using the Site at eight separate camera trap locations between the 2019 and 2020 studies (**Plate 5**). Echidna is listed as Special Least Concern in accordance with the *Nature Conservation Act 1992* (NC Act).
- Seven species of microbat were detected using passive detection methods, including the Song Meter and Echo Meter. These include *Chalinolobus gouldii* (Gould's wattled bat), *Chalinolobus nigrogriseus* (Hoary wattled bat), *Miniopterus australis* (Little bent-wing bat), *Mormopterus norfolkensis* (East coast freetail bat), *Nyctophilus gouldi* (Gould's long-eared bat), *Scotorepens sp. (Parnaby)* (Central-eastern broad-nosed bat), and *Tadarida australis* (White-striped freetail bat). All species are colonial breeding species and are likely to use hollow-bearing trees, decorticating bark, rock crevices and man-made structures throughout the Site for shelter and breeding purposes. Presence of Gould's long-eared bat was also detected via camera trap and is shown in **Plate 6.**
- A Wedge-tailed eagle (*Aquila audax*) and nest were observed within the Site. The Wedge-tailed eagle was observed sitting on the nest which is an active breeding behaviour for this species and shown in **Plate 7**.
- Presence of *Phascolarctos cinereus* (Koala) within the Site's southern extent was confirmed from camera trap footage at two separate locations in 2020 (**Plate 8**). Additionally, several indirect observations of Koala were made during the field assessments in 2019 and 2020. This included Koala scats and scratches encountered during targeted surveys and opportunistically. The Koala is listed as Vulnerable under the NC Act EPBC Act.



Plate 1: Copper-backed broodfrog encountered in 2019.



Plate 2: White-faced heron captured in Cardno, 2019.



Plate 3: Red-necked wallaby population frequently encountered within the northern region of the Site.



Plate 4: Sugar glider captured in Cardno, 2019.



Plate 5: Short-beaked echidna captured in Cardno, 2019.



Plate 6: Gould's long-eared bat captured in Cardno, 2019.



Plate 7: Wedge-tailed eagle's nest located within northern portion of the Site.



Plate 8: Koala captured on a camera trap in the southern extent of the Site in 2020.

The Site supports a large number of notable habitat features, including hollow bearing trees, stags, nests and logs. The locations of the habitat features opportunistically recorded during the field assessment within the Site are shown on **Figure 1** and are further details in the Vegetation Management Plan.

Hollow-bearing trees and stags within the Site are likely to be used by a range of hollow dependant birds, such as parrots, as well as arboreal mammals (e.g. Sugar gliders), and microbat species. Hollow logs within the Site similarly may provide shelter for a number of fauna groups including amphibians and reptiles, as well as Echidna. Several species of hollow-nesting bird species, such as *Platycercus adscitus palliceps (*Pale-headed rosella), *Cacatua galerita* (Sulphur-crested cockatoo)*, Cacatua sanguinea* (Little corella)*, Eolophus roseicapilla* (Galah), *Trichoglossus haematodus moluccanus* (Rainbow lorikeet), and *Trichoglossus chlorolepidotus* (Scaly-breasted lorikeet) were observed throughout the Site. Multiple species were seen actively utilising hollows within the Site. Specifically, active breeding was observed twice during field investigations as detailed below.

- Two *Cacatua galerita* (Sulphur-crested cockatoo) individuals were observed emerging from within a hollow bearing tree when stag watching at dusk.
- An *Aquila audax* (Wedge-tailed eagle) was observed sitting on a nest near an ephemeral watercourse within the northern portion of the Site.

The presence of juvenile Common brushtail possums detected in the northwest of the Site also indicates that hollow-bearing trees in this area are likely being used by these species for breeding and shelter.

The Site maintains ecological connectivity to vegetated areas along the southern and western boundary of the Site. Furthermore, watercourses within the Site provide fauna movement opportunities throughout the Site and into the surrounding environment. The Site is largely mapped within a State-mapped ‘Regional biodiversity corridor’ and it is likely that the vegetated areas of the Site aid in fauna movement opportunities for a number of species, including Koala.

2.2.2 Waterways and aquatic habitat

The Site supports numerous ephemeral waterways which have ponded in several areas forming aquatic habitats. These areas provide habitat for aquatic species such as frogs, reptiles, freshwater fish, insects and waterbird species. Additionally, these sites may also be used for foraging from time-to-time by transitory wetland and migratory birds. Watercourses within the Site provide fauna movement opportunities throughout the Site and into the surrounding environment. The field assessment included an assessment of the aquatic habitat features within the northern extent of the Site shown in **Figure 1.**

Several native aquatic fauna species were detected in these areas, including: *Intellagama lesueurii* (Eastern water dragon), Striped marshfrog, Copper-backed broodfrog, *Uperoleia fusca,* (Dusky gungun), *Cherax depressus* (Orange-fingered yabbie), and *Hypseleotris galii* (Firetail gudgeon). Non-native species, including relatively large numbers of *Gambusia holbrooki* (Mosquitofish) and *Rhinella marina* (Cane toad), are also present.

A full list of the fauna encountered during the field surveys has been provided as **Appendix B.**

3 Legislative Considerations

3.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act provides a legislative framework to protect and manage nationally and internationally significant flora, fauna, ecological communities and heritage places. The EBPC Act defines these as Matters of National Environmental Significance (MNES). The MNES which are applicable to the Site include the potential to impact upon:

- listed threatened species (flora and fauna); and
- migratory species.

The EPBC Act Policy Statement 1.1, the 'Significant Impact Guidelines' lists a set of 'significant impact criteria' for vulnerable species. The Master Plan design requires the removal of Koala habitat; as such, a significant impact self-assessment against these criteria was completed and determined that the development is unlikely to have significant impact upon a MNES (the full EPBC self-assessment is provided as an attachment to the Ecological Assessment Report). Nonetheless, referral to the Commonwealth is recommended for adverse impacts to habitat critical to the survival of the Koala.

3.2 *Nature Conservation Act 1992*

The northern portion of the site contains numerous animal breeding places including hollow-bearing limbs, stags and nests. A Species Management Program is required where an animal breeding place has been identified and activities are required to tamper with the breeding place in order to complete the scope of works. Two SMP templates are available; SMP 'low risk of impacts' and SMP 'high risk of impacts'. An SMP 'low risk of impacts' is required if any animal breeding places (i.e. hollow bearing trees) for Least Concern fauna species are to be tampered with as part of the proposed works. The SMP 'low risk of impacts' relates to protected animals classed as Least Concern under the *Nature Conservation Act 1992*, where the impacts are unlikely to affect the broader population.

An SMP 'high risk of impacts' relates to Endangered, Vulnerable or Near Threatened (EVNT) species, Special Least Concern species, or Least Concern colonial breeders, where the broader the population is at greater risk from impacts. Whilst an SMP is not required for Koala (as Koalas do not use a habitual breeding place) - Sugar glider and the various microbat species recorded on Site are considered Least Concern colonial breeders. It is also relevant to note that, while not observed breeding on Site, *Bulbucus ibis* (Cattle egret - another Least Concern colonial breeder) in breeding plumage were observed on Site in October 2020.

Both the SMP 'low risk of impacts' and SMP 'high risk of impacts' require information including the location of the activity, area of impact and species that that are the subject of the tampering of the breeding place. The SMP 'high risk of impacts' requires additional information that is tailored to the relevant EVNT species, Special Least Concern species, or Least Concern colonial breeders (such as Gould's wattled bat, Hoary wattled bat, Little bent-wing bat, East coast freetail bat, Gould's long-eared bat, Central-eastern broad-nosed bat, and White-striped freetail bat, Sugar glider, and Cattle egret found on Site). As the SMP 'high risk of impacts' can also include measures which extend to Least Concern fauna species, only an SMP 'high risk of impacts' and associated Impact Management Plan will be required for the Project.

The *Code of Practice Care of Sick, Injured or Orphaned Protected Animals in Queensland* (Code of Practice) is made under the NC Act and provides information, recommendations, minimum standards and guidelines to ensure that all parties involved act in an appropriate manner. A Fauna spotter catcher must supervise clearing works and comply with the code of practice.

3.3 *Nature Conservation (Koala) Conservation Plan 2017*

Under the *Nature Conservation (Koala) Conservation Plan 2017*, the Koala Conservation Plan Map shows Koala Priority Areas and Koala Habitat Areas. The main purpose of Koala Priority Areas is to strategically focus long-term management and monitoring efforts on areas that have the highest likelihood of achieving conservation outcomes for Koalas. In addition, the purpose of designating Koala habitat areas is to avoid impacts on Koala habitat to ensure the long-term persistence of koala populations in the wild. The Site is located in the Priority Koala Area and portions of the Site are mapped as Core Koala Habitat and Locally Refined Koala Habitat Area; as such, the Project will require interference with Core Koala Habitat Locally Refined Koala Habitat Area (**Figure 2**).

Under the *Planning Regulation 2017* (Planning Regulation) (Schedule 10, Part 10, Division 3, Section 16A), development interfering with Koala habitat in the Koala Priority Area and Koala habitat area does not apply for the development of infrastructure for parks, recreation and sporting facilities, if the development is carried out by or for the State or a public sector entity.

Pursuant to the *Nature Conservation (Koala) Conservation Plan 2017,* the Site is located within the SEQ region and is therefore located in Koala district A. A person clearing Koala habitat trees in Koala district A or B must ensure that the clearing is carried out in a way that complies with sequential clearing conditions.

The presence of Koalas on Site has been confirmed through camera trap footage. Further, the Site supports vegetation communities dominated by Koala habitat trees. Should a Koala be encountered on Site during the Project, it must be managed in accordance with the stipulations described below.

3.3.1 Sequential Clearing

The *Nature Conservation (Koala) Conservation Plan 2017* (Part 3, Section 10) states that sequential clearing conditions must fulfil all of the following items:

(a) clearing of the koala habitat trees is carried out in a way that ensures koalas on the area being cleared (the clearing site) have enough time to move out of the clearing site without human intervention, including, in particular, for clearing sites with an area of more than 3ha, by—

i. carrying out the clearing in stages; and

ii. ensuring not more than the following is cleared in any 1 stage—

a. for a clearing site with an area of 6ha or less—50% of the site's area;

b. for a clearing site with an area of more than 6ha—3ha or 3% of the site's area, whichever is the greater; and

iii. ensuring that between each stage and the next there is at least 1 period of 12 hours starting at 6p.m. on a day and ending at 6a.m. on the following day during which no trees are cleared on the site;

(b) clearing of the koala habitat trees is carried out in a way that ensures, while the clearing is carried out, appropriate habitat links are maintained within the clearing site and between the site and its adjacent area, to allow koalas living on the site to move out of the site;

(c) no koala habitat tree in which a koala is present, and no koala habitat tree with a crown overlapping a tree in which a koala is present, is cleared.

The total area of the site is 101 ha and the impact footprint of the Master Plan is estimated to be 25.7 ha, clearing must be carried out in stages with no more than 3 ha or 3% of the Site's area cleared in any one stage. As such the clearing stages must account for clearing of an estimated 25.7 ha, and clearing is to occur in nine stages and sequentially from the northern extent towards the conservation area in the south of the Site as shown in Error! Reference source not found.. The existing gate separating the northern and southern portions of the Site must be opened prior to clearing to facilitate safe fauna movement. Additionally, the existing barbed wire fencing located internally within the Site is to be removed prior to clearing works to facilitate the safe movement of fauna away from clearing activities and to minimise fauna injury.

3.3.2 Koala Spotter

The *Nature Conservation (Koala) Conservation Pan 2017* (Part 3, Section 11) states that a Koala spotter must be present for clearing in a Koala habitat area. The Site is partially mapped within a Koala habitat area; as such, a Koala spotter will be required to supervise clearing within the Koala habitat area (**Figure 2**). However, it is recommended that a Koala spotter is present to supervise all clearing work. The primary role of the Koala spotter is to locate Koalas in trees, which can be difficult to detect. A Koala spotter is a person with demonstrable experience in:

(a) locating Koalas in Koala habitats; or

(b) conducting fauna surveys.

3.4 *Fisheries Act 1994*

Three waterways for Waterway Barrier Works are mapped within the Site - one orange 'moderate risk' waterway and two green 'low risk' waterways. The Project presents a potential risk of adverse impacts to fish passage as a result of placement of in-stream barriers. The Master Plan design demonstrates consideration of the waterways within the Site, however a review of detailed design plans will be required to determine if the development will trigger Operational work for Waterway Barrier Works. It is recommended that the

detailed design incorporate the requirements of the Accepted development requirements for operational work that is constructing or raising *waterway barrier works*. Further, a certified Erosion and Sediment Control Plan must be included in the Construction Environment Management Plan documentation.

4 Fauna Impact Assessment

4.1 Impact Assessment

The Project will result in the clearing of native vegetation that supports native fauna and least concern animal breeding places. Direct impacts may include:

- physical disturbance and disruption;
- loss of breeding resources; and / or
- direct loss of habitat or habitat features.

Indirect impacts may include:

- loss of habitat resources such as foraging grounds, prey abundance and refuge;
- alterations to habitat structure, through the loss or reduction of vegetation;
- loss of habitat connectivity;
- increases in noise and light pollution.

4.1.1 Impacts During Clearing and Construction

The clearing activities have the potential to directly impact fauna through physical disturbance and disruption, loss of breeding resources; and / or direct loss of habitat or habitat features. These impacts may occur as a result of the felling of trees containing known or suspected breeding features, including tree hollows. In the case of ground dwelling species, impacts may occur as a result of machinery crushing burrows or soil crevices. Additionally, the Project will result in the permanent removal of 133 habitat trees (i.e. of these, 67 are stags, 41 support hollow bearing limbs, and 50 trees support other habitat) and clearing of an estimated 25.7 ha of vegetation clearing resulting in a corresponding reduction in the local availability of fauna habitat. Further, clearing operations and construction may impact the Wedge-tailed eagle's breeding within the Site and has the potential to cause the pair to abandon their nest.

Indirect impacts may include erosion and sedimentation affecting downstream areas, clearing of additional habitat outside of the approved area, introduction of weeds and pests, and increased construction light and noise within the Site. It is understood that the ephemeral ponds will be retained and that clearing will not occur within proximity of these areas.

4.1.1.1 Barriers to movement

Some existing internal barbed wire fencing is present within the Site. This fencing delineates the grazing paddocks from the ungrazed paddocks. It is recommended that internal barbed wire fencing is removed prior to clearing to remove barriers and to facilitate safe fauna movement to the conservation area. The existing gate separating the northern and southern portions of the Site must be removed prior to commencement of clearing activities to allow for the safe passage of fauna from the clearing area into the conservation area (**Figure 2**).

4.1.2 Impacts During Operations

During operations, the Project may impact both directly and indirectly upon native flora and fauna within the Site. Specifically, the Site will ultimately support various sporting and recreational activities, including flood lighting, which will reduce the quality of surrounding habitat for nocturnal species. Direct impacts, such as increased vehicle strike incidence, may occur as a result of increased traffic in the area.

Indirect impacts may also occur, such as the introduction of barriers to fauna movement, and the alteration of air, noise and light quality of the surrounding environment. Such indirect impacts may consequently reduce the quality of the Site and immediate surrounds for breeding and foraging resources that are currently used by fauna. This may also lead to the improvement of surrounding habitat for disturbance tolerant species (such as crows and noisy miners) which may occur at the expense of less tolerant habitat specialists (such as small granivorous birds). These alterations may result in changes to the composition of the surrounding faunal community.

5 Impact Mitigation Measures

5.1 Design

The design measures to be considered to mitigate impacts to native fauna include:

- The design is to avoid placement of infrastructure and activities within the central waterways within the northern portion of the Site to allow for ecological and hydrological connectivity. Infrastructure located in these areas must be sensitively designed to retain ecological connectivity and allow fish passage with respect to the three mapped waterways for Waterway Barrier Works within the Site.
- The design must maximise the retention of Koala habitat trees and habitat trees within the Site by:
  - Consolidating infrastructure in previously modified areas including the grazed paddocks in the north-eastern extent of the Site; and
  - Sensitive placement of BMX tracks and pedestrian pathways informed by the tree location identified in the Arboricultural impact assessment to retain vegetation and hydrological flows.
- Lighting design is to be in accordance with the best practice lighting design detailed in the *National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds 2020*[2] and the design should consider the following:
  - Use adaptive light controls to manage light timing, intensity and colour;
  - Light only the object or area intended and keep lights as close to the ground, directed and shielded to avoid light spill;
  - Use the lowest intensity lighting appropriate for the task;
  - Use non-reflective, dark-coloured surfaces; and
  - Use lights with reduced or filtered blue, violet and ultra-violet wavelengths.
- The detailed design should incorporate the requirements of the Accepted development requirements for operational work that is constructing or raising waterway barrier works.

5.2 Pre-clearing

The pre-construction measures to be implemented to mitigate impacts to native fauna have been detailed below.

- Ensure that a High-Risk SMP for the Project has been submitted and approved by the Department of Environment and Science (DES). This SMP is to include provision for all colonial breeding species identified on Site.
- Ensure clearing works are scheduled outside of breeding season for EVNT and least concern colonial breeding species fauna identified within the Site. Specific breeding timeframes for EVNT and colonial breeding least concern species known to occur on Site must be defined in detail in the SMP.
- Ensure that this WHMP is included in the Construction Environmental Plan (CEMP) documentation and that the requirement for sequential clearing, fauna spotter catcher and separate Koala spotter is communicated to the construction contractor.
- Removal of the existing internal barbed wire fencing and gate prior to clearing to remove barriers and facilitate safe fauna movement to the conservation area.
- Sequential clearing must be in accordance with **Figure 2** towards the designated conservation area towards the southern extent on the Site. Additionally, the existing gate separating the northern and southern portions of the Site must be removed prior to commencement of clearing activities to allow for the safe passage of fauna from the clearing area into the conservation area

[2] DAWE (2020) *National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds 2020*, Department of Agriculture, Water and the Environment.

- Communication with adjoining landholders should be undertaken as a courtesy to inform of potential increases in fauna movement.
- A pre-clearance survey is to be completed by a suitably qualified person with a current Rehabilitation Permit from DES no more than two weeks prior to the commencement of clearing works.
- Flagging of habitat trees/features (e.g. arboreal termitaria and Koala habitat trees) to be completed prior to clearing by the fauna spotter catcher. Inspection of hollows and nests during the pre-clearance survey should be completed using pole mounted cameras wherever possible.

5.3 During Clearing

The following clearing measures are to be implemented to minimise direct impacts during clearing and construction.

5.3.1 Injury/mortality

- Clearing must be supervised by a fauna spotter catcher and Koala spotter. The fauna spotter catcher must be suitably qualified and hold a current Rehabilitation Permit with DES. A Koala spotter must be a person with demonstrable experience in: locating Koalas in Koala habitats; or conducting fauna surveys.
- Specific clearing requirements for Koalas specify that no tree with a Koala in it is to be felled and that works must stop if a Koala is detected and works must not recommence until the Koala has left the site. Additional requirements for Koala include:
  - a fauna spotter-catcher (Koala spotter) who is responsible for Koala spotting will be present at all times during clearing operations and will direct vegetation clearance so as to avoid harm to Koalas;
  - on the morning of commencement of clearing, a spotter catcher will conduct a Site walk through to ensure no Koalas have moved onto the Site overnight;
  - clearing of vegetation will be undertaken in a staged and sequential manner. Directional felling will be used (moving north to south towards the conservation area) as indicated in **Figure 2**;
  - unauthorised translocation of Koalas is prohibited and constitutes an offence under the NC Act. A tree in which a Koala is present, and any adjacent trees, are not to be cleared until the Koala has moved from the site of its own volition. No tree supporting a Koala (or any tree with a canopy that touches a tree with a Koala in it) will be removed until the Koala has moved on of its own accord;
  - stripped earth and vegetation is not to be stockpiled within any areas to be retained;
  - no clearing of vegetation is to occur between 6pm and 6am; and
  - as directed by the spotter catcher, understorey and non-habitat trees (e.g. juvenile vegetation) are to be removed prior to removing habitat trees.
- Minimise clearing to smallest extent necessary.
- If practicable within the broader project timeframes, clearing should occur outside of breeding and torpor periods.
- Marked habitat trees (e.g. trees containing hollows, nests, arboreal termitaria and Koala habitat trees) should be felled using an excavator with grabber attachment (preferentially) for clearing. In consultation with the spotter catcher, other methods may be used but trees must not fall to the ground in an uncontrolled manner (i.e. trees not to be pushed over).
- Felled habitat trees are to be left overnight to allow fauna to self-relocate – stockpiling within the clearing footprint is to be completed the following morning.
- Prohibition of domestic dogs and security dogs on site.
- Where hollow-bearing trees are required to be felled, these should be inspected by a fauna spotter catcher both before and after clearing.
- The details for nearby, suitable wildlife care facilities or veterinarians (detailed below) are to be included in the CEMP:
  - RSPCA – 1300 264 625
  - Bryants Road Veterinary Surgery - (07) 3801 1744
  - Daisy Hill Koala Hospital – (07) 3078 3101

- Works are to be completed in accordance with a High-Risk SMP and associated Impact Management Plan as well as a site specific CEMP.
- Conduct of emergency fauna euthanasia (if required) with adherence to the following provisions:
  - euthanasia may only occur in accordance with Section 12 and 13 of the *Code of Practice Care of Sick, Injured or Orphaned Protected Animals in Queensland*;
  - only those people trained and competent, evidence of which includes specific provisions stating same on their scientific purposes or rehabilitation permit, may undertake the euthanasia;
  - methods must be humane and produce a painless death as rapidly as possible;
  - methods which are not acceptable include: car exhaust fumes, cervical dislocation in animals larger than 150 g, drowning, freezing (for any vertebrate);
  - methods which are acceptable are described in Humane Killing of Animals used for Scientific Purposes Guidelines (James Cook University). A summary table has been provided as **Appendix C**; and
  - all legal requirements are to be met with regards to the use of certain drugs, for example sodium pentobarbitone (refer to euthanasia guidelines in **Appendix C**).

5.3.2 Physical Disturbance and Disruption

- Clearing is to be conducted in a staged and sequential manner as follows:
  - Clearing from the northern end of the Site, moving south towards the conservation area.
  - Providing enough indirect disturbance and time to allow any fauna present to leave the Site without intervention (e.g., clearing of shrubs and understorey first if present);
  - Clearing must occur in nine stages with a maximum of 3 ha clearing in one stage and allowing at least one 12-hour period from 6 pm on the day of clearing to 6am the following day in which **no** clearing occurs as shown in **Figure 2.**
  - It should be noted that any tree with a Koala in it or where the crown of an adjoining tree overlaps a tree containing a Koala must not be cleared until it has left without human intervention; and
  - Maintaining a habitat link between the clearing Site and the areas of retained vegetation during the clearing operations (i.e. clear from already open and cleared areas towards areas of retained bushland);
- Prohibition of domestic dogs and security dogs on site.
- Fell vegetation away from any vegetation which is to be retained.
- Clear vegetation in a manner that will prevent damage to vegetation to be retained.
- Where hollow-bearing trees are required to be felled, these should be inspected by a fauna spotter catcher both before and after clearing.
- Cleared hollow bearing trees should be retained and used within the retained vegetation in the southern extent of the Site to augment terrestrial fauna habitat.
- Any fauna recovered during vegetation clearance will, immediately upon capture, be inspected for any signs of physical injury. If the fauna appears to be injured, they will be immediately transported to a suitably qualified veterinary surgeon for appropriate treatment. Uninjured fauna will be relocated to the fauna relocation area shown in **Figure 2.**

5.3.3 Habitat Modification

- Minimise clearing to smallest extent necessary.
- Install flagging or similar to areas of vegetation to be retained.
- Retain any felled habitat features and place in retained areas of vegetation to provide supplementary habitat.

5.3.4 Water Quality

- Install erosion and sediment control (ESC) measures in accordance with an approved ESC Plan prior to the commencement of clearing works.
- Ensure ESC measures are functioning effectively as per the monitoring schedule in the CEMP.
- Works are to cease during rainfall events that exceed 25 mm in 24 hrs.

5.3.5 Weed infestation

- Site inductions for all personnel.
- Monitor and manage erosion and weeds following site works.
- All construction vehicles entering the Site should be washed down prior to onsite works to prevent the incursion of weeds into the Site.
- Any fill brought to Site for the proposed works should be inspected to ensure that it is clean (i.e. free from weed seeds) prior to use.
- Works to be completed in accordance with CEMP.

5.3.6 Noise and light pollution

- Works to be completed in accordance construction hours specified within CEMP.
- Avoid night works wherever possible.

5.4 Post-clearing and Construction

Following completion of clearing, exclusion fencing is to be maintained for the full period of construction to reduce the likelihood of fauna re-entering the Site. It is recommended that surveys are completed within the fauna relocation area at regular intervals during construction to investigate for signs of fauna death or stress. Any evidence of this should be investigated and reported as required.

At the completion of all vegetation clearance, a brief post works Fauna Management Report is to be completed by the fauna spotter catcher. This report is to contain:

- details on any incidents that occurred during the works;
- details on any translocated fauna (such as species, location of release, time of release, condition of animal, etc.);
- provide an evaluation of the fauna management techniques; and
- provide recommendations relating to any appropriate future management measures.

5.5 Operations

5.5.1 Injury/mortality

- Ensure operational activities within retained vegetation are prohibited (e.g. by installing fencing).
- Restrict speed on internal site roads/driveways.

5.5.2 Physical disturbance and disruption

- Ensure fauna-friendly fencing is established in accordance with the Koala Sensitive Design Guideline[3].
- Ensure operational activities within retained vegetation are prohibited (e.g. by installing fencing).
- Restrict speed on internal site roads/driveways.

5.5.3 Weed infestation

- Monitor the status of weed infestations following Site works and manage as necessary.

[3] DES (2020) *Koala-sensitive Design Guideline* (online) https://environment.des.qld.gov.au/__data/assets/pdf_file/0025/102859/koala-sensitive-design-guideline.pdf Department of Environment and Science.

- All operational vehicles entering the site should be clean and free of weed seed to prevent the incursion of weeds into the site.

5.5.4 Water quality

- Maintain ESC measures in accordance with an approved ESC Plan following on from clearing works.
- Ensure ESC measures are functioning effectively as per the monitoring schedule in the CEMP.

5.5.5 Noise and light pollution

- Operational hours of the Sporting Facility must be restricted to the approved operational hours.
- Ensure lighting and street lightings are regularly maintained to ensure fauna sensitive measures are effective and functioning.

6 Project Risk Assessment

6.1 Project Risk Assessment

The mitigation and management measures outlined in **Table 6-1** have been developed based on the proposed concept layout shown in the Master Plan (**Appendix A**) and are generally in accordance with accepted best management practices for tree clearing and construction operations.

The damage mitigation hierarchy focuses on preferentially avoiding, minimising, and mitigating impacts. This is primarily focussed on the clearing activities proposed, as these have the greatest likelihood of impact to native fauna and their breeding places within the Site.

To assess the suitability of proposed measures, a risk assessment has been undertaken. The results of this assessment are presented in **Table 6-1.** The risk assessment demonstrates that the unmitigated risk levels are reduced by the proposed measures. The risk assessment criteria matrix used to develop **Table 6-1** have been provided as **Appendix D**.

The risk ratings presented in **Table 6-1** are to be interpreted as follows:

- **Low**: Risk can be adequately managed by routine procedures and work practices;
- **Medium**: Control measures other than administrative controls are needed;
- **High**: Significant risk control measures need to be implemented before works commence and must be maintained; and
- **Critical**: Operations are not to be undertaken without extensive risk control and mitigation measures in place prior to the commencement of works and such measures must be maintained for the duration of the project.

Table 6-1 Risk assessment for proposed mitigation measures

Job Step	Possible Impacts	Unmitigated Risk Rating	Control Measures	Residual Risk Rating
Design			▪ The design is to avoid placement of infrastructure and activities within the central waterways within the northern portion of the Site to allow for ecological and hydrological connectivity. Infrastructure located in these areas must be sensitively designed to retain ecological connectivity and allow fish passage. ▪ The design must maximise the retention of Koala habitat trees and habitat trees within the Site by: – Consolidating infrastructure in previously modified areas including the grazed paddocks in the north-eastern extent of the Site; and – Sensitive placement of BMX tracks and pedestrian pathways informed by the tree location identified in the Arboricultural impact assessment to retain vegetation and hydrological flows. ▪ Lighting design is to be in accordance with the best practice lighting design detailed in the National Light Pollution Guidelines for Wildlife including marine	

Job Step	Possible Impacts	Unmitigated Risk Rating	Control Measures	Residual Risk Rating
			turtles, seabirds and migratory shorebirds 2020 and the design should consider the following: – Use adaptive light controls to manage light timing, intensity and colour; – Light only the object or area intended and keep lights as close to the ground, directed and shielded to avoid light spill; – Use the lowest intensity lighting appropriate for the task; – Use non-reflective, dark-coloured surfaces; and – Use lights with reduced or filtered blue, violet and ultra-violet wavelengths. ▪ The detailed design should incorporate the requirements of the *Accepted development requirements for operational work that is constructing or raising waterway barrier works.*	
Pre-clearing	Poor planning leading to injury/mortality during clearing	High	▪ Ensure clearing works are scheduled outside of breeding season for fauna identified within the Site. Breeding timeframes for EVNT and colonial breeding species must be defined in detail in the SMP. ▪ Ensure that a High-Risk SMP has been submitted and approved by DES for the proposed clearing works. The SMP should include provision for all colonial breeding species on Site. ▪ Ensure that this WHMP is included in the Construction Environmental Plan (CEMP) documentation and that of the requirement for sequential clearing and fauna spotter catcher and separate Koala spotter is communicated to the construction contractor. ▪ Sequential clearing must be in accordance with Figure 2 towards the designated conservation area towards the southern extent of the Site. Additionally, the gates to the conservation area must remain open to ensure fauna movement is not jeopardized. ▪ Communication with adjoining landholders should be undertaken as a courtesy to inform of potential increases in fauna movement. ▪ A pre-clearance survey is to be completed by a suitably qualified person with a current Rehabilitation Permit from DES no more than two weeks prior to the commencement of clearing works. ▪ Flagging of habitat trees/features (e.g. arboreal termitaria, nests, and Koala habitat trees) is to be completed prior to clearing by the fauna spotter catcher. Inspection of hollows and nests during the pre-clearance survey should be completed using pole mounted cameras wherever possible.	Medium
Clearing	Injury/mortality	High	▪ Fauna spotter catcher and Koala spotter present for all clearing works. ▪ Obtain a High-risk SMP approval from the Department of Environment and Science (DES) prior to commencing clearing. Clearing timeframes should be	Medium

Job Step	Possible Impacts	Unmitigated Risk Rating	Control Measures	Residual Risk Rating
			scheduling around breeding periods for EVNT and colonial breeding species as defined in the SMP. ▪ Minimise clearing to smallest extent necessary. ▪ Install flagging or similar to areas of vegetation to be retained. ▪ Flagging of habitat trees/features to be completed prior to clearing. ▪ Clearing to be completed sequentially with areas of lower breeding feature density cleared first to provide a disturbance mechanism for fauna to self-relocate from adjoining habitat. ▪ Clearing is generally to progress from north to south towards the defined conservation area. ▪ Clearing of the Site must occur in nine stages with a 12 hour period (6 pm and 6 am the following day) between clearing stages. ▪ If practicable within the broader project timeframes, clearing should occur outside of breeding and torpor periods. ▪ Wildlife carers and vets to be advised one week in advance of clearing commencement date. ▪ Ensure clearing contractors have been provided with the SMP and this WHMP prior to commencing works. ▪ Clearing of marked habitat trees to be felled preferentially using an excavator with grabber attachment for clearing. In consultation with spotter catcher, other methods may be used but trees must not fall to the ground in an uncontrolled manner (i.e. trees not to be pushed over). ▪ Fauna spotter catcher and Koala spotter to be present on site during all clearing activities. ▪ Felled habitat trees to be left overnight to allow fauna to self-relocate – stockpiling within the clearing footprint is to be completed the following morning. ▪ Works to be completed in accordance with SMP and a site specific Construction Environment Management Plan (CEMP).	
	Physical disturbance and disruption	High	▪ Sequential clearing to be undertaken away from the northern extent of the Site and moving south towards the defined conservation area. ▪ Minimise clearing to smallest extent necessary. ▪ Install flagging or similar to areas of vegetation to be retained. ▪ Where possible, conduct clearing outside key breeding/torpor periods. ▪ Use of excavator with grabber attachment for clearing (trees not to be pushed over).	Medium

Job Step	Possible Impacts	Unmitigated Risk Rating	Control Measures	Residual Risk Rating
			▪ Fauna spotter catcher and Koala spotter to be present on site during all clearing activities. ▪ Felled habitat trees to be left overnight to allow fauna to self-relocate – stockpiling within the clearing footprint to be completed the following morning. ▪ Captured fauna to be released as close as safely possible to site of capture. ▪ Works to be completed in accordance with SMP and CEMP.	
	Habitat modification	High	▪ Minimise clearing to smallest extent necessary. ▪ Install flagging or similar to areas of vegetation to be retained. ▪ Retain any felled habitat features and place in retained areas of vegetation to provide supplementary habitat.	Medium
	Weed infestation	Medium	▪ Site inductions for all personnel. ▪ Monitor and manage erosion and weeds following site works. ▪ Works to be completed in accordance with CEMP.	Low
	Noise and light pollution	Medium	▪ Works to be completed in accordance with CEMP. ▪ Works to cease during rainfall that exceeds 25 mm in 24 hrs. ▪ Avoidance of night works wherever possible.	Low
Post-clearing and Construction	Injury/mortality	Medium	▪ Install flagging or similar to areas of retained vegetation. ▪ Activities within retained vegetation prohibited. ▪ Restrict speed on internal site roads/driveways.	Low
	Physical disturbance and disruption	Medium	▪ Activities within retained vegetation prohibited. ▪ Restrict speed on internal site roads.	Low
	Weed infestation	Medium	▪ Site inductions for all personnel. ▪ Monitor and manage weeds following site works. ▪ Works to be completed in accordance with CEMP including a Weed Management Plan.	Low
	Noise and light pollution	Medium	▪ Works to be completed in accordance with CEMP. ▪ Works to be completed during daylight hours.	Low
Operations	Injury/mortality	Medium	▪ Ensure operational activities within retained vegetation are prohibited (e.g. by installing temporary construction fencing). ▪ Restrict speed on internal site access roads.	Low
	Water Quality	Medium	▪ Maintain ESC measures in accordance with an approved ESC Plan following on from clearing works.	Low

Job Step	Possible Impacts	Unmitigated Risk Rating	Control Measures	Residual Risk Rating
			▪ Ensure ESC measures are functioning effectively as per the monitoring schedule in the CEMP.	
	Weed infestation	Medium	▪ Monitor and manage weeds following site works. ▪ All operational vehicles entering the site should be clean and free of weed seed to prevent incursion of weeds into the site.	Low
	Noise and light pollution	Medium	▪ Operational hours must be restricted to the stated operational hours; ▪ Ensure lighting and flood lighting is regularly maintained to ensure fauna sensitive measures are effective and functioning.	Low

Figures

FIGURE 1 – HABITAT FEATURES

FIGURE 2 – WILDLIFE HABITAT MANAGEMENT PLAN

Legend

- Cadastre (QSpatial, 2018)
- Site Boundary
- Waterways (Masterplan)
- Aquatic Habitat

EVNT

- Koala scat
- Koala - Camera trap

Habitat Features

- Log
- Nest
- Wedge Tailed Eagle Nest
- Habitat tree

Mapped Regional Ecosystems

- Category A or B area containing endangered RE
- Category A or B area containing of concern RE
- Category A or B area containing least concern RE
- Category C or R area containing endangered RE
- Category C or R area containing of concern RE
- Category C or R area containing of concern RE

12.9-10.4
12.9-10.4
12.11.24/12.11.25
12.11.24/12.11.25
12.9-10.4
12.3.11
non-rem
12.11.24/12.11.25
12.3.11
12.9-10.4
222
223
non-rem
12.3.11
12.3.11
n-rem
12.11.24/12.11.25
219
220
12.3.11
12.3.11
non-rem
12.11.23/12.11.27
12.11.23/12.11.27
218
12.11.23/12.11.27
12.11.23/12.11.27
12.11.23/12.11.27
non-rem
non-rem
12.3.11
12.3.11
12.11.23/12.11.27
12.11.23/12.11.27
12.11.23/12.11.27
12.11.23/12.11.27

Redland CITY COUNCIL

FIGURE 1
1:5,000 Scale at A3

m
0 50 100 150 200

Habitat Features

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-11-27 | Project: NE30016
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30016-GS-003_EcologicalFeatures.mxd 01
Aerial Imagery supplied by Nearmap (May, 2020)

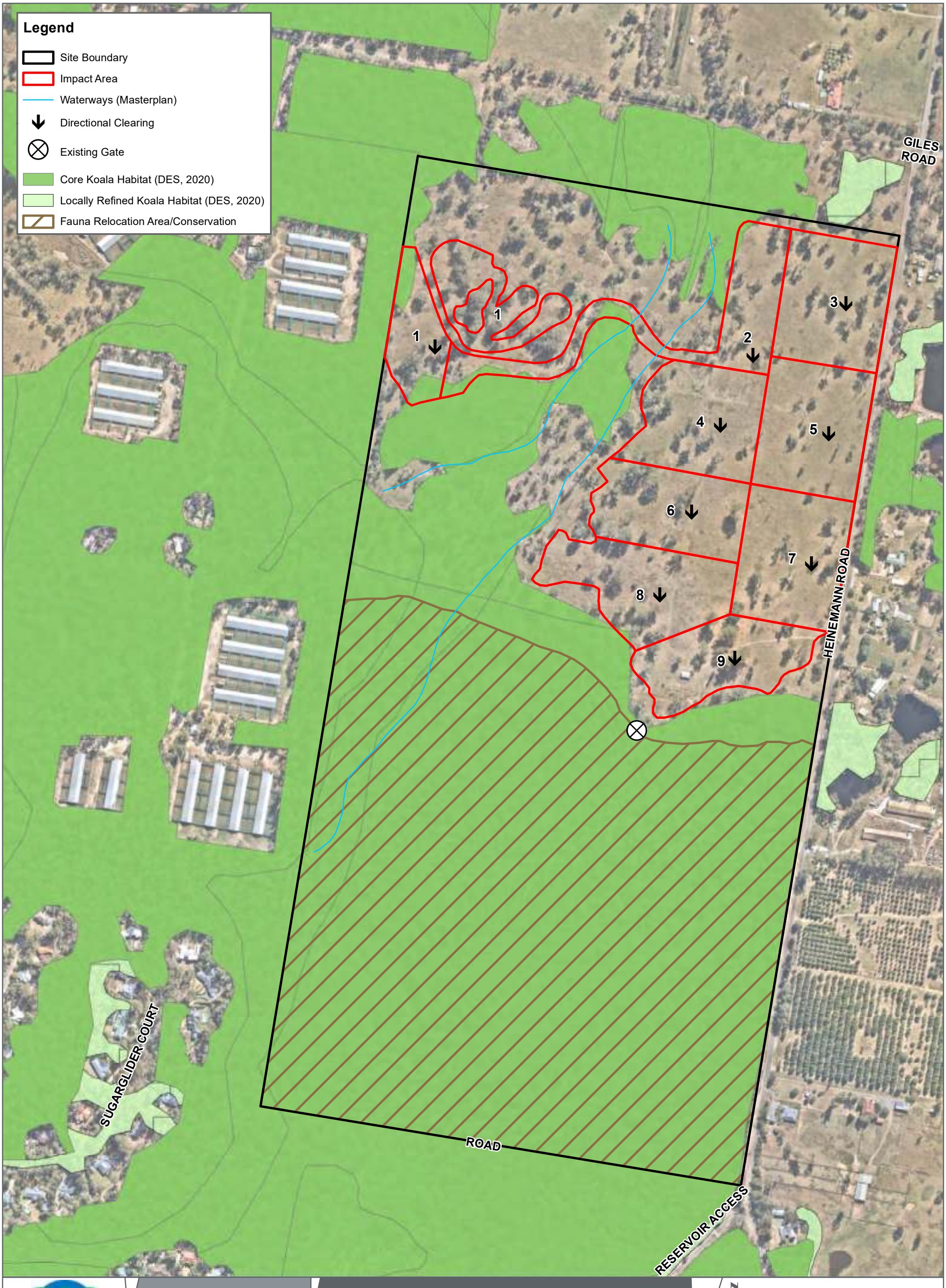


FIGURE 2

1:5,000 Scale at A3

m

0 50 100 150 200

Wildlife Habitat Management Plan

REDLANDS SPORTS PRECINCT
BRISBANE, QLD

Redland CITY COUNCIL

Cardno

Map Produced by Cardno QLD Pty Ltd
Date: 2020-11-27 | Project: NE30016
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30016-GS-010_WildlifeHabitatMgmtPlan 02.mxd 01
Aerial Imagery supplied by Nearmap (May, 2020)

APPENDIX

A

EXTRACT OF MASTER PLAN

Redlands Coast Regional Sport and Recreation Precinct Master Plan - Sub-precincts

1 ***Sports field sub-precinct***
Includes lit rectangular playing fields on benches, two clubhouses, formal and overflow car parking and small recreation node

2 ***Recreation sub-precinct***
Includes regional-level play and activity node, barbecues and picnic facilities, kickabout and field games area, sealed multi-use paths and formal car parking

3 ***Bike activity sub-precinct***
Includes criterium track incorporating three loops, bmx track with track marshal's observation tower and administration booth, pump track, shared clubhouse, formal and overflow car parking

4 ***Wetland and forest sub-precinct***
Includes sealed multi-use paths, raised boardwalks, unsealed tracks amongst inviting vegetation and wetland areas

5 ***Conservation sub-precinct***
Includes unsealed tracks and trails for a mix of users



APPENDIX

B

FAUNA SPECIES LIST

Class	Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status
Fauna					
amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog	C	-
amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog	C	-
amphibians	Bufonidae	*Rhinella marina*	cane toad	-	-
amphibians	Myobatrachidae	*Uperoleia fusca*	dusky gungan	C	-
birds	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill	C	-
birds	Ptilonorhynchidae	*Ailuroedus crassirostris*	green catbird	C	-
birds	Anatidae	*Anas superciliosa*	Pacific black duck	C	-
birds	Accipitridae	*Aquila audax*	wedge-tailed eagle	C	-
birds	Ardeidae	*Bubulcus ibis*	cattle egret	C	-
birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C	-
birds	Cacatuidae	*Cacatua sanguinea*	little corella	C	-
birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo	C	-
birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C	-
birds	Anatidae	*Chenonetta jubata*	Australian wood duck	C	-
birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C	-
birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C	-
birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)	C	-
birds	Corvidae	*Corvus coronoides*	Australian raven	C	-
birds	Corvidae	*Corvus orru*	Torresian crow	C	-
birds	Phasianidae	*Coturnix ypsilophora*	brown quail	C	-
birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C	-
birds	Artamidae	*Cracticus torquatus*	grey butcherbird	C	-
birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra	C	-
birds	Dicruridae	*Dicrurus bracteatus bracteatus*	spangled drongo (eastern Australia)	C	-
birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron	C	-
birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C	-
birds	Cacatuidae	*Eolophus roseicapilla*	galah	C	-
birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C	-
birds	Cuculidae	*Eudynamys orientalis*	eastern koel	C	-
birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C	-
birds	Columbidae	*Geopelia striata*	peaceful dove	C	-
birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C	-
birds	Artamidae	*Gymnorhina tibicen*	Australian magpie	C	-
birds	Hirundinidae	*Hirundo neoxena*	welcome swallow	C	-
birds	Maluridae	*Malurus lamberti*	variegated fairy-wren	C	-
birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C	-
birds	Meliphagidae	*Manorina melanocephala*	noisy miner	C	-
birds	Meliphagidae	*Manorina melanophrys*	bell miner	C	-
birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C	-
birds	Meropidae	*Merops ornatus*	rainbow bee-eater	C	-
birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C	-
birds	Estrildidae	*Neochmia temporalis*	red-browed finch	C	-
birds	Columbidae	*Ocyphaps lophotes*	crested pigeon	C	-
birds	Pachycephalidae	*Pachycephala pectoralis youngi*	golden whistler (south-eastern Australia)	C	-
birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C	-
birds	Pardalotidae	*Pardalotus striatus*	striated pardalote	C	-
birds	Psittacidae	*Parvipsitta pusilla*	little lorikeet	C	-
birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant	C	-
birds	Columbidae	*Phaps chalcoptera*	common bronzewing	C	-
birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C	-
birds	Meliphagidae	*Phylidonyris niger*	white-cheeked honeyeater	C	-
birds	Psittacidae	Platycercus adscitus palliceps	pale-headed rosella (southern form)	C	-
birds	Podargidae	*Podargus strigoides*	tawny frogmouth	C	-
birds	Psophodidae	*Psophodes olivaceus*	eastern whipbird	C	-
birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C	-
birds	Rhipiduridae	*Rhipidura leucophrys leucophrys*	willie wagtail (southern)	C	-
birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C	-
birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	C	-
birds	Halcyonidae	*Todiramphus macleayii*	forest kingfisher	C	-
birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C	-
birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet	C	-
birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C	-
malacostracans	Parastacidae	*Cherax depressus*	orange-fingered yabbie	-	-
mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Quee	C	-
mammals	Bovidae	*Bos taurus*	European cattle	-	-
mammals	Canidae	*Canis lupus familiaris*	dog	-	-

Class	Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status
Fauna					
mammals	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C	-
mammals	Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat	C	-
mammals	Equidae	*Equus caballus*	horse	-	-
mammals	Leporidae	*Lepus europaeus*	European brown hare	-	-
mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C	-
mammals	Macropodidae	*Macropus parryi*	whiptail wallaby	C	-
mammals	Macropodidae	*Macropus rufogriseus*	red-necked wallaby	C	-
mammals	Miniopteridae	*Miniopterus australis*	little bent-wing bat	C	-
mammals	Molossidae	*Mormopterus norfolkensis*	east coast freetail bat	C	-
mammals	Muridae	*Mus musculus*	house mouse	-	-
mammals	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat	C	-
mammals	Petauridae	*Petaurus breviceps*	sugar glider	C	-
mammals	Phascolarctidae	*Phascolarctos cinereus*	koala	V	V
mammals	Muridae	*Rattus norvegicus*	brown rat	-	-
mammals	Muridae	*Rattus Rattus*	black rat	-	-
mammals	Vespertilionidae	*Scotorepens sp. (Parnaby)*	central-eastern broad-nosed bat	C	-
mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	-
mammals	Molossidae	*Tadarida australis*	white-striped freetail bat	C	-
mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C	-
mammals	Canidae	*Vulpes vulpes*	red fox	-	-
mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby	C	-
ray-finned fishes	Poeciliidae	*Gambusia holbrooki*	mosquitofish	-	-
ray-finned fishes	Eleotridae	*Hypseleotris galii*	firetail gudgeon	-	-
reptiles	Scincidae	*Cryptoblepharus virgatus*	striped snake-eyed skink	C	-
reptiles	Elapidae	*Demansia psammophis*	yellow-faced whipsnake	C	-
reptiles	Agamidae	*Diporiphora australis*	tommy roundhead	C	-
reptiles	Agamidae	*Intellagama lesueurii*	eastern water dragon	C	-
reptiles	Agamidae	*Pogona barbata*	bearded dragon	C	-
reptiles	Varanidae	*Varanus varius*	lace monitor	C	-

APPENDIX

C

EUTHANASIA GUIDELINES

Wildlife

Animal Type	Recommended	Acceptable
Crustaceans and molluscs	• MS-222 • CO_2 bubbled in water • Clove oil (AQUI-S)	• Chilling followed by a secondary method
Cephalopods	• MS-222 • Clove oil (AQUI-S) • Magnesium salts immersion	• Pithing
Amphibians	• MS-222 (solution or IP) • Benzocaine (after neutralising solution) • Clove oil (AQUI-S) • Pentobarbitone IP	• Overdose of anaesthetic followed by pithing • Stunning followed by decapitation • Pithing • Hypothermia (warm water species) followed by pithing
Reptiles	• Pentobarbitone IV or MS-222 IP	• Overdose of anaesthetic followed by pithing • Stunning followed by decapitation or pithing • Pentobarbitone IP
Turtles and tortoises	• Captive bolt (large turtles) • MS-222 IP (small turtles and tortoises)	• Stunning followed by secondary method • Pentobarbitone IP
Fish	• MS-222 (solution or IP) • Benzocaine immersion (after neutralising solution) • Clove oil (AQUI-S) • Hypothermia (warm water species) followed by pithing	• Stunning and brain destruction • Cervical dislocation • Stunning followed by pithing • Pentobarbitone IP
Birds – small (wren, finch, small parrots)	• Pentobarbitone IH or PO • Carbon dioxide inhalation	• Inhalation anaesthetics overdose • Cervical dislocation • Decapitation
Birds – medium (cockatoos, large parrots, magpie, ducks)	• Pentobarbitone IV or IH • Carbon dioxide inhalation	• Gunshot • Inhalation anaesthetics overdose • Cervical dislocation • Decapitation

Birds (Emu, ostrich, geese, pelican, stork)	• Pentobarbitone IV • Injectable anaesthesia overdose followed by secondary method	• Gunshot • Inhalation anaesthetics overdose
Bats	• Carbon dioxide inhalation • Pentobarbitone IP	• Cervical dislocation (under 150g only) • Decapitation • Stunning and exsanguination • Inhalational anaesthetics followed by a secondary method
Mammals under 300g (mice, rats, small dasyurids, small possums, small bats)	• Carbon dioxide inhalation • Pentobarbitone IV, IP or IH	• Cervical dislocation (under 150g only) • Decapitation • Stunning and exsanguination • Inhalational anaesthetics followed by a secondary method
Mammals over 300g under 5kg (larger possums, quoll, mala, small macropods, echidna)	• Pentobarbitone IV, IP or IH	• Injectable anaesthesia overdose followed by secondary method • Gunshot
Mammals over 5kg (kangaroos, wallabies, wombats, koala)	• Pentobarbitone IV	• Injectable anaesthesia overdose followed by secondary method • Gunshot • Stunning followed by exsanguination
Marine mammals	• Pentobarbitone IV or IP • Captive bolt	• Inhalational anaesthesia overdose followed by secondary method

IV – intravenous, IH – Intrahepatic, IP – intraperitoneal, PO – per os (orally) (NB the humane provision of pentobarbitone is facilitated by the provision of an anaesthetic or sedative)

Acceptable methods of early life stages of animals

Animal Type	Recommended	Acceptable
Laboratory rodents		
Embryos and foetuses <15 days gestation	Euthanasia of mother and/or removal of foetus and decapitation	
Foetuses >15 days gestation	• Pentobarbitone IP • Decapitation	• Hypothermia followed by secondary method (including fixation if furless) • Anaesthesia followed by secondary method including fixation (if fur is present)

Neonates <10 days	• Pentobarbitone IP • Decapitation	• Hypothermia followed by secondary method (<7 days only) • Stunning and cervical dislocation or decapitation • Anaesthetic overdose followed by secondary method
Rabbits and guinea pigs		
Embryos and foetuses <50% of gestation	• Euthanasia of mother and/or removal of foetus	
Foetuses >50% of gestation	• Pentobarbitone • Decapitation	• Cervical dislocation
Neonates <10 days	• Pentobarbitone	• Decapitation • Cervical dislocation
Larger mammals		
Embryos and foetuses <50% gestation	Euthanasia of mother and/or removal of foetus	
Foetuses >50% gestation	• Pentobarbitone IP	• Stunning followed by secondary method
Neonates (pre-weaning)	• Pentobarbitone IP	• Stunning followed by secondary method
Marsupials		
Pouch young <50g (no fur)	• Pentobarbitone	• Decapitation
Amphibians and fish		
Eggs	• MS-222 • Destroy viability of the egg (freeze, puncture, hypochlorite solution)	• Cooling (4°C, 20 minutes) followed by fixation or rapid freezing (liquid N_2)
Tadpoles/larvae/fry	• MS-222 • Benzocaine (after neutralising solution)	• Decapitation
Reptiles and Birds		
Eggs/embryos <50% gestation	• Destroy viability of the egg (freeze, shake, puncture, inject pentobarbitone)	
Eggs/embryos >50% gestation and hatchlings	• Pentobarbitone • Decapitation (depending on size) • Cervical dislocation (depending on size)	• Pithing if foetus is large enough Carbon dioxide inhalation • Inhalational anaesthetic overdose followed by secondary method

Unacceptable methods

The following methods are not acceptable as a primary method of humane killing:
• Air embolism (injection of air intravenously)
• The use of chloral hydrate, chloroform or ether (usually by inhalation)

• Drowning
• Hypothermia (adult exothermic animals)
• Exsanguination (without preceding loss of consciousness)
• Formaldehyde immersion or injection
• Non-penetrative captive bolt
• Stunning
• Intravenous potassium chloride, magnesium sulphate or neuromuscular blockers
• Smothering or strangulation
• Freezing
• Toxins or poisons
• Thoracic compression

APPENDIX

D

RISK ASSESSMENT MATRIX

Table 1-1 Definitions of 'Likelihood' for risk assessment

	Likelihood					
Historical	Unheard of in the industry	Has occurred once or twice	Has occurred many times in the industry but never for this activity	Has occurred once or twice for this activity	Has occurred frequently for the activity	Has occurred frequently at the location
Frequency (continuous operation	Once every 10,000 to 100,000 years	Once every 1,000 to 10,000 years	Once every 100 to 1000 years	Once every 10 to 100 years	Once every 1 to 10 years	More than once per year
Probability (single activity)	1:100,000 to 1,000,000	1:10,000 to 100,000	1:1,000 to 10,000	1: 100 to 1,000	1:10-100	>1:10
	1	**2**	**3**	**4**	**5**	**6**
	Remote	**Highly Unlikely**	**Unlikely**	**Possible**	**Likely**	**Highly Likely**

Table 1-2 Definitions of 'Consequences' for risk assessment.

Consequences	Protected Species	Ecological Diversity	Water Quality	Air Quality	Soil and Groundwater	Protected Areas	Cultural Heritage (indigenous and European)
Catastrophic	▪ Eradication of local population. ▪ Total loss of critical habitat.	▪ Significant and permanent effects on a regional scale (State/Bioregion).	▪ Continuous or regular contamination above background or recognised levels at a regional scale (State/Bioregion).	▪ Continuous exceedance above recognised standards. ▪ Fatality possible.	▪ Extensive off-site contamination on a regional scale. ▪ Cost of effective treatment not possible. ▪ Sustained damage to humans and environment likely.	▪ Permanent impact to one or more values of a protected area.	▪ Significant permanent impact on aesthetic, heritage, economic or recreational values. ▪ Societal benefits do not outweigh impacts.
Massive	▪ Extensive impact on population/s ▪ Significant impact of critical habitat	▪ Significant and permanent effect of large scale (Catchment)	▪ Continuous or regular contamination above background or recognised levels at a large scale (Catchment).	▪ Frequent and sustained exceedance above recognised standards. ▪ Fatality possible.	▪ Extensive off-site contamination on a medium scale. ▪ Treatment difficult/expensive. ▪ Damage to environment and humans possible.	▪ Significant long-term impact on one or more protected areas values.	▪ Significant long-term impact on aesthetic, heritage, economic or recreational values. ▪ Societal benefits do not outweigh impacts.
Major	▪ Large disruptions to most of population. ▪ Minor impacts on critical habitat. ▪ Overall population viability maintained.	▪ Significant and permanent effects on a medium scale (sub-catchment)	▪ Continuous or regular contamination above background or recognised levels at a medium scale (Sub-catchment).	▪ Frequent, short term exceedance above recognised standards. ▪ Illness possible, environmental impacts possible.	▪ Extensive off-site contamination probable. ▪ Treatment difficult/expensive. ▪ Limited threat to environment and humans.	▪ Moderate long-term impact on one or more protected areas values.	▪ Moderate impact on aesthetic, heritage, economic or recreational values. ▪ Societal benefits do not outweigh impacts.
Moderate	▪ Minor disruptions to small part of population. ▪ Minor and reversible	▪ Reduction in diversity on a medium scale (Sub-catchment).	▪ Continuous or regular contamination above background or recognised levels at a local to medium scale	▪ Frequent temporary exceedance above recognised standards.	▪ Moderate contamination contained within Site. ▪ Readily treated.	▪ Moderate medium-term impact on one or more protected areas values.	▪ Moderate impact on aesthetic, heritage, economic or

Consequences	Protected Species	Ecological Diversity	Water Quality	Air Quality	Soil and Groundwater	Protected Areas	Cultural Heritage (indigenous and European)
	impacts on critical habitat. ▪ Overall population viability maintained	▪ Overall ecological integrity is maintained. ▪ Impacts to community and species regionally abundant.	(waterway to Sub-catchment).	▪ Illness possible, environmental impacts possible.	▪ No significant threat to environment or humans.	▪ Full recovery expected.	recreational values. ▪ Societal benefits outweigh impacts.
Minor	▪ Minor and temporary disruptions to small part of population ▪ No impact to critical habitat.	▪ Reduction in diversity on a localised scale (site level). ▪ Overall ecological integrity is maintained. ▪ Impacts to community and species regionally abundant.	▪ Continuous or regular contamination below background or recognised levels at a local scale (single waterway).	▪ Occasional and temporary exceedance above recognised standards. ▪ No human or environmental impacts.	▪ Minor contamination contained within Site. ▪ Readily treated. ▪ No threat to environment or humans.	▪ Minor medium-term impact on one or more protected areas values. ▪ Full recovery expected.	▪ Minor impact on aesthetic, heritage, economic or recreational values.
Slight	▪ Impact limited to behavioural responses by species.	▪ Very minor reduction in diversity at a local scale (site level). ▪ Overall ecological integrity is maintained. ▪ Impacts to community and species regionally abundant.	▪ Occasional contamination below background or recognised levels at a local scale (single waterway).	▪ Very infrequent and temporary exceedance above recognised standards. ▪ No human or environmental impacts.	▪ Minor contamination contained within Site. ▪ No groundwater impacts ▪ Readily treated. ▪ No threat to environment or humans.	▪ Minor short-term impact on one or more protected areas values.	▪ Negligible impact on aesthetic, heritage, economic or recreational values.

Table 1-3 Risk Matrix

Consequence	1 Remote	2 Highly unlikely	3 Unlikely	4 Possible	5 Likely	6 Highly likely
Catastrophic						
Massive					Critical	
Major				High		
Moderate			Medium			
Minor		Low				
Slight						

APPENDIX

J

VEGETATION MANAGEMENT PLAN

Vegetation Management Plan

Redlands Coast Regional Sports and Recreation Precinct

NE30016



Prepared for

Redland City Council

28 July 2020

Cardno

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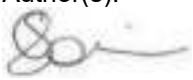
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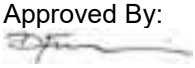
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Date Approved	28/07/2020

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
1	30/06/2020	Draft for client consideration	SS	DF
2	28/07/2020	Final with additional survey	MT	DF

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Appendices

Appendix A Tree Plans

Appendix B Arborist Report

1 Introduction

This Vegetation Management Plan (VMP) has been prepared in relation to the Redlands Coast Regional Sports and Recreation Precinct as part of the master planned development of the property located at 277-293 Heinemann Road, Mount Cotton, also described as Lot 420 on S312160 (the Site).

The purpose of the Precinct is to deliver sport, recreation and conservation outcomes for the community. The Site on which the Precinct is proposed to be developed is approximately 101 hectares (ha) in size. The northern portion of the Site will primarily accommodate sporting facilities, while the southern extent which includes an estimated 52 ha will be retained and enhanced as a conservation reserve.

This VMP considers 'Significant Trees' located in areas to be likely subject to construction activities associated with sporting facilities in the northern portion of the Site. Significant Trees within areas likely to be subject to earthworks (i.e. sporting fields, car parks, roads and the sealed criterium track) plus a 6m buffer were located by the project arborist. For the purpose of this VMP a Significant Tree is defined as:

- Any tree with a DBH ≥40cm; or
- Any tree that has a DBH <40cm that is one or more of the following:
    - Listed as a threatened species under Commonwealth or State legislation or a species regarded of significance by Council in Appendix 1 of PSP1;
    - Hollow bearing trees and trees with nests;
    - All non-juvenile koala habitat trees (i.e. species in the genera of *Eucalyptus, Corymbia, Melaleuca, Lophostemon* and *Angophora* that are >4m in height or has a trunk with a circumference of >31.5cm at 1.3 m above the ground.)

This VMP has been prepared to address the potential impacts to vegetation associated with establishing the facility including:

- Clearing and grubbing works;
- Construction of sporting recreational facilities; and
- Protection of vegetation to retain during the 'construction phase' of the development.

The Precinct is in the concept master planning stage, and as such this plan will require amendment to reflect detailed design drawings.

Plans illustrating trees subject to the VMP is provided as **Appendix A** and the Arborist report is provided as **Appendix B** which records the particulars for individual trees.

2 Responsibilities

Site Environment Officer –

- Ensure a site induction is provided for all contractual staff and employees to inform on the requirements of this VMP.
- Ensure all staff are familiar with vegetation retention areas.
- Responsible for coordinating the involvement of the project fauna spotter-catcher, koala spotter and project arborist.
- Responsible for coordinating and submitting necessary reporting and monitoring.

Fauna Spotter Catcher and Koala Spotter–

- Responsible for undertaking the pre-clearing fauna trapping program.
- Responsible for the management of animal welfare issues during the clearing and as required during the importation of fill.
- Responsible for post-clearing report.

Project Arborist –

- Ensure all tree protection measures are installed properly prior to clearing.
- Ensure clearing around trees to be retained is carried out in the required manner.

3 Existing Environment

3.1 Vegetation Communities

Areas of non-remnant vegetation in the Site are characterised as pastoral land that has been subject to historic clearing with the exception of scattered large eucalyptus trees. These large trees include *Eucalyptus tereticornis, E. racemosa* and *E. pilularis* specimens that often support hollows. The ground layer is dominated by exotic *Sporobolus pyramidalis* (Giant rat's tail grass) in some locations and the native species *Imperata cylindrica* (Blady grass) dominates in others. The ground layer also is characterised by an abundance of exotic herbs and forbs, including *Senecio madagascariensis* (Fire weed).

Melaleuca dominated swamp areas are associated with watercourses and associated alluvial plains. *Melaleuca quinquenervia* and *Eucalyptus tereticornis* dominated the canopy in these areas, which also supported a sub-canopy largely containing *M. quinquenervia*. The shrub layer, where present, was observed to support a number of *Solanum* species including *S. stelligerum* and the exotic *S. torvum*. The ground layer generally included *Juncus* species and *Axonopus compressus*. This vegetation community aligns with RE 12.9-10.4 which allows for the presence of *M. quinquenervia* and *E. tereticornis* on lower slopes.

Areas mapped as regrowth of heterogeneous patches of REs 12.11.24/12.11.25 support vegetation that has greater affiliations with RE 12.11.23.

Remnant and regrowth vegetation described as RE 12.3.11 was confirmed within the Site. The canopy strata of this community was observed to support *E. tereticornis*, *E. siderophloia* and *E.* The sub canopy strata included *M. quinquenervia* and *Lophostemon suaveolens*. The shrub layer in these areas was generally absent and the ground layer includes *Imperata cylindrica*.

3.2 Declared Weeds

The Site supports a number of weed species, although none are at a density that is significantly impacting on the ecology of the Site. The following list includes all of the Restricted Invasive Plants, declared under the provisions of the *Biosecurity Act 2014*, which were observed within the Site.

- *Asparagus aethiopicus* (Asparagus fern);
- *Cinnamomum camphora* (Camphor laurel);
- *Eichhornia crassipes* (Water hyacinth);
- *Lantana camara* (Lantana);
- *Lantana montevidensis* (Creeping lantana);
- *Senecio madagascariensis* (Fireweed);
- *Anredera cordifolia* (Madeira vine);
- *Bryophyllum delagoense* (Mother-of-millions);
- *Sporobolus pyramidalis* (Giant rat's tail grass);
- *Sphagneticola trilobata* (Singapore daisy); and
- *Tecoma stans* (Yellow bells).

It should be noted that *Sporobolus pyramidalis* (Giant rat's tail grass) dominated the north-eastern portion of the Site and indicated scattered infestation of *Senecio madagascariensis* (Fireweed) throughout this area of the Site

3.3 Fauna Species

A range of fauna species were encountered on the Site, the Ecological Assessment Report prepared for the Site provides further details in this regard.

While all native species must be considered for the purposes of this VMP, the primary species recorded on Site that is of particular interest in the Koala. Several indirect observations of likely Koala were made during the field assessment. This included Koala scats and scratches encountered during targeted surveys and opportunistically. The Koala is listed as Vulnerable under the NC Act EPBC Act.

The following other notable fauna observations are of particular relevance with respect to fauna management during construction.

- *Pseudophryne raveni* (Copper-backed brood frog) was heard calling proximate to drainage lines and waterbodies throughout the Site.
- It was noted during the field assessment that the Site supports grazing land for *Macropus rufogriseus* (Red-necked wallaby). This species was frequently encountered within the northern region of the Site during the field assessment.
- The camera trap analysis identified a number of species often difficult to detect including *Petaurus breviceps* (Sugar glider)**.** Sugar gliders are colonial breeding species and likely use hollow-bearing trees within the Site for shelter and breeding purposes.
- *Tachyglossus aculeatus* (Short-beaked echidna) was captured using the Site at four separate camera trap locations. Echidna is Special Least Concern in accordance with the NC Act.
- A number of bird species such as *Egretta novaehollandiae* (White-faced heron) were detected on the camera traps. The Site supports a number of pools suitable for foraging by transitory wetland and migratory birds. No Migratory species protected under the EPBC Act were observed within the Site.
- One microbat was detected via camera trap using the Site. This species was identified as *Nyctophilus gouldi* (Gould's long-eared bat)**.** Gould's long-eared bat is a colonial breeding species and likely use hollow-bearing trees and being bark throughout the Site for shelter and breeding purposes.
- A Wedge-tailed eagle (*Aquila audax*) and nest were observed within the Site. The Wedge-tailed eagle was observed sitting on the nest which is an active breeding behaviour for this species.

4 Fauna and Vegetation Management Measures

4.1 Vegetation Protection Measures

Plans illustrating trees subject to the VMP is provided as **Appendix A**. All trees illustrated within the plans will likely require removal to facilitate the construction of facilities. It is likely that some trees within the 6m buffer zone could be retained subject to further detailed design. All vegetation outside of the 6m buffer to proposed infrastructure will be retained for the purposes of this plan.

A number of measures pertaining to tree protection are identified in **Appendix B**. These in addition to the following must be considered as part of construction activities:

- Prior to commencement of any site works, hollow bearing trees (HBT) within the development footprint and those within 10 m of same are to be surveyed and marked in the field using high visibility paint or flagging tape. The location of the features already recorded on Site are illustrated on in the Wildlife Habitat Management Plan (WHMP).
- Clearing must be directional and sequential as stated in the WHMP to minimise impacts to Koalas during clearing including:
    - Clearing must occur in nine stages with a maximum of 3 ha clearing in one stage and allowing at least one 12-hour period from 6 pm on the day of clearing to 6am the following day in which no clearing occurs.
- Install tree protection fencing along the boundary of the Site in line with Section 4.3 of AS4970 and the following section of this VMP.
- 'No-Go' signage to be placed around exclusion fencing.
- Prune overhanging branches or install branch protection measures in accordance with *AS4373 Pruning of Amenity Trees* and Section 4.5.2 of AS4970 (**Diagram 1**).
- Where fill will encroach on a tree protection zone (TPZ) TPZ additional watering of the remaining exposed area of TPZ may be required, in accordance with Project Arborist recommendations.
- Where an access track for heavy machinery will be required for the duration of the operations and it substantially (i.e. more than 10%) impact the TPZ of a tree to retain, ground protection measures are to be used in accordance with Section 4.5.3 of AS4970 (**Diagram 1**).

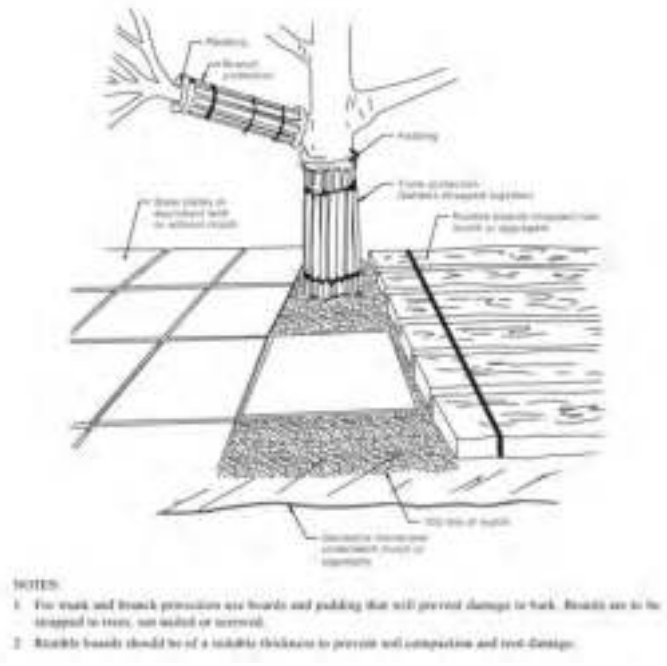


Diagram 1: extract from Section 4.5.3 of AS4970

4.2 Clearing of Habitat Trees

4.2.1 General

A spotter catcher must conduct a preclearing survey. A spotter catcher must be present during all clearing works. Clearing must be conducted in accordance with an approved Fauna Management Plan that specifically addresses koala management protocols.

4.2.2 Hollow Salvaging

The following salvage protocol is to be implemented to minimise loss of habitat features:

- Spotter catcher to check all trees prior to removal to identify whether other specimens have hollows prior to clearing.
- All hollows are to be salvaged following clearing.
- Hollows to be removed as follows:
    - Remove resident fauna (if practicable while the tree is standing).
    - Cut the trunk below the internal chamber (i.e. below sufficient termite mud to retain its integrity – if this is not possible retain mud for future use).
    - Carefully lower the hollow portion of the tree and lower to the ground.
    - To aid in protection of trunk spray with three coats of lanolin oil.
    - A suitably qualified person (e.g. ecologist and/or spotter catcher) will identify those hollows suitable for reinstatement in trees, versus those suitable for use as ground habitat.
    - For hollows to be reinstated in 'receive' trees, if termite mud is insufficient to retain integrity of the floor, cap the base of the trunk segment with >10mm weather proof ply and weather-proof screws. Seal gaps and paint with colours resembling the tree. Drill a 5mm hole at the lowest point to allow water to drain from the hollow limb.
    - For hollows to be reinstated in trees, if the top of the trunk segment is open, cap with steel mounted at an angle (to allow runoff) but with no eaves. Secure with weatherproof screws.
- Hollows are to be stored in a dry location away from termites and borers.
- When the 'receive' site is identified, secure the hollows to the recipient tree by way of galvanised steel cable and turnbuckles. The latter allows for adjustments to occur at a later day if required. The trunk of the recipient tree is to be protected by use of timber blocks secured between the tree and cable. For ground habitat – evenly place hollows throughout the nominated restoration area.

4.3 Clearing Non-habitat Trees

After under scrubbing is complete, non-habitat trees (i.e. trees other than those identified as habitat trees) will be cleared and stockpiled for mulching or reused for habitat features.

Clearing of non-habitat trees will only occur where their removal will not impact on identified habitat trees (e.g. canopies do not interconnect with habitat trees).

4.4 Disposal

Vegetation cleared from the site shall be disposed of in accordance with the following methods.

On-site wood chipping shall only be carried out during the hours of 8am-6pm Monday to Saturday.

- The woodchipper shall be located such that nuisance or annoyance is not caused to neighbouring properties in the vicinity of the Site.
- No Restricted Pest Plants or other environmental weeds are to be chipped for reuse on-site.
- Wherever possible, the woodchip should be spread over the areas of the Site.

Selective reuse of structurally sound hollow limbs and tree in the enhancement of habitat in the waterways and southern portion of the Site.

4.5 Post-clearance reporting

Provide a written report to Council within two weeks of the completion of clearing that addresses the following Fauna Report detailing:

i. The length of clearing time.
ii. Animal trapping prior to and during clearing.
iii. Animal relocations.
iv. Fauna injuries and euthanisations.

APPENDIX

A

TREE PLANS

HEINEMANN ROAD 5

Legend

- Site Boundary
- Trees Surveyed
- Road (QSpatial, 2019)
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure

Redland CITY COUNCIL

FIGURE 6

1:3,000 Scale at A3

m
0 25 50 75 100

Vegetation Management Plan

REDLANDS SPORTS PRECINCT

N

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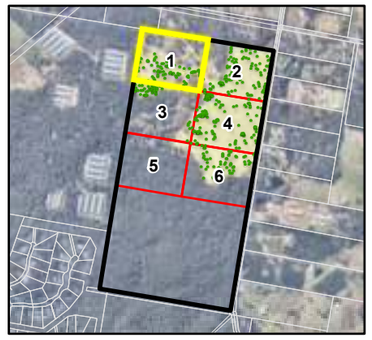
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Vegetation Management Plan Page 1

REDLANDS SPORTS PRECINCT

Legend

- Site Boundary
- Trees Surveyed
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure



1:1,500 Scale at A3

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Vegetation Management Plan Page 2

REDLANDS SPORTS PRECINCT

Legend

- Site Boundary
- Trees Surveyed
- Road (QSpatial, 2019)
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure



1:1,500 Scale at A3

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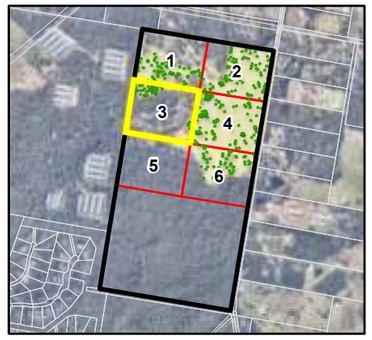
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Vegetation Management Plan Page 3

REDLANDS SPORTS PRECINCT

Legend

- Site Boundary
- Trees Surveyed
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure



1:1,500 Scale at A3

m
0 15 30 45 60

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Vegetation Management Plan Page 4

REDLANDS SPORTS PRECINCT

Legend

- Site Boundary
- Trees Surveyed
- Road (QSpatial, 2019)
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure



1:1,500 Scale at A3

m
0 15 30 45 60

N

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Date: 2020-07-28 | Project: NE30016
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30016-GS-008_VMP_DDP.mxd 02
Aerial Imagery supplied by Nearmap (May, 2020)

Vegetation Management Plan Page 5

REDLANDS SPORTS PRECINCT



Legend

- Site Boundary
- Trees Surveyed
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure



1:1,500 Scale at A3

m
0 15 30 45 60

N

Cardno

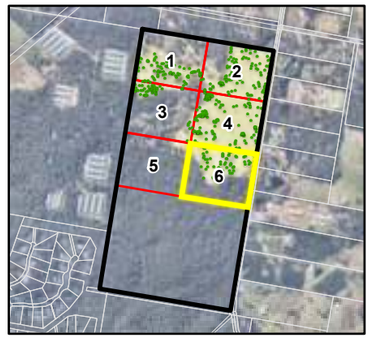
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Coordinate System: GDA 1994 MGA Zone 56
Map: NE30016-GS-008_VMP_DDP.mxd 02
Aerial Imagery supplied by Nearmap (May, 2020)

Vegetation Management Plan Page 6

REDLANDS SPORTS PRECINCT

Legend

- Site Boundary
- Trees Surveyed
- Road (QSpatial, 2019)
- Tree Protection Zone
- Cadastre (QSpatial, 2018)
- 6m buffer to proposed infrastructure



1:1,500 Scale at A3

m
0 15 30 45 60

N

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-07-28 | Project: NE30016
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30016-GS-008_VMP_DDP.mxd 02
Aerial Imagery supplied by Nearmap (May, 2020)

APPENDIX

B

ARBORIST REPORT

Independent
Arboricultural
Services



Preliminary Arboricultural Report

Prepared For: Cardno

Redlands Coast Regional Sport Grounds
277 Heinemann Road
Mount Cotton QLD 4165
Date: 24th June 2020

Independent Arboricultural Services - Disclaimer

The material contained in this document has been prepared on an independent basis free of any bias and represents the honest opinion of the consulting arborist.

Tissue or soil samples have not been collected nor submitted for testing unless otherwise stated. Excavation is limited to minor earthworks and we submit this assessment on the basis that all data is based on visual inspection of the tree/s and its/their location, species, health and condition at the time of writing unless otherwise stated. Measurements and tree locations noted in this report are approximate and have not been determined by survey unless information and analysis has been provided by the consultant or such information is otherwise noted. Please request a more detailed arborist report if further information and analysis is required. Depending on site requirements, specific alternate specialist advice including engineering consultancy and certification maybe required in combination with this assessment. This assessment contains arborist advice and associated general information only and does not purport to provide other site-specific specialist advice such as engineering certification unless arrangement to source such advice for inclusion in this assessment has been requested and authorised.

This report containing opinions, advice and recommendations based on information and data gathered from site inspections carried out by personnel from Independent Arboricultural Services as well as information provided by the client and/or its representatives, is to be relied on by the client in that context. It is assumed that all such information provided to Independent Arboricultural Services is correct. All recommended arboricultural works detailed in this assessment including pruning of tree canopy or roots, tree removal, tree transplantation or other associated works including stump grinding or the application of any prescribed treatment shall be carried out in accordance with applicable standards including Australian Standards AS 4373-2007- Pruning of amenity trees and AS 4970-2009- Protection of trees on development sites.

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The invoice for this report will be issued to the person or entity as per the address advised at the time of confirmation of appointment. Assessment in this report is based on plans provided at the time of confirmation of engagement and report preparation. Additional time required for re-assessment of report detail due to subsequent re-issue of plans after report preparation will be subject to an additional fee which will be charged at our hourly rate. This report shall not be conveyed to any third party including regulatory authority/s until full payment of this invoice is received by Independent Arboricultural Services and a finalised report has been issued unless agreement to do so has been granted.

Factors including the absence of historical records or local knowledge, recognition of the variability of the integrity of a tree as a naturally living organism as well as the impact of conditions within its surrounds to which it maybe subject including the impacts of mechanical force and the occurrence of weather events, do not allow an arborist to guarantee the age of a tree, or the length of time a tree/s may live or such time as it /they may fail. There is no warranty or guarantee, expressed or implied that the problems or deficiencies of the plants or property in question may not arise in the future.

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Document Tracking & Information

Project Name	Preliminary Arboricultural Assessment
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Client	Cardno
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Abbreviations

RCC	Redland City Council	**RPA**	Root Protection Area
DA	Development Application	**TMP**	Tree Management Plan
VPO	Vegetation Protection Order	**CMP**	Construction Management Plan
ULE	Useful Life Expectancy	**VMP**	Vegetation Management Plan
BLF	Building Location Footprint	**AS**	Australian Standard
BLE	Building Location Envelope	**AS 4373: 2007**	Pruning of amenity trees
TPZ	Tree Protection Zone	**AS 4970: 2009**	Protection of trees on development sites
SRZ	Structural Root Zone	**DBH**	Diameter at Breast Height

All comments and recommendations in this report have been determined in accordance with Australian Standards AS 4373-2007- Pruning of amenity trees and AS 4970-2009 – Protection of trees on development sites. All recommended tree work should be carried out in accordance with these standards.



Roger Rankine - Consulting Arborist

Map

Figure 1: Subject Site



(Google Maps 2020)

Blue outline indicating the extents of the survey area

Introduction

This report is based on a visual inspection carried out from the ground on the 22nd to 24th June 2020. No soil or tissue sampling has been conducted. Tree assessment and Qualitative Visual Tree Analysis has been carried out in accordance with TRAQ ISA guidelines. Data and information provided to the client by others has been incorporated into this report as appropriate.

All Arboricultural recommendations contained in this report have been determined in accordance with Australian Standards AS 4373-2007 - Pruning of amenity trees and AS 4970 – Protection of trees on development sites.

For the purposes of this report reference to a Consulting or Project Arborist is held to mean an Arboricultural specialist who holds minimum Arboricultural qualifications of Dip Arb/AQF 5, appropriate professional insurances and has appropriate experience in the protection of trees on construction sites. Where tree work is specified, all recommended tree work is to be carried out in accordance with the above-mentioned standards by an appropriately trained and AQF qualified arborist practitioner/s with an up-to-date record of training and membership of a recognised Australian Arboricultural association, e.g. Qld Arboricultural Association (QAA), Arboriculture Australia (AA), or a recognised international Arboricultural association. No climbing spikes are to be used if pruning is to be carried out on live trees except in the instance of an emergency.

Qualifications of the report authors include Diploma of Arboriculture/AQF Level 5 and ISA Certified Arborist accreditation. Report authors hold current insurances and memberships including qualified memberships of Queensland Arboricultural Association (QAA), and Arboriculture Australia (AA) as well as current accreditation and membership of International Society of Arboriculture (ISA). Independent Arboricultural Services is a qualified registrant on the QAA Register of Consulting Arborists.

Introduction & Site Notes

This report has been compiled at the request of Cardno to provide a tree survey and arboricultural advice in relation to trees located on 277 Heinemann Road, Mount Cotton. Affected trees will be referred to in the following report as the Subject Trees.

This report is based on a visual inspection carried out from the ground on the 22nd to 24th June 2020. No soil or tissue sampling has been conducted. Tree assessment and Qualitative Visual Tree Analysis has been carried out in accordance with TRAQ ISA guidelines.

All trees identified in this report will be described by their botanical and/or common names. Further report details will include: assessment of current tree health and form, arboricultural work required, any infrastructure and associated OH&S environmental or infrastructure issues and tree protection measures that should be employed to protect identified trees during proposed development works to be carried out on this property.

All arboricultural recommendations contained in this report have been determined in accordance with Australian Standards AS 4373-2007 - Pruning of amenity trees and AS 4970 – 2009 – Protection of trees on development sites.

For the purposes of this report reference to a Consulting or Project Arborist is held to mean an arboricultural specialist who holds (minimum) arboricultural qualifications of Dip Arb/AQF 5, appropriate professional insurances and has appropriate experience in the protection of trees on construction sites. Where tree work is specified, all recommended tree work is to be carried out in accordance with the above-mentioned standards by an appropriately trained and AQF qualified arborist practitioner/s with an up-to-date record of training and membership of a recognised Australian arboricultural association, e.g. QAA, Arboriculture Australia (AA), or a recognised international arboricultural association. No climbing spikes are to be used if pruning is to be carried out on live trees except in the instance of an emergency.

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Independent Arboricultural Services is an approved registrant on the QAA Register of Consulting Arborists.

Arborist Observations

Tree identification was carried out on 22nd to 24th June 2020. All environmentally significant/feature trees located within the *Subject Site Nominated Area*, have been identified and assessed.

Please refer to the following Tables for further detail of tree health, form and dimensions including height, spread, DBH and TPZ's of all tree inspected.

Trees were plotted with Tree Plotter™ and diameter measurements were taken with a Richter Diameter Tape. Photos taken with an Apple Ipad and iPhone 7.

Arborist Comment

This report has been drafted for the purposes of providing preliminary arboricultural advice in relation to future construction on the *Subject Site*. The following comments are provided as a guide for future reference during design layout planning phase.

All significant and feature trees have been classified into Categories. The potential removal of vegetation for reasons of OH&S failure/fall hazard will necessarily increase with the future use and therefore occupancy rating of the *Subject Site*. Removal of RCC and Qld State declared weed species would be timely to prevent further unwanted spread of these species. Removal of species with poor structure should be carried out as required. Please note that permissions must be granted from Redland City Council before any clearing commences.

Considering that most tree roots are typically located within the top 600mm of the soil profile, future Design Plans should be drafted so as to retain, protect and minimise adverse impact including need for incursion into TPZ/s of retained trees.

Where trees are to be retained on the *Subject Site*, plans must be drafted to allow for the isolation of TPZs from cut & fill, Building Location Envelope (BLE) and ancillary needs such as scaffolding. Sufficient design allowance and alternate construction methodology must also be made for the installation of new infrastructure for sewerage, stormwater, fencing, curbing and guttering etc. where there is proposed incursion within TPZs.

Further specification of protection measures to mitigate the effect of future construction works on retained trees will be required prior to Design Plans being finalised. Design Planners should be cognisant of existing hydrology around retained trees including retention of natural ground levels within TPZs.

As required during future design planning and construction phases, tree protection measures including the use of over-engineered sleeved pier and raised beam design and water/air excavation (under low pressure) can be utilised to allow construction to be carried out close to retained tree/s while minimising the extent of disturbance within root zone/s. Over- engineered design will allow for relocation of piers if large tree roots are

encountered during excavation for pier installation. This design will also ensure current ground levels can be maintained within TPZ/s.

All construction works within TPZ/s of retained trees must be carried out with due care and under the supervision of the Project Arborist. A batter bucket must be used and machinery operated from outside all TPZs of retained trees with the machine operated in a backward direction away from the tree stem. Similarly, the removal of existing fence structures within any TPZ must be carried out with due care and under the supervision of the Project Arborist.

Subject to further Project Arborist advice, the use of additional stem and branch protection and/or the use of coarse gravel could be considered in the event that there is no other alternate accessway for vehicular traffic to access or move within the *Subject Site* without causing impact to the TPZ of a retained tree.

Existing ground levels are to be maintained and no removal of top soil is to occur within any TPZ (of retained tree/s). Issues such as replacement mulching and/or watering maybe required in the event that rain shadowing by buildings is caused over any TPZ.

Pruning to remove deadwood >30mm from within the canopies of retained trees which overhang any BLE or public thoroughfare area, prior to the commencement of construction works, will assist to address associated OH&S fall hazard issues. All pruning must be carried out by qualified (min AQF Level III (Arb)), insured and experienced Arborist Practitioners who are trained in the pruning of tree species located on the *Subject Site.*

General Comment & Recommendations

All construction work within the TPZ of any retained tree must be authorised & supervised by the Project Arborist.
The use of amended construction methodology and low-pressure water or air excavation along exposed TPZ perimeter/s and/or minor areas of proposed incursion (under Project Arborist supervision) will assist to ensure ground disturbance and damage to tree roots is minimised within the TPZ of affected trees.
Removal of the concreted surface must occur from above the existing surface. Removal work is to be carried out with a style batter bucket with the machinery operated in a backward direction toward the extremity. Due care must be taken to ensure that TPZs of adjacent trees are isolated and protected from vehicular entry and therefore soil compaction within the protected root zone (of retained trees).
Addition of new soil and replanting must be carried out with due care. There shall be no use of strip style excavation within the TPZ of any retained tree, e.g. for removal of top soil, installation of boundary fencing, future foundations, installation of services, kerb/roadside guttering etc. If works are on the perimeter of the TPZ the Project Arborist to be consulted.
Where fencing is to be replaced, it is preferable to use existing post holes when they located within TPZs. New pier holes to be water excavated under Arborist Supervision.
It is imperative that TPZ fencing or branch /stem and ground protection measures are installed for the protection of all retained trees prior to the commencement of the future Construction Phase, and that it remains insitu for the duration and until completion of proposed construction works.
TPZ fencing and other measures must be fixed so that they cannot be moved either by accidental physical impact or other inadvertent means. There shall be no entry within any TPZ by any construction crew or other persons during the construction phase without authorisation and/or attendance of the Project Arborist. That is, no storage of builders' materials, machinery, pedestrian traffic, disposal of waste paints, fuels etc.

Tree Protection Measures and Signage

Note 1: TPZ perimeter fencing may be grouped where perimeters overlap /as appropriate

Note 2: Signage is to be installed in accordance with Australian Standard AS 4970-2009 – Protection of trees on development sites as illustrated below.

Figure 1:

Protective Fencing



Figure 2:

Examples of trunk, branch and ground protection

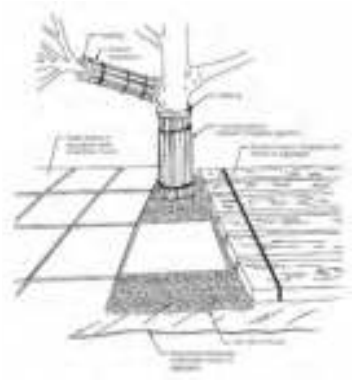


Figure 3:

Tree Protection Zone Signage[1]



Figure 4



Figure 5



Figure 6



Figure 7



Figure 4-7: Low pressure Ground Excavation and Water Cutting

Figure 8



Figure 9

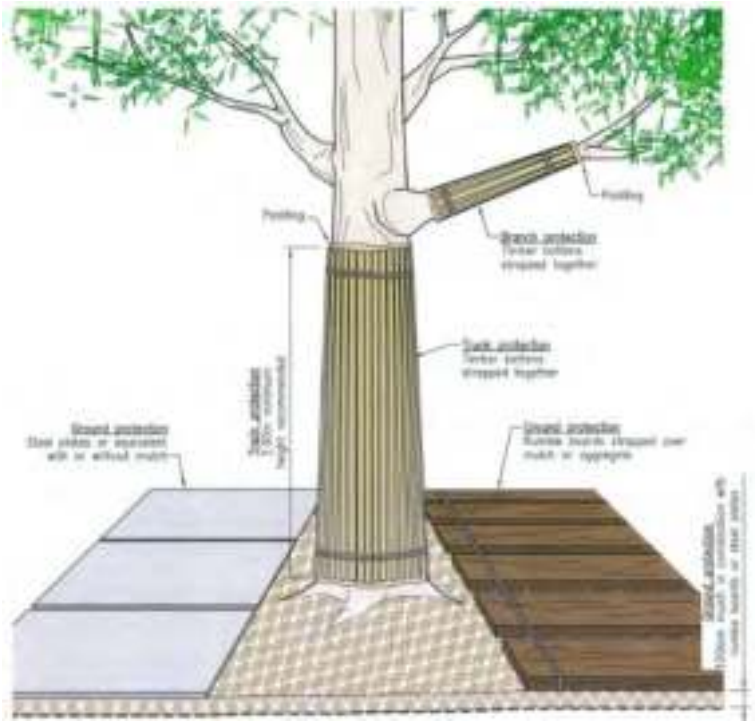


Figure 8-9: Example of fauna friendly rigid style temporary fencing

1 Source: AS4970-2009 Protection of Trees on Development Sites



Tree Protection Fencing to be utilised

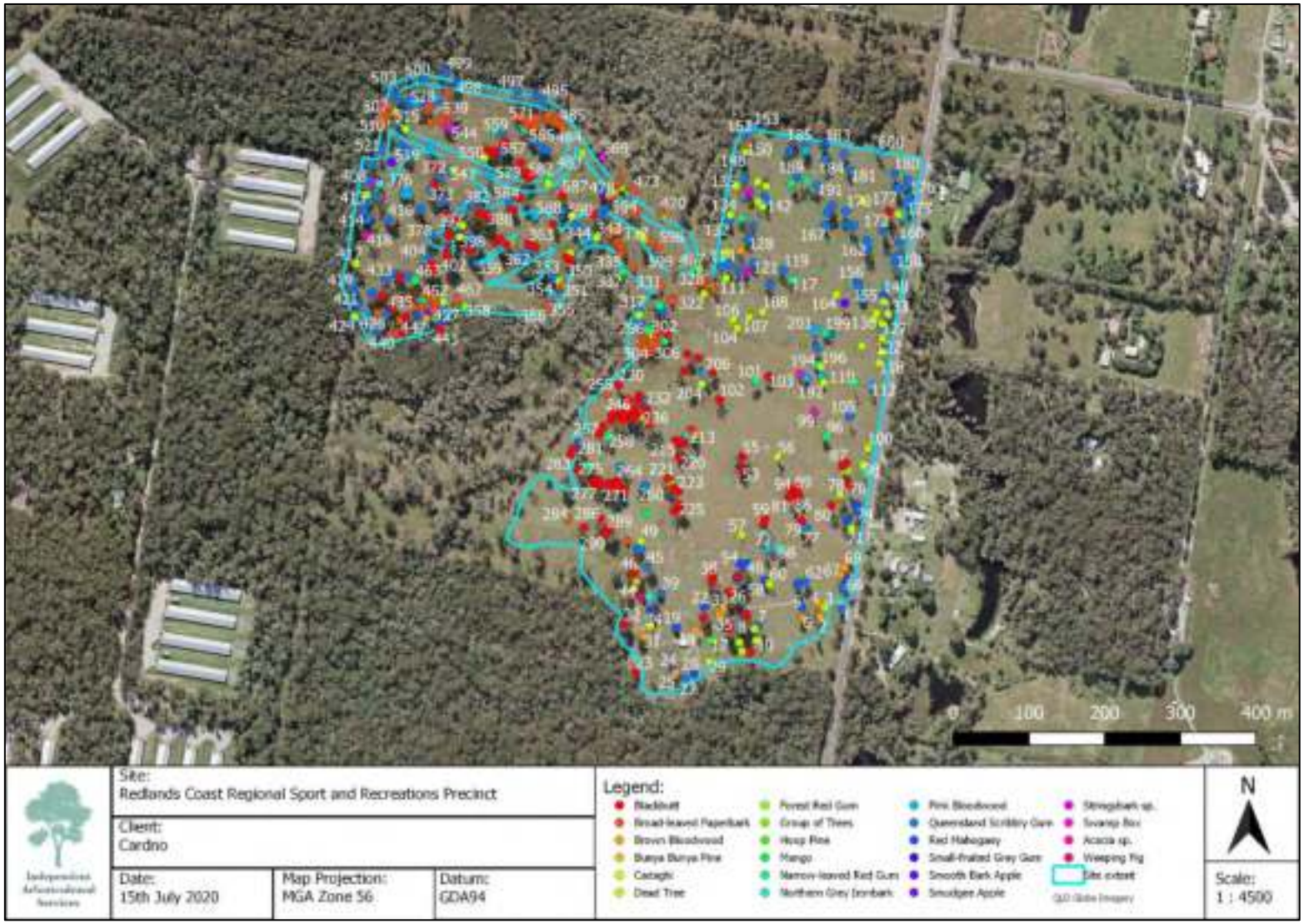


Where works will be undertaken close to and within Tree Protection Zones specific tree protection measures to be utilised a directed by the project Arborist.

Tree Management Plan (TMP) - Works progress: Development Phase

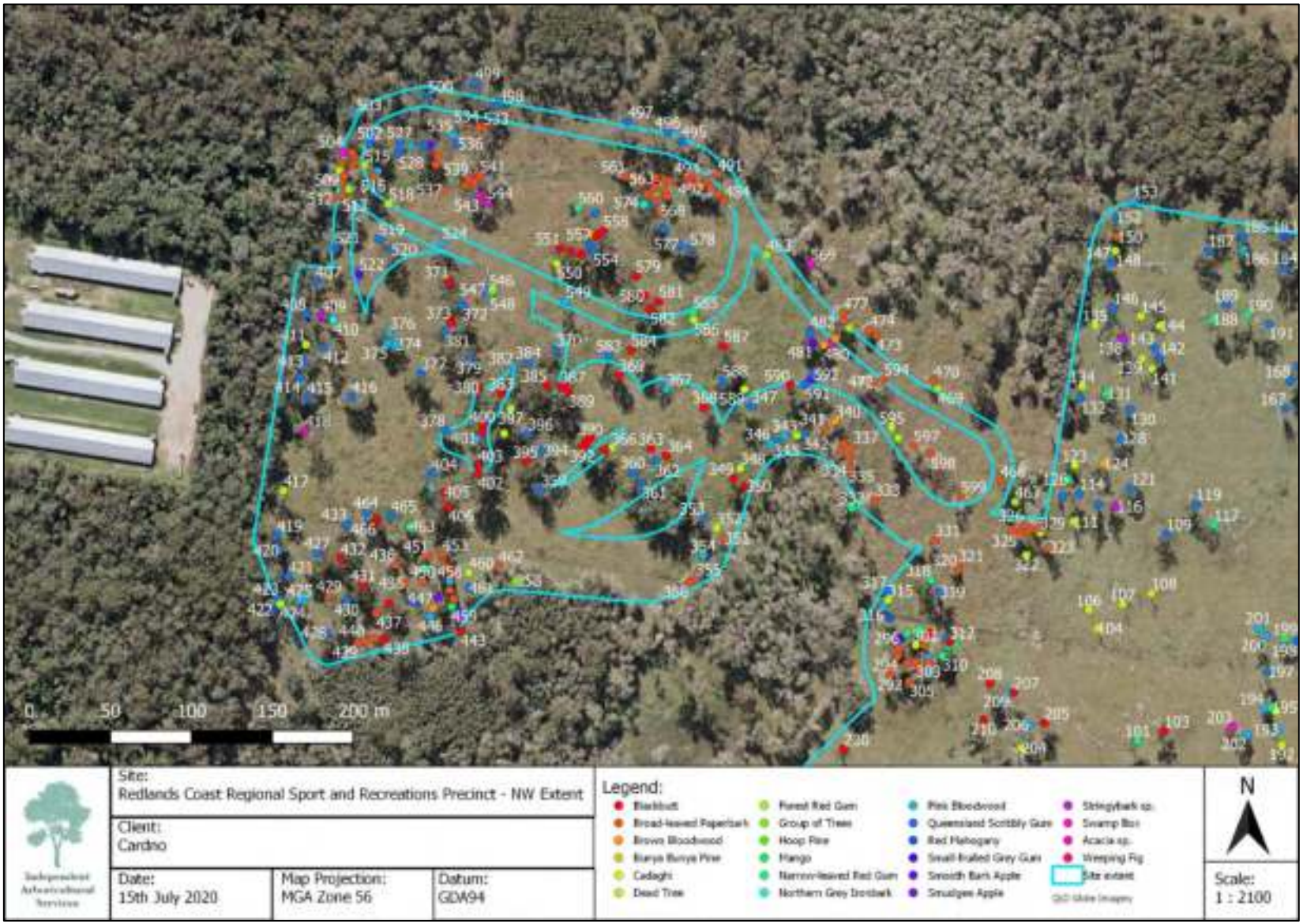
Stage	Tasks	Specific Outcomes
Pre-construction Phase		
Prepare and finalise Arboricultural Impact Assessments for submission to Council	Project Arborist to be appointed Review tree details in all approved Arboricultural reports following any new issue of plans	Submit Arboricultural reports including Arboricultural Impact Assessment for final Council Approval
Project Arborist to conduct Prestart Meeting with all representatives involved in construction	Prior to meeting: TPZs to be mulched and TPZ temporary protection/fencing installed **Arboricultural Report, TMP & Council approval copies to be included in CMP** and made available to onsite crews	Prestart Certification and approvals in place & available onsite with CMP
Commencement - Construction Phase		
Initial Site Preparation	Project Arborist to supervise all work within TPZs including tree work, construction work & removal of slipway. **Construction crew or others are not to remove any part of a tree!** Project Arborist to supervise water cutting Retain all clean removed topsoil. Piled soil or mulch must not to be stockpiled within TPZ of identified trees. Arborist prestart site inspection.	Compliance Certification of Arboricultural works for lodgement to Council Arborist certification of TPZ measures.
Prestart Toolbox Meeting	All relevant onsite crews to be briefed by Project Arborist prior to commencement of each work phase. Project Arborist must be notified and onsite at all times when construction works are within or very close to TPZ. Note: Onsite attendance of Project Arborist is a condition for issue of Arboricultural Site Audit Statement/s.	Arborist Site Audit Reporting system to be in place. Copies of Arboricultural Report to be retained onsite. Arboricultural Site Audit Statement/s will not be issued retrospectively
Construction Phase		
Site Establishment	Project Arborist to monitor tree health during establishment phase including bulk earthworks, changes in hydrology etc.	Instigate remedial tree care measures if required
Construction work	Site Manager to liaise with and ensure Project Arborist is advised in time to allow them to be present for all work carried out within TPZ area including any work likely to affect identified tree/s. Any deviation/s from approved plans to be approved by Project Arborist. **Project Arborist to provide ongoing Site Audit Certification of all work within TPZ**	Any remedial tree works to be carried out by qualified arborists under supervision of Project Arborist. Project Arborist is responsible for issue of Arborist Site Audit Reports.
Practical Completion	Project Arborist to carryout review of tree health and vigour and advise on TPZ fencing.	On Project Arborist approval, carryout removal of remaining temporary tree protection measures
Post Construction Phase		
Final Arborist inspection	Carryout tree health review and provide recommendations for required tree care.	Issue of final Arborist Site Audit Compliance Statement for inclusion in final DA documentation and sealing.

Tree Locations: Overview

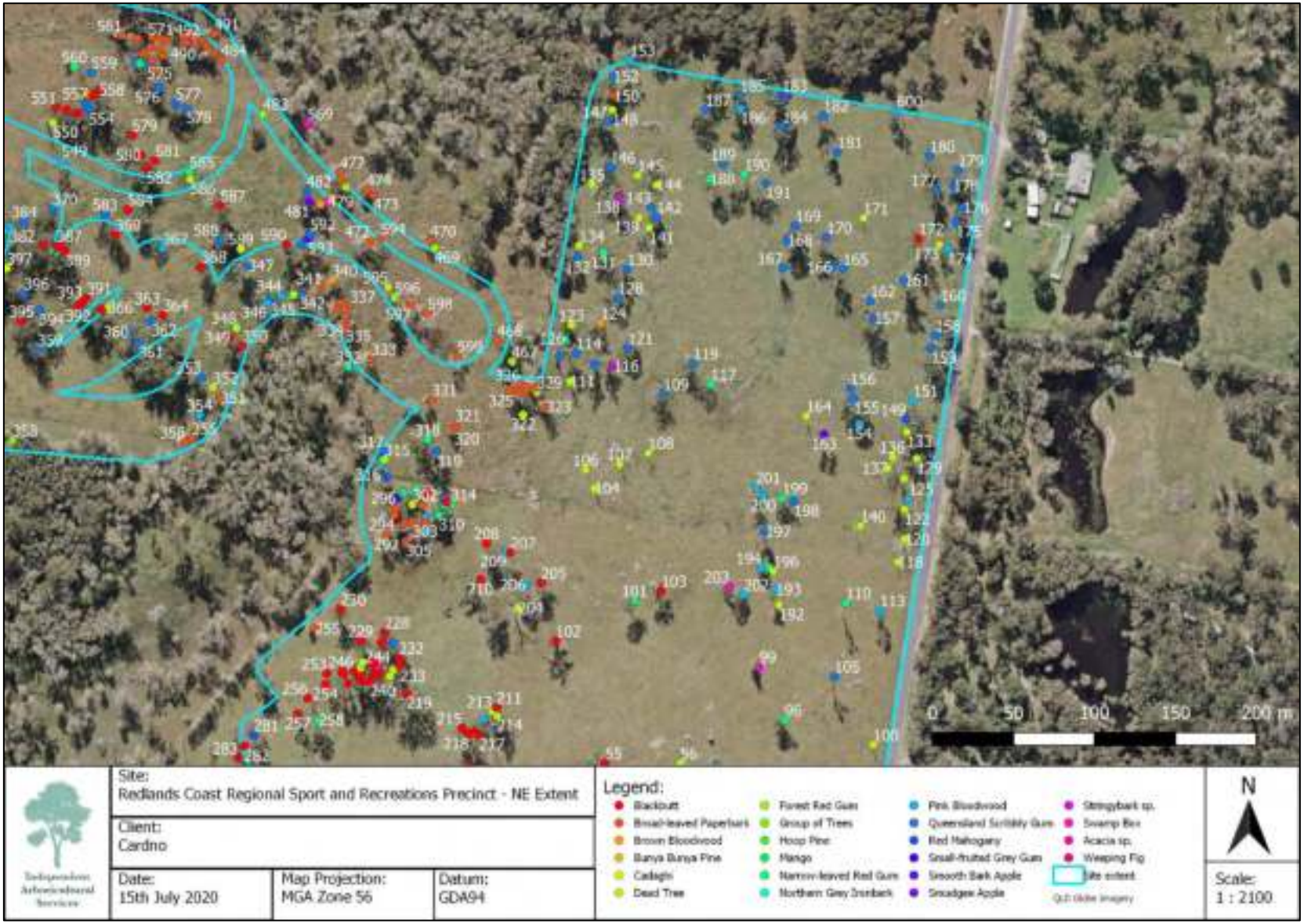


Please Note: Tree Locations are an approximate only.

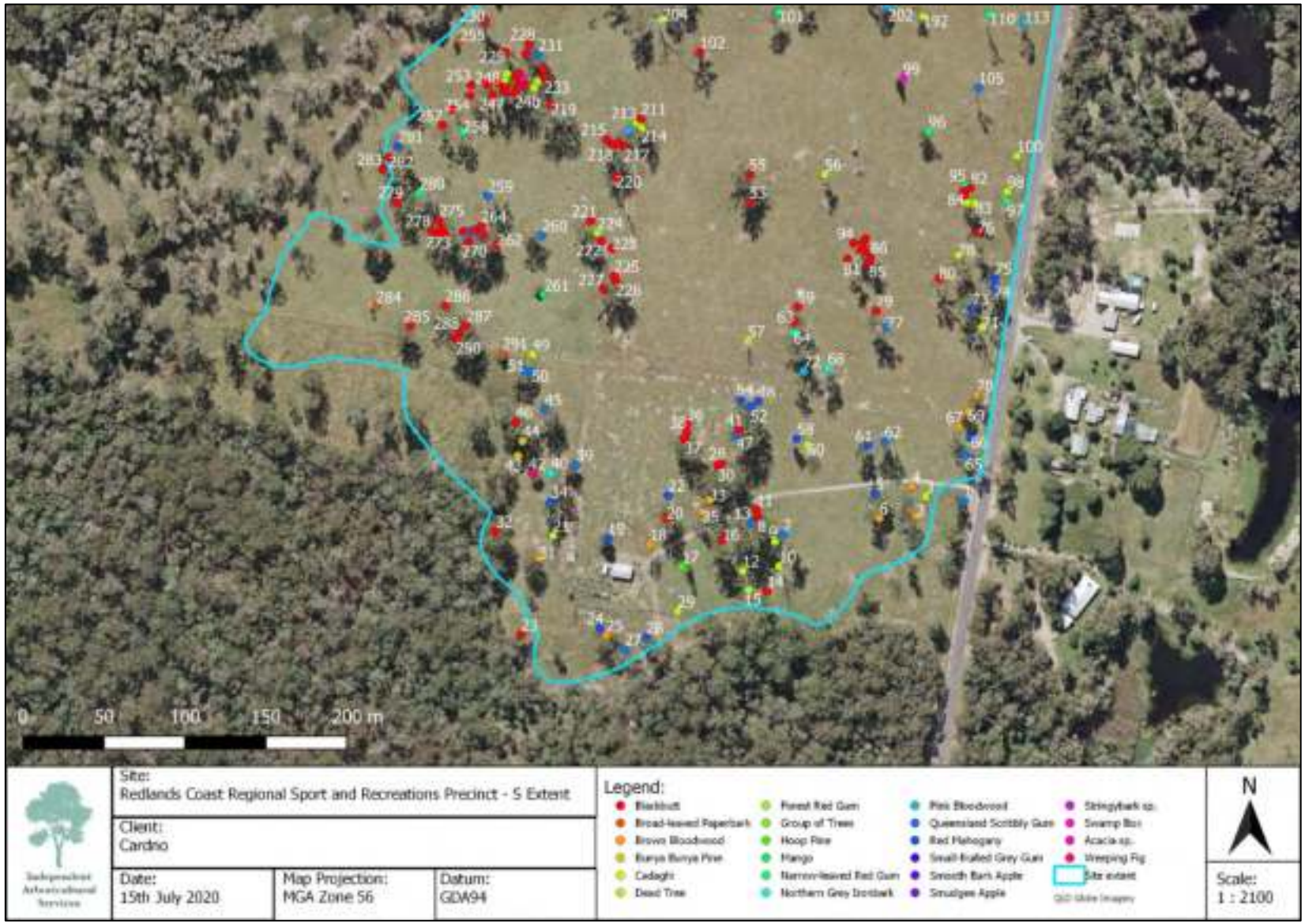
Tree Locations: North-West Extent



Tree Locations: North-East Extent



Tree Locations: Southern Extent



Findings

Please refer to the following Cascade chart[2] for tree quality assessment. Definitions of terms used in classification of all trees are outlined in Appendix, briefly trees have been classified into the following categories:

Category A:

Definition:

Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

Category B:

Definition:

Those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested).

Category C:

Definition:

Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or younger trees.

Category R:

Definition:

Those in such condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management.

[2] British Standard BS 5837:2005 Table One, p6

Tree Detail

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
1	*Eucalyptus racemosa*	Queensland Scribbly gum	50	6	10	8	Fair	Typical	C	Deadwood, unattached branches
2	*Corymbia trachyphloia*	Brown Bloodwood	46	5.52	18	9	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
3	*Stag*	Dead tree	14	2	6	3	Dead	Dead	C	
4	*Corymbia trachyphloia*	Brown Bloodwood	46	5.52	18	9	Fair	Typical	C	Deadwood, unattached branches, retain and protect, undertake the removal of deadwood in crown
5	*Eucalyptus resinifera*	Red Mahogany	72	8.64	14	10	Fair	Typical	B	Deadwood
6	*Corymbia trachyphloia*	Brown Bloodwood	62	7.44	19	10	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
7	*Eucalyptus racemosa*	Queensland Scribbly gum	89	10.68	16	8	Fair	Poor	C	Cavity
8	*Eucalyptus pilularis*	Blackbutt	114	13.68	18	24	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
9	*Stag*	Dead tree	55	6.6	12	6	Dead	Dead	C	Decay
10	*Stag*	Dead tree	62	7.44	12	6	Dead	Dead	C	Decay
11	*Eucalyptus pilularis*	Blackbutt	92.63	11.12	18	22	Fair	Typical	C	Co-dominant limbs, deadwood, retain and protect, undertake the removal of deadwood in crown
12	*Stag*	Dead tree	67	8.04	12	6	Dead	Dead	C	Decay
13	*Eucalyptus racemosa*	Queensland Scribbly gum	55	6.6	17	12	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
14	*Eucalyptus pilularis*	Blackbutt	70	8.4	14	12	Fair	Typical	B	Deadwood, wound
15	*Stag*	Dead tree	54	6.48	12	8	Dead	Dead	C	Deadwood
16	*Eucalyptus pilularis*	Blackbutt	80	9.6	19	13	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
17	*Araucaria cunninghamiana*	Hoop Pine	35	4.2	12	6	Fair	Typical	C	Co-dominant limbs
18	*Corymbia trachyphloia*	Brown Bloodwood	35	4.2	8	6	Poor	Typical	C	Deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
19	*Eucalyptus resinifera*	Red Mahogany	63.25	7.59	10	7	Poor	Typical	C	Deadwood
20	*Eucalyptus pilularis*	Blackbutt	70	8.4	19	14	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
21	*Stag*	Dead tree	64.82	7.78	10	8	Dead	Dead	C	Deadwood, decay
22	*Eucalyptus resinifera*	Red Mahogany	64	7.68	20	16	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
23	*Eucalyptus pilularis*	Blackbutt	45	5.4	10	6	Fair	Typical	C	Deadwood
24	*Eucalyptus resinifera*	Red Mahogany	40	4.8	14	12	Poor	Poor	C	Cavity, decay
25	*Corymbia trachyphloia*	Brown Bloodwood	35	4.2	12	8	Fair	Typical	C	
26	*Eucalyptus pilularis*	Blackbutt	96	11.52	19	17	Fair	Typical	C	Broken limbs, deadwood, unattached branches, retain and protect, undertake the removal of deadwood in crown
27	*Eucalyptus racemosa*	Queensland Scribbly gum	80	9.6	12	8	Poor	Poor	C	Deadwood
28	*Eucalyptus resinifera*	Red Mahogany	70.71	8.49	12	8	Fair	Poor	C	
29	*Stag*	Dead tree	35	4.2	10	5	Dead	Dead	C	
30	*Eucalyptus pilularis*	Blackbutt	98	11.76	19	16	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
31	*Corymbia trachyphloia*	Brown Bloodwood	109	13.08	16	12	Fair	Poor	C	Co-dominant limbs, deadwood
32	*Eucalyptus pilularis*	Blackbutt	110	13.2	20	18	Fair	Typical	B	
33	*Corymbia trachyphloia*	Brown Bloodwood	78	9.36	18	16	Poor	Poor	R	Broken limbs, cavity, co-dominant limbs, deadwood, decay, remove and replace
34	*Eucalyptus resinifera*	Red Mahogany	52	6.24	12	8	Fair	Typical	C	Deadwood
35	*Corymbia trachyphloia*	Brown Bloodwood	49	5.88	18	14	Fair	Typical	C	Deadwood, wound, retain and protect, undertake the removal of deadwood in crown
36	*Eucalyptus pilularis*	Blackbutt	67	8.04	20	13	Fair	Typical	B	Deadwood, retain and protect, undertake removal of palm fronds
37	*Eucalyptus pilularis*	Blackbutt	86	10.32	20	16	Fair	Typical	C	Co-dominant limbs, deadwood, retain and protect, undertake removal of palm fronds

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
38	*Eucalyptus pilularis*	Blackbutt	68.01	8.16	20	16	Fair	Poor	C	Co-dominant limbs, deadwood, decay, retain and protect, undertake removal of palm fronds
39	*Eucalyptus racemosa*	Queensland Scribbly gum	57	6.84	8	9	Fair	Typical	B	Deadwood
40	*Eucalyptus siderophloia*	Northern Grey Ironbark	75	9	20	12	Fair	Typical	C	Deadwood
41	*Eucalyptus pilularis*	Blackbutt	118	14.16	25	20	Fair	Typical	A	Broken limbs, deadwood, retain and protect
42	*Ficus benjamina*	Weeping Fig	32	3.84	6	8	Fair	Typical	C	
43	*Araucaria bidwillii*	Bunya Pine	40	4.8	8	6	Fair	Typical	C	
44	*Araucaria bidwillii*	Bunya Pine	40	4.8	6	6	Fair	Typical	C	
45	*Eucalyptus racemosa*	Queensland Scribbly gum	104	12.48	14	12	Fair	Typical	B	Deadwood
46	*Eucalyptus pilularis*	Blackbutt	101	12.12	18	16	Fair	Typical	B	Co-dominant limbs, deadwood
47	*Eucalyptus racemosa*	Queensland Scribbly gum	35.01	4.2	10	7	Fair	Typical	C	Cavity, co-dominant limbs, deadwood, retain and protect
48	*Eucalyptus resinifera*	Red Mahogany	55	6.6	18	12	Fair	Poor	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
49	*Stag*	Dead tree	35	4.2	8	6	Dead	Dead	C	
50	*Eucalyptus racemosa*	Queensland Scribbly gum	35	4.2	8	10	Fair	Poor	C	Deadwood
51	*Eucalyptus racemosa*	Queensland Scribbly gum	45	5.4	12	10	Fair	Poor	C	Deadwood
52	*Eucalyptus resinifera*	Red Mahogany	53	6.36	18	14	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
53	*Eucalyptus pilularis*	Blackbutt	69	8.28	16	8	Fair	Typical	B	
54	*Eucalyptus resinifera*	Red Mahogany	62	7.44	20	15	Fair	Typical	B	Co-dominant limbs, deadwood, retain and protect, undertake the removal of deadwood in crown
55	*Eucalyptus pilularis*	Blackbutt	135	15	24	18	Fair	Poor	C	
56	*Stag*	Dead tree	33	3.96	16	6	Dead	Dead	C	Deadwood, habitat present
57	*Stag*	Dead tree	82	9.84	15	9	Dead	Dead	C	Cavity, deadwood, decay
58	*Eucalyptus resinifera*	Red Mahogany	46	5.52	12	8	Fair	Typical	C	Deadwood
59	*Eucalyptus pilularis*	Blackbutt	66	7.92	20	17	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
60	*Stag*	Dead tree	45	5.4	8	6	Dead	Dead	C	
61	*Eucalyptus resinifera*	Red Mahogany	70	8.4	24	14	Fair	Typical	B	Deadwood
62	*Eucalyptus racemosa*	Queensland Scribbly gum	98	11.76	26	16	Fair	Typical	B	Deadwood, habitat present, wound
63	*Eucalyptus pilularis*	Blackbutt	86	10.32	20	18	Fair	Typical	C	Cavity, deadwood, wound, retain and protect, undertake the removal of deadwood in crown
64	*Eucalyptus siderophloia*	Northern Grey Ironbark	53	6.36	20	13	Poor	Typical	C	Deadwood, epicormic growth, retain and monitor tree, retain and protect, undertake the removal of deadwood in crown
65	*Eucalyptus racemosa*	Queensland Scribbly gum	84	10.08	12	6	Fair	Typical	C	Deadwood, decay, habitat present
66	*Eucalyptus resinifera*	Red Mahogany	67	8.04	20	10	Fair	Typical	B	Deadwood
67	*Corymbia trachyphloia*	Brown Bloodwood	33	3.96	12	8	Fair	Typical	C	Deadwood
68	*Eucalyptus siderophloia*	Northern Grey Ironbark	77	9.24	20	13	Poor	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
69	*Corymbia trachyphloia*	Brown Bloodwood	45	5.4	10	9	Fair	Poor	C	Co-dominant limbs, deadwood
70	*Corymbia trachyphloia*	Brown Bloodwood	51.88	6.23	12	8	Fair	Typical	C	Deadwood
71	*Stag*	Dead tree	84	10.08	12	8	Dead	Dead	C	Deadwood, habitat present
72	*Corymbia intermedia*	Pink Bloodwood	45	5.4	20	13	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
73	*Eucalyptus resinifera*	Red Mahogany	95.52	11.46	20	16	Fair	Typical	C	Co-dominant limbs, deadwood
74	*Eucalyptus resinifera*	Red Mahogany	73	8.76	20	16	Fair	Typical	C	Deadwood
75	*Eucalyptus resinifera*	Red Mahogany	79	9.48	20	16	Fair	Typical	C	Deadwood, girdling roots
76	*Eucalyptus pilularis*	Blackbutt	65	7.8	20	16	Fair	Typical	C	Deadwood, unattached branches
77	*Eucalyptus racemosa*	Queensland Scribbly gum	75	9	18	11	Fair	Typical	C	Broken limbs, cavity, deadwood
78	*Stag*	Dead tree	90	10.8	24	14	Dead	Dead	C	Deadwood, habitat present
79	*Eucalyptus pilularis*	Blackbutt	61	7.32	23	13	Fair	Poor	C	Broken limbs, cavity, deadwood, retain and monitor tree, retain and protect, undertake the removal of deadwood in crown
80	*Eucalyptus pilularis*	Blackbutt	89	10.68	18	16	Poor	Poor	C	Deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
81	*Eucalyptus pilularis*	Blackbutt	50	6	18	8	Fair	Typical	C	Deadwood, decay
82	*Stag*	Dead tree	33	3.96	12	1	Dead	Dead	R	Deadwood
83	*Stag*	Dead tree	40	4.8	15	8	Dead	Dead	R	Deadwood
84	*Eucalyptus pilularis*	Blackbutt	54	6.48	23	12	Poor	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
85	*Eucalyptus pilularis*	Blackbutt	30	3.6	10	4	Fair	Poor	C	
86	*Eucalyptus pilularis*	Blackbutt	40	4.8	10	6	Fair	Poor	C	
87	*Eucalyptus pilularis*	Blackbutt	60	7.2	20	13	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
88	*Eucalyptus pilularis*	Blackbutt	50	6	10	6	Fair	Poor	C	Co-dominant limbs
89	*Eucalyptus pilularis*	Blackbutt	30	3.6	10	6	Fair	Poor	C	Deadwood
90	*Stag*	Dead tree	53.15	6.38	12	6	Fair	Poor	C	Deadwood
91	*Eucalyptus pilularis*	Blackbutt	45	5.4	10	6	Fair	Poor	C	Deadwood
92	*Eucalyptus pilularis*	Blackbutt	56	6.72	20	13	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
93	*Eucalyptus pilularis*	Blackbutt	61.03	7.32	12	6	Fair	Poor	C	Deadwood
94	*Eucalyptus pilularis*	Blackbutt	40	4.8	14	8	Fair	Typical	C	Deadwood
95	*Eucalyptus seeana*	Narrow Leaf Red Gum	45	5.4	15	13	Fair	Typical	C	Retain and protect
96	*Eucalyptus seeana*	Narrow Leaf Red Gum	54	6.48	12	8	Fair	Typical	B	
97	*Eucalyptus seeana*	Narrow Leaf Red Gum	28	3.36	15	10	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
98	*Stag*	Dead tree	62.68	7.52	8	3	Dead	Dead	C	Cavity, deadwood
99	*Lophostemon suaveolens*	Swamp Box	44.72	5.37	8	4	Fair	Poor	C	Vine growth
100	*Stag*	Dead tree	65	7.8	8	2	Dead	Dead	C	Cavity, deadwood
101	*Eucalyptus seeana*	Narrow Leaf Red Gum	65	7.8	14	12	Fair	Typical	B	
102	*Eucalyptus pilularis*	Blackbutt	69.28	8.31	18	14	Poor	Poor	C	Deadwood
103	*Eucalyptus pilularis*	Blackbutt	75	9	6	4	Poor	Poor	C	Deadwood, decay
104	*Stag*	Dead tree	60	7.2	6	4	Dead	Dead	C	

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
105	*Eucalyptus racemosa*	Queensland Scribbly gum	60	7.2	22	12	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
106	*Stag*	Dead tree	40	4.8	8	6	Dead	Dead	C	
107	*Stag*	Dead tree	45	5.4	9	6	Dead	Dead	C	
108	*Stag*	Dead tree	40	4.8	8	6	Dead	Dead	C	
109	*Eucalyptus racemosa*	Queensland Scribbly gum	92	11.04	14	10	Fair	Typical	B	Deadwood, decay
110	*Eucalyptus seeana*	Narrow Leaf Red Gum	50	6	21	8	Poor	Typical	C	Deadwood, epicormic growth, retain and protect, undertake the removal of deadwood in crown
111	*Stag*	Dead tree	120	14.4	8	6	Dead	Dead	C	Deadwood, habitat present
112	*Eucalyptus racemosa*	Queensland Scribbly gum	40	4.8	10	6	Poor	Poor	C	
113	*Corymbia intermedia*	Pink Bloodwood	47	5.64	20	14	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
114	*Eucalyptus racemosa*	Queensland Scribbly gum	60	7.2	14	10	Poor	Poor	C	Deadwood
115	*Eucalyptus racemosa*	Queensland Scribbly gum	75	9	14	10	Fair	Typical	C	Deadwood
116	*Eucalyptus spp.*	Stringybark	65	7.8			Fair	Typical	C	Deadwood
117	*Eucalyptus seeana*	Narrow Leaf Red Gum	46	5.52	10	8	Fair	Typical	C	Deadwood
118	*Stag*	Dead tree	43	5.16	8	1	Dead	Dead	C	Deadwood, decay
119	*Eucalyptus racemosa*	Queensland Scribbly gum	92	11.04			Fair	Typical	B	Deadwood, habitat present
120	*Stag*	Dead tree	64	7.68	16	10	Dead	Dead	C	Deadwood, decay, pest infestation, retain and protect, undertake habitat pruning
121	*Eucalyptus racemosa*	Queensland Scribbly gum	61	7.32	12	10	Fair	Typical	B	
122	*Stag*	Dead tree	25	3	8	1	Dead	Dead	C	Deadwood, decay
123	*Stag*	Dead tree	45	5.4	9	4	Dead	Dead	C	Deadwood
124	*Corymbia trachyphloia*	Brown Bloodwood	65	7.8	12	8	Fair	Typical	C	Deadwood
125	*Corymbia intermedia*	Pink Bloodwood	42	5.04	17	11	Fair	Typical	C	Retain and protect
126	*Eucalyptus seeana*	Narrow Leaf Red Gum	89	10.68	16		Fair	Poor	C	Deadwood, habitat present
127	*Stag*	Dead tree	74	8.88	12	5	Dead	Dead	C	Cavity, deadwood, decay, retain and protect, undertake habitat pruning

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
128	*Eucalyptus racemosa*	Queensland Scribbly gum	60	7.2	10	14	Fair	Poor	C	Deadwood
129	*Stag*	Dead tree	71	8.52	16	9	Dead	Dead	C	Broken limbs, cavity, deadwood, decay, retain and protect, undertake habitat pruning
130	*Eucalyptus racemosa*	Queensland Scribbly gum	70	8.4	16	10	Fair	Poor	B	Deadwood, habitat present
131	*Eucalyptus seeana*	Narrow Leaf Red Gum	94	11.28	14	10	Fair	Typical	B	
132	*Eucalyptus racemosa*	Queensland Scribbly gum	50	6	16	14	Fair	Typical	B	Deadwood
133	*Stag*	Dead tree	97	11.64	22	19	Dead	Dead	C	Broken limbs, cavity, deadwood, decay, retain and protect, undertake habitat pruning
134	*Stag*	Dead tree	50	6	8	1	Dead	Dead	C	
135	*Stag*	Dead tree	60	7.2	8	1	Dead	Dead	C	Deadwood
136	*Stag*	Dead tree	73	8.76	22	19	Dead	Dead	C	Broken limbs, cavity, deadwood, decay, retain and protect, undertake habitat pruning
137	*Stag*	Dead tree	44	5.28	17	11	Dead	Dead	C	Broken limbs, deadwood, decay, retain and protect, undertake habitat pruning
138	*Eucalyptus spp.*	Stringybark	92	11.04	12	10	Fair	Poor	C	Cavity, deadwood
139	*Stag*	Dead tree	55	6.6	18	8	Dead	Dead	C	
140	*Stag*	Dead tree	30.81	3.7	17	10	Dead	Dead	C	Deadwood
141	*Stag*	Dead tree	60	7.2	16	10	Dead	Dead	C	Deadwood, habitat present
142	*Eucalyptus racemosa*	Queensland Scribbly gum	49	5.88	12	10	Fair	Poor	C	Deadwood, head died out
143	*Eucalyptus racemosa*	Queensland Scribbly gum	42	5.04	12	10	Fair	Typical	C	Deadwood, one sided
144	*Stag*	Dead tree	35	4.2	5	1	Dead	Dead	C	Deadwood
145	*Stag*	Dead tree	35	4.2	9	1	Dead	Dead	C	Deadwood
146	*Eucalyptus racemosa*	Queensland Scribbly gum	70	8.4	18	12	Fair	Typical	C	Deadwood
147	*Eucalyptus racemosa*	Queensland Scribbly gum	90	10.8	18	12	Fair	Poor	C	Deadwood
148	*Stag*	Dead tree	40	4.8	11	1	Dead	Dead	C	Deadwood
149	*Eucalyptus resinifera*	Red Mahogany	80	9.6	26	20	Poor	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
150	*Melaleuca quinquenervia*	Broad-leaved Paperbark	41	4.92	8	4	Fair	Typical	C	

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
151	*Corymbia intermedia*	Pink Bloodwood	44	5.28	24	9	Fair	Typical	C	Retain and protect
152	*Eucalyptus racemosa*	Queensland Scribbly gum	132	15	18	12	Fair	Poor	C	Cavity, deadwood, decay, habitat present, head died out
153	*Corymbia intermedia*	Pink Bloodwood	59	7.08	26	14	Fair	Typical	B	Deadwood
154	*Corymbia intermedia*	Pink Bloodwood	48	5.76	17	12	Fair	Poor	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
155	*Eucalyptus racemosa*	Queensland Scribbly gum	73	8.76	24	16	Fair	Typical	B	Deadwood, retain and protect
156	*Eucalyptus racemosa*	Queensland Scribbly gum	67	8.04	22	14	Fair	Typical	C	Deadwood, pest infestation, retain and protect
157	*Eucalyptus racemosa*	Queensland Scribbly gum	86	10.32	23	17	Fair	Typical	C	Cavity, deadwood, retain and protect, undertake the removal of deadwood in crown
158	*Eucalyptus racemosa*	Queensland Scribbly gum	106	12.72	23	20	Fair	Typical	C	Broken limbs, cavity, deadwood, retain and protect, undertake habitat pruning
159	*Eucalyptus racemosa*	Queensland Scribbly gum	62	7.44	22	16	Fair	Typical	C	Cavity, deadwood, retain and protect, undertake the removal of deadwood in crown
160	*Eucalyptus racemosa*	Queensland Scribbly gum	93	11.16	22	16	Fair	Typical	C	Broken limbs, cavity, deadwood, retain and protect, undertake the removal of deadwood in crown
161	*Eucalyptus racemosa*	Queensland Scribbly gum	78	9.36	23	17	Fair	Typical	C	Deadwood, habitat present, pest infestation, retain and monitor, installation of bracing system recommended, retain and protect, undertake the removal of deadwood in crown
162	*Eucalyptus racemosa*	Queensland Scribbly gum	94	11.28	22	14	Fair	Typical	C	Broken limbs, deadwood, habitat present, retain and protect, undertake the removal of deadwood in crown
163	*Angophora leiocarpa*	Smooth Bark Apple	68	8.16	25	14	Fair	Typical	C	Deadwood, habitat present, head died out, retain and protect
164	*Stag*	Dead tree	60	7.2	13	9	Dead	Dead	C	Cavity, deadwood, decay, habitat present, retain and protect, undertake habitat pruning
165	*Eucalyptus racemosa*	Queensland Scribbly gum	77	9.24	19	12	Fair	Typical	C	Broken limbs, deadwood, one sided, wound, retain and protect, undertake the removal of deadwood in crown

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
166	*Eucalyptus racemosa*	Queensland Scribbly gum	50	6	17	10	Fair	Typical	C	Deadwood, one sided, wound, retain and protect, undertake the removal of deadwood in crown
167	*Eucalyptus racemosa*	Queensland Scribbly gum	74	8.88	20	15	Very Poor	Typical	C	Co-dominant limbs, deadwood, head died out, retain and protect, undertake habitat pruning
168	*Eucalyptus racemosa*	Queensland Scribbly gum	68	8.16	21	14	Fair	Typical	C	Deadwood, retain and protect
169	*Eucalyptus racemosa*	Queensland Scribbly gum	68	8.16	22	15	Fair	Typical	C	Broken limbs, deadwood, retain and protect, undertake the removal of deadwood in crown
170	*Eucalyptus racemosa*	Queensland Scribbly gum	85	10.2	23	17	Poor	Typical	C	Deadwood, pest infestation, retain and protect, undertake the removal of deadwood in crown
171	*Stag*	Dead tree	42	5.04	9	5	Dead	Dead	C	Deadwood
172	*Eucalyptus pilularis*	Blackbutt	79	9.48	25	18	Fair	Typical	B	Deadwood, retain and protect
173	*Stag*	Dead tree	100	12	15	9	Dead	Dead	C	Cavity, deadwood, decay, habitat present , pest infestation, retain and protect, undertake habitat pruning
174	*Corymbia intermedia*	Pink Bloodwood	34	4.08	12	8	Fair	Poor	C	One sided
175	*Eucalyptus racemosa*	Queensland Scribbly gum	69.07	8.29	22	10	Fair	Typical	C	Deadwood
176	*Eucalyptus racemosa*	Queensland Scribbly gum	75	9	22	15	Fair	Typical	C	Deadwood, habitat present , unattached branches, retain and protect, undertake the removal of deadwood in crown
177	*Eucalyptus racemosa*	Queensland Scribbly gum	69	8.28	23	13	Fair	Typical	C	Broken limbs, deadwood, habitat present , pest infestation, unattached branches, retain and protect, undertake the removal of deadwood in crown
178	*Eucalyptus racemosa*	Queensland Scribbly gum	63	7.56	23	12	Fair	Typical	C	Deadwood, epicormic growth, head died out, retain and protect, undertake the removal of deadwood in crown
179	*Eucalyptus racemosa*	Queensland Scribbly gum	63	7.56	23	15	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
180	*Eucalyptus racemosa*	Queensland Scribbly gum	63	7.56	20	13	Fair	Typical	C	Deadwood, habitat present, retain and protect, undertake the removal of deadwood in crown

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
181	*Eucalyptus racemosa*	Queensland Scribbly gum	73	8.76	16	11	Fair	Typical	C	Cavity, deadwood, habitat present , head died out, retain and protect
182	*Eucalyptus racemosa*	Queensland Scribbly gum	73	8.76	21	14	Poor	Typical	C	Deadwood, habitat present , head died out, retain and monitor, installation of bracing system recommended, retain and protect, undertake habitat pruning
183	*Eucalyptus resinifera*	Red Mahogany	108	12.96	24	17	Fair	Poor	C	Deadwood, pest infestation, retain and protect, undertake the removal of deadwood in crown
184	*Eucalyptus racemosa*	Queensland Scribbly gum	81	9.72	22	16	Poor	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
185	*Eucalyptus racemosa*	Queensland Scribbly gum	71	8.52	22	14	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
186	*Corymbia intermedia*	Pink Bloodwood	46	5.52	22	16	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
187	*Eucalyptus racemosa*	Queensland Scribbly gum	70	8.4	23	17	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
188	*Eucalyptus seeana*	Narrow Leaf Red Gum	61	7.32	22	14	Fair	Typical	B	Deadwood, retain and protect
189	*Eucalyptus racemosa*	Queensland Scribbly gum	65	7.8	22	13	Fair	Typical	C	Deadwood, retain and protect, undertake the removal of deadwood in crown
190	*Eucalyptus seeana*	Narrow Leaf Red Gum	57	6.84	22	11	Poor	Typical	C	Deadwood, head died out, pest infestation, retain and protect, undertake the removal of deadwood in crown
191	*Eucalyptus racemosa*	Queensland Scribbly gum	61	7.32	23	15	Poor	Typical	C	Deadwood, habitat present, retain and protect, undertake the removal of deadwood in crown
192	*Stag*	Dead tree	43	5.16	12	10	Dead	Dead	C	Deadwood, retain and protect, undertake habitat pruning
193	*Corymbia intermedia*	Pink Bloodwood	38	4.56	14	9	Fair	Typical	C	Deadwood, retain and protect
194	*Corymbia intermedia*	Pink Bloodwood	27	3.24	10	5	Fair	Poor	C	Deadwood, retain and protect
195	*Eucalyptus seeana*	Narrow Leaf Red Gum	42	5.04	10	7	Fair	Typical	C	Retain and protect
196	*Stag*	Dead tree	21	2.52	6	1	Dead	Dead	C	Deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
197	*Eucalyptus racemosa*	Queensland Scribbly gum	70.04	8.4	14	8	Very Poor	Poor	R	Broken limbs, co-dominant limbs, deadwood, head died out, lightning damage, pest infestation, remove and replace
198	*Eucalyptus racemosa*	Queensland Scribbly gum	36	4.32	10	6	Fair	Poor	C	Deadwood, unattached branches, wound, retain and protect, undertake the removal of deadwood in crown
199	*Eucalyptus seeana*	Narrow Leaf Red Gum	38	4.56	10	8	Fair	Typical	C	Retain and protect
200	*Corymbia intermedia*	Pink Bloodwood	39	4.68	8	5	Poor	Poor	R	Co-dominant limbs, deadwood, included bark , one sided , pest infestation, remove and replace
201	*Corymbia intermedia*	Pink Bloodwood	40	4.8	14	8	Fair	Typical	C	Deadwood, retain and protect
202	*Corymbia intermedia*	Pink Bloodwood	66.76	8.01	12	11	Fair	Typical	C	Co-dominant limbs, deadwood, retain and protect
203	*Lophostemon suaveolens*	Swamp Box	59	7.08	10	6	Poor	Typical	C	Deadwood, head died out, wound, retain and protect, undertake habitat pruning
204	*Stag*	Dead tree	149	15	25	15	Dead	Dead	C	Cavity, deadwood, habitat present, retain and protect, undertake habitat pruning
205	*Eucalyptus pilularis*	Blackbutt	100	12	24	16	Poor	Poor	C	Cavity, deadwood, epicormic growth, head died out, wound, retain and protect, undertake habitat pruning
206	*Corymbia intermedia*	Pink Bloodwood	57	6.84	20	14	Fair	Typical	B	Deadwood
207	*Eucalyptus pilularis*	Blackbutt	64.9	7.79	18	12	Poor	Poor	C	Cavity, co-dominant limbs, deadwood, head died out
208	*Eucalyptus pilularis*	Blackbutt	64	7.68	20	12	Fair	Poor	C	Deadwood
209	*Corymbia intermedia*	Pink Bloodwood	34.21	4.11	13	7	Fair	Typical	C	Co-dominant limbs
210	*Eucalyptus pilularis*	Blackbutt	106	12.72	27	17	Fair	Typical	B	Deadwood, retain and protect, undertake the removal of deadwood in crown
211	*Eucalyptus pilularis*	Blackbutt	98.38	11.81	22	14	Poor	Poor	C	Co-dominant limbs, deadwood
212	*Corymbia intermedia*	Pink Bloodwood	45.45	5.45	12	9	Fair	Poor	C	Co-dominant limbs
213	*Stag*	Dead tree	30	3.6	14	7	Dead	Dead	R	
214	*Stag*	Dead tree	35	4.2	14	7	Dead	Dead	R	
215	*Eucalyptus pilularis*	Blackbutt	46.52	5.58	18	8	Fair	Poor	C	Deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
216	*Eucalyptus pilularis*	Blackbutt	51.66	6.2	18	8	Fair	Poor	C	Co-dominant limbs, deadwood
217	*Eucalyptus pilularis*	Blackbutt	59	7.08	18	8	Fair	Typical	C	Deadwood
218	*Eucalyptus pilularis*	Blackbutt	73.41	8.81	18	10	Poor	Poor	C	Co-dominant limbs, deadwood
219	*Eucalyptus pilularis*	Blackbutt	177	15	24	20	Fair	Typical	A	Deadwood, habitat present , wound, retain and protect, undertake habitat pruning
220	*Eucalyptus pilularis*	Blackbutt	50.77	6.09	8	7	Poor	Poor	C	Deadwood
221	*Eucalyptus pilularis*	Blackbutt	70	8.4	18	9	Poor	Typical	C	Deadwood, wound
222	*Eucalyptus pilularis*	Blackbutt	73	8.76	18	9	Poor	Poor	C	Co-dominant limbs, deadwood
223	*Eucalyptus pilularis*	Blackbutt	89.89	10.79	15	7	Poor	Poor	C	Co-dominant limbs, deadwood, retain and protect, undertake habitat pruning
224	*Stag*	Dead tree	61.4	7.37	17	8	Dead	Dead	C	Deadwood
225	*Eucalyptus pilularis*	Blackbutt	82.11	9.85	18	12	Fair	Poor	C	Co-dominant limbs, deadwood, pest infestation
226	*Eucalyptus pilularis*	Blackbutt	96.75	11.61	21	12	Poor	Poor	C	Co-dominant limbs, deadwood, wound
227	*Eucalyptus pilularis*	Blackbutt	52	6.24	21	12	Poor	Typical	C	Deadwood
228	*Eucalyptus pilularis*	Blackbutt	79.93	9.59	22	17	Fair	Typical	C	Deadwood
229	*Eucalyptus pilularis*	Blackbutt	77	9.24	23	14	Fair	Typical	B	Compacted soil, retain and protect
230	*Eucalyptus pilularis*	Blackbutt	68	8.16	23	15	Fair	Typical	B	Compacted soil
231	*Eucalyptus racemosa*	Queensland Scribbly gum	87	10.44	22	17	Fair	Typical	B	Co-dominant limbs, deadwood
232	*Eucalyptus pilularis*	Blackbutt	44.94	5.39	18	10	Poor	Poor	C	Co-dominant limbs, deadwood, head died out
233	*Eucalyptus pilularis*	Blackbutt	40	4.8	18	10	Fair	Typical	C	Cavity, deadwood
234	*Eucalyptus pilularis*	Blackbutt	32	3.84	16	5	Poor	Poor	C	Deadwood, vine growth
235	*Stag*	Dead tree	36.88	4.43	13	4	Dead	Dead	R	
236	*Stag*	Dead tree	37.48	4.5	13	4	Dead	Dead	R	Co-dominant limbs, deadwood
237	*Eucalyptus pilularis*	Blackbutt	67.18	8.06	22	16	Poor	Poor	C	Co-dominant limbs, deadwood, head died out
238	*Eucalyptus pilularis*	Blackbutt	31.14	3.74	14	6	Fair	Poor	C	Co-dominant limbs
239	*Eucalyptus pilularis*	Blackbutt	59	7.08	18	11	Fair	Typical	C	Co-dominant limbs
240	*Eucalyptus pilularis*	Blackbutt	43	5.16	18	8	Fair	Typical	C	Deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
241	*Eucalyptus pilularis*	Blackbutt	73.24	8.79	20	12	Poor	Poor	C	Deadwood, pest infestation
242	*Stag*	Dead tree	33.84	4.06	18	6	Dead	Dead	R	Deadwood, decay
243	*Stag*	Dead tree	51	6.12	18	11	Dead	Dead	R	Deadwood, decay
244	*Lophostemon suaveolens*	Swamp Box	16	2	8	3	Fair	Typical	C	
245	*Eucalyptus pilularis*	Blackbutt	34	4.08	16	5	Poor	Poor	C	Deadwood
246	*Eucalyptus pilularis*	Blackbutt	68.62	8.23	22	16	Fair	Typical	C	Co-dominant limbs, habitat present
247	*Eucalyptus seeana*	Narrow Leaf Red Gum	31	3.72	11	6	Fair	Typical	C	
248	*Lophostemon suaveolens*	Swamp Box	13	2	6	3	Fair	Typical	C	
249	*Eucalyptus pilularis*	Blackbutt	35	4.2	19	9	Fair	Poor	C	Deadwood, head died out
250	*Eucalyptus pilularis*	Blackbutt	44	5.28	20	13	Fair	Poor	C	Co-dominant limbs, deadwood
251	*Eucalyptus pilularis*	Blackbutt	47	5.64	22	15	Fair	Typical	C	
252	*Eucalyptus pilularis*	Blackbutt	50	6	22	15	Fair	Typical	C	
253	*Eucalyptus pilularis*	Blackbutt	40	4.8	20	15	Poor	Typical	C	Deadwood, head died out
254	*Eucalyptus pilularis*	Blackbutt	37	4.44	19	9	Fair	Poor	C	Deadwood
255	*Melaleuca quinquenervia*	Broad-leaved Paperbark	35	4.2	6	4	Fair	Typical	C	
256	*Eucalyptus pilularis*	Blackbutt	63.76	7.65	20	13	Poor	Poor	C	Co-dominant limbs, deadwood, head died out
257	*Eucalyptus pilularis*	Blackbutt	54	6.48	20	13	Fair	Typical	B	Deadwood
258	*Eucalyptus seeana*	Narrow Leaf Red Gum	68	8.16	20	17	Fair	Typical	B	Deadwood, habitat present
259	*Eucalyptus racemosa*	Queensland Scribbly gum	103	12.36	23	17	Fair	Typical	B	Deadwood, habitat present, retain and protect, undertake habitat pruning
260	*Eucalyptus racemosa*	Queensland Scribbly gum	96	11.52	24	20	Fair	Typical	B	Deadwood, habitat present, retain and protect, undertake habitat pruning
261	*Mangifera indica*	Mango	28	3.36	8	8	Fair	Typical	C	
262	*Eucalyptus pilularis*	Blackbutt	58.22	6.99	17	13	Fair	Poor	C	Co-dominant limbs
263	*Eucalyptus pilularis*	Blackbutt	42.8	5.14	17	10	Fair	Poor	C	Co-dominant limbs, one sided
264	*Eucalyptus pilularis*	Blackbutt	59	7.08	21	13	Fair	Typical	B	
265	*Eucalyptus pilularis*	Blackbutt	62	7.44	21	14	Fair	Typical	B	
266	*Eucalyptus racemosa*	Queensland Scribbly gum	25	3	11	4	Fair	Typical	C	

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
267	*Eucalyptus racemosa*	Queensland Scribbly gum	21	2.52	11	4	Fair	Typical	C	
268	*Eucalyptus pilularis*	Blackbutt	45.28	5.43	19	13	Fair	Typical	C	Co-dominant limbs
269	*Eucalyptus pilularis*	Blackbutt	55	6.6	22	13	Fair	Typical	C	Deadwood
270	*Eucalyptus pilularis*	Blackbutt	83	9.96	23	14	Fair	Poor	C	Co-dominant limbs, deadwood
271	*Corymbia intermedia*	Pink Bloodwood	31.21	3.75	12	7	Fair	Poor	C	
272	*Eucalyptus resinifera*	Red Mahogany	36	4.32	19	11	Fair	Poor	C	Compacted soil, deadwood
273	*Eucalyptus pilularis*	Blackbutt	59.41	7.13	22	13	Fair	Poor	C	Co-dominant limbs, deadwood
274	*Eucalyptus pilularis*	Blackbutt	50.61	6.07	22	13	Fair	Poor	C	Co-dominant limbs, deadwood
275	*Eucalyptus pilularis*	Blackbutt	62	7.44	23	14	Fair	Poor	C	Co-dominant limbs, deadwood, wound
276	*Eucalyptus pilularis*	Blackbutt	41	4.92	23	14	Fair	Typical	C	Deadwood, retain and monitor, installation of bracing system recommended
277	*Eucalyptus pilularis*	Blackbutt	38	4.56	23	14	Fair	Typical	C	Deadwood
278	*Eucalyptus pilularis*	Blackbutt	58	6.96	23	14	Fair	Typical	B	Deadwood
279	*Eucalyptus pilularis*	Blackbutt	89.82	10.78	23	18	Fair	Poor	C	Co-dominant limbs, deadwood
280	*Eucalyptus seeana*	Narrow Leaf Red Gum	82.38	9.89	18	17	Fair	Typical	B	Co-dominant limbs, deadwood
281	*Eucalyptus resinifera*	Red Mahogany	53	6.36	24	16	Fair	Typical	C	Deadwood
282	*Eucalyptus pilularis*	Blackbutt	77.23	9.27	22	16	Fair	Poor	C	Co-dominant limbs, compacted soil, deadwood
283	*Eucalyptus pilularis*	Blackbutt	64	7.68	22	14	Fair	Typical	C	Deadwood
284	*Melaleuca quinquenervia*	Broad-leaved Paperbark	33	3.96	7	5	Fair	Typical	C	
285	*Eucalyptus pilularis*	Blackbutt	74	8.88	24	16	Fair	Typical	C	Co-dominant limbs, deadwood
286	*Eucalyptus pilularis*	Blackbutt	83	9.96	24	15	Fair	Typical	C	Broken limbs, deadwood, unattached branches
287	*Eucalyptus pilularis*	Blackbutt	96.98	11.64	24	15	Fair	Poor	C	Co-dominant limbs, deadwood, one sided
288	*Eucalyptus pilularis*	Blackbutt	70.29	8.43	24	16	Fair	Poor	C	Co-dominant limbs, deadwood, one sided
289	*Eucalyptus pilularis*	Blackbutt	71.03	8.52	24	16	Fair	Poor	C	Co-dominant limbs, deadwood
290	*Eucalyptus pilularis*	Blackbutt	62.8	7.54	22	13	Fair	Poor	C	Co-dominant limbs, deadwood, one sided
291	*Melaleuca quinquenervia*	Broad-leaved Paperbark	48.1	5.77	8	8	Fair	Typical	C	
292	*Melaleuca quinquenervia*	Broad-leaved Paperbark	56	6.72	12	6	Good	Poor	C	Wound

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
293	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	12	6	Good	Typical	C	Vine growth
294	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	6	4	Poor	Poor	R	Vine growth
295	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	8	4	Poor	Poor	C	Deadwood, vine growth
296	*Eucalyptus propinqua*	Small Fruited Grey Gum	35	4.2	6	5	Fair	Poor	C	
297	*Eucalyptus seeana*	Narrow Leaf Red Gum	60	7.2	14	8	Fair	Typical	C	Broken limbs, deadwood
298	*Eucalyptus seeana*	Narrow Leaf Red Gum	54	6.48	14	8	Fair	Typical	C	
299	*Eucalyptus resinifera*	Red Mahogany	58	6.96	10	8	Fair	Poor	C	Wound
300	*Eucalyptus pilularis*	Blackbutt	50	6	4	8	Fair	Typical	C	Deadwood
301	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	6	Fair	Typical	C	
302	*Stag*	Dead tree	35	4.2	8	5	Dead	Dead	R	
303	*Melaleuca quinquenervia*	Broad-leaved Paperbark	55	6.6	12	8	Poor	Poor	R	Decay, wound
304	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	10	5	Fair	Typical	C	
305	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	12	5	Fair	Typical	C	
306	*Melaleuca quinquenervia*	Broad-leaved Paperbark	49	5.88	12	10	Fair	Typical	C	Deadwood
307	*Corymbia intermedia*	Pink Bloodwood	25	3	6	4	Fair		C	
308	*Melaleuca quinquenervia*	Broad-leaved Paperbark	45	5.4	14	6	Fair	Typical	C	Deadwood, one sided
309	*Corymbia intermedia*	Pink Bloodwood	65.57	7.87	12	8	Poor	Poor	C	Deadwood, decay, epicormic growth
310	*Eucalyptus seeana*	Narrow Leaf Red Gum	45	5.4	10	6	Fair	Typical	C	Deadwood
311	*Eucalyptus seeana*	Narrow Leaf Red Gum	45	5.4	10	6	Fair	Typical	C	Deadwood
312	*Eucalyptus pilularis*	Blackbutt	55	6.6	16	8	Fair	Typical	B	
313	*Eucalyptus racemosa*	Queensland Scribbly gum	83	9.96	16	10	Fair	Typical	B	Deadwood
314	*Eucalyptus seeana*	Narrow Leaf Red Gum	40	4.8	8	6	Fair	Typical	C	
315	*Stag*	Dead tree	90	10.8	14	8	Dead	Dead	C	Retain and protect, undertake habitat pruning
316	*Corymbia intermedia*	Pink Bloodwood	40	4.8	10	6	Fair	Typical	C	
317	*Eucalyptus racemosa*	Queensland Scribbly gum	45	5.4	10	9	Fair	Typical	C	
318	*Eucalyptus seeana*	Narrow Leaf Red Gum	80	9.6	22	20	Fair	Typical	B	Deadwood
319	*Eucalyptus racemosa*	Queensland Scribbly gum	86	10.32	26	18	Fair	Typical	B	Deadwood, epicormic growth, habitat present

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
320	*Melaleuca quinquenervia*	Broad-leaved Paperbark	45	5.4	8	6	Fair	Poor	C	
321	*Melaleuca quinquenervia*	Broad-leaved Paperbark	45	5.4	8	6	Fair	Typical	C	
322	*Stag*	Dead tree	80	9.6	8	6	Dead	Dead	C	Deadwood, habitat present
323	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	10	6	Fair	Typical	C	
324	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	12	6	Fair	Typical	C	
325	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	6	Fair	Typical	C	
326	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	6	Fair	Typical	C	
327	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	6	Fair	Typical	C	
328	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	8	6	Fair	Typical	C	
329	*Stag*	Dead tree	30	3.6	9	3	Dead	Dead	C	Deadwood
330	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	10	6	Fair	Typical	B	Deadwood
331	*Melaleuca quinquenervia*	Broad-leaved Paperbark	58	6.96	8	5	Fair	Typical	C	Co-dominant limbs, deadwood
332	*Eucalyptus seeana*	Narrow Leaf Red Gum	65	7.8	18	14	Fair	Typical	C	Deadwood, habitat present
333	*Melaleuca quinquenervia*	Broad-leaved Paperbark	55	6.6	10	6	Fair	Typical	C	
334	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	8	8	Fair	Typical	C	Deadwood
335	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	11	8	Fair	Poor	C	Deadwood, one sided
336	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50	6	11	8	Fair	Poor	C	Deadwood, one sided
337	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	11	8	Fair	Poor	C	Deadwood, head died out, one sided
338	*Melaleuca quinquenervia*	Broad-leaved Paperbark	45	5.4	8	6	Fair	Poor	C	Deadwood, habitat present , head died out
339	*Melaleuca quinquenervia*	Broad-leaved Paperbark	59	7.08	10	6	Fair	Poor	C	Deadwood, habitat present , head died out
340	*Corymbia trachyphloia*	Brown Bloodwood	47	5.64	12	8	Fair	Typical	C	Deadwood, wound
341	*Melaleuca quinquenervia*	Broad-leaved Paperbark	58	6.96	8	8	Fair	Typical	C	
342	*Eucalyptus racemosa*	Queensland Scribbly gum	73	8.76	14	9	Fair	Typical	B	Deadwood, habitat present
343	*Stag*	Dead tree	40	4.8	4	2	Dead	Dead	R	
344	*Corymbia intermedia*	Pink Bloodwood	62	7.44	16	8	Fair	Typical	B	Deadwood
345	*Eucalyptus racemosa*	Queensland Scribbly gum	55	6.6	14	8	Fair	Typical	B	Deadwood, one sided
346	*Corymbia intermedia*	Pink Bloodwood	55	6.6	14	8	Poor	Poor	C	Deadwood, decay, epicormic growth

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
347	*Eucalyptus racemosa*	Queensland Scribbly gum	119	14.28	22	17	Fair	Poor	C	Deadwood, one sided , wound
348	*Stag*	Dead tree	42.43	5.09	14	8	Dead	Dead	R	Deadwood
349	*Eucalyptus pilularis*	Blackbutt	70	8.4	14	10	Fair	Typical	B	
350	*Eucalyptus pilularis*	Blackbutt	70	8.4	18	12	Fair	Typical	B	Deadwood
351	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	14	12	Fair	Typical	C	Deadwood
352	*Stag*	Dead tree	49	5.88	10	9	Dead	Dead	C	Vine growth
353	*Eucalyptus racemosa*	Queensland Scribbly gum	63	7.56	16	12	Fair	Typical	B	Deadwood
354	*Corymbia intermedia*	Pink Bloodwood	43	5.16	12	6	Poor	Poor	C	Deadwood, decay, wound
355	*Melaleuca quinquenervia*	Broad-leaved Paperbark	49	5.88	10	6	Fair	Typical	C	Deadwood
356	*Melaleuca quinquenervia*	Broad-leaved Paperbark	35	4.2	8	3	Poor	Poor	C	Deadwood, vine growth
357	*Various spp.*	Group of Trees					Fair	Typical	C	
358	*Various spp.*	Group of Trees					Fair	Typical	C	
359	*Eucalyptus racemosa*	Queensland Scribbly gum	60	7.2	12	8	Fair	Typical	B	Deadwood
360	*Eucalyptus racemosa*	Queensland Scribbly gum	80	9.6	20	16	Fair	Typical	B	Deadwood
361	*Eucalyptus racemosa*	Queensland Scribbly gum	58.31	7	18	10	Fair	Typical	C	Deadwood
362	*Eucalyptus racemosa*	Queensland Scribbly gum	60	7.2	18	10	Poor	Poor	C	Deadwood, wound
363	*Eucalyptus pilularis*	Blackbutt	55	6.6	16	8	Poor	Poor	C	Deadwood
364	*Eucalyptus pilularis*	Blackbutt	50	6	14	8	Fair	Typical	B	Deadwood
365	*Eucalyptus pilularis*	Blackbutt	74	8.88	18	16	Fair	Typical	B	Deadwood
366	*Stag*	Dead tree	50	6	14	8	Dead	Dead	C	Deadwood
367	*Corymbia intermedia*	Pink Bloodwood	40	4.8	8	6	Fair	Typical	C	
368	*Eucalyptus pilularis*	Blackbutt	60	7.2	18	13	Fair	Typical	B	Deadwood
369	*Eucalyptus pilularis*	Blackbutt	55	6.6	18	14	Fair	Typical	B	
370	*Eucalyptus racemosa*	Queensland Scribbly gum	96	11.52	18	16	Fair	Typical	B	Deadwood, habitat present
371	*Eucalyptus pilularis*	Blackbutt	110	13.2	20	20	Fair	Poor	C	Co-dominant limbs, deadwood
372	*Eucalyptus racemosa*	Queensland Scribbly gum	138	15	18	18	Fair	Poor	C	Deadwood, decay, habitat present , head died out
373	*Eucalyptus pilularis*	Blackbutt	58.31	7	14	8	Poor	Poor	R	Deadwood, decay

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
374	*Corymbia intermedia*	Pink Bloodwood	49.5	5.94	10	8	Fair	Poor	C	Co-dominant limbs, deadwood
375	*Corymbia intermedia*	Pink Bloodwood	54.08	6.49	12	10	Fair	Poor	C	Co-dominant limbs, deadwood
376	*Corymbia intermedia*	Pink Bloodwood	57.66	6.92	12	10	Fair	Poor	C	Co-dominant limbs, deadwood
377	*Eucalyptus racemosa*	Queensland Scribbly gum	152	15	20	18	Fair	Poor	C	Cavity, deadwood, decay, head died out
378	*Eucalyptus racemosa*	Queensland Scribbly gum	90	10.8	26	20	Fair	Typical	B	Deadwood
379	*Eucalyptus racemosa*	Queensland Scribbly gum	75	9	16	14	Fair	Typical	B	Deadwood
380	*Eucalyptus pilularis*	Blackbutt	108	12.96	24	20	Fair	Typical	B	Deadwood
381	*Eucalyptus racemosa*	Queensland Scribbly gum	80	9.6	12	8	Fair	Typical	C	Co-dominant limbs, deadwood
382	*Corymbia intermedia*	Pink Bloodwood	90	10.8	20	14	Fair	Typical	B	Deadwood
383	*Eucalyptus pilularis*	Blackbutt	176	15	35	20	Fair	Typical	B	Cavity, deadwood
384	*Eucalyptus racemosa*	Queensland Scribbly gum	94	11.28	10	9	Fair	Poor	C	Deadwood, decay, one sided , wound
385	*Eucalyptus pilularis*	Blackbutt	115.43	13.85	20	18	Fair	Poor	C	Deadwood, decay
386	*Eucalyptus pilularis*	Blackbutt	55	6.6	10	5	Fair	Poor	C	Cavity, deadwood
387	*Eucalyptus pilularis*	Blackbutt	58.31	7	16	12	Fair	Typical	C	Cavity, deadwood
388	*Eucalyptus pilularis*	Blackbutt	72	8.64	16	12	Fair	Typical	C	Cavity, deadwood
389	*Eucalyptus pilularis*	Blackbutt	77	9.24	22	12	Fair	Typical	C	Cavity, deadwood
390	*Eucalyptus pilularis*	Blackbutt	84.85	10.18	16	12	Fair	Typical	C	Cavity, deadwood
391	*Eucalyptus pilularis*	Blackbutt	40	4.8	8	5	Fair	Poor	C	Cavity, deadwood
392	*Eucalyptus pilularis*	Blackbutt	50	6	15	12	Fair	Poor	C	Deadwood
393	*Eucalyptus pilularis*	Blackbutt	40	4.8	8	5	Fair	Poor	C	Deadwood
394	*Eucalyptus racemosa*	Queensland Scribbly gum	106	12.72	30	20	Fair	Typical	B	Deadwood, habitat present
395	*Eucalyptus pilularis*	Blackbutt	128	15	18	16	Fair	Poor	C	Co-dominant limbs
396	*Eucalyptus racemosa*	Queensland Scribbly gum	85	10.2	18	16	Fair	Typical	B	Deadwood
397	*Stag*	Dead tree	45	5.4	8	6	Dead	Dead	C	Deadwood
398	*Stag*	Dead tree	40	4.8	9	6	Dead	Dead	C	Deadwood, habitat present
399	*Eucalyptus pilularis*	Blackbutt	146	15	22	126	Fair	Poor	C	Co-dominant limbs, deadwood
400	*Eucalyptus pilularis*	Blackbutt	71.59	8.59	18	12	Fair	Poor	C	Co-dominant limbs, deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
401	*Corymbia intermedia*	Pink Bloodwood	40	4.8	8	6	Fair	Poor	C	One sided
402	*Eucalyptus pilularis*	Blackbutt	132	15	35	20	Fair	Typical	B	Deadwood
403	*Eucalyptus pilularis*	Blackbutt	132	15	20	12	Fair	Typical	C	Deadwood
404	*Eucalyptus racemosa*	Queensland Scribbly gum	129	15	26	20	Fair	Typical	B	Deadwood
405	*Eucalyptus pilularis*	Blackbutt	114	13.68	22	19	Fair	Typical	B	Habitat present
406	*Eucalyptus pilularis*	Blackbutt	80.93	9.71	22	19	Fair	Typical	C	Deadwood
407	*Eucalyptus racemosa*	Queensland Scribbly gum	58	6.96	16	8	Fair	Typical	B	Deadwood
408	*Eucalyptus racemosa*	Queensland Scribbly gum	110	13.2	18	12	Fair	Typical	C	Cavity, deadwood
409	*Eucalyptus spp.*	Stringybark	44	5.28	14	8	Fair	Typical	C	
410	*Eucalyptus siderophloia*	Northern Grey Ironbark	44	5.28	14	8	Fair	Typical	C	Deadwood
411	*Stag*	Dead tree	70	8.4	16	8	Dead	Dead	C	Habitat present
412	*Eucalyptus racemosa*	Queensland Scribbly gum	66	7.92	18	12	Fair	Typical	C	Deadwood, decay, wound
413	*Eucalyptus racemosa*	Queensland Scribbly gum	70	8.4	20	10	Fair	Typical	C	Co-dominant limbs, deadwood
414	*Eucalyptus racemosa*	Queensland Scribbly gum	70	8.4	20	10	Fair	Typical	C	Co-dominant limbs, deadwood
415	*Eucalyptus racemosa*	Queensland Scribbly gum	965	15	20	10	Fair	Typical	C	Co-dominant limbs, deadwood, habitat present
416	*Eucalyptus racemosa*	Queensland Scribbly gum	88	10.56	16	10	Fair	Typical	C	Co-dominant limbs, deadwood
417	*Stag*	Dead tree	95	11.4	14	8	Dead	Dead	C	Deadwood, habitat present
418	*Acacia sp.*	Wattle	43	5.16	10	8	Fair	Poor	C	Cavity, deadwood, decay
419	*Eucalyptus racemosa*	Queensland Scribbly gum	67	8.04	18	12	Fair	Typical	C	Compacted soil, deadwood
420	*Eucalyptus racemosa*	Queensland Scribbly gum	84	10.08	16	10	Poor	Poor	C	Deadwood, epicormic growth
421	*Eucalyptus racemosa*	Queensland Scribbly gum	75	9	16	10	Poor	Poor	C	Deadwood, habitat present
422	*Eucalyptus resinifera*	Red Mahogany	75	9	12	10	Fair	Poor	C	Co-dominant limbs, deadwood
423	*Eucalyptus racemosa*	Queensland Scribbly gum	64	7.68	20	12	Fair	Typical	C	Deadwood
424	*Stag*	Dead tree	50	6	14	8	Dead	Dead	C	Deadwood
425	*Corymbia intermedia*	Pink Bloodwood	44	5.28	12	8	Fair	Typical	C	Deadwood
426	*Corymbia intermedia*	Pink Bloodwood	54	6.48	12	8	Fair	Typical	C	Deadwood, one sided

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
427	*Eucalyptus racemosa*	Queensland Scribbly gum	90	10.8	20	18	Fair	Typical	B	Deadwood, habitat present, blood wood growing intertwined
428	*Eucalyptus racemosa*	Queensland Scribbly gum	110	13.2	20	18	Fair	Poor	C	Deadwood, decay, habitat present , wound, blood wood growing intertwined
429	*Melaleuca quinquenervia*	Broad-leaved Paperbark	30	3.6	6	3	Fair	Typical	C	Deadwood, retain and protect
430	*Eucalyptus racemosa*	Queensland Scribbly gum	81	9.72	20	12	Fair	Typical	C	Deadwood
431	*Eucalyptus pilularis*	Blackbutt	87	10.44	20	18	Fair	Poor	C	Cavity, deadwood, decay
432	*Eucalyptus pilularis*	Blackbutt	107	12.84	20	18	Fair	Poor	C	Cavity, deadwood, decay
433	*Eucalyptus racemosa*	Queensland Scribbly gum	99	11.88	18	16	Fair	Typical	C	Deadwood, retain and protect
434	*Eucalyptus pilularis*	Blackbutt	92	11.04	24	20	Fair	Typical	B	Deadwood, habitat present
435	*Melaleuca quinquenervia*	Broad-leaved Paperbark	35	4.2	7	4	Fair	Typical	C	
436	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	7	6	Fair	Typical	C	Deadwood
437	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	7	6	Fair	Typical	C	Deadwood, vine growth
438	*Eucalyptus pilularis*	Blackbutt	98	11.76	26	20	Fair	Typical	B	
439	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	5	Fair	Typical	C	
440	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	5	Fair	Typical	C	
441	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	5	Fair	Typical	C	Deadwood
442	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	5	Fair	Typical	C	Deadwood
443	*Eucalyptus pilularis*	Blackbutt	96	11.52	28	18	Fair	Typical	C	Cavity, deadwood
444	*Eucalyptus resinifera*	Red Mahogany	35	4.2	10	4	Poor	Poor	C	Deadwood, head died out
445	*Eucalyptus spp.*	Stringybark	35	4.2	12	8	Poor	Typical	C	Deadwood, head died out
446	*Corymbia intermedia*	Pink Bloodwood	57	6.84	16	8	Fair	Typical	C	Deadwood
447	*Corymbia trachyphloia*	Brown Bloodwood	57	6.84	16	8	Fair	Typical	C	Deadwood
448	*Angophora woodsiana*	Smudgee	67	8.04	18	10	Poor	Poor	C	Deadwood, decay
449	*Eucalyptus resinifera*	Red Mahogany	35	4.2	10	4	Fair	Typical	C	Deadwood
450	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	6	5	Fair	Typical	C	
451	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	6	5	Fair	Typical	C	
452	*Eucalyptus seeana*	Narrow Leaf Red Gum	50	6	8	4	Fair	Typical	C	Deadwood

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
453	*Melaleuca quinquenervia*	Broad-leaved Paperbark	49	5.88	9	7	Fair	Typical	C	Deadwood
454	*Melaleuca quinquenervia*	Broad-leaved Paperbark	49	5.88	9	7	Fair	Poor	C	Deadwood, vine growth
455	*Melaleuca quinquenervia*	Broad-leaved Paperbark	35	4.2	9	3	Fair	Poor	C	Deadwood, vine growth
456	*Corymbia intermedia*	Pink Bloodwood	20	2.4	9	3	Fair	Typical	C	
457	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	6	Fair	Typical	C	Deadwood, vine growth
458	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	8	6	Fair	Typical	C	Deadwood, vine growth
459	*Eucalyptus seeana*	Narrow Leaf Red Gum	20	2.4		10	Poor	Poor	C	Deadwood
460	*Stag*	Dead tree	65	7.8	12	8	Dead	Dead	C	Deadwood, habitat present
461	*Eucalyptus racemosa*	Queensland Scribbly gum	71	8.52	16	8	Fair	Typical	C	Deadwood, wound
462	*Melaleuca quinquenervia*	Broad-leaved Paperbark	48	5.76	8	6	Fair	Typical	C	Deadwood
463	*Eucalyptus seeana*	Narrow Leaf Red Gum	88	10.56	20	16	Fair	Typical	C	Cavity, deadwood, decay, wound
464	*Eucalyptus racemosa*	Queensland Scribbly gum	95	11.4	18	14	Fair	Typical	B	Deadwood, habitat present
465	*Eucalyptus racemosa*	Queensland Scribbly gum	80	9.6	18	14	Fair	Typical	B	Deadwood, habitat present
466	*Eucalyptus pilularis*	Blackbutt	92	11.04	16	12	Poor	Poor	R	Deadwood, decay, habitat present
467	*Eucalyptus tereticornis*	Forest Red Gum	66	7.92	25	17	Fair	Typical	B	Deadwood over 25mm, Habitat Features
468	*Melaleuca quinquenervia*	Broad-leaved Paperbark	53	6.36	17	8	Fair	Poor	C	Co-dominant Limbs, Deadwood under 25mm
469	*Eucalyptus tereticornis*	Forest Red Gum	17	2.04	7	3	Fair	Typical	C	Deadwood under 25mm
470	*Melaleuca quinquenervia*	Broad-leaved Paperbark	42	5.04	9	5	Fair	Typical	C	
471	*Melaleuca quinquenervia*	Broad-leaved Paperbark	72	8.64	18	13	Fair	Typical	B	
472	*Melaleuca quinquenervia*	Broad-leaved Paperbark	70	8.4	18	10	Fair	Typical	C	Vine growth
473	*Melaleuca quinquenervia*	Broad-leaved Paperbark	44	5.28	8	6	Fair	Typical	C	One sided
474	*Melaleuca quinquenervia*	Broad-leaved Paperbark	46	5.52	8	6	Fair	Typical	C	
475	*Eucalyptus tereticornis*	Forest Red Gum	44	5.28	18	12	Fair	Typical	C	Deadwood under 25mm
476	*Melaleuca quinquenervia*	Broad-leaved Paperbark	61	7.32	17	10	Fair	Typical	B	Deadwood over 25mm
477	*Melaleuca quinquenervia*	Broad-leaved Paperbark	51	6.12	18	8	Fair	Typical	C	Deadwood over 25mm
478	*Corymbia trachyphloia*	Brown Bloodwood	29	3.48	15	9	Fair	Typical	C	
479	*Lophostemon suaveolens*	Swamp Box	66.76	8.01	18	13	Fair	Typical	C	Deadwood over 25mm

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
480	*Corymbia trachyphloia*	Brown Bloodwood	53.67	6.44	19	16	Fair	Typical	C	Pest Infestation
481	*Angophora leiocarpa*	Smooth Bark Apple	29	3.48	16	6	Fair	Typical	C	
482	*Eucalyptus racemosa*	Queensland Scribbly gum	51.4	6.17	18	15	Fair	Typical	C	Co-dominant Limbs
483	*Eucalyptus tereticornis*	Forest Red Gum	55	6.6	19	12	Fair	Typical	C	Deadwood over 25mm
484	*Melaleuca quinquenervia*	Broad-leaved Paperbark	25	3	6	5	Good	Typical	C	
485	*Melaleuca quinquenervia*	Broad-leaved Paperbark	12	2	5	3	Fair	Poor	C	Vine growth
486	*Melaleuca quinquenervia*	Broad-leaved Paperbark	15	2	5	3	Fair	Poor	C	Vine growth
487	*Melaleuca quinquenervia*	Broad-leaved Paperbark	56	6.72	15	8	Fair	Typical	C	Deadwood over 25mm
488	*Melaleuca quinquenervia*	Broad-leaved Paperbark	18	2.16	8	8	Fair	Typical	C	
489	*Melaleuca quinquenervia*	Broad-leaved Paperbark	19	2.28	7	4	Fair	Poor	C	
490	*Melaleuca quinquenervia*	Broad-leaved Paperbark	29	3.48	7	6	Fair	Typical	C	
491	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	15	10	Fair	Typical	C	Co-dominant Limbs
492	*Lophostemon suaveolens*	Swamp Box	51	6.12	14	8	Fair	Typical	C	Vine growth
493	*Melaleuca quinquenervia*	Broad-leaved Paperbark	60	7.2	14	7	Fair	Typical	C	Vine growth
494	*Melaleuca quinquenervia*	Broad-leaved Paperbark	59	7.08	17	11	Fair	Typical	C	Deadwood under 25mm, Pest Infestation
495	*Eucalyptus racemosa*	Queensland Scribbly gum	85	10.2	23	18	Fair	Typical	B	Deadwood over 25mm, Habitat Features, Unattached Branches
496	*Eucalyptus racemosa*	Queensland Scribbly gum	77	9.24	23	17	Fair	Typical	B	Deadwood over 25mm, Habitat Features
497	*Eucalyptus racemosa*	Queensland Scribbly gum	112	13.44	25	18	Fair	Typical	B	Deadwood over 25mm, Habitat Features
498	*Eucalyptus racemosa*	Queensland Scribbly gum	80	9.6	24	19	Fair	Typical	B	Broken Limbs, Deadwood over 25mm, Habitat Features
499	*Eucalyptus racemosa*	Queensland Scribbly gum	73	8.76	22	17	Fair	Typical	B	Broken Limbs, Deadwood over 25mm, Habitat Features
500	*Eucalyptus racemosa*	Queensland Scribbly gum	78	9.36	23	16	Fair	Typical	B	Broken Limbs, Deadwood over 25mm, Habitat Features
501	*Eucalyptus racemosa*	Queensland Scribbly gum	100	12	24	18	Fair	Typical	B	Broken Limbs, Deadwood over 25mm, Habitat Features
502	*Eucalyptus racemosa*	Queensland Scribbly gum	56	6.72	20	12	Poor	Poor	C	Broken Limbs, Deadwood over 25mm, Habitat Features, One sided

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
503	*Corymbia intermedia*	Pink Bloodwood	51	6.12	24	13	Fair	Typical	C	Deadwood over 25mm
504	*Lophostemon suaveolens*	Swamp Box	57	6.84	19	11	Fair	Typical	B	Deadwood over 25mm
505	*Melaleuca quinquenervia*	Broad-leaved Paperbark	47	5.64	16	13	Poor	Typical	C	Deadwood over 25mm, Fungus/Fruiting Bodies
506	*Melaleuca quinquenervia*	Broad-leaved Paperbark	36	4.32	16	10	Fair	Typical	C	Vine growth
507	*Melaleuca quinquenervia*	Broad-leaved Paperbark	46	5.52	15	11	Fair	Typical	C	Broken Limbs, Vine growth
508	*Melaleuca quinquenervia*	Broad-leaved Paperbark	50.21	6.03	15	11	Poor	Poor	C	Broken Limbs, Deadwood over 25mm
509	*Stag*	Dead tree	45	5.4	13	7	Dead	Dead	R	
510	*Melaleuca quinquenervia*	Broad-leaved Paperbark	66	7.92	19	9	Poor	Typical	C	Broken Limbs, Cavity, Wound
511	*Melaleuca quinquenervia*	Broad-leaved Paperbark	51	6.12	19	9	Fair	Typical	C	Co-dominant Limbs
512	*Melaleuca quinquenervia*	Broad-leaved Paperbark	73	8.76	19	9	Fair	Typical	B	Co-dominant Limbs, Deadwood over 25mm
513	*Melaleuca quinquenervia*	Broad-leaved Paperbark	47	5.64	18	7	Poor	Poor	C	Deadwood over 25mm
514	*Eucalyptus tereticornis*	Forest Red Gum	65	7.8	26	16	Fair	Typical	B	Deadwood over 25mm
515	*Eucalyptus tereticornis*	Forest Red Gum	65	7.8	26	16	Fair	Typical	B	Deadwood over 25mm
516	*Melaleuca quinquenervia*	Broad-leaved Paperbark	71	8.52	20	14	Fair	Typical	B	Deadwood over 25mm
517	*Corymbia intermedia*	Pink Bloodwood	31	3.72	17	9	Fair	Typical	C	Deadwood over 25mm
518	*Stag*	Dead tree	78	9.36	22	13	Dead	Dead	C	Cavity, Habitat Features
519	*Eucalyptus racemosa*	Queensland Scribbly gum	90	10.8	18	12	Fair	Typical	C	Cavity, Deadwood over 25mm, Habitat Features, Unattached Branches, Wound
520	*Eucalyptus racemosa*	Queensland Scribbly gum	81	9.72	18	12	Fair	Typical	C	Cavity, Deadwood over 25mm, Habitat Features, Unattached Branches, Wound
521	*Eucalyptus racemosa*	Queensland Scribbly gum	178	15	23	11	Poor	Poor	C	Broken Limbs, Cavity, Deadwood, Deadwood over 25mm, Decay, Habitat Features, Head died out
522	*Angophora leiocarpa*	Smooth Bark Apple	81	9.72	27	18	Good	Typical	B	Broken Limbs, Deadwood over 25mm
523	*Eucalyptus racemosa*	Queensland Scribbly gum	81	9.72	24	17	Poor	Typical	C	Broken Limbs, Deadwood, Deadwood over 25mm, Unattached Branches
524	*Corymbia intermedia*	Pink Bloodwood	15	2	8	3	Fair	Typical	C	
525	*Corymbia intermedia*	Pink Bloodwood	15	2	6	3	Fair	Typical	C	
526	*Eucalyptus racemosa*	Queensland Scribbly gum	56	6.72	22	17	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
527	*Eucalyptus racemosa*	Queensland Scribbly gum	47	5.64	20	9	Fair	Typical	C	
528	*Eucalyptus racemosa*	Queensland Scribbly gum	52	6.24	20	10	Fair	Typical	C	Deadwood over 25mm, Unattached Branches
529	*Angophora leiocarpa*	Smooth Bark Apple	24	2.88	8	3	Poor	Poor	C	
530	*Melaleuca quinquenervia*	Broad-leaved Paperbark	21.4	2.57	6	3	Fair	Typical	C	
531	*Melaleuca quinquenervia*	Broad-leaved Paperbark	16.43	2	6	3	Fair	Typical	C	
532	*Melaleuca quinquenervia*	Broad-leaved Paperbark	21.12	2.53	6	3	Fair	Typical	C	
533	*Melaleuca quinquenervia*	Broad-leaved Paperbark	15	2	6	3	Fair	Typical	C	
534	*Melaleuca quinquenervia*	Broad-leaved Paperbark	19.8	2.38	5	3	Fair	Typical	C	
535	*Corymbia intermedia*	Pink Bloodwood	59	7.08	24	15	Very Poor	Poor	C	Deadwood over 25mm, Head died out
536	*Eucalyptus racemosa*	Queensland Scribbly gum	99	11.88	24	16	Fair	Typical	B	Broken Limbs, Deadwood over 25mm, Habitat Features
537	*Melaleuca quinquenervia*	Broad-leaved Paperbark	75	9	16	14	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm, Vine growth
538	*Melaleuca quinquenervia*	Broad-leaved Paperbark	29	3.48	6	4	Poor	Poor	C	Head died out
539	*Melaleuca quinquenervia*	Broad-leaved Paperbark	28	3.36	6	3	Poor	Poor	C	Head died out
540	*Melaleuca quinquenervia*	Broad-leaved Paperbark	58	6.96	18	10	Fair	Typical	C	Deadwood over 25mm
541	*Melaleuca quinquenervia*	Broad-leaved Paperbark	63.13	7.58	18	10	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm
542	*Lophostemon suaveolens*	Swamp Box	14	2	10	5	Fair	Typical	C	Vine growth
543	*Lophostemon suaveolens*	Swamp Box	49	5.88	10	9	Fair	Poor	C	One sided
544	*Lophostemon suaveolens*	Swamp Box	66.48	7.98	15	13	Fair	Typical	B	Deadwood over 25mm
545	*Eucalyptus tereticornis*	Forest Red Gum	15	2	6	2	Fair	Typical	C	
546	*Corymbia intermedia*	Pink Bloodwood	17	2.04	5	2	Fair	Typical	C	Vine growth
547	*Lophostemon suaveolens*	Swamp Box	12	2	4	2	Fair	Typical	C	
548	*Corymbia intermedia*	Pink Bloodwood	15	2	6	5	Fair	Typical	C	
549	*Corymbia intermedia*	Pink Bloodwood	51	6.12	21	13	Fair	Typical	C	Deadwood over 25mm
550	*Stag*	Dead tree	75	9	20	9	Dead	Dead	C	Deadwood over 25mm, Decay, Vine growth
551	*Eucalyptus pilularis*	Blackbutt	59	7.08	18	13	Poor	Poor	C	Kino flow , Wound

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
552	*Eucalyptus pilularis*	Blackbutt	49	5.88	18	13	Fair	Poor	C	One sided
553	*Eucalyptus pilularis*	Blackbutt	62.43	7.49	19	14	Fair	Typical	C	Deadwood over 25mm
554	*Eucalyptus racemosa*	Queensland Scribbly gum	58	6.96	19	12	Fair	Poor	C	Broken Limbs, Epicormic Growth, Wound
555	*Eucalyptus racemosa*	Queensland Scribbly gum	36	4.32	17	9	Fair	Poor	C	Deadwood over 25mm
556	*Eucalyptus pilularis*	Blackbutt	96.11	11.53	23	18	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm
557	*Corymbia trachyphloia*	Brown Bloodwood	15	2	6	3	Fair	Typical	C	
558	*Eucalyptus pilularis*	Blackbutt	63.13	7.58	23	11	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm
559	*Eucalyptus racemosa*	Queensland Scribbly gum	64	7.68	22	12	Fair	Typical	C	Deadwood over 25mm
560	*Eucalyptus seeana*	Narrow Leaf Red Gum	29	3.48	9	5	Fair	Typical	C	Co-dominant Limbs
561	*Melaleuca quinquenervia*	Broad-leaved Paperbark	49	5.88	17	6	Poor	Typical	C	Cavity, Deadwood, Head died out, Vine growth
562	*Melaleuca quinquenervia*	Broad-leaved Paperbark	35	4.2	12	8	Fair	Typical	C	Deadwood over 25mm
563	*Melaleuca quinquenervia*	Broad-leaved Paperbark	49	5.88	12	8	Fair	Typical	C	Deadwood over 25mm
564	*Melaleuca quinquenervia*	Broad-leaved Paperbark	26	3.12	10	6	Fair	Typical	C	
565	*Melaleuca quinquenervia*	Broad-leaved Paperbark	25	3	10	6	Fair	Typical	C	
566	*Melaleuca quinquenervia*	Broad-leaved Paperbark	26	3.12	9	4	Fair	Typical	C	
567	*Eucalyptus seeana*	Narrow Leaf Red Gum	42	5.04	22	1	Fair	Typical	C	Deadwood over 25mm
568	*Melaleuca quinquenervia*	Broad-leaved Paperbark	38.29	4.59	16	6	Fair	Typical	C	Co-dominant Limbs
569	*Lophostemon suaveolens*	Swamp Box	15	2	4	2	Fair	Typical	C	
570	*Melaleuca quinquenervia*	Broad-leaved Paperbark	36.89	4.43	14	5	Fair	Typical	C	Co-dominant Limbs
571	*Melaleuca quinquenervia*	Broad-leaved Paperbark	44.94	5.39	15	7	Fair	Typical	C	
572	*Melaleuca quinquenervia*	Broad-leaved Paperbark	52.44	6.29	15	7	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm
573	*Melaleuca quinquenervia*	Broad-leaved Paperbark	40	4.8	13	4	Fair	Typical	C	Vine growth
574	*Eucalyptus racemosa*	Queensland Scribbly gum	59	7.08	20	14	Fair	Typical	B	Deadwood over 25mm
575	*Eucalyptus racemosa*	Queensland Scribbly gum	76	9.12	22	16	Fair	Typical	B	Deadwood over 25mm
576	*Eucalyptus racemosa*	Queensland Scribbly gum	92	11.04	22	16	Poor	Typical	C	Broken Limbs, Deadwood over 25mm, Lightning Damage, Vine growth
577	*Eucalyptus racemosa*	Queensland Scribbly gum	61.77	7.41	21	16	Fair	Typical	C	Deadwood over 25mm

Tree Id	Botanical Name	Common Name	DBH [cm]	TPZ [m]	Height [m]	Spread [m]	Health	Form	Cat	Comments
578	*Eucalyptus racemosa*	Queensland Scribbly gum	70.8	8.5	21	16	Fair	Typical	C	Deadwood over 25mm
579	*Eucalyptus pilularis*	Blackbutt	76	9.12	24	15	Fair	Typical	B	Deadwood over 25mm
580	*Eucalyptus pilularis*	Blackbutt	61	7.32	23	14	Fair	Typical	C	Deadwood over 25mm
581	*Eucalyptus pilularis*	Blackbutt	46	5.52	23	14	Fair	Typical	C	Deadwood over 25mm, One sided
582	*Eucalyptus pilularis*	Blackbutt	72	8.64	24	15	Fair	Typical	C	Deadwood over 25mm, Unattached Branches
583	*Eucalyptus racemosa*	Queensland Scribbly gum	79	9.48	24	15	Fair	Typical	C	Broken Limbs, Deadwood over 25mm
584	*Eucalyptus pilularis*	Blackbutt	72	8.64	24	16	Fair	Typical	C	Co-dominant Limbs, Deadwood over 25mm, Included bark
585	*Eucalyptus seeana*	Narrow Leaf Red Gum	27.8	3.34	8	4	Fair	Typical	C	
586	*Stag*	Dead tree	67	8.04	20	9	Dead	Dead	C	Deadwood over 25mm, Decay, Vine growth
587	*Eucalyptus pilularis*	Blackbutt	99	11.88	26	18	Good	Typical	A	Deadwood, Deadwood over 25mm
588	*Eucalyptus racemosa*	Queensland Scribbly gum	74	8.88	25	17	Fair	Typical	C	Broken Limbs, Deadwood over 25mm, Pest Infestation
589	*Corymbia torelliana*	Cadaghi	29	3.48	9	7	Fair	Typical	R	
590	*Eucalyptus pilularis*	Blackbutt	80	9.6	27	18	Fair	Typical	B	Deadwood over 25mm
591	*Eucalyptus racemosa*	Queensland Scribbly gum	51	6.12	20	15	Fair	Typical	C	Deadwood over 25mm
592	*Eucalyptus racemosa*	Queensland Scribbly gum	107	12.84	22	14	Poor	Poor	C	Broken Limbs, Cavity, Deadwood over 25mm, Habitat Features
593	*Angophora leiocarpa*	Smooth Bark Apple	38	4.56	10	9	Fair	Poor	C	Broken Limbs, Epicormic Growth, One-sided
594	*Melaleuca quinquenervia*	Broad-leaved Paperbark	70	8.4	18	10	Fair	Typical	C	Vine growth
595	*Stag*	Dead tree	53	6.36	17	11	Dead	Dead	C	Deadwood, Deadwood over 25mm
596	*Eucalyptus tereticornis*	Forest Red Gum	75	9	26	15	Fair	Typical	B	Deadwood over 25mm
597	*Melaleuca quinquenervia*	Broad-leaved Paperbark	61	7.32	16	13	Fair	Typical	C	
598	*Melaleuca quinquenervia*	Broad-leaved Paperbark	74	8.88	17	14	Poor	Typical	C	Deadwood over 25mm
599	*Melaleuca quinquenervia*	Broad-leaved Paperbark	63	7.56	17	14	Fair	Typical	C	Deadwood over 25mm

Table Legend:			
Health	**Form**	**Aged Class**	**Further Detail**
G: Good	G: Good	J – Juvenile	DBH - Diameter at Breast Height measured at 1.4m above ground level
F: Fair	F: Fair	FTLM – Full to Late Maturity	DBH is the circumference divided by π
P: Poor	P: Poor	M – Mature	TPZ - Tree Protection Zone displaced as metres radius
D: Dead	T: Typical	S – Senescent	Note: TPZ - minimum area is 2.0m / maximum area is 15m

Site Plans



Reference Page

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Appendix 1


Tree
Protection
Zone
NO ACCESS
Contact:
To reorder this sign, go to www.independentarb.com.au

Company Details

Independent Arboricultural Services

Independent Arboricultural Services, incorporated in May 2007, offers a completely independent arborist consulting and reporting service. Its directors and associated consultants bring extensive arboricultural knowledge gained over many years to this company. All consulting staff hold AQF Level 5 (Diploma of Arboriculture). Specialised advice when required, such as provision of survey mapping or engineering advice and certification is sourced from reputable professional providers according to site requirements as per Australian Standard 4970-2009.

Statement of Goal

To deliver continual improvement through the use of world's best arboricultural practices, supported by ongoing education and exposure to leading industry experts and research throughout the world.

Mission Statement

To provide timely, relevant and actionable consulting advice and practice based on the latest available and best scientific arboricultural knowledge.

Environmental Statement

Independent Arboricultural Services supports long term environmental sustainability sustainable sourced paper and ensuring all inks cartridges are recycled where possible.
Independent Arboricultural Services actively seeks to maintain a positive carbon footprint status and to that end is committed to protecting and preserving the environment, continuing to carry out tree planting, transplanting and replacement planting where practical, having planted in excess of 4000 trees in the first 2 years after its inception in May 2007 alone. Arboricultural recommendations involving the removal of tree/s will include replanting at a minimum ratio of 2 trees for any tree removed where possible. All arboricultural recommendations are made in accordance with world's best arboricultural practice and within the Australian Standards AS 4373-2007 Pruning of amenity trees and AS 4970 – Protection of trees on development sites so as to ensure optimal outcomes for all living trees.
Independent Arboricultural Services acknowledges the benefits of healthy trees with good vigour and vitality and actively promotes better understanding in the general community of the contribution that trees make to reducing greenhouse gasses, the contribution of trees to better water retention and the prevention of soil erosion, the ability of trees to provide protection to infrastructure by diffusing strong winds in weather events and the contribution of trees to general liveability within the urban environment.
It is an acknowledged fact that air temperature beneath a tree canopy can be in excess of 5° Celsius lower than the surrounding ambient air temperature thereby reducing reliance on greenhouse gas producing air conditioners and coal fired power sources.